Herbicide Directory

Plant Growth Regulator (PGR) Directory

Weed Control

The use of herbicides to control weeds is often important in determining the success or failure of a crop. However, many other practices can be implemented before and after a herbicide application to help reduce weed competition. The use of these practices is termed Integrated Weed Management.

Integrated Weed Management

A farming system that uses an array of inter-dependent cultural, biological, mechanical and herbicidal weed control practices is implementing Integrated Weed Management (IWM). It is essential that IWM involve a variety of tools including the rotation and/or mixes of available herbicide groups, ensuring that weeds are exposed to a diverse range of control mechanisms. The goal of IWM is to improve the health and vigour of crops so that they may out-compete weeds emerging in the stand. This helps to reduce selection for resistance to any single control agent and to delay or prevent the development of herbicide resistant weeds.

Practicing IWM does not mean abandoning chemical weed control, just relying on it less exclusively. For example:

- You may decide to choose a taller wheat variety or a tall, viny pea variety for a certain field. These crop selections will compete strongly with weeds, possibly allowing you to skip a spray operation in more competitive crops.
- You could insert a short-term forage crop into your crop rotation. Studies show that short-term (3 year) alfalfa stands can reduce wild oat and green foxtail populations by up to 80 percent the year after terminating the forage crop.
- Early sown barley may give you enough of a "jump" on the weeds that you can avoid herbicide applications.
- Use of vigorous, high-quality seed, sown shallow, can give you better crop competition than poor-quality or deeply sown crop seed.
- Banding nitrogen near the seed-row can give your crop an advantage over weeds, whereas broadcasting fertilizer benefits both crop and weed equally.

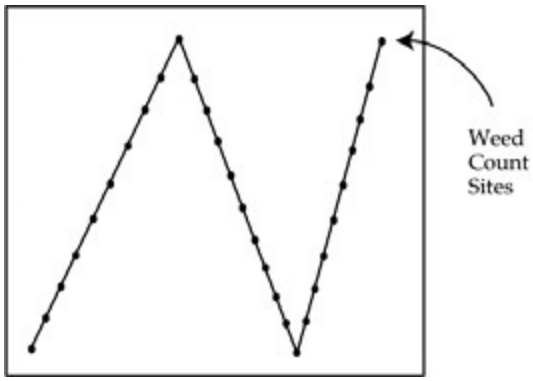
For more information, refer to "Integrated Weed Management: Making it Work on Your Farm" factsheet, available from Manitoba Agriculture.

Making Spray Decisions

Field Scouting

Field scouting is an important tool for making informed spray decisions. Accurately assessing the type and number of weeds in the field will help you determine if a spray operation is necessary. The scouting pattern diagram on this page provides a guideline for scouting a field. The entire field should be walked to get a feel for the distribution and species of the weeds present. A minimum of 20 weed counts should be taken across the field. A smaller number may be used, but be aware that accuracy decreases as the number of counts gets smaller. Count the number of weeds in a 1 square metre or a 0.25 square metre area and divide the total number of weeds by the number of counts taken to obtain an average for the field. If using 0.25 square metre samples, make sure to multiply by four so your average is for a 1 square metre area.

Some weeds are not distributed uniformly and may be found in patches (for example, Canada thistle) or in low spots. As well, the type and number of weeds found along the field edges may be very different from those found inside the field. These areas should be considered separate from the rest of the field. If possible, patches, low spots, and field borders should be treated separately, as field-wide spraying may not be required. Look out for new invading weeds and patches of herbicide-resistant weeds. Herbicide-resistant weeds and new invaders should be removed (manually if necessary), regardless of their number, to prevent them from spreading and becoming a serious control problem. Mapping your field's weed problems will allow you to monitor the spread of weed patches over time and help you assess the effectiveness of your control program.



Yield Losses Caused by Weeds

Knowing the amount of crop yield loss caused by a given weed density will help you decide if a spray operation is required. The tables on the following pages give an indication of the yield loss caused by some of the important grassy weeds.

THE FOLLOWING TABLES SHOULD BE USED ONLY AS A GUIDE.

The figures are based on Western Canadian research trials and will not be accurate all of the time. The yield loss values apply only to healthy, well fertilized crops with good stand establishment. Crops that are diseased or emerged unevenly will not compete well with weeds and will suffer larger yield losses than indicated in these tables. The yield loss figures are based on competition from a single weed species only. Other weeds, such as wild mustard or Canada thistle, must be controlled if the figures are to be accurate. As well, the tables are based on competition from normal height crops. Semi-dwarf or hybrid varieties may not compete as well with weeds and the figures may not be accurate in these cases.

Table 1. Yield Losses (Percent) in Wheat Caused by Wild Oats.

	Wild Oats Density (number/m^2)																
	1	2	4	6	8	10	12	14	16	18	20	25	30	35	40	45	50
Wild oats are 1 leaf stage ahead of the crop	1	2	4	6	8	10	12	14	15	17	19	22	26	29	32	34	37
Wild oats are the same leaf stage as the crop	1	1	2	4	5	6	7	8	9	10	11	14	16	18	20	22	24
Wild oats are 1 leaf stage behind the crop	0	1	1	2	3	3	4	5	5	6	7	8	10	11	13	14	15

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Figure 1. Spray Decision Guideline for Wild Oats in Wheat.

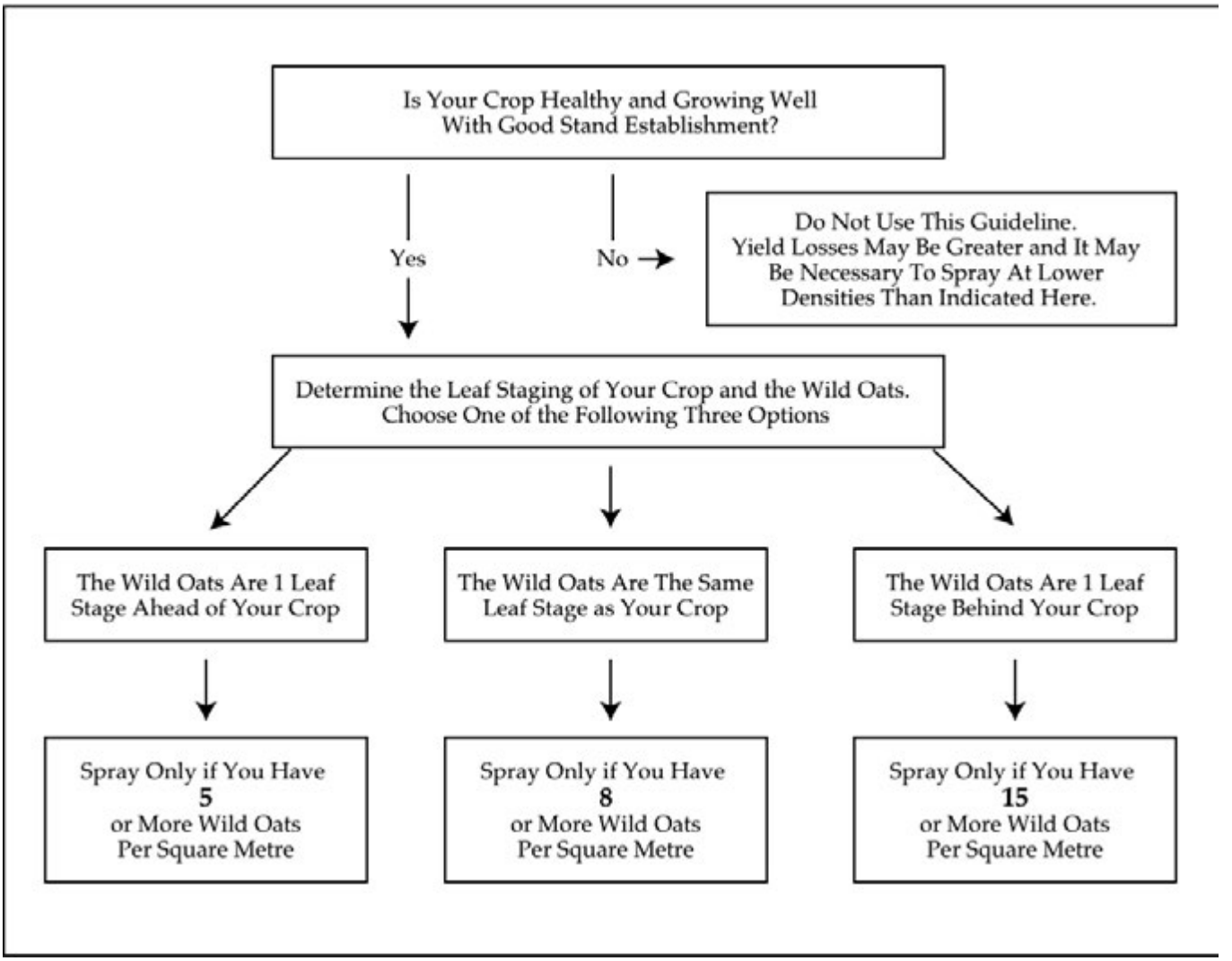
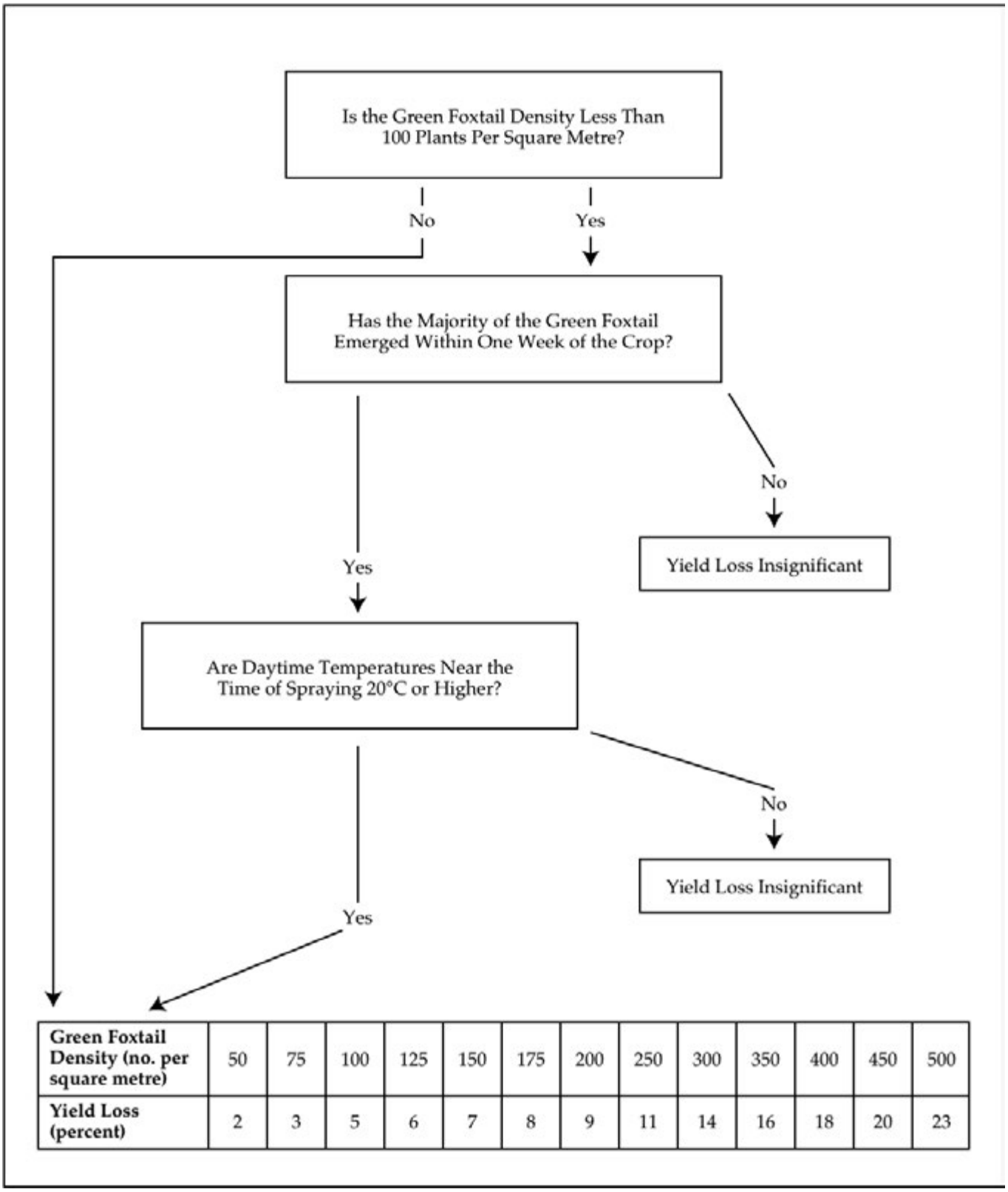


Table 2. Yield Losses (Percent) in Wheat Caused by Green Foxtail (Wild Millet).



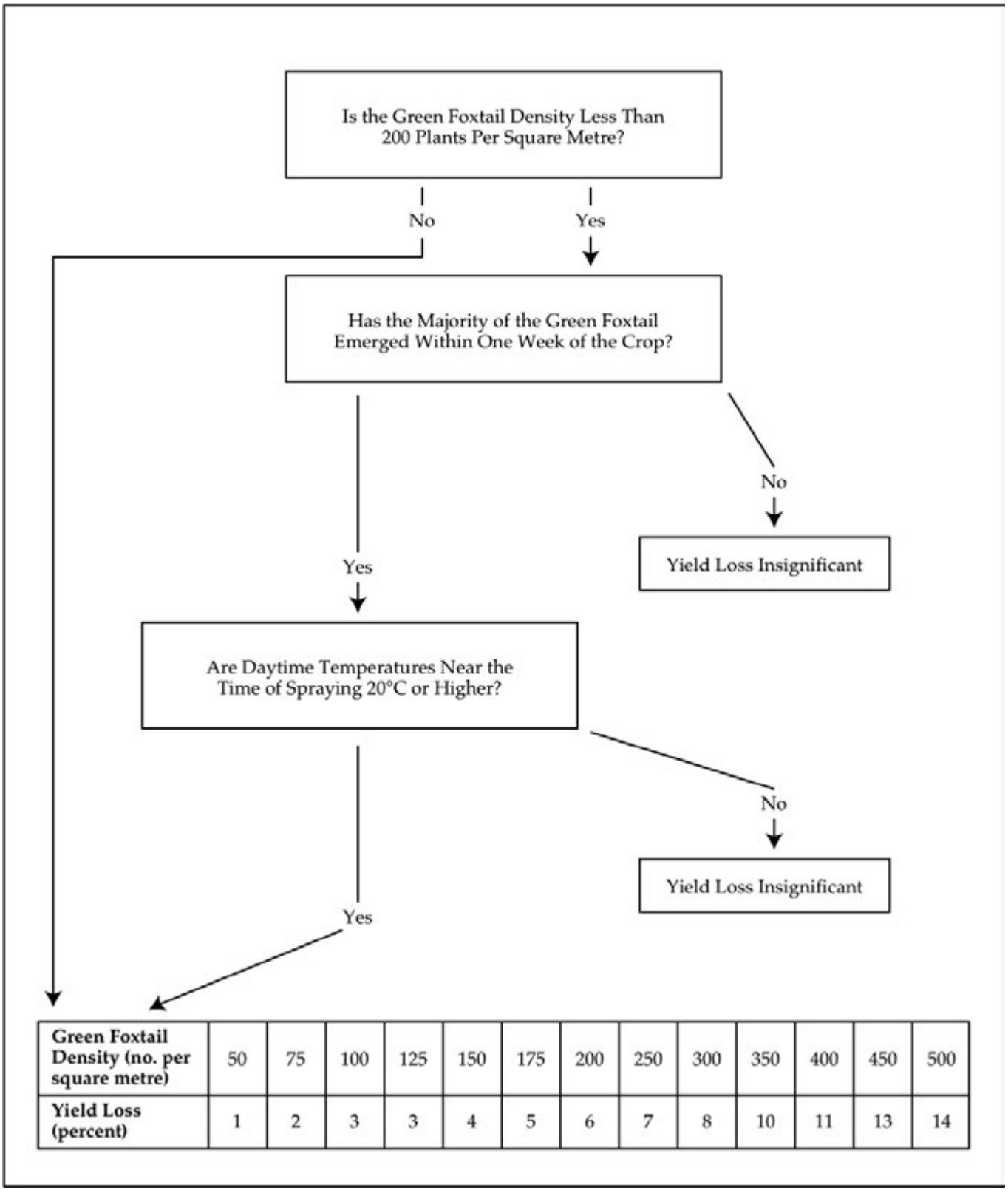
Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	2	3	5	6	7	8	9	11	14	16	18	20	23

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 3. Yield Losses (Percent) in Barley Caused by Wild Oats.

Crop Density (plants/m^2)	Relative Emergence	Wild Oat Density (plants/m^2)											
		1	5	10	15	20	25	30	40	50	70	100	150
300	Wild oats are 1 leaf stage ahead of the crop	0.3	1.4	2.8	4.1	5.4	6.7	8.0	10.3	12.6	16.8	22.4	30.2
	Wild oats are the same leaf stage as the crop	0.3	1.3	2.5	3.7	4.8	6.0	7.1	9.2	11.3	15.1	20.3	27.6
	Wild oats are 1 leaf stage behind the crop	0.2	0.9	1.7	2.6	3.4	4.2	5.0	6.6	8.1	11.0	15.0	20.9
225	Wild oats are 1 leaf stage ahead of the crop	0.4	1.9	3.6	5.4	7.0	8.6	10.2	13.1	15.9	20.9	27.4	36.2
	Wild oats are the same leaf stage as the crop	0.3	1.6	3.1	4.6	6.1	7.5	8.8	11.4	13.9	18.4	24.4	32.6
	Wild oats are 1 leaf stage behind the crop	0.2	1.0	2.0	3.0	4.0	4.9	5.8	7.6	9.3	12.6	17.1	23.6
175	Wild oats are 1 leaf stage ahead of the crop	0.5	2.3	4.6	6.7	8.7	10.7	12.5	16.1	19.3	25.1	32.3	41.8
	Wild oats are the same leaf stage as the crop	0.4	1.9	3.8	5.6	7.3	8.9	10.5	13.6	16.4	21.6	28.2	37.1
	Wild oats are 1 leaf stage behind the crop	0.2	1.1	2.3	3.4	4.4	5.5	6.5	8.5	10.4	14.0	18.9	25.9

Table 4. Yield Losses (Percent) in Barley Caused by Green Foxtail (Wild Millet).



Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	1	2	3	3	4	5	6	7	8	10	11	13	14

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 5. Yield Losses (Percent) in Canola Caused by Wild Oats and Volunteer Cereals.

	Weed Density (number/m^2)												
	1	2	4	6	8	10	12	14	16	18	20	25	30
Wild oats	3	5	6	8	9	10	11	12	13	14	15	16	18
Volunteer wheat	1	3	6	8	10	11	12	14	15	16	17	19	21
Volunteer barley	3	5	8	10	12	14	15	17	18	19	20	23	25

Sources: Dew and Keys, Agriculture Canada (Lacombe, Alberta); and O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Figure 2. Spray Decision Guideline for Wild Oats and Volunteer Cereals in Canola.

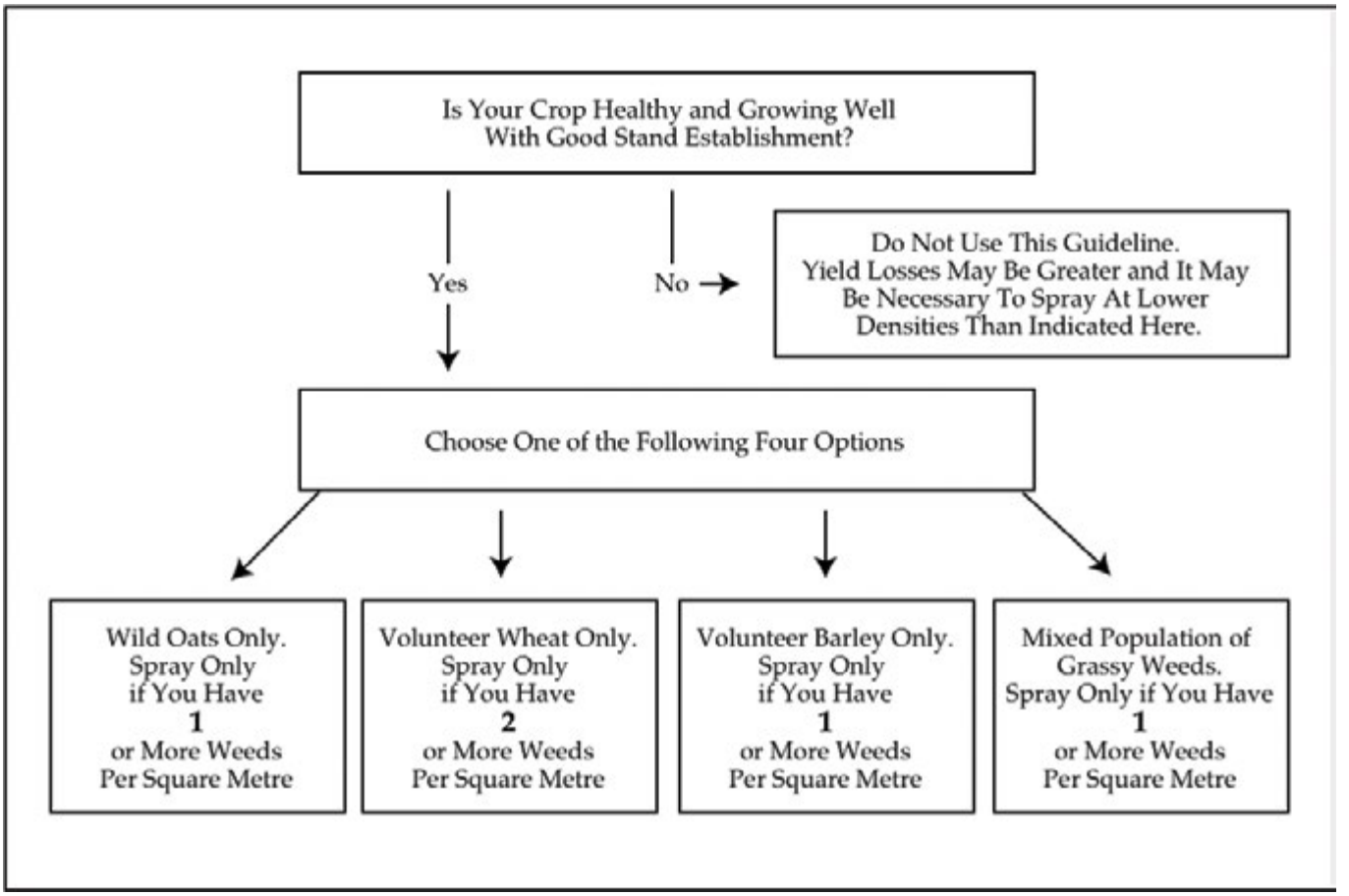
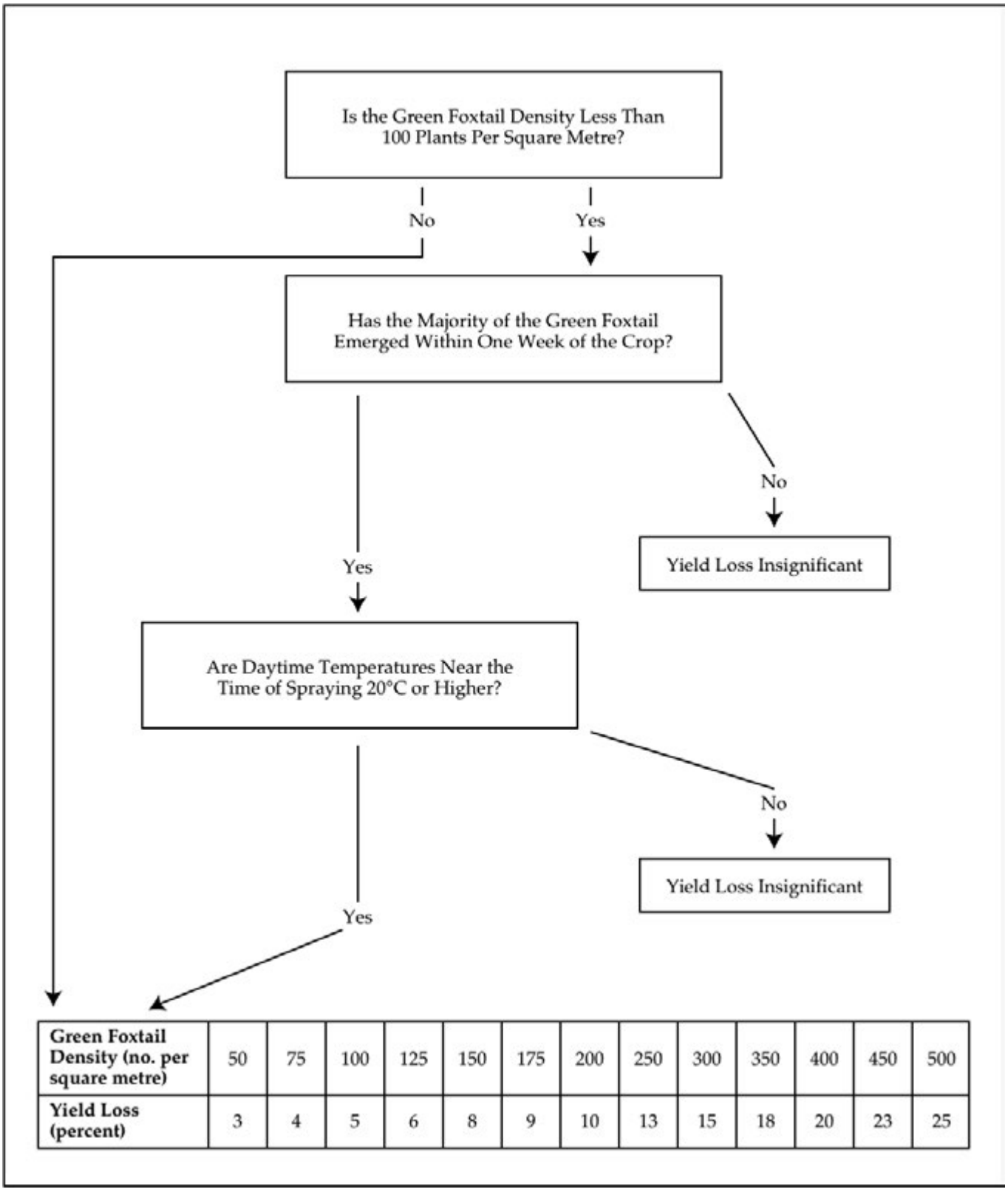


Table 6. Yield Losses (Percent) in Canola Caused by Green Foxtail (Wild Millet)



Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	3	4	5	6	8	9	10	13	15	18	20	23	25

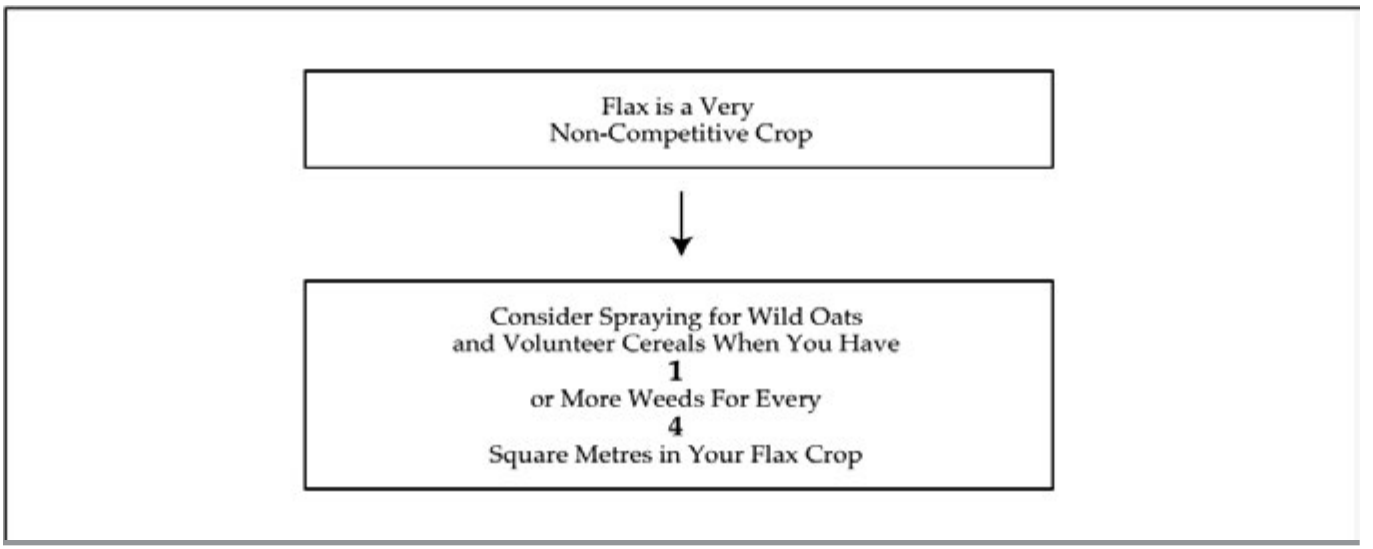
Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 7. Yield Losses (Percent) in Flax Caused by Wild Oats and Volunteer Cereals.

	Weed Density (number/m^2)									
	1	2	3	4	5	6	7	8	9	10
Wild oats	6	8	10	12	13	15	16	17	18	19
Volunteer wheat	6	11	15	18	22	24	27	29	31	33
Volunteer barley	6	12	16	21	24	28	31	34	36	39

Sources: Dew and Keys, Agriculture Canada (Lacombe, Alberta); and Friesen et al., University of Manitoba (Winnipeg, Manitoba)

Figure 3. Spray Decision Guideline for Wild Oats and Volunteer Cereals in Flax.



Deciding to Spray – Economic Thresholds and Herbicide Resistance

An economic threshold is the level of infestation at which lost yield exceeds the cost of the chemical and its application. Determining the economic threshold will help you decide if a spray operation is necessary.

The following example outlines how to determine an economic threshold:

You have a wild oat problem in your wheat. After a thorough field scouting, you have determined that your field has an average density of 35 wild oats per square metre. You know that the crop and weeds are at the same leaf stage. Using Table 1, choose the "Same Leaf Stage" row and read across to 35 wild oats per square metre. You will find that your yield loss will be about 18 percent.

You think it could be a 60 bushel per acre wheat crop, and expect to get $6 per bushel for it. Therefore:

- 60 bushels x 0.18 (percent of expected yield loss) = 10.8 bushels per acre of lost yield
- 10.8 bushels x $6 per bushel = $64.80 per acre of lost income

Now find out the price of your herbicide. Most wild oat herbicides for wheat cost between $10 to $25 per acre. In this case, lost income exceeds the cost of the herbicide and application, so spraying would be justified.

Alternatively, you may want to use the figures provided with some of the yield loss tables. These figures provide flowcharts to assist you in making spray decisions. In some cases the flowcharts may indicate to spray when you do not have an economic threshold weed density, but most times they will prevent you from spraying unnecessarily.

Another factor to consider when deciding whether to spray is your herbicide rotation. A minimum one-in-three rotation of herbicide groups is currently recommended to delay the development of herbicide resistance for weeds such as wild oats and green foxtail. Skipping a spray operation will give you an extra year of flexibility in your herbicide rotation. This means that you have one extra herbicide group to choose from the year after you skipped the spray operation. When making spray decisions, the ability to rotate herbicides should be considered in addition to the economics of spraying.

Making the Spray Decision

Remember that economic thresholds should be used only as guides when making a spray decision. Lost income caused by dockage or downgrading must also be considered. FIELDS THAT ARE NOT SPRAYED THIS YEAR HAVE A HIGHER POTENTIAL FOR PROBLEMS THE FOLLOWING YEAR BECAUSE OF WEED SEED RETURN. A farmer's experience and common sense play an important role when deciding to spray. Used properly, however, the economic threshold can be an important tool in making spray decisions.

Brush Control

Woody species can have both positive and negative characteristics. Many woody plants are useful for fruit, their ornamental qualities or wood for fuel or for building materials. However, when useful species dominate landscapes where they are not desired, they require controlling. Other woody species, and there may be some overlap with the species above, can be toxic to people and animals, or become invasive on the landscape, reducing utilization of the land for other purposes like grazing, recreation, sightlines for transportation corridors or protecting against the destruction of infrastructure.

Control of woody species can be challenging and require a different approach from the control of herbaceous plants whose tops die down to the ground each year.

Woody species also provide an opportunity for management through physical cutting or plowing/dozing the tops to severely compromise the woody plant's ability to survive. While these methods can be quite effective, they can also encourage regrowth from the cut surface or from underground roots. The use of herbicides in conjunction with these operations can result in better overall results, by suppressing or preventing the return of secondary growth of that plant. Similarly, fire can sometimes be used to reduce woody growth on a wider landscape basis, but may not be targeted enough for all situations, and comes with some risk of escape and resulting liability from unintended destruction of property.

While herbicides can be an effective tool for managing woody species, timing can be different than with the management of herbaceous plants. Approaching control of perennial plants with herbicides is often more successful when the perennial plant is treated when stored energy levels are low. The energy reserve in herbaceous perennial plants typically declines through the season until the point when energy begins to flow to the root again after flowering. This results in a low ebb of energy reserves typically just as flowers emerge. However, woody species have their low energy ebb just after they leaf out in the spring, and the rest of the entire season is spent rebuilding those reserves and setting new buds for the following year. As a result, the susceptibility to the timing of systemic herbicide application differs between herbaceous and woody plants. In perennial herbaceous plants, this vulnerability occurs in late summer and fall as plants shift from fueling aerial growth to fueling the building of root reserves for winter. In woody plants, however, plants are particularly vulnerable just after leafing out and then that vulnerability gradually declines as the growing season progresses.

As the control of woody species often occurs in congested sites, where control needs to be very localized and targeted to a single individual or interspersed undesirable individuals within a collection of desirable individuals, there are additional application methods that differ from broadcast applications that are utilized in open habitats. The height of woody vegetation may also restrict broadcast applications to delivery with aircraft, ground applications need to be more specialised. Below are a series of approaches that can be used to apply herbicide to control woody species.

Foliar

Foliar applications, as mentioned before are somewhat limited by the height of the canopy, unless executed by aircraft. But foliar treatment can also take place from the ground using vehicle-based methods or hand wand applications. Vehicle based sprayers can include those with solid booms with relatively conventional nozzles, or those with 'boomless nozzles' that deliver a fan of spray horizontally from the delivery vehicle over the target. The advantage to boomless nozzles is that they allow the vehicle to navigate tight pathways and spray past obstacles without having to physically retract a rigid boom. Delivery vehicles for boomless nozzles can range from all-terrain vehicles to tractors to road based vehicles such as trucks.

Foliar applications can also be made from the ground using single nozzle handheld systems. Low volume systems that are most common in vehicle delivery systems may also be useful for low growing and/or young woody plants (below waist height) like those used for applying to herbaceous plants. High volume applications are useful for larger woody plants and higher pressure, higher volume wands can reach the upper reaches of woody plants of moderate height that are taller than the applicator but not greatly so. The higher volumes delivering larger droplets help to reduce the risk of off target drift to some degree, but caution should still be taken when treating taller vegetation using this approach that applications take place under conditions that minimize the risk of drift and takes place in areas where drift is less problematic.

Wipers or rollers may also be used to apply herbicide solutions to short brush species. This method has minimal off target drift since the herbicide solution is applied to the absorptive material of the roller drum or wiper using low pressure and the roller/wiper makes direct contact with the target to deliver the herbicide solution to the plant.

Basal and Single Stem Treatments

Cut stump

The principal behind cut stump treatments is straight forward. The tree is cut down. Then shortly after the tree is felled, a treatment is applied to the area of the cut surface where the wood and the bark meet called the cambium. The cambium is the living part of the stem of woody plants and any material inside of that thin layer (wood) or outside of that layer (bark) is inert. The cut stump application is designed to allow the treatment to move into that live layer and circulate to the buds on the roots or just below the cut region that may produce regrowth or 'suckers'.

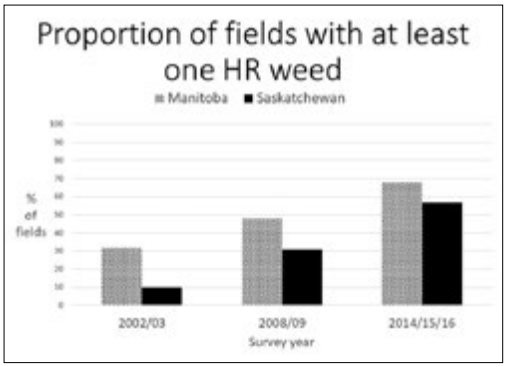
Basal bark treatments

Basal treatments are usually used on smaller diameter woody plants of 6 inches (15 cm) or less with relatively thin bark. The thinner bark of these young saplings allows the penetration of the herbicides through to the cambium where they either kill a band of the cambium around the tree effectively girdling it and thereby killing the tree, or to allow the treatment to circulate to growing points. Herbicide carriers are often waterless, using mineral or vegetable oil carriers, allowing these applications to take place year-round.

- ***Low Volume*** applications that treat on side of the stem thoroughly with spray solution from the base of the stem upwards for at least one foot (30 cm).
- ***Streamline*** applications use a thins stream of solution to an area of the stem that is about 1 to 1.5 feet (30 to 50 cm) above the base of the stem. The stream of solution is applied around the entire circumference of the stem in a roughly 2 inch (5 cm) band.
- ***Frilling*** applications, sometimes referred to as 'hack and squirt', are used on larger trees that have developed a thicker bark layer that makes direct treatment less effective. An axe, hatchet or machete is used to cut through the bark and penetrate past the cambium layer slightly. The resulting frill that is produced acts as a cup to hold the herbicide solution. Concentrated herbicide solution is applied to the frill so that it contacts the cambium layer. This can be done through spraying, dribbling, or squirting the herbicide solution into the frill. Frills should be made at relatively close regular intervals around the girth of the tree to girdle it.
- ***Injection*** applications use either heavy duty needles, spikes, hand drills or capsules to penetrate the bark layer of woody plants to facilitate the entry of the herbicide solution into the tree. Similar to the frills, the injection sites should be made a regular intervals to ensure treatment of the entire stem.

Weed Resistance to Herbicides

In recent years, the number of herbicide-resistant weeds and the areas they infest have increased.



Most herbicide-resistant weed infestations have developed following repeated use of the same herbicide (or herbicide group) for a number of years on the same field. Growers who have developed weed resistance on their farms will typically see a weed, which is normally controlled by a herbicide, escape uncontrolled after a number of years of use of the same product or product group. Individual plants may be resistant to 1.5 up to 10 or more times the normal field rate.

Herbicide Groups

To help you plan your herbicide program, the following table lists "herbicide groups." To slow down the process of developing weed resistance, tank mix products from different groups to control the same key weeds and/or use products from different groups from year to year on your fields. 'Herbicide Layering' is another way to use multiple herbicide groups that control of the same weed for managing herbicide resistance. Layering involves application of a soil active herbicide followed by in-crop foliar sprays. The soil applied herbicide provides a base for control and the foliar herbicide picks up any stragglers. Soil applied herbicides also help to control certain difficult to control weeds as well as improving crop yields by removal of weeds in the crop's sensitive early growth stage.

Table 8. Herbicide Mode of Action and Chemical Family for Resistant Weed Management

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack† Tradenames*
Unknown (0)	pelergonic acid	*Beloukha*	-
	ammonium salts of fatty acid	*Axxe*	-
ACC-ase Inhibitor (1) Aryloxyphenoxy propionic acid "Fop"	clodinafop	*Horizon NG=Foothills NG, Cadillac One=Ladder All In, Aurora=Cadillac= Foax=Ladder 240 EC= Signal=Slam'-R = Viking Clodinafop= Winner*	*Signal FSU*†, Traxos, TraxosTwo*†*
	fenoxaprop	*Puma Advance, HellCat=Vigil WB =Viking Fenoxaprop*	*Cirray, Tundra*
	quizalofop	*Assure II=Yuma GL=COOP/IPCO Contender II=Quiz=Idol= Leopard= ADAMA Quizalofop Elegant 10EC=Marshall =Caziva Ultra Q =Viking Quizalofop*	*Boa IQ*†, Anaconda*†, Odyssey Ultra Q*†, Solo Ultra Q*†, Davai Q Plus*†, Select Plus*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack† Tradenames*
Cyclohexanedione "Dim"	clethodim	*Select=Centurion= Advantage Clethodim 240= Antler 240 EC =Arrow=Clethodim 240= IPCO GraminX=Independence=Shadow RTM= CO-OP Patron II=Statue =Deputy=Viking Clethodim, Arrow-All-In =Shadow XL=IPCO GraminX Complete=CO-OP Patron Complete, Antler Unpacked*	*Ninja Master*†, Samurai Master†*, Select Plus*
	sethoxydim	*Poast Ultra*	-
	tralkoxydim	*Achieve=Bison=Marengo=Nufarm Tralkoxydim*	-
Phenylpyrazolin "Den"	pinoxaden	*Axial =Pina =Ace 50 =Viking Pinoxaden, Brazen II =Epic=Trondus =CO-OP/IPCO Avant =EPCI II=Advantage Pinoxaden*	*Avenza*†, Axial Xtreme*, Axial Xtreme iPak*†, BroadBand*, Cirray, Rezuvant†*, Traxos, TraxosTwo*†*
ALS Enzyme Inhibitor (2) Imidazolinone "Imi"	imazamox	*Solo ADV, Davai 80SL= Amity WDG=Samuari=Next =Dakota =Viking Imazamox, Venim, Image*	*Altitude FX3*†, Ares SN, Duet=Judo=Ninja=Quasar† =Viking Skien, Anaconda*†, Boa Pro*†, Ninja Master*†, Samurai Master†*, Odyssey NXT, Odyssey Ultra Q*†, Python*†, Solo Ultra Q*†, Viper ADV*=Benz* , Davai Q Plus*†*
	imazapyr	*Arsenal Powerline*	*Ares SN*
	imazethapyr	*Pursuit 240=Kamikaze=Phantom =Viking Imazethapyr*	*Ninja Master*†, Duet=Judo=Ninja, Odyssey NXT, Odyssey Ultra Q*†*
Sulfonylurea "SU"	ethametsulfuron	*Muster*	-
	foramsulfuron	*Option 2.25 OD*	-
	halosulfuron	*Permit WG*	-
	metsulfuron	*Ally =Plotter =Ally Toss-N-Go=MPower Pro, Escort*	*Clearview*, Express Pro, Navius Flex*=TruRange*, Reclaim II*†, Sightline*†, Smoulder*, Travallas**
	nicosulfuron	*Accent=Nicosh , Accent IS*	*Steadfast IS*
	rimsulfuron	*Prism=Sharda Rimsulfuron=Hinge, Sortan IS*	*Steadfast IS*
	thifensulfuron	*Pinnacle=Volta*	*Ammo DR†*, Audible*†, Barricade II*† =Foxxy R*†, Broadside*†=Refine M*†, Foxxy CRX*†, Predicade*†, Refine SG=Deploy=MPOWER RX =Viking Avesta, Retain SG*†=Foxxy Pro RX*† =Viking Navik*†, Sentrallas*, Signal FSU*†, Travallas*, Triton K*†*
	tribenuron	*Express SG=MPOWER Extra= Inferno WDG=Involve 50WDG=Cleat =Tribe 75WDG =Viking Tribenuron*	*Ammo DR†*, Audible*†, Barricade II*† =Foxxy R*†, Broadside*†=Refine M*†, Express Pro, Foxxy CRX*†, Inferno Duo=Himalaya Extra† =Viking Visby†, Intruvix*†, Intruvix II*†, Luxxur†, Predicade*†, Refine SG=Deploy= MPOWER RX=Boost=Draft, Retain SG*†=Foxxy Pro RX*† =Viking Navik*†, Revenge E*†, Signal FSU*†, Travallas, Triton K*†*
Triazolopyrimidine "TZP"	florasulam	*PrePass Flex, Priority=Battlefront=Blitz= Flora =Advantage Florasulam 50 SC=Clorvante=Bombard 50 SC=Start 25 WDG =Viking Florasulam*	*Alloy*†, Akito*, Avenza*†, Broadband*, Cirpreme/ Cirpreme XC*†, Exhilarate†*, Inferno Trio*, Topline*†, Himalaya Pass†*, Korrex II*†, Deathstar*†, Paradigm PRE†, PrePass XC*†, Steel* =Battlestar*= Viking Bodo*, Outshine*†, Stellar Unpacked*†, Stellar XL*, Thunderhawk†*, Tridem*†*
	pyroxsulam	*Simplicity*	*Erebus Xtreme*, Rexade*†, Tandem*†, Tridem*†*
Sulfonylamino-carbonyltriazolinone "SACT"	flucarbazone	*Everest/Sierra 3.0 AG , Himalaya=Viking Flucarbazone*	*Himalaya Pass†*, Inferno Duo=Himalaya Extra†=Viking Visby†, Inferno Trio*, Batalium**
	propoxycarbazone-sodium	*Olympus*	-
	thiencarbazone	*Varro*	*Predicade*, Varro FX*, Velocity m3**

Table 8. Herbicide Mode of Action and Chemical Family for Resistant Weed Management, *continued*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack‡ Tradenames*
Mitotic Inhibitor (3) Dinitroaniline (DNA)	ethalfluralin	*Edge MicroActiv =Advantage Ethalfluralin*	-
	trifluralin	*Treflan=Bonanza=Rival =Advantage Trifluralin=Thrill =Bonita*	*Fortress MicroActiv*= Advantage Triallate-Trifluralin**
Benzamide	propyzamide	*Kerb SC*	-
Growth Regulators (4) Phenoxy acetic acids	2,4-D amine	*2,4-D, USHA6, others*	*Restore II*
	2,4-D ester	*2,4-D Ester, Salvo, Lima 660EC , Viking 2,4-D Ester*	*Ammo DR†*, Leader*= Swipe*= Thrasher*=Thumper*, Blackhawk* , Blackhawk EVO*, Estaprop XT=Dichlorprop DX, Enforcer D*, Flurox- 24†=Rush 24†= Foxxy Pro† =Viking Kalmar† =Foxxy Extreme† =Attain XC†, Octtain XL =OSIM Plus=Rush 24 All In=CO-OP OcTTain XL-IPCO OcTTain XL, Reclaim*†, Reclaim II*†, IPCO/CO-OP Convex*† =Revenge Pro*†, Rexade*†, Retain SG*= Foxxy Pro RX*†, TraxosTwo*†, Triton K*†*
	2,4-D choline	-	*Enlist Duo*, Grazon XC/Aspect*
	2,4-DB	*Embutox, Cobutox, Caliber*	-
	Dichorprop (2,4-DP)	-	*Estaprop XT=Dichlorprop DX, Optica Trio, Oxbow*, Blackhawk EVO**
	MCPA amine	*MCPA Amine*	*Optica Trio, Sword, Tracker XP*
	MCPA ester	*MCPA LV ester, CheckMate, Media Brands*	*Alloy*†= Batalium*, Buctril M*=Badge II*= Brilliant*= Logic M*=Mextrol 450*=Canuck*, Curtail M, Enforcer M*= ForceFighter*†=Foxxy Canuck*†=CO-OP Emit*=IPCO Emit*=Pierce*, Exhilarate*†=CO-OP Exhilarate*†=IPCO Exhilarate*†, Goldwing*, Deathstar*†, Prestige XC† = Foxxy CM† =Esteem†, Pixarro†, Predicade*†, Prestige XL = Outshine*†, Stellar Unpacked*†= Stellar XL*, Thunderhawk†*, Topline*†, Trophy†=Foxxy M†, Truslate Pro=CO-OP/IPCO State*
	MCPA K+	*Various*	*Clovitox Plus, Topside, Tropotox Plus*
	MCPA Na (sodium)	-	-
	MCPB	-	*Clovitox Plus, Topside, Tropotox Plus*
	Mecoprop–p (MCBP)	*Mecoprop-P*	*Optica Trio, Sword, Tracker XP*
Benzoic acids	dicamba		
	• bapma salt	*Engenia*	-
	• Dimethylamine salt	*Ammo=Disha 480=Oracle =Viking Dicamba*	*Ammo DR†*, Intruvix*†, Korrex II*†, Sword, Tracker XP, Triton K* , Intruvix II**
	• Digycolamine salt	*Banvel VM, XtendiMax , XtendiMax 2*	*Pulsar=DiFlux, Roundup Xtend*
	• Sodium (Na) salt	-	*Distinct=Overdrive*
	• Isopropylamine	-	*Glykamba**
Pyridine-carboxylate	aminopyralid	-	*Clearview*†, Milestone, Restore II, Reclaim II*†, Restore NXT*, Sightline*†*
	aminocyclopyrachlor	-	*Navius Flex*=TruRange**
	clopyralid	*Lontrel=Pyralid=Clobber= Advantage Clopyralid 360 =Spur 360 =Viking Clopyralid*	*Akito*, Cirpreme/Cirpreme XC*†, Curtail M=Clobber M, =Certain=Spur-M =Viking Drammen, Eclipse†*, Foxxy CRX*†, Momentum, Inertia, Foxxy CM†=Prestige XC† =Esteem†, Prestige XL, Prominex* , Truslate Pro=CO-OP/IPCO State*

Table 8. Herbicide Site of Action and Chemical Family for Resistant Weed Management, *continued*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack† Tradenames*
Pyridyloxy carboxylates	fluroxypyr	*Ikwin=Fluro Star =Cavalier 180, Perimeter II =Cavalier 333*	*Akito*, Altitude FX3*†, Attain XC†=Flurox-24†= Foxxy Pro†=Rush 24† =Viking Kalmar†, Audible*†, Avenza*†, Axial Xtreme*, Axial Xtreme iPak*†, Barricade II*†=Viking Brevik*†, Foxxy R*†, Batalium*, Cirpreme XC*†, EnforcerD*, Enforcer M*= ForceFighter†*=Foxxy Canuck*†=CO-OP Emit*=IPCO Emit*=Pierce*, Erebus Xtreme*, Erebus Xtreme*, Foxxy CRX*†, Foxxy RCK*†, Foxxy MR*†, Infinity FX*†, Momentum, Inertia, Deathstar*†, OcTTain XL =OSIM Plus=Rush 24 All In=CO-OP OcTTain XL= IPCO OcTTain XL, Pixarro†, Predicade*†, Prestige XC†= Foxxy CM†=Esteem†, Prestige XL, Prominex*, Pulsar=DiFlux, Retain SG*†=Viking Navik*†, = Foxxy CRX*†, Rezuvant†*, Sentrallas*, Sightline*†, Signal FSU*†, Steel* =Battlestar* =Viking Bodo* =Alloy* =Outshine*†, Stellar Unpacked*†, Stellar XL*, Tandem*†, Travallas*, TraxosTwo*†, Tridem*†, Trophy†=Foxxy M† , Truslate Pro=CO-OP/IPCO State , Varro FX**
Pyridine carboxilic acid	florpyrauxifen	-	*Restore NXT*
	halauxifen		*Cirpreme/Cirpreme XC*†, Exhilarate*†= Co-op Exhilarate*†=IPCO Exhilarate*†, Paradigm PRE†*, Pixarro*†, Prominex*, Prospect*, Rexade*†, Rezuvant†**
	picloram	*Tordon 22K*	*Grazon XC/Aspect*
Quinoline carboxilic acid	quinclorac (dicots)	*Clever=Ingenious, Facet L*	*Advantage Glufosinate Plus*†*
Photosystem II Inhibitor (5) Triazine	atrazine	*Aatrex*	*Primextra II Magnum**
	simazine	*Princep Nine-T=Simazine 480*	-
Triazinone	hexazinone	*Velpar DF CU*	-
	metribuzin	*Sencor=TriCor=Squadron=Buzzin=Meter 75 DF, Metrix SC=Tricor LQ =Meteor*	*Strim MTZ* , IPCO Bifecta EZ**
Photosystem II Inhibitor (6) Benzothiadiazinones	bentazon	*Basagran=Benta Super=Beserk=Broadloom= Boa =Viking Bentazon, Basagran Forté*	*Hurricane*, Anaconda*†, Boa Pro*†, Python*†, Viper ADV* , Ransack*† =Benz* , Taipan*†*
Nitriles	bromoxynil	*Pardner, Brotex 240=Bromotril= Brox 240 EC= Starbuck, Brotex 480= Brotex 4AT*	*Batalium*, Leader*= Swipe*= Thrasher*=Thumper*, Axial Xtreme iPak*†, Buctril M*=Badge*= Brilliant*= Canuck*=Logic M*=Mextrol 450*, Certitude*†, Conquer*†=Revenge B*†, Emphasis*†=IPCO Octagon*†, Conquer II*, Enforcer D*, Enforcer M* =CO-OP/IPCO Emit*=Pierce*, ForceFighter*†=Foxxy Canuck*†, Infinity*, Infinity FX*†, OnDeck*, Tundra*, Velocity m 3* , Oxbow**
Phenyl-pyridazines	pyridate	*Tough EC*	-
Photosystem II Inhibitor (7)	linuron	*Lorox*	-
EPSP Synthase Inhibitor (9)	glyphosate-IPA, K, DMA	*several - see page 252*	*CleanStart*†, Eclipse XC*†, Enlist Duo*, Flexstar GT*, PrePass XC †*, Roundup Xtend*
Glutamine Synthet- ase Inhibitor (10)	glufosinate	*Liberty 150=Vigor= Advantage Glufosinate-ammonium 150SN= Justice =Opportunity 15SL =Granata=ADAMA Glufosinate 150 SL =Viking Glufosinate 150, Liberty 200, Advantage Glufosinate 280*	-
Bleaching: DOXP Synthase Inhib. (13)	clomazone	*Command 360 ME=IPCO Clomazone=Czar*	*Command Charge*†, IPCO Trigon*†*

Table 8. Herbicide Mode of Action and Chemical Family for Resistant Weed Management, *continued*

Mode of Action (Group)	Active Ingredient	Herbicide Tradename	Premix or Co-pack† Tradenames*
PPO (Protox) Inhibitor (14) Diphenyl ethers	acifluorfen	*Ultra Blazer*	*Hurricane**
	fomesafen	*Reflex*	*Flexstar GT**
N-Phenyl-imides	flumioxazin	*Chateau=Valtera*	*Fierce*=Torpedo* (IVM only)*, *IPCO Bifecta EZ**
	trifludimoxazin	-	*Voraxor, Voraxor Complete*†*
Phenylpyrazole	pyraflufen	-	*BlackHawk*, Blackhawk EVO*, Conquer II*, Goldwing*, Thunderhawk†**
Pyrimidinedione	saflufenacil	*Heat=Detail* (IVM only)	*Heat Complete†*, Smoulder*, Voraxor, Voraxor Complete*†*
	tiafenacil	*Insight Liquid SC*	-
Triazolinone	carfentrazone	*Aim EC=InStep=Revenge=IPCO C-Zone=Foremost =Viking Carfentrazone*	*Authority Strike†, Command Charge*†, Conquer*†=Revenge B*†, Emphasis*†=IPCO Octagon*†, Conquer II*, Focus*, Inferno Trio*, Intruvix*†, IPCO Trigon*†, Prospect*, Revenge E*† Revenge Pro*†= IPCO/CO-OP Convex*†, Intruvix II**
	sulfentrazone	*Authority*	*Authority Strike†, Authority Supreme*†*
Very Long Chain Fatty Acid Inhibitor (15) Acetamide	dimethanamid-P	*Frontier Max*	-
Chloroacetamide	S-metolachlor+ safener	*Dual II Magnum=Komodo=Metallica =Stallion*	*Primextra II Magnum*, Strim MTZ**
	pyroxasulfone	*Zidua SC*	*Authority Supreme*†, Fierce*=Torpedo* (IVM only)*, Focus*, Heat Complete†*, Voraxor Complete*†*
Thiocarbamate	EPTC	*Eptam*	-
	triallate	*Avadex Brands =Advantage Triallate*	*Fortress MicroActive* =Advantage Triallate-Trifluralin**
Auxin Inhibitor (19)	diflufenzopyr	-	*Distinct*=Overdrive**
Photosystem I Inhibitor (22)	diquat	*Reglone= Advantage Diquat 240= Armory= Bolster=Craven=Desica=Dessicash Desiccant= Diquat 240=Drifast=Clone=Stage =Viking Diquat, Reglone Ion, Reward*	-
Unknown (26)	quinclorac (grass)	*Clever=Ingenious, Facet L*	-
Bleaching: HPPD Inhibition (27) Pyrazolone	pyrasulfotole	-	*Axial Xtreme iPak*†, Infinity*, Infinity FX*†, Tundra*, Velocity m3**
	tolpyralate	*Shieldex*	*OnDeck**
	topramezone	*Impact=Armezon*	*Certitude*†*
Triketone	mesotrione	*Callisto 480 SC*	-
	tembotrione	*Laudis*	-
Cellulose Synthesis Inhibitor (29) Alkylazines	indazaflam	*Esplanade*	-

Adapted from WSSA Herbicide Classification System For Resistant Weed Management. Weed Technol. 17:606-608 and the NDSU Weed Control Guide.

Contact herbicides = Groups 5, 6, 7, 10, 14, and 22.

*** Products contain more than one active ingredient and appear in more than one group. In some instances, both active ingredients act to kill the same weed using different modes of action. Using these products or tank mixes of products from different groups that control the same high risk weed (see the Herbicide Resistant Weeds in Western Canada chart in the Weed Control Introduction) will slow down the process of developing weed resistance.**

New herbicides do not necessarily have a unique mode of action and may fall within the groups listed in the charts.

Herbicides that have the same mode of action may not control the same weed spectrum or have the same crop safety. For example, *Assert* and *Ally* have the same mode of action; however, *Assert* controls wild oats while *Ally* does not.

† Products are packaged with multiple components in one package. Each component may also have multiple active ingredients.

How Do Herbicides Work?

There are several ways to define how herbicide work:

- **Timing (may apply to crop and/or weed and may be one timing for the crop and another for the weed):**
  - **PPI (Pre-Plant Incorporated):** the product is applied to the soil and worked in with a tillage implement prior to seeding. The product remains effective in the soil for one to several weeks, preventing weeds from emerging within the crop.
  - **PRE (Pre-Emergent Surface):** the product is applied to the soil surface and relies on rainfall to move it into the emergence zone of target weeds in the soil. The product remains effective in the soil for one to several weeks, preventing weeds from emerging within the crop. Products may allow application in the fall or in the spring prior to seeding or following seeding up until the emergence of the crop and target weeds.
  - **POST (post-emergent foliar):** the product is applied at the seedling stage of the weed and/or the crop. Early applications are usually the most beneficial to crop yield because of the removal of competition by the target weed at the crop's most vulnerable stage.
  - **Pre-harvest:** applied prior to the harvest of the crop to address weeds growing in mature.
- **Target:**
  - **Cell membrane disruptor:** causes the plant cells to produce compounds that attack the intregrity of the cell membrane. Result is the spilling of cell contents into the environment and rapid drying of affected tissues.
  - **Inhibitor of essential growth component (amino acids, lipids):** blocks the production of essential building blocks for plant growth and maintenance. Target weeds stop growing and display a loss of green colour, typically in new growth first and then in older tissues as plants need to repair their tissues after environmental damage.
  - **Pigment inhibitor:** new tissues produced after exposure to the herbicide develop without colour (white). Some tissues may display red or purple tinges as a result of the presence of stress compounds called anthocyanins.
  - **Plant hormone mimic/Hormone transport inhibitor:** the herbicide produces the same response in plants as the natural hormone but susceptible plants are unable to break down these compounds as they would natural hormones. Results in unregulated growth of the plant cells causing distorted growth and a proliferation of non-functional tissue in the stem/root, blocking water flow to plant shoots. Transport inhibitors concentrate both natural and synthetic hormones in the tissues where they were produced, causing distorted growth.
  - **Seedling Root inhibitor:** stops roots growth of susceptible weeds. Susceptible weeds fail to emerge from treated soil.
  - **Seedling Shoot inhibitor:** stops shoot growth in susceptible weeds. Susceptible weeds fail to emerge from treated soil.
  - **Unknown:** the target of the herbicide is not known.

  Movement:
  - **Little to no plant movement:** typically soil active products. Does not move from the point where it enters the plant, or only by diffusion.
  - **Apoplastic Movement:** xylem-mobile; moves passively within free space and cell walls, upward through the transpiration stream (with water). Foliar applied products are relatively immobile. Soil active products are taken up by the root and transported to the upper portions of the plant.
  - **Symplastic Movement:** phloem-mobile – enters the cell where it is actively moved within the plant to areas of rapid growth along with other nutrients and sugars.
- **Spectrum:**
  - **Non-selective:** controls or injures most plants, except for those crops that have been bred to tolerate the herbicide.
  - **Selective:** controls weeds within a crop. Specific herbicides may be specific to control of the following weed types
    - Broadleaf
    - Grass
- **Biochemistry:**
  - The "Group" numbering system, developed by Weed Science Society of America (WSSA), and was adopted by the Pest Management Regulatory Agency of Health Canada for use on Canadian labels.
  - This system uses the herbicide's chemistry to summarize their general Mode of Action on weeds. There are also sub-divisions with in these Groups (see Table 8 Herbicide Mode of Action and Chemical Family for Resistant Weed Management in the Weed Control Introduction) that may have differing resistance patterns.
  - All herbicides within a Group share a common mode of action and resistance mechanism.
  - Herbicides within a Group may have different basic chemical structures. The difference in these basic structures are captured by the family.
  - In general, weeds resistant to one herbicide within a Group (or family where they are available) will be resistant to all herbicides within the Group/sub-group. There are exceptions to this rule. Cross resistant between families within a Group is common.
  - Resistance management strategies are required wherever resistance is known or there is a risk of resistance development.
  - Heavy reliance on herbicides without the integration of other non-herbicide management practices raises the risk of resistance evolution greatly.

After applying a herbicide, fields can be scouted to determine the effectiveness of the treatment. The symptoms of different herbicide groups, and the approximate time it takes to develop these symptoms, are listed in the following table. Weed patches that are not affected should be noted and checked, as they may be herbicide resistant. Note that symptoms may take longer to develop when conditions are not conducive to rapid plant growth.

The following table gives a brief description of symptoms that may be exhibited if plants are injured by a herbicide. The symptoms of each group are addressed for both foliar and soil exposures.

Table 9. The Mode of Action, Site of Uptake and Symptoms of Different Herbicide Groups

Herbicide Group	Mode of Action	Site of Uptake	Weed symptoms/timing	
			Grass weeds	Broadleaf weeds
1	Systemic	Foliar	Reduced growth, yellowing of growing point in 1 to 3 weeks. Newest leaf of affected plant pulls out easily in 3 to 5 days.	Tolerant
2	Systemic	Foliar/Soil	Newest leaves yellowed in 3 to 10 days, dead in 1 to 3 weeks.	Newest growth discolored (red/yellow/purple) and/or miniaturized; the whole plant is involved in 1 to 3 weeks.
3	Systemic	Soil	Reduced emergence, poor root development of emerged plants. Roots often swollen/stunted and root tips darkened.	Reduced emergence, poor root development of emerged plants.
4	Systemic	Foliar	Tolerant to moderate rates. High rates cause symptoms similar to drought. Improper timing may cause kernel abortion in cereal crops.	Abnormal growth (twisted stems, cupped leaves) in 2 to 10 days.
5	Systemic	Soil	Wilted and yellowed oldest leaves beginning at leaf margins, death in 7 to 10 days.	
	Contact	Foliar	Yellowed oldest leaves, death within days.	Yellowed/bleached oldest leaves where spray contacts, death within days.
6	Contact	Foliar	Some leaf tip burn or white tissues possible.	Yellowed leaves in 2 to 4 days, death in 1 to 2 weeks.
9	Systemic	Foliar	Wilted, yellowed leaves in 7 to 10 days. Newest growth is impacted first followed by the rest of the plant.	
10	Contact	Foliar	Wilted, bleached leaves in 3 to 5 days, death in 1 to 2 weeks.	
13	Systemic	Soil	Bleached leaves, susceptible seedlings die shortly after emergence.	
14	Contact	Foliar	Some leaf burn at contact points or leaf edges.	Leaves yellowed and desiccated in 1 to 3 days. (Post-emergence applications)
	Systemic	Soil	Bleaching and yellowing, death prior to or shortly following emergence	
15	Systemic	Soil	Reduced emergence, emerged plants stunted. Leaf rolling (grasses). Leaf tips compressed and crinkled (broadleaves). Buggy-whipping. Plants deep blue-green.	
19	Systemic	Foliar	Twisting of older leaves, new leaves fail to expand, plant death in 2 to 4 weeks.	
22	Contact	Foliar	Leaves wilted within hours, desiccated in 1 to 3 days.	Leaves wilted in 1 to 3 days, desiccated and dead in 3 to 7 days.
26 (grass weeds only)	Systemic	Foliar	Immediate cessation of growth, rapid desiccation of new leaves and purpling and yellowing of older tissues.	See Group 4.
27	Systemic	Foliar	Some bleaching and whitening of leaves.	Leaves bleached and whitened in 2 to 10 days and death in 7 to 10 days.
29	Systemic	Soil	Seedlings fail to emerge.	Seedlings fail to emerge.

How to Identify Weed Resistance

It is important to avoid confusing herbicide failure caused by resistance with herbicide failure caused by various other factors (such as weather or application errors). When a herbicide fails to control weeds because of weather or application factors, that herbicide may work in the field the next season. But when herbicides fail because of the development of resistance, they will fail in subsequent years, regardless of weather or application procedures.

Herbicide resistance should be suspected under the following conditions:

- A weed species that the herbicide controlled in previous seasons now escapes the treatment, while other weeds that appear on the label continue to be controlled in the field.
- The escapes cannot be attributed to adverse weather or emergence after application (if a post-emergence product is in question).
- Irregular-shaped patches of a weed develop where the herbicide gives little or no control.
- Records of the past history of the field show repeated use of the same herbicide, or combinations of herbicides, that kill the weed in question in the same way.

Table 10. Herbicide-Resistant Weeds in Western Canada

Weed	Herbicide Group	Locations Confirmed
Barnyard grass	Group 2	MB
Canada fleabane	Group 9	Occurs in several US states
	Multiple Resistant: Groups 2 & 9	Occurs in Ontario
Cleavers	Group 2	AB, MB, SK
	Group 4	AB
	Multiple combinations of: Groups 2 & 4	AB
Chickweed	Group 2	AB, MB, SK
Cow cockle	Group 2	AB
Downy brome	Group 2	Occurs in Montana
	Group 9	AB
Foxtail, green	Group 1	AB, MB, SK
	Group 2	MB, SK
	Group 3	AB, MB, SK
	Multiple combinations of: Groups 1 & 3	MB, SK
Foxtail, yellow	Group 1 + 2	MB , SK
Hemp-nettle	Group 2	AB, MB , SK
	Group 4	AB
	Multiple combinations of: Groups 2 & 4	AB
Kochia	Group 2	AB, MB, SK (overwhelming majority)
	Group 4 (dicamba and /or fluroxypyr)	AB, SK , MB
	Group 5	Occurs in North Dakota and Montana
	Group 9 (glyphosate)	AB, MB, SK
	Group 14	SK, also occurs in North Dakota
	Multiple Resistant: Groups 2 & 9	AB, MB, SK
	Multiple Resistant: Groups 2 & 4	AB, SK , MB
	Multiple Resistant: Groups 2, 4 (dicamba) & 9	AB, SK, MB
	Multiple Resistant: Groups 2, 4 & 9	AB
Lamb's-quarters	Group 2	SK
	Group 5	Occurs in Ontario
Marshelder (false ragweed)	Group 2	Occurs in North Dakota
Mustard, ball	Group 2	AB

Table 10. Herbicide-Resistant Weeds in Western Canada, *continued*

Weed	Herbicide Group	Locations Confirmed
Mustard, wild	Group 2	AB, MB, SK
	Group 4	MB
	Group 5	MB
Narrow-leaved hawk's-beard	Group 2	AB
Persian darnel	Group 1	AB, SK
Ragweed, giant	Group 2 & 9	Occurs in Ontario, Minnesota
Redroot pigweed	Group 2	MB, SK
	Group 5	Occurs in Ontario
Russian thistle	Group 2	AB, SK
	Group 9	Occurs in Montana
Shepherd's-purse	Group 2	AB, MB, SK
Smartweed, pale	Group 2	MB, SK
Spiny annual sow-thistle	Group 2	AB, MB, SK
Stinkweed	Group 2	AB, MB, SK
Waterhemp	Group 2 & 9	Occurs in North Dakota, MB
	Group 9 & 14	MB, North Dakota, Ontario, multiple US states
	Group 2, 5, 9 & 14 , 27	
Wild buckwheat	Group 2	AB
Wild oats	Group 1	AB, MB, SK
	Group 2	AB, MB, SK
	Group 15 (triallate)	AB, MB, SK
	Multiple combinations of: Groups 1 & 2, Groups 1,8 & 15 (triallate) Groups 2, 8 & 15 (triallate) Groups 1, 2, 8 & 15 (triallate) Groups 1, 2, 8, 15 (triallate) & 25 Groups 1, 2, 14, 15 (triallate and pyroxasulfone) (MB)	AB, MB, SK

See Table 8 Herbicide Site of Action and Chemical Family for Resistant Weed Management in the Weed Control Introduction for a complete list of products in each Herbicide Resistance Group.

If Weed Resistance Develops on Your Farm

It is important to identify weed resistance before it spreads across your farm. Plan on conducting a "patch watch" scouting program this summer to identify suspicious patches before they become difficult to manage. Resistant weed patches have been identified on fields where producers were unaware of their existence.

Your patch watch program should begin shortly after spraying and continue through July after the crop has headed out and most weeds are visible from a distance. If you find suspicious looking patches, contact your local agricultural office or crop protection company representative to assist you in confirming weed resistance. If resistance is suspected:

1. Map the location of the patches and mark them with stakes so you will remember their location.
2. Mow, cultivate or spot spray the patches. Resistant patches should not be allowed to produce seed.
3. Patchy areas should NOT be harvested with the rest of the field. Harvest these areas separately, and make sure to clean all harvesting equipment before leaving the area to prevent the spread of seeds across the field or a neighbouring field.
4. Check patches each year to monitor their spread. Keeping your resistant weeds isolated to a manageable patch is easier than dealing with an entire field of resistant weeds.

Adjuvants and Your Herbicide

Adjuvants are important ingredients in chemical weed control. Many herbicides must be applied with an adjuvant. If it is forgotten, the level of weed control can vary widely, and re-spraying may be necessary.

Many products have adjuvants built into the formulation. Others require adjuvant addition (e.g. *Refine SG*). Some adjuvants were developed specifically for one herbicide, and these are either pre-packaged with the herbicide, or are identified by name on the label (e.g. *Turbocharge* for *Marengo, Amigo* for *Select/Centurion*).

Consult a company representative to determine the support for pesticide adjuvant combinations not listed on the product label.

With some products, adjuvants need to be added only under certain conditions. For example, glyphosate products have built-in adjuvants, but require additional adjuvant when low rates (pre-seeding or chem-fallow), high water volumes, or certain tank mixes are used.

Adjuvants should be added only when required. If one is not required, addition can reduce weed control or injure crops. Product labels will describe when an adjuvant is required, and what type should be used.

There are two main classes of adjuvants: "activators or spray modifiers" (including surfactants and crop oils), and "utility modifiers" (including pH adjusters, water conditioners, low-drift adjuvants, and anti-foaming agents). The most important class of adjuvants is the activators. Surfactants, the main group within the activators, are "surface active agents." These chemicals produce effects at points where two substances touch, such as between two liquids (herbicide and water) or between a solid and a liquid (herbicide and leaf surface). Some surfactants act as dispersing agents, helping to keep a pesticide suspended in water. Others work on the plant, improving the wetting, sticking and penetrating characteristics of the herbicide droplets. Oil-based adjuvants contain petroleum or vegetable oil and an emulsifier that suspends the oil in tiny droplets within the spray solution. Oil-based adjuvants typically assist in herbicide penetration into the leaf.

There are two basic types of surfactants (ionic and non-ionic), of which the non-ionic are most common. The following table lists the surfactants registered for use with herbicides in Western Canada.

Adjuvants and Registered Pesticides:

Note – some products are specific about the concentration of active ingredient in the surfactant for product performance. Check with the product page in this guide or the product label.

Trade Name	Composition	Adjuvant Type	Registered Pesticides (Adjuvant label only)
Addit Adjuvant (PCP#29263)	37% surfactant blend	Oil-surfactant blend	*Bison*
Adigor Adjuvant (PCP#28151), *Cohere Adjuvant* (PCP#33552)	48.8% methylated rape seed oil 28.2% ethoxylated alcohols	MSO-surfactant blend	*Broadband, Brazen II (Cohere Adjuvant), Trondus*
Agral 90 (PCP#24725)	90% nonylphenoxy polyethoxy ethanol	Non-ionic surfactant	*Accent, Altitude FX, Battalion*, diquat, *Escort*, flucarbazone, glyphosate, *Muster, Pinnacle, Prism*, imazethpyr, metsulfuron, thifensulfuron/tribenuron, *Reflex, Reward, Triton K* (Not all adjuvants may be used with all herbicides listed)
Agral 90 (PCP#11809), *IPCO Agsurf Original* (PCP#15881), *MPOWER Icon* (PCP#28342)	92% nonylphenoxy polyethoxy ethanol		
Agsurf II (PCP#30071)	92% alcohol ethoxylate		
Albaugh Surfactant (PCP#32599)	100% surfactant blend		Clodinafop
Amigo Adjuvant (PCP#22644), *X-Act* (PCP#28225), *CO-OP Patron Adjuvant* (PCP#33662), *IPCO X-Surf Adjuvant* (PCP#33660), *MPOWER Empire* (PCP#33380), *Surf-Act* (PCP#32313)	30% phosphate ester surfactant	Anionic surfactant and acidifier/water conditioner	clethodim†*
Assist Oil Concentrate (PCP#16937), *CropOil 83/17 Adjuvant* (PCP#30978), *XA Oil Concentrate* (PCP#11769), *Score Adjuvant Liquid* (PCP#12200), *Chem Spray* (PCP#29712)	83% paraffin based mineral oil 17% surfactant blend	Oil-surfactant blend	*AAtrex, Basagran* (all crops), *Ultra Blazer*, clodinafop†*, *Impact*, quizalofop *(Contender, Yuma GL), Simplicity* (Not all adjuvants may be used with all herbicides listed)
Citowett Plus Adjuvant (PCP#12766), *Super Spreader* (PCP#17402)	50% octylphenoxypolyethoxy ethanol	Non-ionic surfactant	*Accent, AAtrex, Basagran* (peas), *Escort*, flucarbazone, metsulfuron, *Muster, Pinnacle, Prism*, thifensulfuron/ tribenuron, *Triton K*
Companion Adjuvant (PCP#15882)	70% octylphenoxypolyethoxy-(9)-ethanol	Non-ionic surfactant	Glyphosate, metsulfuron, *Muster*

Trade Name	Composition	Adjuvant Type	Registered Pesticides (Adjuvant label only)
Enhance (PCP#29270), *Nufarm Enhance* (PCP#29952), *ADAMA Adjuvant 80* (PCP#30419)	80% triglyceride ethoxylate 10 POE	Non-ionic surfactant	*Accent,* diquat, *Escort, Folicur 432 Fungicide*, glyphosate, *Lontrel, Muster, Pinnacle, Prism*, imazethapyr, metsulfuron, thifensulfuron/tribenuron, *Signal, Signal FSU, Reflex, Reward, Valtera*
Gateway (PCP# 31470)	59% paraffinic oil, 24% alkylated alcohol non-ionic surfactants	Oil-surfactant blend	*Clearview, Reclaim II, Sightline A, Escort, glyphosate*
Hasten Spray Adjuvant (PCP#27420)	73.3% methyl and ethyl oleate (esterified vegetable oil)	Methylated Seed Oil	*Impact*
HiActivate Non-Ionic Liquid Spreader Activator (PCP#31817)	900 g/L alkylarylpolyoxyethylene glycols, free fatty acids & isopropyl alcohol	Non-ionic surfactant	*Accent, Assure, Ally, Pursuit*
IPCO MSO Adjuvant (PCP#33757)	100% surfactant blend	Methylated Seed Oil	tralkoxydim, quizalofop, imazamox, imazamox+imazethapyr, *Arsenal Powerline*, glyphosate, *Shieldex*, topramezone, thifensulfuron:tribenuron (2:1), *Valtera, Heat* ***Insecticides:*** *Coragen/Acelepryn, Benevia*
IPCO Surfactant NI (PCP#33759)	100% surfactant blend	Non-ionic surfactant, Water Modifier, Drift Retardant	glyphosate, flucarbazone, quizalofop, imazethapyr, diquat, *Aim, Fulfill Insecticide*
Journey HSOC (PCP#33800)	50% methylated seed oil of soybean	Methylated Seed Oil	clethodim, quizalofop, clodinafop
LI 700 (PCP#23026)	80% surfactant blend	Non-ionic surfactant, Water Modifier, Drift Retardant	Diquat, flucarbazone, glyphosate, *Fulfill* insecticide, quizalofop *(Assure II)*
Liberate Adjuvant (PCP#29491)	100% lecithin, methyl esters of fatty acids and alcohol ethoxylate	Methylated Seed Oil, Water Modifier, Drift Retardant, Sticker	Flucarbazone, *Pursuit, Reflex, Odyssey*, quizalofop *(Assure II)*, thifensulfuron/ tribenuron, tribenuron, metsulfuron *(Accurate)*
Masterlock (PCP# 34451)	100% surfactant blend	Non-ionic surfactant	*Cadillac 240 Unpacked, Nufarm Signal Herbicide, Marshall, Yuma GL Liquid EC, Assure II, Leopard*
Merge Adjuvant (PCP#24702), *MPOWER Assassin* (PCP#33444), *Surjet* (PCP#33339)	50% surfactant blend 50% solvent (petroleum hydrocarbons)	Oil-surfactant blend	*Ares*, Heat WG, Heat LQ**, quinclorac, *Odyssey, Odyssey Ultra*, Poast Ultra*, quizalofop, *Solo*
MSO Concentrate with Leci-Tech (PCP#28385), IPCO *Contender MSO Adjuvant with Leci-Tech* (PCP#32198)	70% methylated seed oil of soybean	Methylated Seed Oil, Drift Retardant	imazethapyr, *Odyssey, Poast Ultra*, quizalofop *(Contender)*
StrikeLock (PCP#34946)	100% surfactant blend	Methylated Seed Oil	Arrow 240 EC, Marshall, Yuma GL Liquid EC, Assure II, Leopard, Cadillac 240 Unpacked, Nufarm Signal Herbicide
Sure-Mix Surfactant (PCP#25467)	60% praraffinic petroleum oil 40% surfactant blend	Oil-surfactant blend	quizalofop

Trade Name	Composition	Adjuvant Type	Registered Pesticides (Adjuvant label only)
Turbocharge Adjuvant (PCP#23135), *Adjuvant for Nufarm Tralkoxydim* (PCP#30828), *Carrier* (PCP#30639)	50% mineral oil 39.5% surfactant blend	Oil-surfactant blend	*Paradigm PRE*, tralkoxydim†*, clethodim (*Statue* only)*

*** The adjuvant is packaged with the product.**

† Note: All products may not be registered with all adjuvants. See product page in the following sections to determine which adjuvants are registered for each herbicide.

Crop and Herbicide Recommendation Tables

The following charts give general weed control comparisons based on rates, timing and other application instructions and precautions as outlined in this Guide.

A dot (•) will indicate if the weed is listed on a product label. Where rate ranges are listed for controlling a given weed, ratings are based on results achieved with the higher rate unless noted otherwise. 'S' indicates weed suppression.

Weed Control Tables

Table 1. Weed Control in Barley

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Triallate[9,10]	465	15			•																						
Triallate/Trifluralin[9]	469	3,15		•	•	S								S	S			S	S								
Trifluralin (green foxtail control)[9]	477	3		•																							
Trifluralin (grassy and broadleaf)[9]	477	3	•	•	•	•		•							•			•									
POST-emergent herbicides																											
2,4-D	100	4						•		•	•[5]	•		•	•		•	•	•	•	•	TG	•	TG		•	S
Akito	110	2,4				•		•	•		•			•						•		•		•	•	•	
Ammo DR	114	2,4				•		•	•	•	•[5]	•	•	•	•		•	•	•	•	•	TG	•	TG		•	•
Audible	120	2,4				•		•	•			•	•	•	•	S	•	•	•	•	•	S	•	S	•	•[2]	•
Avenza	128	1,2,4	•	•		•	•		•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	•
Axial Xtreme iPak	132	1,2,6,27	•	•	•	•		•	•		•[4]	•	•	•	•	S	•	•	•	•	•	S	•	S		•	
AxialXtreme	130	1,4	•	•	•	S			•					•														
Broadband	147	1,2	•	•	•	•		•	•				S				•	S		•		S	•			•	
Bromoxynil	149	6				•				•				•	•		•[7]	•[7]	•		•		•[7]				
Bromoxynil/2,4-D	152	4,6				•	•			•		•		•	•		•	•	•	•	•		•			•	•
Bromoxynil/MCPA	155	4,6				•	•			•		•		•	•		•	•	•	•	•	TG	•	TG		•	•
Bromoxynil+MCPA+fluroxypyr	159	4,6				•[7]	•	•[7]	•[7]	•[7]		•[7]	•[7]	•	•		•	S	•[7]	•[7]	•[7]		•[7]	TG	•[7]	•	•[7]
Cirpreme + MCPA	170	2,4				•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
Cirray	172	1	•	•	•																						
Clopyralid	183	4				•																TG		•			
Clopyralid + fluroxypyr	186	4				•			•					•										•	•		
Clopyralid/MCPA	188	4				•				•	•[3]	•		S	•		•	•[7]		•[7]	•[7]	TG	•	•		•[7]	•
Clopyralid/MCPA+fluroxypyr	190	4				•		S	•		•[3]	•	S	•	•	•	•	•		•	•	•	•	•	•	•	•
Deathstar	196	2,4				•		•	•	•		•	•	•	•		•	•		•	•		•	S	•	•	
Dicamba/fluroxypyr	201	4				•			•					•	S			S	•						•		
Dicamba+MCPA/2,4-D	197	4				•			•	•		•	•[1]	•	•		•	•	•	•	•	TG	•	TG		•	
Dicamba/Mecoprop/MCPA	203	4				•	•		•			•	•	•	•		•	•	•	•	•		•	TG		•	•
Dichlorprop/2,4-D	205	4				•	•[3]			•	S	•		•	•	•	•	•	•	•	•	•	•	TG		•	•
EnforcerD	213	4,6				•[7]	•		•		TG		•	•	•	•[7]	•	•[7]	•[7]	•			•	S	•[7]	•	
Exhilarate	227	2,4				•	•	•	•		•	•	•	S	•	•	•	•		•	•	S	•	S	•	•	
Fenoxaprop	234	1	•	•	•																						
Florasulam	241	2				•		•	•				S				•	S		•	•	S	•			•	

Table 1. Weed Control in Barley *continued*

POST-emergent herbicides	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Florasulam/fluroxypyr + MCPA	245	2,4				•		•	•	•		•	•	•	•		•	•		•	•		•		•	•	
Fluroxypyr	253	2,4				S		•	•				S	•		•									•		
Fluroxypyr + 2,4-D, *OcTTain XL*	256	4				•		S	•	•	•[3]	•	S	•	•	•	•	•	•	•	•	S	•	S	•	•	•
Fluroxypyr + MCPA	258	4				S			•	•		•	•[3]	•	•		•	•		•	S		•		•	•	•
Foxxy MR	264	2,4				•		•	•	•	•[5]	•	•	•	•		•	•	•	•	•	TG	•	TG	•	•	•
Infinity	311	6,27				•		•	•		•[4]	•	•	•	•	S	•	•	•	•	•	S	•	S		•	
MCPA	331	4								•	•[8]	•	S	•	•		•	•		•	•		•				
Mecoprop-p	336	4						•	•						•		•							TG			
Metribuzin	339	5					•	•					•[7]		•		•	•	•		•		•			•	
Metsulfuron	343	2						•				•	•		•		•	•	•	•	•	•[3]	•			•	
OnDeck	358	6,27		•		•		•	•				•	•	•			•			•					•	
Optica Trio	360	4				•		•	•					•	•		•	•					•	TG		•	
Oxbow	365	4,6				•		•	•	•				•	•		•	S	•		•		•				
Pinoxaden	372	1	•	•	•																						
Pixxaro	374	4	•			•		•	•	•	•	•	•	•	•	•	•	•		•	S		•	S	•	•	
Prominex	383	4	•			•		•	•			•	•	•	•	•	S	•		•				•	•		
Quinclorac	387	4,26	•	•					•													S			•		
Rezuvant/Rezuvant XL	408	1,4	•	•	•	•		•	•			•	•	•	•	•	•	•		•					•		
Sentrallas	417	2,4				•		•	•				•	•	•		•	•	•		•		•				
Thifen:Triben (2:1) + Fluroxypyr	444	2,4				•		•	•			•	•		•		•	•	•	•	•		•			•[2]	•
Thifen:triben (25:25) + Fluroxypyr	442	2,4				•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Thifensulfuron/tribenuron (2:1)	446	2				•		•	S			•	•		•	S	•	•	•	•	•	S	•	S		•[2]	•
Thifensulfuron/tribenuron (2:1) + MCPA	449	2,4				•		•	S		•[6]	•	•	•	•	S	•	•	•	•	•	S	•	S		•	•
Topline	451	2,4				•		•	•		•[5]	•	•		•		•	•		•	•	TG	•	TG		•	•
Tralkoxydim	458	1	•	•	•																						
Travallas	461	2,4				•	•	•	•		•[4]	•	•	•	•		•	•	•	•	•	•	•	TG	•	•[2]	
Triton K	482	2,4				•				•	•[6]	•		•	•		•	•	•	•			•	TG		•	•
Tundra	484	1,6,27	•	•	•	•		•	•		•[4]	•	•	•	•	S	•	•	•	•	•	S	•	S		•	

• Control. S – Suppression. TG – Top growth control.
[1] MCPA K mixes only. [2] Will not control CLEARFIELD canola varieties. [3] Spring seedlings only. [4] Up to 25 cm diameter. [5] Seedlings and overwintered rosettes.
[6] Less than 15 cm diameter. [7] Controlled at higher rates. [8] Fall application. [9] Only controlled when weeds are emerging from seed (not controlled if emerged at application). [10] Crop and use may vary between different brands. Consult product page for crop and use.

Table 2. Weed Control in Oats

POST-emergent herbicides	Page	Herbicide Mode of Action Group	Foxtail, Green and Yellow	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
2,4-DB	104	4		•[5]					TG				•		•	•		•	S[5]	TG[5]	•	TG[5]			
Akito	110	2,4		•		•	•		•			•						•		•		•	•	•	
Audible	120	2,4		•		•	•			•	•	•	•	S	•	•	•	•	•	S	•	S	•	•[2]	•
Barricade II	444	2,4		•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Bromoxynil	149	6		•				•				•	•		•[5]	•[5]	•[3]		•		•[5]				
Bromoxynil/MCPA	155	4		•	•			•		•		•	•		•	•	•	•	•	TG	•	TG		•	•
Clopyralid	183	4		•[5]																TG		•			
Clopyralid/MCPA	188	4		•				•	•[3]	•		S	•		•	•[5]		•	•[5]	TG	•	•		•[5]	•
Clopyralid/MCPA+Fluroxypyr[6]	190	4		•		S	•		•[3]	•	S	•	•	•	•	•		•	•	•	•	•	•	•	•
Dicamba + MCPA	197	4		•			•	•		•	S	•	•		•	•	•	•	•	TG	•	TG		•	
Dicamba/Mecoprop/MCPA	203	4		•	•		•			•	•	•	•		•	•	•	•	•	•	•	TG		•	•
MCPA	331	4						•		•	S	•	•		•	•		•	•		•				
MCPB/MCPA	334	4									S		•		•	•		•		TG	•	•		•	
Mecoprop-p	336	4				•	•						•		•							TG			
Optica Trio	360	4		•		•	•					•	•		•	•					•	TG		•	
Sentrallas	417	2,4		•		•	•				•	•	•		•	•	•		•		•				
Stellar Unpacked/Stellar XL (see Florasulam/ fluroxypyr + MCPA)	245	2,4		•		•	•	•		•	•	•	•		•	•		•	•		•		•	•	
Thifensulfuron/tribenuron (2:1)	446	2		•		•	S			•	•		•	S	•	•	•	•	•	S	•	S		•[2]	•
Thifensulfuron/tribenuron (2:1) + MCPA	449	2,4		•		•	S		•	•	•		•	S	•	•	•	•	•	S	•	S		•	•
Topline	451	2,4		•		•	•		•[5]	•	•		•		•	•		•	•	TG	•	TG		•	•

• Control. S – Suppression. TG – Top growth control.
[2] Will not control CLEARFIELD canola varieties. [3] Spring seedlings only. [4] Seedlings and overwintered rosettes. [5] Controlled at higher rates. [6] *Prestige Brands, CO-OP/IPCO State* and *Truslate Pro* only.

Table 3. Weed Control in Rye or Triticale

POST-emergent herbicides	Page	Herbicide Mode of Action Group	CROP F - Fall Rye, R - Spring Rye, T - Triticale	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Mustard, Canola	Volunteer Sunflowers
2,4-D[3]	100	4	F/R								•	•[2]	•		•	•		•	•	•	•	•	TG	•	TG	•	S
Bromoxynil[1]	149	6	F				•				•				•	•		•[3]	•[3]	•		•		•[3]			
Bromoxynil/MCPA[1]	155	4,6	F				•	•			•		•		•	•		•	•	•	•	•	TG	•	TG	•	•
Dicamba + 2,4-D[2]	197	4	R				•			•	•		•		•	•		•	•	•	•	•	TG	•	TG	•	
Infinity	311	6,27	T				•		•	•		•[1]	•	•	•	•	S	•	•	•	•	•	S	•	S	•	
Infinity FX	313	4,6,27	T				•		•	•		S[1]	•	•	•	•	•	•	•	•	•	•	S	•	S	•	
MCPA[3]	331	4	F/R								•		•	S	•	•		•	•		•	•		•			
Simplicity	426	2	F/R/T	•	S	•	S		•	•		S	•	•					•	S	•	•		•	S	•[4]	
Tralkoxydim	458	1	F/R/T	•	•	•																					

• Control. S – Suppression. TG – Top growth control.
[1] Up to 25 cm diameter. [2] Seedling stage only. [3] Controlled at higher rates. [4] Not CLEARFIELD varieties.

Table 4. Weed Control in Wheat (Spring, Durum and Winter)

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	CROP: W - Winter, S - Spring, D - Durum	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Annual bromes	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Authority 480 /Authority Strike[10]	121	14	S/D						•			S					•	•			•	S								
Fierce[10]	236	14,15	W/S	•	•		•[J]	S	•		•			•[1]			•	•		•	•	S		•					S	
Focus (residual component)[10]	260	14,15	W/S	•	•	•	•[JD]	S	S			•					S	S		S	•					•				
IPCO Bifecta EZ[14]	319	5,14	S	•	•	•	•[D]		•		•	•		•			•	•		•	•	•	•	•					S	
Olympus	356	2	W/S/D				•[JD]	S																						
Triallate[10,13]	465	15	S/D					•																						
Triallate/Trifluralin[10]	469	3,15	S/D		•			•									S	S			S	S								
Trifluralin (foxtail control)[10]	477	3	S/D		•	•																								
Valtera[10]	488	14	S		S						•			•			•	•			•								S	
POST-emergent herbicides																														
2,4-D	100	4	W/S/D								•		•	•[1]	•		•	•		•	•	•	•	•	TG	•	TG		•	S
Akito	110	2,4	W/S/D						•		•	•		•			•						•		•		•	•	•	
Altitude FX3[6]	112	2,4	S[6]	•	•	•	S[JD]	•	•			•					•	•	S	•	•	S	•	•		•		•	•	
Ammo DR	114	2,4	S						•		•	•	•	•[1]	•	•	•	•	S	•	•	•	•	•	TG	•	TG		•	•
Audible	120	2,4	W/S/D						•		•	•	•	•[1]	•	•	•	•	S	•	•	•	•	•	TG	•	TG	•	•	•
Avenza	128	1,2,4	W/S	•	•	•			•	•		•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	•
Axial Xtreme	130	1,4	S	•	•	•		•	S			•					•			S										
Axial Xtreme iPak	132	1,4,6 ,27	S	•	•	•		•	•		•	•		S	•	•	•	•	S	•	•	•	•	•	S	•	S		•	
Batalium	134	2,4,6	W/S/D	S		S			•	•		•	•		•		•	•		•	•	•	•	•	S	•	S	•		•
Bentazon + 2,4-D	138	4,6	S										•					•		•	S	•	•	•		•			•	
Broadband	147	1,2	S	•	•	•		•	•		•	•				S				•	S		•		S	•			•	
Bromoxynil	149	6	W/S/D						•				•				•	•		•[5]	•[5]	•		•		•[1]				
Bromoxynil/2,4-D	152	4,6	S/D						•	•			•		•		•	•		•	•	•	•	•		•			•	•
Bromoxynil/MCPA	155	4,6	W/S/D						•	•			•		•		•	•		•	•	•	•	•	TG	•	TG		•	•
Bromoxynil + MCPA + Fluroxypyr	159	4,6	W/S/D						•[5]	•[5]	•[5]	•[5]	•[5]			•[5]	•	•		•	S	•[5]	•[5]	•[5]		•[5]	TG	•[5]	•[5]	•[5]
Cirpreme/MCPA	170	2,4	W/S/D						•		•	•	•	•	•	•	S	•	•	•	•		•	•	•	•	•	•	•	•
Cirray	172	1	S	•	•	•		•																						
Clodinafop	178	1	S/D	•	•	•		•																						
Clopyralid	183	4	S						•																TG		•			
Clopyralid + fluroxypyr	186	4	S/D						•			•					•										•	•		
Clopyralid/MCPA	188	4	S/D						•				•	•[1]	•		S	•		•	•[5]		•	•[5]	•	•	•		•[5]	•
Clopyralid/ MCPA+Fluroxypyr	190	4	W/S/D						•		S	•		•[1]	•	S	•	•	•	•	•		•	•	•	•	•	•	•	•
Deathstar	196	2,4	S/D						•		•	•	•		•	•	•[13]	•		•	•		•	•		•		•[13]	•	
Dicamba/fluroxypyr	201	4	S						•			•					•	S			S	•						•		
Dicamba + MCPA/2,4-D	197	4	W/S/D						•			•	•		•	•[3]	•	•		•	•	•	•	•	TG	•	TG		•	S
Dicamba/Mecoprop/MCPA	203	4	W/S/D						•	•		•			•	•	•	•		•	•	•	•	•	TG	•	TG		•	•
Dichlorprop/2,4-D	205	4	W/S/D						•	•[5]			•		•		•	•	•	•	•	•	•	•	•	•	TG		•	•
Enforcer D	213	4,6	S/D						•[5]	•		•		•[5]		•	•	•	•[5]	•	•[5]	•[5]	•	•		•	S	•[5]	•	
Erebus Xtreme	225	2,4	W/S/D	•	•	•	•[J], S[D]	•	•		•	•		s	•	•	•		•		•	S	•	•		•	S	•	•[4]	
Exhilarate	227	2,4	W/S/D	•					•	•	•	•		•[7]	•	•	S	•	•	•	•		•	•	S	•	S[7]	•	•	
Fenoxaprop	234	1	S/D	•	•	•		•																						
Florasulam	241	2	S/D						•		•	•				S				•	S		•	•	S	•			•[4]	
Florasulam/fluroxypyr + MCPA	245	2,4	S						•		•	•	•		•	•	•	•		•	•		•	•		•		•	•	
Flucarbazone	247	2	W/S/D	S	•	S		•	S[5,12]											•	•		•	•					•[4]	
Fluroxypyr	253	4	W/S/D						S			•				S	•		•						S			•		
Fluroxypyr + 2,4-D, *OcTTain XL*	256	4	W/S/D						•		S	•	•	•[1]	•	S	•	•	•	•	•	•	•	•	S	•	S	•	•	•
Fluroxypyr + MCPA	258	4	S/D						S			•	•		•	•	•	•		•	•		•	S		•		•	•	•
Foxxy MR	264	2,4	S/D						•		•	•	•		•	•	•	•	S	•	•	•	•	•	TG	•	TG	•	•	•
Infinity	311	6,27	W/S/D						•		•	•		S	•	•	•	•	S	•	•	•	•	•	S	•	S		•	

Table 4. Weed Control in Wheat (Spring, Durum and Winter) *continued*

POST-emergent herbicides	Page	Herbicide Mode of Action Group	CROP: W - Winter, S - Spring, D - Durum	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Annual bromes	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Infinity FX	313	4,6,27	W/D						•		•	•		S	•	•	•	•	•	•	•	•	•	•	S	•	S	•	•	
MCPA	331	4	W/S/D										•		•	S	•	•		•	•		•	•		•				
Mecoprop-p	336	4	S/D								•	•						•		•							TG			
Metribuzin	339	5	S/D							•	•					•		•		•	•	•		•		•			•	
Metsulfuron	343	2	S/D								•				•	•	•	•		•	•	•	•	•	•[8]	•	•[8]		•	
OnDeck	358	6,27	W/S/D		•	•			•		•	•					•	•			•			•					•	
Optica Trio	360	4	W/S/D						•		•	•					•	•		•	•					•	TG		•	
Oxbow	365	4,6	W/S/D						•		•	•	•				•	•		•	S	•		•		•				
Pinoxaden	372	1	W/S	•	•	•		•																						
Pixxaro	374	4	W/S/D	•					•		•	•	•	S[7]	•	•	•	•	•	•	•		•	S		•	S[7]	•	•	
Predicade	380	2,4	S/D	•	•	•		•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Prominex	383	4	W/S/D	•					•		•	•			•	•	•	•	•	S	•	•	•				•	•		
Quinclorac	387	4,26	S/D	•	•							•													S			•		
Rexade	406	2,4	W/S/D	•	S	•	•[J],S[D]	•	•	S	•	•	•	•	•	•	S	•	•	•	•	•	•	•		•	S	•	•	
Rezuvant/Rezuvant XL	408	1,4	S	•	•	•			•	•		•	•			•	•	•	•	•	•	•		•	S		•	S	•	•
Sentrallas	417	2,4	W/S/D						•		•	•				•	•	•		•	•	•		•		•				
Signal SFU	422	1,2,4	S/D	•	•	•		•	•		•	•			•	•	•	•	S	•	•	•	•		S	•	S	•	•	•
Simplicity OD/Simplicity GoDRI	426	2	W/S	•	S	•	•	•	S		•	•		S		•			•		•	S	•	•		•	S		•[4]	
Tandem	437	2,4	W/S	•	S	•	•	•	S		•	•		S	•	•	•		•		•	S	•	•		•	S	•	•[4]	
Thifen:Triben (2:1) + Fluroxypyr	444	2,4	S						•		•	•			•	•		•		•	•	•	•	•		•			•	•
Thifen/Triben (25:25) + Fluroxypyr	442	2,4	W/S/D						•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Thifensulfuron/tribenuron (2:1)	446	2	W/S						•		•	S			•	•		•	S	•	•	•	•	•	S	•	S		•[4]	•
Thifensulfuron/tribenuron (2:1) + MCPA	449	2,4	W/S					•	•	•		S	•[8]	•	•	•	•	•	S	•	•	•	•	•	S	•	S	•	•	•
Topline	451	2,4	S/D						•		•	•		•[2]	•	•		•		•	•		•	•	TG	•	TG		•	•
Tralkoxydim	458	1	W/S	•	•	•		•																						
Travallas	461	2,4	W/S/D						•	•	•	•	•	•[4]	•	•	•	•		•	•	•	•	•	•	•	S	•	•[4]	
Traxos	463	1	S/D	•	•	•		•																						
TraxosTwo	465	1,4	S/D	•	•	•		•	•		S	•	•	•[1]	•	S	•	•	•	•	•	•	•	•	S	•	S	•	•	•
Tridem + 2,4-D	475	2,4	W/S/D				•[J]	•	•		•	•	•		•	S	•	•		•	•	•	•	•	•	•	•	•	•	
Triton K	482	2,4	W/S/D						•				•	•[8]	•		•	•		•	•	•	•			•	TG		•	•
Tundra	484	1,6,27	S	•	•	•		•	•		•	•		S	•	•	•	•	S	•	•	•	•	•	S	•	S		•	
Varro	492	2	W/S/D	•	•	S	S[JD]	•	•			•				•		S	S	•	•	S	•			•			S	
Varro FX	494	2,4	W/S						•		•	•				•	•	•	•		•	•	•	•				•	•	
Velocity m3	496	2,6,27	W/S/D	•	•	S	S[JD]	•	•		•	•		S	•	•	•	•	S	•	•	•	•	•	S	•	S		•	

• Control, S – Suppression, TG – Top growth control, [JD] J – Japanese brome, D – Downy brome

[1] Spring seedlings only. [2] Spring seedlings and overwintered rosettes. [3] MCPA K mixes only. [4] Will not control CLEARFIELD canola varieties.

[5] Controlled at the higher rates. [6] For use on CLEARFIELD wheat varieties only. [7] Up to 30 cm tall or across. [8] Less than 15 cm diameter. [10] Weeds controlled when emerging from seed only (not controlled if emerged at application). [12] Not registered for all products. See product page. [13] Crop and use may vary between different brands. Consult product page for crop and use. [14] Apply before planting, during planting or winthin 3 days after planting but before crop emerges.

Table 5. Weed Control in Corn

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Volunteer Cereals	Foxtail, Green	Foxtail, Yellow	Wild Oats	Quackgrass	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed Annual Species	Sow-thistle (Perennial)	Stinkweed	Sunflower, Volunteer	Thistle, Canada	Volunteer Canola
Aatrex	106	5					•		•								•	•	•			•					
Fierce[9]	236	14,15	•		•		S		•		•	•		•[1]		•	•	•		S		•					S
Focus (residual component)[8,9]	260	14,15	•		•	•	S		S			•				S	S	S	•					•			
Frontier Max[9]	265	15			•																						
Heat Complete (residual component)[9]	290	14,15			S	S	S		•			•				•	•	•	•					•			•
Metolachlor[8,9]	337	15	•		•	•													S								
Primextra II Magnum[8,9]	381	5,15	•		•	•			•								•	•	•			•					
Roundup Xtend2[1]	412	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•[7]
Simazine	424	5	•			•	•		•								•					•					
Sortan IS	431	2	•		•	S		•	•								S		•								•
Voraxor Complete (residual component)[9]	502	14,15	•		•	•	**S**		**S**			**S**				**S**	**S**	**S**	•					**S**			**S**
Zidua SC[9]	503	15	•		•	•	S									S	S		•								
POST-emergent herbicides (some products may be used PRE or POST)																											
2,4-D	100	4									•		•	•	•	•	•	•	•	•	•	•	TG	•	•	S	•
2,4-DB	104	4							•					TG			•	•	•		•	S	TG	•	•	TG	•
Aatrex	106	5					•		•								•	•	•			•					
Bentazon	138	6									•	•	•				•	•	S	S	•	•		•		S	•
Bromoxynil	149	6							•				•			•	•	•	•	•		•		•			•
Bromoxynil/MCPA	155	4,6							•	•			•		•	•	•	•	•	•	•	•	S	•	•	S	•
Callisto	162	27																									•
Dicamba	197	4							•			•					•	•	•			•	S			S	
Dicamba + 2,4-D amine	197	4							•			•	•	S	•	•	•	•	•	•	•	•	S	•	•	S	•
Distinct	210	4,19							•				•			•	•		•			•	S			TG	•
Eclipse XC[1]	212	4,9	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
Enlist Duo[13]	215	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Glufosinate 200SN[3]	271	10	•		•	•	•	S	•		•		•				•	•	•		•	•	•	•		S	
Glyphosate[1, 4]	273	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•[7]
Laudis	326	27			•				S							•	•		•								
Lontrel XC (clopyralid)	183	4							•					•									•			•	
MCPA	331	4											•		•		•	•			•	•		•			
MCPB/MCPA	334	4															•	•	•		•		S	•		S	•
Nicosulfuron	349	2	•		•	S	•	•																			
Option 2.25 OD[6]	361	2	•		•	•					•						•	•	•								
Permit WG	369	2									•		•				•	•	•		•	•					•[12]
Roundup Xtend2[1]	412	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•[7]
Shieldex	419	27	S		•	S							•				•		•		•	•					
Sortan IS	431	2	•		•	S		•	•								S		•								•
Steadfast IS	433	2		•	•		•																				•[12]
Topramezone[10]	452	27	S		S	S					S					•	S	•	•			S					•
Topramezone + Atrazine	452	5,27	S		S	S					S						•	•	•			•					•
Tough EC	456	6										•				•	•	•	•								
Zidua SC[9]	503	15	•		•	•	S									S	S		•								

• Control. S – Suppression. TG – Top growth control.

[1] For use on glyphosate tolerant varieties only. [2] See product page for registered corn varieties. [3] For use on *Liberty 200 SN* tolerant corn varieties only. [4] Not all glyphosate products are registered for use on glyphosate tolerant corn. [6] For use in Manitoba only. [7] Will not control glyphosate tolerant varieties. [8]Apply pre-seed or pre-emergent. [9] Selective activity only when weeds are emerging from seed. [10] Must be applied with a tank mix partner. [12] Except CLEARFIELD tolerant varieties. [13] *Enlist* corn varieties only.

Table 6. Weed Control in Soybean

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Canola	Canada Thistle	Dandelion	Perennial Sow-thistle	Quackgrass
Authority 480/Authority Strike [6,7]	121	14							•		S			•	•			•	S	•		•	•				
Authority Supreme[6]	125	14,15	•	•	•			S	•		•			•	•			•				•					
Dicamba[10,11]	197	4							•		•				•	•		•			•			TG		TG	
Ethalfluralin[6,15]	223	3	•	•	•	S	S	S	•	•	S		S	•	•		S	•	S		S						
Fierce[6]	236	14,15		•					•	•				•	•	•	•	•			•		S		•		
Focus (residual component)[6,7]	260	14,15	•	•	•			S	S		•			S	S	S		•				S	•				
Heat Complete (residual component)[6,7]	290	14,15		S	S			S	•		•			•	•	•		•				•	•				
IPCO Bifecta EZ[16]	319	5,14	•	•	•				•	•	•	•		•	•	•	•	•	•	•	•		s		•		
Metolachlor[6]	337	15	•	•	•													S									
Metribuzin + *Treflan EC* (PPI)	339	5	•	•	•			•	•	•			•		•	•		•	•		•	•	•				
Roundup Xtend[10]	412	4,9	•	•	•	•	•	•	•	•	•	•	•	•[12]	•	•		•	•	•	•	•	•[9]	•	•	•	•
Trifluralin (broadleaf & grassy weeds)[6]	477	3	•	•	•			•	•	•					•			•	•								
Valtera[5,6]	488	14		S						•				•	•		•	•					•		•		
Voraxor Complete (residual component)[6,7]	502	14,15	•	•	•			S					S	•	•		•	S		S			S				
Zidua SC[6]	503	15	•	•	•			S					S	S			•										
POST-emergent herbicides (some products may be used PRE or POST)																											
Bentazon	138	6								•	•	•			•	•	•	S	S	•	•	•	•	•			
Clethodim	174	1	•	•	•	•	•	•																			
Dicamba[10,11]	197	4							•		•				•	•		•			•			TG		TG	
Enlist Duo[14]	215	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•
Flexstar GT[1,2]	239	9,14	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Glufosinate 200SN[8]	271	10	•	•	•			•	•	•		•			•	•		•		•	•	•		S		•	S
Glyphosate[2,3]	273	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•[9]	•	•	•	•
Hurricane	293	6,14													S			•									
Imazamox *(Solo ADV & Davai 80 SL* only)	297	2	•	•	•	•	•	•	S		S			S	•	•		•		•	•	•	•[4]				
Imazamox + bentazon	300	2,6		•	•	•	•	•			•				•	•		S	•	•		•	•				
Imazamox/Imazethapyr	302	2	•	•		•	•[4]	•	•	•	•		•		S	•		•	•	•	•	•	•[4]				
Imazethapyr	306	2															•						•[4]				
Odyssey Ultra Q	355	1,2	•	•	•	•	•	•	S	•	•		S		S	•		•	•	•	•	•	•[4]				S
Pinnacle	440	2													•	•		•			•						
Poast Ultra	377	1	•	•	•	•	•	•																			•
Quizalofop	389	1	•	•	•	•	•	•																			•
Reflex + Basagran[1]	396	6,14										•			•	•		S		•	•	•	•				
Roundup Xtend[10]	412	4,9	•	•	•	•	•	•	•	•	•	•	•	•[12]	•	•		•	•	•	•	•	•[9]	•	•	•	•
Select Plus	415	1	•	•	•	•	•	•																			
Ultra Blazer	486	14										•			•	•		•			•			S			

• Control. S – Suppression. TG – Top growth control.

[1] For use in the Red River Valley of Manitoba only. [2] For use on glyphosate tolerant varieties only. [3] Not all glyphosate products are registered for use on glyphosate tolerant soybeans. [4] Will not control CLEARFIELD varieties. [5] Apply in fall or spring prior to seeding of or up to 3 days after seeding. [6] Control of the following weeds emerging from seed (not controlled if emerged at application). [7] For in season activity only. For initial burn down of other weeds see Table 16b. [8] For use in *Liberty* tolerant soybeans only. [9] Will not control glyphosate tolerant varieties. [10] For use on RR Xtend soybean varieties only. [11] Not all dicamba products are registered for use on RR Xtend soybeans. [12] Including glyphosate resistant biotypes. [13] Seedlings only. [14] For *Enlist E3* soybean varieties only. [15] Crop and use may vary between different brands. Consult product page for crop and use. [16] Apply before planting, during planting or within 3 days after planting but before crop emerges.

Table 7. Weed Control in Field Pea

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's -purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer canola
Authority 480/Authority Strike[3,4]	123	14							•			S					•	•		•	S						
Authority Supreme[4]	125	14,15	•	•				S	•			•					•	•	S	•		•			•		•
Ethalfluralin[4, 5]	223	3	•	•		S	S	S	•		•	S				S	•	•		•	S		S				
Fierce	236	14,15	•	•				S	•		•	•		•[5]			•	•		•	S		•				S
Focus (residual component)[3,4]	260	14,15	•	•				S	S			•					S	S	S	•					S		
Heat Complete (residual component)[3,4]	290	14,15		S				S	S			S					S	S	S	S					S		S
IPCO Bifecta EZ	319	5,14	•	•					•		•	•	•	•			•	•	•	•	•	•	•				S
Metribuzin + *Treflan* (PPI)[4]	339	3,5	•	•				•	•		•					•		•	•	•	•	•	•		•		•
Metribuzin + *Rival* (PPI)[4]	339	3,5	•	•				•	•		•					•	•	•	•	•		•	•		•		•
Triallate[4]	465	15						•																			
Trifluralin (broadleaf & grassy weeds)[4]	477	3	•	•				•	•		•							•		•	S						
Valtera[4]	488	14		S[1]							•			•			•	•		•							•
Voraxor Complete (residual component)[3,4]	502	14,15		s				S									•	•		S		S					S
Zidua SC[4]	503	15		S				S									S	S		S							
POST-emergent herbicides																											
Anaconda	115	1,2,6	•	•	•	•	•	•	S			S					S	•	•	•	•	•	•		•		•
Bentazon	138	6									•	•	•					•	•	S	S	•	•		•	•	•
Clethodim	174	1	•	•	•	•	•	•																			
Imazamox	297	2	•	•		•	•[2]	•	S			S						•	•	•		•	•		•		•
Imazamox+Bentazon	300	2,6	•	•		•	•[2]	•	S			S					S	•	•	•	•	•	•		•		•
Imazamox+Imazethapyr	302	2	•	•[1]		•	•[2]	•	S		•	•			•	S		S	•	•	•	•	•		•		•[2]
Imazamox+Quizalofop	305	1,2	•	•	S	•	•	•	S			S			•			•	•	•		•	•		•		•[2]
Imazethapyr	306	2		•[1]				S	S		•	•				•			•	•		•	•		•		•[2]
MCPA Sodium Salt/Amine	331	4													•			•	•			•			•		
MCPB+MCPA	334	4														S		•	•	•		•		TG	•	•	•
Metribuzin (post-emergence)	339	5									•					•		•	•				•		•		•
Odyssey Ultra Q	355	1,2	•	•	S	•	•	•	S		•	•			•	S		S	•	•	•	•	•		•		•[2]
Poast Ultra	377	1	•	•	•	•	•	•																			
Quizalofop	389	1	•	•	•	•	•	•																			
Samurai Master	415	1,2	•	•		•	•	•	S			S						•	•	•		•	•		•		•
Select Plus	415	1	•	•			••	•																			

• Control. S – Suppression. TG – Top growth control.

[1] Green foxtail only. [2] Will not control CLEARFIELD varieties. [3] For in season activity only. For initial burn down of other weeds see Table 16b. [4] For control of the marked weeds when emerging from seed (not controlled if emerged at application). [5]seedlings only

Table 8. Weed Control in Other Pulses

			CROP				ANNUAL WEEDS																					PERENNIALS		
PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Fababean	Fenugreek	Chickpea	Sweet White Lupin	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Dandelion	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Canola	Canada Thistle	Dandelion	Quackgrass
Authority/Authority Strike[11,12]	123	14	X		X								•		S			•	•			•	S		•		•	•			
Authority Supreme[11]	125	14,15			X		•	•	•			S	•		•			•	•	S		•					•				
Ethalfluralin[11]	223	3	X		X		•	•	•	S	S	S	•	•	S		S	•	•			•	S			S					
Lorox L	328	5				X	S	S	S				•	•				•	•			•			•	•	•				
Metolachlor[11]	337	15				X	•	•	•													S									
Metribuzin + *Treflan* (PPI)[11]	339	3,5	X				•	•	•			•	•	•			•		•	•		•	•			•	•				
Trifluralin (broadleaf & grassy weeds)[11]	477	3	X				•	•	•			S	S	•					•			•									
Valtera[11]	488	14			X			S						•				•	•		•	•						S		•	
POST-emergent herbicides																															
Bentazon	138	6	X											•	•	•			•	•	•	S	S		•	•	•	•	TG		
Clethodim	174	1	X	X	X		•	•	•	•	•	•																			
Imazamox/Imazethapyr	302	2	X	X			•	•		•	•[9]	•	•	•	•		•		S	•		•	•		•	•	•	•[9]			
Metribuzin (post-emergence)	339	5			X									S			S		S	S						S	S				
Odyssey Ultra Q	355	1,2	X				•	•	•	•	•	•	S	•	•		S		S	•		•	•		•	•	•	•[9]			S
Poast Ultra	377	1	X	X	X	X	•	•	•	•	•	•																			•
Quizalofop	389	1	X		X		•	•	•	•	•	•																			•
Select Plus	415	1	X		X		•	•	•	•	•	•																			
Tough EC	456	6			X										•			•	•	•		•									

• Control. S – Suppression. TG – Top growth control.

[1] Navy, kidney and pinto beans only. [2] Navy and kidney beans only. [3] Pinto, pink and red beans only. [4] For use on navy beans in the Red River Valley of Manitoba. Does not include weeds controlled by Basagran Forté. [5] Not all dry bean types have been tested for tolerance to this herbicide. [9] Not including CLEARFIELD varieties. [10] Apply prior to seeding of or up to 3 days after seeding. [11] For control of the marked weeds when emerging from seed (not controlled if emerged at application). [12] For in season activity only. For initial burn down of other weeds see Table 16b.

Table 9. Weed Control in Dry Bean

			ANNUAL WEEDS																					PERENNIALS	
PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Canola	Canada Thistle	Quackgrass
Eptam Liquid EC[7]	217	15	•	•	•	•	•	•		•					•			•							S
Ethalfluralin[2, 7, 8]	223	3	•	•	•	S	S	S	•	•	S		S	•	•			•	S		S				
Frontier Max[2, 7]	265	15		•																					
Metolachlor[1, 7]	337	15	•	•	•													S							
Permit WG[5]	369	15								•		•			•	•		•		•	•		•[6]		
Trifluralin (broadleaf & grassy weeds)[7]	477	3	•	•	•			S	S	•					•			•							
POST-emergent herbicides (some products may be used PRE or POST)																									
Bentazon[5]	183	6								•	•	•			•	•	•	S	S	•	•	•	•	TG	
Clethodim	174	1	•	•	•	•	•	•																	S
Imazamox+Bentazon	300	2,6	•	•	•	•	•[6]	•	S		S			S	•	•		•	•	•	•	•	•		
Imazamox+Quizalofop	297	1,2	•	•	•	•	•	•	S		S				•	•		•		•	•	•	•[2]		S
Imazethapyr[3]	306	2															•								
Poast Ultra	377	1	•	•	•	•	•	•																	•
Permit WG[5]	369	2								•		•			•	•		•		•	•		•[6]		
Quizalofop[5]	389	1	•	•	•	•	•	•																	•
Select Plus	415	1	•	•	•	•	•	•																	
Reflex + Basagran[4]	396	6,14										•			S	•		S		•	•	•	•	TG	

• Control. S – Suppression. TG – Top growth control.

[1] Navy, kidney and pinto beans only. [2] Navy and kidney beans only. [3] Pinto, pink and red beans only. [4] For use on navy beans in the Red River Valley of Manitoba. Does not include weeds controlled by Basagran Forté. [5] Not all dry bean types have been tested for tolerance to this herbicide. [6] Not including CLEARFIELD varieties. [7] For control of the marked weeds when emerging from seed (not controlled if emerged at application).

Table 10. Weed Control in Lentil

			ANNUAL WEEDS																				PERENNIALS		
PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Canola	Canada Thistle	Dandelion	Quackgrass
Ethalfluralin[1, 4, 5]	223	3	•	•	•	S	S	S	•	•	S		S	•	•			•	S		S					
Focus (residual component)[4]	260	14,15	•	•	•			S	S		•			S	S	S		•				S	•			
Heat Complete (residual component)[4]	290	14,15		S	S			S	S		S			S	S	S		S				S				
IPCO Bifecta EZ	319	5,14	•	•	•				•	•	•	•		•	•	•	•	•	•	•			S		•	
Trifluralin (broadleaf & grassy weeds)[4]	477	3	•	•	•			S	S	•					•			•								
Valtera[4]	488	14		S						•				•	•		•	•					•		•	
Voraxor Complete (residual component)[4]	502	14,15		S	S			S					S	•	•		S	S		S			S			
Zidua SC[4]	503	15		S	S			S					S	S			S									
POST-emergent herbicides																										
Clethodim	174	1	•	•	•	•	•	•																		•
Imazamox[2]	297	2	•	•	•	•	•[3]	•	S		S				•	•		•		•	•	•	•[3]			
Imazamox/Imazethapyr[2]	302	2	•	•		•	•[3]	•	S	•	•		S		S	•		•	S	•	•	•	•[3]			
Imazamox+Quizalofop[2]	297	1,2	•	•	•	•	•	•	S		S				•	•		•		•	•	•	•[2]			S
Metribuzin (post-emergence)	339	5								S			S		S	S					S	S	S			
Odyssey Ultra Q[2]	355	1,2	•	•	•	•	•	•	S	•	•		S		S	•		•	S	•	•	•	•[3]			S
Poast Ultra	377	1	•	•	•	•	•	•																		•
Quizalofop	389	1	•	•	•	•	•	•																		•
Select Plus	415	1	•	•	•	•	•	•																		

• Control. S – Suppression. TG – Top growth control.
[1] Fall applications only. [2] For use ONLY on CLEARFIELD lentil varieties. [3] Not including CLEARFIELD varieties. [4] For control of the marked weeds when emerging from seed (not controlled if emerged at application).

Table 11. Weed Control in Flax

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Quackgrass	Volunteer Cereals	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada
Authority 480/Authority Strike[6,7]	121	14							•			S				•	•			•	S					
Eptam Liquid EC[3,6]	217	15	•	•	•	S	•	•			•						•			•						
Triallate[7]	465	15						•																		
Triallate/Trifluralin[7]	469	3,15		•	•			•	S							S	S			S	S					
Trifluralin (broadleaf and grassy weeds)[4]	477	3	•	•	•			S	S		•						•			•						
POST-emergent herbicides																										
Bentazon	138	6									•	•	•				•		•	S	S	•	•		•	•
Bromoxynil[1]	149	6							•				•			•	•		•	•	•		•		•	
Bromoxynil/MCPA[1]	155	4,6							•	•			•		•	•	•		•	S	•	•	•	TG	•	TG
Clethodim[1]	174	1	•	•	•	•	•	•																		
Clopyralid[1]	183	4							•															TG		•
Clopyralid/MCPA[1]	188	4							•				•	•[2]	•	S	•		•	•		•	•	TG	•	•
MCPA	331	4											•	TG	•	•	•		•	•	TG	•	•	TG	•	TG
Poast Ultra[1]	377	1	•	•	•	•	•	•																		
Quizalofop[1]	389	1	•	•	•	•	•	•																		
Select Plus	415	1	•	•	•			•																		

• Control. S – Suppression. TG – Top growth control.
[1] Registered for use on both flax and solin (low linolenic acid flax). [2] Spring seedlings only. [3] Not recommended for use on flax in Saskatchewan. [4] Fall application only.
[5] For in season activity only. [6] For initial burn down of other weeds see Table 16b. [7] For the control of marked weeds when emerging from seed (not controlled if emerged at application)

Table 12. Weed Control in Canola

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada
Command 360ME, Command Charge (residual component)	181 193	13,14										S	•[8]															
Ethalfluralin[8]	223	3	•	•	•		S	S	S	•		•	S				S	•	•			•	S		S			
IPCO Trigon (residual component)	322	6,13, 14											•[8]															
Triallate[8]	465	15							•																			
Triallate/Trifluralin[8]	469	3,15		•	•				•	S								S	S			S	S					
Trifluralin (broadleaf & grassy weeds)[8]	477	3	•	•	•				S	S		•							•			•						
POST-emergent herbicides																												
Advantage Glufosinate Plus	108	4,10	•	•		•	S	•	•[3]	•			•[3]		•[3]	•[3]	•	•	•	•	•	•	•	•	•	•	•	•
Ares SN[2]	116	2	•	•	•		•	•[6]	•	•		•	•				•		•	•	•	•	•	•	•		•	
Clethodim	174	1	•	•	•	•	•	•	•																			
Clopyralid	183	4								•																TG		•
Eclipse XC[4]	212	4,9	•	•		•[7]	•	•	•	•	•	•	•		•[7]	•	•	•	•		•	•	•	•	•	•[7]	•	•[7]
Glufosinate 150[1]	267	10	•	•		•	•[3]	•[3]	•[3]	•		•	•[3]		•[3]	•[3]	•[3]	•	•	•	•	•	•	•	•	•	•	•
Glyphosate[4,5]	273	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Imazamox[2]	297	2	•	•	•		•	•[6]	•	S			S						•	S	•	•	•	•	•		•	
Imazamox/imazethapyr[2]	302	2	•	•			•	•[6]	•	•		•	•			•	•		S		•	•	•	•	•		•	
Muster	345	2														•	•				•	S			•		•	
Odyssey Ultra Q[2]	355	1,2	•	•	•	S	•	•	•	•		•	•			•	•		S		•	•	•	•	•		•	
Poast Ultra	377	1	•	•	•	•	•	•	•																			
Quinclorac	387	4,26	•	•									•													S		
Quizalofop	389	1	•	•	•	•	•	•	•																			
Select Plus	415	1	•	•	•		•	•	•																			
Solo Ultra Q[2]	297	1,2	•	•	•	S	•	•	•	S			S						•	S	•	•		•	•		•	
Thifensulfuron/tribenuron (2:1 ratio) (*Draft* only)[9]	446	2										•	S			•	•		•	S	•	•	•	•	•		•	S

• Control. S – Suppression. TG – Top growth control.

[1] For use only on Liberty Link canola varieties. [2] For use only on CLEARFIELD canola varieties. [3] 1.35 L per acre rate of *Glufosinate 150SN*. Control may be reduced at lower rates. [4] For use only on glyphosate tolerant canola varieties. [5] Not all glyphosate products are registered for use on glyphosate tolerant canola. [6] Will not control CLEARFIELD wheat volunteers. [7] Season long control. [8] For control of weeds when emerging from seed (not controlled if emerged at application). [9] For use in SU tolerant canola only.

Table 13. Weed Control in Potatoes

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Volunteer Canola	Volunteer Corn	Volunteer Barley	Volunteer Wheat	Wild Oats	Quackgrass	Chickweed	Hemp-nettle	Lamb's-quarters	Mustard, Wild	Nightshade	Pigweed, Redroot	Pigweed, Prostrate	Purslane	Smartweed (Annual)	Shepherd's-purse	Stinkweed
Chateau (see *Valtera*)	488	14											•		•	•	•				
Eptam Liquid EC	217	15	•	•			•	•	•	S	•		•		•[2]	•	•	•			
Frontier Max	265	15	•	•											•	•					
Lorox L	328	5	S	S							•		•			•		•	•	•	•
Metolachlor	337	15	•	•											•[1]	S					
Metribuzin[3]	339	5			•						•	•	•	•		•			•	•	•
Strim MTZ[3]	435	5,15	•	•	•						•	•	•	•	•[1]	•			•	•	•
Zidua SC	503	15	•	S					S				S			S					
POST-emergent herbicides(some products may be used PRE or POST)																					
Clethodim	174	1	•	•		•	•	•	•	•											
Metribuzin[3]	339	5			•						•	•	•	•		•			•	•	•
Poast Ultra	377	1	•	•		•	•	•	•	•											
Prism SG	410	2	•	•						•			S			•					

• Control. S – Suppression. TG – Top growth control.

[1] American and Eastern black nightshades. [2] Hairy nightshade. [3] Consult manufacturer or seed provider for varietal tolerance to Metribuzin.

Table 14. Weed Control in Sunflowers

PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada	Volunteer Canola
Authority 480/Authority Strike[4,7]	123	14							•			S					•	•			•	S			•[6]		
Authority Supreme[7]	125	14,15	•	•				•	•			•					•	•		•	•				•		
Eptam Liquid EC[7]	217	15	•	•		•	•	•			•							•			•						
Ethalfluralin[7]	223	3	•	•		S	S	S	•		•	S				S	•	•			•	S	S				
Focus (residual component)[4,7]	260	14,15	•	•				S	S			•					S	S		S	•				S		
Trifluralin[7]	477	3	•	•				S	S		•							•			•						
Zidua SC[7]	503	15		S				S									S	S			S						
POST-emergent herbicides																											
Clethodim	174	1	•	•	•[2]	•	•	•																			
Express SG (see Tribenuron)[5]	232	2							S									•									•
Imazamox[3]	297	2	•	•		•	•[1]	•	S			S						•		•	•		•		•		•[1]
Imazamox/imazethapyr[3]	302	2	•	•		•	•[1]	•	S		•	•			•	S		S		•	•		•		•		•[1]
Muster	345	2													•	•				•			•		•		
Poast Ultra	377	1	•	•	S	•	•	•																			
Quizalofop	389	1	•	•	•[2]	•	•	•																			
Solo Ultra Q[3]	297	1,2	•	•	S	•	•	•	S			S						•		•	•		•		•		•[1]

• Control. S – Suppression. TG – Top growth control.

[1] Will not control CLEARFIELD volunteers. [2] Season-long control. [3] Apply only on CLEARFIELD sunflower varieties. [4] For in season soil activity only. For initial burn down of other weeds see Table 16b. [5] *ExpressSun* (tribenuron tolerant) sunflower varieties only. [6]Authority Strike only. [7]For control of the marked weeds when emerging from seed (not controlled if emerged at application)

Table 15. Weed Control in Special Crops

			CROP							ANNUAL WEEDS																							PERENNIALS			
PRE-emergent herbicides (with residual control)	Page	Herbicide Mode of Action Group	Canaryseed	Safflower	Caraway	Coriander	Buckwheat	Mustard	Oilseed mustard (Brassica juncea)	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Catchfly, night-flowering	Chickweed	Cleavers	Cocklebur	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Volunteer Flax	Volunteer Mustard, Canola	Canada Thistle	Dandelion	Perennial Sow-thistle	Quackgrass
Authority 480/ Authority Strike[12]	121	14						✓								•			S				•	•			S	•[11]		•[11]				
Ethalfluralin[12]	223	3		✓	✓	✓		✓[2]		•	•	•	S	S	S	•		•	S			S	•	•		•	S		S						
Lorox L	328	5			✓	✓																			•										
Triallate[12]	465	15	✓[1]					✓							•																				
Triallate/ Trifluralin[12]	469	3,15						✓			•	•			•	•							•	•		•	•								
Trifluralin[12]	477	3		✓				✓		•	•	•			•	•		•						•		•	•								
POST-emergent herbicides																																			
Bromoxynil	149	6	✓													•				•			•	•	•	•	•		•	•					
Bromoxynil/MCPA	155	4,6	✓													•	•			•	•		•	•	•	•	•	•	•	•		•	•		•
Bromoxynil + MCPA + fluroxypyr	159	4,6	✓													•[10]	•[10]	•[10]		•[10]	•[10]	•[10]	•	•	•	S	•[10]	•[10]		•[10]	•[10]					
Clethodim	174	1		✓	✓	✓		✓	✓	•	•	•	•	•	•																				•
Clopyralid/MCPA+ Fluroxypyr	190	4	✓													•		S	•		•	S	•	•	•	•		•	•	•	•	•	•	•[4]	•	
Curtail M	188	4	✓													•				•	•		S	•	•	•		•	•	•		•	•	•[4]	•	
Dicamba + MCPA	197	4	✓													•			•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	
Dicamba/ Mecoprop/MCPA	203	4	✓													•	•		•		•	•	•	•	•	•	•	•	•	•		•	•		•	
Fluroxypyr + MCPA	258	4	✓						✓[6]	•	•	•	•	•[8]	•	S			•	•	•	•	•	•	•			•	S	•	•	•				
Imazamox	297	2							✓[6]	•	•	•	•	•[8]	•	S			S					•	•	•		•	•	•		•[8]				
Imazamox/ Imazethapyr	302	2							✓[6]	•	•		•	•[8]	•	•		•	•		•	•		•	•	•	•	•	•	•		•[8]				
Muster	345	2						✓[3,9]	✓												•	•			•					•	S					
Poast Ultra	377	1		✓	✓	✓	✓	✓		•	•	•	•	•	•																				•
Quinclorac	387	4,26						✓[3]		•	•								•															S	
Quizalofop	389	1						✓[9]	✓	•	•	•		•	•																	•				
Select Plus	415	1						✓		•	•	•	•	•	•																					

• Control. S – Suppression. TG – Top growth control.

[1] Granular formulation only. [2] Yellow mustard only. [3] Brown and oriental mustards only. [4] Spring seedlings only. [5] Oriental mustard only. [6] For use in CLEARFIELD varieties only. [8] CLEARFIELD varieties not controlled [9] Including Ethiopian mustard (*Brassica carinata*) [10] Controlled at the higher rates. [11] *Authority Strike* only. [12] For control of marked weeds when emerging from seed (not controlled if emerged at time of application)

Table 16a. Herbicides to Control Emerged Weeds Before Seeding or After Seeding but Prior to Crop Emergence

HERBICIDE	Page	Herbicide Mode of Action Group	Pre-seeding	Pre-emergent	Barley	Canaryseed	Canola	Chickpea	Corn, Field	Corn, Sweet	Dry Bean	Field Pea	Flax	Forage Grasses	Lentil	Oat	Potatoes	Rye	Soybean	Wheat
Enlist Duo	215	4,9	✓	✓	✓				✓									✓		✓
Glyphosate[1]	273	9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Insight	314	14	✓	✓					✓											✓
The following products may or must (+) be mixed with glyphosate – for the marked crops																				
+ 2,4-D (up to 294 g ae/acre)	100	4	✓	✓	✓													✓	✓[3]	✓
Authority Strike (burnoff component)	123	14	✓	✓				✓				✓	✓						✓	✓
Beloukha	136	26	✓	✓	✓	✓		✓			✓	✓			✓	✓		✓		✓
BlackHawk	142	4,14	✓	✓	✓	✓			✓							✓[4]		✓	✓	✓
Blackhawk EVO	144	4,14	✓	✓	✓	✓			✓							✓[4]		✓		✓
+ Bromoxynil	149	6	✓	✓	✓		✓									✓				✓
+ Bromoxynil/MCPA	155	4,6	✓		✓	✓			✓	✓			✓	✓		✓		✓		✓
Carfentrazone	163	14	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓
Certitude	168	6,27	✓				✓													
Command Charge (burnoff component)	193	13,14	✓	✓			✓													
Conquer II	194	6,14	✓				✓													
+ Express FX	230	2,4	✓		✓											✓				✓
+ Express Pro	232	2	✓		✓															✓
+ Florasulam	241	2	✓		✓											✓				✓
+ Flucarbazone+Tribenuron	250	2	✓	✓																✓
Focus (burnoff component)	260	14,15	✓	✓					✓			✓			✓				✓	✓[5]
GoldWing	281	4,14	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓		✓		✓
+ Heat Brands	286	14	✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓			✓	✓
+ Heat Complete (burnoff component)	290	14,15	✓	✓				✓	✓			✓			✓				✓	
Himalaya Pass	292	2	✓	✓																✓
Inferno Trio	308	2,14																		✓
+ Intruvix /Intruvix II	316	2,4,14	✓		✓											✓				✓
IPCO Trigon (burnoff component)	322	6,13,14					✓													
+ Korrex II	324	2,4	✓	✓	✓											✓				✓
+ MCPA (up to 200 g ae/acre)	331	4	✓		✓			✓[1,2]	✓[2]	✓[2]		✓[1,2]	✓[2]		✓[1,2]	✓		✓		✓
+ Olympus	356	2	✓	✓																✓
+ Paradigm PRE	367	2,4	✓		✓											✓				✓
Prospect	385	4,14	✓		✓		✓					✓	✓							✓
Quinclorac (*Facet L* only)	387	4,26	✓	✓			✓													
Smoulder	429	2,14	✓		✓															✓
Thunderhawk	450	2,4,14	✓	✓	✓											✓				✓
+ tribenuron	471	2	✓		✓	✓[3]					✓[3]	✓[3]		✓[3]		✓[3]			✓[3]	✓
Tough EC	456	6					✓	✓	✓	✓		✓								
Voraxor	500	14	✓	✓	✓				✓			✓			✓				✓	✓
Voraxor Complete (burnoff component)	502	14,15	✓	✓	✓				✓			✓			✓				✓	✓

[1] Maximum of 140 gae per acre in chickpea, field pea and lentil (see glyphosate page). [2] Amine formulations only. [3] Only for select products. See product page for details. [4] Applied a minimum of 7 days before planting. [5]Spring winter wheat only, NOT durum

Table 16b. Control of Emerged Weeds Before Seeding or After Seeding but Prior to Crop Emergence

HERBICIDE	Page	Herbicide Mode of Action Group	Brome (Downy, Japanese)	Foxtail Barley	Foxtail, Green	Quackgrass	Volunteer Cereals	Wild Oats	Buckwheat, Wild	Cleavers	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Narrow-leaved Hawk's-beard	Night-flowering catchfly	Russian Thistle	Shepherd's-purse	Smartweed (incl.lady's-thumb)	Stinkweed	Volunteer Canola (including glyphosate tolerant varieties)	Volunteer Flax
Enlist Duo	215	4,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Glyphosate (180 g ae/acre)[1]	267	9	•	S	•	•	•	•	•	•	S	•	•	•	•	•	•	S	•	•	•	•		•
Glyphosate (360 g ae/acre)[1]	267	9	•	•	•	•	•	•	•	•	S	•	•	•	•	•	•	•	•	•	•	•		•
Insight	314	14						•	•					•	•				•				•	
Tough EC	456	6								•				•	•	•								
The following products may or must (+) be mixed with glyphosate – weeds marked are those that the product has activity on in addition to glyphosate																								
+ 2,4-D	100	4										•		•	•	•	•		•	•		•	•	
Authority Strike (burnoff component)	123	14							•	•				•	•				•	•		•	•	
Beloukha	136	26									S				•					•				
BlackHawk	142	4,14								•	•	•		•	•	S	•			•		•	•	
Blackhawk EVO	144	4,14							•	•	•			•	•	•	•	•		•			•	
+ Bromoxynil	149	6							•					•	•	•			•		•	•	•	
+ Bromoxynil/MCPA	155	4,6							•			•	•	•	•	•	•	•	•	•	•	•	•	
Carfentrazone, *Command Charge* (burnoff component)	163, 193	14								•				•	•				•	•		•	•	
Certitude	168	6,27												•									•	
Conquer II	194	6,14								•				•	•						•		•	
+ *Express FX*	230	2,4							•		•	•	•	•	•	•	•		•	•		•	•	
+ *Express Pro*	232	2								•	•						•	S					•	
+ Florasulam	241	2							•	•	•	•	•			•	•			•	•	•	•	
+ Flucarbazone+Tribenuron	250	2		•				S			S						•			•			•	
Focus (burnoff component)	260	14,15								•				•	•					•		•	•	
+ *Inferno Trio*	308	2,14						•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	
Inferno Trio	308	2,14						S	•	•	S		S	•	•	•	S		•	•		•	•[4]	
GoldWing	281	4,14							S[5]	•		S[5]		•	•	•	•	•				•	•	
+ *Heat Brands*	286	14							•	•	•	•		•	•	•	•					•	•	
+ *Heat Complete* (burnoff component)	290	14,15							•	•	•	•		•	•	•	•					•	•	
Himalaya Pass	292	2									S			•						•			•[4]	
+ *Intruvix*	316	2,4,14							•	•	•	•	•	•	•	•	•		•	•		•	•	
+ *Intruvix II*	316	2,4,14	•		•		•	•	•	•	•	•	•	•	•	•	•		•	•		•	•	
IPCO Trigon (burnoff component)	322	6,13, 14							•	•				•	•	•			•	•	•	•	•	
+ *Korrex II*	324	2,4							•	•			•	•	•	•	•					•	•	
+ MCPA (up to 200 gae/acre)	331	4										S	•	•	•	•	•		•	•	•	•	•	
+ *Olympus*	356	2	•	•																				
+ *Paradigm PRE*	367	2,4							•	•	•	•	•	S	•	•	•	•		•	•	•	•	•
Prospect	385	4,14							S	•	•	•	•		•					•		S		
+ *Prospect*	385	4,14							•	•	•	•	•	S	•	•			•	•	•	•	•	
Quinclorac (*Facet L* only)	387	4,26			•					•														•
Smoulder	429	2,14							•	•				•	•	•	•					•	•	
Thunderhawk	450	2,4,14							•	•	•	•	•	•	•	•	•	•		•	•	•	•	
+ Tribenuron	471	2									•						•		•	•		•	•	
Voraxor/Voraxor Complete (burnoff component)	500	14,15							•	•				•	•	•	•			S		S	•	

• Control. S – Suppression.

[1] Rates of application varies among brands. Consult the product page for application rates. [2] Spring seedlings only. [3] Initial burndown only. [4] Except CLEARFIELD varieties. [5] Control at high rate.

Table 17. Herbicides for Use as Harvest Aid or Desiccant Before Crop Harvest

HERBICIDE	Page	Herbicide Mode of Action Group	Alfalfa	Barley	Canola	Chickpea	Dry bean	Faba bean	Forage	Field Pea	Flax	Lentil	Oat	Potato	Soybean	Sunflower	Wheat
Advantage Glufosinate Plus	108	4,10			✓[9]												
Beloukha	136	26		✓									✓	✓			✓
Carfentrazone[3,4]	163	14		✓		✓	✓	✓		✓			✓	✓	✓		✓
Diquat[3,5]	207	22			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
Glyphosate[1,2,6]	273	9		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
Heat Brands[3,4]	286	14		✓[8]	✓	✓	✓	✓		✓		✓[7]			✓	✓	✓[8]
Glufosinate 150SN	267	10	✓									✓[6]		✓[6]			
Valtera[3]	488	14				✓	✓			✓		✓					✓

[1] Rates of application vary among brands. Consult glyphosate page for specific application rates. [2] For pre-harvest perennial weed control and may provide harvest management benefit. [3] For rapid plant tissue dry down to facilitate harvest. [4] Should be tank mixed with glyphosate when used prior to harvest. Not for crops grown for seed when glyphosate used. [5] Refer to product page for surfactant requirements. [6] Not for crops grown for seed. [7] Red lentil only. [8] *Heat LQ* only. [9] For use only on Roundup Ready canola with the pod shatter reduction trait.

Table 18. Weed Control in Fallow

HERBICIDE	Page	Herbicide Mode of Action Group	Brome, Downy	Foxtail Barley	Foxtail, Green	Quackgrass	Wild Oats	Volunteer Cereals	Buckwheat, Wild	Dandelion	Flixweed/Tansy Mustard	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Narrow-leaved Hawk's-beard	Night-flowering catchfly	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed (incl. Lady's-thumb)	Sow-thistle (perennial)	Stinkweed	Thistle, Canada	Volunteer Canola (including glyphosate tolerant varieties)	Volunteer Flax
Dicamba + 2,4-D	197	4							•		•		•	•	•			•	•		•			S		
Dicamba/Mecoprop/MCPA	203	4							•		•		•	•	•			•	•		•			S	•	
Glyphosate (180 g ae/acre)[2]	273	9	•	S	•	S	•	•	•	S	•	•	•	•	•	•	S	•	•	•	•	S	•	S	•[1]	•
Glyphosate (360 g ae/acre)[2]	273	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•[1]	•
Insight	314	14					•		•				•	•				•	•						•	
IPCO Bifecta EZ	319	5,14	•		•				•	•			•	•	•			•	•	•	•				**S**	
The following products may ( ) or must (+) be mixed with glyphosate – weeds marked are those that the product has activity on in addition to glyphosate																										
+ 2,4-D	100	4									•		•	•	•	•	•		•	•			•		•	
+ *BlackHawk*	142	4,14							S	•[4]	•		•	•	•	•	•	•	•	•			•		•	
+ Bromoxynil	149	6							•				•		•				•		•		•		•	
+ Bromoxynil/MCPA	155	4,6							•		•	•	•	•	•		•	•	•	•	•		•		•	
Carfentrazone	163	14							•				•	•	•	•							•		•	
+ *Distinct* (low rate)	210	4,19							•	TG			•	•		•		•								
Distinct (high rate)	210	4,19							•	TG			•	•		•		•			•	S	•	TG	•	
+ *Express Pro*	232	2								•			•			•	S				•			S[3]	•	
+ Florasulam	241	2							•	•	•	•		•		•				•	•		•		•	
+ *Heat Brands*	286	14							•	•	•		•	•	•	•		•					•		•	
+ *IIntruvix/Intruvix II*	316	2,4,14	•		•		•	•	•	•	•	•	•	•	•	•			•	•			•		•	
+ *Korrex II*	324	2,4							•	•	•	•	•	•	•	•				•	•	•	•		•	
+ tribenuron	471	2								•									•	•			•		•	
Voraxor	500	14							•				•	•	•	•		•		S			•		•	

• Control. S – Suppression. TG – Top growth control.

[1] Not including glyphosate tolerant canola. [2] Rates of application varies among brands. Consult the product page for application rates. [3] Fall rosettes and spring seedling. [4] Spring seedlings.

Table 19. Post-harvest Weed Control in Stubble

HERBICIDE	Page	Herbicide Mode of Action Group	Flixweed	Narrow-leaved Hawk's-beard	Shepherd's-purse	Stinkweed	Thistle, Canada	Quackgrass	Dandelion
2,4-D	100	4	•		•	•	S		S
Authority 480	121	14							
Authority Supreme	125	14,15				•			
BlackHawk	142	4,14	•	•	•	•			
Blackhawk EVO	144	4,14		•	•				•
Dicamba + Glyphosate	197	4,9	•		•	•	S	S	
Dicamba/Mecoprop/MCPA	203	4	•		•	•	S		
Distinct (low rate)♦	210	4,19		•			TG		TG
Distinct (high rate)	210	4,19		•			TG		•
Express Pro♦	232	2		•					•
Florasulam + glyphosate	243	2,9	•	•	•	•			•
Glyphosate	273	9	•	•		•	•	•	•
Intruvix	316	2,4,14	•	•		•	S		•
IPCO Bifecta EZ	319	5,14			•				•
MCPA	331	4	•		•	•	S		S
Paradigm PRE + gyphosate	367	2,4,9	•	•	•	•	•	•	•
Smoulder	429	2,14	•	•		•	•		•

• Control. S – Suppression. Levels of suppression vary depending on the product and growing conditions in the fall. Regrowth requiring in-crop treatments can be expected. TG – Top growth control.
♦ To be used only in a mix with glyphosate.

Table 20. Weed Control in Grass Pastures and Hayfields

HERBICIDE	Page	Herbicide Mode of Action Group	Absinthe	Bindweed, Field	Burdock	Thistle, Canada	Dandelion	Dock, Curled	Daisy, English	Flixweed	Foxtail Barley	Gumweed	Narrow-leaved Hawk's-beard	Knapweed	Leafy Spurge	Nodding Thistle	Poplar	Pussy Toes	Red Bartsia	Sage, Pasture	Snowberry	Sow-thistle, Perennial	Stinkweed	Tansy, Common	Wild Rose	Willow	Wormwood, Biennial
2,4-D (500 g/L)	100	4	S	S	•	S	S	•		•		S	•		S	S	S	S	•	S	S	S	•				•
2,4-DB	104	4		S		S	S	•[3]					•[3]									S	•				
Clearview[4]*/Reclaim II*	393	2,4	•[3]	S	•	•	•	•		•		•	•	•		•		•		•	•	•	•	•	•		•
Dicamba	197	4		S		S	S	S	S					S	S					S	•	S					
Dicamba + 2,4-D	197	4	S	S	•	S	S	S	S	•		S			S	S	S		•	S	•	S	•		•	S	
Escort	219	2				S	•										•[3]					S		•	•	•[3]	
Grazon XC	283	4			•	•	•	•							•[2]							S		•	•	•[3]	
Kerb SC	323	3									•														•		
MCPA (500 g/L)	331	4		S		S	S	S		•		S			•[3]							S	•				•
MCPB/MCPA	334	4		S		S																S	•				
Milestone[4]*/Restore II*	398	2,4	•[3]		•	•	•	•		•		•	•	•								•		•	S		
Navius Flex/TruRange[5]	347	2,4				•	•			•				•	•		•				•	•	•	•	•	•	
Overdrive	363	4,19					S								S												•
Restore NXT[4]	401	4	•		•	•		•		•		•		•		•						•		•			
Sightline	421	2,4	•[3]			•	•	•		•			•	•		•		•				•	•	•	•		
Tordon 22K	454	4		•[2]		•								•	•[2]					•							

• Controlled. S – Top growth suppression only.
[1]Rates may vary between different brands. Check product page for specific rate for product and use. [2] May require multiple applications for complete control. [3] Controlled by the highest rate within this range. [4]Permanent grass pasture and rangeland only. [5]Rangeland or permanent pasture only.

Table 21. Weed Control in Shelterbelts

			USE			SHELTERBELT SPECIES												WEEDS																							
HERBICIDE	Page	Herbicide Mode of Action Group	Before Planting	After Planting (New & Established)	Established	American Elm	Birch	Caragana	Crabapple	Green Ash	Juniper	Lilac	Manitoba Maple	Poplar	Scots Pine	Siberian Elm	Willow	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Quackgrass	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Sow-thistle (Perennial)	Stinkweed	Thistle, Canada
Casoron	167	20		•		•		•	•	•	•	•	•			•			•		•	•							•	•	•	•	•	•			•	
Glyphosate	273	9	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Linuron	328	5			•	•		•		•			•		•	•	•	S	•		•	•							•		•			•		•		
Metribuzin[3]	339	5	•					•		•		•		•					•[4]	•									•		•		•	•				
Simazine	424	5			•	•		•		•			•			•		•	•[1]	•	•								•					•				
Trifluralin	477	3	•		•	•		•		•					•	•		•	•	•	•	•							•		•		•					

• Control. S – Suppression. TG – Top growth control.

[1] Yellow foxtail only. [3] PPI tank mixed with *Trefland EC*, not all brands. [4] Green foxtail only.

Table 22a. Weed Control in Forage Crops - Crops

			GRASSES																					LEGUMES								COVER CROPS				
HERBICIDE	Page	Herbicide Mode of Action Group	Altai Wild Rye Grass	Bromegrass	Creeping Red Fescue	Crested Wheatgrass	Intermediate Wheatgrass	Kentucky Bluegrass	Meadow Fescue	Meadow Foxtail	Millets	Northern Wheatgrass	Orchardgrass	Pubescent Wheatgrass	Reed Canarygrass	Russian Wild Ryegrass	Ryegrass, Annual	Ryegrass, Perennial	Slender Wheatgrass	Streambank Wheatgrass	Tall Fescue	Tall Wheat grass	Timothy	Western Wheatgrass	Alfalfa	Alsike Clover	Cicer Milkvetch	Red Clover	Sainfoin	Sweet Clover	Trefoil, Bird's-foot	White Dutch Clover	Barley	Flax[16]	Oats	Canola	Wheat
2,4-D[8]	100	4	X	X	X	X	X	X	X	X	S	X	X	X	X	X	X		X	X	X	X	X	X	X								X				X
2,4-DB[8]	104	4		S[4]	S[4]	S[4]	S[4]		S[4]				S[4]							S[4]	S[4]	S[4]	S[4]		S	S		S			S	S	X		X		X
Avadex Liquid EC[18]	127	15																							S[1]	S[1]		S[1]		S[1]	S[1]		X	X		X	X
Bentazon[8]	138	6		S[2]	S[2]	S[2]				S[2]	S		S[2]										S[2]		X[2]	X[2]		X[2]	X[2]	X[2]				X			
Bromoxynil[8]	149	6		S[2]	S[2]	S[2]	S[2]		S[2]		S		S[2]		S[2]	S[2]			S[2]			S[2]	S[2]		X[2]								X	X	X		X
Bromoxynil / MCPA ester[8]	155	4,6		S[2]	S[2]	S[2]	S[2]		S[2]	S[2]			S[2]		S[2]	S[2]			S[2]	S[2]	S[2]	S[2]	X										X	X	X		X
Clethodim[8]	174	1																							S									X		X	
Clopyralid	183	4	X	X	X	X	X	X	X	X			X		X	X			X	X	X	X[9]	X										X	X	X	X	X
Curtail M	188	4																					E										X	X	X		X
Dicamba + 2,4-D	197	4		S	X[2]	S	S		S	S			S	S					S	S	S	S	S										X				X
Dicamba / Mecoprop / MCPA[8]	203	4		X[9]	X[9]	X[9]	X[9]	X[9]	X[9]	X[9]			X[9]	E[9]					E[9]	E[9]	E[9]	E[9]	E[9]	E[9]									X		X		X
Ethalfluralin[18]	223	3																							S[2]											X	
Eptam Liquid EC[18]	217	15																							S		S[2]			S[2]	S						
Fenoxaprop[8]	234	1																S[2]																			
Fluroxypyr / 2,4-D	256	2,4		X[2]	X[2]	X[2]	X[2]														X[2]		X[2]														
Imazamox+ Bentazon	300	2,6																							X	X		X	S								
Imazethapyr[8]	306	2																							X[15]											X[11]	
Infinity	311	6,27		E														X					X[2]										X				X
Infinity FX	313	4,6,27		E	X													X					X[2]														
Kerb SC	323	3																							E						E						
MCPA[8]	331	4		X[8,9]	X[8,9]	X[8,9]	X[8,9]	X[8,9]	X[8,9]				X[8,9]		X[8,9]	X[8,9]	X[8,9]		X[8,9]			X[8,9]	X[8,9]		S[5,6]	S[5]		S[5]					X	X	X		X
MCPB + MCPA[8]	334	4	S[4]	S[4]	S[4]	S[4]	S[4]		S[4]			S[4]		S[4]	S[4]	S[4]			S[4]	S[4]	S[4]	S[4]	S[4]	S[4]	S[2,8]	S		S					X		X		X
Metsulfuron[8]	343	2			X	X	X						X										E[8,17]										X				X
Odyssey NXT	302	2																							X[2]						X[2]						
Poast Ultra	377	1			X[2]																				X	X	X		X	X				X		X	
Prestige XC (see clopyralid / MCPA + fluroxypyr)	190	4		X[2]	X[2]	X[2]	X[2]														X[2]		X[2]										X				X
Princep Nine-T	424	5																							E						E						
Quizalofop[8]	389	1																							X[2]	X[2]	S[2]	X[2]	S[2]	S[2]	S[2]	S[2]		X		X	
Select Plus[2]	415	1																							X												
Thifensulfuron / Tribenuron (2:1)[8]	446	2		X	X	X	X	E				X	X	X					X	X	X	X		X									X		X		X
Tralkoxydim[8]	458	1		X[2]	X[2]	X[2]	X[2]					S[2]							S[2]					S[2]	S[1]	S[1]		S[1]	S[1]	S[1]	S[1]	S[1]	X				X
Trifluralin[8,18]	477	3																							S[13]	S[14]	S[14]	S[14]	S[12]	S[12]	S[14]			X[7]		X	
Velpar DF CU	498	5																							E												

S – seedling only. E – Established only. X – seedling or established. [1] Underseeded only. [2] For seed production only. [4] DO NOT graze or harvest for livestock in the year of treatment. [5] Use MCPA sodium salt on seedling forages only when underseeded to flax, oats, wheat or barley. DO NOT use on Flemish varieties of alfalfa. [6] For use as a spot treatment only control red bartsia. [7] Apply to fall prior to seeding. [8] All products may not be registered for crops and weeds indicated. Check product labels. [9] For forage production only. [10] Check recommendations for varietal restrictions. [11] CLEARFIELD varieties only. [12] Liquid formulations in spring only. [13] *Bonanza 10G, Treflan EC* (spring only). [14] *Treflan EC* in spring only. [15] Apply to seedlings stands that will be in production for three years after application and establishment stands that will be in production for 2 years after application. [16] May not include Solin (low linolenic acid flax). Check product label for restrictions. [17] Fall application only. [18] For application prior to emergence of the crop.

Table 22b. Weed Control in Forage Crops - Weeds

HERBICIDE	Page	Herbicide Mode of Action Group	GRASSES: Barnyardgrass	Foxtail Barley	Foxtail, Green	Foxtail, Yellow	Quackgrass	Wild Oats / Tame Oat	BROADLEAVED WEEDS: Blue Bur	Buckwheat, Wild	Burdock	Catchfly, Night-flowering	Chickweed	Cleavers	Cockle, Cow	Cocklebur	Dandelion	Dock, Curled	Flixweed	Goat's-beard	Goosefoot, Oat-leaved	Hawk's-beard, Narrow-leaved	Hemp-nettle	Knotweed, Prostrate	Kochia†	Lamb's-quarters	Lettuce, Prickly	Mustard, Wild	Pigweed, Prostrate	Pigweed, Redroot	Pigweed, Russian	Plantain, Common	Radish, Wild	Ragweed, False / Giant	Russian Thistle	Scentless Chamomile	Shepherd's-purse	Smartweed, Lady's-thumb	Sow-thistle (Annual)	Sow-thistle (Perennial)	Stinkweed	Sunflower, Prairie / Annual	Thistle, Canada	VOLUNTEER CROPS: Cereal Grains (wheat, barley)	Flax	Canola	Alsike Clover
2,4-D	100	4							•		•					•	TG	•	•[5]	•	•	•[5]				•	•	•	•		•	•	•			•[5]	•	•	TG	•[5]	TG	TG			•	
2,4-DB	104	4								•							TG	S			•	•					•		•		•		•			•	S		TG	•		TG				
Avadex Liquid EC	127	15						•[2]																																							
Bentazon	138	6											•	•		•										•		•	S				•	S		•	•			•		TG			•	
Bromoxynil	149	6							•	•					•	•									•	•		•	•	•	•			•			•								
Bromoxynil / MCPA Ester	155	4,6							•	•		•			•	•			•						•	•			S[4]					•	•	•	•		TG	•		TG			•	
Clethodim	174	1	•		•	•	S	•																																			•			
Clopyralid	183	4								•																								•					TG			•				•
Curtail M	188	4								•	•				•	•[7]			•[5]						S	•	•	•		•	•	T	•	•		•[5]	•	•	•	TG	•[5]	•	TG			•	
Dicamba + 2,4-D	197	4							•	•	•			•	•	•			•	•		•[5]			•	•	•	•		•	•	•	•	•	•		•	•		TG		•	TG			•	
Dicamba / Mecoprop / MCPA	203	4								•		•		•	•				•				•	•	•	•		•	•	•				•		•	•	•	TG	•	•	TG			•	
Ethalfluralin	223	3	•			•	•		S[2]		•			•	S	•							S		•	•			•	•				S			S					S			
Eptam Liquid EC	217	15	•			•	•	S	•					•													•				•	•											•			
Fenoxaprop	234	1	•			•	•		•[2]																																					
Fluroxypyr / 2,4-D	256	4							•	•	•		S	•		•	•[5,6]	•[5]	•	•	•[5]					•	•	•			•[6]		•	•	•		•[6]		•	S	TG	•	•	TG			•	
Imazamox+ Bentazon	300	2,6	•			•	•		•		S				S	•									S	•		•	•	•				•			•	•					•			
Imazethapyr	306	2			S																							•		•						S	•		•					•		
Infinity	311	6,27								•			•	•			S		•				•		•	•		•		•				•		•	•	•	S	•		S			•	
Infinity FX	313	4,6,27								•			•	•			S		•				•		•	•		•		•				•		•	•	•	S	•		S		•	•	
Kerb SC	323	3		•			•	•					•																														•			
MCPA	331	4	•						•		•					•		•	•		•		S[3]		•	•	•	•		•	•			•	TG		•[5]		TG	TG			TG				
MCPB + MCPA	334	4																•					S			•		•		•		•	S			•		S	TG	•[5]		•			•	
Metsulfuron	343	2							•	S			•		•				•				•			S		•	•		•	S	•	•	•	•	S	S	•		S			•[1]	
Odyssey NXT	302	2	•			•			•	S			•	•					•				S			S		•		•				•		•	•			•			•[1]		•[1]	
Poast Ultra	377	1	•	S		•	•	S	•																																		•			
Prestige XC (see clopyralid/ MCPA + fluroxypyr)	190	4								•			S	•			•[5]		•[5]				S		•	•		•		•	•				•	•	•	•	•	S	•	•	S			•	
Princep Nine-T	424	1	•			•			•[2]	•																•								•												•
Quizalofop	389	1	•	S	•	•	S	•																																			•			
Select Plus	415	1	•	•	•	•		•																																						
Thifensulfuron / Tribenuron (2:1)	446	2								•			•	S	•				•			•	•			•		•		•				•	S	•	•		S	•	•	S			•[1]	
Tralkoxydim	458	1	•			•	•		•																																					
Trifluralin	477	3	•			•	•		•[2]		•				•									•		•			•																	
Velpar DF CU	498	5															TG					•													•					TG								

• Control. S –= Suppression. TG – Top growth control.

[1] Will not control CLEARFIELD varieties. [2] For control of wild oats only. [3] Controlled by MCPA K only. [4] Controls redroot pigweed only when a cereal cover crop is used.

[5] Spring seedlings only. [6] Controlled only when growing rapidly. [7] Spring germinating rosettes.

†Note: Surveys have found that 90 percent of fields have group 2 resistant kochia. Group 2 herbicides alone will not likely provide effective control.

Table 23. Industrial Vegetation Products

HERBICIDE	Page	Herbicide Mode of Action Group	Selective	Bare Ground	Absinthe	Bindweed, Field	Burdock	Thistle, Canada	Dandelion	Dock, Curled	Daisy, English	Flixweed	Foxtail Barley	Gumweed	Narrow-leaved Hawk's-beard	Knapweed	Leafy Spurge	Nodding Thistle	Poplar	Pussy Toes	Red Bartsia	Sage, Pasture	Snowberry	Sow-thistle, Perennial	Stinkweed	Tansy, Common	Wild Rose	Willow	Wormwood, Biennial
2,4-D (500 g/L)	100	4	✓		S	S	•	S	S	•		•		S	•		S	S	S	S	•	S	S	S	•				•
2,4-DB	104	4	✓			S		S	S	•[3]					•[3]									S	•				
Arsenal Powerline[5]	118	2		✓		•	•	•									•		•					•	•		•		
Clearview/Sightline	393/421	2,4	✓		•[3]			•	•	•		•			•	•[3]		•		•				•	•	•			
Dicamba	197	4	✓			S		S	S	S	S					S	S					S	•	S					
Dicamba + 2,4-D	197	4	✓		S	S	•	S	S	S	S	•		S			S	S	S		•	S	•	S	•		•	S	
Escort[5]	219	2	✓					S	•										•[3]					S		•	•	•[3]	
Esplanade[4,5]	221	29		✓		•				•																			
MCPA	331	4	✓			S		S	S	S		•		S[5]			•[3]							S	•				•
MCPB/MCPA	334	4	✓			S		S																S	•				
Milestone	398	4	✓		•[3]			•	S[3]	•[3]						S[3]									S[3]				
Navius Flex[5]	347	2,4	✓					•	•			•				•	•		•				•	•	•	•	•	•	
Overdrive	363	4,19	✓						S								S												•
Restore NXT	401	4			•			•		•						•		•						•		•			
Telar	438	2	✓					•				•			•									•	•	•		S	
Tordon 22K[5]	454	4	✓			•[2]		•								•	•[2]					•							

• Control. S – Top growth suppression only.

[1] Rates may vary between different brands. Check product page for specific rate for product and use. [2] May require multiple applications for complete control.

[3] Controlled by the highest rate. [4] Weeds emerging from seed only. [5] Soil residual control.

Special Weed Problems

This section identifies specific weeds and some herbicides recommended for control. Refer to the particular crop section or the product label for information on specific products that may be used on the crops and for application instructions.

Absinthe

2,4-D LV Ester (500 g/L) - In grass pastures with no legumes, spray 1.82 L per acre in late June, prior to flowering. Re-treat regrowth in late summer when plants have 6 to 10 inches (15 to 25 cm) of new growth. More than 1 season of treatment may be required.

Casaron - In poplar plantations and shelterbelts, absinthe is controlled with fall applications at a rate of 70 kg per acre.

Dicamba - In grass pasture and rangeland only, apply 240 g ae per acre (see dicamba page for specific formula rates) in 20 to 30 gallons (90 to 135 L) per acre for top growth control when leaves are fully expanded.

Reclaim II /Clearview/Sightline- In grass pastures and rangeland, apply *Reclaim II A/Clearview/Sightline A* at 55 grams per acre plus *Reclaim II B* or 2,4-D 700 ester (with Clearview/Sightline) at 0.69 L per acre or Clearview/Sightline A at 93 grams per acre for season long control.

Restore II /Milestone - In grass pastures and rangeland, apply *Restore II* at 0.97 L per acre or Milestone at 202 mL per acre when weeds are actively growing.

Alders

2,4-D LV Ester (500 g/L) - In grass pastures and non-crop land, apply 1.78 L per acre to the foliage of actively growing brush.

Dicamba + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply dicamba at 2.1 L per 1,000 L of water with 2,4-D LV ester or amine at 4.0 L per 1,000 L of water to the foliage of actively growing brush in the spring or early summer and wet the foliage until the point of runoff.

Aspen Poplar (Trembling Aspen)

Dicamba + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply dicamba at 1.32 L per acre with 2,4-D LV ester or amine at 1.78 L per acre in 20 gallons per acre (90 L per acre) water to the foliage of actively growing brush in spring or early summer.

Escort - In pasture and rangeland, apply *Escort* at 60 grams per acre with non-ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Navius Flex /TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 135 grams per acre for control of trembling aspen.

Baby's Breath (Perennial)

Dicamba - In grass pastures with no legumes, apply 3.72 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water when actively growing.

Reclaim II/Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A /Clearview/Sightline A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 81 grams per acre for season long control.

Biennial Wormwood

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing plants.

Distinct - *Distinct* applied post-emergent in corn at 115 grams per acre plus a non-ionic surfactant and UAN (liquid 28-0-0) at 1.25 L per 100 L of spray solution will control biennial wormwood (2 to 8 leaf stage). Fallow or post-harvest, *Distinct* applied at 115 grams per acre tank-mixed with glyphosate and *Merge* adjuvant (200 mL per acre) controls biennial wormwood (2 to 8 leaf stage).

Glyphosate - In glyphosate tolerant corn and soybean, apply a single application of 360 g ae per acre.

MCPA - Amine 500 formulations applied at 0.45 to 0.71 L per acre, Ester 600 formulations at 0.42 to 0.61 L per acre and Na formulations at 0.81 to 1.1 L per acre will control biennial wormwood.

Overdrive - In grass pastures and non-crop land, apply at 115 grams per acre for control.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre when weeds are actively growing for season long control.

Restore II /Milestone - In grass pastures, apply *Restore II* 0.97 L per acre or *Milestone* at 202 mL per acre for control.

Roundup Xtend /Roundup Xtend 2- Apply *Roundup Xtend* at 1.5 L per acre or *Roundup Xtend 2* at 1.14 L per acre for control of biennial wormwood (2 to 8 leaf stage).

Black Medic

Dichlorprop/2,4-D; Mecoprop-p; dicamba/mecoprop/MCPA; 2,4-D amine or LV ester - Apply in registered crops at registered rates to black medic in the 1 to 4 leaf stage for suppression only.

Chokecherry

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing brush.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex /TruRange* at 135 grams per acre for control of chokecherry (up to 3 metres).

Common Tansy

Glyphosate - Apply at 1.9 to 2.8 L per acre in 10 gallons of water per acre (40 L per acre) to actively growing plants that are 8 to 10 inches (20 to 25 cm) tall (summerfallow, stubble and noncropland).

Escort - In pastures, rangeland and rough turf, apply 8 grams per acre in 10 to 20 gallons per acre (45 to 90 L per acre) of water to actively growing plants of less than 4 inches (10 cm) tall. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Navius Flex /TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Reclaim II/Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre or *Clearview/Sightline A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre for season long control.

Restore II/Milestone - In grass pastures and rangeland, apply *Restore II* at 0.97 L per acre or *Milestone* at 202 mL per acre for suppression.

Curled Dock

2,4-DB - Apply 0.91 to 1.1 L per acre to young and actively growing plants to give top growth control.

Dicamba - As a patch treatment or in pasture and rangeland, apply 0.92 L per acre *Banvel II* in 10 to 20 gallons per acre (45 to 90 L per acre) water to actively growing weeds for top growth control.

Glyphosate - As a spot treatment, apply 2.83 to 4.86 L per acre (360 g/L formulations or equivalent of other formulations) in 10 gallons per acre (45 L per acre) water when most plants have reached the early bud stage. DO NOT disturb treated plants for at least 10 days following treatment.

MCPA amine, 2,4-D amine - Apply 0.445 to 0.69 L per acre of formulations containing 500 g/L MCPA or 2,4-D amine to give top growth control.

MCPB/MCPA - Apply 1.72 L per acre to plants at the rosette stage for control.

Dichlorprop/2,4-D - 0.71 L per acre for suppression before plants are 2 inches (5 cm) tall.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 69 grams per acre plus *Reclaim II B* at 0.69 L per acre for season long control.

Restore II - In grass pastures and rangeland, apply *Restore II* at 0.86 L per acre to control curled dock (<4 leaf).

Diffuse and Spotted Knapweed

Dicamba - In grass pastures, rangeland and non-crop land, apply at 1.86 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water to actively growing weeds.

Lontrel - Apply at a rate of 82 g ai per acre for control.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Reclaim II /Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 55 grams per acre for season long control of spotted knapweed or apply *Reclaim II A* at 93 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 93 grams per acre plus 2,4-D amine at 340 to 445 g ae per acre from the rosette to bud stage for diffuse knapweed control.

Restore II/Milestone - In grass pastures and rangeland, apply *Restore II* at 0.57 L per acre or *Milestone* at 120 mL per acre when actively growing to control spotted knapweed. Apply *Restore II* at 0.97 L per acre or *Milestone* at 202 mL per acre for suppression of diffuse knapweed.

Tordon 22K - In rangeland and grass pasture, apply 0.91 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Field Bindweed

2,4-D amine - In grass pastures containing no legumes or as a spot treatment, apply 1.82 L per acre of formulations containing 500 g/L 2,4-D amine at early flowering stage.

2,4-DB - As a spot treatment in labelled crops apply 2.83 to 4.86 L per acre in 10 gallons per acre (45 L per acre) water at the bud stage. DO NOT disturb plants for at least 10 days following treatment. Heavy rainfall within 2 hours of application may wash chemical off the foliage and a repeat treatment may be required. Rainfall occurring within 6 hours after application may reduce control.

Bentazon - In labelled crops, apply 0.71 L per acre followed by 0.71 L per acre 7 to 10 days later. Apply in 20 to 35 gallons per acre (90 to 160 L per acre) water before field bindweed has developed a dark green colour and before it has begun trailing. Use a recommended surfactant (see recommendations under the appropriate crop).

Dicamba - As a patch treatment or in rangeland, apply 1.0 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply when field bindweed is in the flowering stage and allow 3 weeks after treatment before resuming normal summerfallow tillage.

Flexstar GT - *Flexstar GT* applied at 840 mL per acre as a pre-seed or pre-emergent application for soybeans or as an early post-emergent application on 1 to 2 trifoliate leaf stage of glyphosate tolerant soybeans will control field bindweed from the cotyledon to 3 or 4 true leaf stage. For use in the Red River Valley of Manitoba only.

Glufosinate 200SN - Apply *Glufosinate 200SN* to *Glufosinate 200SN* tolerant corn or soybeans at 0.81 L per acre from emergence to 6 leaf stage of field bindweed for season long suppression.

Glyphosate - As a spot treatment, apply 2.8 to 4.9 L per acre (360 g/L formulations or equivalent of other formulations) in 10 to 30 gallons per acre (45 to 135 L per acre) at the full bloom stage or beyond. Allow 7 or more days after application before tillage.

MCPB/MCPA - Apply 1.72 L per acre to plants in spring during rapid growth.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre when actively growing for top growth control.

Restore II - For season long control in grass pastures and rangeland only, apply *Restore II* at 0.97 L per acre.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) for spot treatment, using hand wand application equipment only, to a maximum of one acre of every two acre area of land. of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Field Horsetail

Glyphosate - *VP480* at a rate of 1750 g ae per acre plus a non-ionic surfactant at 0.5 mL per 100 L of spray solution is registered for the control of field horsetail in Christmas tree plantations. Research has shown that application in spring or early summer, just after the plants have emerged is the timing that gives the best level of control with glyphosate. The use of a silicone-based adjuvant such as *SylGard/Xiameter* or *Dynamax* will also improve control.

Casaron - In poplar plantations and shelterbelts, apply in early spring or late fall prior to annual weed emergence, or after cultivation has removed existing weeds at rate of 45 to 70 kg per acre.

MCPA amine, potassium and sodium salt mixtures - Apply 0.57 L per acre of formulations containing 500 g/L MCPA after the weeds have fully emerged for top growth control. May be used in wheat, oats, barley, flax and rye.

Foxtail Barley

Flexstar GT - *Flexstar GT* applied at 840 mL per acre as a pre-seed or pre-emergent application will control foxtail barley in glyphosate tolerant soybeans (see *FlexStar GT* page). For use in the Red River Valley of Manitoba only.

Focus - Apply in fall or spring as a pre-plant or pre-emergent treatment to wheat, spring or winter, corn or soybeans for pre-emergent suppression of foxtail barley.

Glyphosate - Prior to crop emergence, apply 1 to 2 L per acre (360 g/L formulations or equivalent of other formulations) in 5 to 10 gallons per acre (23 to 45 L per acre) water to foxtail barley at the seedling to heading stage. Late fall applications may provide better control of established plants than spring applications.

Glyphosate - In glyphosate tolerant canola, apply 2 applications, each at 0.5 L per acre (360 g/L formulations or equivalent of other formulations), for season long control.

Inferno Duo - Prior to crop emergence apply 12.75 grams per acre of *Inferno Duo* with 180 to 360 gae per acre of glyphosate.

Kerb SC - Apply registered rates in 20 gallons per acre (90 L per acre) water between October 1 and freeze-up. Use the lower rate on grey-wooded soils or where perennial bluegrass or fescues are the predominant pasture species. DO NOT use *Kerb* for foxtail barley removal in seed grass stands or desired foliage stands of timothy or fescue grass species. At recommended rates, pasture stands of perennial bluegrass and fescue may be reduced by 10 to 15 percent. Where perennial bluegrass and fescues are the dominant pasture species, use the lower rate of *Kerb*. Spray overlaps may seriously harm desirable pasture grass species. Where the grass stand comprises mostly foxtail barley and reseeding to a desirable grass species is required, delay seeding into the *Kerb*-treated soil until the end of June. DO NOT harvest or graze within 60 days of application with *Kerb*. Avoid using *Kerb* on soils having more than 6 percent organic matter.

Quizalofop - In registered crops apply 200 mL per acre to foxtail barley in the maximum 3 to 4 leaf + 3 tiller stage.

Olympus **+ glyphosate** - Preplant surface or postplant preemergence applications of *Olympus* at 5.8 grams per acre tankmixed with glyphosate at 360 g ae per acre controls foxtail barley (seedling to heading stages). For more consistent control of subsequent flushes, follow an application of *Olympus* + glyphosate with an in-crop application of *Varro*.

Goat's-Beard

2,4-D - Apply 125 to 227 g ae per acre in early fall or early spring.

Dicamba - In grass pasture and rangeland only, apply 1.86 L per acre in 20 to 30 gallons (90 to 135 L) per acre when leaves are fully expanded.

Dichlorprop + 2,4-D - Apply 1.62 L per acre in early spring or fall.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre when actively growing for season long control.

Restore II - In grass pastures, apply 0.97 L per acre.

Gumweed

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester at 227 to 340 g ae per acre to the foliage of actively growing plants.

MCPA amine, potassium and sodium salt formulations - Apply 0.71 L per acre of formulations containing 500 g/L MCPA for top growth control.

Reclaim II /Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A/Clearview/Sightline A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre or 2,4-D Amine (*Clearview* and *Sightline*) at 340 g ae per acre when actively growing for season long control.

Restore II/Milestone - In grass pastures, apply *Restore II* at 0.97 L per acre or *Milestone* at 120 mL per acre plus 2,4-D at 340 g ae per acre for season long control.

Hemp Dogbane

2,4-D amine or LV ester - Apply 1.38 to 1.82 L per acre of formulations containing 500 g/L 2,4-D in fall before frost and while plant leaves are green.

MCPA amine, potassium and sodium salt formulations - Apply 0.71 L per acre of formulations containing 500 g/L MCPA for top growth control.

Glyphosate - Apply 2.83 to 4.86 L per acre (360 g/L formulations – see glyphosate page for other rates) when hemp dogbane is in the early bud stage. Apply in 10 gallons per acre (45 L per acre) water. DO NOT disturb treated plants for at least 7 days after application.

Hoary Cress

Glyphosate - As a spot treatment in labelled crops, apply 2.83 to 4.86 L per acre (360 g/L formulations or equivalent of other formulations) in 10 to 30 gallons per acre (45 to 135 L per acre) water when most plants have reached the early bud stage. DO NOT disturb treated plants for at least 10 days following treatment.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre acres when actively growing for season long control.

Restore II - For season long control in grass pastures and rangeland only, apply *Restore II* at 0.97 L per acre.

Leafy Spurge

2,4-D amine - Apply 1.82 L per acre of formulations containing 500 g/L 2,4-D at early flowering stage. Repeat at least once to new growth later in the season. Control of established plants and new seedlings will require continued applications for a period of at least 4 to 5 years.

Dicamba - Apply 0.84 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water for top growth control when the weed is actively growing. Patch treatment or pasture.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Overdrive - In grass pastures and non-crop land, apply at 115 grams per acre for top-growth control.

Locoweeds, Lupines, and Milk-vetches

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 to 2.75 L per acre at the full bloom stage.

Milkweed

Glyphosate - When making Preharvest applications, use 1.0 L per acre (360 g/L formulations or equivalent of other formulations). For patch treatments, apply 4.86 L per acre (360 g/L formulations or equivalent of other formulations) in 10 gallons per acre (45 L per acre) water. Apply when most plants have reached the bud to bloom stage. Reduced results may occur on plants treated after full bloom as not all milkweed plants reach the required stage of growth at the same time. Repeat treatments may be required. DO NOT disturb plants for 10 days following treatment. DO NOT apply to plants covered with dust.

Pasture Sage

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.2 L per acre to the foliage of actively growing plants.

Dicamba - In grass pastures, rangeland and non-crop land, apply dicamba at 1.86 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water to actively growing weeds.

Reclaim II/Clearview/Sightline- In grass pastures and non-crop land, apply *Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 81 grams per acre for 12 months of control.

Tordon 22K - In rangeland and grass pasture, apply 1.82 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Perennial Smartweed

Glyphosate - Apply 2.0 L per acre (360 g/L formulations or equivalent of other formulations) in 10 gallons per acre water. Apply when vines are a minimum of 8 inches (20 cm) tall, but before flowering.

Poplar

Dicamba + 2,4-D - In grass pasture and rangeland only, apply dicamba at 2.1 L plus 2,4-D 500 amine at 4 L or 2,4-D 600 ester at 3.3 L per 220 gallons (1000 L) of water and apply by wand to the point of runoff when leaves are fully expanded.

Escort - In pasture and rangeland, apply *Escort* at 40 grams per acre with non-ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Glyphosate - As a non-selective spot treatment, apply 1.21 to 2.43 L per acre (360 g/L formulations or equivalent of other formulations) in 10 to 30 gallons per acre (45 to 135 L per acre) water in the summer through early fall when brush is actively growing.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 135 grams per acre for control of black and balsam poplar as well as plains cottonwood and trembling aspen.

Povertyweed

Dicamba - As a spot treatment or in grass pasture or rangeland apply 1.86 L per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water when weed is actively growing. Dicamba at 0.61 L per acre will provide only top growth control.

Tordon 22K - In rangeland and grass pasture, apply 1.82 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Prairie Everlasting, Prairie Sage

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing plants in the early fall, and repeat in the spring.

Reclaim II/Clearview/Sightline - In grass pastures and rangeland, apply *Reclaim II A/Clearview/Sightline A* at 69 grams per acre plus *Reclaim II B* at 0.69 L per acre or for *Clearview/Sightline* mix with 445 g ae per acre of 2,4-D Amine when actively growing for 12 month control or *Reclaim II A/Clearview/Sightline A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or for *Clearview/Sightline* mix with 445 g ae per acre of 2,4-D Amine for 24 month control.

Purple Loosestrife

(dryland situations only)

Glyphosate - Apply 2.43 L per acre (360 g/L formulations or equivalent of other formulations) in 30 to 60 gallons per acre (135 to 270 L per acre) water when purple loosestrife is actively

growing and at or beyond the bloom stage. If using hand held equipment, apply a 1 to 2 percent solution until plants are wet. Use a 33 percent product solution if using a wiper applicator. DO NOT treat plants over open water. If possible, remove and destroy the flower heads before treatment to ensure prevention of seed set. For large monocultures of purple loosestrife, gradually work from the periphery inward over a number of years to allow competing vegetation to invade the treated area. Sprayed areas should be monitored for new seedlings to prevent re-infestation of purple loosestrife.

Reclaim II - In grass pastures and rangeland, *Reclaim II A* at 93 grams per acre plus *Reclaim II B* at 0.69 L per acre when actively growing for control.

Red Bartsia

2,4-D amine or LV ester - Apply 0.57 L per acre of formulations containing 500 g/L 2,4-D in 10 gallons per acre (45 L per acre) water. On hayland, treat within 10 days after first cutting. Roadsides and pastures should be sprayed as soon as the red bartsia appears, usually in early July. Repeat treatment if necessary for later germination.

Roses

Dicamba + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply dicamba at 1.48 L per acre with 2,4-D LV ester or amine at 1.78 L per acre to the foliage of actively growing brush in the spring or early summer.

Escort - In pasture and rangeland, apply *Escort* at 12 grams per acre with non-ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Grazon XC - In permanent grass pasture and rangeland, apply *Grazon XC* at 2.5 L per acre for control.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control of wild rose.

Reclaim II - In grass pastures and non-crop land, apply *Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre for 2 years of control.

Russian Knapweed

Dicamba - In grass pasture and rangeland only, apply 3.72 L per acre in 20 to 30 gallons (90 to 135 L) per acre when leaves are fully expanded.

Reclaim II - In grass pastures and rangeland, apply *Reclaim II A* at 55 grams per acre plus *Reclaim II B* at 0.69 L per acre when weeds are actively growing for season long control.

Restore II/Milestone - In grass pastures and rangeland, apply *Restore II* 0.97 L per acre or *Milestone* at 202 mL per acre when actively growing for suppression.

Tordon 22K - In rangeland and grass pasture, apply 1.82 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Saskatoon

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing brush.

Stinging Nettle

2,4-D amine - Apply 0.91 to 1.82 L per acre of formulations containing 500 g/L 2,4-D amine.

Restore II - In grass pastures and rangeland, apply *Restore II* 0.57 L per acre.

Toadflax (Yellow)

Dichlorprop/2,4-D - Apply 0.71 L per acre in 10 to 18 gallons per acre (45 to 80 L per acre) water in wheat or barley for toadflax suppression. Apply when majority of toadflax is no taller than 6 inches (15 cm). The use of Dichlorprop/2,4-D for suppression of toadflax in wheat or barley should be part of a long-term planned approach for toadflax control, which includes spring and fall tillage, fall patch spraying, fallow.

Glyphosate - Apply 2.83 to 4.86 L per acre (360 g/L formulations or equivalent of other formulations) when most plants have reached the early bud stage of growth. Allow 7 more days after application before tillage. A rate of 1.0 L per acre may be used with preharvest applications or when controlling in summerfallow situations.

Grazon XC - In permanent grass pasture and rangeland, apply *Grazon XC* at 1.9 L per acre for control. Use a recommended surfactant (such as any non-ionic surfactant) at the rate of 0.25 L per 100 L of water.

Metsulfuron plus 2,4-D - Apply 2 to 3 grams per acre *Ally* plus 0.34 to 0.45 L per acre 2,4-D LV ester or amine (500 g/L formulations) in 10 gallons per acre (45 L per acre) water for toadflax suppression in wheat, barley, and creeping red fescue. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for suppression.

Thifensulfuron/tribenuron (2:1) - In registered crops, apply 8 grams per acre of DG formulations or 12 grams per acre of *Refine SG* in 10 gallons per acre (45 L per acre) water for suppression of toadflax. Apply when toadflax is less than 15 cm (6 inches) in height. Add non-ionic surfactant at 0.2 L per 100 L spray solution.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L per acre in 90 to 180 gallons per acre (400 to 800 L per acre) of water to actively growing weeds. **WARNING** - Picloram is a very persistent and water-soluble herbicide. DO NOT apply to permeable soil. DO NOT apply to irrigated areas. Take special precautions to prevent drift.

Western Snowberry (Buckbrush)

2,4-D amine or LV ester (500 g/L) - Apply 1.82 L per acre 2,4-D amine or LV ester in a minimum of 20 gallons per acre (90 L per acre) water in spring or early summer. Retreatment may be necessary the following year.

Dicamba plus 2,4-D LV ester (500 g/L) - Apply 1.48 L per acre dicamba tank mixed with 1.82 L per acre 2,4-D LV Ester in 20 gallons per acre (90 L per acre) water in spring or early summer after the leaves are fully expanded.

Escort - Apply 10 grams per acre in 10 to 20 gallons per acre (45 to 90 L per acre) water between mid-June and mid-August after the brush has leafed out, but before the leaves turn their fall colours.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Reclaim II/Clearview/Sightline - In grass pastures and non-crop land, apply *Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview/Sightline A* at 81 grams per acre for 2 years of control.

White Cockle

2,4-DB - Apply *Embutox 625* at 1.1 L per acre or *Caliber 400* at 1.7 L per acre or *Cobutox 600* at 1.1 L per acre for top growth control to registered crops only.

Barricade II **+ MCPA Ester (190 mL per acre)** - In registered crops apply to white cockle up to 10 cm in height.

Express SG - Apply in a mix with glyphosate prior to seeding registered follow crops to control spring rosettes. In rangeland apply 20 grams per acre from the early bud to pre-bloom stage.

Mecoprop - Apply 2.2 L per acre in 18 gallons per acre (*80 L per acre) of water for top growth control of established plants. Will also control seedlings. Apply to registered crops only.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex/TruRange* at 68 grams per acre for control.

Travallas - In registered crops apply to white cockle up to 10 cm tall or across.

Wolf Willow (Silverberry)

Dicamba + 2,4-D amine or LV ester (500 g/L) - In grass pastures with no legumes, apply dicamba at 2.1 L per 1000 L of water with 2,4-D LV ester or amine at 4.0 L per 1000 L of water to the foliage of actively growing brush in the spring or early summer and wet the foliage until the point of runoff.

Reclaim II/Clearview/Sightline - In grass pastures and non-crop land, apply *Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre or *Clearview /Sightline A* at 81 grams per acre plus 2,4-D Amine at 445 g ae per acre for 2 years of control.

Wild Tomato

2,4-D or MCPA amine or ester (500 g/L) - Apply 0.34 to 0.45 L per acre to registered crops up to the 8 leaf stage of wild tomato.

Bromoxynil+MCPA ester - Apply 0.40 L per acre to registered crops from the 1 to 6 leaf stage of wild tomato.

Willow

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 L per acre to the foliage of actively growing brush.

Dicamba + 2,4-D - In grass pasture and rangeland only, apply dicamba at 1.7 L plus 2,4-D 500 amine at 3.24 L per acre in 20 to 30 gallons (90 to 135 L) of water per acre when leaves are fully expanded.

Escort - In pasture and rangeland, apply *Escort* at 40 grams per acre with non-ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons per acre (45 to 90 L per acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Glyphosate - As a non-selective spot treatment, apply 1.21 to 2.43 L per acre (360 g/L formulations or equivalent of other formulations) in 10 to 30 gallons per acre (45 to 135 L per acre) water in the summer through early fall when brush is actively growing.

Grazon XC - In permanent grass pasture and rangeland, apply *Grazon XC* at 2.5 L per acre for control.

Navius Flex/TruRange - In grass pastures and rangeland, apply *Navius Flex /TruRange* at 135 grams per acre for control.

Soil Residual Herbicides

When applied at recommended rates in a crop, most herbicide residues will disappear within a few weeks after application and impose no restriction on cropping options the next year. However, some herbicide residues do not degrade quickly, and can persist in the soil for months or years following application, thereby restricting the crops that can be grown in rotation. Herbicide residues in the soil are deactivated in various ways including:

- Break down by chemical reactions,
- Break down by soil microbes,
- Escape to the atmosphere as a gas (volatilization),
- Break down by light (photodegradation),
- Leaching,
- Binding to soil particles.

Herbicides often disappear from the environment by more than one of these mechanisms. Many herbicides considered to be non-residual are bound temporarily to soil particles while they are broken down gradually by either soil microbes or chemical reactions. The binding action insures that the herbicide is not available to the crop in quantities that will cause damage.

As a general rule, breakdown processes are favoured by warm, moist soil conditions. During the winter, when the ground is frozen, and in the summer when the soil is dry, herbicide degradation is reduced. The residual activity of certain herbicides is also affected by soil organic matter and soil pH. These soil factors are seldom uniform across a field.

Herbicide carryover is aggravated by low levels of organic matter and is more likely to occur on eroded hilltops than in other parts of a field. The risk of herbicide carryover will also be greater in sprayer overlaps which are most common around headlands and slough margins.

Growers should be aware of the residual properties before applying any herbicide if they are to avoid cropping restrictions in following years. Knowledge of the limitations associated with herbicides that leave a soil residue, along with an accurate record of application (e.g. rates, locations) will serve to minimize rotational problems. Each herbicide used in mixes should be considered separately.

Soil tests using chemical extraction cannot always give a good indication of the potential injury risk from herbicide residue because of the influence of organic matter, clay and pH. Because of this, a field bioassay or laboratory bioassay, where plants are grown directly in the treated soil are best for detecting the potential for injury. These tests are not intended to be used to shortcut restrictions on the label, but provide information on rotational crops where none is available.

Injury symptoms from other causes can resemble herbicide carryover injury (e.g. cold weather, flooding, drought, insects, diseases, etc.). Consult with your local agronomist on potential causes before spending money on testing.

Herbicides that leave a soil residue and are of particular concern in Western Canada are found in the following chart.

Re-cropping Restrictions for Residual Herbicides:

Figures listed are the number of cropping seasons before each crop can be grown ("1" means that the crop can be grown the year following application). For plant-back restrictions less than one season; the delay is indicated with a "d" for number of days or with "mths" for the number of months. A blank space means that there are no recommendations given on the product label and a field bioassay is recommended by many product manufacturers to determine if these crops are safe to plant. A field bioassay is a strip of a test crop that covers an area of the field that is representative of the field variation and should include an untreated area.

PRODUCT	Alfalfa	Barley	Canaryseed	Clearfield canola	Non-Clearfield canola	Fababeans	Field corn	Dry beans	Field Peas	Flax	Forage grasses	Lentils	Mustard†	Oats	Potatoes	Rye	Soybeans	Sunflowers	Wheat (durum)	Wheat (spring)	Wheat (winter)
2,4-D*	1	1	1	1	1		1	1	1	1	1	1		1		1			1	1	1
Altitude FX3		1		1	1				1	1		1	2	1				1		1	3 mths
Amitrol 240		1d	1	1d	1d		10d*	10d*	5d*	1		1	1	1			6d	1	1d	1d	1d
AAtrex, Primextra II Magnum						1*	1		1*	1*											
Ares		1	1	1	2		1		1	2		1		1				2	2	1	
Assert (Black and Grey Wooded soils)		1	2	1	1				1	1				2				1	1	1	
Assert (Brown and Dark Brown soils)		1	2	1	2				2	2				2				1	1	1	
Authority 480◊	1	1	1	1	1	0	1		0	0		2	1	1	1		0	0	1	1	4 mths
Authority Strike◊	1	1				0	1		0	0		2	0		0		0	0	1	1	4 mths
Authority Supreme		1		1	1		1		0			2	1	1			0	0	1	1	4 mths
Clomazone, *Command Charge, IPCO Trigon*		1		0	0		1	1	1			1	0	1	1		0		1	1	4 mths
Clopyralid/MCPA (+/- fluroxypyr)	2	1	2	1	1	2	1	2	1*	1	1	2	1	1		1	2	2	1	1	1
Dicamba*		1		1*	1*		1	1*						1			1		0*	0*	1
Dicamba/Fluroxypyr		1	2	1	1	2	2	2	1	1	1	1	1	2	2	1	2	2	1	1	1
Eclipse, Clopyralid		1		1	1				10 mths*	1	1		1	1		1			1	1	
Ethalfluralin	0		2	0	0	0		0	0		2	0	0	2			0	0	1*	1*	
Express Pro		1d		10 mths	10 mths	10 mths	10 mths	10 mths	10 mths	10 mths		10 mths		1d			10 mths		1d	1d	1d
Fierce							7 days										0			7 days	
Flextstar GT							10 mths	10 mths									10 mths			10 mths	4 mths
Florasulam	1		1	1		1	1	1*	1		1	1	1	1		1	1	1	1	1	
Florasulam/fluroxypyr + MCPA		1		1	1				1					1					1	1	1
Florasulam + glyphosate (prior to Aug 1)		0d		1	1				1					0d					0d	0d	0d
Flucarbazone (Brown soils)																				1	
Flucarbazone (Dark Brown soils)		1		1	1				1*	1							1	1	1	1	
Flucarbazone (Black soils)		1		1	1			1	1*	1							1	1	1	1	
Flucarbazone (Grey-Wooded soils)		1		1	1				1*											1	
Fluroxypyr, *Sentrallas*	1***	1		1	1	1***	1***	1***	1	1	1	1	1	1	1***	1	1***	1***	1	1	1
Focus		1		1	1		0		0	1		0	1	1			0	0	1	0	0
Frontier Max							0*	0*													1
Heat Complete		**1**		**1**	**1**	**1**		**0**	**0**	**1**		**0**			**1**		**0**	**0**	**1**	**1**	4 mths
Imazamox/Imazethapyr*, *Odyssey Ultra Q**	1	1	2	1	2		1		1	2		1†††		1			1	2	2	1	
Imazethapyr	1	1		0					0			1								1	
Imazamox, Imazamox+bentazon, Image		1	1	1	1		1		1	1		1	2	1			1	1	1	1	3 mths
Infinity / Tundra / Velocity m3	1	1	1	1	1		1		1	1		2		1			1		1	1	
Kerb SC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Korrex		0		1	1		1	1	1	1		1	1	0	1		1	1	0	0	0

PRODUCT	Alfalfa	Barley	Canaryseed	Clearfield canola	Non-Clearfield canola	Fababeans	Field corn	Dry beans	Field Peas	Flax	Forage grasses	Lentils	Mustard†	Oats	Potatoes	Rye	Soybeans	Sunflowers	Wheat (durum)	Wheat (spring)	Wheat (winter)
Metolachlor							1								1		1				4.5 mths
Metribuzin				2	2	0			0						0*		0*	2			
Metsulfuron (pH less than 7, Brown and Dark Brown		1	4		2					2		3	4	1					1	1	
Metsulfuron (pH less than 7, other soils)		1	4		1					1		3	4	1					1	1	
Metsulfuron (pH 7 to 7.9, Brown and Dark Brown soils)		1	4		3					3		4	4	2					1	1	
Metsulfuron (pH 7 to 7.9, other soils)		1	4		2					3		4	4	1					1	1	
Muster	2	1	2		2	2		2	2	1	2*	2	2	1					1	1	1
Nicosulfuron	10 mths	10 mths		10 mths	10 mths		10 mths										10 mths			1	4 mths
Option	1	1		1	1		1	1	1					1	1		1			1	1
Paradigm PRE, Exhilarate	1	1		1	1	1	1	1	1	1		2	1	1	1		1	1		1	
Permit WG		2 mths		2	2		1 mths	0	1					2 mths	1		1	2	2 mths	2 mths	2 mths
Pixxaro		1		1	1		1		1	1		2	1	1			1	1		1	
Quinclorac		0		1	1				1	2		2						1	0	0	
*Reflex**							1	0									1			1	0
Rexade		1		1	1				1	1		2	1	1			1	1		1	
Rimsulfuron, *Sortan IS*		1		1	1	1	0	1	1	1		1		1	1		1	1	1	1	4 mths
Signal FSU		1		1	1				1	1	1	1	1	1		1			1	1	
Simplicity		1		1	1				1	1		1	1	1			1			1	
Smoulder		1d		11 mths	11 mths		11 mths		11 mths	11†† mths		11††† mths		1			11 mths		1d	1d	1d
Tandem		1		1	1				1	1		1	1	1						1	
Thifen:triben (2:1) + fluroxypyr	2	1	2	1	1	2	2	2	1	1	1	1	1	1	2	1	2	2	1	1	1
Thifen:triben (25:25) + fluroxypyr	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Travallas		10 mths		10 mths	10 mths	10 mths	10 mths	10 mths	10 mths	10 mths		10 mths		10 mths					10 mths	10 mths	10 mths
Trifluralin	0	1*	2	0	0	0	1*	0	0	1*	2	0	0	2		0	0	0	1*	0*	1*
Triallate	0	0	0	0	0	1	1	1	0	0		1	0	2		1	1	1	0	0	0
Triallate/trifluralin		0	2	0	0				0	0		0	0	2		1	1	1	0	0	0
Valtera (Crop uses)	11 mths	11 mths	1	11 mths	11 mths	1	1	9 mths	0	1	1	1	1	1	1	1	0	9 mths	1	0	4 mths
Varro, Predicade	1	1	1	1	1		1	1	1	1	1†	1	1	1			1	1	1	1	10 mths
Voraxor , Voraxor Complete		1		1	1		1	1	1	1		1	1				1		1	1	3 mths

*** The minimum re-cropping intervals are listed. These intervals may be longer than those listed depending on the use rates, region, province, soil types, environment, time of application and crop variety. Refer to product page for more information.**

**** Drought restrictions apply to drought conditions (80% of normal June to September rainfall) for high pH soils (greater than pH 7.5) and severe drought (less than 65% of normal June to Sept. rainfall) for all soils.**

***** May not be supported for all products; see product page for details.**

† May not be valid for all varieties or crop types. See product page for details.

†† in the Brown soil zone, DO NOT seed flax for 22 months.

††† Clearfield lentils ONLY.

◊ Replant intervals are for high rate

0 - May be seeded or reseeded the year of application. No re-cropping restrictions. 1 - Next cropping season after application. 2 - Two cropping seasons after application. NR - Not recommended.

Note: The re-cropping intervals listed may not be sufficient to prevent crop injury during periods of below average rainfall.

Effect of Rainfall on Herbicide Efficacy

Required Interval	Product
15 minutes	Diquat
30 minutes	clodinafop
1 hour	*Axial Xtreme, Axial Xtreme iPak, Blackhawk EVO, Broadband,* bromoxynil, bromoxynil/MCPA ester, bromoxynil/MCPA+fluroxypyr, carfentrazone, clethodim, dicamba/fluroxypyr, *Enforcer D, Erebus Xtreme, Exhilarate,* fenoxaprop, flucarbazone, Inferno Trio, flucabazone+tribenuron, fluroxypyr, *Infinity, Insight Liquid SC, Oxbow, OnDeck, Paradigm PRE,* pinoxaden, *Pixxaro, Poast Ultra, Predicade,* quizalofop, *Refine SG, Shieldex,* Thifen:Triben (25:25), tralkoxydim, *Traxos, Tundra, Varro, Varro FX, Velocity m3*
2 hours	2,4-D LV Ester, *Aatrex* (post-emergent application), *Ares SN, Avenza*, metsulfuron+2,4-D LV Ester, *Enlist Duo,* fluroxypyr + 2,4-D ester, MCPA Ester, *Simplicity, Travallas, Tridem*
3 hours	*Altitude,* dicamba/mecoprop-p/MCPA, imazamox, imazamox/imazethapyr, *Odyssey Ultra Q, Solo Ultra Q, imaxamox/quizalofop*
4 hours	2,4-D Amine, *Cirpreme, Distinct*, glufosinate (all), *Hurricane*, *Manipulator 620*, MCPA Amine, metsulfuron + 2,4-D Amine, *Navius Flex/TruRange*, nicosulfuron, *Overdrive, Permit WG* (post-emergent applications), *Reflex, Rexade,* rimsulfuron, *Signal FSU, Tandem*, thifensulfuron:tribenuron (2:1) 75% WDG, *Steadfast IS , Advantage Glufosinate 280*
6 hours	*Assert,* clopyralid/MCPA (+/- fluroxypyr), MCPA-K, MCPA Sodium Salt, metribuzin, *Muster, Option,* quinclorac, *Tordon 22K,* tribenuron, *Triton K, Ultra Blazer, Advantage Glufosinate Plus*
8 hours	Bentazon, *CleanStart*
No specific recommendation*	2,4-DB, *Akito,* bromoxynil/2,4-D ester, clopyralid, dicamba, dichlorprop/2,4-D, *Enforcer D, Escort, Express FX*, *Express Pro,* florasulam/fluroxypyr + MCPA, florasulam + glyphosate, fluroxypyr+MCPA, fluroxypyr+MCPA+bromoxynil, glyphosate, *Grazon XC,* imazamox+bentazon, imazethapyr, *Korrex II, Lorox L*, MCPB/MCPA, mecoprop-p, *Momentum, Optica Trio, Reclaim II, Restore II, Restore NXT, Topline,* topramazone

*** The products listed make no specific time recommendation on the label. The required rainfree period could be up to 8 hours. See the product page in the guide or consult the product label.**

Note: The term "Rainfastness" refers to the time needed between application and rainfall to avoid significant reduction in efficacy. Rainfall shortly after application of most post-emergent herbicides may reduce weed control. Effect will vary with product, the interval between spraying and rainfall and the intensity and duration of the rainfall. These guidelines are based on label information. Use the longest time interval on the component products when considering tank mixes.

Products Available as Prepackaged Tank Mixes

Product Name (Manufacturer)	Component 1 or A	Component 2 or B	Component 3 or C	Crops	Weeds Controlled	Area Treated per Package	
						Acres	Ha
Ammo DR (Agracity)	dicamba (*Ammo*)	Thifensulfuron: tribenuron - 2:1 (*MPower R*)	2,4-D Ester	Barley, spring wheat	See component products	40/960	16/388
Anaconda (Agracity)	Imazamox (*Samurai*)	Bentazon (*Boa*)	Quizalofop (*MPOWER Quiz*)	Field pea	See component products	40	16
Boa IQ (Agracity)	Imazamox (*Samurai*)	Quizalofop (*Quiz*)		Dry beans, faba bean, field pea, soybean	See component products	20/120	8/48
Boa Pro (Agracity)	Imazamox (*Samurai*)	Bentazon (*Boa*)		Field peas, soybeans	See component products	40	16
Deathstar (Agracity)	Imazamox (*Battlefront*)	Fluroxypyr (*Foxxy*)	MCPA 600 Ester	Barley, wheat (spring, durum)	See component products	40	16
Cirpreme (XC) (Corteva)	*Paradigm*	*Lontrel 360 (XC)* (see Clopyralid)	Must be mixed with MCPA purchased separately	Wheat (including durum) and barley	See component products includes Canada thistle, cleavers and dandelion	40	16
Command Charge	*Aim*	*Command 360ME*		Prior to seeding canola	See component products	80	32
Emphasis (ADAMA) *Revenge B* (Agracity) *COOP/IPCO Octagon* (FCL/IPCO)	Carfentrazone	Bromoxynil		Prior to seeding canola	Weeds controlled by component products plus: Volunteer canola	80	32
Davai Q Plus (ADAMA)	Imazamox (*Davai 80 SL*)	Quizalofop (ADAMA *Quizalofop*)		Dry beans, soybeans, CLEARFIELD lentil, field peas	See component products	40	16
Glyphosate + clopyralid (*Eclipse XC* - Corteva),	Clopyralid *(Lontrel=Eclipse A)*	Glyphosate *(VP480=Eclipse B)*		Glyphosate tolerant canola varieties	See component products	40	16
Himalaya Pass (Agracity)	flucarbazone (*Himalaya*)	Florasulam (*Battlefront*)		Prior to seeding: wheat (spring, NOT durum)	Weeds controlled by component products plus top growth of dandelion up to 6 leaves	80	32
Intruvix (FMC)	*Express FX*	*Aim EC*		Barley, oats, wheat (spring, durum, winter)	See component products	80	32
IPCO Trigon (IPCO)	Carfentrazone *(IPCO C-Zone)*	Bromoxynil *(IPCO/ COOP Brotex 4AT)*	Clomazone (*IPCO Clomazone*)	Prior to seeding canola	See component products	80	32
Odyssey Ultra Q (BASF)	*Odyssey NXT*	*quizalofop (Caziva Ultra Q*	*Merge* (adjuvant)	Field peas, CLEARFIELD lentil	See component products	40	16
Predicade (FMC)	*Barricade II* (Predicade Broadleaf)	*Varro* (Predicade Grass)	MCPA 600 Ester	Wheat (spring, durum, winter)	See component products	40	16
Python (ADAMA Canada)	Imazamox (*Python A = Davai 80SL*)	Bentazon (*Python B*)		Field peas, soybeans	See component products	40	16
Refine M (FMC), *Broadside* (Loveland)	Thifensulfuron/tribenuron (*Refine SG*)	MCPA Ester		Wheat (durum, spring, winter), barley, oat	See component products	80	32
Retain SG (Loveland) *Foxxy Pro RX* (Agracity)	Thifensulfuron/tribenuron (2:1)	Fluroxypyr	2,4-D 700 ester	Wheat (spring, durum) barley	Weeds Controlled by *Refine SG* plus non-Group 2 resistant cleavers	40	16
Revenge E (Agracity)	Carfentrazone (*Revenge*)	Tribenuron (*MPOWER Extra*)		Prior to seeding barley, wheat (spring, durum)	See component products	160	65
IPCO Convex (IPCO) *Revenge Pro* (Agracity)	Carfentrazone	2,4-D Ester		Prior to seeding barley, rye, wheat (spring, durum, winter) or in chem-fallow	Weeds controlled by the component products plus chickweed, horsetail, jimsonweed, kochia, Pennsylvania smartweed and tansy mustard	80	32

Products Available as Prepackaged Tank Mixes *continued*

Product Name (Manufacturer)	Component 1 or A	Component 2 or B	Component 3 or C	Crops	Weeds Controlled	Area Treated per Package	
						Acres	Ha
Samurai Master (Agracity)	Imazamox (*Samurai*)	Clethodim (*Independence*)		Field pea	See component products	80	32
Solo Ultra Q (BASF)	*Solo ADV*	*quizalofop (Caziva Ultra Q)*		CLEARFIELD lentil, CLEARFIELD canola	See component products	40	16
Tandem (Corteva)	*Simplicity*	*fluroxypyr*		Wheat (spring, durum, winter)	see component products	40	16
Thunderhawk (Nufarm)	*Thunderhawk A* (Goldwing)	*Thunderhawk B* (Florasulam)		Prior to the seeding of barley, oats, wheat (spring only)	See component products	80	32
TraxosTwo (Syngenta)	*Traxos*	*OcTTain* (fluroxypyr+ 2,4-D)		Wheat (spring, durum)	See component products	20	8
Triton K (FMC)	Tribenuron (*Express SG*)	2,4-D LV Ester	Dicamba (*Banvel II*)	Spring wheat, barley	See component products	40	16
Voraxor Complete	Voraxor	Zidua		Prior to the seeding of field corn, soybeans, field pea, lentil	See component products	39 to 80	15.8 to 32

Note: See the component products listed for information concerning staging, application information, safety precautions, the effect of weather and grazing, re-cropping, harvest interval and storage precautions. The more stringent recommendation of the two products should be followed. Mix products in the order listed.

Product Pages

2,4-D

Herbicide Group
4 - 2,4-D

Company and Formulation:

	PCP# (Product Name)		
	600 Amine*	700 Ester**	**Choline***
ADAMA Canada		33111	
AgraCity		30460 (MPOWER 2,4-D)*** 34808 (*2,4-D ESTER 700 II*)	
Albaugh	31332	29979	
Corteva Agriscience			33701 (Enlist 1)
Federated Cooperatives		32882	
Interprovincial Cooperative Limited	17511	27819	
Loveland Products Canada	5931	27818 (*Salvo*)	
Nufarm Agriculture	14726	27820	
Sharda Cropchem	33920 (*USHA6*)	34240 (*Lima 660EC*)	
Viking		34813	

*** formulated as a solution.**
**** formulated as an emulsifiable concentrate.**
***** Note: This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.**

- **600 Amine:** 564 g ae/L present as dimethylamine salt.
- **700 Ester:** 660 g ae/L present as 2-ethylhexyl ester.
  - Container size - various
- **Choline:** 454 g ae/L present as a choline salt.

Crops, Rates and Staging:

Application rates for individual products may vary from those listed. Refer to the label for product specific use rates. Rates greater than those listed may cause crop injury.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Post-emergent:

Crop	Maximum Safe Rate (g ae per acre)	Stage
Wheat*, barley, spring rye	227 to 283*** (Esters) 227 (Amines) 202 (Enlist 1)	4 leaf to early flag leaf. full 3 leaf to early flag leaf (Enlist 1 only)
Fall rye, winter wheat**	213 (Esters) 205 (Amines) 165 (Enlist 1)	In spring, apply after winter cereals begin to grow but before emergence of the flag leaf. From full tillering to prior to flag leaf stage. Spring application only, apply after winter cereals begin to grow. From full tillering to prior to flag leaf stage (Enlist 1 only)
Corn**	227 (Amines) 213 (Esters)	Apply as an overall spray before corn is 6 inches (15 cm) tall and before the 6 leaf stage. After 6 inches (15 cm) use a directed spray. Avoid making applications under hot/humid conditions onto corn.

Crop	Maximum Safe Rate (g ae per acre)	Stage
Seedling and established grasses for forage and seed production**	213 (Esters and Amines)	Apply from the 3 leaf stage to emergence of the flag leaf of seedling grasses. For established grasses for seed production, apply in spring up to emergence of the flag leaf.
Established forage grass (not for seed production)**	426 (Esters and Amines)	Apply in spring up to emergence of the flag leaf of established grasses, or in the fall after harvest.
Established grass pastures	907 (Esters and Amines)	No restrictions, apply when weeds are actively growing. For control of brush species, apply at time of rapid growth (usually May to mid-June, and September prior to colour change).

*** Viking 2,4 D Ester is only registered on wheat.**
**** Note: Registered for use only with certain brands of 2,4-D; use of non-registered products is at the risk of the user.**
***** Note: Rates above 227 g ae per acre can result in crop injury. This injury is typically offset by the benefits of improved weed control.**

In 2,4-D Choline-Resistant Crops:
Enlist field corn – up to V8 growth stage or 120 cm in height, whichever comes first.
Enlist E3 soybeans – no later than R2 (full flowering stage.
Apply Enlist 1 at maximum 330 gae per acre up to a maximum of 2 applications per season (total of 660 gae per acre)

Pre-plant or Pre-emergent:

- ***Barley, rye, wheat (spring, winter)*** – Apply 134 to 213 g ea per acre (weeds less than 8 cm) to a maximum of 294 g ae per acre (weeds greater than 8 cm) of *Nufarm 2,4-D Ester 700* or *ADAMA 2,4-D Ester 700 Liquid Herbicide* only prior to seeding or after seeding but prior to emergence of the crop.
- ***Soybean*** – Apply from 134 to 213 g ae per acre of 2,4-D 700 Ester (*Nufarm 2,4-D Ester 700, ADAMA 2,4-D Ester 700 Liquid Herbicide* and *Loveland Salvo* only) 7 days prior to seeding.

Rate per acre*		Formulation		
(g ae)	(oz. ae)	564 g ae/L (600 Amine)	660 g ae/L (700 Ester)	454 g ae/L (Choline Enlist 1)
113	4	201 mL	172 mL	249
125	4.4	222 mL	189 mL	275
134	4.75	225 mL	202 mL	295
170	6	301 mL	258 mL	374
205	7.25	364 mL	311 mL	452
213	7.5	377 mL	322 mL	469
227	8	402 mL	344 mL	500
283	10	503 mL	430 mL	623
340	12	603 mL	515 mL	749
483	17	854 mL	730 mL	
510	18	905 mL	773 mL	
907	32	1608 mL	1374 mL	

*** Actual product rates vary somewhat between products for similar uses. Check the product labels for the specific use rate for the product selected.**

Weeds, Rates and Staging:

Apply at lower rates when weeds are small (2 to 4 leaf stage) and actively growing. Higher rates are needed when weeds are larger, in heavy populations, or growing under stressful conditions (excessively cold, hot, dry or wet).

For pre-seed or pre-emergent application of *NuFarm 2,4-D 700 Ester* or *ADAMA 2,4-D Ester 700 Liquid Herbicide* only, apply 134 to 213 g ae per acre to control weeds less than 8 cm tall or 294 g ae per acre before the emergence of cereals to control weeds greater than 8 cm tall or harder to control weeds.

Note: The rates listed differ slightly from product to product. Check individual product labels for exact use rates.

Susceptible Weeds:

125 to 227 g ae per acre

- Bluebur
- Burdock
- Cocklebur
- Daisy fleabane
- False flax
- Flixweed (late fall application or spring seedlings)
- Goat's-beard
- Kochia
- Lamb's-quarters
- Mustards (except dog and tansy mustard)
- Narrow-leaved hawk's-beard (fall application to seedlings or spring application at 1 to 2 leaf stage)
- Plantain
- Prickly lettuce
- Ragweed (common, false and giant)
- Russian pigweed
- Russian thistle
- Shepherd's-purse**
- Stinging nettle
- Stinkweed**
- Sweet clover
- Thyme-leaved spurge
- Vetch (Enlist 1 only)
- Volunteer canola (including all herbicide tolerant varieties)
- Wild radish
- Wild sunflower

Harder to control weeds:

227 to 340 g ae per acre

- Annual sow-thistle
- Biennial wormwood*
- Blue lettuce*
- Burdock (top growth only of bolting plants)
- Canada thistle***
- Common chickweed
- Common groundsel**
- Common peppergrass
- Dandelion*
- Flixweed (spring prior to bolting)
- Hairy galinsoga
- Knotweed
- Leafy spurge*
- Mustard (dog and tansy)
- Narrow-leaved hawk's-beard (spring prior to bolting)
- Oak-leaved goosefoot
- Pineappleweed
- Prostrate pigweed
- Purslane
- Redroot pigweed
- Russian knapweed*
- Russian thistle
- Sheep sorrel
- Smartweed (including lady's-thumb)
- Tumble pigweed
- Wild buckwheat*
- Velvetleaf
- Yellowrocket*

Top growth control only (at rates for harder to control weeds):

- Bull thistle
- Buttercup
- Curled dock
- Field bindweed
- Gumweed
- Hedge bindweed
- Hoary cress
- Horsetail
- Mouse-eared chickweed
- Perennial sow-thistle
- Tartary buckwheat
- Volunteer sunflower

*** Control of seedlings at rates given above and top growth control only of established plants.**

**** Spring seedlings. Winter annual weeds – apply in late fall or early spring prior to bolting.**

***** Suppression only. Apply when Canada thistle plants are actively growing and have 6 to 8 inches (15 to 20 cm) of new growth. Regrowth will be present the following spring and in-crop treatments will be required.**

Formulation Characteristics:

Formulation	Risk of Vapour Drift	Activity on Weeds	Risk of Crop Injury
LV ester	Medium	Fast	Medium
Amine	Very low	Medium	Low
Choline salt	Very, very low	Medium	Low

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 L per acre. Water rates depend on product and use. Consult label for details. Higher application volumes (40 L per acre or greater) reduce the risk of crop injury.
- **Nozzles and Pressure:** 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver proper coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D	POST (foliar)	Synthetic auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Best weed control occurs when temperatures are above 21°C (daytime) or 10°C (nighttime) and humidity is above 70 percent. DO NOT apply if temperature exceeds 27°C.

Tank Mixes:

None listed on *2,4-D amine or ester labels*.
Enlist corn and Enlist E3 soybeans can be tank mixed with 0.76 L per acre glyphosate (when using 480 gae per L formulation).

Restrictions:

- **Rainfall:**
  - ***2,4-D amine:*** within 4 hours will reduce control.
  - ***2,4-D LV ester, 2,4-D choline salt:*** within 2 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing:** DO NOT permit lactating dairy animals to graze fields within 7 days of application. DO NOT harvest forage or cut for hay within 30 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Re-cropping:** No recropping guidelines are provided on the labels. As a general guideline, there should be no cropping restrictions the year following an in-crop treatment.
- **Aerial Application:** Some formulations may be applied by air. Check the label for detailed instructions.
- **Storage:** 2,4-D LV ester may be frozen. 2,4-D amine requires heated storage.
- **Buffer Zones:**
  Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Crop	Application method	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Field crops	Ground*	1	1	1
	Ground * (Enlist 1 only)	1	0	1
	Fixed wing aircraft	10	0	45
	Fixed wing aircraft (Enlist 1 only)	1	0	45
	Helicopter	10	0	40
	Helicopter (Enlist 1 only)	1	0	40
Fallow, pastures, rangeland	Ground*	1	1	2
	Fixed wing aircraft	15	0	60
	Helicopter	15	0	50

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to introduction.

Hazard Rating:

***Amine 600, Choline salt* formulations:**

 Warning – Poison

***Ester 700* formulations:**

 Danger – Poison

 Warning – Skin Irritant

***Choline salt* formulation:**

Eye and skin irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

2,4-DB

Herbicide Group
4 - 2,4-DB

Company:

Interprovincial Cooperative Limited (*Cobutox 625* – PCP#27911)
Nufarm Agriculture (*Embutox* – PCP#27912)
Loveland Products Canada (*Caliber 625* – PCP#27910)

Formulation:

625 g/L 2,4-DB formulated as an emulsifiable concentrate.

- Container size - 10 L

Crops and Staging:

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Crop	Stage
Seedling alfalfa, bird's-foot trefoil*	1 to 4 trifoliate leaf stage
Clover (alsike**, red**, white, Dutch but NOT sweet clover)*	As soon as possible after emergence of the 1st trifoliate leaf
Wheat, barley or oats	5 leaf to emergence of the flag leaf
Field corn	15 inches (40 cm) to prior to tasseling using drop nozzles.
Pastures containing forage legumes	After cutting or grazing and regrowth less than 3 inches (7.5 cm)

*** With or without a cereal cover crop.**
**** Alsike and red clovers may be damaged by 2,4-DB applications.**

Seedling Forage Grasses*:
Apply from 2 to 4 leaf stage of:

- Bromegrass (smooth)
- Fescue (creeping red, meadow, tall)
- Orchard grass
- Timothy
- Wheatgrass (crested, intermediate, streambank, tall)

*** Not for seed production. Not for feeding in the establishment year.**

Weeds and Staging:

Weeds controlled at the 0.71 L per acre rate from the 2 to 4 leaf stage:

- Lamb's-quarters
- Mustard (ball, wild, wormseed)
- Ragweed
- Redroot pigweed
- Shepherd's-purse
- Stinkweed

Weeds controlled at higher recommended rates (0.91 to 1.1 L per acre):

Weed	Stage
Bull thistle	Rosette to early bud stage
Canada thistle*	6 inch (15 cm) to early bud
Chicory	Rosette
Curled dock**	Young and actively growing
Dandelion*	Prior to bud
Field bindweed*	Late summer
Horsetail*	4 to 5 inches (10 to 13 cm)
Narrow-leaved hawk's-beard	Apply at rosette stage after alfalfa has gone dormant
Oak-leaved goosefoot	Up to 2 leaf stage
Perennial sow-thistle*	Rosette
Plantain	Prior to flowering
Smartweed (green, lady's-thumb)**	Seedlings

Weed	Stage
Wild buckwheat	Up to 2 leaf stage
Wild radish	Up to 2 leaf stage
Yellow rocket	Late September to mid-October

*** Top growth control**
**** Suppression**
Refer to individual product labels for details on application rates to use for different weed species.

Rates:

Crop	Rate (L per acre)
Cereals, seedling forage legumes and grasses	0.71 to 0.91
Corn and pastures containing forage legumes	0.71 to 1.11

Application Information:

- **Water Volume:** 61 to 81 L per acre.
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver proper coverage with a minimum of fine droplets.

How it Works:

Refer to How Do Herbicides Work in introduction for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-DB	POST (foliar)	Synthetic auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Severe damage to legumes can occur if high temperatures (more than 27°C) or high humidity prevail at the time of application. DO NOT apply under dry soil/drought conditions.

Tank Mixes:

Herbicides:

Underseeded Legumes:

- MCPA amine (35 g ae per acre*)
  *** 500 g/L formulation**
- This tank mix may increase crop damage (stunting).
- Follow all precautions and restrictions on both product labels.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on 2,4-DB labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Not specified on the label. A period of up to 8 hours may be required. Contact the manufacturer for more details.
- **Grazing Restrictions:** DO NOT graze or cut treated crops or forage until 30 days after application.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.

Sprayer Cleaning:

No sprayer clean-out information is provided on the labels. 'Method B' in the introduction, is typically considered effective in cleaning solvent based formulations such as emulsifiable concentrates. Contact the manufacturer for detailed clean-out instructions.

Hazard Rating:


Caution – Poison

Refer to the Introduction for an explanation of the symbols.

AAtrex Liquid

Herbicide Group
5 - atrazine

Company:
Syngenta Canada (PCP#18450)

Formulations:
480 g/L atrazine formulated as a liquid suspension.
- Container size - 2 x 10 L

Crops, Rates and Staging:
Corn (silage, field, sweet): 0.33 to 1.25 L per acre* using the following application methods:
- ***Pre-plant incorporated (PPI).***
- ***Pre-emergent surface (after planting but before emergence of weeds and crop):*** Recommended only on irrigated fields. Inconsistent weed control will occur if 0.5 inches (1.25 cm) of water/precipitation does not occur within 7 days of application.
- ***Post-emergence:*** 1 to 6 leaf stage and when corn is less than 12 inches (30 cm) tall. Add 1.11 to 2.23 L per acre of oil concentrate or 6.88 L per acre crop oil. Crop injury may occur when *AAtrex* and oil is applied post-emergence during cold weather.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

*** Use the low rate on crops grown on sandy soils, and where weed infestations are light.**

It is recommended that any products containing atrazine not be used in areas treated with this product during the previous season.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Weeds and Staging:
For pre-plant incorporated, pre-emergent and post-emergent (when weeds are less than 4 inches or 10 cm tall) control of the following weeds:
- Lamb's-quarters
- Mustard (wild, wormseed)
- Purslane
- Ragweed
- Redroot pigweed
- Smartweed (including lady's-thumb)
- Volunteer clover
- Wild buckwheat
- Wild oats

Application Information:
- **Water Volume:** Minimum 61 L per acre.
- **Nozzles and Pressure:** 30 to 45 psi (200 to 300 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage and a minimum of fine droplets that are prone to drift.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
atrazine	PPI (soil active) POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Broadleaf & grass	5

Effects of Growing Conditions:
Post-emergent applications made during periods of cold weather may cause crop lightening. Hot, dry weather preceding post-emergent applications may result in reduced weed control. *AAtrex* will move with soil if eroded.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:
- **Pre-Emergent and Pre Plant Incorporated:**
  - *Dual II Magnum*
  - Glyphosate
- **Post-Emergent*:**
  - *Dual II Magnum*
  - Bromoxynil/MCPA (*Buctril M* only)**
  - Bromoxynil (*Pardner* only)

  *** DO NOT use oils or adjuvants with post-emergent tank mixes.**

  **** DO NOT treat after the 6 leaf stage, crop injury may occur.**

Fertilizers: For pre-emergent applications, nitrogen solutions or complete liquid fertilizers may replace all or part of the water as a carrier. *AAtrex* may be impregnated onto dry granular fertilizers. DO NOT impregnate onto nitrate, super- phosphate or limestone.

DO NOT apply *AAtrex* with nitrogen fertilizer after corn has emerged, as crop injury will occur.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the *AAtrex* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. See the general guidelines for mixing pesticides for more information.

Restrictions:

- **Rainfall:** Within 2 hours of post-emergence applications may result in reduced weed control.
- **Grazing Restrictions:** DO NOT graze or cut for feed before ear emergence.
- **Pre-harvest Interval:** Leave at least 45 days from application to harvest for sweet corn and 60 days for field corn.
- **Re-cropping Interval:** All crops, except corn and triazine-tolerant canola, may be affected the year following the use of atrazine. Flax, peas and faba beans have some tolerance to atrazine residues and are usually not affected by rates of up to 0.9 L per acre applied the previous year. Other more sensitive crops may be affected 2 or more growing seasons after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	10	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

- DO NOT mix or load within 30 metres of any wells, lakes, streams, ponds, dugouts or sinkholes.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for several hours. Scrub inside surfaces but do not enter tank. Flush sprayer system with water.

DO NOT clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Hazard Rating:


Caution – Eye Irritant

Keep out of reach of children. Harmful if swallowed.

Refer to the Introduction for an explanation of the symbols.

Advantage Glufosinate Plus

Herbicide Group
4 – quinclorac (broadleaf)
10 – glufosinate

Company:
Advantage Crop Protection Inc.

Formulation:
***Advantage Glufosinate Plus* (PCP#34985):** 146 g/L glufosinate ammonium and 15 g/L quinclorac formulated as a solution.
- Container size – 10 L, 120 L, 500 L, 1000 L

Crops and Staging:
Liberty Link Canola – cotyledon to early bolting stage. Temporary crop discoloration (bronzing, speckling) may be observed after application.
DO NOT apply products that contain quinclorac more than once every two years.

Weeds, Rates and Staging:

Weed	Weed Stage (from emergence to stage)	Rate (L per acre)
Cow cockle	4 leaf	0.54
Green foxtail	6 leaf (max. 3 tillers)	
Barnyard grass	4 leaf	0.81
Wild mustard	5 leaf	
Lamb's-quarter, smartweed (lady's thumb)	6 leaf	
Stinkweed	8 leaf	
Volunteer flax	2.5 inches (6 cm)	0.81
Russian thistle	3 inches (8 cm)	
Wild buckwheat	3 leaf	1.08
Redroot pigweed, round-leaved mallow, quackgrass*	4 leaf	
Volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)	
Hemp-nettle (1 to 3 leaf pairs), shepherd's-purse	6 leaf	
Common chickweed (max. 4 leaf pairs), sow-thistle	8 leaf	
Kochia	3 inches (8 cm)	
Canada thistle*, scentless chamomile	4 inches (10 cm)	
Cleavers	3 whorls (nodes)	1.35
Stork's-bill and heavy populations of wild buckwheat	3 leaf	
Quackgrass (light to moderate** or heavy infestations*)†, wild oats	4 leaf (max. 2 tillers except quackgrass)	
Heavy infestations† volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)	
Hemp-nettle	8 leaf (1 to 4 leaf pairs)	
Dandelion rosettes	6 inches (15 cm) across	
Flixweed, Canada thistle*	4 inches (10 cm)	

Weed	Weed Stage (from emergence to stage)	Rate (L per acre)
Quackgrass***		1.62
Canada thistle**		

*** Top growth suppression. Plants may return from surviving growing points.**
**** Extended top growth suppression.**
***** Season long control.**
†The company does not provide guidelines for weed densities. When in doubt as to the infestation level, use the high rate or contact the manufacturer.

Application Information:

- **Water Volume: 110 l/ ha**

Apply Advantage Glufosinate Plus in a minimum of 110 litres of water per hectare at a pressure of 275 kPa and at a ground speed of 6 to 8 km/h. If check valves are used, apply at 310 kPa. The use of 80° or 110° flat fan nozzles is highly recommended for optimum spray coverage and canopy penetration.

- DO NOT use flood jet nozzles, controlled droplet application equipment or air-assisted spray equipment.
- Uniform, thorough coverage of foliage is important to achieve consistent weed control.

Application of the spray at a 45° angle forward will result in better spray coverage. Follow directions elsewhere on the label for the correct rate and timing of application.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Glufosinate	POST (foliar)	Glutamine Synthase inhibitor/membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf & grass	10
Quinclorac	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Advantage Glufosinate Plus activity is influenced by environmental conditions. Cool temperatures (less than 10°C), drought, and low humidity conditions slow weed growth. Applications made under these stressed conditions may result in reduced weed control. DO NOT apply to crop that is under stress from conditions such as frost, hail, drought or extremes in temperature. Cool weather may delay weed control and if prolonged may results in poor weed control.

Tank Mixes:

Herbicides:

Note: Do not tank mix Advantage Glufosinate Plus with herbicides, fertilizers or chemical additives unless recommended on this label or the label of each tank mix partner.

***Liberty Link Canola* only:**

Advantage Clethodim 240 – 26 mL/ac
FBN Clethodim 240 – 26 mL/ac

Note: The above mixes are those listed on the *Advantage Glufosinate Plus* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours after application.
- **Grazing Restrictions:** DO NOT graze, cut for hay, or feed other portions of the treated canola to livestock.
- **Preharvest Interval:** DO NOT within 60 days of harvest when tank-mixed with clethodim or alone.
- **Re-cropping Interval:** in case of crop failure, only canola may be reseeded the same year. No restrictions for canola. 70 days for spring wheat, durum and barley. 10 months for field peas, sunflowers, flax and lentils. 12 months for oats.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT Freeze. Store in a cool, dry place. Store this product away from food or feed.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1		1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method (A, B,)' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Warning– Poison
Caution – skin and eye irritant
Refer to the Introduction for an explanation of the symbols.

Akito

Herbicide Group
2 - florasulam
4 - fluroxypyr, clopyralid

Company:
UPL AgroSolutions Canada (PCP#33657)

Formulation:
2.5 g/L florasulam, 100 g/L fluroxypyr, and 80 g/L clopyralid formulated as an emulsifiable concentrate.
- Container sizes - 2 x 8.1 L, 97.2 L

Crops and Staging:
Note: *The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (for example, sandy soil) and/or the depth to the water table is shallow. Use should be avoided in these areas.*

Wheat (spring, durum, winter), barley: 3 leaf stage to just before the emergence of the flag leaf.
Oats: From the 3 to 6 leaf stage.
When tank mixing, check broadleaf product description for additional restrictions.

Weeds, Rates and Staging:
Apply early to the main flush of actively growing broadleaved weeds.
Weeds controlled:
- Canada thistle** (10 cm to pre-bud)
- Cleavers (1 to 8 whorls)
- Common chickweed
- Dandelion (up to 30 cm in diameter)
- Kochia (2 to 8 leaf)
- Narrow-leaved hawk's-beard*
- Scentless chamomile
- Shepherd's-purse
- Sow-thistle (perennial)
- Volunteer canola (not CLEARFIELD varieties)
- Volunteer flax (up to 12 cm)
- Wild buckwheat

*** Suppression only.**
**** Season long control, with some regrowth in the fall.**

Rates:
Note: Maximum of one application of this product per year.
400 mL per acre
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage. DO NOT apply with spray droplets smaller than ***ASAE S572.1 coarse*** classification.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar) with little soil activity	ALS Amino Acid synthesis inhibitor	Toward regions of growth (symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic auxin	Moves through the plant (symplast)	Broadleaf only	4
clopyralid	POST (foliar)	Synthetic auxin	Moves through the plant (symplast)	Broadleaf only	4

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of *Akito* by allowing maximum foliar uptake and contact activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- **In all wheat (spring, durum, winter):**
  - MCPA Ester 600 (up to 0.43 L per acre)
  - 2,4-D Ester 700 (up to 0.52 L per acre)
  - *Simplicity GoDri**
  - *Axial**
  - *Traxos**
- **In barley:**
  - MCPA Ester 600 (up to 0.19 L per acre)
  - 2,4-D Ester 700 (up to 0.52 L per acre)
- **In oats:**
  - MCPA Ester 600 (up to 0.36 L per acre)

*** Tank-mixes with *Akito* alone or *Akito* + MCPA or 2,4-D**

Note: The above tank mixes are those listed on the *Akito* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. See the general guidelines for mixing pesticides for more information.

Restrictions:

- **Rainfall:** No restrictions listed.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 7 days after treatment.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** Wheat, barley, oat, rye, canola, flax, or mustard may be seeded in the year following treatment or fields can be summerfallowed. DO NOT seed field peas for at least 10 months following treatment. If severe drought conditions are experienced during the months of June to August inclusive in the year of application, delay seeding field peas an additional 12 months (total 22 months following application).
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in cool (above 5°C), dry, locked, well-ventilated area. If product is frozen, bring to room temperature and agitate before use.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
 Danger – Eye and Skin Irritant
Refer to the Introduction for an explanation of the symbols.

Altitude FX3

Herbicide Group
2 - imazamox
4 - fluroxypyr

Company:
BASF Canada

Formulations:
Altitude FX3 contains the following separate components:

***AC 299,263 120 AS* (PCP#26705):** 120 g/L imazamox formulated as a solution.
- Container size - 2.68 L

***Starane II* (PCP#29463):** 333 g/L of fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 5 L

MCPA, 2,4-D, or *Curtail M* must be added and are purchased separately.

Crops and Staging:
CLEARFIELD wheat varieties: 3 leaf (after appearance of first tiller) to 6 leaf stage to ensure optimal crop tolerance. Apply only to CLEARFIELD wheat varieties; application to any other variety of wheat or any other crop will result in crop death.

Weeds and Staging:
Grasses:
Apply from 1 to 4 leaf stage to a maximum of two tillers.
- Barnyard grass
- Foxtail (green, yellow)
- Japanese brome*
- Persian darnel
- Volunteer cereals (barley, canary seed, oats, non-CLEARFIELD spring wheat, durum)
- Wild oats

Broadleaves:
Apply up to 4 leaf stage unless otherwise indicated.
- Cleavers (1 to 4 whorls)
- Cow cockle
- Green smartweed
- Kochia
- Lamb's-quarters
- Redroot pigweed
- Round-leaved mallow*
- Russian thistle*
- Shepherd's-purse
- Stinkweed
- Stork's-bill (1 to 8 leaf)*
- Volunteer canola (except CLEARFIELD varieties)
- Volunteer flax (1 to 12 cm)
- Wild buckwheat
- Wild mustard

*** Suppression**

Rates:

***AC 299,263 120 AS*:** 67 mL per acre.
Starane II: 126 mL per acre.
Altitude FX3 must be tank mixed with one of the registered tank mix options found under the "tank mix" section below. Add a non-ionic surfactant (such as *Agral 90* or *Ag-Surf II*) at 0.25 L per 100 L of spray solution. Surfactant not included.
DO NOT apply *Altitude FX3* or other products containing imazamox or fluroxypyr more than once per season.
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar)	ALS Amino Acid inhibitor	Toward regions of growth (Symplast)	Broadleaf & grass	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Toward regions of growth (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Initial crop injury may be observed after application but this is outgrown and should not affect yield. Severe crop injury will occur as a result of spray overlap. AVOID SPRAYER OVERLAP.
DO NOT spray if temperatures of +5°C are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Herbicides:

- ***Altitude FX3* must be mixed with one of the following:**
  - MCPA or 2,4-D Ester (213 g ae per acre)
  - *Curtail M* (0.61 to 0. 81 L per acre)

Restrictions:

- **Rainfall:** Rainfall within 3 hours after application may reduce activity.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated crop within 14 days of application or cut for hay within 42 days of application.
- **Pre-harvest Interval:** DO NOT apply within 79 days of harvest.
- **Re-cropping Interval:** Winter wheat may be seeded 3 months after application. Barley, canola (all varieties), field peas, flax, lentil, oats, and spring wheat may be grown safely the year following application. Condiment mustard may be grown the second season following *Altitude FX3* application. Conduct a field bioassay the year before growing any other crop than those listed above.
  Note: *Where less than 125 mm of accumulated rainfall is received between June 1 and September 1 in the year of application, or additionally for the brown soil zone where less than 15 mm is received in any single month through June, July and August, regardless of total rainfall during that time, delay planting canaryseed, canola (non-CLEARFIELD), flax, tame oats, winter wheat and durum wheat by an additional year. If the same drought conditions as described above occur in either the year of application or the year following, delay planting tame mustard by an additional year.*
    - *As with other herbicides that break down through microbial activity, additional conditions that may slow breakdown and increase the risk of follow crop injury are soil pH of less than 6.5, organic matter of less than 3 percent, very sandy soils and prolonged cold.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C. Combustible – DO NOT store near heat or open flame.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	15	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Starane II:


Warning – Eye Irritant


Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Ammo DR

Herbicide Group
2 - thifensulfuron, tribenuron
4 - dicamba, 2,4-D

This product is a a prepackaged tank mix of Ammo *(see dicamba), MPower 2,4-D 700 Ester (see 2,4-D) and* MPower R *(see thifensulfuron:tribenuron (2:1)). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and general information on the component products see the product pages listed above.*

Company:
AgraCity Crop & Nutrition

Formulation:
The *Ammo DR* package contains the following components:
***Ammo* (PCP#34024):** 480 g ae/L dicamba formulated as an emulsifiable concentrate.
- Container sizes - 4.7 L, 113 L

-plus-
***MPOWER 2,4-D 700 Ester* (PCP#30460):** 660 g ae/L 2,4-D formulated as an emulsifiable concentrate.
- Container sizes - 9.8 L, 235 L

plus-
***MPOWER R* (PCP#30945):** 50% thifensulfuron + 25% tribenuron formulated as water dispersible granules.
- Container sizes - 320 g, 24 x 320 g

Crops and Staging:
Spring wheat, barley: 4 to 5 leaf stage

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width unless otherwise specified.
Weeds controlled or suppressed by thifensulfuron:tribenuron (2:1) plus the 'susceptible weeds' controlled by 2,4-D plus the weeds controlled by the cereal rate of dicamba (either alone or mixed with 2,4-D).

Rates:
Note: Maximum of ONE APPLICATION of this or other products containing these components per year.
***Ammo*:** 118 mL per acre.
-plus-
2,4-D Ester: 245 mL per acre.
-plus-
***MPOWER R*:** 8 g per acre.
Add *Agral 90, Agsurf II,* or *Citowett Plus* at 0.2 L per 100 L of spray solution if not mixed with a wild oat herbicide.
MPOWER R (thifensulfuron:tribenuron (2:1)) may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Anaconda

Herbicide Group
1 - quizalofop
2 - imazamox
6 - bentazon

This product is a prepackaged tank mix of Boa Pro *(see imazamox/bentazon) and* Quiz *(see quizalofop). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and general information on the component products see the product pages listed above.*

Company:
AgraCity

Formulation:
The *Anaconda* package contains the following components:

***Samurai* (PCP#33033):** 70% imazamox formulated as a water dispersible granule.
- Container sizes - 470 g, 24 x 470 g

-plus-

***Boa* (PCP#33011):** 480 g/L bentazon formulated as an emulsifiable concentrate.
- Container sizes - 14.5 L, 348 L

-plus-

***Quiz* (PCP#33481):** 96 g/L quizalofop-P-ethyl formulated as an emulsifiable concentrate.
- Container sizes - 8 L, 192 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Field pea	3 to 6 true leaf stage	65

Weeds and Staging:
Weeds controlled by *Boa Pro* (see Imazamox/Bentazon) plus the weeds controlled by *Quiz* (see quizalofop) at 150 mL per acre.

Rates:
Note: Maximum of ONE APPLICATION of this or other products containing imazamox per year.

Samurai: 11.7 g per acre.

-plus-

Boa: 362 mL per acre.

-plus-

Quiz: 200 mL per acre.

Add *Assassin* or *Merge* at 0.5 L per 100 L of spray solution PLUS 28 percent UAN at 0.81 L per acre (both sold separately). Failure to include UAN or adjuvant will result in significantly reduced product performance.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Ares SN

Herbicide Group
2 -imazamox, imazapyr

Company:
Corteva Agriscience (PCP#33167)

Formulation:
33 g/L imazamox and 15 g/L imazapyr formulated as a solution.
- Container sizes - 1 x 9.8 L jug, *Surjet* 8.1 L jug

Crops and Staging:
CLEARFIELD canola: 2 to 7 leaf stage.
CLEARFIELD oilseed mustard (*Brassica juncea*): 2 to 7 leaf stage.

Weeds, Rates and Staging:
Merge or *Surjet* adjuvant must be used at a rate of 0.5 L per 100 L of spray solution.

At 244 mL per acre, *Ares SN* will control:

- ***Grasses*** - From 1 to 6 true leaf stage with up to 2 tillers:
  - Barnyard grass
  - Foxtail (green and yellow)
  - Japanese brome*
  - Persian darnel
  - Volunteer cereals (barley, canaryseed, durum, oats and wheat - NOT including CLEARFIELD varieties)
  - Wild oats

  *** Spring germinating Japanese brome maximum 4 leaf stage.**
- ***Broadleaf Weeds*** - up to 4 leaf stage unless otherwise indicated:
  - Chickweed
  - Cleavers (up to 4 whorls)
  - Cow cockle
  - Green smartweed
  - Hemp-nettle
  - Lamb's-quarters **
  - Redroot pigweed
  - Round-leaved mallow
  - Russian thistle
  - Shepherd's-purse
  - Stinkweed
  - Stork's bill
  - Volunteer canola (not CLEARFIELD varieties)
  - Volunteer tame mustard (not CLEARFIELD oilseed varieties - *B. juncea*)
  - Wild buckwheat**
  - Wild mustard

  **** up to 6 leaf stage**

DO NOT apply *Ares SN* more than once per year or follow *Ares SN* with other products containing the active ingredient imazamox or imazapyr in the same year. Refer to the product label for complete mixing instructions for this product and its mixes. A general mixing guide can be found in the introduction.

Application Information:
- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** Use 50 mesh or coarser filter screens for both nozzles and in-line screens. Use 16 mesh suction screens.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar)	ALS Amino Acid inhibitor	Toward regions of growth (Symplast)	Broadleaf & grass	2
imazapyr	POST (foliar)	ALS Amino Acid inhibitor	Toward regions of growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

DO NOT apply to any crops that have been subjected to stress from conditions such as hail damage, flooding, drought, hot, humid weather, widely fluctuating temperature conditions, prolonged cold weather or injury from prior herbicide applications, as crop injury may result. DO NOT spray if temperatures of +5°C or lower are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Herbicides:

- ***In CLEARFIELD canola only. DO NOT apply to CLEARFIELD oilseed mustard:***
  - *Lontrel XC* (52 mL per acre)

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Ares SN* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfast within 2 hours of application.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvest of registered crops.
- **Grazing Restrictions:** No information is provided on the label. DO NOT feed treated crops to livestock prior to crop maturity.
- **Re-cropping Interval:** Fields treated with *Ares SN* can be seeded after a minimum of 10 months to spring wheat, barley, canaryseed, chickpea, CLEARFIELD canola/oilseed *B. juncea*, field corn, field pea, or lentil. Non-CLEARFIELD canola, durum, flax and sunflowers may be seeded the second full season after application.
  If rainfall was less than 140 mm during the growing season (June 1st to August 31st) in the year of application, delay seeding rotational crops an additional 12 months. CLEARFIELD crops will be the lowest risk recropping options under these conditions. Contact Corteva Agriscience for additional advice regarding crops grown in rotation. The company recommends that a field bio-assay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat
Field Sprayer	CLEARFIELD Canola CLEARFIELD Canola Quality *Brassica Juncea*	1

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat. DO NOT apply in areas where surface water from the treated area can run off into aquatic habitats.**

Sprayer Cleaning:

Refer to 'Method C' in the general sprayer cleaning section in the introduction.

Hazard Rating:

No specific hazards.

Arsenal PowerLine

Herbicide Group 2 - imazapyr

Company:
BASF Canada

Formulations:
240 g/L of Imazapyr present as the isopropylamine salt, formulated as a solution.
- Container size - 2 x 9.5 L

Crops and Staging:
For control of undesirable vegetation in non-cropland sites (including grazed or hayed areas within these site), low volume foliar brush control* and cut stump treatment. DO NOT use in residential or recreational areas, where bystanders could be exposed during or after application. DO NOT apply to cropland.

*** Please refer to the product label for forestry site preparation and for low volume foliar brush control**

Weeds, Rates and Staging:
Must be applied post-emergence to small, emerged and vigorously growing weeds. Apply with either a non-ionic surfactant at 0.25 L per 100 L of spray solution or methylated seed oil (MSO) at 1 L per 100 L of spray solution. Use higher rate in range for larger weeds or where heavy or well-established infestations occur.

Apply ONE APPLICATION of this product or other products containing Imazapyr per year.

Weeds controlled at 0.95 to 1.21 L per acre:
- Clovers
- Dandelion
- Mustards**
- Foxtail (green, yellow)**

Weeds controlled at 1.21 L per acre:
Above weeds plus:
- Black medick
- Bladder campion
- Bluegrass (annual, Canada)
- Bromegrass
- Bull thistle
- Burdock
- Canada thistle
- Cinquefoil (rough, sulfur)
- Fescues
- Poplar
- Fleabanes
- Field bindweed
- Goat's-beard
- Goldenrod
- Groundsel (common)
- Hemp-nettle**
- Lamb's-quarters**
- Leafy spurge
- Maple
- Milkweed
- Mouse-eared chickweed
- Mulleins
- Old witchgrass
- Ox-eye daisy
- Pigweeds**
- Pineappleweed
- Plantains
- Poison ivy
- Quackgrass
- Ragweed
- Russian thistle**
- Sheep-sorrel
- Stinkweed
- Sow-thistle (annual)*
- Toadflax
- Tufted vetch
- Wild buckwheat**
- Wild grape
- Wild raspberry
- Wild rose
- Wild strawberry
- Yellow nutsedge

**** NOT Group 2 resistant biotypes**

Weeds controlled at 1.21 to 1.86 L per acre*:**
- *Phragmites australis subsp. australis* (European Common Reed)***

***** For control of non-native invasive *Phragmites* only in dry areas. NOT intended for native *Phragmites* control or application where surface water is present. Contact local authorities for definitive *Phragmites* identification. Apply as a low volume directed spray to cover all of the foliage in late summer or early fall while foliage is still green and fully elongated. NOT for application to the soil.**

Cut Stump Treatment:
Control the regrowth of undesirable shrubs and trees after cutting, on non-crop areas. Apply to the cambium (boundary between bark and wood) of freshly cut stump surfaces in summer and autumn months. DO NOT over apply solution causing runoff or pooling.

Mix† at a rate of 63 to 94 mL* with 1 L of water to cut stump to control re-growth of the following brush species:
- Alder
- Aspen
- Ash
- Birch
- Cherry
- Dogwood
- Mountain ash
- Maple
- Oak
- Poplar
- Willow

*** A rate in the upper end of the range is recommended for larger diameter stumps. Antifreeze (ethylene glycol) may be used to prevent freezing.**

† Spray or brush the solution on the cambium area of the freshly cut stump surface. Ensure that the solution thoroughly wets the entire cambium area.

Application Information:

- **Water Volume:** Minimum 40 to 222 L of water per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE S572.1 medium*** droplets by ground.
- **Equipment:**
  - ***High volume spray equipment:*** High pressure handguns and vehicle mounted high volume directed spray equipment. Use the least amount of water practical to obtain uniform coverage of foliage to avoid runoff from the foliage.
  - ***Boom Sprayer◊†:*** Conventional boom mounted, manifold mounted, and off-centered nozzles. Sprayers without drift reduction systems should use between 25 to 60 psi (175 kPa to 425 kPa).
  - ***Low volume hand held equipment:*** Backpack, knapsack, and other pump-up type pressure sprayers used to direct applications to weed foliage.

† A foam reducing agent may be added at the recommended label rate, if needed.

◊ Spray tank with the agitator running. Boom height must be 60 cm or less above the weed canopy or ground.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Imazapyr	POST (foliar)	Amino acid synthesis inhibitor	Towards Areas of Growth (Symplast)	Broadleaf and grass	2

Effects of Growing Conditions:

For maximum activity, apply *Arsenal PowerLine* when used alone or with tank mix partners when weeds are small and actively growing.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- *Banvel VM* (0.85 to 1.86 L per acre)
- Glyphosate (except MA salt - see glyphosate)

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter into treated areas DO NOT re-enter treated area within 12 hours after application.
- **Grazing Restrictions:** There are no grazing restrictions following application. DO NOT cut forage for hay for 7 days after application.
- **Re-cropping Interval:** DO NOT apply to cropland.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store at temperatures above -12°C. DO NOT mix or store in unlined steel (except stainless steel) containers or spray tanks.
- **Buffer Zones:** Hand-held or backpack sprayer and spot treatment do not require buffer zones.

Use	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Non-crop areas and forestry site preparation	1	20**
Control of *Phragmites* at high rate	1	30**

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

**** Buffer zones for protection of terrestrial habitats are not required for use on rights-of-way, including roadside and railroad ballast, rail and hydro rights-of-way, utility easements and roads.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction. See the label for product specific cleaning details.

Hazard Rating:


Caution – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Audible

Herbicide Group
2 - thifensulfuron, tribenuron
4 - fluroxypyr

This product is a prepackaged tank mix of the equivalent of thifensulfuron/tribenuron and fluroxypyr. Information listed is restricted to Crop, Weeds and Rates. For other detailed information on the component products see the product pages listed above.

Company:
Albaugh

Formulation:
The *Audible* package contains the following components:

***Draft* (PCP#31904):** 50% thifensulfuron methyl + 25% tribenuron methyl formulated as a water dispersible granule.
- Container size - 2 x 324 g

***Audible B* (PCP#33387):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 2 x 5 L

Crops and Staging:
Barley, spring wheat (including durum) and oats: 2 leaf up to and including initiation of stem elongation.
Winter wheat: In the spring from 3 tiller stage until the emergence of the flag leaf.

Weeds and Staging:
Apply from the seedling to 4 leaf or whorl stage (up to 10 cm tall or wide) unless otherwise indicated for the following weeds:
- *Weeds controlled by thifensulfuron/tribenuron plus:*
  - Cleavers (1 to 8 whorls)
  - Kochia (2 to 8 leaf)
  - Stork's bill (1 to 8 leaf)*
  - Volunteer flax (1 to 12 cm)

  * **Suppression only.**

Rates:
Draft: 8 g per acre.
Audible B: 125 mL per acre.

Add *Agral 90, AgSurf, Citowett Plus* at 0.2 L per 100 L of spray solution.

Thifensulfuron and tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Note: Maximum of ONE APPLICATION per year of this or other products containing thifenulfuron, tribenuron or fluroxypyr.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Herbicides: None registered.

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Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Authority 480

Herbicide Group
14 - sulfentrazone

Company:
FMC Corporation (PCP#29012)

Formulation:
480 g/L sulfentrazone formulated as a suspension concentrate.
- Container size - 4 x 3.79 L

Crops, Rates and Staging:
Pre-plant surface: Apply to the soil surface prior to seeding the crop.
Pre-emergent or after harvest once soil temperatures have dropped below 10 C and prior to freeze up: Apply to the soil surface up to 3 days after seeding. Crops emerging or near emerging at application may be injured. Any registered crop can be seeded the following spring.

At 88 mL per acre:
- Mustard
- Wheat (spring, durum)*

*** DO NOT apply *Authority 480* (or any other herbicide containing sulfentrazone) to spring wheat if an application of *Focus* (or any other herbicide containing pyroxasulfone) was applied in the previous fall.**

Up to 118 mL per acre:
- Chickpea
- Faba bean
- Field pea
- Flax
- Soybean
- Sunflower

All applications require rainfall for proper activation. (See "Effects of Growing Conditions")

Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sand, loamy sand or sandy loam) and/or the depth to the water table is shallow.

Weeds, Rates and Staging:
Controls the following weeds when applied to the soil prior to emergence:

At 88 mL per acre:
- Kochia
- Russian thistle (suppression only)

At 118 mL per acre:
- *Above weeds plus:*
  - Cleavers (suppression)
  - Common groundsel
  - Eastern black nightshade
  - Lamb's-quarters
  - Purslane
  - Pigweed (green, redroot)
  - Waterhemp
  - Wild buckwheat
  - Yellow woodsorrel

Use the higher rates within the rate range for soils with pH less than 7.0 and organic matter greater than 3 percent when crops are registered for both rates.

DO NOT APPLY *Authority 480* to:
- coarse-textured (sand, loamy sand, sandy loam) soils,
- fine textured soils with less than 1.5 percent organic matter,
- soils with organic matter content greater than 6 percent,
- soils with a pH of 7.8 or greater,
- fields treated with *Authority 480* (or other products containing sulfentrazone) per 24-month period (Including fall application).

Application Information:
- **Water Volume:** Minimum 40 L per acre. Use as high water volume as practical to achieve even distribution over the soil surface.
- **Nozzles and Pressure:** Maximum 30 psi (175 kPa) if using conventional nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets or larger.
- DO NOT mechanically incorporate in the fall or spring as this can destroy the herbicide barrier and allow weed escapes.
- DO NOT apply to frozen soils or existing snow cover to prevent run-off of the herbicide.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
sulfentrazone	PRE (residual soil activity)	PPO Inhibitor/ Membrane disruptor	Little movement (Symplast)	Broadleaf	14

Effects of Growing Conditions:

All applications require rainfall for proper activation. If weed growth begins before activation occurs, poor control may result on emerged weeds. A moderate rainfall (10 to 20 mm) or equivalent irrigation is required within 10 to 14 days to activate pre-emergent surface treatments. Dry conditions that persist after any application may reduce weed control. On sandy soils, heavy rainfall following application may cause leaching of *Authority 480* that may result in reduced weed control and increased risk of crop injury.

DO NOT apply to fields that are covered in snow.

Tank Mixes:

Herbicides:

- ***Field Peas only:*** Imazethapyr (28.3 mL per acre) – black and grey wooded soils only.
- ***Wheat (spring, durum), Faba bean, Field Peas and Soybean only*:*** *Express SG* (6 grams per acre) + glyphosate.
  *** See precautions on 'Tribenuron' regarding potential pulse crop injury.**

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Restrictions:

- **Rainfall:** Rainfall following application is required for adequate weed control.
- **Grazing Restrictions:** DO NOT graze stubble after a post harvest fall application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Re-cropping Interval:**
  - Registered crops may be planted anytime after application.
  - Winter wheat may be seeded 4 months after application.
  - Alfalfa, barley, canary grass, canola, field corn, mustard (following use of high rate), oats and wheat (spring and durum - following use of the high rate) may be seeded 12 months after application.
  - Sweet corn, lentils and sorghum may be seeded 24 months after application.
  - For all other crops 36 months must pass following application and a successful bioassay indicating adequate tolerance before planting.
  - **For each year of drought** experienced, **add one year** to the intervals above and conduct a bioassay to confirm tolerance of the rotational crop. Longer re-cropping intervals should be used under dry conditions.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store above 5°C to keep from freezing. If frozen, and solid crystals are observed, warm to above 15°C and shake or roll container periodically to dissolve solids.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Leaving cleaning solution in the sprayer tank and plumbing for an extended period will improve cleaning effectiveness.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Authority Strike

Herbicide Group
14 - sulfentrazone, carfentrazone

Company:
FMC Corporation

Formulation:
***Authority Strike* (PCP#34867):** 380 g/L sulfentrazone and 42 g/L carfentrazone-ethyl formulated as a suspension emulsion.
- Container size – 4.52 L

Crops, Rates and Staging:
Apply in the spring prior to seeding or up to 3 days after seeding the following crops:

At 113 ml/acre (40 ac/jug):
Wheat (spring and durum), mustard

At 113 ml/acre (40 ac/jug) or 162 ml/acre (28 ac/jug):
Chickpea, faba bean, field pea, flax, soybean, sunflower

All applications require moisture for proper activation.

For burn-off control of emerged weeds, if glyphosate is not used with *Authority Strike*, the addition of an adjuvant is required. Use a non-ionic surfactant (NIS) at 0.25% v/v (0.25 L per 100 L of spray solution) or use Merge at 1% v/v.

Weeds, Rates and Staging:
At 113 ml/acre (40 ac/jug):
Controls the following weeds when applied to the soil prior to emergence:
- Kochia

The following emerged weeds are controlled by *Authority Strike* up to the 10 cm stage unless otherwise indicated (burn-off):
- Common lamb's-quarters[2]
- Black nightshade[1]
- Eastern black nighshade[1]
- Morning glory[3]
- Redroot pigweed
- Tall waterhemp[1]
- Velvetleaf

At 162 ml/acre (28 ac/jug):
Controls the following weeds when applied to the soil prior to emergence:
- Cleavers[4]
- Common groundsel
- Common lamb's-quarters
- Common purslane
- Common waterhemp
- Eastern black nightshade
- Large crabgrass
- Powell pigweed
- Redroot pigweed
- Smooth crabgrass
- Wild buckwheat
- Yellow woodsorrel

The following emerged weeds are controlled by *Authority Strike* up to the 10 cm stage unless otherwise indicated (burn-off):
- Carpetweed
- Cleavers
- Cocklebur
- Common lamb's-quarters
- Common purslane
- Common waterhemp
- Black nightshade
- Eastern black nightshade
- Flixweed
- Hairy nightshade
- Jimsonweed
- Kochia
- Morning glory
- Pennsylvania smartweed (seedling)
- Pigweed (prostrate, smooth, tumble)
- Russian thistle[1]
- Shepherd's purse
- Stinkweed
- Tall waterhemp
- Tansy mustard
- Volunteer canola (including glyphosate-tolerant)

[1] Up to 5 cm tall.
[2] Up to 7.5 cm tall.
[3] Up to 3 leaves.
[4] Weed suppression is a visual reduction in weed competition (reduced population or vigour) as compared with an untreated area. The degree of suppression will vary with weed size and environmental conditions prior to and following treatment.

DO NOT APPLY *Authority Strike* to:
- Coarse textured (sand, loamy sand, sandy loam) soils,
- Fine textured soils with less than 1.5 percent organic matter,
- Soils with organic matter content greater than 6 percent,
- Soils with a pH of 7.8 or greater

DO NOT apply *Authority Strik*e to field treated with *Authority Strike* (or other products containing sulfentrazone) in the previous year.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre. Use as high water volume as practical to achieve even distribution over the soil surface.
- **Nozzles and Pressure:** Maximum 30 psi (175 kPa) if using conventional nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ASABE medium droplets or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Sulfentrazone	PRE (residual soil activity)	PPO Inhibitor/ Membrane disruptor	Little movement (symplast)	Broadleaf	14
Carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage(symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:

All applications require rainfall for proper activation of the sulfentrazone component. If weed growth begins before activation occurs, poor control may result on emerged weeds. A moderate rainfall (10 to 20 mm) or equivalent irrigation is required within 10 to 14 days to activate pre-emergent surface treatments. Dry conditions that persist after any application may reduce weed control. On sandy soils, heavy rainfall following application may cause leaching of Authority Strike that may result in reduced weed control and increased risk of crop injury.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Pre-seed Pre-emergent:*** Glyphosate 0.5 to 1 L/acre (360 g ae/L)

Aim EC:

- *Authority Strike* (113 ml/ac) + *Aim EC* (4 ml/ac). The additional carfentrazone will control the same weeds as *Aim EC* labelled at 24 ml/ac rate.
- *Authority Strike* (113 ml/ac) + *Aim EC* (10 ml/ac). The additional carfentrazone will control the same weeds as *Aim EC* labelled at 30 ml/ac rate.

Note: the above Tank Mixes are those listed on the Authority Strike label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Heavy rainfall shortly after application may reduce the weed control of the carfentrazone component. Moderate rainfall (see 'Effects of Growing Conditions' above for details) within a few days of application is required for proper activity of the sulfentrazone component.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** Not applicable
- **Grazing:** No restrictions
- **Re-cropping:**
  - Registered crops may be seeded anytime following application.
  - Winter wheat may be seeded 4 months after application.
  - Alfalfa, barley, canola, field corn, mustard (following use of high rate), spring and durum wheat (following use of high rate) may be seeded 12 months after application.
  - Sweet corn, lentils and sorghum may be seeded 24 months after application.
  - For all other crops 36 months must pass following application and a successful field bioassay indicating adequate tolerance before planting.
  - For each year of drought experienced, add one year to the intervals above and conduct a field bioassay to confirm tolerance of the rotational crop. Longer recropping intervals should be used under dry conditions.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store above 5ºC to keep from freezing. If frozen, and solid crystals are observed, warm to above 15ºC and shake or roll container periodically to dissolve solids.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	10

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method (A, B, C)' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Danger – Poison
Refer to the Introduction for an explanation of the symbols.

Authority Supreme

Herbicide Group
14 - sulfentrazone
15 - pyroxasulfone

Company:
FMC Corporation (PCP#32562)

Formulation:
250 g/L pyroxasulfone and 250 g/L sulfentrazone formulated as a suspension concentrate.
- Container size - 2 x 8 L

Crops, Rates and Staging:
Pre-plant or pre-emergent (up to 3 days after seeding): chickpea, field pea, soybean, or sunflowers or after harvest once soil temperatures have dropped below 10 C and prior to freeze up:
Note: Maximum ONE APPLICATION of products containing pyroxasulfone over a 12 month period.
Maximum of ONE APPLICATION of *Authority Supreme* or other products containing sulfentrazone over 24-months. In case of extremely low rainfall in any of those years, a subsequent application of herbicides containing sulfentrazone should be further delayed by the equivalent number of years in which extremely low rainfall occurred.
Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sand, loamy sand or sandy loam) and/or the depth to the water table is shallow.
After a fall application any registered crop can be seeded the following spring.

Treatment	Rate (per acre)	
	Soil Type	
	Medium Texture (1 to 3 percent O.M.)*	Medium-Fine to Fine Texture (3 to 6 percent O.M.)*
Setup Treatment	162 mL	
Residual Treatment	202 mL	243 mL

*** O.M. = organic matter content**

Coarse	Medium	Medium-Fine	Fine
Sand, loamy sand, sandy loam	Loam, silt loam, silt	Sandy clay loam, sandy clay, silty clay loam	Silty clay, clay loam, clay

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

DO NOT apply *Authority Supreme* to:

- coarse textured soils
- soils with less than 1 percent organic matter content or greater than 6 percent organic matter content
- soils with pH greater than 7.8.

Weeds and Staging:

Control of the following weeds emerging from seed (not controlled if emerged at application):

- Barnyard grass
- Brome (downy, Japanese)
- Cleavers
- Common groundsel
- Cow cockle
- Eastern black nightshade
- Foxtail (green, yellow)
- Kochia
- Lamb's-quarters
- Palmer amaranth
- Pigweed (green, redroot)
- Purslane
- Ragweed, common*
- Stinkweed
- Waterhemp
- Wild buckwheat
- Wild mustard*
- Wild oats*
- Witchgrass
- Yellow woodsorrel

*** Suppression only.**

Application Information:

- **Water Volume:** Minimum of 40 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- DO NOT mechanically incorporate in the fall or spring as this can destroy the herbicide barrier and allow weed escapes.
- DO NOT apply to frozen soils or existing snow cover to prevent run-off of the herbicide.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
sulfentrazone	PRE (surface) with residual soil activity	PPO Inhibitor/ Membrane disruptor	Little movement (Symplast)	Broadleaf	14
pyroxasulfone	PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Moisture is necessary to activate both the pyroxasulfone and sulfentrazone components in soil for effective weed control. Moderate rainfall will improve weed control activity. A minimum of 12.5 mm (0.5 inches) of rainfall or irrigation is required in one event to activate the product. Dry weather following applications may reduce effectiveness. Heavy rainfall shortly after application may reduce weed control and increase the risk of injury. Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity. Temporary growth suppressions may occur on eroded knolls, hilltops, areas with coarse gravelly deposits, low organic matter and/or high soil pH.

Tank Mixes:

Herbicides:

Prior to All Crops:

- Glyphosate (180 to 360 g ae per acre)
- *Express SG* (6 grams per acre)*+ glyphosate (rates above) – peas and soybeans only

  *** See precautions on 'Tribenuron' regarding potential pulse crop injury.**

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Avoid application when heavy rain is forecast. A minimum of 12.5 mm (0.5 inches) of rainfall or irrigation is required in one event after application to activate the product.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze stubble after a post harvest fall application.
- **Pre-harvest Interval:** Not applicable.
- **Re-cropping Interval:** Registered crops may be seeded any time after treatment. Winter wheat may be seeded 4 months after application. Barley, canola, field corn, mustard, oats, sunflower, or wheat (spring and durum) may be seeded 12 months after application. Lentils may be seeded 24 months after application. All other crops require 36 months from application to seeding. ***Note:*** *If there is a lack of adequate or normal soil moisture due to drought conditions following an application of Authority Supreme, the minimum rotational crop interval listed must be extended for one additional year and a representative bioassay of the field must be conducted with the potential rotational crop and adequate soil moisture to determine the crop sensitivity to Authority Supreme.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place over 5°C in original container. DO NOT freeze, but if frozen raise product temperature to 15°C and shake or roll to dissolve crystals.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	5	3	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Warning – Contains the Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Avadex Brands **(this referring text to be removed in the 2025 edition)** *See Triallate*

Avenza

Herbicide Group
1 - pinoxaden
2 - florasulam
4 - fluroxypyr

Company:
Corteva Agriscience

Formulation:
The *Avenza* package contains the following components:

***Avenza A* (PCP#33455):** 5 g/L florasulam and 100 g/L fluroxypyr formulated as a suspension concentrate.
- Container sizes - 8.1 L, 64.8 L, 97.2 L

-plus-

***Avenza B* (PCP#33278):** 50 g/L pinoxaden formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 80 L, 120 L

Crops and Staging:
Spring wheat (excluding durum), winter wheat and barley: 3 leaf to just prior to flag leaf emergence.

Weeds and Staging:
Grass Weeds controlled: (1 to 6 leaf, prior to 4th tiller)
- Barnyard grass†
- Foxtail (green, yellow)
- Proso millet
- Volunteer canary seed
- Volunteer oats
- Wild oats

Broadleaf Weeds controlled when tank mixed with 235 mL per acre of MCPA Ester 600:
- Burdock (seedlings up to 4 leaf)
- Canada thistle†
- Chickweed
- Cleavers
- Cocklebur
- Cow cockle
- Dandelion (seedlings, rosettes, overwintered rosettes (up to 25 cm in diameter))†
- Flixweed
- Hemp-nettle
- Kochia
- Lamb's-quarters
- Mustard (ball, wild)
- Narrow-leaved hawk's-beard
- Plantain
- Prickly lettuce
- Ragweed
- Redroot pigweed
- Russian thistle
- Shepherd's-purse
- Smartweed
- Sow-thistle (annual, perennial)
- Stinkweed
- Stork's-bill (1 to 8 leaf)
- Vetch
- Volunteer canola (all varieties)
- Volunteer flax
- Wild buckwheat
- Wild radish
- Wild sunflower (annual)

†**Top growth control only.**

Rate:
Avenza A at 405 mL per acre plus *Avenza B* at 500 mL per acre + MCPA Ester 600 at 235 mL per acre.

When tank mixed with 235 mL per acre MCPA Ester 600 additional surfactant is NOT required.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. For ground applications use 30 to 40 psi (200 to 275 kPa) pressure. Flat fan nozzles of 80° or 100° are recommended.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1
florasulam	POST (foliar) with little soil activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Weed control following application of *Avenza* may be reduced or delayed under stress conditions such as drought, heat, insufficient fertility, flooding or prolonged cool temperatures. Grass escapes or re-tillering may occur if application is made during prolonged stress conditions. Optimum weed control will be obtained if application of *Avenza* herbicide is delayed until the stress conditions have ended and weeds are once again actively growing.

Tank Mixes:

Herbicides:

- MCPA Ester 600 (235 mL per acre)

Fungicides: None registered.

- *Stratego* (label rates)
- *Tilt* (label rates)

Insecticides: None registered.

Fertilizers: None registered.

Restrictions:

- **Rainfall:** Rainfast within 1 hour of application.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** DO NOT harvest the treated crop for grain within 60 days of application.
- **Grazing Restrictions:** DO NOT graze for 7 days or silage/hay for 30 days following application.
- **Re-cropping Interval:** Fields previously treated with *Avenza* can be seeded the following year to alfalfa, barley, canola, corn, dry common beans, faba bean, flax, lentil, mustard (brown, oriental and/or yellow) oats, peas, potatoes (except seed potatoes), soybeans, sunflower or wheat.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in original containers in a secure, dry, well ventilated, heated storage.
- **Buffer Zones:** Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

This product utilizes a combination of 'Method A' and 'Method B' for cleanout requiring the use of All Clear Spray Tank Decontaminator plus ammonia for the second rinse. Refer to the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

Avenza A:


Warning – Eye and Skin Irritant

Avenza B:


Danger – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Axial Xtreme

Herbicide Group
1 - pinoxaden
4 - fluroxypyr

Company:
Syngenta Canada (PCP#30391)

Formulation:
50 g/L pinoxaden and 87.5 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 2 x 10 L, 80 L, 400 L

Crops and Staging:
Spring wheat (NOT including durum) and barley:

1 to 6 leaf stage prior to the emergence of the 4th tiller and before the first node can be felt in the stem.

Weeds, Rates and Staging:
Apply *Axial Xtreme* at 0.5 L per acre (no adjuvant required)

Grasses - 1 to 6 leaf prior to the emergence of the 4th tiller
- Barnyard grass
- Foxtail (green, yellow)
- Proso millet
- Volunteer oats
- Volunteer canary seed
- Wild oats

Broadleaf Weeds - stages indicated below:
- Cleavers (up to 4 whorls)
- Kochia (2 to 8 leaf)
- Stork's bill (up to 6 leaf)*
- Wild buckwheat (up to 4 leaf)*

*** Suppression.**

Maximum ONE APPLICATION per year of this or other products containing pinoxaden or fluroxypyr.

Application Information:
- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Maximum 40 to 45 psi (275 to 310 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** classification droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1
fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Tolerance and efficacy is best when applied during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under prolonged stress caused by excessive cool or heat, flooding or drought, or poor fertility, control of some weeds may be reduced and or crops may be injured.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Bromoxynil/MCPA†
- *Curtail M*†
- *Infinity*††
- MCPA Ester (280 to 310 mL per acre – 600 g/L form)†
- Thifensulfuron/tribenuron (*Refine SG* only)
- Thifensulfuron/tribenuron (*Refine SG* only) + MCPA Ester (rates above)†

† **A reduction in barnyard grass control may be observed with this mix.**

†† **A reduction in green foxtail control may be observed with this mix.**

Fungicides:

- Propiconazole (*Tilt* only at 101 to 202 mL per acre)

Insecticides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Axial Xtreme* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvest.
- **Grazing Restrictions:** Must not be grazed within 7 days or cut for livestock feed within 30 days of treatment.
- **Re-cropping Interval:** Barley, canola, flax, forage grasses, lentil, mustard, oats, peas, rye or wheat may be seeded the first full season after application or fields can be fallowed.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. DO NOT freeze.
- **Buffer Zones:** Avoid drift. Leave at least 15 metres between the downwind edge of the boom and sensitive areas such as shelterbelts, hedgerows, wetlands, woodlots, vegetated ditch banks, ponds, streams, and sloughs. Buffer zones can be reduced by 70 percent when using shrouds or by 30 percent when using cones mounted less than 12 inches from the crop canopy.

Sprayer Cleaning:

Refer to 'Method B' in the introduction. Use 500 g or mL per 100 L of rinsate for alkali detergents or 250 g or mL per 100 L of rinsate for concentrated laundry detergents. DO NOT use chlorine based cleaners.

Hazard Rating:

 Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Axial Xtreme iPak

Herbicide Group
1 - pinoxaden
4 - fluroxypyr
6 - bromoxynil
27 - pyrasulfotole

This product is a prepackaged tank mix of Axial Xtreme *and* Infinity.. *Information listed is restricted to Crop, Weeds and Rates. For other detailed information on the component products see the product pages listed above.*

Company:
Syngenta Canada

Formulation:
The *Axial Extreme iPak* package contains the following components:

***Axial Xtreme* (PCP#30391):** 50 g/L pinoxaden and 87.5 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 1 x 10 L, 80 L

***Infinity* (PCP#28738):** 37.5 g/L pyrasulfotole and 210 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container sizes - 1 x 6.7 L, 53.6 L

Crops and Staging:
Spring wheat (NOT including durum) and barley*:* 1 to 6 leaf stage prior to the emergence of the 4th tiller and before the first node can be felt in the stem.

Weeds and Staging:
Weeds controlled by the component products.

Rates:
***Axial Extreme*:** 0.5 L per acre (no adjuvant required)

***Infinity*:** 0.33 L per acre

Maximum ONE APPLICATION of this or other products containing the active ingredients pinoxaden, pyrasulfotole or bromoxynil per year.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

AXXE Broad Spectrum Herbicide

Herbicide Group
N/A

Company:
BioSafe Systems (PCP#32719)

Formulations:
36% Ammonium Salt of Fatty Acid
- Container sizes - 9.46, 18.9, 114, 208, 984, 1041 L

Crops and Staging:
For pre-seed burndown, spot application or shielded inter-row application in field crops, pastures, and non-crop areas on farms. Avoid contact with desirable vegetation or crop injury will occur.

Weeds and Staging:
Axxe is non-selective and will burn any tissues contacted whether weed or crop. Application to small seedlings that have not established an extensive root will be controlled. Application to larger annuals and perennial weeds will result in top-growth control where plants may regrow from lateral buds or perennial roots following treatment. Un-emerged seedlings will not be controlled.

Application Rates:

Mix *Axxe* at a 13.8% v/v or 13.8 L per 100 L of spray solution and apply until the point of run-off or at the application volumes below based on weed size. Apply *Axxe* spray solutions only when weed surfaces are dry as water on the plant surface will dilute the herbicide rate. DO NOT apply to weeds when wet from dew, rain or irrigation.

Height of plants (weeds)	0 to 3 cm	3 to 6 cm	6 cm and larger
Axxe rate (L/acre)	18.2	35.2	106
Minimum total application volume (L/acre)	131.5	253	309

Application Information:

- **Water Volume:** 131.5 to 309 L per acre.
- **Nozzles and Pressure:** Use low spray pressure to reduce foaming and avoid contact with desirable plants. Most spray nozzles are designed to operate at 70 to 105 kPa (10 to 15 psi) and provide uniform spray coverage of weeds. DO NOT apply this product through any type of irrigation system.

How it Works:

Axxe is a contact herbicide that is not translocated in plants and causes the loss of plant cell membrane integrity, exposing the cell contents to the atmosphere, resulting in rapid dry-down (necrosis) and death of the contacted tissues.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Within 3 hours of application may result in reduced weed control.
- **Restricted Entry Interval:** No restrictions.
- **Pre-harvest Interval:** Not for application directly to crops.
- **Grazing Restrictions:** No restrictions. Ammonium salts of fatty acids are a food additive.
- **Re-cropping Interval:** *Axxe* has a short life in soil and most crops can be seeded immediately after use.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store product in original container in a secure, dry area away from other pesticides, food or feed.
- **Buffer Zones:** None indicated. TOXIC to terrestrial plants and aquatic organisms. Avoid overspray of water and sensitive habitats.

Hazard Rating:

 Warning – Eye Irritant

 Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Batalium

Herbicide Group
2 – flucarbazone
4 – fluroxypyr, MCPA
6 - bromoxynil

Company:

UPL AgroSolutions Canada Inc. (PCP#35024)

Formulation:

16.7 g/L flucarbazone, 74.1 g/L fluroxypyr, 197 g/L MCPA and 197 g/L bromoxynil formulated as a suspension concentrate

- Container size – 2 x 11.5 L and 114.7 L

Crops, and Staging:

Wheat (spring, durum, winter): 2 to 6 total leaves (4 leaves on main stem plus 2 tillers)

Weeds and Staging:

Apply to actively growing weeds under ideal environmental conditions.

Grass Weeds Controlled and Suppressed (S) – 1 to 6 leaf stage unless otherwise indicated:

- Barnyard grass (S)
- Green foxtail
- Japanese brome (1 to 4 leaf)
- Volunteer oat
- Wild oat
- Yellow foxtail (S)

Broadleaf weeds – up to 8 leaf stage unless otherwise indicated:

- American nightshade*
- Bluebur*
- Buckwheat (common, tartary, wild)
- Canada thistle†
- Cleavers (1 to 4 whorls)
- Cocklebur*
- Common groundsel
- Common ragweed
- Cow cockle*
- Flixweed*
- Kochia (up to 5 cm)
- Lamb's-quarters
- Mustard (ball [2 to 4 leaf], wild**, wormseed)
- Night-flowering catchfly*
- Perennial sow-thistle†
- Prickly lettuce†† (up to 12 leaf)
- Redroot pigweed**
- Russian thistle*
- Scentless chamomile*
- Shepherd's-purse**
- Smartweed (green**, lady's-thumb*, pale*)
- Stinkweed (2 to 9 leaf)
- Stork's bill (S) (1 to 8 leaf)
- Volunteer canola**
- Volunteer flax (1 to 12 cm)
- Volunteer sunflower*
- Wild tomato*

***Up to 4 leaf**
****2 to 6 leaf**
† **Top growth suppression only**
†† **Suppression in winter wheat only**

Rate:

Apply at 575 mL per acre with a non-ionic surfactant at 2.5 L per 1000 L of solution.
Refer to the product label for complete mixing instructions.
Note: *Maximum one application of Batalium per growing season.*

Application Information:

- **Water Volume:**
  - ***Ground:*** 22 to 45 L per acre
  - ***Aerial:*** Minimum of 11 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. For ground applications use 30 to 50 psi (207-345 kpa) pressure. Flat fan nozzles of 80° or 110° are recommended. For aerial application, apply at no less than 43 psi (300 kpa) pressure.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flucarbazone	POST (foliar) with soil residual activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (symplast)	Broadleaf and grasses	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (symplast)	Broadleaf only	4

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA	POST (foliar)	Synthetic Auxin	Throughout the plant (symplast)	Broadleaf only	4
Bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little (apoplast)	Broadleaf only	6

Effects of Growing Conditions:

For best results apply to wheat and weeds that are actively growing. Wheat exposed to water-logged or saturated soils, temperature extremes, drought, low fertility, or plant disease at application time could show injury symptoms. Weed control also may be reduced by these conditions.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

Tank mix with MCPA Ester 600 at 185 mL per acre for additional control of hemp-nettle (up to 4 leaf stage).

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** Leave 80 days between application and harvest.
- **Grazing:** DO NOT graze treated fields.
- **Re-cropping:** The following crops may be planted 11 months after an application of Batalium:

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Spring Wheat	Spring Wheat	Spring Wheat	Spring Wheat
Barley	Barley	Barley	
Canola	Canola	Canola	
Field Pea*	Field Pea*	Field Pea*	
	Field Bean	Flax	
	Flax	Durum Wheat	
	Durum Wheat	Soybean	
	Soybean	Sunflower	
	Sunflower		

*Field pea may be grown the year following Batalium application providing the following are all met:

1. Soil pH must be below 7.5
2. Organic matter must be above 4%, and
3. Precipitation must be equal to or above 10-year average (minimum 100 mm within 60 days of application in year of application)

- **Aerial Application:** May be applied by aircraft**.**
- **Storage:** Store in a cool, dry place. Store this product away from food or feed.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1	
Field sprayer	2	1	1
Fixed wing aircraft	5	1	70
Helicopter	5	2	55

See the Key to Product Pages in the introduction for an explanation of the different habitats.

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the Introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Poison


Eye irritant and skin irritant

Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Beloukha

Herbicide Group 26 –pelargonic acid

Company:
Belchim Crop Protection Canada

Formulation:
***Beloukha Herbicide* (PCP#33685):** 500 g/L pelargonic acid formulated as emulsifiable concentrate.
***Beloukha Agricultural Herbicide* (PCP#33686):** 680 g/L pelargonic acid formulated as emulsifiable concentrate.
- Container size - 2 x 9.46 L

Crops and Staging:
Preseed burndown: Prior to seeding or up to 3 days after seeding and prior to emergence of cereal and pulse crops.
Post-harvest and Non-crop areas: Total vegetation control.
Harvest Aid:
- ***Wheat, barley, oats:*** when seed moisture is less than 30 per cent. Harvest when vegetation is dry.
- ***Potato:*** use at onset of senescence of foliage at least 2 weeks prior to harvest.
  One repeat application may be required 7 to 14 days after the first.

Weeds and Staging:
Apply when weeds are up to 10 cm tall. Repeat application may be required on a 7 to 14 day interval as required for complete control, especially of biennial and perennial species.

Weeds controlled:
- Annual sow-thistle*
- Barnyard grass*
- Black medic
- Bluegrass
- Bromegrass*
- Canada fleabane*
- Chickweed (common, mouse-eared)
- Cranesbill
- Dandelion*
- Dutch clover*
- Fescue
- Fireweed*
- Field bindweed*
- Goosefoot (lamb's-quarters, maple leaved)
- Common groundsel
- Henbit
- Knotweed (prostrate)*
- Mayweed (chamomile)*
- Meadow fescue*
- Nettle (common)*
- Nightshade (black)
- Perennial ryegrass
- Perennial sow-thistle
- Plantain
- Purslane
- Redroot pigweed
- Shepherd's-purse
- Wall rocket (annual)
- Willowherb*

*** Suppression only**

Rate:
Maximum FOUR APPLICATIONS per year.

	Rate (L/acre)	
	500 g/L	680 g/L
Post-harvest and Non-crop Areas	6.5 to 10.9	4.9 to 8.1
Harvest Aid: wheat, barley, oats	4.5 to 8.9	3.2 to 6.5
Harvest Aid: potato	6.5 to 8.9	4.9 to 6.5

Application Information:

- **Water Volume:**
  - ***Harvest Aid:***
    - ***Wheat, barley, oats*** **-** 80 to 121 L per acre
    - ***Potatoes*** **-** 121 L per acre. Up to 445 L per acre of water if top-growth is dense
  - ***Pressed, Post–harvest and Non-crop areas:*** 121 L per acre
- **Equipment, Nozzles and Pressure:**
  - ***Boom Sprayer:*** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE medium droplets.
  - ***Hand-held and High Volume:*** Spray all leaf surfaces uniformly to complete wetness but not to run-off.
  - ***Selective Placement Equipment:***
    - ***Shielded sprayers*** - use according to manufacturer's directions.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pelargonic acid	POST (foliar)	Inhibition of lipid synthesis	Little movement due to rapid cell leakage	Broadleaf and grass	26

Effects of Growing Conditions:

DO NOT apply *Beloukha* during periods of extreme weather conditions, drought, or heavy rainfall. Allow the correct environmental conditions (i.e. irrigate in drought or allow to dry in wet conditions) for at least 3 days prior to applying.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more
- information.
- **Restricted Entry Interval:** DO NOT enter treated fields until spray has dried.
- **Pre-harvest Interval:** Not specified.
- **Grazing Restrictions:** Not specified. DO NOT graze treated areas.
- **Re-cropping Interval:** No restrictions.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store above 5°C. Store in a cool, dry, secure and well-ventilated area.
- **Buffer Zones:** Avoid spraying in situations where drift may occur. DO NOT apply during periods of dead calm.

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat:
Ground*	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Warning – Eye and Skin Irritant


Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Bentazon

Herbicide Group
6 - bentazon

Company:

BASF Canada (*Basagran* – PCP#12221, *Basagran Forté* – PCP#22006)
AgraCity (*Boa* – PCP#33011)
Nufarm Agriculture (*Berserk* – PCP # 34190)
Sharda CropChem Canada (*Benta Super* – PCP#32827)
UPL AgroSolutions Canada (*Broadloom* – PCP#32661)
Viking (*Viking Bentazon* – PCP#34758)

Formulation:

480 g/L bentazon formulated as a solution. *Basagran Forté* has a built-in adjuvant. Other products require the addition of an adjuvant.

- Container sizes:
  - ***Basagran, Benta Super, Broadloom:*** 2 x 9 L, 450 L (*Broadloom* only)
  - ***Boa:*** 2 x 7.5 L, 348 L
  - ***Basagran Forté, Berserk:*** 2 x 10 L
  - ***Viking Bentazon:*** 2 x 7.25 L, 348 L

Crops and Staging:

All Products:

Crop	Stage
Soybean	No restrictions
Dry bean***	After the first trifoliate leaf
Corn	No restrictions
Pea	After 3 leaf pairs but prior to flowering
Faba bean	After 2 to 3 leaf stage or at least 4 inches (10 cm) tall
Flax	After 2 inches (5 cm) in height

***Basagran Forté* only:**

Crop	Stage
Forage millet and forage sorghum (forage and seed production)*	3 to 10 inches (7.5 to 25 cm) prior to canopy closure
Established clover (alsike, red) for seed production only*	3 to 10 inches (7.5 to 25 cm) prior to canopy closure

***Basagran, Berserk, Broadloom, Boa* and *Benta Super* only:**

Crop	Stage
Spring wheat (excluding durum)**	No restrictions (limited to the 4 leaf to flag leaf by 2,4-D staging)
Solin (low linolenic acid flax)	After 2 inches (5 cm) in height
Forage grasses for seed production*: Bromegrass, creeping red fescue, crested wheatgrass, meadow foxtail, orchardgrass, timothy.	1 to 7 leaf stage
Forage legumes (seedlings) for seed production*: Alfalfa, alsike clover, red clover, sainfoin.	After the third trifoliate leaf
Established alfalfa for seed production.*	Prior to flowering
Established clover (Sweet, or Red) and sainfoin for seed production.*	3 to 10 inches (7.5 to 25 cm) prior to canopy closure

*** One application per season.**
**** *Basagran, Benta Super, Broadloom, and Boa* only at 0.4 L per acre. Must be tank mixed with 2,4-D (no adjuvant required).**
***** Test a small area of a new variety for tolerance before widespread use. Refer to product labels for a list of dry bean types registered for *Basagran, Benta Super, Berserk and Boa. Basagran Forté* registered for all dry bean types but not tested for tolerance on all types.**
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

***Basagran Liquid, Berserk, Broadloom, Boa* and *Benta Super* only:** Add *Assist* or *XA Oil Concentrate* at 0.4 to 0.8 L per acre. Use the low rate of *Assist* or *XA Oil Concentrate* only if hot, humid conditions (above 28°C and 80 percent relative humidity) prevail. *Citowett Plus* may be used on peas at 0.25 L per 100 L spray mixture. Ammonium sulphate may be added for applications to soybean and dry beans with *Assist oil concentrate* only.

Benta Super can also be applied with *Citowett Plus* at 0.25 L per 100 L of spray solution.

***Basagran Forté* only:** *Basagran Forté* does not require the addition of *Assist* or *XA oil concentrate*. Ammonium sulphate can be added for applications to soybean only.

Apply the rate listed when weeds in the table are within the recommended height:

Annual Weeds	0.71 L per acre		0.91 L per acre	
	Inches	Maximum Leaf Stage	Inches	Maximum Leaf Stage
Buttercup			2 to 4	6*
Cleavers			1 to 3 whorl stage	
Cocklebur	3 to 7	6*	7 to 12	10*
Common chickweed			1 to 3 weeks after emergence	
Common groundsel			2 to 4	
Common ragweed			1 to 2	6
Corn spurry			1 to 4	
Flower-of-an-hour	1 to 2	6*	2 to 4	10*
Giant ragweed			2 to 6	4
Hairy galinsoga			2 to 3	6*
Hairy nightshade			0.2 to 0.8	6
Jimsonweed			2 to 6	10
Lady's-thumb (smartweed)	1 to 3	6*	3 to 8	10
Lamb's-quarters			0.5 to 1.0	8
Purslane			1 to 2	6
Redroot pigweed (suppression only)			0.5 to 1.5	4
Russian thistle (suppression only*)			1 to 3	4*
Shepherd's-purse	Rosette to 4	6*	4 to 10	6
Stinkweed	Rosette to 2	6*	2 to 6	6
Stork's-bill			1.5 to 4	2 to 6 leaf stage
Volunteer canola	0.75 to 6	8	0.75 to 6	8
Wild mustard	1 to 5	6*	5 to 10	10
Wild radish			1 to 2	6
Canada thistle	6 to 8			
Field bindweed (suppression only)	1 to 2.5			
Yellow nutsedge	6 to 8			

* ***Basagran Forté* and *Berserk* only.**

Basagran, Boa and *Benta Super* may be applied in spring wheat (except durum) at 0.4 L per acre when tank mixed with 2,4-D amine or ester at 143 to 190 g ae per acre to control the weeds controlled by 2,4-D plus lady's-thumb, redroot pigweed and daisy fleabane. No adjuvant is required for this mix.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 40 to 160 L per acre. A minimum of 80 L per acre is recommended for optimum control.*
  - ***Aerial:*** 20 to 40 L per acre.
- **Nozzles and Pressure:** Maintain 40 to 60 psi (275 to 425 kPa)* when using conventional flat fan nozzles capable of delivering high water volumes with ***ASABE medium*** droplets. Low drift nozzles may require higher pressures for proper performance. Contact the herbicide manufacturer regarding the suitability of low drift nozzles for use with this product. Direct nozzles 45° forward to improve contact with vertical targets.

  *** Higher water volumes and pressures should be used when the weeds are at the upper end of their recommended treatment stage.**

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bentazon	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Poor results will occur if temperatures are cool. Optimum results are achieved when applied at daytime temperatures between 20 and 28°C. Applications at temperatures greater than 28°C may result in crop injury. May result in crop injury when applied to crops that are stressed due to severe weather conditions such as frost, drought or water saturated soil.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In soybean*:**
  - *Pinnacle* (2.2 to 3.2 grams per acre)
  - *Berserk* or *Broadloom* plus *Pursuit* or *Ultra Blazer* plus *Assist* or *XA oil concentrate*
- ***In dry bean**:**
  - *Basagran, Berserk, Broadloom, Boa* and *Benta Super* only (0.71 L per acre) plus *Reflex** plus *Agral 90*.
- ***In spring wheat (not including durum)*:**
  - *Basagran, Berserk, Broadloom, Boa* and *Benta Super* only (0.4 L per acre) may be tank mixed with 2,4-D amine or ester at 143 to 190 g ae per acre. This tank mix DOES NOT need any adjuvant.

*** For use in the Red River Valley of Manitoba only.**

Fungicides: None registered.

Insecticides: None registered

Fertilizers:

- ***In soybean*:**
  - *Basagran*, *Basagran Forté*, *Berserk, Broadloom, Boa* and *Benta Super* plus UAN (4 L per acre) or AMS (2.4 L per acre)
- ***In dry bean:***
  - *Basagran, Berserk, Broadloom, Boa* or *Benta Super* plus AMS (1.5 percent v/v). Use with *Assist oil concentrate*.
- DO NOT add fertilizer with *Assist* or *XA Oil Concentrate* when tank mixing with *Pinnacle*. The risk of crop injury increases with the use of fertilizer mixes under hot, humid conditions.
- Use of fertilizer mixes is not recommended for use under western Canadian environmental conditions for other crops.

When mixing Bentazon refer to the tank mix partner label for any additional restrictions and precautions.

Allow 4 days between application of Bentazon and other herbicides, fertilizers or insecticides.

Note: The above mixes are those listed on the Bentazon labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 to 8 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 12 hours.
- **Grazing Restrictions:** Allow 30 days between treatment with *Basagran Forté* and harvest of forage sorghum and millet for hay. Otherwise DO NOT graze treated crops or cut for feed prior to crop maturity.
- **Pre-harvest Interval:** 50 days for Bentazon + 2,4-D in wheat, 84 days for Bentazon + *Reflex* in dry beans in Manitoba. Other uses are restricted only by appropriate staging.
- **Re-cropping Interval:** No restrictions the year after application.

- **Aerial Application:** May be applied by air for weed control in dry beans or soybeans only. *Assist* or *XA Oil Concentrate* at 0.05 to 0.1 L per acre must be added. DO NOT use *Assist* or *XA Oil Concentrate* in excess of 0.1 L per acre as substantial crop injury could occur. DO NOT apply fertilizer mixes in soybean or 2,4-D tank mix in wheat by air. Crop canopy should NOT cover the weeds.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres††) Required for the Protection of: Terrestrial habitat
Ground†	Sorghum**, forage millet**, forage grasses and legumes, peas*	1
	Corn, dry bean, faba bean, flax, pea**, soybean, spring wheat*	2
Fixed wing airplane***	Dry bean	20
	Soybean	35
Helicopter***	Dry bean	20
	Soybean	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** *Basagran, Berserk, Broadloom, Boa* and *Benta Super* only**
**** *Basagran Forté* only**
***** *Basagran, Berserk* and *Broadloom* only**
† Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.
†† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction.

Hazard Rating:

***Basagran, Boa, Benta Super, Viking Bentazon*:**

 Caution – Poison

Potential Skin Sensitizer

***Basagran Forté*:**

 Warning – Poison

 Danger – Corrosive to Eyes

 Warning – Contains the Allergen Soy

Potential Skin Sensitizer

 ***Berserk, Broadloom:*** Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

BlackHawk

Herbicide Group
4 - 2,4-D
14 - pyraflufen-ethyl

Company:
Nufarm Agriculture (PCP#32111)

Formulation:
473 g/L 2,4-D ester and 6.1 g/L pyraflufen-ethyl formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9 L, 96 L, 480 L

Crops and Staging:
Apply pre-seeding or up to 3 days after seeding the following crops:
- Wheat (spring, durum, winter)
- Barley
- Corn (field)
- Canaryseed (including hairless varieties for human consumption)
- Rye (spring, fall)
- Soybean
- Triticale
- Chemfallow

Oats – 7 days prior to seeding.

Post-harvest: Apply in the fall (up until soil freeze). Crops not listed above can be planted one month after application.

Weeds, Rates and Staging:
Apply 300 mL per acre to young, actively growing weeds that are less than 5 cm in height or width, unless indicated otherwise.
- Annual sow-thistle
- Bluebur (up to 4 leaf)
- Burdock (up to 4 leaf)
- Cleavers
- Cocklebur
- Dandelion (spring seedlings)
- Cow cockle*
- False flax
- Fleabane (Canada*, daisy)
- Flixweed
- Goat's-beard
- Kochia
- Lamb's-quarters
- Mallow
- Mustards (except dog and tansy)
- Narrow-leaved hawk's-beard**
- Plantain
- Pigweed (redroot, Russian)
- Prickly lettuce
- Ragweed (common, false, giant)
- Shepherd's-purse
- Stinging nettle
- Stinkweed
- Sweet clover (seedling)
- Thyme-leaved spurge
- Volunteer canola (all varieties)
- Wild buckwheat*
- Wild mustard*
- Wild sunflower

*** Suppression**

**** Up to 5 cm in the fall, up to 2 leaf in spring**

† ***Blackhawk* applied alone requires the addition of a non-ionic surfactant *(Nufarm Enhance, Agral 90)* at 0.25 L per 100 L of spray solution.**

Maximum TWO APPLICATIONS of *Blackhawk, Conquer II* or *Goldwing* at the low (133 mL per acre) rate listed in this Guide (maximum 3.67 grams per acre of the pyraflufen active) WITHIN A TWO YEAR TIME SPAN.

Blackhawk may degrade if left in the sprayer for an extended period under alkaline conditions. Apply within 24 hours of mixing.

Application Information:
- **Water Volume:** Minimum 20 L per acre up to 40 L per acre (recommended).
- **Nozzles and Pressure:** Flat fan nozzles operated at a pressure of 30 to 40 psi (210 to 275 kPa) are recommended. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Boom height must be 60 cm or less above the crop or ground.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
pyraflufen	POST (foliar), with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14

Effects of Growing Conditions:

Control may be reduced if weeds are under stress (e.g. drought, heat or cold stress). Weeds hardened off by cold weather or drought may not be adequately controlled or suppressed.

Tank Mixes:

Herbicides:

Pre-seed and Pre-emergent:

- Glyphosate (180 to 360 g ae per acre) (no surfactant required)

Note: The above mixes are those listed on the *Blackhawk* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label. Consult the manufacturer.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT harvest for feed or forage for 30 days.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay for 30 days after application. DO NOT allow lactating dairy cows to graze for 7 days after application. Animals intended for meat should be withdrawn from treated fields 3 days before slaughter.
- **Storage:** Store in a cool, dry place away from direct sunlight. DO NOT Freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Danger – Poison


Warning – Contains the Allergen Soy

Skin and Eye Irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Blackhawk EVO

Herbicide Group
4 – dichlorprop, 2,4-D
14 – pyraflufen-ethyl

Company:
Nufarm Agriculture Inc

Formulation:
Blackhawk EVO **(PCP#34904):** 7.3 g/L pyraflufen-ethyl plus 284 g ae/L 2,4-D Ester plus 284 gae/L dichlorprop formulated as an emulsifiable concentrate.

- Container size – 2x10L, 120L, 480L

Crops and Staging:
Wheat (spring, durum, winter), barley, spring and winter rye, triticale, field corn, canary grass: Pre-seed or prior to crop emergence - maximum of 3 days after seeding

Oats: Apply up to a minimum of 7 days prior to planting

Fall burndown: Applications can be made up until soil freeze in the fall with no spring re-cropping restrictions

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds up to 5cm in height or width.

Weeds Controlled:

- Annual sowthistle
- Black medic*
- Broadleaf plantain
- Canada fleabane (including glyphosate-resistant biotypes)
- Cleavers (including glyphosate-resistant biotypes)
- Common ragweeds (including group 2 and glyphosate resistant biotypes)
- Dandelion
- Kochia (including group 2 and glyphosate resistant biotypes)
- Lamb's-quarters (including group 2 and 5 resistant biotypes)
- Narrow-leaved hawk's-beard (in fall, and at the 1-2 leaf stage in spring)
- Night flowering catchfly
- Powell's amaranth
- Redroot pigweed (including group 2 and 5 resistant biotypes)
- Shepherd's-purse
- Volunteer canola (all herbicide tolerant types)
- Wild buckwheat
- Wild mustard

*** Suppression only.**

Rate:
Blackhawk EVO: *250-375 mL/acre. 250 mL/acre is the standard rate, apply up to 375 mL/acre during stress conditions, for larger weeds, or for optimum wild buckwheat control.*
Note: Do not use Blackhawk EVO as a pre-emergence treatment and a postharvest/fall burn-down application on the same fields in the same year.

Product degradation may occur under alkaline conditions (pH>7.5). Use the spray preparation within 24 hours.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground***: Minimum 20-40 L/acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage. Flat fan nozzles are recommended. Do not apply with spray droplets smaller than ASAE medium droplets. Spray pressure between 30 to 40 psi (210 to 275 kPa) is recommended.
- **Screens:** Use a 50 mesh or larger screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D, Dichlorprop	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
Pyraflufen-ethyl	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of Blackhawk EVO by allowing maximum foliar uptake and contact activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and regrowth may occur.

Tank Mixes:

Tank mix partners applied at label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate (follow label rates)

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December

2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control. Avoid application when heavy rainfall is forecast.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Grazing:** Do not graze field corn for 75 days after application, or cereal grain crops until 30 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Re-cropping:** Grow all major crops the year after application.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Do not allow to freeze. Store in a cool, well-ventilated area and out of the reach of children and animals.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages for an explanation of the different habitats.

*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the intorduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Poison
Eye irritant
Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Boa IQ

Herbicide Group
1 - quizalofop
6 - bentazon

This product is a prepackaged tank mix of Boa *(see bentazon) and* Quiz *(see quizalofop). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above and select the most restrictive.*

Company:
AgraCity

Formulation:
The *Boa IQ* package contains the following components:
***Boa* (PCP#33011):** 480 g/L bentazon formulated as a solution.
- Container sizes - 2 x 9.1 L, 455 L

-plus-
***Quiz* (PCP#33481):** 96 g/L quizalofop formulated as an emulsifiable concentrate.
- Container sizes - 6 L, 150 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Dry bean	No stage restrictions	30
Faba bean	No stage restrictions	30
Field pea	No stage restrictions	65
Soybean	No stage restrictions	80

Weeds and Staging:
Broadleaf weeds controlled by *Boa* (see Bentazo) at 0.91 L per acre plus the grass weeds controlled by *Quiz* (see Quizalofop) at 0.3 L per acre.

Rates:
Boa: 0.91 L per acre
-plus-
Quiz: 0.3 L per acre.
Boa IQ requires the addition of *Assassin* or *Merge* adjuvant at 0.5 L per 100 L of spray solution, and which must be purchased separately. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Broadband

Herbicide Group
1- pinoxaden
2- florasulam

Company:
Syngenta Canada

Formulation:
***Broadband* (PCP#29138):** 92.7 g/L pinoxaden and 7.7 g/L florasulam formulated as an emulsifiable concentrate.
- Container sizes - 10.5 L, 84.2 L

***Adigor Adjuvant* (PCP#28151):** 11.3 L, 90.4 L

Crops and Staging:
Barley, spring wheat (NOT including durum): up to the emergence of the flag leaf.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
Apply *Broadband* at 263 mL per acre and *Adigor* adjuvant at 280 mL per acre.

Grass weeds - 1 to 6 leaves and prior to the emergence of the 4th tiller:
- Barnyard grass
- Foxtail (green, yellow)
- Proso millet
- Volunteer oats
- Volunteer canary seed
- Wild oats

Broadleaf weeds - 1 to 6 leaf stage:
- Annual smartweed (including lady's-thumb)
- Common chickweed
- Cleavers
- Hemp-nettle†
- Pigweed, redroot†
- Shepherd's-purse
- Sow-thistle (annual, perennial**)†
- Stinkweed
- Volunteer canola*
- Wild buckwheat
- Wild mustard

† **Suppression only.**
* **Not CLEARFIELD varieties.**
** **Applications made at advanced leaf stages will reduce product effectiveness.**

Maximum ONE APPLICATION per year of this or other products containing the active ingredient pinoxaden.
Maximum ONE APPLICATION of this or other products containing florasulam over a TWO YEAR TIME SPAN.

Application Information:
- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Low drift nozzles may require higher pressures for proper performance.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1
florasulam	POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:
DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result.

Temporary crop injury may occur with tank-mixes under extreme weather conditions or when the crop is suffering from stress due to inadequate or abnormally high moisture levels or extreme temperatures.

Tank Mixes:

Herbicides:

- *Curtail M* (0.6 L per acre)
- MCPA LV500 ester (280 mL per acre)

Fungicides:

- Propiconazole (*Tilt* only at label rates)

Fertilizers: None registered

Note: The above mixes are those listed on the *Broadband* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields within 12 hours.
- **Pre-harvest Interval:** Leave 60 days between treatment and harvest.
- **Grazing Restrictions:** DO NOT cut for livestock feed within 30 days or grazed by livestock within 7 days of treating the crop.
- **Re-cropping Interval:** No restrictions the year following treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in dry, heated storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	5	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

 Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Bromoxynil

Herbicide Group
6 - bromoxynil

Company:

Bayer (*Pardner*)
Interprovincial Cooperative Limited (*Brotex 240*, *Brotex 480, IPCO Brotex 4AT, CO-OP Brotex 4AT*)
ADAMA Canada (*Bromotril*)
WinField United Canada (*Starbuck*)
Albaugh (*Brox 240 EC*)
AgraCity (*MPOWER Buck*)

Formulation:

***Pardner* (PCP#18001), *MPOWER Buck* (PCP#33399):** 280 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container sizes: 2 x 8 L (*Pardner*), 8.1 L (*MPOWER Buck*)

***Bromotril* (PCP#28276), *Brox 240 EC* (PCP#32622), *Starbuck* (PCP#33919), & *Brotex 240* (PCP#28519):** 240 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container sizes - 2 x 9.7 L, 115 L (*Brotex 240*, *Brox 240 EC* and *Starbuck* only), 116.4 L (*Bromotril II* only), 500 L (*Brox 240 EC* only).

***Brotex 480* (PCP#31348) & *IPCO Brotex 4AT* (PCP#33554), *CO-OP Brotex 4AT* (PCP#33828):** 480 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 2 x 9.7 L

Crops, Staging and Rates:

***Pardner*:** 0.40 to 0.48 L per acre.

***Brotex 240, Brox 240 EC, Starbuck, & Bromotril*:** 0.49 to 0.57 L per acre.

***Brotex 480* & *Brotex 4AT* (Brands):** 0.24 to 0.28 L per acre.

See the following chart for registered crops and specific rates and stages. NR = Not Registered.

Crop	Stage	Rate (L per acre)				
		Pardner, MPOWER Buck	*Brotex 240*	*Bromotril*	*Brox 240/ Starbuck*	*Brotex 480/ Brotex 4AT*
Barley, oats, triticale, wheat (spring and durum**)	2 leaf stage to early flag	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Winter wheat	2 to 4 leaf stage (fall application) First growth to early flag leaf (spring application)	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Corn (field or sweet)	4 to 8 leaf	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Corn (field or sweet) with drop pipes	Beyond 8 leaf	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Canaryseed (seed production only)	3 to 5 leaf	0.40	0.49	0.49	0.49	0.24
Seedling alfalfa	2 to 6 trifoliate leaf stage	0.40	0.49	0.49	0.49	0.24
Established alfalfa (seed production only)	Up to 10 inches (25 cm); apply no more than twice in one growing season	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Fall rye	First growth to early flag leaf (spring application only)	0.40 to 0.48	0.49 to 0.57	0.49 to 0.57	0.49 to 0.57	0.24 to 0.28
Flax and solin (low linolenic acid flax)	2 to 4 inches (5 to 10 cm)	0.40	0.49	0.49	0.49	0.24
Forage millet and sorghum	4 leaf to 8 inches (20 cm)	0.40	0.49	NR	0.49	0.24
Industrial Hemp	2 to 4 leaf	NR	NR	NR	NR	0.24***

Crop	Stage	Rate (L per acre)				
		Pardner, MPOWER Buck	*Brotex 240*	*Bromotril*	*Brox 240/ Starbuck*	*Brotex 480/ Brotex 4AT*
Seedling grasses (seed production only): bromegrass, fescue (creeping red, meadow), orchard grass, reed canary grass, Russian wildrye, timothy, wheatgrass (crested, intermediate, slender, tall)	2 to 4 leaf (establishment year only)	0.40 to 0.48	0.49 to 0.57	NR	0.49 to 0.57	0.24 to 0.28
Pearl millet and sorghum (grain)*	4 leaf to 8 inches (20 cm)	0.40	NR	NR	NR	NR
Prior to direct-seeding cereal crops (mixed with glyphosate only)	Apply according to weed stage	0.40	0.49	NR	0.49	0.24
Pre-seed/pre-plant prior to seeding canola (mixed with glyphosate only)	Apply according to weed stage	0.40 to 0.51	0.61	NR	0.49 to 0.57	0.29

*** NOTE: Since application to grain pearl millet and sorghum is registered under User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance.** ***Users of this product on grain pearl millet and sorghum do so at their own risk.***
****** ***Pardner*** **only.**
***** Make one application of 0.24 L per acre or two applications of 0.12 L per acre 10 days apart within the staging window given.**

Weeds and Staging:

Weeds controlled at the 1 to 4 leaf stage:

- American nightshade
- Annual smartweed (green, pale, lady's-thumb)
- Bluebur
- Cocklebur
- Common ragweed
- Cow cockle*
- Kochia**
- Pigweed*†
- Russian thistle**
- Stinkweed*
- Volunteer canola*
- Wild mustard*

Weeds controlled at the 1 to 8 leaf stage:

- Buckwheat (tame, Tartary, wild)
- Common groundsel
- Lamb's-quarters

*** Controlled with high rate only.**
**** Apply before plants are 2 inches high.**
† Not controlled in seedling alfalfa.

Application Information:

- **Water Volume:**
  - ***Ground***:
    - ***Corn, millet, sorghum*** **-** 80 to 120 L per acre.
    - ***Seedling grasses*** **-** 60 L per acre.
    - ***Other crops*** **-** 40 L per acre.
  - ***Aerial (wheat and barley only):*** 8 to 16 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Avoid spraying if temperatures are greater than 25°C. Leaf scorching may occur in corn and flax if applied during or after adverse growing conditions, such as cool and wet or hot (greater than 27°C) and humid weather.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Crop	Tank Mixes
Spring wheat	2,4-D†, *Achieve Liquid*, MCPA
Winter wheat	2,4-D, *Achieve Liquid*, MCPA
Barley	2,4-D†, *Achieve Liquid*, MCPA†
Oats	MCPA
Fall rye, canaryseed	MCPA*
Flax	MCPA (amine, ester or K salt)
Seedling forage grasses***	MCPA
Corn	*Accent*♦ + surfactant (field corn only), *AAtrex*** (0.4 L/acre)
Prior to seeding: cereals, canola††	Glyphosate
Prior to seeding (*Koril* only)	*Aim, CleanStart*

*** The ester formulations are preferred but other formulations can be used.**
**** DO NOT add oil or surfactant to this mix. DO NOT use atrazine formulations that contain oil.**
***** *Brox 240 EC, Brotex 240, Brotex 480, Brotex 4AT, Starbuck* and *Pardner* only.**
† May be applied by air.
†† *Brotex 480, MPOWER Buck* and *Pardner* only. Not all glyphosate products/formulations are registered for this use. Refer to individual product labels.
♦ Since the use of this tank mix on corn is registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Users of this tank mix on corn do so at their own risk.

Fertilizers: None registered.
Insecticides: None registered.
Fungicides: None registered.
Note: The above mixes are those listed on the bromoxynil labels only.

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Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze treated wheat, barley, oats, forage millet, sorghum or seedling alfalfa crops or cut for feed within 30 days of application. DO NOT graze other treated crops or cut for hay prior to crop maturity. DO NOT graze or feed industrial hemp to livestock.
- **Re-cropping Interval:** No restrictions.
- **Aerial Application:** Registered for aerial application on wheat and barley. The use of low water volumes, 8 to 16 L per acre may result in less effective weed control than seen with ground application.
- **Storage:** *IPCO Brotex 480* must be stored at temperatures of 7°C or higher. Others may be stored at freezing temperatures and they will return to original state by warming to room temperature (20 to 22°C) and shaking thoroughly.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	1
Fixed wing aircraft**	20	5	55
Helicopter**	20	3	45

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**
**** Wheat and barley crops only.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:
All:

 Warning – Poison

***Brotex 240*, *Bromotril*, *Brotex 4AT*, *Starbuck*, *Brox 240*:**

 Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Bromoxynil / 2,4-D Ester

Herbicide Group
4 - 2,4-D
6 - bromoxynil

Company:
Bayer (*Thumper*)
ADAMA Canada (*Thrasher**)
Interprovincial Cooperative Limited *(Leader)*
Sharda CropChem *(Swipe)*

***Note:** This product is no longer manufactured but still remain in distribution. This product may be removed from future editions.*

Formulation:
***Thumper* (PCP#22659), *Swipe* (PCP#34380):** 280 g/L bromoxynil and 280 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 8 L

***Leader* (PCP#28853) & *Thrasher* (PCP#28779):** 225 g/L bromoxynil and 225 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 115 L* 120 L**

*** *Leader* only**
**** *Thrasher* only**

Crops and Staging:
Spring wheat (including durum) and barley at the 4 leaf to early flag leaf stage.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
Weeds controlled at the 1 to 4 leaf stage:
- American nightshade
- Ball mustard
- Bluebur
- Cocklebur
- Common ragweed
- Cow cockle
- Flixweed
- Jimsonweed
- Night-flowering catchfly
- Redroot pigweed
- Shepherd's-purse
- Smartweed (green, lady's-thumb, pale)
- Volunteer canola
- Volunteer sunflower

Weeds controlled at the 1 to 8 leaf stage:
- Buckwheat (tame*, Tartary, wild)
- Common groundsel
- Lamb's-quarters
- Stinkweed
- Wild mustard

*** up to 4 leaf stage with *Approve***

Weeds controlled from 1 to 12 leaf (max. 2 inches tall):
- Kochia
- Russian thistle

Rates:
***Thumper, Swipe*:** 0.4 L per acre
***Leader*, *Thrasher*:** 0.5 L per acre

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
  - ***Aerial:*** 12 to 16 L per acre. Use the higher volume when there is a heavy crop canopy, or when the majority of weeds are cow cockle, smartweed, or pigweed.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional 80° or 110° flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.
- **Screens:** All strainer and nozzle screens must be 50 mesh or coarser.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6
2,4-D	POST (foliar)	Synthetic Auxin	Symplast	Broadleaf only	4

Effects of Growing Conditions:

Less than acceptable weed control may be expected if weeds are under stress because of excessive moisture, drought, or cool weather.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In wheat (spring, durum) and barley*:**
  - *Liquid Achieve*
- ***In wheat (spring, durum, winter):***
  - *Varro**
- ***In wheat (spring, durum) only*:**
  - *Clodinafop 240 EC*[Δ]

* ***Thumper and Swipe*** **only.**

[Δ] **Manufacturers may only support specific mixes. Contact the manufacturer for more information.**

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the Bromoxynil/2,4-D Ester labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 24 hours.
- **Grazing Restrictions:** DO NOT graze or cut for livestock feed within 30 days of application. Withdraw meat animals 3 days before slaughter.
- **Pre-harvest Interval:** DO NOT harvest within 30 days of application.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** May be applied by air.
- **Storage:** May be frozen. Shake well before using after being frozen.

- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	1
Fixed wing aircraft	20	5	55
Helicopter	20	3	45

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy. Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method C' in the introduction.

Hazard Rating:
All Products:


Warning – Poison

Thumper and Swipe:


Caution – Skin and Eye Irritant

Leader* and *Thrasher:


Warning – Skin and Eye Irritant


Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Bromoxynil + Carfentrazone-ethyl

Herbicide Group
6 – bromoxynil
14 – carfentrazone-ethyl

This product is a prepackaged tank mix of bromxynil and carfentrazone
Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
ADAMA (*Emphasis*)
Agracity (*Revenge B*)
Interprovincial Cooperatives (*IPCO/COOP Octagon*)

Formulation:
The Bromoxynil + Carfentrazone packages contain two components each:

***Emphasis A* (PCP#33987 – *Emphasis*), *Revenge* (PCP#33716 – *Revenge B*), *IPCO C-Zone* (PCP#33580 – *IPCO/COOP Octagon*):** 240 g/L carfentrazone-ethyl formulated as an emulsifiable concentrate.

- Container sizes - 2 x 600 mL (*Conquer, Emphasis, Revenge B*), 2.4 L (*Octagon*)

-plus one of-

Bromotril 240EC (PCP#28276 – *Emphasis*): 240 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 2 x 9.7 L

-or-

***Buck* (PCP#33399 - *Revenge B*):** 280 g/L formulated as an emulsifiable concentrate.

- Container size - 2 x 8.1 L

-or-

***IPCO/COOP Brotex 4AT* (PCP#33554/33828 - *IPCO/COOP Octagon*):** 480 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 2 x 9.7 L

Crops and Staging:
Apply prior to the seeding of canola

Weeds and Staging:
Weeds controlled by carfentrazone and bromoxynil plus:
- Volunteer canola – fully expanded cotyledon to 4 leaf stage.

Rates:
Carfentrazone: 15 mL per acre.
-plus either-
Bromotril 240EC: 240 mL per acre.
-or-
MPOWER Buck: 202 mL per acre.
-or-
IPCO/COOP Brotex 4AT: 118 mL per acre.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate (label rates)

See component products for more information on restrictions, applications details and handling. Unless indicated differently above use most limiting restrictions across all components for the mix.

Bromoxynil / MCPA Ester

Herbicide Group
4 - MCPA
6 - bromoxynil

Company:
Bayer (*Buctril M*)
Nufarm Agriculture (*Mextrol 450*)*
ADAMA Canada (*Badge*)
AgraCity (*Canuck*)
Albaugh (*Brox M, Double Trouble*)
Interprovincial Cooperative Limited (*Logic M*)
Sharda CropChem *(Brilliant)*

* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:
Buctril M **(PCP#18022),** ***Canuck*** **(PCP#34173),** ***Brilliant*** **(PCP#34383):** 280 g/L bromoxynil and 280 g/L of MCPA Ester formulated as an emulsifiable concentrate.
- Container sizes:
  - ***Buctril M:*** 8 L
  - ***Canuck:*** 2 x 8 L, 120 L, 384 L

Mextrol 450 **(PCP#26999),** ***Badge*** **(PCP#16164),** ***Logic M*** **(PCP#28109) &** ***Brox M*** **and** ***Double Trouble*** **(PCP#32472),** ***Double Trouble*** **(PCP#33787):** 225 g/L bromoxynil and 225 g/L of MCPA Ester formulated as an emulsifiable concentrate.
- Container sizes:
  - ***Logic M:*** 10 L, 115 L
  - ***Badge:*** 10 L, 120 L
  - ***Mextrol 450:*** 100 L, 500 L
  - ***Brox M*** **and** ***Double Trouble:*** 2 x 9.7 L, 115 L, 500 L

Crops and Staging:

Field Crops:

- ***All Products*:**

Crop	Stage
Barley, oats, spring wheat (including durum)	2 leaf to early flag
Winter wheat	2 to 4 leaf stage in the fall or after growth resumes up to early flag leaf
Fall rye	When growth commences in spring to early flag leaf
Canaryseed (*Logic M* only - including hairless varieties for human consumption)	3 to 5 leaf stage
Flax and solin (low linolenic acid flax)	2 inches (5 cm) to early bud stage. Best tolerance occurs when flax is 2 to 4 inches (5 to 10 cm) tall.
Corn	4 to 6 leaf stage

Seedling forage grasses: 2 to 4 leaf stage.

- ***All Products*:**
  - Bromegrass
  - Fescue (creeping red, meadow)
  - Reed canarygrass
  - Russian wild-rye
  - Timothy
  - Wheatgrass (crested, intermediate, slender, tall)
- ***Buctril M, Logic M, Brilliant and Badge only*:**
  - Fescue (tall)
  - Meadow bromegrass
  - Meadow foxtail
  - Orchard grass
  - Wheatgrass (streambank)

Established Forage Grasses:

- Timothy (seed or hay) - prior to emergence of the flag leaf.

Perennial Cereal Rye* (*Buctril M, Brilliant* and *Canuck* only):

- ***Established stands*:** 2 leaf up to early flag leaf stage.
- ***Establishment year*:** 2 to 4 leaf stage in the fall, or from the time growth commences to early flag leaf stage in the spring.

**** Since the use of this tank mix on perennial cereal rye is registered under the User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance. Users of this tank mix on perennial cereal rye do so at their own risk.***

Weeds and Staging:

Weeds up to 4 leaf stage:

- American nightshade
- Annual smartweeds (green, lady's-thumb, pale)
- Bluebur
- Ball mustard
- Cocklebur
- Cow cockle
- Flixweed
- Jimsonweed
- Kochia**
- Night-flowering catchfly
- Redroot pigweed*
- Russian thistle**
- Scentless chamomile***
- Shepherd's-purse
- Volunteer canola
- Volunteer sunflower

*** May not be controlled in flax.**
**** Control before plants are 2 inches tall.**
***** Spring seedlings only.**

Weeds up to 6 leaf stage:

- Wild tomato (*Buctril M, Logic M* & *Badge* only)

Weeds up to 8 leaf stage:

- Buckwheat (tame, tartary, wild)
- Common groundsel
- Common ragweed
- Lamb's-quarters
- Mustard (wild, wormseed)
- Stinkweed

Weeds suppressed in winter wheat from the 2 to 12 leaf stage:

- Prickly lettuce (All except *Logic M* and *Buck M*)

Weeds where top growth is controlled:

- Canada thistle
- Perennial sow-thistle

Rate:

***Buctril M, Brilliant, Canuck*:** 0.4 L per acre.
***Mextrol 450, Badge, Brox M, Double Trouble* & *Logic M*:** 0.5 L per acre.

Application Information:

- **Water Volume:**
  - ***Corn*:** 80 to 120 L per acre.
  - ***Flax, Solin*:** 20 to 40 L per acre.
  - ***Cereals*:** 20 to 40 L per acre.
  - ***Seedling forage grasses*:** 60 L per acre.
  - ***Established timothy*:** 60 L per acre.
  - ***Perennial Cereal Rye*:** Not less than 20 L per acre.
  - ***Aerial*:** 8 to 16 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets

Refer to specific labels for recommended water volumes.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6
MCPA	POST (foliar)	Synthetic Auxin	Symplast	Broadleaf only	4

Effects of Growing Conditions:

Best weed control when humidity is high at the time of spraying and for the following day or two. Prolonged cool conditions may result in reduced weed control. Spraying during early morning may increase the risk of flax injury.

Avoid spraying in temperatures greater than 25°C.

DO NOT apply to flax, canaryseed or corn if daytime temperatures exceed 27°C within 48 hours before or after application.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicide Tank Mix Table:

Crop & Tank Mixes	*Badge*	*Buctril M & Brilliant*	*Logic M*	*Mextrol 450*	*Canuck*	*Brox M & Double Trouble*
Flax (including solin):						
Poast Ultra + *Merge* adjuvant	✓	✓	✓	✓	✓	✓
Clethodim + adjuvant	✓*	✓**	✓	✓*	✓	✓**
Spring wheat (including durum) and barley:						
Liquid Achieve	✓	✓	✓	✓	✓	✓
Ally	✓	✓	✓	✓	✓	✓
MCPA (amine, ester & K)	✓	✓	✓	✓	✓	✓
Refine SG (4 g/acre)#		✓	✓		✓	✓
Puma Advance		✓				
Puma Advance + *Refine SG* (rates above)		✓				
Spring wheat (including durum):						
Varro		✓				
Spring wheat only (NOT including durum):						
Axial	✓	✓				
Spring wheat only (NOT including durum) and barley:						
Axial		✓				
Winter wheat:						
Refine SG (4 g/acre)#			✓			✓

Crop & Tank Mixes	*Badge*	*Buctril M & Brilliant*	*Logic M*	*Mextrol 450*	*Canuck*	*Brox M & Double Trouble*
Oats:						
MCPA (amine, ester & K)	✓	✓	✓	✓	✓	✓
Corn:						
AAtrex	✓	✓	✓	✓	✓	✓

*** *Select* only**
**** *Select* and *Centurion* only.**
 # Requires the addition of a surfactant as per *Refine SG*.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the bromoxynil/MCPA Ester labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour of application may reduce weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 24 hours, or 15 days for corn to be harvested by hand.
- **Grazing Restrictions:** DO NOT graze treated grain or established timothy crops or cut for feed within 30 days of application. DO NOT graze meadow foxtail in the year of treatment. DO NOT graze other treated forage grasses within 56 days of treatment.
- **Pre-harvest Interval:** DO NOT harvest perennial cereal rye within 30 days of application, or flax or solin within 60 days of application.
- **Re-cropping Interval:** No re-cropping restrictions the year after treatment.
- **Aerial Application:** May be applied by air to wheat, barley, and oats only. Use higher water volume (see 'Application Information') when the majority of weeds are cow cockle, smartweed, hemp-nettle, pigweed, and Canada thistle.
- **Storage:** May be frozen. Shake the container well when thawed to reconstitute components before use.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres †) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground only*	All	1	1	4
Fixed wing aircraft	Oats	15	2	60
	Barley, wheat	20	5	60
	Rye	1	0	60
Helicopter	Oats	15	1	50
	Barley, wheat	20	3	50
	Rye	1	0	50

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:

All Products:

 Warning – Poison

 Warning – Potential Skin Sensitizer

 Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Bromoxynil + MCPA + Fluroxypyr

Herbicide Group
4 - fluroxypyr, MCPA
6 - bromoxynil

Company:

Nufarm Agriculture (*Enforcer M*)
ADAMA Canada (*ForceFighter M*)
AgraCity (*Foxxy Canuck*)
Interprovincial Cooperatives *(IPCO Emit, CO-OP Emit)*
Sharda CropChem *(Pierce)*

Formulation:

***Enforcer M* (PCP#30691), *IPCO Emit* (PCP# 34600), *CO-OP Emit* (PCP#34614), *Pierce* (PCP#34328):** 80 g/L fluroxypyr, 200 g/L bromoxynil and 200 g/L MCPA Ester co-formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10 L, 120 L or 480 L

-or-

The *ForceFighter M* package contains the following components:

***Badge* (PCP#16164):** 225 g/L bromoxynil and 225 g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10 L, 2 x 120 L

***Fluroxypyr 180 EC* (PCP#30815):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 9.6 L, 115.2 L

-or-

The *Foxxy Canuck* package contains the following components:

***Canuck* (PCP#34173):** 280g/L bromoxynil and 280 g/L MCPA ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 8 L, 384 L

***Foxxy* (PCP#32952):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 9.6 L, 230 L

Crops and Staging:

Wheat (durum, spring) oats* and barley: 2 leaf stage until the flag leaf is fully emerged.
Winter wheat:** in spring once tillered until the flag leaf is fully emerged.
Canaryseed* (including for human consumption): from the 3 to 5 leaf stage.
Forage Grasses for seed production only*†:

- ***Seedlings:*** Apply from the 3 to 6 leaf stage.
- ***Established:*** Up to the first node detectable in the stem.
  - Bromegrass (meadow, smooth, Hybrid)

† NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

* ***Enforcer M, IPCO Emit* and *CO-OP Emit* only.**

** ***Enforcer M, IPCO Emit* and *CO-OP Emit, Pierce* only.**

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Apply to emerged weeds up to the 6 leaf stage unless otherwise indicated.

***Enforcer M, IPCO Emit* and *CO-OP Emit, Pierce* only applied at the 0.25 L per acre rate will control the following weeds (see "Rates:" below):**

- Kochia (up to 5 cm tall)
- Lamb's-quarters
- Wild buckwheat*
- Wild mustard

***Enforcer M, IPCO Emit, CO-OP Emit, Pierce* (at the high rate), *ForceFighter M* or *Foxxy Canuck* will control the following weeds (see "Rates:" below):**

Weeds listed above plus:

- American nightshade†
- Bluebur†
- Buckwheat (tame, Tartary, wild)
- Canada thistle (top growth control only)
- Chickweed
- Cleavers (up to 6 whorls)
- Cocklebur†
- Common groundsel
- Common ragweed
- Cow cockle†
- Flixweed†
- Hemp-nettle
- Mustard (ball†, wild, wormseed)
- Night-flowering catchfly†
- Perennial sow-thistle (top growth control only)
- Redroot pigweed*
- Russian thistle (< 5 cm tall)†
- Scentless chamomile†
- Shepherd's-purse†
- Smartweed† (green, lady's-thumb, pale)
- Stinkweed
- Stork's-bill*
- Velvetleaf†
- Volunteer canola/rapeseed†
- Volunteer flax
- Volunteer sunflower†

*** Suppression only.**

† Up to 4 leaf stage only.

Rates:

***Enforcer M, IPCO Emit, CO-OP Emit, Pierce*:** 0.25 to 0.51 L per acre

-or-

***ForceFighter M*:**

- ***Badge*:** 0.5 L per acre
- ***Fluroxypyr 180 EC*:** 0.24 L per acre

-or-

Foxxy Canuck:

- ***Canuck:*** 0.4 L per acre
- ***Foxxy:*** 0.24 L per acre

Application Information:

- **Water Volume:**
  - ***Enforcer M, IPCO Emit, CO-OP Emit, Pierce:*** Minimum 20 to 40 L per acre; Use the higher volume when there is a heavy crop canopy or weeds are at an advanced stage.
  - ***ForceFighter M* and *Foxxy Canuck:*** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA, fluroxypyr	POST (foliar)	Synthetic auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Optimum activity is experienced between 12 to 24°C when weeds are actively growing. Weeds may not be actively growing and as a result reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after an application may reduce crop tolerance and weed control efficacy.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides (*Enforcer M, IPCO Emit, CO-OP Emit, Pierce*):

- ***In wheat (durum, spring, winter), barley and oats:***
  - *Nufarm Boost* (see thifensufuron/tribenuron) at 2.7 g/acre.
- ***In wheat (durum, spring, winter) and barley*:**
  - Tralkoxydim (*Liquid Achieve* and *Nufarm Tralkoxydim* only)
- ***In wheat (spring and durum only) and barley*:**
  - Fenoxaprop (*Puma Advance* only)
- ***In spring wheat (including durum) only*:**
  - Clodinafop 240 EC (*Signal* only)
  - *Simplicity*
  - *Varro*

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the Bromoxynil+MCPA+Fluroxypyr labels only.
Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze or cut for livestock feed within 30 days of application. Withdraw meat animals from treated feed 3 days before slaughter.
- **Pre-harvest Interval:** DO NOT harvest within 60 days of application.
- **Re-cropping Interval:** Barley, canola, flax, forage grasses, lentil, mustard, oats, pea, rye and wheat can be seeded the following year or fields can be fallowed.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a ventilated room above freezing. If frozen, allow container to warm and shake well before using.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only* (*Enforcer M, IPCO Emit, CO-OP Emit, Pierce* only)	1	1	1
Ground only* (*ForceFigther* and *Foxxy Canuck*)	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

The manufacturer provides no recommendations on how to clean equipment used to apply this product. As a petroleum based emulsifiable concentrate, 'Method B' in the general section on sprayer cleaning in the introduction may be the most effective.

Hazard Rating:

Enforcer M, IPCO Emit, CO-OP Emit, Pierce:

 Warning – Poison

 Caution – Skin and Eye Irritant, Potential Skin Sensitizer

ForceFighter:

 Warning – Poison

Foxxy Canuck:

 Danger – Poison

Refer to the Introduction for an explanation of the symbols.

Callisto 480 SC*

Herbicide Group 27 - mesotrione

** for use in Manitoba only*

Company:

Syngenta Canada (PCP#27833)

Formulations:

480 g/L of mesotrione formulated as a suspension

- Container size – 4 x 2.4 L

Crops, Rates and Staging:

Field corn – 2 leaf up to and including 6 leaf

Weeds, Rates and Staging:

Apply Callisto at 63 mL per acre with Aatrex Liquid 480 at minimum 250 mL per acre + Agral 90 at 2 L per 1000 L of solution.

Note: DO NOT make a foliar post-emergent application of any organophosphate or carbamate insecticide within 7 days before or 7 days after a Callisto 480 SC application or severe injury may occur to corn. **DO NOT** cultivate corn within 7 days before or after a post-emergent Callisto 480 SC application.

Weeds Controlled:

- Volunteer canola - cotyledon to 4 leaf

Application Information:

- **Water Volume:**
  - ***Ground:*** minimum 40 L per acre
- **Nozzles and Pressure:** Do not apply with spray droplets smaller than ***ASAE S572.1*** droplets medium classification.
- **Screens:** 50 mesh or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
mesotrione	POST (foliar)	HPPD Pigment Inhibitor	Towards regions of growth (Symplast)	Broadleaf only	27

Effects of Growing Conditions:

Under unfavorable conditions such as drought, heat, flooding, prolonged cool temperatures or insufficient fertility, adequate control may not be achieved and re-growth may occur.

Tank Mixes:

Callisto must be applied with Aatrex 480 at minimum 250 mL per acre + Agral 90 at 2L per 1000 L of solution.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the Introduction.

Restrictions:

- **Rainfall:** 3 hours
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** grain corn 100 days, silage corn 45 days.
- **Re-cropping:** Canola, spring wheat, oats, barley, field corn (grain or silage), soybean – 11 months if total precipitation during the (April to September) year of application is equal or greater than the 30 year average for local location. For all other crops perform a field bioassay.
- **Aerial Application:** DO NOT apply air.
- **Storage:** May be frozen. Store this product away from food or feed. Store in a cool, dry place.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Field sprayer	1		4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
† **Distance is measured from the downwind edge of the boom to sensitive areas.**

Sprayer Cleaning:

Use a combination of 'Method A' and 'Method B' in the general section on sprayer cleaning in the Introduction.

Hazard Rating:

Caution eye irritant.
Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Carfentrazone

Herbicide Group 14 - carfentrazone-ethyl

Company:

FMC Corporation (*Aim EC* – PCP#28573)
AgraCity (*Revenge* – PCP#33716)
Albaugh (*InStep* – PCP#33956)
Interprovincial Cooperatives (*IPCO C-Zone* – PCP#33580)
WinField United Canada (*Foremost* – PCP#34275)
Viking (*Viking Carfentrazone* – PCP# 34736)

Formulations:

240 g/L carfentrazone-ethyl formulated as an emulsifiable concentrate.

- Container sizes:
  - *Aim EC* - 8 x 1.2 L, 4 x 4.8 L
  - *Revenge, Viking Carfentrazone* - 2 x 4.8 L
  - *InStep* - 4 x 2.4 L
  - *IPCO C-Zone* - 2.4 L (sold only as a component of *CO-OP IPCO Octagon*)
  - *Foremost* - 4 x 2.4 L

Crops, Rates and Staging:

Pre-Seeding:

Use a non-ionic surfactant at 0.25 to 0.35 L per 100 L of spray solution or use *Merge* at 1 L per 100 L of spray solution when used alone or if mixed with glyphoste at less than180 g ae per acre. Destination MSO at 1 L per 100 L spray solution, Journey or Destinaire HSOC at 0.5 L per 100 L spray solution are only registered for use with *AIM EC* only. See label for specific mixes.

From 14.8 to 29.5 mL per acre prior to the seeding of:

- Sorghum

From 14.6 to 47.3 mL per acre prior to the seeding of:

- Barley
- Buckwheat
- Canola (rapeseed)
- Chickpea
- Corn (field and sweet)
- Dry bean
- Faba bean
- Field pea
- Flax
- Hops (hooded sprayer only)†
- Lentil
- Millet (pearl and proso)
- Mustard
- Oats
- Potatoes†
- Rye
- Safflower
- Soybean
- Sunflower
- Triticale
- Wheat (including spring, winter and durum)

† ***Aim EC* only**

Harvest aid treatment*:

Use *Agral 90* or *Ag-Surf* at 0.25 L per 100 L of spray solution or use *Merge* at 1 L per 100 L of spray solution when used alone.

Note: As of January 1, 2022 www.keepingitclean.ca indicates that grain from crops treated with this product prior to harvest may have market access concerns. Please see introduction for more information AND *consult potential grain buyers before using this product*.

Crop	Rate (mL per acre)
Barley, oats, wheat, millet, dry bean, chickpea, faba bean, field pea, soybean, triticale	29.5 to 47.3
Sorghum	29.5
Potato**	94† to 142

*** DO NOT apply as a tankmix with glyphosate to crops if grown for seed purpose.**
**** A second application of 94 to 142 mL per acre may be applied in potato.**

Weeds, Rates and Staging:

Apply to listed weeds up to 10 cm in height unless otherwise indicated:

Weeds	Rate (mL per acre)
Eastern black nightshade (up to 5 cm), lamb's-quarters (up to 7.5 cm), redroot pigweed, waterhemp (up to 5 cm), velvetleaf	14.8
Above weeds plus: Flixweed**, hairy nightshade, lamb's-quarters, pigweed (prostrate, smooth, tumble, waterhemp), Pennsylvania smartweed (seedling), purslane, round-leaved mallow, stinkweed**, tansy mustard	23.5
Above weeds plus: Cleavers*, cocklebur, eastern black nightshade, kochia, jimsonweed, Russian thistle (up to 5 cm)**, shepherd's-purse*, volunteer canola (all varieties)	29.5
Above weeds plus: Burclover, corn spurry, prickly lettuce, venice mallow (up to 5 cm)	47.3

*** *Aim*, *IPCO C-Zone* and *Foremost* only.**
**** *Aim, IPCO C-Zone*, *Revenge* and *Foremost* only.**

Application Information:

- **Water Volume:** Use a minimum of 40 L per acre. Higher spray volumes is required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Maximum 35 psi (210 kPa) if using conventional nozzles. Low drift nozzles may require higher pressure for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14

Effects of Growing Conditions:

Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity. Under warm moist conditions, herbicide symptoms may be accelerated. While under very dry conditions, the expression of herbicide symptoms may be reduced as weeds hardened off by drought are less susceptible.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- *Authority 480*
- *Authority Supreme*
- Glyphosate (180 to 360 g ae per acre)
- 2,4-D Ester (134 to 214 g ae per acre) (see 2,4-D for crop options – prior to seeding or after seeding and prior to crop emergence)
- Bromoxynil†† (57 g active ingredient per acre – canola, wheat, barley, oats)
- Bromoxynil + glyphosate†† (rates and crops above)
- *Command 360 ME* + glyphosate† (prior to seeding canola – all varieties)
- *Express SG* + glyphosate† (fallow or a minimum of 24 hours prior to seeding barley, oats, wheat (spring, winter, durum), dry bean, faba bean, field pea, lupin and soybean)
- *Express FX* + glyphosate† (fallow or prior to seeding wheat [spring, durum and winter], barley and oats)
- *Express Pro* + glyphosate† (fallow and prior to seeding wheat [spring, durum and winter] oats and barley)

Harvest aid treatment:

- ***Barley, chickpea, dry beans, faba bean, field pea, millet, oats, sorghum, and wheat:***
  - Glyphosate* (360 g ae per acre)
- ***Potato only:*** Reglone** (0.51 to 0.9 L per acre)

*** IPA or K salt only.**

**** For potato desiccation – should a second desiccation application be required after a first application of *Aim EC* plus *Reglone* tank mix, use *Aim EC* at 94 to 142 mL per acre alone or as a tank mix with *Reglone* at 0.51 L per acre.**

† *Aim* only.

†† *Aim, Foremost and Revenge* only.

Note: The above mixes are those listed on the Carfentrazone labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour after application may reduce activity. Heavy rainfall shortly after application may reduce activity.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 7 days between application and harvest for potatoes and 3 days for all other registered crops for harvest aid uses.
- **Grazing Restrictions:** No restrictions.
- **Re-cropping Interval:** There are no rotational restrictions on crops registered for pre-seed use. All other crops may be planted 12 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place and avoid excess heat.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat
Ground only*	5

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches above the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat. DO NOT apply in areas where surface water from the treated area can run off into aquatic habitats.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Carfentrazone + 2,4-D Ester

Herbicide Group
4 - 2,4-D
14 - carfentrazone

This product is the equivalent of a prepackaged tank mix of Carfentrazone and 2,4-D 700 Ester. Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

AgraCity (*Revenge Pro*)
Interprovincial Cooperative Ltd. (*COOP/IPCO Convex*)

Formulation:

The Carfentrazone + 2,4-D ester package contains the following components:
***Revenge* (PCP#33716 - *Revenge Pro*), *IPCO C-Zone* (PCP#33580 - *COOP/IPCO Convex*):** 240 g/L carfentrazone formulated as a emulsifiable concentrate.

- Container size - 1.2 L

-plus-

***MPOWER 2,4-D Ester 700 II* (PCP#34808 - *Revenge Pro*), *IPCO/COOP 2,4-D Ester 700* (PCP#27819/32882 - *IPCO/COOP Convex*):** 660 g ae/L 2,4-D formulated as an emulsifiable concentrate.

- Container size - 2 x 8.69 L

Crops and Staging:

Apply to the soil surface up to 1 day prior to seeding spring wheat, durum wheat*, winter wheat*, barley, rye, or in chemfallow.
* ***IPCO/COOP Convex* only.**

Weeds and Staging:

Apply 15 mL per acre of *IPCO C-Zone* plus 217 mL per acre of 2,4-D Ester 700 plus glyphosate (sold separately) at 180 to 360 g ae per acre controls the weeds controlled by the component products (glyphosate at 180 g ae per acre) plus:

- Chickweed
- Horsetail
- Jimsonweed
- Kochia (all biotypes)
- Smartweed (Pennsylvania)
- Tansy mustard

Tank Mixes:

Herbicides: Glyphosate (IPA, DMA, K+)
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Casoron

Herbicide Group 20 - dichlobenil

Company:
UPL AgroSolutions Canada (PCP#12533)

Formulation:
4 percent dichlobenil formulated as a granular.
- Container size - 22.7 kg

Crops:
Poplar plantations
Shelterbelts consisting of the following species:
- Ash
- Barberry
- Birch (cutleaf-weeping)
- Boxwood Caragana
- Cedar (White, Eastern Red)
- Crabapple
- Elm
- Euonymus (Burning bush)
- Forsythia
- Honeysuckle
- Juniper
- Lilac
- Linden
- Locust
- Maple
- Mock orange
- Poplar
- Rose
- Spirea
- Willow

NOTE: DO NOT apply to shelterbelts with mugo pine, firs, hemlock, holly, spruce or other shallow rooted species or injury may result. DO NOT apply in or around greenhouses. DO NOT use on light sandy soils.

Weeds and Staging:
Apply in early spring or late fall prior to annual weed emergence, or after cultivation has removed existing weeds.
- Annual bluegrass
- Artemisia (absinthe,* wormwood, sage)
- Bindweed*
- Canada thistle*
- Chickweed
- Dandelion*
- Foxtail (green and yellow)
- Groundsel
- Horsetail
- Knotweed
- Kochia
- Lamb's-quarters
- Loosestrife
- Mustard
- Nutsedge*
- Pigweed
- Plantain
- Purslane
- Quack grass*
- Sheep sorrel*
- Shepherd's-purse
- Smartweed
- Sow-thistle
- Spurge
- Vetch*
- Wild buckwheat*

*** Controlled with fall applications at the higher rates.**

Rates:
45 to 70 kg per acre. At the low rate, a 15 kg bag will treat a 4 yd by 407 yd (4 m by 340 m) strip of shelterbelt. At the high rate, a 15 kg bag will treat a 4 yd by 256 yd (4 m by 214 m) strip of shelterbelt. If application is followed by 0.5 to 1.0 inches (1.3 to 2.5 cm) of irrigation, the lower rates are recommended.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dichobenil	PRE (soil active)	Cellulose synthesis inhibitor	Upward (Apoplast)	Broadleaf & grass	20

Effects of Growing Conditions:
DO NOT apply during periods of high soil temperatures (more than 15°C).

Tank Mixes:
None registered.

Restrictions:

- **Rainfall:** Does not reduce activity.
- **Restricted Entry Interval:** DO NOT enter treated areas for at least 24 hours.
- **Grazing Restrictions:** DO NOT graze in treated area.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. DO NOT freeze.
- **Buffer Zones:** Site characteristics and conditions that may lead to runoff include, but are not limited to, heavy rainfall, moderate to steep slope, bare soil, poorly draining soil (e.g., soils that are compacted, fine textured or low in organic matter). Avoid application of this product when heavy rain is forecast.

Equipment Cleaning:

Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:

No specific rating. Keep out of reach of children. Harmful if swallowed. Avoid skin or eye contact.

Certitude

Herbicide Group
6 - bromoxynil
27 - topramezone

Company:

BASF Canada

Formulation:

The *Certitude* package contains the following components:

***Certitude A* (PCP#33908) or Component A:** 336 g/L topramezone formulated as a suspension.

- Container size - 291 mL

-plus-

***Certitude B* (PCP#33893):** 235 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 9.71 L

-plus-

***Merge* (PCP#24702):** 50% surfactant blend plus 50% solvent formulated as a surfactant.

- Container size - 8.1 L

Crops and Staging:

Canola: Pre-seed

Weeds and Staging:

Weeds controlled:

- Kochia* (up to 10 cm in height)
- Volunteer canola* (cotyledon to 6-leaf)

*** Controls all herbicide resistant biotypes/varieties.**

Rate:

Certitude A: 7 mL per acre

-plus-

Certitude B: 243 mL per acre

-plus-

Merge: 202 mL per acre

Note: Maximum of ONE APPLICATION of *Certitude* per season.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
    Note: 40 L per acre is recommended for thorough coverage and optimal efficacy on herbicide resistant kochia.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Low drift nozzles may require higher pressures for proper performance. DO NOT apply in periods of dead calm.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
topramezone	POST (foliar)	HPPD Pigment Inhibitor	Little (apoplast) some uptake by roots	Broadleaf & grass	27
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane Disrupter	Little (apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled. DO NOT apply in periods of dead calm. DO NOT apply if temperatures of 5°C or lower are forecast within 3 days of application.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate (180 to 360 g ae per acre)

Fungicides: None registered.

Insecticides: None registered

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour will reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for at least 24 hours.
- **Pre-harvest Interval:** There is no required pre-harvest interval between a pre-seed application and harvest.
- **Grazing Restrictions:** DO NOT graze or feed other portions of the treated canola to livestock.
- **Re-cropping Interval:** Winter wheat can be seeded 4 months after application. Alfalfa, barley, canola, field corn, field pea, lentils, navy (white) bean, potato, soybean, spring wheat (including durum) can be seeded 1 year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. *Certitude B* formulations will solidify at temperatures below -20°C, but it will be usable again at temperatures above 0°C.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A,' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details. Refer to the tank mix partner's product label for any additional cleaning instructions.

Hazard Rating:

 Danger – Poison

 Danger – Corrosive to Eyes and Skin

 Warning – Eye Irritant

 Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Cirpreme*/Cirpreme XC

Herbicide Group
2 - florasulam
4 - halauxifen, clopyralid

Company:
Corteva Agriscience

Formulation:
The *Cirpreme** package contains the following components:
***Paradigm* (PCP#31304):** 20% halauxifen and 20% florasulam formulated as a water dispersible granule
- Container size - 1 x 800 g

***Lontrel 360* (PCP#23545):** 360 g/L clopyralid formulated as a solution.
- Container size - 1 x 6.7 L

The *Cirpreme XC* package contains:
Cirpreme A (PCP#34180): 20% halauxifen and 20% florasulam formulated as a water dispersible granule
- Container size - 1 x 800 g

Lontrel XC (PCP#32795): 600 g/L clopyralid formulated as a solution.
- Container size - 1 x 4.1 L

* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Crops and Staging:
Spring wheat (including durum), winter wheat and barley: 3 leaf to just prior to emergence of the flag leaf

Weeds and Staging:
Apply to emerged, young and actively growing weeds that are less than 8 leaf stage unless otherwise stated.
The use of MCPA 600 Ester is recommended at 189 to 283 mL per acre.

Weeds controlled - *Cirpreme* + MCPA 600 Ester at 283 mL per acre:
- Alfalfa, volunteer (up to 25 cm in height)
- American dragonhead (up to bud stage or 15 cm)
- Annual sunflower
- Barnyard grass (up to 5 leaf, 2 tiller)
- Burdock
- Canada fleabane (up to 15 cm in height)
- Chickweed
- Cleavers (1 to 9 whorl)
- Cocklebur
- Cow cockle
- Dandelion (seedlings, overwintered rosettes & mature plants)
- Field horsetail (top growth)
- Flixweed (up to 8 leaf and 8 cm in height)
- Hemp-nettle
- Henbit (up to 8 leaf or 15 cm)
- Lamb's-quarters
- Mustard (wild, ball*)
- Narrow-leaved hawk's-beard (up to bolting and 30 cm in height)
- Plantain (top growth)
- Prickly lettuce
- Ragweed, common (up to 6 leaf)
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Scentless chamomile (up to the bud stage and 15 cm)
- Shepherd's-purse (up to bolting and 20 cm in height)
- Smartweed, annual (green, lady's-thumb)
- Sow thistle, annual (up to 4 leaf)
- Sow-thistle, perennial (up to the bolting stage & 20 cm in height)
- Stinkweed
- Stork's-bill (up to 8 leaf)
- Thistle, Canada (up to the bud stage)
- Velvetleaf (up to 5 leaf)
- Vetch
- Volunteer canola
- Volunteer flax (up to 15 cm)
- Volunteer sunflower
- Wild buckwheat
- Wild radish

Weeds suppressed:
- Kochia**
- Night-flowering catchfly (up to bolting, 15 cm in height)
- White cockle (spring seedlings and over-wintered plants up to bud stage)

*** Best results are obtained when applied to actively growing weeds in the 1 to 4 leaf (seedling) stage**
****Light to moderate infestations (up to 150 plants per m^2; up to 15 cm in height)**

Rate:

Paradigm/Cirpreme A: 10 grams per acre.
-plus-
Lontrel 360: 84 mL per acre.
-or-
Lontrel XC: 52 mL per acre.
It is recommended that *Cirpreme/Cirpreme XC* be mixed with MCPA Ester 600 at 283 mL per acre (not supplied).
Add *Agral 90, Agsurf II*, or *Citowett Plus* at 0.2 L per 100 L of spray solution or *Merge* at 0.5 L per 100 L of solution.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets by ground. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
clopyralid	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Control is best with actively growing weeds. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and regrowth may occur. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- **All registered crops:**
  - MCPA 600 Ester (189 to 280 mL per acre)
  - *Axial*
- **Wheat (Spring, durum, winter) only:**
  - *Simplicity OD*
  - *Simplicity GoDRI*

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Cirpreme/Cirpreme XC* labels only.
Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.
Adding ingredients in the correct order is critical for optimum performance. Add water dispersible granule *Paradigm/Cirpreme A* first, followed by the grass tank-mix then add the *Lontrel* component, add MCPA Ester and recommended surfactant as required.
General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT harvest the treated crop within 60 days after application.
- **Grazing Restrictions:** Livestock may be grazed on treated crops 7 days following application. DO NOT cut the treated crop for hay or silage within 21 days after application.
- **Re-cropping Interval:** Alfalfa, spring wheat, barley, canola (including oilseed quality *B. juncea*), dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types), faba beans, flax, field peas, potatoes (except seed potatoes), mustard (oriental, brown and yellow), soybeans, oats, or sunflower may be seeded 10 months after application. Lentils can be planted 22 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in a secure, dry heated storage.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to to 'Method C' in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
Paradigm/Cirpreme A:
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Cirray

Herbicide Group 1 - pinoxaden, fenoxaprop-p-ethyl

Company:
Bayer

Formulation:
***Cirray* (PCP#34306):** 50 g/L pinoxaden and 50 g/L fenoxaprop-p-ethyl formulated as an emulsifiable concentrate with cloquintocet-mexyl at 25 g/L as a safener.
- Container sizes - 6.48 L, 103.6 L

Crops and Staging:
Spring wheat and barley: 1 to 6 leaves on the main stem plus 3 tillers

Weeds, Rates and Staging:
Apply 323 mL per acre to actively growing weeds with 1 to 6 leaves on the main stem, plus 3 tillers.
Weeds controlled:
- Green foxtail
- Yellow foxtail
- Barnyard grass
- Wild oats
- Persian darnel

Note: Maximum of ONE APPLICATION of this product or other product containing fenoxaprop or pinoxaden per year.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** minimum 20 L per acre.
  - ***Aerial:*** 12 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with no smaller than ***ASABE medium*** droplets by ground or air. Low drift nozzles may require higher pressures for proper performance.
- **Screens:** 50 mesh nozzle screens.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST	Lipid synthesis inhibitor	Symplastic	Selective	1
fenoxaprop-p-ethyl	POST	Lipid synthesis inhibitor	Symplastic	Selective	1

Effects of Growing Conditions:

Weed control can be reduced or delayed under stress conditions such as drought, heat, or insufficient fertility, flooding, or prolonged cool temperatures. Grass escapes or re-tillering may occur if application is made during prolonged stress conditions. DO NOT apply to crop that is stressed by conditions, such as frost, low fertility, drought, flooding, disease, or insect damage as crop injury may result.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted. Consult label of broadleaf herbicide prior to use.

Herbicides:

- 2,4-D Ester LV 700
- *Ally*
- *Attain XC*
- Bromoxynil/MCPA Ester†
- *Frontline XL*
- *Infinity***
- MCPA Amine 500
- MCPA Ester†
- Mecoprop-P (150 g ae/L)***
- *Pixxaro*
- *Prestige XC*
- *Refine SG*
- *Refine SG* + *Buctril M*
- *Refine SG* + MCPA Ester†*
- *Thumper*
- *Trophy*†

† A reduction in barnyard grass control may be observed.

*** Suppression only of green foxtail.**

**** For control of common ragweed and suppression of round-leaved mallow only.**

***** A reduction in wild oat control may be observed.**

Fungicides: *Tilt 250E*.

Insecticides: None registered

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 65 days between application and harvest for grain or straw.
- **Grazing Restrictions:** DO NOT graze or feed to livestock for 30 days after treatment.
- **Re-cropping Interval:** There are no crop rotation limitations the year following application.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store this product away from food or feed. Keep in original container, tightly closed, during storage. Store in a cool, dry, well-ventilated area away from feed and foodstuffs, and out of reach of children and animals. Keep away from fire or open flame, or other sources of heat. If frozen, allow to thaw and agitate thoroughly prior to use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	1
Fixed wing aircraft	1	0	25
Helicopter	1	0	25

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:


Danger – Eye and Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Clethodim

Herbicide Group 1 - clethodim

Company:

UPL AgroSolutions Canada (*Select* – PCP#22625 & *Amigo* – PCP#22644; *Select 1EC* – PCP# 34250)
ADAMA Canada (*Arrow** – PCP#28224 & *X-ACT Adjuvant* – PCP#28225; *Arrow-All-In* – PCP#33225; built in adjuvant)
Advantage Crop Protection (*Advantage Clethodim 240* – PCP#33721 & *Advantage Clethodim Adjuvant* – PCP#33902)
AgraCity (*Independence* – PCP#32851 & *Empire Adjuvant* – PCP#33380)
Albaugh (*Clethodim 240* – PCP#32334 & *Surf-Act* – PCP#32313; *Deputy* – PCP#33703 & *Surf-Act* – PCP#32313).
BASF Canada (*Centurion* – PCP#27598 & *Amigo* – PCP#22644)
Interprovincial Cooperative Ltd. (*IPCO GraminX* – PCP#33659 & *IPCO X-Surf Adjuvant* – PCP#33660; *CO-OP Patron II* – PCP#33661 & *CO-OP Patron II Adjuvant* – PCP#33662; *IPCO GraminX Complete* – PCP#34933; *CO-OP Patron Complete* – PCP#34934)
Loveland Products Canada (*Shadow RTM* – PCP#29277 & *Amigo* – PCP#22644; *Shadow XL* – PCP 34960)
Nufarm Agriculture (*Statue* – PCP#32885
WinField United Canada (*Antler 240EC* – PCP#32880 & *Journey HSOC* – PCP#33800; *Antler 360 Unpacked* – PCP#33866)
Viking (*Viking Clethodim* – PCP#34745)

* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

Arrow-All-In, Select 1EC, Shadow XL, IPCO GraminX Complete, CO-OP Patron Complete: 120 g/L clethodim formulated as an emulsifiable concentrate.

- Container sizes:
  - *Arrow-All-In* - 2 x 6 L
  - *Select 1EC* - 2 x 6.1 L, 97.6 L
  - *Shadow XL* - 6 L, 97.6 L
  - *IPCO GraminX Complete & CO-Op Patron Complete* - 6.1 L, 97.6 L

Antler 360 Unpacked: 360 g/L clethodim formulated as an emulsifiable concentrate.

- Container size - 4 x 4 L

Other products: 240 g/L clethodim formulated as an emulsifiable concentrate.

- Container sizes:
  - *Statue* - 2 x 3 L clethodim, adjuvant sold separately
  - *Independence* - 6 L clethodim + 15 L adjuvant
  - *Antler 240* - 3 L clethodim + 7.5 L adjuvant
  - Other products - 3 L clethodim + 9 L adjuvant

Crops, Rates and Staging:

Crops are tolerant at all growth stages at maximum rates, but "Pre-harvest Intervals" must be observed to prevent excess residue in the grain (see "Restrictions:" section below).

To a maximum rate of 150 mL per acre for 120 g/L formulations, 50 mL per acre for *Antler 360 Unpacked*, and 75 mL per acre for other formulations:

- Chickpea*
- Dry bean# (black, great northern, navy, pink, pinto, red)
- Faba bean$^{\Delta\Delta\Delta\dagger}$
- Prairie Carnation**†

To the maximum rate in the Weeds, Rates and Staging chart below:

- Alfalfa (seedling only)
- Buckwheat$^{\Delta\Delta\Delta\Delta}$
- Canola
- Caraway$^{\Delta\dagger}$
- Carinata$^{\Delta\Delta\Delta}$
- Coriander**†
- Dill (seed production)$^{***\Delta\Delta\dagger}$
- Fenugreek***†
- Field pea
- Flax (including Solin)
- Hops$^{\Delta\Delta\Delta\dagger}$
- Lentil
- Mustard, condiment (brown, oriental, yellow)
- Mustard, oilseed types (*B. juncea*)$^{\Delta}$
- Potato
- Safflower (6 to 8 leaf)$^{\Delta\dagger}$
- Soybean
- Sunflower

*** Apply up to the 9 node stage (7 inches or 18 cm maximum height)**
**** Apply in the 2 to 5 leaf stage, one application per year.**
***** Apply in the 3 to 5 leaf stage, one application per year.**
 # *Select, Centurion, Shadow RTM, Antler 360 Unpacked, Statue*,*Independence* and *Viking Clethodim* are registered for all *Phaseolus vulgaris* varieties. Since not all varieties of dry beans have been tested for tolerance to clethodim, first use of clethodim should be limited to a small area of each variety to confirm tolerance. *Antler, Arrow-All-In,* and *Clethodim 240* and *Deputy* are registered for use on black, great northern, navy, pink, pinto, and red dry bean types only.

[Δ] ***Select, Centurion, Shadow RTM, Statue, IPCO GraminX, CO-OP Patron II, Advantage Clethodim, IPCO GraminX Complete, CO-OP Patron Complete*** **and** ***Independence, Independence*** **and** ***Viking Clethodim*** **only.**
[ΔΔ] ***Select, Centurion, Shadow RTM, IPCO GraminX, CO-OP Patron II, IPCO GraminX Complete, CO-OP Patron Complete*** **and** ***Advantage Clethodim*** **only.**
[ΔΔΔ] ***Select, Centurion, Shadow RTM, IPCO GraminX, CO-OP Patron II, IPCO GraminX Complete*** **and** ***CO-OP Patron Complete*** **only.**
[ΔΔΔΔ] ***Select*** **and** ***Centurion*** **only.**
[†] ***NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.***

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

DO NOT apply more than a combined total rate of 37.5 g clethodim active ingredient (300 mL per acre of 120 g/L formulations, 100 mL per acre of 360 g/L formulations, or 150 mL per acre of 240 g/L formulations), or other products containing clethodim, to the same field per season.

Adjuvants: Clethodim products must be applied with 0.5 L of *Amigo* adjuvant (*Centurion, Shadow RTM, Antler 360 Unpacked* or *Select*), *Empire* (*Independence*), *Nufarm Carrier* adjuvant (*Statue*), *X-ACT* (*Antler 240EC, Arrow*), *Surf-Act* (*Clethodim 240, Deputy, Advantage Clethodim Adjuvant (Advantage Clethodim 240), IPCO X-Surf (IPCO GraminX*), *Patron II* adjuvant (*CO-OP Patron II*) or Viking Phosphate Ester Adjuvant (*Viking Clethodim*) per 100 L of spray solution (unless otherwise indicated on the label). For spray water sources high in bicarbonate ions (CO3) see 'Effects of Growing Conditions' section following.

Arrow-All-In, *Select 1EC* , *IPCO GraminX Complete* and *CO-OP Patron Complete* do not require the addition of an adjuvant since it is built into the formulations.

Weed	Rate (mL per acre)			Stage
	240 g/L	120 g/L	360 g/L	
Barnyard grass, foxtail (green, yellow)*†, proso millet, volunteer cereals (barley*†, canary seed, corn, oats*†, wheat*†), wild oats†	50**	100**	33.3**	Apply at 2 to 6 leaf stage. † Apply at the 2 to 4 leaf stage when treated with the lowest rate.
Moderate to heavy infestations of the above grasses, plus Persian darnel, Japanese brome[Δ], foxtail barley[Δ]	75	150	50	For best results in either case, apply at the 2 to 3 leaf stage.
Quackgrass (suppression only)	75	150	50	2 to 6 leaf stage or 3 to 6 inches (6 to 15 cm) tall. For best results, apply at the 3 to 5 leaf stage.
Quackgrass (season long control), Japanese brome (max 3 tillers)[Δ], foxtail barley (max 3 tillers)[Δ]	150***	300	100	

*** Apply to light infestations of these weeds only for the lowest rate. The manufacturers do not provide guidelines for weed densities under light infestations. When in doubt as to the level of weed infestation, use the higher rate or contact the manufacturer.**
**** At this rate, clethodim should NOT be tank mixed with any other pesticide and should only be applied under the following growing conditions: good crop stand, within the recommended leaf staging (2 to 3 leaf is optimum timing) prior to tillering, light weed infestations, adequate moisture and fertility, absence of stress, and good growing conditions.**
***** Apply with 1 L of adjuvant per 100 L of spray solution.**
[Δ] ***Select, Centurion, Shadow RTM, IPCO GraminX, CO-OP Patron II, IPCO GraminX Complete*** **and** ***CO-OP Patron Complete*** **only.**

Refer to the product labels for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Use 40 L per acre under dense weed infestations or dense crop canopies.
  - ***Aerial:*** Minimum of 11.3 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional 80° flat fan nozzles tilted forward at a 45° angle. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clethodim	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward regions of growth (Symplast)	Grasses only	1

Effects of Growing Conditions:

Clethodim will be less effective when plants are stressed by lack of moisture, excessive moisture, low temperature and/or very low relative humidity. Re-growth of tillers may occur if application is made under any of the above stress conditions.

Clethodim activity is reduced by levels of bicarbonate ions in spray water equal to or greater than 500 ppm. The addition of ammonium sulphate at 1.6 L per acre (490 g per L liquid) or 0.8 kg per acre (99 percent dry), or the addition of 28-0-0 liquid fertilizer at 0.5 L per acre to the tank prior to the addition of clethodim has been shown to restore control.

Tank Mixes:

Clethodim may be tank mixed with other pesticides at the all but the lowest rates. Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Add the recommended amount of adjuvant with all tank mixes unless otherwise indicated.

Herbicides:

- ***In flax (not including solin):***
  - Bromoxynil/MCPA Ester (label rates) [Δ]
  - *Curtail M*[†]
  - MCPA Ester (rates for flax)
- ***In Solin (low linolenic flax):***
  - Bromoxynil/MCPA Ester (label rates) [Δ]
  - *Curtail M*[†]
- ***In canola:***
  - *Muster*[†] (redroot pigweed is controlled at the 8 grams per acre rate of *Muster* in this tank mix).
- ***In CLEARFIELD canola only:***
  - *Pursuit* at 42 to 85 mL per acre[†]
- ***In Liberty Link canola:***
  - *Glufosinate 150SN* (*Liberty 150 SN* and *Interline* only) at label rates mixed with 360 g/L formulations at 17 mL per acre, 240 g/L formulations at 25 mL per acre, and 120 g/L formulations at 50 mL per acre.
  - *Glufosinate 150SN* (*Liberty 150 SN* and *Interline* only) at label rates mixed with *Antler 360 Unpacked* up to 50.6 mL per acre, *Select 240 EC, Centurion, CO-OP Partron II, IPCO GraminX, Shadow RTM* and *Viking Clethodim* up to 75 mL per acre. Add adjuvant for clethodim product to the tank first, then Glufosinate 150SN and then Clethodim.
- ***In field peas:***
  - *Pursuit*
- ***In Glyphosate tolerant soybean:***
  - Glyphosate (360 to 720 g ae per acre)[†]*

[†] **Apply with the 150 mL per acre rate of *Arrow-All-In*, 50 mL per acre rate of *Antler 360 Unpacked*, or the 75 mL per acre rate of other clethodim formulations only.**

[Δ] **Manufacturers may only support specific mixes. Contact the manufacturer for more information.**

* ***Select, Shadow RTM, Antler, Arrow, Arrow-All-In, IPCO GraminX, CO-OP Patron II, IPCO GraminX Complete and CO-OP Patron Complete* only.**

Allow 4 days between application of clethodim and any other chemical not recommended as a tank mix combination on the label.

Fertilizer: None registered.
Insecticide: None registered.
Fungicides: None registered.

Note: The above mixes are those listed on the clethodim labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Check with each manufacturer for other products they support. Mixes must be applied according to the most restrictive use limitations for all products added to the tank.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut treated crops for forage until 60 days after application of clethodim to annual crops, and 30 days after application to seedling alfalfa.
- **Pre-harvest Interval:**

Pre-harvest Interval (days)	Crops
21	Hops
30	Alfalfa, fenugreek
40	Dill seed
60	Canola, carinata, chickpeas (Desi and Kabuli) coriander, dry beans, faba bean, flax (including Solin), lentil, or mustard (brown, yellow, oriental), potatoes
70	Safflower
72	Sunflower
75	Field peas, soybeans

- **Aerial Application:** *Select, Centurion, Shadow RTM, IPCO GraminX* and *CO-OP Patron II* may be applied by air in carinata, canola, chickpea, dry bean, faba bean, flax, field pea, lentil, mustard, potato, soybean, sunflower only. *Antler 360 Unpacked*, *Independence*, *Statue* and *Viking Clethodim* may be applied by air in canola, chickpea, dry bean, flax, field pea, lentil, mustard, potato, soybean, sunflower only. *Antler, Arrow 240, Arrow All-In*, *Clethodim 240* and *Deputy* may not be applied by air.
- **Storage:** May be stored at any temperature. Shake well before use.
- **Buffer Zones:**
  - ***Antler, Arrow, Statue:*** Leave a 15 meter buffer by ground and a 30 meter buffer by air (where aerial application is permitted) between the edge of sensitive habitats and the closest spray pass.
  - ***Arrow-All-In* (ground only), *Clethodim 240* & *Deputy* (ground only), *Independence, Statue, Viking Clethodim:***

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground only*	All	1	1	1
Fixed wing aircraft	Desi and Kabuli chickpeas, dry common beans, faba bean	1	1	20
	Other registered crops	5	1	40
Helicopter	Desi and Kabuli chickpeas, dry common beans, faba bean	1	1	20
	Other registered crops	5	1	35

  - ***Select, Centurion, Shadow RTM, Antler 360 Unpacked, CO-OP Patron II, IPCO GraminX, IPCO GraminX Complete* and *CO-OP Patron Complete:***

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground only*	Desi and Kabuli chickpeas, dry common beans, Prairie carnation, pigeon pea	1	1	1
	Other registered crops	1	1	2
Fixed wing aircraft	Desi and Kabuli chickpeas, dry common beans, faba bean	4	1	30
	Other registered crops	10	1	60
Helicopter	Desi and Kabuli chickpeas, dry common beans, faba bean	1	1	30
	Other registered crops	10	1	50

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method B' in the general sprayer cleaning section in the introduction.

Hazard Rating:
***Select, Shadow, Independence, Statue, Centurion* and *Viking Clethodim*:**

 Warning – Skin and Eye Irritant

Antler, Antler 360 Unpacked, Arrow, Arrow-All-In* and *Patron:

 Caution – Skin and Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Clodinafop

Herbicide Group 1 - clodinafop

Company:
Syngenta Canada (*Horizon NG* – PCP#29089; built in adjuvant)
ADAMA Canada (*Ladder 240 EC** – PCP#29495; *ADAMA Adjuvant 80* – PCP#30419; *Ladder All In* – PCP#32497; built in adjuvant)
Albaugh (*Slam'R* – PCP#31053*; Albaugh Surfactant* – PCP#32599; *Winner* – PCP#33786; *Albaugh Surfactant* – PCP#32599)
AgraCity (*Aurora* – PCP#29711; *Chem Spray COC Adjuvant* – PCP#29712)
Farmers Business Network Canada (*Foax* – PCP#31261; *CropOil 83/17 Adjuvant* – PCP#30978)
Loveland Products Canada (*Foothills NG* – PCP#30341; built in adjuvant)
Nufarm Agriculture (*Signal* – PCP#29172*; Nufarm Enhance* – PCP#29952)
WinField United Canada (*Cadillac Unpacked* – PCP#30428; *Cadillac One* – PCP#32539; built in adjuvant)
Viking (*Viking Clodinafop* – PCP# 34749; *Viking Crop Oil Concentrate* – PCP# 34811)
**** Note:** This product is no longer manufactured but inventories remain in distribution. This product may be removed from future editions.*

Formulation:
Horizon NG*, Foothills NG*: 60 g/L clodinafop-propargyl formulated as an emulsifiable concentrate.
- Container sizes** - 15.14 L, 121.1 L

Cadillac One*, Ladder All In*: 80 g/L clodinafop-propargyl formulated as an emulsifiable concentrate.
- Container sizes** - 11.3 L, 90.6 L

Cadillac Unpacked, Foax, Ladder 240 EC, Aurora, Signal, Slam'R, Viking Clodinafop, Winner: 240 g/L clodinafop-propargyl formulated as an emulsifiable concentrate.
- Container sizes** - 3.68 L, 7.36 L, 14.72 L, 18.4 L, 22.8 L, 58.9 L, 115 L
  - ***CropOil 83/17, and Albaugh Surfactant:*** 3.78 L,
  - ***Nufarm Enhance:*** 4 L, 16 L, 64 L
  - ***ADAMA Adjuvant 80:*** 4 L, 12 L
  - ***Viking Crop Oil Concentrate:*** 15 L

*** These products have a built in adjuvant system and do not require the addition of an adjuvant.**
**** Package sizes are totals across all containers in the pack and availability varies of each by company. Not all sizes may be available from each company.**

Crops and Staging:
Spring wheat (including durum) - prior to the emergence of the 4th tiller.
When tank mixing, check broadleaf product description for additional restrictions.

Weeds, Rates and Staging:
NG Formulations: 376 mL per acre, no additional adjuvant required.
-or-
Cadillac One, Ladder All In: 283 mL per acre, no additional adjuvant required.
-or-
240 EC Formulations: 93 mL per acre plus recommended adjuvant at 0.8 L per 100 L spray solution. For *Signal* only add *Nufarm Enhance* adjuvant or *Journey HSOC*, for *Ladder 240EC* only add *ADAMA Adjuvant 80* at 0.25 L per 100 L spray solution, for *Slam'R* only add *Albaugh Surfactant* at 0.25 L per 100 L spray solution.

For control of:

Weed	Stage
Barnyard grass	1 to 5 leaf prior to tillering
Foxtail (green, yellow)	1 to 5 leaf stage, prior to emergence of 3rd tiller
Volunteer canaryseed, wild oats	1 to 6 leaf, maximum 3 tillers
Volunteer oats	3 to 6 leaf, maximum 3 tillers

NG Formulations: 474 mL per acre, no additional adjuvant required;
-or-
Cadillac One, Ladder All In: 356 mL per acre, no additional adjuvant required.
-or-
240 EC Formulations: 115 mL per acre plus recommended adjuvant at 1.0 L per 100 L spray solution of the recommended adjuvant. For *Signal* only add *Nufarm Enhance* adjuvant or *Journey HSOC*, for *Ladder 240 EC* only add *ADAMA Adjuvant 80* at 0.32 L per 100L spray solution for *Slam'R* and *Winner* only add *Albaugh Surfactant* at 0.25 L per 100 L spray solution..

For control of:

Weed	Stage
Persian darnel	1 to 5 leaf prior to tillering

Apply at the 2 to 3 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are controlled before tillering. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 L to 40 L per acre.
  - ***Aerial:*** 12 L per acre.
- **Nozzles and Pressure:** 40 to 45 psi (275 to 310 kPa) when using conventional 80° or 110° flat fan stainless steel nozzles tilted forward at an angle of 45°. Low drift nozzles may require higher pressures for proper performance. Consult with herbicide manufacturer regarding the suitability of low drift nozzles for use with this product.

Tank Mixes:

Mixes provide control of wild oats, green foxtail, and weeds/insects controlled by the tank mix partner unless otherwise noted.
Herbicides:

	Aurora	*Cadillac Unpacked*	*Cadillac One*	*Foax*	*Ladder*	*Ladder All In*	*NG Formulaitons*	*Nufarm Clodinafop*	*Signal*	*Slam'R & Winner*
2,4-D amine (160 to 212 g ae/acre)††	•	•	•	•	•	•	•	•	•	•
Bromoxynil#	•	•	•	•	•	•	•	•	•	•
Bromoxynil/MCPA*** #	•	•	•	•	•	•	•	•	•	•
Bromoxynil/2,4-D (label rates)	•	•	•	•	•	•	•	•	•	•
Curtail M (0.6 to 0.81 L/acre)	•	•	•	•	•	•	•	•	•	•
Dichlorprop/2,4-D (0.71 L/acre)**	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ	•Δ
MCPA 600 amine or 600 ester†† (0.34 to 0.45 L/acre)	•	•	•	•	•	•	•	•	•	•
MCPA Sodium Salt (0.48 to 1.09 L/acre)*		•	•		•	•	•		•	
Mecoprop-p (2.2 to 2.8 L/acre)		•	•		•	•	•		•	•
Metsulfuron (3 g/acre)††† #	•	•	•	•	•	•	•	•	•	•
Pulsar (80 acres/case)			•			•	•			•
Pulsar + MCPA Ester (rates above)			•			•	•			•
Refine SG (8 g/acre)†††			•			•	•		•	
Trophy (20 acres/case)		•	•		•	•	•		•	

Refer to the broadleaf herbicide label for crop staging, and other information. When tank mixing *Clodinafop 240 EC*, always add the broadleaf herbicide first, followed by clodinafop, with the adjuvant added last. Reductions in green foxtail and wild oats control may be observed when tank mixed with 2,4-D amine and MCPA amine.

Insecticides:

- *Lambda-cyhalothrin*[#] (25 to 33 mL per acre)[G]

Fungicides:

- *Propiconazole*[#] (0.1 L[#] to 0.2 L per acre)[G]
- Clodinafop may also be mixed with *Lambda-cyhalothrin*[#] plus *propiconazole*[#] at the rates above[G].

Fertilizers: None registered.

[#] Check product label for specific tank mix partners and appropriate rates
[Δ] NOT for use with *Estaprop XT* or *Dichlorprop DX*.
*** Rate above 0.81 L per acre may cause crop injury.**
**** Barnyard grass also controlled.**
***** Barnyard grass and Persian darnel also controlled. May be applied by air.**
[††] See 2,4-D for equivalent formulation rates.
[†††] Additional adjuvants are not required.
[G] All products except *Aurora*.

Note: The above mixes are those listed on the clodinofop labels only.

Clodinafop manufacturers may also support mixes with pesticides that are not on the clodinafop labels. Check with each manufacturer for the products they support. Mixes must be applied according to the most restrictive use limitations for all products added to the tank.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clodinafop	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1

Effects of Growing Conditions:

For optimum results, apply to actively growing weeds. DO NOT apply to crops or weeds that are stressed by hot or cool conditions, frost, drought, low fertility, water-saturated soil, disease or insect damage as crop injury and poor weed control may result.

Restrictions:

- **Rainfall:** Within 30 minutes may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or harvest treated crops for forage within 3 days of application.
- **Pre-harvest Interval:** Leave at least 60 days from application to harvest.
- **Re-cropping Interval:** No restrictions in the year following treatment.
- **Storage:** May be frozen.
- **Aerial Application:** May be applied by air.
- **Buffer Zones:**

Application method	Buffer Zones (metres [†]) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground*	15	0
Aerial	72	76

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**
[†] Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general tank cleaning section in the introduction. If mixed with other pesticides, the cleaning method above should be combined with the method recommended for the tank mix partner if different from above.

Hazard Rating:

240 EC formulations:

 Caution – Poison

 Warning – Eye and Skin Irritant

NG Formulations:

 Caution – Skin Irritant

Cadillac One, Ladder All In:

 Danger – Corrosive to Eyes

All products except *Ladder*:

 Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Clomazone

Herbicide Group 13 - clomazone

Company:

FMC Corporation (*Command 360 ME* – PCP#27827)
Interprovincial Cooperatives (*IPCO Clomazone* – PCP#33910)
Sharda CropChem Limited (*Czar* – PCP#34338)

Formulation:

360 g/L clomazone formulated as a microcapsule suspension.

- Container sizes:
  - *Command 360ME* - 2 x 5.4 L
  - *IPCO Clomazone* - 10 L (sold only as a component of the copack *IPCO Trigon*)
  - *Czar* - 2 x 5 L

Crops and Staging:

Apply to soil prior to seeding to herbicide-tolerant canola (all varieties), mustard (brown, Oriental, yellow)*, Ethiopian mustard (*Brassica carinata*)*, camelina*.

*** *Command 360ME* only**

Weeds, Rates and Staging:

Apply pre-emergent to weeds.

Apply 101 mL per acre for suppression of:

- Cleavers
- Chickweed (suppression only - *Command* only)

Apply 135 mL per acre for control of:

- Cleavers
- Chickweed (suppression only - *Command* only)

Maximum ONE APPLICATION per year of *Clomazone* or other products containing the active ingredient clomazone.

DO NOT APPLY *Clomazone* to:

- sandy soils
- soils with greater than 10 percent organic matter
- fields receiving applications of solid manure, unless it has been thoroughly incorporated to a depth of 10 to 15 cm

Application Information:

- **Water Volume:** minimum 40 L per acre.
- **Nozzles & Pressure:** Use 30 psi (207 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clomazone	PRE (soil active)	DOXP Pigment synthesis inhibitor	Upward (Apoplast)	Broadleaf (& grass at higher rates)	13

Effects of Growing Conditions:

Rainfall (5 to 10 mm), or equivalent irrigation, is required within 7 to 10 days for activation. Dry conditions that persist after application may reduce weed control. Heavy rainfall after application may dilute the active layer and result in reduced weed control.
DO NOT apply when temperature exceed 25°C due to increased risk of vapour drift. Temporary whitening/yellowing of the crop may occur when emerging from treated soil. Under some conditions, temporary whitening or yellowing of leaves may occur on approved rotational crops where undesirable soil residues of *Clomazone* exist. Refer to the label for more details.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- **Canola (prior to seeding):**
  - *Carfentrazone*
  - *Carfentrazone + glyphosate*

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Moderate rainfall after application is required for activation. Heavy rainfall shortly after application may reduce activity.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay.
- **Re-cropping Interval:** Winter wheat may be sown 4 months after application. Canola, corn (field, sweet), dry bean (kidney, navy), field pea, potatoes, soybean, lentil, barley, oats and wheat (spring or durum) may be planted the year after application. All other crops may be planted 16 months after application. Under some conditions, temporary whitening or yellowing of leaves may occur on approved rotational crops where undesirable soil residues of clomazone exist. Refer to label for more information on recropping precautions.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store above 5°C to keep from freezing. If frozen, thaw before use. If solid crystals are observed, warm to above 15°C and shake or roll container periodically to dissolve solids. DO NOT store near heat or open flame.
- **Buffer Zones:** DO NOT apply *Clomazone* within 90 metres of sensitive plants and sensitive terrestrial habitats or within 370 metres of fruit, nursery and greenhouse production. A buffer zone of 370 metres should also be observed for applications adjacent to residential areas and established vegetation. DO NOT apply *Clomazone* directly to surface water or to areas where runoff is likely to occur.
  See the Key to Product Pages in the introduction for an explanation of the different habitats.
  † Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.
  - Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

Refer to 'Method A or B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Poison

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Clopyralid

Herbicide Group
4 - clopyralid

Company:

Corteva Agriscience (*Lontrel XC*)
Sharda CropChem Canada (*Pyralid*)
AgraCity (*Clobber*)
Advantage Crop Protection (*Advantage Clopyralid 360*)
Albaugh (*Spur 360*)
Viking (*Viking Clopyralid*)

Formulation:

***Lontrel XC* (PCP#32795):** 600 g/L clopyralid formulated as a solution.

- Container size - 4 x 2.67 L

***Clobber* (PCP#33114), *Advantage Clopyralid 360* (PCP#33795), *Spur 360* (PCP#34501), *Viking Clopyralid* (PCP#34779):** 360 g/L clopyralid formulated as a solution.

- Container sizes:
  - *Advantage Clopyralid 360* - 4.45 L
  - *Clobber, Viking Clopyralid* - 2 x 8.9 L

***Pyralid* (PCP#32265):** 300 g/L clopyralid formulated as a solution.

- Container size - 4 x 4.45 L

Crops, Rates and Staging:

Clopyralid Rate (g ai per acre)	Formulation (mL per acre)					
	360 g/L forms		*Lontrel XC*		*Pyralid*	
	mL per acre	mL per 1000 m^2	mL per acre	mL per 1000 m^2	mL per acre	mL per 1000 m^2
31	85	-	52	-	102	-
41	112	28	68	17	136	34
61	170	42	102	25	204	50
82	240	56	137	34	272	67
121	340	83	202	50	403	100

Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (for example, sandy soil) and/or the depth to the water table is shallow. Use should be avoided in these areas.

Barley, wheat (spring, durum, winter), oats: Apply in spring at 41 to 61 g ai per acre from the 3 leaf to flag leaf emergence stage.

Flax and solin (low linolenic acid flax): Apply at 82 to 121 g ai per acre from the 2 to 4 inches (5 to 10 cm) in height.

Canaryseed (including for human consumption - *Lontrel XC* only): Apply at 41 g ai per acre from the 3 leaf to just prior to flag leaf emergence.

Canola: Apply at 61 to 121 g ai per acre from the 2 to 6 leaf stage. Argentine (*B. napus)* and Polish (*B. rapa*) varieties only; application to any other canola type oilseeds may cause crop injury.

Corn* (Lontrel XC *only): Apply at 41 g ai per acre from spike to V6.

Seedling forage grasses*: Apply at 61 to 121 g ai per acre from the 2 to 4 leaf stage.

Established grasses*: Apply at 61 to 121 g ai per acre at the shot blade stage, or in the fall after harvest or in early spring.

Seedling and established grasses* for forage and seed production including:

- Bromegrass (smooth)
- Fescue (creeping red, meadow, tall)
- Kentucky bluegrass
- Meadow foxtail
- Orchardgrass
- Reed canarygrass
- Timothy
- Wheatgrass (crested, intermediate, slender, streambank, tall**)
- Wildrye (Altai, Russian)

Clopyralid at 121 g ai per acre:
Fallow: Stage according to weeds.
Shelterbelts*: containing villosa lilac, acute willow, Colorado spruce, white spruce, buffaloberry and chokecherry*.
Plantation poplar (including hybrid poplar)*
*** NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance. Users of this product for these uses do so at their own risk.***
**** for forage use only**
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Apply to weeds when young and actively growing.

Weeds Controlled		Rate* (g ai per acre)
Alsike clover Canada thistle*†	Vetch (*Vicia* spp.) Volunteer soybean ΔΔ	61
Canada thistle**† Common groundsel Common ragweed Knapweed (spotted and diffuse)Δ Ox-eye daisy (suppression) Perennial sow-thistle (top growth only)	Scentless chamomile Sheep sorrel (suppression) Volunteer alfalfa - 2 to 20 inches (5 to 50 cm) tall Wild buckwheat	82
Canada thistle***† Ox-eye daisy	Sheep sorrel	121

Δ ***Lontrel XC* and *Advantage Clopyralid 360* only.**
ΔΔ ***Lontrel XC* only.**
† **Canada thistle - after all thistles have emerged and when the majority are in the rosette to pre-bud stage.**
* **Top growth suppression for 6 to 8 weeks. Some regrowth may occur by end of season, but will not interfere with crop harvest.**
** **Provides season long control of Canada thistle. Not all root stalks will be killed and some regrowth may occur by the end of the growing season.**
*** **Provides season long control of Canada thistle with suppression into the following year.**

Application Information:

- **Water Volume:** 40 to 80 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver thorough, even coverage with ***ASABE medium*** or larger droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clopyralid	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Poor control may occur under dry conditions. Injury to flax may occur when tank mixing with MCPA. To reduce the risk of crop injury, DO NOT apply tank mixes if temperature exceeds 27°C.

Tank Mixes:

Herbicides:
Clopyralid applications following applications of products containing bromoxynil (*Approve*, *Badge*, *Bromotril*, *Buctril M*, *Enforcer*, *Koril*, *Logic M, Mextrol, Pardner, Thumper*) should be delayed by 14 days to allow the Canada thistle to recover from leaf burn.

Recommended rates of clopyralid may be used for each crop unless otherwise indicated. Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides	Crop (rate g ai per acre – if different from label rates range above)					
	Canola	Flax	Barley	Spring Wheat (Not durum)	Oats and Canaryseed*	Corn
Poast Ultra	(61 to 121)	(61 to 121)	-	-	-	-
Select	(61 to 121)	(82 to 121)	-	-	-	-
Glyphosate (glyphosate tolerant canola and corn only)	(41)	-	-	-	-	(41)*
2,4-D ester or amine (170 to 227 g ae/acre)	-	-	(41 to 61)	(41 to 61)	-	-
MCPA Ester or amine (0.28 to 0.38 mL/acre - 600 g/L)	-	(61)	(41 to 61)	(41 to 61)	(41 to 61)	-
Poast Ultra plus MCPA (rates above)	-	(61 to 121)	-	-	-	-
Select plus MCPA (rates above)	-	(31 to 41)	-	-	-	-
Tralkoxydim *(Achieve* only*)* + MCPA Ester (rates above)	-	-	(31 to 41)	(31 to 41)	-	-
Fluroxypyr + MCPA Ester	-	-	(31 to 41)	(31 to 41)	-	-
Tralkoxydim + Fluroxypyr + MCPA Ester	-	-	(31 to 41)	(31 to 41)	-	-

***Lontrel XC* only**

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the clopyralid labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance.

Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** For field corn, do not graze or harvest for silage within 40 days of treatment. For all other crops or areas treated with this product may be grazed immediately following treatment.
- **Re-cropping Interval:** Clopyralid residues in the soil may affect succeeding crops. The year after application, replant to wheat, barley, oats, rye, flax, forage grasses, mustard or canola. DO NOT use manure from animals fed or bedded with clopyralid-treated straw, except on fields that are to be sown to clopyralid-tolerant crops.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in heated storage. If product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:** Leave a buffer of 2 meters from the most downwind point of application and sensitive terrestrial habitats.

Sprayer Cleaning:

No detailed cleaning procedures are indicated on the label. Use a commercial all purpose spray sprayer cleaning product for adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Lontrel XC:

Keep out of reach of children.

Other Clopyralid products:


Caution – Poison


Danger – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Clopyralid + Fluroxypyr

Herbicide Group
4 - clopyralid, fluroxypyr

Company:
Loveland Products Canada (*Momentum*)
Sharda Crop Chem (*Inertia*)

Formulation:
***Momentum* (PCP#30456), *Inertia* (PCP#34225):** 90 g/L clopyralid and 90 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 8.99 L

Crops and Staging:
Apply at the 3 leaf to just before the flag leaf stage of barley, wheat (spring, durum).
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
The following weeds are controlled at the 1 to 4 leaf per whorl stage unless specified:
- Canada thistle**
- Cleavers
- Kochia (2 to 8 leaf)
- Stork's-bill (1 to 8 leaf)*
- Volunteer flax (1 to 12 cm)
- Wild buckwheat

*** Suppression only.**
**** Season long control, some regrowth may occur in the fall. Apply from the 4 inch (10 cm) to pre-bud stage.**

Rates:
0.45 L per acre.
Apply a maximum of ONE APPLICATION of this product or other products containing either clopyralid or fluroxypyr per year.

Application Information:
- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Use 30 to 40 psi (200 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clopyralid, fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
When weeds are stressed because of drought, flooding, hot or cool (less than 8°C) temperatures, weeds are not actively growing and control may be reduced. DO NOT apply to weeds stressed longer than 20 days from lack of moisture as poor control can result.

Tank Mixes:
Herbicides:
- MCPA Ester 500 (0.34 to 0.45 L per acre)
- MCPA Ester 600 (0.28 to 0.38 L per acre)

***Momentum* alone or tank mixed with MCPA Ester rates above may be mixed with the following:**
- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim† (0.20 L per acre) plus registered adjuvant
  - Fenoxaprop 120 EC† (0.16 to 0.31 L per acre).
- ***In spring wheat (including durum):***
  - Clodinafop† (label rates)
  - *Simplicity OD* (0.2 L per acre)
  - *Traxos* (label rate)

  † Note: The manufacturer may not support all brand of these products. See the label or contact the manufacturers for more information.

Check the labels of mix partners for additional crop staging restrictions.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Momentum* and *Inertia* labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval between application and rain without loss of control may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields or cut for hay within 3 days of application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** Wheat, barley, oats, rye, flax, canola, mustard and peas may be planted the year after application or the field may be fallowed. DO NOT under-seed crops to forage legumes the year after treatment. DO NOT sow any other crops until the second year after application. Apply manure bedded with straw from treated crops only to the crops listed above.
  - *DO NOT seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Loveland Products Canada representative or retailer for more information before seeding field peas following drought conditions in the previous year.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool (above 5°C), dry area. If product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

  - Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

No specific cleaning recommendations are provided on the *Momentum* or *Inertia* labels. As a petroleum based emulsifiable concentrate, 'Method B' in the general section on sprayer cleaning in the introduction may be the most effective. Check with the manufacturer for more information.

Hazard Rating:


Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Clopyralid / MCPA

Herbicide Group
4 - clopyralid, MCPA

Company:

Nufarm Agriculture (*Curtail M*)
AgraCity (*Clobber M*)
Albaugh (*Spur-M*)
Sharda CropChem (*Certain*)
Viking (*Viking Drammen*)

Formulation:

***Curtail M* (PCP#30914), *Clobber M* (PCP#34157), *Certain* (PCP#34356), *Spur-M* (PCP#34458), *Viking Drammen* (PCP#34798):** 50 g/L clopyralid and 280 g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes:
  - *Curtail M, Certain, Spur-M* – 2 X 8 L (*Curtail M* and *Certain* only), 112 L
  - *Clobber M* – 2 x 12 L. 96 L, 576 L
  - *Viking Drammen* – 2 x 12 L

Crops and Staging:

Apply at the 3 leaf to just before the flag leaf stage of the following crops:

- Barley
- Canaryseed* (including hairless varieties for human consumption)
- Oat
- Flax and solin (low linolenic acid flax) at 2 to 6 inches (5 to 15 cm) height.
- Timothy (established for seed, and hay or forage production)*
- Wheat (spring, durum)

NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

The following weeds are controlled at the 1 to 4 leaf stage unless specified:

At 0.61 L per acre:

- Burdock
- Canada thistle (low infestations)***
- Cocklebur
- Field horsetail†
- Flixweed**
- Lamb's-quarters
- Plantain†
- Prickly lettuce
- Ragweed
- Shepherd's-purse**
- Stinkweed**
- Sunflower (annual, volunteer)
- Wild mustard
- Wild radish
- Vetch

At 0.81 L per acre, the above weeds plus:

- Buckwheat (tartary, wild)
- Canada thistle (medium to high infestations)***
- Common groundsel
- Dandelion*
- Kochia (suppression only)**
- Pigweed (redroot, Russian)
- Scentless chamomile**
- Smartweed
- Sow-thistle (annual, perennial†)
- Volunteer canola

*** Spring rosettes only.**
**** 2 to 4 leaf stage, (spring seedlings only for winter annual weeds).**
***** Season long control, some regrowth may occur in the fall. Apply from the 4 inch (10 cm) to prebud stage.**
† Top growth control only.

Application Information:

- **Water Volume:**
  - ***Cereals and Flax:*** 40 to 60 L per acre
  - ***Canary seed and timothy:*** 40 to 80 L per acre
- **Nozzles & Pressure:** Use 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage. Flat fan tips tilted forward at a 45° angle are recommended in flax.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA, clopyralid	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

When weeds are stressed because of drought, flooding, hot or cool (less than 15°C) temperatures, weeds are not actively growing and control may be reduced. DO NOT apply to weeds stressed longer than 20 days from lack of moisture as poor control can result.

Tank Mixes:

Curtail M at 0.81 L per acre should be used in all tank mixes unless otherwise indicated. See labels for adjuvant rates.

In spring wheat (including durum) and barley:

- *Achieve Liquid* (0.20 L per acre) plus adjuvant

Check product labels for additional crop staging restrictions.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the *Curtail M* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields or cut for hay within 7 days of application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** Wheat, barley, oats, rye, corn, flax, canola, forage grasses and mustard may be planted the year after application. DO NOT under-seed crops to forage legumes the year after treatment.
  - DO NOT seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Nufarm Agriculture representative or retailer for more information before seeding field peas following drought conditions in the previous year.
  - DO NOT sow any other crops until the second year after application. Apply manure bedded with straw from treated crops only to the crops listed above.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool (above 5°C), dry area. If product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

No detailed cleaning procedures are indicated on the label. Use a commercial all purpose spray sprayer cleaning product for adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:


Caution – Poison


Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Clopyralid / MCPA + fluroxypyr

Herbicide Group 4 - fluroxypyr, clopyralid, MCPA

Company:

Corteva Agriscience (*Prestige Brands*)
ADAMA Canada (*Esteem*)
AgraCity (*Foxxy CM*)
Interprovincial Cooperatives (*IPCO State, CO-OP State*)
NuFarm Canada (*TruSlate Pro*)

Formulation:

The *Prestige XC* package has the following components:

***Prestige XC A* (PCP#29462):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 3.3 L

***Prestige XC B* (PCP#29465):** 50 g/L clopyralid and 280 g/L MCPA Ester formulated as an emulsifiable concentrates.

- Container sizes - 2 x 8.0 L

-or-

The *Foxxy CM* package has the following components:

Foxxy (PCP#32952): 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 6.4 L, 230 L

***Clobber M* (PCP#34157):** 50 g/L clopyralid and 280 g/L MCPA ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 8 L or 576 L

-or-

The *Esteem* package has the following components:

***ADAMA Fluroxypyr* (PCP#30815):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container size - 9.6 L

***ADAMA Clopyralid 360* (PCP#32898):** 360 g/L clopyralid formulated as a solution.

- Container size - 3.32 L

***ADAMA MCPA 2 EH Ester 600* (PCP#31669):** 600 g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container size - 11 L

-or-

***Prestige XL* (PCP#31428):** 61.56 g/L fluroxypyr and 42.72 g/L clopyralid and 239.5 g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 9.5 L per case, 113.6 L drum

-or-

***CO-OP State* (PCP# 34610), *IPCO State* (PCP#34597):** 77 g a.e/L fluroxypyr, 60 g a.e./L clopyralid and 210 g a.e./L MCPA ester formulated as an emulsifiable concentrate.

-or-

***Truslate Pro* (PCP#34546):** 77 g a.e/L fluroxypyr, 60 g a.e./L clopyralid and 210 g a.e./L MCPA ester formulated as an emulsifiable concentrate.

- Container size - 10 L

Crops and Staging:

Cereals:

- ***Spring wheat (including durum), barley, oats†† and canaryseed*†† (including hairless varieties for human consumption):*** 3 leaf to just before the emergence of flag leaf stage
- ***Winter wheat††:*** Apply in the spring from the 3 tiller stage to just before the emergence of flag leaf

Forage Grasses* grown for seed production:

- ***Seedling and established stands:*** 4 leaf until the emergence of the flag leaf.
  - Bromegrass (meadow††, smooth†††, hybrid†)
  - Fescue (creeping red, tall)†††
  - Timothy†††
  - Wheatgrass (crested†††, intermediate†††, slender†)

**** NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Users of this product on forage grasses and canary seed do so at their own risk.***

† ***Prestige Brands* only.**

†† ***Prestige Brands*, *CO-OP State*, *IPCO State*, and *TruSlate Pro* only.**

††† ***Prestige Brands*, *Esteem, CO-OP State*, *IPCO State*, and *TruSlate Pro* only.**

Improved Grass Pastures: *Prestige XL*, *CO-OP State*, *IPCO State* and *TruSlate Pro* only may be applied to improved grass-only tame pastures at the rates listed below.

Weeds, Rates and Staging:

DO NOT follow application of these products with another application of these products or other products containing fluroxypyr in the same year. Unless otherwise stated, the following weeds will be controlled if sprayed in the 2 to 4 leaf stage.

Only *Prestige XC A* at 125 mL per acre plus *Prestige XC B* at 607 mL per acre or *Prestige XL* at 708 mL per acre; or *CO-OP State*, *IPCO State*, or *TruSlate Pro* at 500 mL per acre or Esteem (*ADAMA Fluroxypyr 180* at 240 mL per acre plus *ADAMA Clopyralid* at 84 mL per acre plus *ADAMA MCPA Ester 600* at 280 mL per acre) controls:

- Burdock
- Canada thistle (light infestations)
- Chickweed‡
- Cleavers†
- Cocklebur
- Field horsetail***
- Flixweed (spring seedlings only)
- Kochia
- Hemp-nettle (2 to 6 leaf)‡
- Lady's thumb (up to 8 leaf) ‡‡
- Lamb's-quarters‡‡
- Plantain***
- Prickly lettuce
- Ragweeds
- Shepherd's-purse
- Stinkweed
- Stork's-bill (1 to 8 leaf)
- Vetch
- Volunteer flax (1 to 12 cm)
- Volunteer sunflower
- Wild annual sunflower
- Wild buckwheat††
- Wild mustard
- Wild radish

***Prestige XC A* at 166 mL per acre plus *Prestige XC B* at 809 mL per acre or *Esteem* (*ADAMA Fluroxypyr 180* at 320 mL per acre plus *ADAMA Clopyralid 360* at 111 mL per acre plus *ADAMA MCPA 2EH Ester 600* at 365 mL per acre) or *Foxxy CM* (*Foxxy* at 324 mL per acre plus *Clobber M* at 809 mL per acre); or *Prestige XL* at 947 mL per acre controls:**

The weeds controlled by Prestige Brands *above plus:*

- Annual sow-thistle
- Canada thistle* (moderate to heavy infestations)
- Chickweed (up to 6 cm)Δ
- Common groundsel
- Dandelion**
- Flixweed**
- Hemp-nettle (2 to 6 leaf stage)Δ
- Perennial sow-thistle*
- Redroot pigweed
- Round-leaved mallow (1 to 6 leaf)
- Russian pigweed
- Scentless chamomile
- Smartweed
- Tartary buckwheat
- Volunteer canola

*** Spray when 4 to 6 inches (10 to 15 cm) high. Season long control, with some regrowth in the fall.**
**** Spring rosettes only.**
***** Top growth control only.**
† 1 to 4 whorls with *Esteem* and *Foxxy CM*; 1 to 8 whorls with *Prestige Brands, CO-OP State, IPCO State* and *TruSlate Pro*.
†† 1 to 4 leaf with *Foxxy CM*, 1 to 8 leaf with *Esteem, CO-OP State, IPCO State, TruSlate Pro* and *Prestige Brands*.
Δ Suppression only with *Foxxy CM, CO-OP State, IPCO State,* and *Truslate Pro*, control with *Esteem*, *Prestige Brands*.
‡ Suppression only with *CO-OP State*, *IPCO State* or *TruSlate Pro* only.
‡‡ Prestige XL only.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
  - ***Aerial:*** 12 to 20 L per acre. Consult label for buffer zones.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE S572.1 coarse*** droplets. Tilt nozzles forward at a 45° angle to improve coverage of vertical targets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
clopyralid	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
MCPA	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

The activity of clopyralid/MPCPA + fluroxypyr is influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought or heat stress) or if heavy infestations exist.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- **In wheat (spring, durum, winter*) and barley:**
  - *Liquid Achieve*‡
  - *Puma Advance***
- **In wheat (spring, durum, winter):**
  - *Simplicity OD***
  - *Simplicity GoDRI**

*** *Prestige XL* only.**

**** *Prestige XL*, *CO-OP State*, *IPCO State*, and *TruSlate Pro* only.**

‡ **Not registered with *CO-OP State*, *IPCO State* or *TruSlate Pro*.**

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the clopyralid/MPCPA + fluroxypyr labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours of post-emergent application may result in reduced weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut for animal feed treated cereal or forage crops unless indicated below.
  - ***Wheat, barley, oats, or improved grass pastures:*** DO NOT cut or graze treated fields for 7 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Pre-harvest Interval:** DO NOT harvest treated crops within 60 days of application.
- **Re-cropping Interval:** Wheat, oats, barley, rye (not under-seeded to forage legumes, clover or alfalfa), flax, canola, field pea* and mustard may be seeded the season following application.
  **** NOTE: DO NOT seed to field pea for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field pea grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field pea an additional 12 months (22 months following application).***
  - *Contact the manufacturer for more information before seeding field peas following drought conditions in the previous year.*
  - DO NOT seed legume forages or crops other than those listed above until the second season following application.
- **Aerial Application:** Only *Prestige Brands CO-OP State*, *IPCO State* and *TruSlate Pro* may be applied by air.
- **Storage:** Store product in original containers in a secure, dry, heated area. If the product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only* (*Prestige* Brands, *CO-OP State*, *IPCO State*, and *TruSlate Pro*)	1	0	1
Ground only* (*Esteem, Foxxy CM*)	1	1	4
Fixed wing aircraft**	4	0	70
Helicopter**	1	0	55

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones for ground applications can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

**** Only *Prestige Brands, CO-OP State, IPCO State,* and *TruSlate Pro* may be applied by air.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

Prestige XL , CO-OP State, IPCO State, and TruSlate Pro: Refer to 'Method A' or 'Method B' using a specialized spray tank cleaner in the general section on sprayer cleaning in the introduction.

Other Products: Refer to 'Method C' in the general section on sprayer cleaning in the introduction. The addition of detergent to the second rinse is helpful for cleaning products with oil based formulations such as emulsifiable concentrates.

Hazard Rating:

Danger – Poison

Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Command Charge

Herbicide Group
13 - clomazone
14 – carfentrazone-ethyl

This product is a prepackaged tank mix of the equivalent of Command 360 ME *(*Command Charge A*) and the equivalent of* Aim EC *(*Command Charge B *). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above and select the most restrictive.*

Company:

FMC Corporation

Formulation:

The *Command Charge* package contains the following components:

***Command Charge A* (PCP#33558):** 360 g/L clomazone formulated as a microcapsule suspension.

- Container size - 2 x 5.4 L

-plus-

***Command Charge B* (PCP#33535):** 240 g/L carfentrazone-ethyl formulated as an emulsifiable concentrate.

- Container size - 2 x 1.2 L

Crops and Staging:

Apply prior to seeding canola and mustard.

DO NOT apply *Command Charge* to:

- Sandy soils
- Soils with greater than 10 percent organic matter
- Fields receiving applications of solid manure unless it has been thoroughly incorporated to a depth of 10 to 15 cm.

Weeds and Staging:

Emerged weeds controlled by *Command Charge B* (see *Aim EC*) and cleavers emerging from seed controlled by *Command Charge A* (see *Command 360 ME*).

Rate:

Note: MAXIMUM OF ONE APPLICATION per year of this or other products containing clomazone.

***Command Charge A*:** 135 mL per acre.

-plus-

***Command Charge B*:** 30 mL per acre.

Recommended to be tank mixed with glyphosate. If no glyphosate is used, add *Agral 90* or *Agsurf* at 0.25 L per 100 L of spray solution or *Merge* at 1 L per 100 L of spray solution. Tank mixes with glyphosate do not require a surfactant.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate (182 to 364 g ae per acre)

Note: The above Tank Mixes are those listed on the *Command Charge* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, applications details and handling. Unless indicated differently above use most limiting restrictions across all components for the mix.

Conquer II

Herbicide Group
6 - bromoxynil
14 - pyraflufen-ethyl

Company:

Nufarm Agriculture (PCP#33350)

Formulation:

15 g/L pyraflufen-ethyl and 467 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container sizes - 2 x 9.71 L, 77.7 L

Crops and Staging:

Canola, wheat (spring, durum, winter), barley, fall rye, oats, triticale, corn, canary seed: Apply prior to seeding or post-seeding but prior to crop emergence.

Fallow: Apply to small, actively growing weeds

Weeds, Rates and Staging:

Apply *Conquer II* at 122 mL per acre to control:

- Annual Sowthistle*
- Cleavers
- Cow cockle*
- Dandelion*
- Flixweed*
- Kochia
- Lamb's-quarters
- Narrow-leaved hawk's-beard*
- Night-flowering catchfly (Seedling)
- Redroot pigweed
- Stinkweed*
- Volunteer canola (cotyledon to 4 leaf)
- Wild buckwheat*
- Wild mustard*

*** Suppression only, control when mixed with the appropriate rate of glyphosate. Refer to the glyphosate label for rate recommendation.**

Apply *Conquer II* at 122 mL per acre plus glyphosate at 180 to 360 g ae per acre (see glyphosate) to control all weeds controlled by *Conquer II* alone and glyphosate alone plus:**

- Pineappleweed*
- Shepherd's-purse
- Stinkweed
- Wild buckwheat
- Wild mustard*

*** Suppression only, control when mixed with the appropriate rate of glyphosate. Refer to the glyphosate label for rate recommendation.**
**** present as isopropylamine or potassium salt**

Apply *Conquer II* at up to 242 mL per acre to control:

- Volunteer canola seedlings beyond the 3 leaf stage

Maximum TWO APPLICATIONS of *Conquer II, Blackhawk*, or *Goldwing* at the low (133 mL per acre) rate listed in this Guide (maximum 3.67 grams per acre of the pyraflufen-ethyl active) over A TWO YEAR TIME SPAN.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles & Pressure:** Flat fan nozzles with a spray pressure of 30 to 40 psi (210 to 275 kPa) is recommended. DO NOT apply with spray droplets smaller than the ***ASABE medium*** classification.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disrupter	Little (Apoplast)	Broadleaf only	6
pyraflufen-ethyl	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of *Conquer II* by allowing maximum foliar uptake and contact activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and regrowth may occur. Weed control may be reduced if the plants are beyond the recommended application growth stage, and during stress conditions, e.g. drought, heat or cold stress, or in heavy infestations where overlapping leaves prevent spray contact. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides

- ***Pre-Emergent and Pre Plant Incorporated:*** Glyphosate (Follow label rates)

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT use treated areas for grazing or green feed until 30 days after application.
- **Re-cropping Interval:** Registered crops can be seeded immediately after application. Any crops not listed can be seeded 30 days after an application of *Conquer II*.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry, secure place. DO NOT freeze. Heated storage required. Store above 3°C.
- **Buffer Zones:**

Application method/rate	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground* - 112 mL/acre	1	1	1
Ground* - 242 mL/acre	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy**

† Distance measured as metres from the downwind edge of the spray boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Danger – Poison

Warning – Contains the Allergen Soy

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Deathstar

Herbicide Group
2 - florasulam
4 - fluroxypyr, MCPA

These products are a prepackaged tank mix of Florasulam, Fluroxypyr and MCPA Ester.
Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
AgraCity

Formulation:
The *Deathstar* package contains the following components:
***Battlefront* (PCP#33003):** 50 g/L florasulam formulated as a suspension concentrate.
- Container sizes - 3.2 L, 9 x 3.2L

-plus-
***Foxxy* (PCP#32952):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes:
  - 2 x 12.8 L, 230 L

Crops and Staging:
Spring wheat, durum wheat, barley: Apply from the 3 to 6 leaf stage, prior to flag leaf.

Weeds and Staging:
Apply when weeds are at the 2 to 4 leaf stage unless otherwise indicated.
***Battlefront* at 40 mL per acre plus *Foxxy* at 320 mL per acre plus MCPA Ester 600 at 300 mL per acre (sold separately) will control:**
- Annual sow-thistle*
- Annual sunflower†§
- Ball mustard§
- Burdock†§
- Canada thistle*
- Chickweed
- Cleavers (1 to 4 whorls)§
- Cocklebur§
- Common ragweed§
- Cow cockle
- Dandelion*
- Flixweed§ (spring rosettes only)
- Hemp-nettle
- Kochia
- Lamb's-quarters§
- Narrow-leaved hawk's-beard*
- Perennial sow-thistle*
- Plantain*
- Prickly lettuce†§
- Redroot pigweed§
- Round-leaved mallow (1-6 leaf)
- Russian pigweed†§
- Shepherd's-purse
- Smartweed
- Stinkweed
- Stork's-bill*
- Vetch§
- Volunteer canola (all varieties)
- Volunteer flax (1 to 12 cm)
- Wild buckwheat
- Wild mustard
- Wild radish§

*** Suppression only.**
† Up to 4 leaf stage.
§ Requires additional 47 mL per acre of MCPA 600 Ester for control.

Tank Mixes:
None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Dicamba

Herbicide Group 4 - dicamba

Company:

BASF Canada (*Engenia, Banvel VM)*
Gharda Chemicals (*Oracle* distributed by UAP)
Bayer (*Xtendimax*, Xtendimax 2*)
Corteva Agriscience (*FeXapan*)*
Sharda Cropchem (*Disha 480*)
AgraCity (*Ammo*)
Viking (*Viking Dicamba*)

* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

Banvel VM **(PCP#29249),** ***Disha 480*** **(PCP#33851):** 480 g ae/L dicamba formulated as a solution of a diglycolamine salt.
Engenia **(PCP#32220):** 600 g ae/L dicamba formulated as a solution of N,N-Bis-(3-aminopropyl) methylamine salt.
Oracle **(PCP#26722),** ***Ammo*** **(PCP#34024),** ***Viking Dicamba*** **(PCP#34737):** 480 g ae/L dicamba formulated as a solution of a dimethylamine salt.
Xtendimax **(PCP#31896),** ***FeXapan*** **(PCP#32188):** 350 g ae/L dicamba formulated as a solution of a diglycolamine salt.
Xtendimax 2 **(PCP#33501):** 474 g ae/L dicamba as a monoethanolamine salt.

- Container sizes - various

Crops, Rates and Staging:

Note: The use of these chemicals may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sand, loamy sand and sandy loam soils) and/or the depth to the water table is shallow (less than 2 m). Avoid use in these situations.

Oracle is registered for the all of the uses below. *Banvel VM* is only registered for pasture and rangeland uses below.

Crop	Stage	g acid equivalent per acre	Rate (mL per acre) Rate (mL per acre)			
			480 g/L forms	*Engenia*	350 g/L forms	*Xtendimax 2*
Spring wheat*	2 to 5 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Barley*	2 to 5 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Oats*	2 to 5 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Canaryseed*	3 to 5 leaf	56	117	95	161	119
Winter wheat*	In spring 6 to 10 inches (15 to 25 cm) - prior to flag leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Spring rye*	2 to 3 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Corn, field	Broadcast up to 8 inches (20 cm). When higher, use drop-nozzles. Apply no later than 2 weeks prior to tassel emergence and prior to 20 inches (50 cm).	117 to 242	243 to 505	200 to 400	333 to 692	246 to 510
Corn, field + 2,4-D		56	117	95	161	119
Red fescue (for seed production)	Seedling: 2 inches (5 cm) tall. Established: up to the flag leaf stage.	117	243	200	333	246
Pastures	Established and actively growing	408 to 710	850 to 1,480	530 to 1182	1174 to 2550	866 to 1882

Crop	Stage	g acid equivalent per acre	Rate (mL per acre) Rate (mL per acre)			
			480 g/L forms	*Engenia*	350 g/L forms	*Xtendimax 2*
Seedling grasses (for seed and forage production): Fescue (creeping red, meadow, tall), meadow foxtail, orchardgrass, smooth bromegrass, timothy, wheatgrass (crested, intermediate, pubescent, slender, streambank, tall)	2 to 4 leaf	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Fall stubble	Apply according to weed stage.	480	1000 (1.0 L)	800	1376	1024
Fall stubble + glyphosate	Apply according to weed stage.	240	500	400	692	510
Pre-seeding cereals	Apply according to weed stage.	61	127	100	175	
Chemfallow + 2,4-D	Apply according to weed stage.	45 to 56	93 to 117	75 to 95	127.5 to 161	94 to 119
Chemfallow + glyphosate	Apply according to weed stage.	56 to 117	117 to 243	95 to 200	161 to 333	119 to 246

*** Should be mixed with a tank mix partner for broad spectrum control**

In Dicamba Tolerant Soybeans:
Apply to Roundup Ready 2 Xtend (dicamba and glyphosate tolerant) and Xtendiflex (dicamba, glyphosate and glufosinate tolerant) soybeans from prior to the emergence of the crop (Pre-plant or Pre-emergence) and/or after the emergence of the crop (Post-emergent) to the crop once or twice up to the early flower stage (R1) of the crop.

Crop	Rate (mL per acre)		
	Engenia	350 g/L forms	*Xtendimax 2*
Dicamba tolerant Soybeans	200 to 400	333 to 692	246 to 510

Weeds, Rates and Staging:

Apply to annual broadleaf weeds at the 2 to 3 leaf stage and to winter annual rosettes up to 2 inch (5 cm) across.

Dicamba applied alone at 45 to 56 g ae per acre will control:

- Cleavers (high rate only)
- Cow cockle
- Corn spurry
- Canada thistle*
- Perennial sow-thistle*
- Smartweed (green, lady's-thumb)
- Tartary buckwheat
- Wild buckwheat

Dicamba at 117 to 242 g ae per acre will control:

- Canada thistle**
- Canada fleabane
- Field bindweed**
- Kochia
- Lamb's-quarters
- Mustard (hare's-ear, Indian, tumble, wild, wormseed)
- Perennial sow-thistle**
- Pigweed (redroot, Russian)
- Ragweed (common, false, giant)

Dicamba at 408 g ae per acre in rangeland or 480 g ae per acre in fallow will control:
Weeds listed above plus:

- Curled dock*
- English daisy
- Goldenrod
- Tansy ragwort

Dicamba at 892 g ae per acre will control:
Weeds listed above plus:

- Diffuse knapweed
- Goat's-beard
- Ground cherry
- Pasture sage
- Povertyweed
- Sheep sorrel
- Thyme-leaved spurge

*** Top growth only.**

**** Three consecutive years of treatment are required for complete control.**

The following chart indicates weed and brush controlled by dicamba + 2,4-D mixes at the listed rates.

Weeds	Rate (g ae per acre)†	
	Dicamba	2,4-D
Poison ivy	322	426
Wild carrot	408	426
Aspen poplar	634	852
Prickly rose, western snowberry†††	710	852
	Rate (L per 1000 L of water)††	
Alder, aspen poplar, cherry, western snowberry, wolf willow, wild rose	408	745

† **Applied by broadcast sprayer.**
†† **Apply to the foliage and stems to the point of run-off using high volume equipment.**
††† **Ester formulations of 2,4-D only.**

Canada thistle, Perennial sow-thistle in fallow: Apply prior to the bud stage. Must be applied to thistle plants with 6 to 10 inches (15 to 25 cm) of new growth.

Canada thistle control in fall after harvest: When thistles exhibit new growth and at least 2 weeks prior to a killing frost.

Refer to label for full lists of weeds controlled by dicamba plus tank mixes in cereals, pastures, fallow and other situations.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Brush control in pastures: When brush is actively growing and is 6 feet (2 metres) in height or less (in spring or early summer). Growth greater than 2 metres may be cut and allowed to regrow prior to treatment.

Application Information:

- **Water Volume:**
  - ***Preseeding burnoff:*** 20 to 45 L per acre.
  - ***Annual crops:*** at least 45 L per acre.
  - ***Pastures, fallow and stubble:*** 45 to 90 L per acre.
  - ***Corn:*** 90 to 140 L per acre.
  - ***Brush:*** high volumes to the point of run-off.
- **Nozzles and Pressure:**
  - ***Broadcast application:***
    - *Dicamba tolerant soybeans (Enginia, FeXapan and Xtendimax only)*: Use nozzles that deliver **extremely coarse** to **ultra coarse** spray droplets (volume median diameter of **450 microns or more**) as defined by ***ASABE standard S572.1*** and as shown in the nozzle manufacturer's catalog.
    - *Other Uses:* Maximum 40 psi (275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver even coverage of ***ASABE coarse*** droplets.
  - ***Brush Control:*** Use high volume spray equipment producing large droplets including, but not limited to, hand-wand, boomless nozzle and Radi-Arc technologies.

Note: Refer to product labels for detailed application information

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba	POST (foliar) PRE (soil active)	Synthetic Auxin	Thoughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Crop damage (stunting, reduced seed set) can occur if the chemical is applied at any time other than the recommended stage.
DO NOT apply to crop under stress from adverse environmental conditions, such as excess moisture, drought and disease. Apply when air temperature is between 10 and 25°C.

DO NOT apply:

- when there is a risk of severe temperature fall in the night;
- under high humidity, temperatures above 30°C, or fog conditions, to prevent drift to sensitive crops;
- when wind is blowing toward a nearby sensitive crop;
- when winds are below 3 km per hour or above 15 km per hour.

Tank Mixes:

Herbicides:

	Spring wheat	Winter wheat	Barley	Oats	Seedling grasses
2,4-D Amine 160 g ae/acre	✓	✓	✓		✓
MCPA Amine (0.34 L/acre)	✓	✓	✓	✓	✓
MCPA K (0.44 L/acre)	✓	✓	✓	✓	✓
Sencor (0.11 to 0.17 L/acre)	✓		✓		
Ally (2 g/acre)	✓		✓		

In Canaryseed: MCPA amine (0.34 L per acre – 500 g ai/L formulation)

In Corn, Spring rye: 2,4-D amine (160 g ae per acre)

In Chemical fallow, stubble: 2,4-D, glyphosate products.

In Red fescue: 2,4-D amine (287 g ae per acre)

In Preseeding burnoff: Glyphosate (136 g ae per acre - see glyphosate for product rates)

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the dicamba labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing and Harvest Intervals:**
  - ***Canaryseed:*** Use only as birdseed.
  - ***Corn:*** DO NOT graze cattle or harvest for silage until 7 days after treatment of dicamba alone or for at least 12 weeks following dicamba tank mixes with other herbicides.
  - ***Cereals, seedling grasses, pasture:*** DO NOT harvest for silage for or graze lactating dairy cattle until 7 days after treatment. If treated vegetation has been consumed by dry dairy animals or meat animals within 30 days of dicamba application, feed the animal with untreated diet for 30 days before slaughter. Meat animals or dry dairy animals may graze or feed on treated pasture 3 days after dicamba application without restrictions on slaughter. Feed untreated forage within 3 days of slaughter.
  - ***Dicamba tolerant Soybeans:*** Pre-harvest interval of 7 to 10 days for soybean forage and 13 to 15 days for soybean hay. A plant back interval of 120 days is required for those not on the dicamba label.
- **Re-cropping Interval:** Grow only cereals, corn, soybeans or white beans the year after treatment with the 1.0 L per acre rate. Grow only cereals, corn, field beans, soybeans or canola the year after applications of 0.5 L per acre. If applications are made after September 1, or if dry weather persists after application, crop injury may occur the following spring.
- **Aerial Application:** May be applied by air on cereals only. Use a minimum water volume of 8 L per acre.
- **Storage:** May be stored at freezing temperatures.
- **Buffer Zones:**
  Buffers are not required for hand-held and backpack applications.

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*	Barley, oats, rye, wheat, canary seed, seedling forage grasses	0	0	1
	Corn, established forage grasses, red fescue	1	1	4
	Dicamba tolerant soybeans (*Engenia* and *Xtendimax* only)	1	1	4
	Stubble, fallow	1	1	5
	Pasture and rangeland	1	1	10

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Winged airplane	Barley, oats, rye, wheat	0	0	50
Helicopter		0	0	45

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to `Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Caution – Poison

Warning – Eye Irritant
Refer to the Introduction for an explanation of the symbols.

Dicamba / Fluroxypyr

Herbicide Group 4 - dicamba, fluroxypyr

Company:
Sharda Cropchem (*Diflux* – PCP#33988)

Formulation:
86.9 g/L dicamba and 113.3 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9.82 L, 78.6 L

Crops and Staging:
Barley and spring wheat (including durum): 2 to 5 leaf stage.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
Unless otherwise indicated apply when weeds are at the 2 to 3 leaf stage and rosettes are less than 2 inches (5 cm) across.
Applications at 246 mL per acre controls:
- Cleavers
- Kochia (up to 9-leaf)
- Wild buckwheat*

Applications at 371 mL per acre controls the weeds above plus:
- Lamb's-quarters*
- Redroot pigweed*
- Russian thistle
- Stork's-bill*
- Volunteer flax
- Wild buckwheat (up to 9-leaf)

*** Suppression only.**
ONE APPLICATION per year is permitted.

Application Information:
- **Water Volume:** Minimum 45 L per acre. If applying near sensitive crops such as soybeans, fruit trees, grapes, ornamentals, peas, lentils, potatoes, or tomatoes use 90 L per acre of water.
- **Nozzles and Pressure:** Use a maximum pressure between 40 and 45 PSI (275 to 310 kPa) for conventional flat fan nozzles. If applying near sensitive crops such as soybeans, fruit trees, grapes, ornamentals, peas, lentils, potatoes, or tomatoes use a maximum of 22 PSI (22 kPa). Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Dicamba, fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to crops that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result. DO NOT apply these products when temperatures are expected to exceed 30°C as off-target movement is more likely to occur, during and after application. Avoid application under high humidity or fog.

Tank Mixes:

Herbicides:

- ***Barley, Spring wheat, and durum only:***
  - MCPA LV600 ester (0.23 L per acre)
- ***Spring wheat, and durum:***
  - *Horizon NG* (376 mL per acre)
  - *Horizon NG* (376 mL per acre) + MCPA LV600 ester (0.23 L per acre)
  - *Traxos* (label rate)
  - *Traxos* (label rate) + MCPA Ester (rates above)

Fertilizers: None registered

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 60 days between treatment and harvest.
- **Grazing Restrictions:** Treated crops may be grazed, or cut for hay or silage after 7 days when used alone, or a minimum of 12 weeks when mixed or longer if the intervals are longer for the tank mix partner.
- **Re-cropping Interval:** Wheat, barley, oats, rye, forage grasses, flax, canola, mustard, lentils and peas may be grown the following season. There are no re-cropping restrictions the second year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen. If frozen, bring to room temperature and agitate before use. This product is combustible. DO NOT store near heat or open flame.
- **Buffer Zones:**
  - Handheld or backpack applications do not require a buffer.

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic habitat	Terrestrial habitat
Ground only*	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

  - Legumes are particularly sensitive to dicamba + fluroxypyr.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

 Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Dicamba / Mecoprop / MCPA

Herbicide Group 4 - dicamba, mecoprop-p, MCPA

Company:

Loveland Products Canada (*Sword* – PCP#27892)
Interprovincial Cooperative Limited (*Tracker XP* – PCP#27790)

Formulation:

275 g/L MCPA + 62.5 g/L mecoprop-p + 62.5 g/L dicamba formulated as a solution.

- Container sizes - 2 x 10 L, 500 L (*Sword* only), 1000 L (*Sword* only)

Crops and Staging:

All Products:
Cereals:

Crop	Stage
Barley	2 to 4 leaf (3 leaf for best crop safety)
Canaryseed (including for human consumption), oats, spring wheat (including durum)	2 to 5 leaf (3 to 4 leaf for best crop safety)
Winter wheat	Spring application only; up to 12 inches (30 cm) high (top leaf extended)
Fallow	Fall stubble

***Sword* only:**

- ***Seedling grasses grown for forage only (NOT for seed production)*:*** Apply at the 2 to 4 leaf stage.
  - Creeping red fescue
  - Meadow foxtail
  - Smooth bromegrass
  - Wheatgrass (crested, intermediate)
  - Orchardgrass
  - Timothy
- ***Established grasses for forage only (NOT for seed production)*:*** Apply up to flag leaf stage.
  - Bromegrass (meadow, smooth)
  - Meadow foxtail
  - Wheatgrass (crested, intermediate, pubescent, slender, streambank, tall, western)
  - Fescue (creeping red, meadow, tall)
  - Orchardgrass
  - Kentucky bluegrass
  - Timothy

**** NOTE: Use only one application per year by ground. Since applications to forage grasses in western Canada has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to forage grasses are at the risk of the user.***

Weeds and Staging:

Weeds controlled at 0.4 to 0.6 L per acre from the 2 to 3 leaf stage unless otherwise indicated:

- Bindweed* (field, hedge)
- Buckwheat (tame, tartary, wild)
- Canada thistle (6 to 8 inches (15 to 20 cm))*
- Cleavers (1 to 2 whorls)
- Corn spurry
- Cow cockle
- Flixweed
- Hemp-nettle (less than 2 pairs of true leaves)
- Kochia
- Lamb's-quarters
- Mustards (ball, tall, wild, wormseed, yellow)
- Night-flowering catchfly
- Pigweed (prostrate, redroot)
- Ragweed, common
- Russian thistle (less than 2 inches (5 cm))
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Sow-thistle (annual, perennial*)
- Stinkweed
- Volunteer canola
- Volunteer sunflowers

*** Top growth control only**

Use the higher rate under adverse weather conditions, when weed density is high, for cleavers control, winter annual control and for suppression of Canada thistle and perennial sow-thistle.

Although dicamba/mecoprop-p/MCPA is registered up to the 5 leaf stage of the crop for the rates listed here, the low rate should be used when the crop is at the 5 leaf stage for optimum crop safety.

For Canada thistle, post-harvest or fallow application, use 0.81 L per acre.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre.
  - ***Aerial:*** Minimum of 12 L per acre
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba, mecoprop, MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Hot and dry or cold and wet weather prior to spraying may result in reduced weed control and increased crop injury.
DO NOT apply within 2 weeks of a killing frost.

Tank Mixes:

Herbicides:

- ***Wheat and Barley:***
  - *Sencor* or linuron for chickweed control.

Fertilizers: None registered.
Insecticides: None registered.
Fungicides: None registered.
Note: The above mixes are those listed on the dicamba/mecoprop-p/MCPA labels only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Activity may be reduced if rainfall occurs within 3 hours of application. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or harvest for livestock feed within 7 days of application.
- **Pre-harvest Interval:** Leave at least 80 days from application to harvest.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** All may be applied by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:** Buffers are not required for hand-held and backpack applications.

Application method	Crops	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground *	Standing Crops	1	1	5
	Fallow and stubble	1	1	5
Fixed wing airplane	Cereals	1	0	60
	Canaryseed	1	0	75
	Forage	1	0	75
	Fallow and stubble	5	1	100
Helicopter	Cereals	1	0	50
	Canaryseed	1	0	60
	Forage	1	0	60
	Fallow and stubble	4	1	80

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:
 Caution – Poison

 Warning – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Dichlorprop/2,4-D

Herbicide Group
4 - dichlorprop, 2,4-D

Company/Products:
Nufarm Agriculture (*Estaprop XT*)
Interprovincial Cooperative Limited (*Dichlorprop-DX*)

Formulation:
***Estaprop XT* (PCP#29660); *Dichlorprop-DX* (PCP#29664):** 210 g/L of dichlorprop-P and 400 g/L of 2,4-D ester formulated as an emulsifiable concentrate.

- Container sizes:
  - ***Estaprop XT*** - 2 x 9.7 L
  - ***Dichlorprop-DX*** - 2 x 10L, 115 L

Crops and Staging:
Wheat (spring, durum) and barley: 4 leaf until the early flag leaf stage.

Winter wheat: in spring from tillering to the early flag leaf stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
Treat weeds when young and actively growing and before they are shielded by the crop. Additional stage restrictions indicated are the minimum indicated over all labels. Check individual labels for exceptions.

- Bluebur
- Burdock
- Canada thistle*
- Cocklebur
- Curled dock*
- Dandelion***
- Flixweed
- Kochia (up to 2 inches)
- Lamb's-quarters
- Mustards (ball, dog, hare's-ear, Indian, tumble, wild, wormseed)
- Night-flowering catchfly♦
- Oak-leaved goosefoot
- Pigweed (redroot, Russian)
- Prickly lettuce (2 to 12 leaf)†
- Ragweed (Common, giant†† ♦♦)
- Round-leaved mallow
- Russian thistle (up to 2 inches)
- Shepherd's-purse
- Sow-thistle (annual, perennial*)
- Spreading atriplex (cotyledon to 10 leaf)††
- Stinkweed
- Stork's-bill
- Toadflax**
- Volunteer canola

Control the following weeds up to the 4 leaf stage:

- Smartweed (including lady's-thumb)
- Tartary buckwheat
- Volunteer Sunflower
- Wild buckwheat

*** Top growth control only**
**** Suppression only; treat before the majority reach 6 inches (15 cm)**
***** Season long control in winter wheat**
♦ Spring annuals only
♦♦ Treat prior to the 6 leaf stage
† In winter wheat only
†† *Estaprop XT* in winter wheat only

Rates:
486 mL per acre.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dichlorprop, 2,4-D	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 97 L per acre*. Use a minimum of 40 L of water per acre to reduce the risk of drift.
  - ***Aerial:*** Minimum 12 L per acre.
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE coarse*** droplets or larger.

*** May vary by product. Check label closely.**

Effects of Growing Conditions:

Applications made under dry conditions may result in reduced control. Crops under stress from adverse environmental conditions, such as excess moisture, frost or drought, may be injured. Best weed control when adequate soil moisture is present and warm temperatures prevail. DO NOT apply when daytime temperatures exceed 27°C.

Tank Mixes:

Herbicides:

Tank Mix Partner (Mixed at label rates unless otherwise indicated)	Crops			
	Spring wheat	Durum	Winter wheat	Barley
Clodinafop$^{\Delta}$	•	•		
Fenoxaprop$^{\Delta}$	•	•		•†
Thifensulfuron/tribenuron$^{\Delta\dagger\dagger}$	•	•	•	•
Tralkoxydim $^{\Delta}$	•	•	•	•

† ***Vigil WB*** **only.**

†† ***Estaprop XT*** **only.**

$^{\Delta}$ **Manufacturers may only support mixes with specific products. Contact the manufacturer for more information.**

Note: Always refer to the label for the tank mix partner in this guide for additional restrictions on staging and varieties.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on dichlorprop-P+2,4-D labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** Leave 12 hours before entering treated fields.
- **Grazing Restrictions:** DO NOT graze the treated crop or harvest for hay or feed within 40 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Pre-harvest Interval:** Leave 40 days from spraying until harvest of winter wheat and 60 days for other crops.
- **Re-cropping Interval:** No restrictions the year after application. Fields treated with *Estaprop XT* may be replanted after a minimum of 30 days.
- **Aerial Application:** May be applied by air. Refer to specific product labels for full details for application by air.
- **Storage:** May be frozen.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat**
	Less than 1 m	Greater than 1 m	
Ground	1	1	1
Fixed wing aircraft	5	1	30
Helicopter	3	1	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Handheld or backpack sprayers do not require a buffer zone.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
 Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Diquat

Herbicide Group 22 - diquat

Company:
Syngenta Canada (*Reglone*, *Reglone Ion*, *Desica*)
ADAMA Canada (*Armory 240*)
Advantage Crop Protection (*Advantage Diquat 240*)
AgraCity (*Clone*)
Sharda Cropchem Canada (*Dessicash Desiccant*)
Federated Cooperatives (*CO-OP Bolster II*)
Interprovincial Cooperative Limited (*IPCO Bolster II*)
Loveland Products Canada (*Stage*)
Nufarm Agriculture (*Drifast*)
WinField United Canada (*Craven*)
Viking (*Viking Diquat*)

Formulation:
***Diquat 240* formulations = *Armory 240* (PCP#32726); *Advantage Diquat 240* (PCP#33731); *IPCO Bolster II* (PCP #33743); *Clone* (PCP#32997); *Co-op Bolster II* (PCP#33744); *Craven* (PCP#32231); *Desica* (PCP#30488); *Dessicash Desiccant* (PCP#31406); *Drifast* (PCP#32648); *Stage* (PCP#31597); *Reglone* (PCP#26396), *Viking Diquat* (PCP#34790):**
240 g/L diquat ion (present as dibromide) formulated as a solution.

- Container sizes - Various from 2 x 10 L to 1000 L

***Reglone Ion* (PCP#31058):** 200 g/L diquat formulated as a solution. Comes with a built-in-adjuvant

- Container sizes - 2 x10 L, 115 L, 450 L

Crops and Staging:
Note: As of January 1, 2022 www.keepingitclean.ca indicates that grain from crops treated with this product may have market access concerns. Please see introduction for more information AND *consult potential grain buyers before using this product.*

Field crops: Diquat is used to dry immature green material at top of indeterminate crops and green weeds to facilitate harvest. Diquat will not speed maturity of green crops. Treatment before the recommended stage can result in reduced yield and quality. Use *Agral 90*, a wetting and spreading agent at a rate of 1 L for each 1000 L of spray mixture unless otherwise stated. For bean or lentils, LI 700 at a rate of 2.5 L for each 1000 L of spray mixture may be used. For all applications of 240 g/L formulations. Refer to product labels for specific recommendations for adjuvant use.

Crop	Stage	Rate (L per acre)			
		240 g/L formulations		*Reglone Ion*	
		Ground	Aerial	Ground	Aerial
Canola*†	90% or more of seed has turned brown.	0.50 to 0.69†	0.69 to 0.93	0.61 to 0.83†	0.83 to 1.11†
Dry Beans (red and white kidney)	Crop has lost 80 to 90% of leaves and 80% of pods are yellow.				
Soybeans					
Faba beans††	Most plants are ripe and dry. Pods fully filled, bottom pods are tan or black in colour.				
Flax and Solin (low linolenic acid flax)	75% of bolls brown.				
Lentil	Lowest pods are light brown and rattle when shaken.				
Mustard (condiment type only)	75% of seed has turned brown.				
Peas	Bottom pods are ripe and dry, seeds detached from pods.				
Sunflowers	Backs of sunflower heads and bracts are turning yellow and seed moisture is 20 to 50%.	0.50 to 0.69†	0.69 to 0.93	0.61 to 0.83†	0.83 to 1.11†
Chickpeas†	Plants yellow, pods mature, seeds changed colour and detached from pods.	0.50 to 0.69†	0.69	0.61 to 0.83†	0.83
Potatoes (top growth mature and few weeds)	Two weeks prior to harvest.	0.5	Requires 2 Passes Pass #1: 0.69 to 0.93 L/acre** Pass #2: (4 to 5 days later) at 0.5 L/acre	DO NOT use *Reglone Ion* on Potatoes	
Potatoes (some top growth and/or some weeds)		0.69 to 0.93**†			
Potatoes (dense crop, heavy weed infestations)		1.42**†			
Alfalfa, bird's-foot trefoil, red clover, alsike clover††† and white clover (for seed production only)***	Pods are ripe but before shattering. Harvest within 7 days.	0.69 to 1.09†	0.69 to 1.09†	0.83 to 1.32†	0.83 to 1.32†

† **Use high rates for dense crops and/or heavy weed infestations. Use of high rates for canola and chickpea is recommended.**
†† **Except *Nufarm Drifast* and *Viking Diquat*.**
††† ***Reglone Ion* only.**
*** This use can cause shattering losses in non-shatter resistant canola.**
**** DO NOT use an adjuvant on potatoes except at the 0.5 L per acre ground application rate.**
***** DO NOT use on forage legumes that have been treated with a residual herbicide in the previous 12 months.**

Industrial Vegetation uses in Non-Crop Areas (*Diquat 240* formulations only): Apply 0.93 to 1.86 L per acre to kill topgrowth vegetation on areas to be maintained vegetation free. May be combined with soil active herbicides to maintain vegetation free.

Application Information:

- **Water Volumes:**
  - ***Ground:*** 91 to 222 L per acre. Use 222 to 445 L per acre on potatoes.
  - ***Aerial:*** 18 L per acre.

  Use the highest water volumes when crop canopy is heavy or if weed growth is dense.
- **Nozzles and Pressure:** 20 to 30 psi (150 to 200 kPa) when using conventional Flat fan nozzle tips are recommended for proper coverage. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Rotary atomizer nozzles and other low volume and ultra low volume application equipment are not recommended for use with diquat.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
diquat	POST (foliar)	PS I Inhibitor/Membrane disruptor	Little (Apoplast)	Non-selective	22

Effects of Growing Conditions:

Best results under cloudy conditions or in evening. Shattering losses can increase if heavy winds, rain or hail occur after the crop has dried down.

Tank Mixes:

Herbicides: None registered.
Insecticides: None registered.
Fungicides: Fungicides may be added when applying diquat to potatoes for vine killing.
Fertilizers: None registered.

Restrictions:

- **Rainfall:** Within 15 minutes may reduce effectiveness.
- **Restricted Entry Interval:** Leave 24 hours before entering treated fields.
- **Grazing Restrictions:** Crop residues remaining after harvest may be fed to livestock.
- **Pre-harvest Interval (note these recommended intervals may be for functional or marketability reasons):**
  - ***Faba bean, Lentil:*** Wait 4 to 7 days to harvest.
  - ***Forage Legumes:*** DO NOT exceed 7 days.
  - ***Canola, Mustard:*** Wait 7 to 10 days; maximum 14.
  - ***Sunflowers:*** Wait 15 to 20 days.
  - ***Flax, Peas:*** When sample tests dry.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** May be applied by air in a minimum of 18 L per acre water volume.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**

Application method	Crops	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*	Potatoes and Industrial Vegetation Management uses	10	5	5
	Other crops under "Crops:" section	5	3	3
Winged aircraft	Potatoes	200	100	100
	Beans, legume forage seed	150	80	90
Helicopter	Potatoes	125	65	80
	Beans, legume forage seed	100	55	70

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones for ground applications can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

When finished spraying diquat, rinse the sprayer out with clean water. Run through pump, lines and nozzles. Drain tank by spraying out on an untreated portion of a crop on which the product is registered, or by spraying on uncropped land. Refill sprayer with water and *Agral 90* at 0.6 L per 1000 L spray solution. Run the solution through lines and boom. Spray out, then refill with clean water. Leave equipment standing overnight, then drain water out.
Refer to the general section on sprayer cleaning in the introduction. for additional information.

Hazard Rating:


Warning – Poison


Caution – May Cause Eye Damage
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Distinct

Herbicide Group
4 - dicamba
19 - diflufenzopyr

Company:
BASF Canada (PCP#25811)

Formulation:
20% diflufenzopyr and 50% dicamba, sodium salt formulated as a water dispersible granule.
- Container size - 2 x 2.3 kg

Crops and Staging:
Fallow and Post-Harvest applications
Corn: 2 to 6 leaf stage
Note: The use of this chemical may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sand, loamy sand and sandy loam soils) and/or the depth to the water table is shallow.

Weeds, Rates and Staging:
Corn:

Distinct *applied post-emergent to weeds below at 115 grams per acre plus a non-ionic surfactant and UAN (liquid 28-0-0) at 1.25 L per 100 L of spray solution will control:*
- Biennial wormwood (2 to 8 leaf)
- Canada thistle*
- Cocklebur (6 leaf)
- Kochia (up to 15 cm)
- Lady's-thumb
- Lamb's-quarters
- Ragweed (common, giant**) (2 to 8 leaf)
- Redroot pigweed
- Sow-thistle, perennial** (2 to 10 leaf)
- Waterhemp
- Velvetleaf
- Volunteer canola (up to 4 leaf)
- Wild buckwheat

Fallow or post-harvest:

It is recommended that *Distinct* be tank-mixed with glyphosate and *Merge* adjuvant (200 mL per acre).

Distinct *at 58 grams per acre, as a tank mix with glyphosate, provides enhanced control of the following weeds:*
- Dandelion*
- Kochia
- Lamb's-quarters
- Narrow-leaved hawk's-beard
- Redroot Pigweed
- Round-leaved mallow
- Sow-thistle, spiny annual
- Wild buckwheat

Distinct *at 115 grams per acre controls:*
- *Weeds listed* at 58 grams per acre plus:
  - Biennial wormwood (2 to 8 leaf)
  - Canada thistle*
  - Cocklebur
  - Lady's-thumb
  - Lamb's-quarters
  - Redroot pigweed
  - Ragweed, common
  - Sow-thistle, perennial**
  - Waterhemp
  - Velvetleaf
  - Volunteer canola (up to 4 leaf)
  - Wild buckwheat

*** Top growth control only.**
**** Suppression only.**

A general guide to mixing can be found in the introduction.

DO NOT exceed a maximum application rate of 115 grams per acre of *Distinct* per season.

Application Information:
- **Water Volume:** 20 to 80 L per acre. High water volumes are required for adequate coverage, particularly when weed densities are high or weed staging is large.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage a of ***ASABE coarse*** droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
diflufenzopyr	POST (foliar)	Auxin transport inhibitor	To growth areas of the plant (Symplast)	Broadleaf only	19

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C or less are forecast within 3 days of application or when temperatures are expected to exceed +27°C on the day of application. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Herbicides:

- ***Fallow and Post-harvest:***
  - Glyphosate (180 to 360 g ae per acre) - recommended
- ***Corn:***
  - None registered in western Canada.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Restrictions:

- **Rainfall:** Rain within 4 hours may reduce control.
- **Restricted Entry Interval:** Leave 12 hours before entering treated fields.
- **Grazing Restrictions:** DO NOT graze or cut as feed for 75 days.
- **Pre-harvest Interval:** DO NOT apply within 120 days of harvesting corn.
- **Re-cropping Interval:** A plant back interval of 30 days is required for the planting of rotational crops. If applying between September 1st and 30th at the low rate (58 g per acre), BASF supports plant back to these crops the following spring – canola, lentil, field peas, soybeans, or cereal crops. Please contact BASF Canada for a full list of supported rotational crops.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place above 5°C.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only	15	15	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Distinct can cause injury to sensitive crops at very low concentrations. Sprayers used to spray this product should be flushed out immediately after use.

Use 'Method B' in the introduction to clean sprayers after using *Distinct*.

Hazard Rating:

Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Eclipse XC

Herbicide Group
4 - clopyralid
9 - glyphosate

This product is a prepackaged tank mix of clopyralid and glyphosate.
Information listed is restricted to Crop, Weeds and Rates. For other detailed information on the component products see the product pages listed above.

Company:

Corteva Agriscience (*Eclipse XC**)

**** Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

The *Eclipse XC* package contains the following components:

***Eclipse XC A* (PCP#32883):** 600 g/L clopyralid formulated as a solution.

- Container size - 2.67 L

-plus-

***Eclipse XC B* (PCP#32852):** 480 g/L glyphosate present as an dimethylamine (DMA) salt and formulated as a solution.

- Container sizes - 2 x 7.5 L, 90 L

Crops and Staging:

Glyphosate tolerant canola varieties only in the 2 to 6 leaf stage. Some yellowing may occur when applied at the 4 to 6 leaf stage. This effect is temporary and will not influence crop growth, maturity or yield.

Weeds and Staging:

No staging is specified on the label.

The weeds controlled by glyphosate at 180 g ae per acre plus:

- ***Annual broadleaf weeds:***
  - Chickweed
  - Corn spurry
  - Cow cockle
  - Kochia*
  - Night-flowering catchfly
  - Shepherd's-purse
  - Smartweed
  - Wild tomato
  - Volunteer canola*
- ***Perennial weeds (season long control):***
  - Canada thistle
  - Dandelion less than 15 cm diameter**
  - Dandelion greater than 15 cm diameter***
  - Perennial sow-thistle**
  - Quackgrass

*** Not including glyphosate tolerant/resistant types.**
**** Top growth only.**
***** Suppression only.**

Rates:

Eclipse XC A: 69 mL per acre
Eclipse XC B: 375 mL per acre
To prepare spray solution, add the clopyralid component to the spray tank. Once it is half filled with water, add the glyphosate component as the remaining water is added to the tank.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage and a minimum of fine droplets that are prone to drift. **DO NOT use with galvanized sprayer tanks since explosive hydrogen gas can be produced.**

Restrictions:

- **Re-cropping Interval:** Wheat, oats, barley, rye (not underseeded to legumes such as alfalfa and clover), forage grasses, flax, canola, mustard and field pea* can be grown the year after application. Manure bedded with straw from treated crops may only be applied prior to the crops listed above with the exception of field pea. Soybean* can be planted the year following *Eclipse XC*.
  *** DO NOT seed to field peas or soybean for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury when grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding these crops an additional 12 months (22 months following application). Contact your local the manufacturer or retailer for more information before seeding these crops following drought conditions in the previous year.**
- **Aerial Application:** DO NOT apply by air.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Edge MicroActiv (this referring text to be removed in the 2025 edition)

see Ethalfluralin

Enforcer D

Herbicide Group
4 - fluroxypyr, 2,4-D
6 - bromoxynil

Company:

Nufarm Agriculture (PCP#30690)

Formulation:

80 g/L fluroxypyr, 190 g/L bromoxynil and 240 g/L 2,4-D ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10 L, 120 L, 480 L

Crops and Staging:

Spring wheat (including durum) and barley: 4 leaf stage until the flag leaf is fully emerged.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Apply to emerged weed seedlings up to the 5 leaf stage unless otherwise indicated.

Weeds controlled at the 0.24 L per acre rate:

- Broadleaf plantain
- Cleavers
- Common groundsel
- Kochia (up to 5 cm tall)
- Hemp-nettle
- Knotweed
- Lady's-thumb
- Lamb's-quarters
- Night-flowering catchfly
- Shepherd's-purse
- Stinkweed
- Stork's-bill
- Volunteer canola
- Wild mustard

Weeds controlled at the 0.48 L per acre rate:

- *Weeds listed above plus:*
  - Canada thistle (suppression)
  - Dandelion
  - Field horsetail
  - Redroot pigweed
  - Round-leaved mallow
  - Russian thistle
  - Volunteer flax
  - Wild buckwheat

Application Information:

- **Water Volume:** Minimum 20 to 40 L per acre. Use the higher volume when there is a heavy crop canopy or weeds are at an advanced stage.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fluroxypyr, 2,4-D	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
bromoxynil	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

Optimum activity is experienced between 12 to 24°C when weeds are actively growing. Weeds may not be actively growing and as a result reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after an application may reduce crop tolerance and weed control efficacy.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim (*Nufarm Tralkoxydim* and *Liquid Achieve* only)
  - Fenoxaprop (*Puma Advance* only)
  - Thifensulfuron/tribenuron (*Boost* only) - 2.7 grams per acre
- ***In spring wheat (including durum) only:***
  - Clodinafop 240 EC (*Signal* only)
  - *Simplicity OD*
  - *Varro*

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Enforcer D* labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze or cut for livestock feed within 30 days of application. Withdraw meat animals from treated feed 3 days before slaughter.
- **Pre-harvest Interval:** DO NOT harvest within 60 days of application.
- **Re-cropping Interval:** Barley, canola, flax, forage grasses, lentil, mustard, oats, pea, rye and wheat can be seeded the following year or fields can be fallowed.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a ventilated room above freezing. If frozen, allow container to warm and shake well before using.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

The manufacturer provides no recommendations on how to clean equipment used to apply this product. As a petroleum based emulsifiable concentrate, 'Method B' in the general section on sprayer cleaning in the introduction may be the most effective.

Hazard Rating:

 Caution – Poison

 Caution – Skin and Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Enlist Duo

Herbicide Group
4 - 2,4-D
9 - glyphosate

Company:
Corteva Agriscience (PCP#30958)

Formulation:
194 g ae/L 2,4-D present as a choline salt and 204 g ae/L glyphosate present as a dimethylamine salt formulated as a solution.
- Container sizes - 2 x 8.7 L, 556.8 L

Crops, Rates and Staging:
Prior to seeding or post-seeding pre-emergence: Wheat (spring, durum, winter), barley, rye, field corn
Post-emergence:
- ***Enlist E3 soybeans:*** up to R2 (full flowering stage)
- ***Enlist corn:*** Up to the V8 growth stage or 120 cm (48 in) height

Weeds and Staging:
Apply when weeds are small and actively growing.

Grassy weeds controlled:
- Barnyard grass
- Foxtail (green)
- Proso millet (wild)
- Quackgrass
- Volunteer barley
- Volunteer wheat
- Wild oats
- Yellow nutsedge**

Broadleaf weeds controlled:
- Biennial wormwood*
- Bindweed (field**, hedge)
- Bluebur
- Blue lettuce*
- Buckwheat (wild, tartary)
- Burdock*
- Canada fleabane
- Canada thistle**
- Chickweed (common, mouse-eared*)
- Cleavers
- Cocklebur
- Common plantain
- Common purslane
- Common tansy
- Corn spurry
- Cow cockle
- Daisy fleabane
- Dandelion
- False flax
- Field horsetail
- Field peppergrass
- Flixweed
- Goat's-beard
- Hairy galinsoga
- Hemp-nettle
- Hoary cress
- Kochia
- Lamb's-quarters
- Leafy spurge*
- Milkweed (common**)
- Mustards (except green tansy)
- Narrow-leaved hawk's-beard
- Night-flowering catchfly
- Nightshade (Eastern black)
- Oak-leaf goosefoot
- Pigweed/amaranth (redroot, Russian, smooth, Palmer**, waterhemp)
- Pineappleweed
- Ragweed (common, giant)
- Round-leaved mallow**
- Russian thistle
- Shepherd's-purse
- Smartweed (green, Pennsylvania, lady's-thumb)
- Sow-thistle, (annual, perennial**)
- Stinkweed
- Sweet-clover
- Vetch
- Velvetleaf
- Volunteer canola
- Wild radish
- Wild sunflower (annual)
- Wild tomato
- Yellow nutsedge**

*** Top growth control.**
**** Use 2 applications for best control. The 2nd application should be no later than the V8 stage of corn. Milkweed should be 15 to 60 cm in height and actively growing. Yellow nutsedge should be 5 to15 cm in height and actively growing. Canada thistle and perennial sow-thistle should be from the rosette stage to 50 cm in height and actively growing. The 2nd application should be at least 2 weeks after the first for best control of these perennial weeds.**

Rates:
Apply at 1.74 L per acre. DO NOT apply more than 2 applications (3.48 L per acre total) per season.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 80 L per acre. Corteva Agriscience recommends 40 to 60 L per acre.
- **Nozzles and Pressure:** DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse to extremely coarse*** droplets by ground to significantly reduce the potential for drift. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
2,4-D choline salt	POST (foliar)	Synthetic Auxin	Symplast	Broadleaf only	4
glyphosate	POST (foliar)	EPSP Amino Acid Synthesis Inhibitor	Toward growth areas (Symplast)	Non-selective broadleaf & grass, except HT crops	9

Effects of Growing Conditions:

Enlist Duo herbicide is a systemic herbicide and is intended for control of emerged annual and perennial weeds. *Enlist Duo* herbicide is selective to *Enlist* (glyphosate and 2,4-D tolerant) varieties. Foliar application to non-tolerant varieties will cause serious crop damage and yield loss. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. In general, increase spray volume as crop canopy, height and weed density increase to obtain adequate spray coverage.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: Glyphosate (480 g/L present as the DMA salt).
Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** *Enlist Duo* should not be applied when rainfall is expected within 2 hours of completion of the application.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***Enlist Corn:*** Lactating livestock may be grazed on treated crops 7 days following application. Withdraw meat animals from treated field at least 3 days prior to slaughter. DO NOT graze *Enlist* soybean.
- **Pre-harvest Interval:** DO NOT harvest within 30 days of application.
- **Re-cropping Interval:** There are no crop rotational restrictions to fields previously treated with *Enlist Duo* after a minimum of 10 months. During the growing season, if replanting is required following application of *Enlist Duo* herbicide, observe all planting restrictions for 2,4-D pre-plant applications (i.e., delay planting a crop sensitive to 2,4-D).
- **Aerial Application:** DO NOT apply by air.
- **Storage:** This product must be stored away from fertilizers, seeds, insecticides, fungicides or other herbicides intended for use on 2,4-D and glyphosate sensitive crops.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:


Caution – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Eptam Liquid EC

Herbicide Group 15 (formerly Group 8) - EPTC

Company:
Gowan Canada (PCP#11284)

Formulation:
800 g/L of EPTC formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 1000 L

Caution: *The level of weed control may be reduced where* Eptam Liquid EC *is used on soils that have been treated with* Eptam Liquid EC *the previous growing season. It is expected that the reduction in control will be greater where* Eptam Liquid EC *have been used repeatedly for 2 or more years.*

Crops, Rates and Staging:
Eptam Liquid EC is applied as a pre-plant incorporated treatment prior to seeding the following crops:

Crop	Rate (L per acre)
Dry beans	1.72 to 2.23
Alfalfa, birdsfoot trefoil, cicer milkvetch**, sweet clover**, sunflowers*	1.72
Potatoes	1.72 to 3.44
Flax*	1.42 to 1.72

*** May also be applied in late fall prior to freeze-up.**
**** Seed production only.**

NOTE: The use of *Eptam Liquid EC* on flax is not recommended in Saskatchewan because of the risk of crop injury.

Where a rate range appears, use the lower rate on light textured soils and the higher rate on heavy textured soils.

DO NOT apply *Eptam Liquid EC* to:
- soils with less than 3 percent organic matter
- soil with more than 15 percent organic matter.

Weeds and Staging:
Must be applied prior to the emergence of the following weeds. Emerged weeds will not be controlled.
- Barnyard grass
- Chickweed*
- Corn spurry*
- Foxtail (green, yellow)
- Hairy nightshade*
- Henbit *
- Lamb's-quarters*
- Nettleleaf goosefoot*
- Pigweed (prostrate, redroot, tumble)*
- Purslane*
- Quackgrass (suppression)**
- Volunteer cereals (wheat, barley, oats)
- Wild oats
- Yellow nutsedge**

*** Will be controlled only if treatment is made when conditions are favourable for germination and growth.**
**** Roots of perennial weeds must be thoroughly chopped prior to application.**

Application Information:
- **Water Volume:** Minimum of 40 L per acre of water. May be mixed with liquid fertilizer in place of water (see label for liquid fertilizer compatibility).
- **Pressure:** 30 to 40 psi (200 to 275 kPa).
- **Equipment and Nozzles:** Since *Eptam Liquid EC* is highly volatile, the product must be incorporated immediately. This is best accomplished by mounting spraying equipment directly onto the incorporation equipment (tandem disks, field cultivators on light soil). May also be applied to cleanly cultivated soil for potatoes, by metering into the irrigation water to achieve the recommended rate per acre ("herbigation" or "chemigation"). See label for detailed instructions.
- **Incorporation:** All growth and stubble should be thoroughly worked into the soil before treatment. Apply to a dry soil surface. Incorporate immediately after application preferably during the spraying operation as *Eptam Liquid EC* is volatile. Set disc and cultivator implements to cut to a depth of 4 to 6 inches (10 to 15 cm). A second operation at a right angle to the first is required. The disc or cultivator must be followed with a harrow or other levelling device that extends beyond the width of the implement. Speeds in excess of 8 km per hour (5 miles per hour) will result in excessive pulverization and crop residue destruction leaving the field susceptible to erosion. The maximum recommended tillage depth is 4 inches (10 cm).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
EPTC	PPI (soil active)	Lipid Synthesis Inhibitor (Non-ACCase)	Little movement in plant (Apoplast)	Broadleaf & Grass	15 (formerly Group 8)

Effects of Growing Conditions:

Crop injury can occur if stressful environmental conditions (cold, wet soils, drought or excessive heat) occur after seeding. To minimize crop injury, delay seeding 10 days if these conditions occur at the time of application, or select an alternative product. Very cold or dry soil conditions during weed emergence will reduce control.

Tank Mixes:

Herbicides:

- ***Dry beans (navy and red kidney only):*** Liquid formulations of *Treflan* and *Rival*.

Insecticides: DO NOT tank mix with insecticides.

Fungicides: None registered.

Fertilizers: May be mixed with liquid fertilizer.

- Compatibility test should be conducted according to instructions on the herbicide label.
- Dry bulk fertilizers, except nitrate fertilizers, may be impregnated or coated with *Eptam Liquid EC*. The impregnated fertilizer should be spread uniformly onto the field using a double overlap pattern immediately after impregnation. The impregnated fertilizer must be applied to the field when the soil surface is dry to at least 0.5 inch (1.5 cm) depth. The first incorporation must be done immediately after application.

Note: The above mixes are those listed on the *Eptam Liquid EC* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No effect once incorporated. DO NOT apply prior to irrigation.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated crops to livestock in the year of application.
- **Re-cropping Interval:** Will not injure crops the year after spring application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:** DO NOT apply within 15 m of fish bearing waters or wildlife habitat.

Sprayer Cleaning:

No detailed cleaning procedures are indicated on the label. Use a commercial all purpose spray sprayer cleaning product for adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:


Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Escort

Herbicide Group
2 - metsulfuron

Company:
Envu Canada (PCP#23005)

Formulation:
60% metsulfuron-methyl formulated as a water dispersible granule.
- Container size - 0.25 kg

Crops and Staging:
Pasture, rough turf, and rangeland: No stage restrictions.

Weeds, Rates and Staging:
For seedling weeds apply to young plants up to 4 inches (10 cm) tall or wide. For established non-woody plants (biennial or perennial) apply up to the early bud stage. For western snowberry, wild rose and other woody species, apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Rate	Weeds Controlled	
8 g/acre	Canada thistle* Dandelion* Russian thistle Sow-thistle*	Common tansy Scentless chamomile Sweet clover
10 g/acre	*Above weeds plus:* Western snowberry	
12 g/acre	*Above weeds plus:* Wild rose	 Dandelion
40 g/acre**	Balsam poplar	Willow
60 g/acre**	Cherry	Trembling aspen

At all rates add *Agral 90, Agsurf II*, or *Citowett* at 0.2 L per 100 L of spray solution.
*** Suppression only.**
**** Rangeland only. See label for detailed application instructions.**
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information
- **Water Volume:** 40 to 91 L per acre for weedy growth and up to 809 L per acre applied to the point of run-off for woody species. See the label for details.
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron-methyl	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf only	2

Effects of Growing Conditions:
DO NOT apply during periods of intense rainfall or to soil saturated with water. Warm, moist conditions following treatment enhance the activity of *Escort*, while cold, dry conditions may reduce or delay activity. Brush hardened off by cold weather and drought stress may not be controlled.

Tank Mixes:

Herbicides: 2,4-D amine or ester (371 g ae per acre) plus surfactant.
Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** May be grazed by cattle on the day of treatment.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**
  Buffers are not required for hand-held and backpack applications.

Rate (g per acre)	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat**
	Less than 1 m	Greater than 1 m	
8 to 12	1	1	10
40	2	1	35
60	3	1	45

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Terrestrial buffers are not required for transport and utility rights-of-way**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Escort can cause severe injury to sensitive crops at very low concentrations. Use 'Method A' in the introduction to clean sprayers immediately after using *Escort*.

Hazard Rating:


Caution – Eye Irritant
Refer to the Introduction for an explanation of the symbols.

Esplanade SC

Herbicide Group
29 - Indaziflam

Company:
Envu Canada (PCP#31333)

Formulation:
200 g/L of indaziflam formulated as a suspension concentrate.
- Container sizes - 4 x 1 L, 2 x 10 L

Crops and Staging:
Non-crop areas where bare ground is desired (i.e., rights-of-way, roadsides, industrial sites, fence lines and other non-crop areas). DO NOT use in residential or recreational areas, where bystanders could be exposed during or after application. DO NOT apply to cropland.

Weeds and Staging:
Soil active, residual control of the emergence of the following weeds. Apply to target surface as a uniform broadcast or band application before weeds germinate.

Broadleaf weeds controlled:
- Bittercress
- Black medick
- Carpetweed
- Chickweed (mouse-eared)
- Common groundsel
- Cudweed
- Curled dock
- Field bindweed
- Fleabane (hairy)
- Hawk's-beard (smooth, green)
- Henbit
- Kochia*
- Lamb's-quarters
- London rocket*
- Mustard (black, wild)
- Nightshade (American black, hairy)
- Pigweed (prostrate, redroot*)
- Plantain (buckthorn)
- Prickly lettuce*
- Prostrate knotweed
- Purple vetch
- Purslane
- Round-leaved mallow
- Shepherd's-purse
- Sow-thistle (annual)
- Spotted spurge
- St-John's wort
- Stork's-bill
- Sunflower (wild, annual)
- White clover*
- White sweetclover
- Yellow star-thistle
- Yellow woodsorrel

Grassy weeds controlled:
- Annual bluegrass
- Annual brome (downy, Japanese)
- Barnyard grass
- Crabgrass (large, smooth)
- Foxtail (green, yellow)
- Medusa head
- Ryegrass (annual, Italian, perennial)
- Stinkgrass
- Tufted lovegrass
- Volunteer common rye
- Wild oats
- Wild proso millet
- Witchgrass

*** Suppression only.**

Rates:
152 mL per acre

Note: Excessive plant debris present on the soil surface at time of application may prevent uniform product distribution reaching the soil and reduce weed control. Performance may be improved by removing excessive debris prior to product application.

Apply ONE APPLICATION of this product or other products containing indaziflam per year.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum 40 to 380 L per acre. Use adequate volumes to provide complete even soil coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE S572.1 coarse droplets*** or coarser. DO NOT apply with hollow cone nozzles or other application equipment that does not provide uniform coverage.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Indaziflam	Pre-emergent	Inhibitor of cell wall synthesis site C	No appreciable movement	Broadleaf and Grassy Weeds	29

Effects of Growing Conditions:

Esplanade SC is a persistent soil active herbicide. As a soil active herbicide, this product relies on rainfall to move it into the germination zone of weedy species. *Esplanade SC* is broken down by soil microbes; therefore, persistence can vary based on availability of rainfall. Low rainfall will allow this product to persist for longer and moist conditions will cause the product to persist for a shorter period. Very heavy rain may leach the product out of the germination zone and reduce control.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Glyphosate† (360 to 1750 g ae per acre)
- *Milestone* (0.1 to 0.2 L per acre)
- Glyphosate† + *Milestone* (rates above)
- *Payload* + Glyphosate† (rates above)
- *Navius Flex* plus a non-ionic adjuvant, *Merge* adjuvant, or *Crop Oil Concentrate*

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

† **Note: The manufacturer may not support all brands of these products. See the label or contact Bayer for more information.**

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Treatments are most effective in controlling weeds when adequate moisture is present and the application is followed by rain prior to weed seed germination.
- **Restricted Entry Interval:** DO NOT enter treated areas until sprays have dried.
- **Grazing Restrictions:** There are no grazing or haying restrictions (including cattle, horses, sheep and goats) when used alone.
- **Re-cropping Interval:** DO NOT apply to cropland.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** CANNOT be stored below freezing. Keep in original container during storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	15**

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

**** Buffer zones for protection of terrestrial habitats are not required for applications to rights-of-way, including railroad ballasts, rail and hydro rights-of-way, utility easements and roads and training grounds on military bases.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Note: Avoid application of this product when winds are gusty.

Sprayer Cleaning:

Refer to 'Method C' in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:


Causes Moderate Eye Irritation

Refer to the Introduction for an explanation of the symbols.

Ethalfluralin

Herbicide Group 3 - ethalfluralin

Company:

Gowan Canada (*Edge MicroActiv* - PCP#32904)
Advantage Crop Protection (*Advantage Ethalfluralin 10%* - PCP#34586)

Formulation:

10% ethalfluralin formulated as a granular.

- Container size - 454 kg

Crops and Staging:

Ethalfluralin can be applied prior to seeding the following crops:

- Seedling alfalfa (seed production only)
- Camelina*
- Canola
- Caraway
- Chickpeas*
- Coriander
- Dry beans**
- Industrial hemp*
- Faba beans
- Lentils†
- Mustard (yellow only)
- Peas
- Safflower
- Soybeans
- Sunflowers

† *Advantage Ethalfluralin 10%* is registered for fall application only, where one incorporation is completed in the fall. *Edge MicroActiv* may be applied spring or fall. Fall application may be for both conventional tillage and direct seeding systems. Spring application of *Edge MicroActiv* is for use with direct seeding systems only. Seeding depth is critical – DO NOT seed more than 1.5 inches (4 cm) deep. Avoid loose seedbeds and planting into cold soils.

*** Since this use is registered under the User Requested Minor Use Label Expansion program, the manufacturers assume no responsibility for herbicide performance. Application to camelina, chickpeas and industrial hemp is at the risk of the user.**

**** *Advantage Ethalfluralin 10%* for navy and kidney only. *Edge MicroActiv* is registered for all dry bean (*Phaseolus vulgarus*) types but tolerance may vary across varieties. Apply to a small area initially to determine tolerance before adopting over a larger area.**

Weeds and Staging:

For pre-emergent control of the following weeds:

Grassy Weeds:

- Barnyard grass
- Foxtail (green**, yellow)
- Volunteer barley*
- Volunteer spring wheat*
- Wild oats*
- Witch grass

Broadleaf Weeds:

- Cleavers*
- Chickweed
- Corn spurry
- Cow cockle
- Hemp-nettle*
- Kochia
- Lady's-thumb*
- Lamb's-quarters
- Nightshade*
- Pigweed (prostrate, redroot)
- Purslane
- Russian thistle*
- Wild buckwheat

*** Suppression only.**
**** Not including group 3 herbicide resistant biotypes.**

Rates:

Note: Successful use of this product requires proper field preparation and product incorporation. For instructions on proper application under various situations see 'Application Information' below.

	Rate (kg per acre)				
	Light Textured Soils		Medium to Heavy Textured Soils		
	2 to 6 percent Organic Matter Dark Brown-Black	6 to 15 percent Organic Matter Deep Black	2 to 4 percent Organic Matter Dark Brown	4 to 6 percent Organic Matter Black	6 to 15 percent Organic Matter Deep Black
Spring	3.4	4.5	3.4	4.5	4.9 to 5.7
Fall	4.5	5.7	4.5	5.7	5.7

DO NOT apply to:

- soils containing less than 2 percent organic matter (including eroded knolls)
- soils containing greater than 15 percent organic matter.
- fields that received applications of manure within the last 12 months. After this period, manure must be thoroughly incorporated to a depth of 10 to 15 cm.

To reduce the possibility of injury to the treated crop, use good quality certified seed. Seed shallow into a warm, moist, firm seedbed using recommended agronomic practices that will promote rapid and even crop germination and emergence.

Application Information:

Apply uniformly with a properly calibrated granular herbicide applicator. Avoid concentration of the herbicide in narrow bands. Calibrate the applicator according to manufacturer's directions and check frequently during application to be sure equipment is operating correctly.

Direct Seeding Systems (minimum tillage systems):

- ***General:***
  - Direct-seeding is defined as seed placement into standing stubble (including chemical fallow) with minimum soil disturbance (<30 percent) and maximum surface residue retention. *Edge MicroActiv* may be used on fields that have been in direct-seeding systems for at least two consecutive years. When seeding, a one pass, direct-seeding operation is recommended.
  - Application to the soil surface provides residual control of susceptible weeds within the top 2.5 cm of the soil surface but will not control weeds that germinate from deeper (>2.5 cm).
- ***Land Preparation:***
  - *Crop Residue Management:* Chopping, spreading and even distribution of straw and chaff residues will prevent plugging or hairpinning during the seeding operation. Poor and uneven crop emergence, cold wet soils, soil nutrient tie-up and delayed and uneven maturity may also be a result of inadequate residue management.
  - *Pre-seeding (Burn Off) Weed Control: Edge MicroActiv* will not control emerged weeds. A pre-seeding burn-off herbicide treatment is required to eliminate weed competition prior to crop emergence.
- ***Instructions:***
  - Use of a single harrow operation assists in managing straw residue to ensure good herbicide soil contact. Avoid excessive soil disturbance.
  - *Seeding Instructions:* Use direct-seeding equipment with seed placement at a uniform depth to ensure seed-soil contact and rapid crop emergence. Minimum soil disturbance ensures a uniform herbicide layer at the soil surface.
  - *Fall Application: Edge MicroActiv* in direct-seeding systems may be applied in the fall between October 1 and prior to soil freeze-up for weed control the following year. Apply at the fall rates in the 'Rates' section using a harrow operation to manage crop residue and ensure herbicide soil contact. DO NOT apply to snow or frozen soil.
  - *Spring Application: Edge MicroActiv* in direct-seeding systems may be applied in the spring as early as field conditions permit and at least 10 days prior to seeding. Apply at the spring rates in the 'Rates' section and use a shallow harrow incorporation within 24 hours of application.

Conventional Tillage Systems:

- ***General:***
  - *Ethalfluralin* for weed control in conventional tillage systems is intended for use on soils which have been conventionally tilled with > 30 percent soil disturbance within the previous two consecutive years or more.
- ***Land Preparation:***
  - *Pre-seeding Weed Control: Ethalfluralin* will not control emerged weeds. If existing weed growth is too heavy to allow uniform application and incorporation, destroy established weeds by cultivation or a foliar herbicide application before application.
- ***Application Instructions*:**
  - Incorporate with a tandem disc, discer or field cultivator (Vibrashank type). Cultivators should have 3 to 4 rows of sweeps spaced 8 inches apart and staggered so that no soil is left unturned. Set equipment to work at a depth of 3 to 4 inches (8 to 10 cm). Operate disc implements at 7 to 10 km per hour (4 to 6 miles per hour), and cultivators at 10 to 13 km per hour (6 to 8 miles per hour).
  - *Fall and Spring Application:* In conventional tillage systems, *Ethalfluralin* can be applied in the fall between September 1 and prior to freeze-up for weed control the following year, or it may be applied in the spring any time up to seeding. DO NOT apply to snow or frozen soil.
  - Apply to a soil surface free of large clods and incorporate in the same operation if possible.
  - Two incorporations are required at right angles for thorough mixing. *The first incorporation must be completed within 24 hours of application.* Delay the second incorporation for at least three days after the first. When applying in the fall, it is preferred that both incorporations be done in the fall. The second incorporation may be delayed until spring to conserve crop residues; however, both incorporations must be done to the same depth.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
ethalfluralin	PPI (Soil active)	Mitosis Inhibitor/cell division	Little movement in plant (Apoplast)	Broadleaf & grass	3

Effects of Growing Conditions:

Crops stressed by cold weather, excessive moisture or drought may be injured by *Ethalfluralin*. Dry soil conditions between application and emergence may result in decreased weed control.

Tank Mixes:

Not applicable.

Restrictions:

- **Rainfall:** No effect once incorporated.
- **Grazing Restrictions:** DO NOT graze or cut treated crops for livestock feed.
- **Re-cropping Interval:** DO NOT grow sugar beets, oats, and small-seeded annual grasses such as timothy, canaryseed and creeping red fescue in rotation following a crop treated with *Ethalfluralin*. DO NOT seed wheat as a rotational crop onto land that has been treated with trifluralin and/or *Ethalfluralin* at oilseed/special crop/barley rates for two consecutive crop years. Thinning of crop may occur in areas that have received abnormally low amounts of precipitation or in crops that are emerging slowly.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen. DO NOT expose to prolonged sunlight or heat.
- **Buffer Zones:** Toxic to fish and other aquatic organisms. DO NOT contaminate water bodies or wetland areas.

Sprayer Cleaning:

Not applicable.

Hazard Rating:

Warning – Eye and Skin irritant.

Refer to the Introduction for an explanation of the symbols.

Erebus Xtreme

Herbicide Group
2 - pyroxulam
4 - fluroxypyr

Company:

Syngenta Canada

Formulation:

The *Erebus Xtreme* package contains two components:

***Erebus Xtreme* (PCP#34353):** 12.8 g/L pyroxulam and 113.5 g/L fluroxypyr formulated as a suspension .

- Container size -2 x 9.46 L

-plus-

Erebus Xtreme B Utility Modifier:

- Container size - 3.88 L

Crops and Staging:

Spring wheat (including durum) and winter wheat – 3 leaf up to and including stem elongation.

Weeds, Rates and Staging:

Add *Erebus Xtreme B Utility Modifier* at 95 mL per acre.

***Erebus Xtreme* at 356 mL per acre:**

- ***Grasses:***
  - Japanese brome (1 to 4 leaf)
  - Wild oats (less than 75 plants/m^2, up to 4 leaf, 2 tiller)
- ***Broadleaves:***
  - Cleavers (1 to 8 whorls)
  - Flax, volunteer (1 to 12cm)
  - Kochia* (2 to 8 leaf)
  - Stork's-bill* (1 to 8 leaf)
  - Wild buckwheat (1 to 4 leaf)

***Erebus Xtreme* at 473 mL per acre:**
The weeds controlled above plus those listed below.

- ***Grasses:***

Weed	Stage
Wild oats	up to the 4 leaf, 2 tillers
Barnyard grass, yellow foxtail, green foxtail*	1 to 5 leaf
Japanese brome	1 to 6 leaf
Downy brome*	2 to 6 leaf, up to 4 tillers

- ***Broadleaves:***
  - Canada thistle* (up to 30 cm, before budding)
  - Cow cockle (up to 8 leaf)
  - Common chickweed (up to 10 cm)
  - Corn spurry (up to 2 whorl or <10 cm)
  - Dandelion* (rosettes <20 cm diameter)
  - Flixweed (up to 10 cm)
  - Hemp-nettle (1 to 8 leaf)
  - Kochia (2 to 8 leaf)
  - Redroot pigweed (1 to 8 leaf)
  - Round-leaved mallow (up to 6 leaf or 10 cm)
  - Russian thistle* (up to 10 cm)
  - Shepherd's-purse (up to 30 cm)
  - Smartweed (1 to 5 leaf)
  - Stinkweed (up to 30 cm)
  - Volunteer canola (1 to 6 leaf)**

*** Suppression only.**
**** Not CLEARFIELD varieties.**
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 L per acre.
  - ***Aerial:*** 12 to 20 L per acre.
- **Nozzles and Pressure:** DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE S572.1) coarse classification. Boom height must be 60 cm or less above the crop or ground. Use low pressures (200 to 275 kPa).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxsulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward area of growth (Symplast)	Broadleaf and grass	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf	4

Effects of Growing Conditions:

Erebus Xtreme Herbicide activity is influenced by weather conditions. Optimum activity requires active crop and weed growth. The temperature range for optimum activity is 12˚ C to 24˚ C. Reduced activity will occur when temperatures are below 8˚ C or above 27˚ C. Frost before application (3 days) or shortly after (3 days) may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions, e.g. drought, heat or cold stress, or if weeds have initiated flowering, or if heavy infestations exist.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- 2,4-D Ester 700 (214 to 243 mL per acre)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control. Avoid application when heavy rain is forecast.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** DO NOT harvest the treated crop within 60 days after application.
- **Grazing:** MUST NOT be grazed or fed to livestock for 7 days after treatment.
- **Re-cropping:** Fields treated can be seeded the following year to barley, canola, corn, dry beans (of the species *Phaseolus vulgaris*), flax, lentils, yellow and brown mustard, oats, peas, potatoes, soybeans, sunflower, or spring wheat; or fields can be summerfallowed.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in original container in a secure, dry, heated storage.
- **Buffer Zones:**

Application method		Buffer Zones (metres†) Required for the Protection of:		
		Freshwater Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*		1	1	5
Aerial	Fixed Wing	4	0	70
	Helicopter	1	0	55

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Caution - Eye and Skin Irritant
Potential Skin Sensitizer

Exhilarate

Herbicide Group
2 - florasulam
4 - halauxifen, MCPA

Company:

Corteva Agriscience (*Exhilarate*)
Interprovincial Cooperative Ltd (*CO-OP Exhilarate, IPCO Exhilarate*)

Formulation:

All *Exhilarate* packages contains the following components:
***Exhilarate A* (PCP#33803):** 20% halauxifen present as a methyl ester and 20% florasulam formulated as a water dispersible granule.

- Container size - 800 g jug

-plus-
***Plus M Ester 600* (PCP#29622 – *Exhilarate*), *IPCO MCPA Ester 600* (PCP#27802 – *IPCO Exhilarate*),**
***CO-OP MCPA Ester 600* (PCP#29001 – *CO-OP Exhilarate*):** MCPA Ester 600 g ae/L formulated as an emulsifiable concentrate.

- Container size - 2 x 7.56 L jugs

Crops and Staging:

Wheat (winter, spring and durum) and barley: 3 leaf stage to just prior to the emergence of the flag leaf emergence.

Weeds and Staging:

Weeds controlled at the 1 to 8 leaf stage unless otherwise specified to control the following weeds:

- American dragonhead (up to bud stage and 15 cm in height)
- Barnyard grass (up to 5 leaf, 2 tiller)
- Canada fleabane (up to 15 cm)
- Canada thistle (up to 30 cm)*
- Chickweed
- Cleavers (up to 9 whorls)
- Common ragweed (up to 6 leaf)
- Cow cockle
- Dandelion (seedlings and overwintered rosettes up to 30 cm diameter)
- Flixweed (up to 8 leaf and 8 cm tall)
- Hemp-nettle
- Henbit (up to bud stage and 15 cm in height)
- Kochia*
- Lamb's-quarters
- Narrow-leaved hawk's-beard (up to 30 cm tall)
- Night-flowering catchfly (up to 15 cm)*
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Scentless chamomile (up to bud stage)*
- Shepherd's-purse (up to 20 cm)
- Smartweed (lady's-thumb, green)
- Sow-thistle, annual (up to 4 leaf)
- Sow-thistle, perennial (up to 6 leaf)*
- Stinkweed (up to 4 leaf)
- Stork's-bill
- Velvetleaf (up to 5 leaf)
- Volunteer alfalfa (up to 25 cm tall)
- Volunteer canola
- Volunteer flax (up to 15 cm)
- White cockle (seedlings and overwintered rosettes up to the bud stage)*
- Wild buckwheat
- Wild mustard (1 to 4 leaf)

*** Suppression.**

Rates:

Exhilarate A: 10 g per acre

Plus M Ester 600, IPCO MCPA Ester 600, COOP MCPA Ester 600: 189 mL per acre

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets by ground. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
MCPA	POST (foliar)	Synthetic Auxin	Symplast	Broadleaf only	4

Effects of Growing Conditions:

Control is best with actively growing weeds. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

Spring wheat (including durum) and winter wheat:

- *Simplicity* (200 mL per acre)
- *Simplicity GoDRI* (28 g per acre) + *Agral 90* (at 0.25% v/v) or *Bindem Utility Modifier* (60 mL per acre)

Spring wheat (including durum):

- *Tandem*

Spring wheat and barley:

- *Axial*

Consult label use for specific surfactant requirements.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** DO NOT harvest the treated crop within 60 days after application.
- **Grazing Restrictions:** Livestock may be grazed on treated crops 7 days following application. DO NOT cut the treated crop for hay or silage within 21 days after application.
- **Re-cropping Interval:** Alfalfa, spring wheat, barley, canola (including oilseed quality *B. juncea*), dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types), faba beans, flax, field peas, potatoes (except seed potatoes), mustard (oriental, brown and yellow), soybeans, oats, or sunflower may be seeded 10 months after application. Lentils can be planted 22 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in a secure, dry heated storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Exhilarate A: Potential Skin Sensitizer

Plus M Ester 600:

 Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Express FX

Herbicide Group
2 - tribenuron
4 - dicamba

Company:
FMC Corporation

Formulation:
***Express FX* (PCP#33039):** 60.87% dicamba and 6.52% tribenuron-methyl formulated as a water dispersible granule.
- Container size - 1.86 kg

Express FX is purchased alone, but it must be mixed with glyphosate before use.

Crops and Staging:
For application to fallow, post-harvest and 1 day prior to seeding the following crops:
- Barley
- Wheat (spring, durum and winter)
- Oats

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 15 cm (6 inches) in height or width. Weeds controlled or suppressed by the tank mix of *Express FX* + glyphosate (182 gae per acre):
- Annual smartweed (green, lady's-thumb)
- Canada fleabane (up to 8 cm)
- Canada thistle (rosette)*
- Cleavers
- Common chickweed (up to 8 leaf)
- Common ragweed (up to 8 cm)
- Cow cockle (up to 3 leaf)
- Dandelion
- Flixweed
- Hemp-nettle
- Kochia** (up to 8 cm)
- Lamb's-quarters
- Narrow-leaved hawk's-beard (up to 8 cm)
- Redroot pigweed
- Russian thistle
- Scentless chamomile (up to 8 cm)*
- Stinkweed
- Tufted vetch*
- Volunteer canola
- White cockle (rosette)*
- Wild buckwheat (up to 8 leaf)
- Wild mustard
- Volunteer flax

*** Suppression only**
**** Except biotypes multiple resistant to glyphosate, Group 2 and dicamba**

Rates:
46.5 g per acre. DO NOT apply more than 46.5 g per acre per year.
Must be tank mixed with glyphosate.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum 22 L per acre.
- **Nozzles and Pressure:** DO NOT apply with spray droplets smaller than ***ASABE coarse*** classification. Boom height must be 60 cm or less above the crop or ground.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tribenuron	POST (foliar)	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf only	2
dicamba	POST (foliar) with slight soil activity	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Apply *Express FX* when air temperature is between 10 and 25°C. DO NOT apply when there is a risk of severe drop in night temperatures. Control of weeds growing in wheel tracks may be reduced if *Express FX* is applied under dry, dusty conditions.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Glyphosate

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Restrictions:

- **Rainfall:** If rain occurs soon after application, control may be reduced.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 7 days after treatment.
- **Re-cropping:** Fields treated with *Express FX* may be seeded to wheat (spring, durum or winter), spring barley or oats a minimum of 24 hours after application. Fields treated with a chemfallow application can be seeded to any crop the following season. Fields treated with a post-harvest application in the fall may be seeded in spring to canola, corn, lentils, oats, spring barley, soybeans, wheat (spring or durum) or white beans (contact manufacturer for timing limitations for canola, lentil, and field corn when seeding in the spring following fall application).
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in original container only, away from fertilizer, seeds, food or feed. Not for use or storage in or around the home. Keep container closed.
- **Buffer Zones:**
  Buffers are not required for hand-held and backpack applications.

Rate (g per acre)	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

**** Terrestrial buffers are not required for transport and utility rights-of-way**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' found in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Poison


Warning – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Express Pro

Herbicide Group
2 - tribenuron, metsulfuron

Company:
FMC Corporation (PCP#29212)

Formulation:
42.9% tribenuron methyl and 8.6 % metsulfuron methyl formulated as a water soluble granule.
- Container size - 560 g container

Express Pro is purchased alone but must be mixed with glyphosate before use.

Crops and Staging:
For application to fallow, post-harvest and prior to seeding of the following crops:
- Spring wheat
- Durum wheat
- Winter wheat
- Barley
- Oats

Allow at least one day (24 hours) between application and seeding.

Fallow and Post-harvest* application:

Allow 10 days between fallow or post-harvest* treatment and tillage.

DO NOT use *Express Pro* on highly variable soils that have large gravely or sandy areas, eroded knolls or calcium deposits.

Weeds, Rates and Staging:
***Express Pro* at 7 grams per acre plus glyphosate at a rate equivalent to 180 g ae per acre (see glyphosate):**
- Weeds controlled by glyphosate products at these rates plus the weeds below up to 3 inches (8 cm) unless otherwise indicated:
  - Canada thistle (rosettes)*
  - Cleavers†
  - Cow cockle (up to 3 leaf)
  - Dandelion (up to 6 inches)†
  - Narrow-leaved hawk's-beard†
  - Night-flowering catchfly*
  - Scentless chamomile
  - Tufted vetch (up to 15 cm)*
  - White cockle (rosettes)
  - Wild carrot (up to 10 cm)*
  - Volunteer canola (including glyphosate tolerant varieties – up to six inches)***†

  † Up to 15 days of extended control.

  *** Suppression only.**

Express Pro may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

If using other herbicides containing the active ingredient metsulfuron methyl, restrict total use of metsulfuron methyl to 0.61 grams active ingredient per acre per year.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** 22 to 45 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Low drift nozzles may require higher pressures for proper performance.
- **Screens:** Use 50 mesh or larger screens in both nozzles and in-line filters.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron, tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2

Effects of Growing Conditions:
Registered crops seeded following *Express Pro* application become stressed by drought, low fertility, saline soils, waterlogged soils (soils at or near field capacity), disease or insect damage may be injured. This injury may be worse on light or low organic matter soils. Weeds hardened off by environmental stress such as those above may not be adequately controlled.

Tank Mixes:

Herbicides:

- Must be mixed with glyphosate.
    - *Aim EC*

Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the *Express Pro* labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check product labels for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Heavy rainfall immediately after application may reduce effectiveness. DO NOT apply if rain is forecast for the time of application. Contact manufacturers for more information.
- **Restricted Entry Interval:** Wait 12 hours before re-entering treated fields.
- **Re-cropping Interval:** Barley, oats and wheat (spring, winter and durum) may be seeded a minimum of 24 hours after application. Canola, dry beans, faba beans, field corn, flax, lentils, peas and soybeans may be planted 10 months following application. Following fall applications, barley, oats, or wheat (spring or durum), may be seeded or fields may be summerfallowed.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat*
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Express Pro can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray this product should be flushed out immediately after use. Refer to 'Method A' found in the general sprayer cleaning section in the introduction. Check the label or contact the manufacturer for more specific sprayer cleaning information.

Hazard Rating:


Caution – Poison


Warning – Eye Irritant


Potential Skin Sensitizer


Contains the Allergens Sulphites and Milk

Refer to the Introduction for an explanation of the symbols.

Fenoxaprop

Herbicide Group 1 - fenoxaprop

Company:

Bayer (*Puma Advance*)
AgraCity (*HellCat*)
Interprovincial Cooperative Limited (*Vigil WB*)
Viking (*Viking Fenoxaprop*)

Formulation:

***HellCat* (PCP#30055), *Vigil WB* (PCP#30844), *Viking Fenoxaprop* (PCP#34817):** 120 g/L fenoxaprop-p-ethyl formulated as an emulsifiable concentrate.

- Container sizes* - 6.2 L, 12.4 L, 18.6 L, 99.3 L, 297.6 L, 312 L, 500 L

***Puma Advance* (PCP#29615):** 90 g/L fenoxaprop-p-ethyl formulated as an emulsifiable concentrate.

- Container sizes - 8.25 L, 123.75 L, 412.5 L

*** Check with individual suppliers for the container sizes they have available.**

Crops and Staging:

Application beyond the maximum rates provided below may result in crop injury.

Crop	Stage
Spring wheat (including durum), barley†	1 to 6 leaves on the main stem plus 3 tillers
Barley††	1 to 5 leaves on the main stem plus 2 tillers
Perennial ryegrass for seed production only* (seedling or established†)	2 to 4 leaves
Meadow bromegrass (seedling or established) (forage or seed production)**	

† ***Puma Advance* only. Late application of other products could result in injury to barley.**
†† ***HellCat, Vigil WB* or *Viking Fenoxaprop* only. Apply to barley only when tank mixed with a registered broadleaf product.**
NOTE: Application of other fenoxaprop products to barley can result in crop injury.
*** Perennial ryegrass with *Vigil WB* by ground only.**
**** Meadow bromegrass with *Puma Advance* by ground only.**

NOTE: Since the uses on forage grasses were registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply this use do so at their own risk.

Durum wheat, forage grasses and barley may experience some initial, temporary stunting and yellowing that rarely results in yield loss. Injury is more likely under stress conditions (see "Effect of Growing Conditions" section).

Treatment at the 3 to 4 leaf stage of cereal crops and weeds will maximize crop tolerance and weed control. Temporary crop injury such as shortening or discolouration may be observed after application. Such injury is more likely to occur in barley and also when fenoxaprop is applied outside recommended stages.

Weeds, Rates and Staging:

Apply from the 1 to 6 leaf stage up to emergence of 3rd tiller of the weeds below. Apply at the 3 to 4 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before tillering.

DO NOT apply fenoxaprop or products containing fenoxaprop to a crop more than once per year.

Weeds	Rate (mL per acre)	
	Puma Advance	120 g/L forms
Green foxtail only	206	156
Low wild oats infestations*	360	271
Moderate-heavy wild oats infestations, barnyard grass, green and yellow foxtail	413	312

*** Low wild oats rate for use on WHEAT AND DURUM ONLY, and when applied alone and NOT in a tank-mix. NOT for use with perennial ryegrass or meadow bromegrass.**

Application Information:

- **Water Volume:**
  - ***Ground:*** 23 to 45 L per acre. Use higher water volumes for dense canopies.
  - ***Aerial:*** A minimum of 14 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional 80° or 110° flat fan nozzles. Angle nozzles forward at 45° to improve contact with vertical leaf surfaces. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets or larger.
  - DO NOT use flood jet nozzles, controlled droplet application equipment or Spra-foil equipment.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fenoxaprop-p ethyl	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward regions of growth (Symplast)	Grasses only	1

Effects of Growing Conditions:

DO NOT apply fenoxaprop 2 to 3 days prior to, or following, temperatures of 3°C or lower as crop injury may occur. Under stressful conditions (hot/dry, water logging, disease or insect damage) or heavy crop canopy, early application will improve weed control.

DO NOT apply by air when both the temperature is greater than 25°C and the relative humidity is less than 30 percent.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

DO NOT apply *Vigil WB* in barley without a broadleaf herbicide mix. ALWAYS tank mix with a registered broadleaf herbicide.

2,4-D Ester (170 g ae per acre† - see 2,4-D page for product rates)
Ally (2 to 3 grams per acre)†
Attain XC ††
Bromoxynil/2,4-D ester$^{\Delta}$
Bromoxynil/MCPA Ester$^{\Delta}$
Curtail M
Dichlorprop/2,4-D$^{\Delta}$
Infinity (0.33 L per acre)††
MCPA Amine or Ester (0.28 L per acre) (600 g ai/L formulation)
Mecoprop-p***$^{\Delta}$*
Prestige XC††
Refine SG††
Refine SG + MCPA (rates above)††
Refine SG (4 grams per acre)+ *Buctril M* (0.4 L per acre)††
*Trophy**††

† **All products except *HellCat*.**
†† ***Puma Advance only*.**
$^{\Delta}$ **Manufacturers may only support mixes with specific brands. Contact the manufacturers for more information.**
*** Use only at the high rate of fenoxaprop.**
**** Use only at the green foxtail rate of fenoxaprop.**
***** Use in wheat only**

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the fenoxaprop labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Leave an interval of 7 days prior to application or 4 days after application of fenoxaprop, when applying any pesticide that is not registered as a tank mix.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut cereal crops or meadow bromegrass for hay, within 25 days of application. DO NOT graze or cut perennial ryegrass crop for hay within 65 days of application.
- **Pre-harvest Interval:** DO NOT harvest within 65 days of application.
- **Re-cropping Interval:** No restrictions in the year after application. Only ONE APPLICATION may be made per year.
- **Aerial Application:** May be applied by air.
- **Storage:** DO NOT freeze.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground*	3	10
Aerial	3	33

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
All:

 Caution – Poison

 Warning – Contains the Allergen Soy

HellCat, Viking Fenoxaprop:

 Warning – Eye and Skin Irritant

Puma Advanced:

 Danger – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Fierce Brands / Torpedo Brands

Herbicide Group
14 - flumioxazin
15 - pyroxasulfone

Company:
Valent Canada, Inc. Distributed by Nufarm Agriculture

Formulation:
***Fierce EZ* (PCP#33869), *Torpedo EZ* (PCP#33872):** 160 g/L flumioxazin and 203 g/L pyroxasulfone formulated as a suspension concentrate.
- Container size - 2 x 7.16 L

Crops, Rates and Staging:
Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.

DO NOT make more than ONE APPLICATION per season.

***Fierce* Spring Applications**

Crop	Stage	Rates
		Fierce EZ **(mL** per **acre)**
Soybeans*, chickpea, field pea	Pre-seed to pre-emergent. Crop should be seeded prior to or within 3 days of application.	178
Spring wheat (not including durum)** and field corn	Pre-seed only. Apply a minimum of 7 days before seeding wheat and apply between 7 and 30 days prior to seeding field corn. Apply on minimum to no-till soils only.	178

*** Seed at least 1.5 inches (4 cm) deep. Apply up to 3 days after seeding and prior to emergence.**
**** Seed wheat at least 1 inch (2.5 cm) deep. Apply a minimum of 7 days prior to seeding spring or winter wheat.**

***Fierce* Fall Applications**

Crop	Stage	Rates
		Fierce EZ **(mL** per **acre)**
Soybeans*, lentils (small reds and large green varieties), chickpea, field pea	Application should be made prior to soil freeze. DO NOT apply on top of snow cover. Higher rates for season long control in medium to fine soils only.	178 to 267
Spring wheat** (not including durum) and field corn	Application should be made prior to soil freeze. DO NOT apply on top of snow cover. **Apply to minimum to no-till soils only.**	178
Winter wheat**	**Apply to minimum to no-till soils only.**	178

Torpedo Brands

Crop	Stage	Rates
		Torpedo EZ **(mL** per **acre)**
For the maintenance of bare ground on industrial sites***	Application should be made prior to soil freeze. DO NOT apply on top of snow cover. Higher rates for medium to fine soils only.	356 to 492

*** Seed at least 1.5 inches (4 cm) deep. Apply up to 3 days after seeding and prior to emergence.**
**** Seed lentils and wheat at least 1 inch (2.5 cm) deep. Apply a minimum of 7 days prior to seeding spring or winter wheat.**
***** *Torpedo* will cause crop injury. DO NOT apply to farm alleys or roads where traffic may result in treated dust settling onto crops or other desirable vegetation.**

Weeds and Staging:

Spray within 6 hours of mixing. *Fierce/Torpedo* will break down in the spray tank left to sit in the sprayer for an extended period.

Apply prior to crop and weed emergence. *Fierce/Torpedo* will not control emerged weeds. If weeds are emerged, apply in a mix with a foliar herbicide (see tank mix section).

***Fierce/Torpedo* will provide control or suppression of the following weeds:**

- Annual sow-thistle
- Barnyard grass
- Brome (downy, Japanese)*
- Canada fleabane
- Chickweed (common)†
- Cleavers
- Crabgrass (large)
- Dandelion (seedlings only)
- Foxtail (green)
- Foxtail barley*
- Kochia
- Lamb's-quarters
- Nightshade (Eastern black, hairy)
- Pigweed (green, redroot, Palmer amaranth, waterhemp)
- Ragweed (common)
- Russian thistle*
- Smartweed (Pennsylvania)
- Velvetleaf
- Volunteer canola (all varieties)*†
- Wild buckwheat
- Wild mustard
- Wild oats*
- Witchgrass

† ***Fierce Brands* only.**
* **Suppression only.**

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 40 L to 120 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** The use of 50 mesh screens is recommended.

DO NOT perform any tillage operations after application otherwise weed control will be reduced. When applied prior to seeding crops must be direct seeded with minimum disturbance systems.

How it Works:

Refer to "How Do Herbicides Work" in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flumioxazin	PRE (surface) with soil activity	PPO Inhibitor/ Membrane disruptor	Upward to leaves. Little downward movement due to rapid cell leakage (Apoplast)	Selective Broadleaf	14
pyroxasulfone	PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Rainfall is required to activate *Fierce/Torpedo* in the soil. Dry weather following applications of *Fierce/Torpedo* may reduce effectiveness. However, when adequate moisture is received after dry conditions, *Fierce/Torpedo* will control susceptible germinating weeds listed on the label. Crop injury may occur when soils are wet and cool following application or soils are poorly drained. Severe injury may occur with flooded soils. Newly emerging foliage can be temporarily injured by heavy rain splashing treated soil on leaves. Heavy crop residues may reduce weed control. Tillage following application can reduce effectiveness – DO NOT till after application.

Irrigation: If rainfall is not received after application, 1.5 to 2.5 cm of irrigation may be applied to improve weed control activity. DO NOT apply irrigation to wheat between emergence and heading.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

Prior to All Crops:

- **Soybean:**
  - Glyphosate (IPA or K salts) 180 to 486 g ae per acre
  - *Pursuit*

  DO NOT apply with *Dual II Magnum* or *Frontier* or injury may occur.
- **Fallow land:**
  - Glyphosate
- **Wheat:**
  - Glyphosate (IPA or K salts) 180 to 486 g ae per acre
- **Bare ground on non-crop areas (*Torpedo* only):**
  - Glyphosate, 2,4-D Ester, *Arsenal*, dicamba, *Hyvar XL, Karmex, Krovar, Telar, Tordon 22K* or *Velpar*.

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: None registered.

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Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rain or irrigation shortly after application is required for activation. If rainfall does not occur, irrigation with at least 1.5 cm of water is recommended before ground crack occurs. Avoid application if heavy rain is forecast.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***Field corn:*** DO NOT permit livestock to graze field or harvest as green feed or silage within 93 days after application.
  - ***Soybeans:*** DO NOT harvest as green feed or permit livestock to graze fields within 21 days after application. DO NOT cut hay/fodder within 50 days after application.
  - ***Wheat (spring and winter):*** DO NOT harvest as green feed or permit livestock to graze fields within 42 days after application. DO NOT cut hay/fodder within 52 days after application.
  - ***All other crops:*** DO NOT graze, cut or feed treated crops to livestock.
- **Re-cropping Interval:**
  - ***Soybean, chickpea, field pea:*** Immediately
  - ***Field corn, wheat (spring, winter):*** 7 days. Wheat may also be seeded any time in the spring following a fall application of up to the highest labelled rate.
  - ***Lentils:*** 6 months or any time in the spring following a fall application of the highest labeled rate.
  - ***Barley, durum wheat, oats, alfalfa:*** 11 months
  - ***Canola, mustard seed:*** 12 months
  - ***Crops not listed:*** A successful soil bio-assay must be performed prior to planting.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a cool, dry place. May be frozen

- **Buffer Zones:** (Liquid formulations only)

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Soybeans, spring wheat and fallow land	4	2	10
Bare gound on non-crop areas (*Torpedo*)	5	3	20

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. See product label for further information.

Hazard Rating:
Warning – Skin and Eye Irritant
Applicators and mixers should only handle a maximum of 58 kg (680 acres at the low rate) of 345 L (~1937 acres at the low rate) of *Fierce EZ* per day with proper personal protective equipment.
Refer to the Introduction for an explanation of the symbols.

Flexstar GT*

** For use only in the Red River Valley of Manitoba*

Herbicide Group
9 - glyphosate
14 - fomesafen

Company:
Syngenta Canada (PCP#30412)

Formulation:
67 g/L fomesafen and 271 g/L glyphosate formulated as a solution.
- Container sizes - 2x10 L, 450 L

Crops and Staging:
Flexstar GT may be applied as a pre-seed burn down or as pre-emergent to the crop of soybeans or as early post-emergent on 1 to 2 trifoliate leaf stage of glyphosate tolerant soybeans only.

For use in the Red River Valley of Manitoba only.

Maximum ONE APPLICATION EVERY TWO CONSECUTIVE YEARS of *Flexstar GT* or other products containing the active ingredient fomesafen.

Weeds, Rates and Staging:
Flexstar applied at 840 mL per acre control of the following weeds at the cotyledon to 3 or 4 true leaf stage. Add *Turbocharge* adjuvant at 0.25 L per 100 L spray solution only when weeds are under stress conditions and for larger weeds.

Grass Weeds:
- Barnyard grass
- Bromegrass (smooth)
- Cattail (common)
- Downy brome
- Foxtail barley
- Foxtail (green, yellow)
- Persian darnel
- Proso millet
- Quackgrass
- Rye, tame
- Volunteer barley
- Volunteer corn (except glyphosate tolerant varieties)
- Volunteer wheat
- Wild oats
- Yellow nutsedge

Broadleaf Weeds:

- Absinthe
- Canada thistle
- Chickweed, common
- Cleavers
- Clover (white)
- Cocklebur
- Cow cockle
- Curled dock
- Dandelion
- Field bindweed
- Fleabane (Canada)
- Flixweed
- Hemp-nettle
- Horsetail
- Knotweed (Japanese, prostrate)
- Lamb's-quarters
- Milkweed (common)
- Narrow-leaved hawk's-beard
- Night-flowering catchfly
- Nightshade (Eastern black)
- Pigweed (redroot, smooth)
- Prickly lettuce
- Ragweed (common)
- Round-leaved mallow
- Russian thistle
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Sow-thistle (annual, perennial)
- Stinkweed
- Stork's-bill
- Volunteer alfalfa
- Volunteer canola (all varieties)
- Volunteer flax
- Wild buckwheat
- Wild mustard
- Wild tomato

A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum of 60 to 80 L clean, clear water per acre. Higher spray volume is required for dense weed stands.
- **Pressure:** 30 psi (210 kPa). Increase pressure to 60 psi (420 kPa) for fields with heavy weed densities or with weeds at the upper limit of their recommended stage.
- **Nozzles:** Use nozzles capable of delivering appropriate pressures and volumes. DO NOT apply with spray droplets smaller than the ***ASABE coarse*** classification.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fomesafen	POST (foliar) with little soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage(Symplast)	Non-selective Broadleaf	14
glyphosate	POST (foliar)	EPSP Amino Acid Synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf & grass	9

Effects of Growing Conditions:

Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity.

Tank Mixes:

None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Restrictions:

- **Rainfall:** Within 4 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave at least 90 days from application to harvest.
- **Grazing Restrictions:** DO NOT graze treated crop or cut for hay.
- **Re-cropping Interval:** Winter wheat may be sown 4 months after application. Spring wheat, dry beans, soybeans and field corn may be grown the year following an application. These re-cropping restrictions refer only to the Red River Valley of Manitoba. Use outside this is region is not registered as re-cropping options have not been determined.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store above -10°C, in a dry place in original container, away from food or feed.
- **Buffer Zones:** Leave a buffer zone of at least 15 m between the last spray swath and the edge of sensitive terrestrial areas such as shelterbelts, hedgerows and shrublands as well as aquatic areas such as ponds, streams, rivers, prairie potholes and sloughs. DO NOT apply when winds are greater than 15 km per hour.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

 Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Florasulam

Herbicide Group
2 - florasulam

Company:

Corteva Agriscience (*PrePass Flex*)
AgraCity (*Battlefront*)
Loveland Products Canada (*Blitz , Bombard 50SC*)
Adama Canada (*Priority*)
Sharda Cropchem (*Flora, Start 25 WDG*)
Advantage Crop Protection (*Advantage Florasulam 50 SC*)
Albaugh (*Clorvante*)
Viking (*Viking Florasulam*)

Formulation:

***PrePass Flex* (PCP#31259)*, *Start 25 WDG* (PCP#34969)*:** 25% florasulam formulated as a water dispersible granule.

- Container size - 8 x 648 g case

***Priority* (PCP#30831)*, *Blitz* (PCP#31687)*, *Battlefront* (PCP#33003)*, *Flora* (PCP#33610)*, *Advantage Florasulam 50 SC* (PCP#34336)*, *Clorvante* (PCP#34431)*, *Bombard 50 SC* (PCP#35006)*, *Viking Florasulam* (PCP#34752):**
50 g/L florasulam formulated as a suspension concentrate.

- Container sizes:
  - *Priority, Battlefront, Advantage Florasulam 50 SC, Bombard 50 SC, Viking Florasulam* - 2 x 6.4 L
  - *Flora* - 2 x 6.4 L
  - *Blitz* - 4 x 3.2 L

NOTE: PrePass Flex, Priority, Blitz , Battlefront, Flora, Advantage Florasulam 50 SC, Clorvante, Bombard 50 SC and Start 25 WDG *are intended to be applied with glyphosate only. Best practice is to mix florasulam products with herbicides from other resistance groups to prevent the development of resistant weed biotypes.*

Crops and Staging:

All Products:

- ***Preseed burndown, fallow or post harvest:*** Florasulam + glyphosate can be applied either in the fall or in the spring prior to seeding spring wheat (including durum), barley or oats or as an initial fallow treatment. *PrePass Flex* and *Start 25 WDG* may be applied in fall prior to seeding winter wheat.

***Battlefront, Advantage Florasulam 50 SC, Clorvante, Bombard 50 SC, Flora* and *Viking Florasulam* only:**

- ***Wheat (spring, durum, winter††), barley:*** 2 to 6 leaf stage.
  †† ***Flora* and *Viking Florasulam* only.**

***PrePass Flex* only:**

- ***Established alfalfa for forage and hay*:*** apply to dormant or semi-dormant alfalfa (not actively growing) in late fall or early spring. See label for details
  * **Note:** Since applications to established alfalfa for forage and hay has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. **Application to established alfalfa for forage and hay is at the risk of the user.**

When mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Broadleaf weeds controlled at the 2 to 4 leaf stage:

- Chickweed
- Cleavers
- Cow cockle**
- Shepherd's-purse
- Smartweed (including lady's-thumb)
- Stinkweed
- Volunteer canola†
- Wild buckwheat
- Wild mustard

Broadleaf weeds suppressed:

- Annual sow-thistle
- Hemp-nettle
- Narrow-leaved hawk's-beard
- Perennial sow-thistle (top growth control only)
- Redroot pigweed

*** Seedlings and overwintered rosettes.**
**** All products except *Advantage Florasulam 50 SC* and *Bombard 50 SC*.**
† Not Including CLEARFIELD canola varieties.

Rates:

PrePass Flex, Start 25 WDG: 8.1 grams per acre

Priority, Blitz, Battlefront, Viking Florasulam, Flora, Advantage Florasulam 50 SC, Clorvante* and *Bombard 50 SC: 40 mL per acre

Refer to the product label for complete mixing instructions for this product and its mixes. A general mixing guide can be found in the introduction.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar) with little soil activity	ALS Amino Acid synthesis inhibitor	Toward regions of growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity of florasulam. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. Under conditions of low crop and high weed density, control may be reduced. Extreme growing conditions such as drought or near freezing temperature prior to, at, or following time of application may reduce weed control and increase the risk of crop injury at all stages of growth.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Preseed Burndown, Fallow or Post-harvest:

- Glyphosate (180 to 360 g ae per acre)

In spring wheat (including durum):

- Bromoxynil

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the florasulam labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 30 minutes application of *Prepass Flex* may reduce effectiveness. No rainfast period is specified on other labels; required interval may be up to 8 hours. Contact manufacturer for more information. DO NOT apply excessive irrigation following application as product may leach.
- **Restricted Entry Interval:** DO NOT enter or allow worker entry into treated areas for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut treated areas for feed or hay within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. When *PrePass Flex* is applied to established alfalfa for forage and hay DO NOT cut for hay or graze within 21 days of application.
- **Pre-harvest Interval:** Leave 60 days between application and harvesting mature crop.
- **Re-cropping Interval:** Wheat, barley, canola, chickpea*, corn*, dry beans*, flax*, lentil*, mustard* (brown, oriental, yellow, and oilseed quality *B. juncea* types), oats**, peas, potato* (except seed potato), soybean* or sunflower* may be grown the year following an application.
  * ***PrePass Flex, Flora, Battlefront* only.**
  ** **All products except *Advantage Florasulam 50 SC* and *Clorvante*.**
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in dry, heated area. If frozen, bring to room temperature and agitate before use.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Check the cleanout requirements of pesticides mixed with this product. Additional cleanout measures may need to be integrated into those provided here.

Hazard Rating:

PrePass Flex:


Warning – Eye Irritant

Other Products:


Caution – Poison


May Cause Skin and Eye Irritation

Refer to the Introduction for an explanation of the symbols.

Florasulam + glyphosate

Herbicide Group
2 - florasulam
9 - glyphosate

This product is a prepackaged tank mix of Florasulam and glyphosate.
Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

Corteva Agriscience (*PrePass XC, PrePass Flex*)
ADAMA Canada (*Priority*)
Loveland Products Canada (*Blitz*)

Formulation:

The *PrePass XC* package contains the following components:

***PrePass XC A* (PCP#29651):** 50 g/L florasulam formulated as a suspension concentrate.
- Container sizes - 1.6 L, 4 x 12 L

***PrePass XC B* (PCP#29652):** 480 g/L glyphosate DMA salt formulated as a solution.
- Container sizes - 2 x 7.5 L, 450 L

-or-

***PrePass Flex** (PCP#31259):** 25% florasulam formulated as a water dispersible granule.
- Container size - 8 x 648 g

-or-

***Priority** (PCP#30831), *Blitz** (PCP#31687):** 50 g/L florasulam formulated as a suspension concentrate.
- Container size - 2 x 6.4 L

*** *PrePass Flex, Priority* and *Blitz* DO NOT come packaged with glyphosate. Glyphosate must be purchased separately.**

Crops and Staging:

Florasulam + glyphosate can be applied either in the fall or in the spring prior to seeding spring wheat (including durum), barley or oats or as an initial fallow treatment.

PrePass XC or *PrePass Flex* may be applied in fall prior to seeding winter wheat.

Weeds and Staging:

Florasulam + glyphosate will control the following weeds:

Weeds controlled by glyphosate at the 180 g ae per acre rate plus enhanced control of the following weeds:

- ***Broadleaf weeds controlled at the 2 to 4 leaf stage:***
  - Canada fleabane (up to 8 cm)†
  - Common chickweed
  - Cleavers
  - Cow cockle
  - Dandelion (up to 30 cm across)
  - Flixweed†
  - Hemp-nettle
  - Kochia*
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard (up to 8 cm)
  - Ragweed, common (up to 8 cm)†
  - Redroot pigweed
  - Russian thistle†
  - Scentless chamomile†
  - Shepherd's-purse
  - Smartweed (including lady's-thumb)
  - Stinkweed
  - Volunteer canola (all varieties)
  - Volunteer flax
  - Wild buckwheat (up to 5 leaf)
  - Wild mustard
- ***Broadleaf weeds suppressed:***
  - Annual sow-thistle
  - Perennial sow-thistle***

*** Note: Florasulam + glyphosate will not control glyphosate resistant kochia.**
**** Earlier applications provide better results.**
***** Applications made at advance stages will reduce effectiveness.**
† ***PrePass XC* and *PrePass Flex* only.**

Rates:

For *PrePass* XC:

***PrePass XC A*:** 40 mL per acre
-plus-
***PrePass XC B*:** 375 mL per acre
-or-

***Prepass Flex*:** 8.1 grams per acre
-plus-
Glyphosate (purchased separately): At least 180 g ae per acre (see glyphosate for product rates)
-or-
***Priority, Blitz*:** 40 mL per acre
-plus-
Glyphosate (purchased separately): 180 g ae per acre (see glyphosate for product rates)

Tank Mixes:

Herbicides

- ***PrePass XC:*** *Vantage Plus Max II***.
- ***PrePass Flex:*** glyphosate IPA, DMA or K+ salt at 180 to 1020 g ae per acre.
- ***Priority* or *Blitz*:** must be mixed with glyphosate IPA or DMA salt at 180 g ae per acre.

**** NOTE: Corteva Agriscience does not support the topping up of *PrePass XC* with other salts of glyphosate as they may have a negative reaction with the florasulam component. *PrePass Flex* may be topped up with any formulation of glyphosate, as indicated above.**

Note: The above mixes are those listed on the florasulam + glyphosate labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Re-cropping Interval:**
  - Applications after August 1: Spring wheat (including durum), barley and oats, may be seeded the following year, or the field may be fallowed.
  - Applications **before August 1**: Barley, canola, chickpeas*, dry beans*, field peas, flax*, lentils*, mustard* (brown, oriental, yellow and oilseed quality *B. juncea*) oats, soybeans*, sunflower* and wheat, may be grown the following year.
    * *PrePass XC*, *PrePass Flex*, and *Priority* only.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Florasulam / fluroxypyr + MCPA Ester

Herbicide Group
2 - florasulam
4 - fluroxypyr, MCPA

Company:

ADAMA Canada (*Outshine*)
Agracity (*Battlestar*)
Corteva Agriscience (*Stellar Unpacked, Stellar XL*)
Sharda Crop Chem (*Alloy, Steel**)
Viking (*Viking Bodo*)
*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Outshine* (PCP#31646), *Steel* (PCP#33936), *Battlestar* (PCP#34567), *Viking Bodo* (PCP#34799), *Alloy* (PCP#34669), *Stellar Unpacked* (PCP#34516):** 2.5 g/L florasulam and 100 g/L fluroxypyr formulated as a suspension concentrate.

- Container size - 2 x 8 L, 97.1 L (*Stellar Unpacked only*), 128 L (*Steel* only)

***MCPA 2 EH Ester 600* (PCP#31669):** 600 g/L of MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes:
  - *MCPA 2 EH Ester 600* - 1 x 9.33 L
  - *Alloy, Stellar Unpacked, Steel and Viking Bodo* - MCPA sold separately

-or-

***Stellar XL* (PCP #32099):** 2.5 g/L florasulam, 100 g/L fluroxypyr and 350 g/L of MCPA as a co-formulated emulsifiable concentrate.

- Container sizes - 2 x 8.1 L, 97.1 L, 518 L

Crops and Staging:

Barley, oats, wheat (spring, durum, winter*): 3 to 6 leaf stage, including staging for *Steel* with MCPA tank mix. DO NOT apply *Alloy* or *Stellar Unpacked* or *Steel* mixed with MCPA on oats. *Alloy, Stellar Unpacked* and *Steel* alone on registered crops starting at the 2 leaf stage.

Seedling and established forage grasses (Group 17) for seed production*†:

- ***Seedlings:*** 4 leaf stage up to the flag leaf stage.
- ***Established:*** no stage restrictions.
  - Bromegrasses
  - Fescues
  - Meadow Foxtail
  - Orchardgrass
  - Redtop
  - Reed canarygrass
  - Ryegrasses
  - Timothy
  - Wheatgrasses

Seedling and established forage grasses for seed, forage and hay production*†:

- Bromegrass (meadow, smooth, hybrid)

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

* ***Stellar XL* only.**

† ***Note** - Since applications to forage grasses have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance.* ***Application to timothy is at the risk of the user.***

Weeds and Staging:

Apply when weeds are at the 2 to 4 leaf stage unless otherwise indicated. Weed list includes *Steel* tank mixed with MCPA Ester.

- Burdock†
- Chickweed (common)
- Cleavers†††
- Cocklebur†
- Flixweed
- Hemp-nettle
- Kochia
- Lamb's-quarters
- Plantain†
- Prickly lettuce†
- Ragweed
- Pigweed (redroot, Russian†)
- Shepherd's-purse
- Smartweed
- Stinkweed†
- Stork's-bill*
- Sunflower (annual)
- Vetch†
- Volunteer canola
- Volunteer flax
- Wild buckwheat
- Wild mustard
- Wild radish†

*** Suppression only.**

† **Weeds listed on MCPA component of *Outshine/Steel/Battlestar* mix only. All weeds controlled with *Stellar XL*.**

†† ***Stellar XL* only.**

††† **1 to 8 whorl for *Stellar XL*. No staging given for *Stellar/Outshine/Steel/Battlestar*.**

Rates:

***Outshine A/Steel/Battlestar/Viking Bodo/Alloy/Stellar Unpacked/*:** 0.4 L per acre
***Outshine B (MCPA)/*Other MCPA 600 Ester mix with *Steel/Battlestar*:** 0.24 L per acre
-or-
***Stellar XL*:** 405 mL per acre

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles & Pressure:** For conventional flat fan nozzles use a pressure of 30 to 40 PSI (200 to 275 kPa). Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Toward regions of growth (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
MCPA	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result.

Tank Mixes:

Herbicides:

- ***Spring wheat (including durum) and barley (*Alloy/Stellar Unpacked/Steel/Battlestar/Bodo *only):***
  - MCPA Ester
- ***Barley, spring wheat:***
  - *Axial****
- ***Spring Wheat (including durum) only:***
  - *Simplicity***
  - *Simplicity GoDRI****

*** All products.**
**** *Stellar, Stellar XL* and *Viking Bodo* only.**
***** *Stellar XL* and *Viking Bodo* only.**

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the florasulam/fluroxypyr + MCPA labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 2 hours of application may reduce efficacy.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 60 days between treatment and harvest.
- **Grazing Restrictions:** DO NOT graze or harvest for livestock feed within 7 days of treating the crop. ***For Group 17 forage grasses (Stellar XL only):*** DO NOT graze dairy animals within 7 days of application. DO NOT harvest green feed or cut for hay/silage within 7 days of application. Withdraw meat animals from grazing within the 7 day period for 3 days before slaughter.
- **Re-cropping Interval:** The following crops may be grown the season following application: barley, canola, corn*, field beans (*Phaseolus vulgaris*)*, flax*, lentils*, mustard*, oats, peas, potato*†, soybean*, sunflower* or wheat or fields can be summerfallowed. There are no recropping restrictions the second year after application.
  * *Alloy, Stellar Unpacked, Steel, Battlestar, Stellar* and *Stellar XL* only.
  † Except seed potatoes for *Stellar*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen. If frozen, bring to room temperature and agitate before use. *Stellar* and *Outshine* only – product is combustible. DO NOT store near heat or open flame.

- **Buffer Zones:**

Product	Buffer Zones (metres†) Required for the Protection of:		
	Freshwater Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Stellar XL, Outshine	1	0	1
Alloy, Stellar Unpacked, Steel, Battlestar	1	0	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Use a combination of 'Method A' and 'Method B' utilizing the commercial spray tank cleaner *All-Clear* as the detergent. See the general section on sprayer cleaning in the introduction. If mixed with another pesticide additional clean-out measures may be necessary.

Hazard Rating:
 Warning – Poison

 Warning – Eye and Skin Irritant

 Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Flucarbazone

Herbicide Group 2 - flucarbazone

Company:
UPL AgroSolutions Canada (*Everest 3.0 AG*)
Syngenta Canada (*Sierra 3.0 AG*)
AgraCity (*Himalaya*)
Viking (*Viking Flucarbazone*)

Formulation:
***Everest 3.0 AG* (PCP#33258), *Sierra 3.0 AG* (PCP#33538):** 200 g/L flucarbazone-sodium formulated as a suspension concentrate.
- Container size - 3.88 L

***Himalaya* (PCP#33370), *Viking Flucarbazone* (PCP#34739):** 66% flucarbazone-sodium formulated as a water dispersible granule.
- Container size - 567 g

Crops and Staging:
Spring application to wheat (spring, durum, winter): 1 leaf to a maximum of 4 main stem leaves plus 2 tillers (6 total leaves).
Note: Several of the tank mix partners have more limiting staging than flucarbazone alone. When tank mixing use the most restrictive application stage or injury may result.

Weeds, Rates and Staging:
Grass weeds: Maximum of 4 main stem leaves and 2 tillers
Broadleaf weeds: 2 to 6 leaf stage

Weed	Rate	
	3.0 AG **mL per acre**	***Himalaya , Viking Flucarbazone*** **g per acre**
Green foxtail*	29.1	8.7
Weeds listed above plus: Wild oats* (light infestations < 100 plants/m^2), volunteer oats, green smartweed, redroot pigweed*, shepherd's-purse*, volunteer canola*, wild mustard*, stinkweed* (2 to 9 leaf stage)	38.4	11.5

Weed	Rate	
	3.0 AG mL per acre	*Himalaya , Viking Flucarbazone* g per acre
Weeds listed above plus: Wild oats* (heavy populations > 100 plants/m^2), Japanese brome up to 4 leaf stage pre-tillering, both growing under ideal growing conditions **Suppression of:** Wild buckwheat (1 to 4 leaf stage), barnyard grass**, yellow foxtail**	48.2	14.4
Grass weeds listed above growing under poor growing conditions or when mixing with herbicides containing the a.i. dicamba	58.2	17.4

Requires the addition of a non-ionic surfactant (*Agral 90, Agsurf II, Liberate, ProSurf, Super Spreader, LI700*) at 2.5 L per 1000 L of spray solution.

*** Will not control imidazolinone tolerant (CLEARFIELD) canola volunteers or Group 2 resistant weed biotypes.**

**** For control of these weeds, see tank mix section of the product label.**

DO NOT apply more than the equivalent of 11.64 g flucarbazone active ingredient per growing season.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 22.5 to 45 L per acre.
  - ***Aerial:*** 11 L per acre.
- **Nozzles and Pressure:** Use 30 to 50 psi (200 to 345 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. Orienting nozzles at a 45 degree angle forward may improve coverage of vertical leaves (grasses).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flucarbazone	POST (foliar) with soil residual activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

Crop tolerance and weed control may be reduced if applications are made to plants growing under stress. Stress includes saturated or water-logged soil, drought, extreme temperatures, low fertility or visible disease symptoms at application. Adopting practices to increase crop vigour will improve crop tolerance.

Tank Mixes:

Herbicides:

Note:

- All mixes must be applied with a registered surfactant unless otherwise indicated. Only one registered surfactant is required.
- All products below may be mixed at label rates with Flucarbazone unless otherwise indicated.
- Flucarbazone at all rates may be mixed with the products listed below unless otherwise indicated.
  - ***In wheat (spring and durum) only:***
    - 2,4-D Amine or Ester (rates up to 227 g ae per acre)*
    - Akito
    - Enforcer D
    - *Enforcer M*[§]
    - *Pixxaro*
    - Tribenuron (*Inferno WDG*)
  - ***In wheat (spring and winter) only:***
    - 2,4-D Amine or Ester (rates up to 227 g ae per acre)
    - Bromoxynil/MCPA (*Buctril M/Logic M* only)
    - MCPA Amine or Ester at rates up to 0.38 L per acre (600 g/L formulation)
    - Thifensulfuron/tribenuron (*Refine SG* only)[§]

- ***In spring wheat (NOT including durum) only:***
  - Bromoxynil (*Brotex 240/Pardner* only)
  - Bromoxynil/2,4-D (*Leader/Thumper* only)
  - *Curtail M***
  - Dichlorprop-D
  - *Frontline 2,4-D*
  - Florasulam + MCPA (*Frontline XL* only)*
  - Florasulam/Fluroxypyr+MCPA (*Stellar XL* only)**
  - Fluroxypyr + 2,4-D (*Attain XC* only)**
  - Fluroxypyr+MCPA (*Trophy* only)
  - Metsulfuron (*Ally* only) + 2,4-D Amine or Ester up to rates above**
  - *OcTTain XL**§
  - *Optica Trio*#*†§
  - *Prestige XC***
  - Thifensulfuron/Tribenuron (*Refine SG* only§) plus 2,4-D Amine or Ester at rates above

*** Apply in 40 L per acre of water. In durum max rate is 170 gae per acre in 45 L of water.**
**** Apply in 40 L per acre of water only with 38.4 to 58.3 mL per acre of *Flucarbazone 3.0/3.0 AG*.**
† Wild oats control may be reduced with this mix.
 # Tank mix only with the highest rate of flucarbazone.
§ *Flucarbazone 3.0 AG* only.

Fertilizers: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the flucarbazone labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields. Mature grain or straw may be fed to livestock.
- **Pre-harvest Interval:** Leave at least 80 days from application to harvest
- **Re-cropping Interval:** See the following chart below:

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Spring wheat Barley Canola (all varieties) Field pea*	Spring wheat Barley Canola (all varieties) Durum wheat Field pea* Flax Field bean Soybean† Sunflower†	Spring wheat Barley Canola (all varieties) Durum wheat Field pea* Flax Soybean† Sunflower†	Spring wheat

† Not including *Sierra 3.0* at this time.

*** NOTE: Field pea may be grown the year following flucarbazone application in fields where precipitation has been equal to or above the 10-year average during the growing season, and where organic matter content is above 4 percent, and pH is below 7.5. The company suggests a minimum of 100 mm (4 inches) of rain is needed in the 60 days following application for adequate breakdown to take place.**

NOTE: Other rotational crops may also be affected under certain environmental conditions, including prolonged drought and/or cold temperatures within the following cropping season, as well as soils with both low OM (less than 2 per cent) and high pH (greater than 7.5).

- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in closed original container in a cool, dry area away from fertilizers, food or feed. DO NOT freeze.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitat	Terrestrial habitat
Field sprayer*	5	2
Fixed wing aircraft	100	65
Helicopter	85	55

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. When mixing with other pesticides, combine the method above with cleanout methods for the tank mix partner.

Hazard Rating:
***Flucarbazone 3.0 AG*:**

Danger – Corrosive to Eyes

***Himalaya, Viking Flucarbazone*:**
Warning eye and skin irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Flucarbazone + Tribenuron

Herbicide Group
2 - flucarbazone, tribenuron

Company:
UPL AgroSolutions Canada (*Inferno Duo*)
AgraCity (*Himalaya Extra*)
Viking (*Viking Visby*)

Formulation:
***Inferno Duo* (PCP#30663):** 45% flucarbazone and 3.9% tribenuron formulated as water dispersible granules.
- Container size - 4 x 1018 grams

-or-
The *Himalaya Extra* package contains the following components:
***Himalaya* (PCP#33370):** 66% flucarbazone-sodium formulated as a water dispersible granule.
- Container size - 695 g

-plus-
***MPOWER Extra* (PCP#33143):** 75% tribenuron methyl formulated as a water dispersible granule.
- Container size - 320 g

-or-
The Viking Visby package contains the following components:
***Viking Flucarbazone* (PCP#34739):** 66% flucarbazone-sodium formulated as a water dispersible granule.
- Container size - 693 g

-plus-
***Viking Tribenuron* (PCP#34738):** 75% tribenuron methyl formulated as a dry flowable.
- Container size - 320 g

Crops and Staging:
Spring wheat (NOT including durum) and winter wheat*: Apply to the soil surface from one week before seeding until crop emergence.
*** Winter wheat with *Inferno Duo* only.**

Weeds, Rates and Staging:

Inferno Duo: Apply 12.75 grams per acre or
Himalaya Extra: Apply 8.7 g per acre of *Himalaya* plus 4 g per acre of *MPOWER Extra*
Viking Visby: Apply 8.7 g per acre of *Viking Flucarbazone* plus 4 g per acre of *Viking Tribenuron*
All Products: Add 180 g ae per acre of glyphosate IPA or K+ salts (see glyphosate) to control:

- *Weeds controlled by glyphosate at 180 g ae per acre (see glyphosate) plus:*
  - Cow cockle
  - Dandelion†
  - Foxtail barley (up to 10 cm)*
  - Narrow-leaved hawk's-beard
  - Shepherd's-purse§
  - Volunteer canola
  - Wild oats†

Mix with glyphosate at 360 g ae per acre to control:

- Foxtail barley (greater than 10 cm, heavy infestations or stressed plants)*

*** Apply prior to seed head emergence and the loss of older leaves.**
† Suppression only.
§ *Inferno Duo* only.

NOTE: The entire 254.5 g pouch of Inferno Duo *must be added to the spray tank. DO NOT use part pouches.*
DO NOT apply flucarbazone/tribenuron more than once per season or follow the application of these products with an application of another flucarbazone product.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Use 30 to 50 psi (200 to 345 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage and a minimum of fine droplets that are prone to drift.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flucarbazone	POST (foliar – emerged weeds) PRE (soil activity)	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf & grass	2
tribenuron	POST (foliar – emerged weeds)	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

Crop tolerance and weed control may be reduced if applications are made to plants growing under stress. Stress includes saturated or water-logged soil, drought, extreme temperatures, low fertility or visible disease symptoms at application.
Adopting practices to increase crop vigor will improve crop tolerance.

Tank Mixes:

Herbicides: Glyphosate IPA or K+ salts only.
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Inferno Duo* label only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** DO NOT apply if rainfall is expected within 1 hour of application.
- **Restricted Entry Interval:** Wait at lest 12 hours before re-entering treated fields.
- **Grazing Restrictions:** DO NOT graze treated fields. Mature grain or straw may be fed to livestock.
- **Pre-harvest Interval:** Leave at least 80 days from application to harvest.

- **Re-cropping Interval:** The following crops may be planted 11 months after application.

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Wheat (spring, winter†) Barley Canola (all varieties) Field pea*	Wheat (spring, winter†, durum) Barley Canola (all varieties) Field pea* Flax Field bean Soybean† Sunflower†	Wheat (spring, winter†, durum) Barley Canola (all varieties) Field pea* Flax Soybean† Sunflower†	Wheat (spring, winter†)

† ***Inferno Duo* only.**

*** NOTE: Field peas may be grown the year following application in fields where precipitation has been equal to or above the 10 year average during the growing season, and where organic matter content is above 4 percent, and pH is below 7.5. The company suggests a minimum of 100 mm (4 inches) of rain is needed in the 60 days following application for adequate breakdown to take place.**

  - *NOTE: Other rotational crops may also be affected if rainfall is less than the 10 year average for the area. Soils in the grey wooded, black and dark brown soil zones with a combination of low organic matter (less than 2 percent), light textured soils or high pH (greater than 7.5) (i.e. eroded knolls, sandy soils) may result in delayed growth and development in rotational crops. DO NOT plant crops other than those listed above in the year following application.*

- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	35	20

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured is metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Inferno Duo:


Caution – Skin Irritant

Potential Skin Sensitizer


Warning – Contains the Allergen Sulphites

Himalaya Extra, Viking Visby:

- ***Himalaya:***


Warning – Eye and Skin Irritant

- ***MPOWER Extra Viking Tribenuron:***


Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Fluroxypyr

Herbicide Group
4 - fluroxypyr

Company:

Great Northern Growers and UAP (*Ikwin*)
FMC Corporation (*Perimeter II*)
Albaugh (*Fluro Star*)
WinField United (*Cavalier 180*, Cavalier 333, Viking Tribenuron*)

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Ikwin* (PCP#33047), *Fluro Star* (PCP#33280), *Cavalier 180* (PCP#34344):** 180 g ae/L fluroxypyr formulated as an emulsifiable concentrae.

- Container sizes - 9.68 L (*Ikwin*), 9.3 L or 115 L (*Fluro Star*)

***Perimeter II* (PCP#30094)*, *Cavalier 333* (PCP#33933):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.

- Container size - 3.4 L

*** *Perimeter II* is only available as a component of co-packaged products or tank mixes with FMC products.**

Crops and Staging:

Spring wheat (including durum), barley, oats*: 2 leaf up to the initiation of stem elongation (nodes can be felt at the base of the stem).
Winter wheat*: Apply to winter wheat in the spring from the 3 tiller stage to just before the flag leaf stage.
*** *Cavalier 333* and *Perimeter II* only.**
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Weeds Controlled	180 g/L		333 g/L	
	Rate (mL per acre)	Stage	Rate (mL per acre)	Stage
Cleavers	162	1 to 4 whorls	85	1 to 6 whorls
Cleavers	-	-	125	1 to 8 whorls
Kochia	243	2 to 8 leaf	125	2 to 8 leaf
Round-leaved mallow	324	1 to 6 leaf	162	1 to 6 leaf
Volunteer flax	243	1 to 12 cm	125	1 to 12 cm
Chickweed††	324	up to 8 cm	162	up to 8 cm
Hemp-nettle†	324	2 to 6 leaf	162	2 to 6 leaf
Stork's-bill†	243	1 to 8 leaf	125	1 to 8 leaf
Wild buckwheat†	324	1 to 4 leaf	85	1 to 8 leaf

† **Suppression only.**
†† **Suppression only with 180 g/L formulations, control with 333 g/L formulations.**

Make only ONE APPLICATION per year of any of these products or other products containing fluroxypyr. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. All other uses minimum 40 L per acre.
  - ***Aerial:*** *Perimeter II* only – 12 to 20 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

The activity these products are influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought, heat or cold stress) or if extremely heavy infestations exist.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

The following mixes may be used with each of the products above unless noted otherwise.

- ***In all labelled crops:***
  - MCPA Ester (up to 560 g ae per acre)
  - *Curtail M* (0.61[††] to 0.81 L per acre)
- ***In all labelled crops - except oats:***
  - 2,4-D ester (up to 560 g ae per acre)

The following mixes may be used with fluroxypyr alone or in combination with the broadleaf tank mix partners above unless otherwise indicated.

- ***In spring wheat (including durum) and barley:***
  - *Assert 300 SC* (0.53 to 0.65 L per acre)
  - *Refine SG*
  - Tralkoxydim[†]*
- ***In spring wheat (including durum) only:***
  - Clodinafop 240 EC[†] (93 mL per acre)
  - Fenoxaprop[†]
  - *Simplicity OD*[††Δ]

Insecticides: None registered.

Fungicides: None registered.

Fertilizer: None registered.

*** Temporary crop injury or reduced wild oats control may occur with this tank mix.**

[†] See product labels for specific brands registered.

[††] *Perimeter II* only.

[Δ] Only with tank mix with 2,4-D ester.

Note: The above mixes are those listed on the fluroxypyr product labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour will reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Grazing Restrictions:** Livestock may be grazed 3 days after application. DO NOT feed or cut forage grasses for hay.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:**
  - ***All Products:*** Barley, canola, flax, forage grasses, lentils, mustard, oats, peas, rye, and wheat, may be grown the year after application. There are no re-cropping restrictions the second year after application.
  - **Perimeter II *only:*** Alfalfa, corn, dry beans, faba beans, potatoes, soybeans and sunflowers may also be seeded the year following.
- **Aerial Application:** *Perimeter II* only may be applied by air.
- **Storage:** Avoid freezing. If frozen, bring to room temperature and agitate before use. These products are combustible. DO NOT store near heat or open flame.

- **Buffer Zones:**
  - ***Ikwin:*** Leave a buffer of 15 metres from water bodies, wetland areas and plants that may be injured.
  - ***Perimeter II, Cavalier 180, Fluro Star:***

Application method	Product	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground only*	*Cavalier 180, Fluro Star*	1	0	1
	Cavalier 333 and *Perimeter II*	1	0	3
Fixed wing aircraft	*Cavalier 333* and *Perimeter II* only	5	0	95
Helicopter	*Cavalier 333* and *Perimeter II* only	3	0	80

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

 ***Ikwin, Fluro Star, Cavalier 180, Cavalier 333:*** Danger – Poison

All products:

 Warning – Eye Irritant

 Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Fluroxypyr + 2,4-D

Herbicide Group
4 - fluroxypyr, 2,4-D

This product is a prepackaged tank mix of Fluroxypyr *(see* Fluroxypyr*) and* 2,4-D ester.
Information listed is restricted to Crop, Weeds, Rates and Tank mixes.
For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

AgraCity (*Foxxy Pro, Foxxy Extreme*)
Corteva Agriscience (*Attain XC**)
Nufarm Agriculture (*Flurox-24*)
ADAMA Canada (*Rush 24*)
Viking (*Viking Kalmar*)
* ***Note:*** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

The *Attain XC* package has the following components:
Attain XC A **(PCP#29973):** 333 g/L fluroxypyr formulated as an emusifiable concentrate.

- Container size - 5 L

Attain XC B **(PCP#29972):** 660 g/L 2,4-D LV ester formulated as an emusifiable concentrate.

- Container size - 2 x 6.8 L

-or-
The packages for *Flurox-24, Rush 24* or *Foxxy Pro* have the following components:
Nufarm Fluroxypyr **(PCP#30194),** ***Fluroxypyr 180 EC*** **(PCP#30815),** ***Foxxy*** **(PCP#32952),** ***Viking Fluroxypyr*** **(PCP#34778):** 180 g/L fluroxypyr formulated as an emusifiable concentrate.

- Container sizes:
  - *Nufarm Fluroxypyr* - 7.28 L
  - *Viking Fluroxypyr* - 9.6 L
  - *Fluroxypyr 180 EC, Foxxy* - 9.6 L, 96 L, 980 L

2,4-D Ester 700 **(PCP#27820),** ***Salvo 2,4-D Ester 700*** **(PCP#27818),** ***2,4-D Ester 700 II*** **(PCP#34808),** ***Viking 2,4-D Ester 700*****:** 660 g/L 2,4-D LV ester formulated as an emusifiable concentrate.

- Container sizes:
  - *Flurox-24* package - 10.3 L
  - *Salvo (Rush 24)*, *Viking 2,4-D Ester 700* - 9.8 L[§]
  - *Foxxy Pro* package - 9.8 L[§], 240 L
  - *Foxxy Extreme* package - 13.3 L, 326 L

  [§] NOTE: The amount of 2,4-D 700 Ester provided in the *Rush 24* and *Foxxy Pro* packages is roughly 75% of the 2,4-D Ester required to achieve the rates listed below. Additional 2,4-D Ester will need to be purchased to achieve labelled use rates.

Crops and Staging:

Spring wheat (including durum), barley: 4 leaf up to the emergence of the flag leaf.

Winter wheat: Apply to winter wheat in the spring from the 3 tiller stage to just before the flag leaf stage (*Attain XC* only).

Forage Grasses for seed production only*:

- Seedling and established grasses at the 4 leaf up to the emergence of the flag leaf.
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red, tall)
  - Timothy
  - Wheatgrass (crested, intermediate)

  **** NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.***

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

The following weeds are controlled at the 2 to 4 leaf stage, unless otherwise specified:

[§] NOTE: The amount of 2,4-D 700 Ester provided in the *Rush 24* and *Foxxy Pro* packages is roughly 75 percent of the 2,4-D Ester required to achieve the rates listed below. Additional 2,4-D Ester will need to be purchased to achieve labelled use rates.

- ***Attain XC A* at 95 mL per acre plus *Attain XC B* at 260 mL per acre or;**
  ***Nufarm* or *ADAMA Fluroxypyr 180* or *Foxxy* at 180 mL per acre plus 2,4-D Ester 700 component[§] at 260 mL per acre controls the weeds controlled by 2,4-D ester at 170 g ae per acre (see 2,4-D) plus the following weeds:**
  - Annual sunflower
  - Cleavers*
  - Field horsetail (top growth)
  - Hoary cress (top growth[Δ])
  - Kochia
  - Vetch
  - Wild buckwheat**

  *** 1 to 4 whorls with *Flurox-24, Rush 24, Foxxy Extreme, Foxxy Pro* and *Viking Fluroxypyr*; 1 to 6 whorls with *Attain XC* only.**
  **** 1 to 4 leaf with *Flurox-24*, *Foxxy Extreme, Foxxy Pro* and *Viking Fluroxypyr*; 1 to 6 leaf with *Attain XC* and *Rush 24* only.**
- ***Attain XC A* at 125 mL per acre plus *Attain XC B* at 340 mL per acre or;**
  ***Nufarm* or *ADAMA Fluroxypyr 180* or *Foxxy* at 240 mL per acre plus 2,4-D Ester 700 component[§] at 340 mL per acre controls the weeds controlled by 2,4-D ester at 227 g ae per acre (see 2,4-D) plus the following weeds:**
  - *All weeds listed above plus:*
    - Cleavers (1 to 8 whorls)[Δ]
    - Docks
    - Dog mustard
    - Field bindweed (top growth)
    - Gumweed
    - Hairy galinsoga
    - Hedge bindweed
    - Hemp-nettle (2 to 6 leaf stage)[†]
    - Kochia (2 to 8 leaf)
    - Round-leaved mallow (1to 6 leaf)
    - Smartweed
    - Stork's bill (1 to 8 leaf)
    - Volunteer flax (1 to 12 cm)
    - Wild buckwheat***

  ***** 1 to 4 leaf with *Flurox 24*, *Foxxy Pro, Foxxy Extreme* and *Viking Fluroxypyr*; 1 to 8 leaf with *Attain XC* and *Rush 24* only.**
  [Δ] *Attain XC* and *Flurox-24* only.
  [†] Suppression only.

Make only ONE APPLICATION per year of any of these products or other products containing the same active ingredients. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** *Attain XC* use 20 to 40 L per acre. All other products minimum 40 L per acre.
  - ***Aerial:*** *Attain XC* only use 12 to 20 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

The following mixes may be used with each of the combinations above unless noted otherwise.

- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim[†]*
- ***In spring wheat (including durum) only:***
  - Clodinafop 240 EC[†] (93 mL per acre)
  - Fenoxaprop[†]
  - *Simplicity OD*[††]
  - *Simplicity GoDRI*[††]

Insecticides: None registered.

Fungicides: None registered.

Fertilizer: None registered.

*** Temporary crop injury or reduced wild oat control may occur with this tank mix.**
[†] See product labels for specific brands registered.
[††] Low rate of *Attain XC* only.

Note: The above mixes are those listed on the fluroxypyr + 2,4-D product labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce effectiveness.
  Grazing Restrictions: DO NOT permit lactating dairy animals to graze cereal fields within 7 days of application. DO NOT harvest cereal crops for forage or cut hay within 30 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. DO NOT feed or cut forage grasses for hay.
- **Re-cropping Interval:**
  - ***All products:*** Barley, canola, flax, forage grasses, lentils, mustard, oats, peas, rye, and wheat, may be grown the year after application. There are no re-cropping restrictions the second year after application.
  - **Attain XC *only:*** Alfalfa, corn, dry beans, potatoes, soybeans, and sunflowers may also be seeded the year following.
- **Aerial Application:** *Attain XC* may be applied by air.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	1
Fixed wing aircraft (*Attain XC* only)	5	0	95
Helicopter (*Attain XC* only)	3	0	80

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Fluroxypyr + MCPA

Herbicide Group
4 - fluroxypyr, MCPA

This product is a prepackaged tank mix of Fluroxypyr *(see* Fluroxypyr*) and* MCPA Ester.
Information listed is restricted to Crop, Weeds, Rates and Tank mixes.
For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:

AgraCity (*Foxxy M*)
Nufarm Agriculture (*Trophy*)

Formulation:

The Fluroxypyr + MCPA package has the following components:
***Nufarm Fluroxypyr* (PCP#30194), *Foxxy* (PCP#32952) or *ADAMA Fluroxypyr 180 EC* (PCP#30815):** 180 g/L fluroxypyr.

- Container sizes:
  - *Nufarm Fluroxypyr, ADAMA Fluroxypyr 180 EC* - 4.8 L
  - *Foxxy* - 9.6 L, 230 L

***NuFarm MCPA Ester 600* (PCP#27803), *MCPA Ester 600* (PCP#34156) or *ADAMA MCPA 2 EH Ester 600* (PCP#31669):**
600 g/L MCPA Ester.

- Container sizes:
  - *NuFarm MCPA Ester 600, ADAMA MCPA 2 EH Ester 600* - 7.5 L
  - *MCPA Ester 600* - 10 L, 230 L

All components above are formulated as emulsifiable concentrates.

Crops and Staging:

Spring wheat (including durum), canaryseed*, barley: 3 leaf up to full emergence of the flag leaf.
*** Trophy *only - Since the use of this product on canaryseed is registered under the User Requested Minor Use registration system, the manufacturer assumes no responsibility for herbicide performance. Users of this product on canaryseed do so at their own risk.***
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled at the 2 to 4 leaf stage, unless specified, include weeds controlled by MCPA 600 ester at 380 mL per acre plus:

- Cleavers (1 to 4 whorls)
- Hemp-nettle (2 to 6 leaf)
- Kochia
- Vetch
- Volunteer flax (1 to 12 cm)

Weeds suppressed include:

- Stork's-bill (1 to 8 leaf)
- Wild buckwheat (1 to 4 leaf)

Rate:

Fluroxypyr component: 0.24 L per acre
MCPA Ester 600 component: 0.38 L per acre.
Maximum ONE APPLICATION per year of these or other products containing fluroxypyr.

Tank Mixes:

Tank mix partners may be mixed at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim†
- ***In Spring wheat (including durum) only:***
  - Clodinafop†

† **See product labels for specific brands registered.**

Note: The above mixes are those listed on the Fluroxypyr + MCPA Ester labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Re-cropping Interval:** Wheat, barley, oats, rye, forage grasses, flax, canola, mustard, lentils and pea may be grown the year after application. There are no re-cropping restrictions the second year after application.
- **Aerial Application:** DO NOT apply by air.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	15	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Focus

Herbicide Group
14 - carfentrazone-ethyl
15 - pyroxasulfone

Company:
FMC Corporation

Formulation:
***Focus* (PCP#32292):** 447 g/L pyroxasulfone and 53 g/L carfentrazone-ethyl formulated as a suspension emulsion.
- Container size - 4 x 4.5 L

Crops and Staging:
Note: *Seed soybeans at least 4 cm deep and other crops at least 1 inch (2.5 cm) deep or injury may occur.*
Note: *The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.*
Apply in the fall or in the spring prior to seeding of or up to 3 days after seeding of:
- Corn
- Lentil†
- Field peas†
- Soybean
- Sunflower
- Wheat (spring and winter, NOT durum)

† **Under certain conditions, *Focus* can affect lentil and field pea growth. See details under "Effects of Growing Conditions" below.**

WARNING – application to emerged crops will result in severe damage to the crop.

DO NOT apply *Focus*:
- to soils with 7 percent or more organic matter content.
- to soils with a pH greater than 7.8.
- to sandy soils with less than 1 percent organic matter content.
- in conjunction with products containing saflufenacil (*Heat*), before or after the application of *Focus* as crop injury may occur.

Weeds and Staging:
Control of the following weeds emerging from seed (not controlled if emerged at application):
- Annual bluegrass
- Barnyard grass
- Brome (downy, Japanese)
- Cleavers
- Foxtail (green, yellow)
- Foxtail barley*
- Kochia*
- Lamb's-quarters*
- Mustard (wild*, wormseed)
- Pigweed (green, redroot)
- Ryegrass (Italian)
- Stinkweed*
- Waterhemp
- Wild buckwheat*
- Wild oats*
- Velvetleaf

*** Suppression only.**

The following emerged weeds are controlled by *Focus* up to the 10 cm stage unless otherwise indicated (burn-off):

At the 90 mL per acre rate:
- Lamb's-quarters (up to 7.5 cm tall)
- Nightshade** (black, Eastern black - up to 5 cm tall)
- Pigweed (redroot, waterhemp**)
- Velvetleaf

At the 113 mL per acre rate:
Weeds controlled post-emergent above plus:
- Flixweed
- Lamb's-quarters
- Nightshade (hairy)
- Pennsylvania smartweed (seedlings)
- Pigweed (prostrate, smooth, tumble, waterhemp)
- Purslane
- Round-leaved mallow
- Stinkweed
- Tansy mustard

At the 136 mL per acre rate:
Weeds controlled post-emergent above plus:
- Carpetweed
- Cleavers
- Cocklebur
- Jimsonweed
- Kochia
- Nightshade (black, Eastern black)
- Russian thistle (up to 5 cm tall)
- Shepherd's-purse
- Volunteer canola

Rates:

Treatment	Rate (per acre)	
	Soil Type	
	Coarse to Medium Texture (1 to 3 percent O.M.)*	Medium to Fine Texture (> 3 to 7 percent O.M.)*
Early season control only (spring application only)	90 mL	
Extended residual control (spring or fall application)	113 mL	136 mL

*** O.M. = organic matter content.**

Coarse to Medium soils	Medium-Fine to Fine soils
Sand, loamy sand, sandy loam, loam, silt loam, silt	Sandy clay loam, sandy clay, silty clay loam, silty clay, clay loam, clay

Maximum ONE APPLICATION of *Focus* or other products containing pyroxasulfone within a 12 month period.
Use non-ionic surfactant at 0.25 L per 100 L of spray solution or *Merge* at 1 L per 100 L of spray solution for emerged broadleaf weeds, if using *Focus* without glyphosate.
DO NOT follow a fall application of *Focus* (or any other product containing pyroxasulfone) with a spring application of *Authority 480* (or any other product containing sulfentrazone) to fields where spring wheat will be planted.
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum of 40 L per acre. Higher spray volume is required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles & Pressure:** Maximum 35 psi (210 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- Apply to a uniform seedbed which is firm and clod free. DO NOT mechanically incorporate between application and seeding the crop as this can destroy the herbicide barrier and allow weeds to escape. DO NOT apply to frozen soils or existing snow cover as runoff may result.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14
pyroxasulfone	PPI, PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

All Crops: Moisture, a minimum of 15-25mm. shortly after application, is necessary to activate the Pyroxasulfone component in soil for effective weed control. Dry weather following applications may reduce effectiveness. Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity. Excessive rainfall, irrigation, or prolonged wet soil conditions after application of *Focus* from seed germination through seedling emergence may increase the risk of seedling injury, especially with shallow seeded crops.
Lentils, Peas: Under certain conditions, *Focus* can affect lentil and pea growth. These conditions include high pH (7.5 and above), cool weather, prolonged and excessive moisture, seedling diseases, and any other conditions, including poor agronomic practices, that are unfavorable to vigorous crop growth. Such effects are often observed as stunting and discoloration. The duration of these effects is somewhat dependent on the duration of the adverse growing conditions. These effects lessen and generally diminish with the return to normal growing conditions.

Tank Mixes:

Herbicides:

- ***Prior to field corn only:***
  - *AAtrex* (0.85 to 1.25 L per acre) (soil activity).
- ***Prior to all crops:***
  - Glyphosate (180 to 360 g ae per acre)
- ***Prior to wheat (spring, winter, NOT durum), soybean*, field pea*:***
  - *Express SG** + glyphosate

  *** Refer to crop specific restrictions of *Express SG* prior to pulse crops.**

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Heavy rainfall shortly after application may reduce weed control of the carfentrazone component. Moderate rainfall (see 'Effects of Growing Conditions' above for details) within a few days of application is required for proper activity of the pyroxasulfone component.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT allow livestock to graze or feed on wheat grain, forage, hay or straw within 42 days after application.
- **Pre-harvest Interval:** Not applicable.
- **Re-cropping Interval:** Field corn, field pea, lentils, soybeans, sunflower, wheat (winter and spring, NOT including durum) may be seeded any time following application. Barley, canola, chickpeas, durum, flax, mustard, oats, safflower may be seeded 12 months after application. Sugar beets may be seeded 24 months after application. Conduct a field bioassay to confirm crop safety prior to seeding any other rotational crops.
  Note: If there is a lack of adequate or normal soil moisture due to drought conditions following an application of Focus, the minimum rotational crop interval described above must be extended for one additional year and a representative bioassay of the field must be conducted with the potential rotational crop and adequate soil moisture to determine the crop sensitivity to Focus.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** STORE ABOVE 5°C TO KEEP PRODUCT FROM FREEZING. If frozen, thaw before use. If solid crystals are observed, warm material to above 15°C by placing container in warm location. Shake or roll container periodically to redissolve solids.
- **Buffer Zones:**

Application Method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	5	3	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

No specific hazards.

Fortress MicroActiv (this referring text to be removed in the 2025 edition)

See Triallate + Trifluralin

Foxxy CRX

Herbicide Group
2 - thifensulfuron, tribenuron
4 - fluroxypyr, clopyralid

This product is a prepackaged tank mix of Foxxy (see Fluroxypyr), MPOWER RX (see 'Thifensulfuron/Tribenuron (2:1 ratio)) and Clobber (see Clopyralid). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above and select the most restrictive.

Company:
AgraCity

Formulation:
The *Foxxy CRX* package contains the following components:
***Foxxy* (PCP#32952):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 9.6 L, 230 L

-plus-
***MPOWER RX* (PCP#33520):** 50% thifensulfuron methyl + 25% tribenuron methyl formulated as a water dispersible granule.
- Container sizes - 320 g, 24 x 320 g

-plus-
***Clobber* (PCP#33114):** 50 g/L clopyralid formulated as an emulsifiable concentrate.
- Container sizes - 3.4 L, 81 L

Crops and Staging:
Barley, spring wheat, durum wheat only: 3 leaf to flag leaf.

Weeds, Rates and Staging:
Weeds controlled by *Foxxy* (see Fluroxypyr) at 0.24 L per acre plus the weeds controlled by *MPOWER RX* (see Thifensulfuron:tribenuron (2:1)) at 8 grams per acre and *Clobber* (see Clopyralid) at 85 mL per acre.

If applied alone, *Foxxy CRX* requires the addition of *Icon*, *Agral 90, Ag-Surf* or *Citowett Plus* adjuvant at 0.2 L per 100 L of spray solution, and which must be purchased separately.

Foxxy CRX may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Foxxy MR

This product is a prepackage tank mix of Thifensulfuron/Tribenuron (2:1), MCPA Ester and fluroxypyr. Information listed is restricted to Crops, Weeds, Rates and Tank Mixes. For other detailed restrictions and other general information on the component products see the product pages listed here.

Herbicide Group
4 - fluroxypyr, MCPA
2 - thifensulfuron, tribenuron

Company:
AgraCity

Formulation:
The *Foxxy MR* package contains the following components:

***Foxxy* (PCP#32952):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 9.6 L, 230 L

-plus-

***MCPA Ester 600* (PCP#34156):** 600 g a.e./L MCPA Ester formulated as an emulsifiable concentrate.
- Container sizes - 9.6 L, 230 L

-plus-

***MPOWER RX* (PCP#33520):** 50% Thifensulfuron-methyl + 25% tribenuron-methyl formulated as water dispersible granules.
- Container sizes - 320 g, 24 x 320 g

Crops and Staging:
Spring wheat, durum wheat, barley: 3-leaf to early flag leaf stage.

Weeds and Staging:
Weeds controlled by Thifensulfuron/Tribenuron (2:1) plus the weeds controlled by MCPA Ester at 240 mL per acre plus:
- Cleavers (1 to 4 whorls)
- Kochia (2 to 8 leaf)
- Volunteer flax (1 to 12 cm)
- Stork's-bill (1 to 8 leaf)*

* **Suppression only.**

Rates:
Note: Maximum ONE APPLICATION of this or other products containing fluroxypyr or thifensulfuron per year.

***Foxxy*:** 240 mL per acre

-plus-

MCPA Ester 600: 240 mL per acre

-plus-

***MPOWER RX*:** 8 g per acre

Add *Agral 90, Agsurf II* or *Citowett Plus* at 0.2 L per 100 L of spray solution if applied without a wild oat herbicide.

MPOWER RX may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Frontier Max

Herbicide Group
15 - dimethanamid

Company:
BASF Canada (PCP#29194)

Formulation:
720 g/L dimethanamid-P formulated as an emulsifiable concentrate.
- Container sizes - 3 L to 1000 L

Crops and Staging:
Pre-plant incorporated:
- Corn (NOT sweet corn, popcorn, or corn grown for seed).

Pre-emergence surface:
- Dry beans (navy and kidney beans only).
- Potatoes – after planting or after hilling, but before emergence of the crop or weeds.

Weeds and Staging:
Pre-emergent control of green foxtail.

Rates:
Pre-plant incorporated treatments:
- Apply at 0.35 to 0.39 L per acre. Apply at the higher rate on fine-textured or high organic soils and for heavier anticipated weed problems.

Pre-emergence surface treatments:

Soil Type (Texture)	Rate (L per Acre)		
	Less than 3 percent Organic Matter	3 to 6 percent Organic Matter	7 to 10 percent Organic Matter
Coarse	0.31	0.31	0.35
Medium and Fine	0.31	0.35	0.39

Application Information:
- **Water Volume:** A minimum of 40 L per acre.
- **Pressure:** 30 to 43 psi (200 to 300 kPa).
- **Nozzles:** Flat fan or flood-jet. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use 16 mesh suction screen, 50 mesh elsewhere on sprayer.
- **Incorporation:** For pre-plant incorporated treatments, apply *Frontier Max* as a broadcast treatment and incorporate using a harrow, rolling cultivator or other implement capable of giving uniform, shallow incorporation into the top 5 cm (2 inches) of soil within 7 days of planting. Avoid deeper incorporation or reduced weed control and/or crop injury may result. Immediate incorporation after application is not necessary.
  - Beans must be planted at least 4 cm (1.5 inches) deep or crop injury may occur.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dimethanamid-P	PPI, PRE (suface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:
Rainfall is required within 7 to 10 days of application to activate and move *Frontier Max* into the soil zone. If dry conditions persist, a shallow cultivation or the use of a rotary hoe is necessary to move the herbicide into moist soil and control weed escapes. Shallow tillage is important to minimize dilution of the herbicide. If drought conditions persist after pre-plant incorporated or pre-emergence applications, weed control may not be adequate.

Tank Mixes:

Herbicides: None registered.

Fertilizers: May be applied with a liquid fertilizer carrier. Test compatibility with liquid fertilizer by mixing a small amount of herbicide with a proportional quantity of liquid fertilizer in a jar. May also be impregnated on dry bulk fertilizers for pre-plant incorporated treatments. A minimum of 90 kg per acre of dry bulk fertilizer should be applied. DO NOT impregnate *Frontier Max* on nitrate fertilizers, superphosphates or limestone.

Insecticides: None registered.

Note: The above mixes are those listed on the *Frontier Max* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall after application is important for good weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 24 hours.
- **Grazing Restrictions:** DO NOT graze or feed the treated corn crop within 40 days of application. DO NOT graze the treated bean crop or feed bean forage, hay or straw to livestock.
- **Re-cropping Interval:** DO NOT plant winter wheat within 120 days of application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Must be stored under heated warehouse conditions.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. When mixing with other pesticides, combine the method above with the method recommended for the tank mix partner if different from above for thorough cleaning.

Hazard Rating:


Caution – Poison


Warning – Eye Irritant and Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Glufosinate

Herbicide Group
10 - glufosinate

Company:

BASF Canada (*Liberty 150SN*)
AgraCity (*MPOWER Vigor*)
UPL AgroSolutions Canada (*Interline*)
Advantage Crop Protection (*Advantage Glufosinate-ammonium 150SN*)
WinField United (*Justice*)
Sharda CropChem (*Opportunity 15SL*)
Viking (*Viking Glufosinate 150)*
NuFarm Agriculture (*Granata)*
ADAMA Canada (*ADAMA Glufosinate 150 SL*)
Advantage Crop Protection (*Advantage Glufosinate 280*)

Formulation:

***Liberty 150 SN* (PCP#28837), *MPOWER Vigor* (PCP#33267), *Interline* (PCP#32860), *Advantage Glufosinate ammonium 150 SN* (PCP#33472), *Justice* (PCP#33615), *Opportunity 15SL* (PCP#34332), *Granata* (PCP#34807), *ADAMA Glufosinate 150 SL* (PCP#34833): Viking Glufosinate 150 (PCP#34726):**
150 g/L glufosinate ammonium formulated as a solution.

- Container sizes:
  - *Liberty 150SN, Interline* - 13.5 L, 108 L, 432 L, 864 (*Interline* only)
  - *MPOWER Vigor, Viking Glufosinate* - 2 x 13.5 L, 108 L, 500 L, 1000 L
  - *Justice* - 108 L, 500 L
  - *Advantage Glufosinate-ammonium 150SN* - 10 L, 120 L, 500 L, 1000 L
  - *Granata* - 500 L
  - *ADAMA Glufosinate 150 SL* - 2 x 13.5 L, 108 L, 432 L

***Advantage Glufosinate 280* (PCP#34902):** 280 g/L glufosinate ammonium formulated as a solution.

- Container sizes: 2 x 10 L, 120 L, 500 L, 1000 L
  - *Advantage Glufosinate 280*

Crops, Rates and Staging:

Liberty Link Canola – cotyledon to early bolting stage. Temporary crop discolouration (bronzing, speckling) may be observed after application.
Note: A valid Liberty and Trait Agreement is required to purchase Liberty 150SN only.

Repeat Applications:

Liberty 150SN only: Up to 3 applications per year to LibertyLink canola at rates up to 1.62 L per acre for each of the three applications (if required) up to early bolting stage of canola. Apply when new weed growth is in the correct leaf stage. DO NOT apply more than 4.86 L per acre per year.
Other Glufosinate 150 SN brands: A second application of up to 1.35 L per acre may be made to fields to a maximum total combined rate of 2.97 L per acre (i.e. 1.62 L plus 1.35 L). DO NOT apply more than 2.97 L per acre in one season.
Advantage Glufosinate 280: a second application of up to 0.72 L per acre may be made to fields to a maximum total combined rates of 1.59 L per acre (i.e. 0.87 L plus 0.72 L). DO NOT apply more than 1.59 L in one season.
Glufosinate tolerant Soybean (*Opportunity 15SL, Granata* and *ADAMA Glufosinate 150 SL* only): Up to two applications of up to 1.35 L per acre from the cotyledon to flowering stage. Maximum 2.7 L per acre per season.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions. **DO NOT tankmix *Liberty 150SN* with *Interline* or *ADAMA Glufosinate 150 SL*.**

Harvest Aid Treatment:
Note: As of January 1, 2022 www.keepingitclean.ca indicates that grain from crops treated with this product prior to harvest may have market access concerns. Please see introduction or the www.keepingitclean.ca website for more information AND *consult potential grain buyers before using this product*.

All 150 Formulations

Crop	Rate (L per acre)	Stage
Alfalfa (seed production only)***	0.81 to 1.09††	50 to 75% pod turn (brown)
Canola† *	0.81 to 1.09	30 to 40% seed colour change (green to brown)
Lentil† **	1.09	40 to 60% pod turn (yellow to brown)
Potato† **	1.21	14 to 21 days prior to harvest

† Not for crops grown for seed.
†† Use the higher rate when crop canopies or weed densities are heavy.
*** *Advantage Glufosinate-ammonium 150SN* only.**
**** *Advantage Glufosinate-ammonium 150SN, MPOWER Vigor* and *Viking Glufosinate* only.**
***** *Advantage Glufosinate-ammonium 150SN, MPOWER Vigor, Interline, Opportunity 15SL*, *Justice* and *Viking Glufosinate* only.**

Advantage Glufosinate 280

Crop	Rate (L per acre)	Stage
Canola†** (only Roundup Ready canola with pod shatter reduction trait)	0.43 - 0.59††	30 to 40 % seed color chnage (green to brown)

†Not for crops grown for seed.
†† Use the higher rate when crop canopies or weed densities are heavy.
****DO NOT harvest treated crop within 5 days after application.**

Weeds, Rates and Staging:

Weed	Weed Stage (from emergence to stage)	All 150 formulations Rate (L per acre)	Advantage Glufosinate 280 Rate (L per acre)
Cow cockle	4 leaf	0.54	0.29
Green foxtail	6 leaf (max. 3 tillers)		
Barnyard grass	4 leaf	0.81	0.43
Wild mustard	5 leaf		
Lamb's-quarters, smartweed (lady's-thumb)	6 leaf		
Stinkweed	8 leaf		
Volunteer flax	2.5 inches (6 cm)	0.81	0.43
Russian thistle	3 inches (8 cm)		
Wild buckwheat	3 leaf	1.08	0.58
Redroot pigweed, round-leaved mallow, quackgrass*	4 leaf		
Light to moderate infestations† of volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)		
Hemp-nettle (1 to 3 leaf pairs), shepherd's-purse	6 leaf		
Common chickweed (max. 4 leaf pairs), sow-thistle	8 leaf		
Kochia	3 inches (8 cm)		
Canada thistle*, scentless chamomile	4 inches (10 cm)		
Cleavers	2 whorls (nodes)	1.35	0.72
Stork's-bill and heavy populations of wild buckwheat	3 leaf		
Quackgrass (light to moderate** or heavy infestations*)†, wild oats	4 leaf (max. 2 tillers except quackgrass)		
Heavy infestations† volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)		
Hemp-nettle	8 leaf (1 to 4 leaf pairs)		
Dandelion rosettes	6 inches (15 cm) across		
Flixweed, Canada thistle*	4 inches (10 cm)		
Jimsonweed††	1 to 6 leaf		

Weed	Weed Stage (from emergence to stage)	All 150 formulations Rate (L per acre)	Advantage Glufosinate 280 Rate (L per acre)
Quackgrass***	4 leaf	1.6	0.87
Canada thistle**	4 inches (10 cm)		
Japanese, Downy brome (spring germinated)	6 leaf (up to emergence of 1st tiller)		

*** Top growth suppression. Plants may return from surviving growing points.**
**** Extended top growth suppression.**
***** Season long control.**
† **The company does not provide guidelines for weed densities. When in doubt as to the infestation level, use the high rate or contact the manufacturer.**
†† ***Liberty150SN* and *Granata* only**

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 45 L per acre. When crop canopy and weed densities are heavy, apply in 69 to 89 L per acre of water.
  - ***Aerial:*** 13 to 22 L per acre.
- **Nozzles and Pressure:**
  - ***Ground:*** Use 40 psi (275 kPa) when using conventional 80° or 110° flat fan nozzles; 45 psi (310 kPA) when using check valves. Angle nozzles forward at 45° to improve coverage of vertical leaf surfaces. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** or larger droplets.
  - ***Aerial:*** DO NOT use raindrop nozzles. Use a combination of nozzles and pressure to provide ***ASABE coarse*** or larger droplet size distribution.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
glufosinate	POST (foliar)	Glutamine Synthase Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf & grass	10

Effects of Growing Conditions:

Glufosinate 150SN activity is influenced by environmental conditions. Cool temperatures (less than 10°C), drought, and low humidity conditions slow weed growth. Applications made under these stressed conditions may result in reduced weed control.

Tank Mixes:

Herbicides:

Note: Avoid mixing different Glufosinate products in the same tank as incompatibilities have been reported.

- Clethodim (*Centurion* or *Select* only) 50 mL to 77* mL per acre plus *Amigo*. For *Centurion* or *Select* tank mixes add *Amigo* to the tank first followed by *Glufosinate 150SN* and then *Centurion* or *Select*. Consult label for specific mixing instructions.
- *Facet* (quinclorac)* (113 mL per acre) plus *Merge* or *Amigo* 0.2 L per acre adjuvant (0.2 to 0.4 L per acre)
- Clethodim (*Centurion* only) 25 mL per acre + *Facet* 113 mL per acre plus *Merge* adjuvant (rates above)**
  *** *Liberty 150SN, Interline, Opportunity 15SL, Justice, Granata, ADAMA Glufosinate 150 SL* only.**
  **** *Liberty 150SN* and *Opportunity 15SL* only.**
- *Advantage Glufosinate 280*:
  Clethodim (*Centurion* or *Select* only) 26 mL per ace plus *Amigo*. For *Centurion* or SelectI tank mixes add *Amigo* to the tank first followed by *Glufosinate 280* and then *Centurion or Select*. Consult labe for specific mixing instructions.
- *Ingenious* (quinclorac) (25 g per acre) plus adjuvant
- *Advantage Clethodim* 26 ml per acre plus adjuvant.

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

Note: The above mixes are those listed on the *Glufosinate 150SN* labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 24 hours after application.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for feed.
- **Preharvest Interval:** DO NOT apply within 60 days of harvest when tankmixed with quinclorac and/or clethodim. For Harvest Aid uses, leave 9 days between application and harvest of lentil and potato.
- **Re-cropping Interval:** No restrictions for field corn, canola and soybeans.. Following *Liberty 150SN* or *MPOWER Vigor* or *Advantage Glufosinate 280* there are no restrictions for dry common beans (not grown for seed), alfalfa, carrot, lettuce, onion and potato. 70 days for buckwheat, barley, millet, oats, rye, sorghum, triticale and wheat. Minimum 120 days for all other crops.
- **Aerial Application:** May be applied by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**
  - ***Advantage Glufosinate-ammonium 150SN:*** Leave 15 meters by ground and 30 meters by air to sensitive aquatic and terrestrial habitats.
  - ***Liberty 150SN, MPOWER Vigor, Interline, Justice, Viking Glufosinate, Advantage Glufosinate 280:***

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground *	All uses	1	0	1
Fixed wing airplane or helicopter	Harvest-Aid uses	1	0	30
	Canola	1	0	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

- DO NOT apply when dead calm or when winds exceed 16 km per hour when using unprotected booms or applying by air, or exceeding 25 km per hour when using shrouded booms.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

 Warning – Poison

 Caution – Skin Irritant

 Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Glufosinate 200 SN

Herbicide Group 10 - glufosinate

Company:

BASF Canada (*Liberty 200 SN* – PCP#25337)
Advantage Crop Protection (*Advantage Glufosinate 200 SN* – PCP#32823)
AgraCity (*MPOWER Vigor 200 SN* – PCP#33613)

Formulation:

200 g/L of glufosinate ammonium formulated as a solution.

- Container size - 10 L

Crops and Staging:

Glufosinate ammonium tolerant corn only: 1 to 8 leaf stage. Refer to product label for appropriate method of determining crop leaf stage.
Glufosinate ammonium tolerant soybean varieties only: up to the start of flowering and prior to canopy closure.

Weeds Rates and Staging:

Weeds controlled with 0.61 L per acre rate

Weed	Weed Stage (from emergence to stage)
Cocklebur	4 leaf
Green foxtail, proso millet, ragweed	5 leaf
Redroot pigweed, shepherd's-purse	6 leaf
Chickweed	8 leaf

Weeds controlled with 0.81 L per acre rate

Weed	Weed Stage (from emergence to stage)
Perennial sow-thistle, wild buckwheat, wild mustard, wild oats, yellow foxtail	4 leaf
Barnyard grass, eastern black nightshade	5 leaf
Canada thistle*, field bindweed*, lady's-thumb, lamb's-quarters, wormseed mustard	6 leaf
Ragweed	7 leaf
Stinkweed	8 leaf

*** Season long suppression.**

Weeds controlled with 1.0 L per acre rate

Weed	Weed Stage
Quackgrass**	1 to 4 leaf
Jimsonweed	1 to 6 leaf stage

**** Season long suppression, apply with ammonium sulphate, 2.4 L per acre (49 percent solution) or 1.2 kg per acre (99 percent).**

Second Application:

- A second application may be made to fields treated initially with up to 1 L per acre, if weeds and crop are at the correct leaf staging. DO NOT apply more than 2 L per acre *Glufosinate 200 SN* to a crop in a single season.

Split Application Program:

- For season long control of the weeds above a split application of *Glufosinate 200 SN* may be employed. The first application must be a minimum of 0.81 L per acre made at the correct weed staging. For the second application of a 0.51 L per acre rate may be used. The second application timing must be made as soon as the second flush of weeds occurs and before the maximum leaf stage for the crop.

Application Information:

- **Water Volume:** A minimum of 45 L per acre.
- **Nozzles and Pressure:** Use 25 to 40 psi (175 to 275 kPa) when using conventional 80° or 110° flat fan nozzles. Angle nozzles forward at 45° to improve coverage of vertical leaf surfaces. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
glufosinate	POST (foliar)	Glutamine Synthase Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf & grass	10

Effects of Growing Conditions:

Glufosinate 200 SN activity is influenced by environmental conditions. Cool temperatures (less than 10°C), drought and low humidity conditions slow weed growth. Applications made under these stress conditions may result in reduced weed control. Weed control may also be reduced when heavy dew, fog, or mist are present at the time of application.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 24 hours after application, without protective clothing as for spraying.
- **Grazing Restrictions:** DO NOT graze treated fields within 20 days of application.
- **Pre-harvest Interval:** Leave 86 days between application and corn harvest, and 70 days for soybean.
- **Re-cropping Interval:** No re-cropping restrictions the year after treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	0	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Poison


Caution – Skin Irritant


Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Glyphosate

Herbicide Group 9 - glyphosate

Product Names, Company, Formulation and Package Sizes:

All products are formulated as solutions.

Container sizes available: Various

Product Name	Company	Salt type*	Active** content (g ae per L)
Advantage Glyphosate 360 (PCP#33694)	Advantage Crop Protection	IPA	360
Advantage Glyphosate 540 (PCP#33764)	Advantage Crop Protection	K+	540
Credit 45 (PCP#29124)†	Nufarm Agriculture	IPA	450
Credit Xtreme (PCP#29888)	Nufarm Agriculture	IPA/K+	540
Crush'R Plus (PCP#29995)	Albaugh	IPA	360
Crush'R 540 (PCP#31655)	Albaugh	K+	540
Destroyer 540 (PCP#32945)	Agracity	K+	540
Disruptor 540 (PCP#32817)	AgraCity	K+	540
Factor 540 (PCP#27988)	Interprovincial Cooperative Limited	K+	540
Gallop (PCP#34489)	Sharda CropChem Canada	IPA/K+	540
Glyforce WDG (PCP#33400)	Sharda CropChem Canada	MA	68.77%
Matrix (PCP#29775)	Interprovincial Cooperative Limited	DMA	480
Roundup Transorb HC (PCP#28198)	Bayer	K+	540
Roundup WeatherMax (PCP#27487)	Bayer	K+	540
R/T 540 (PCP#28487)	Bayer	K+	540
Smoke (PCP#31063)	Farmers Business Network Canada	IPA	360
Sharda Glyphosate (PCP#31493)	Sharda CropChem Canada	IPA	360
Shotgun 540 (PCP#33675)	Albaugh	K+	540
Shotgun 360 (PCP#33671)	Albaugh	IPA	360
StartUp (PCP#29498)	Loveland Products Canada	K+	540
Stonewall 540 (PCP#33379)	WinField United Canada	K+	540
Vector 540 (PCP#31598)	Federated Cooperatives	K+	540

*** Salt type: IPA = Isopropylamine, MA = Monoammonium, DA = Diammonium, DMA = dimethylamine, K+ = Potassium**

**** Formulation concentration is expressed as "grams of acid equivalent per litre of product (g ae/L)" with the exception of *Glyforce WDG*. Glyphosate acid is the herbicidally active component of the formulation and is proportional to the activity of the formulation.**

Note: **Some products may be more effective due to formulation differences (not related to higher glyphosate content) under adverse conditions, but that benefit is reduced when applications are made under optimal conditions for activity (i.e. rapid weed growth, clean leaf surfaces). When selecting a glyphosate product, consult the product labels.**

† *Note: This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Rate (g ae per acre)	Glyphosate formulation concentration (g ae per L)					
	356/360	450	480	500	540	68.77% WDG
36.5	100 mL	81 mL	76 mL	73 mL	67 mL	-
73	200 mL	162 mL	152 mL	146 mL	134 mL	-
110	0.3 L	0.24 L	0.23 L	0.2 L	0.2 L	142 g
120	0.33 L	0.27 L	0.25 L	0.24 L	0.22 L	-
136	0.38 L	0.30 L	0.28 L	0.27 L	0.25 L	-

Rate (g ae per acre)	Glyphosate formulation concentration (g ae per L)					
	356/360	450	480	500	540	68.77% WDG
145	0.4 L	0.32 L	0.3 L	0.28 L	0.27 L	190.2 g
180	0.5 L	0.4 L	0.38 L	0.36 L	0.33 L	242.8 g
275	0.77 L	0.61 L	0.57 L	0.54 L	0.51 L	364.2 g
325	0.91 L	0.73 L	0.68 L	0.65 L	0.61 L	433 g
360	1.0 L	0.81 L	0.76 L	0.73 L	0.67 L	481.6 g
510	1.42 L	1.13 L	1.1 L	1.0 L	0.94 L	671.8 g
540	1.5 L	1.21 L	1.13 L	1.09 L	1.0 L	720.3 g
690	1.9 L	1.54 L	1.44 L	1.38 L	1.28 L	910.5 g
720	2.0 L	1.62 L	1.5 L	1.46 L	1.34 L	959.1 g
1020	2.8 L	2.27 L	2.13 L	2.02 L	1.89 L	1351.7 g
1750	4.9 L	3.88 L	3.6 L	3.48 L	3.24 L	2302.7 g

Crops and Uses:

4. Annual weed control prior to crop emergence or in fallow.
5. Quackgrass control prior to seeding or after harvest.
6. Dandelion control (other than Preharvest).
7. Canada thistle control in fallow, shelterbelts and post-harvest.
8. Alfalfa control (other than Preharvest).
9. Other perennial weeds control in fallow, shelterbelts and post-harvest.
10. Patch treatments of perennial weeds in cereals, corn, soybean and forages.
11. Preharvest perennial weed control.
12. For use in Glyphosate tolerant crops.
13. Tank Mixes.

1. Annual weed control prior to crop emergence or in fallow:

Weeds listed may not occur on all product labels. Check individual product labels for a specific list of weeds controlled.

Rate (g ae per acre)	Surfactant*	Weeds Controlled	Weed Stage
110	0.14 L/acre	**Grasses:** Green foxtail, volunteer cereals, wild oats (light infestations) **Broadleaves:** lady's-thumb, stinkweed, volunteer canola (NOT including glyphosate tolerant varieties), wild mustard.	Less than 3 inches (8 cm) high. Apply at the 1 to 3 leaf stage of wild oats.
145	0.14 L/acre	*Above weeds plus*: **Grasses:** heavy infestations of wild oats **Broadleaves:** suppression of flixweed, kochia.	1 to 3 leaves for wild oats Weeds 3 to 6 inches (8 to 15 cm).
180 to 275	Not required	*Above weeds plus:* **Grasses:** downy brome, Persian darnel. **Broadleaves:** Canada fleabane, cleavers, common ragweed, flixweed, hemp-nettle, lamb's-quarters, narrow-leaved hawk's-beard, redroot pigweed, Russian thistle, volunteer flax, wild buckwheat.	Canada fleabane, common ragweed, less than 3 inches (8 cm) high. Other weeds less than 6 inches (15 cm). Use high rate for narrow-leaved hawk's- beard 3 to 6 inches (8 to 15 cm) or wild buckwheat at the 3 to 4 leaf stage.
325	Not required	*Above weeds plus:* **Grasses:** annual blue grass. **Broadleaves:** annual sow-thistle, kochia, prickly lettuce, shepherd's-purse, narrow-leaved vetch**.	Less than 6 inches (15 cm) high
510	Not required	Above weeds.	Greater than 6 inches (15 cm) high

*** Unless otherwise specified on the product label, use one of the following surfactants: *Agral 90, Agsurf II, Companion* or *LI700*.**

**** Note: Narrow-leaved vetch is an annual species. Established perennial vetches, such as American vetch, may not be controlled at this rate.**

2. Quackgrass control prior to seeding or after harvest:

Rate (g ae per acre)	Quack Grass Stage
360	Season long control of light to moderate infestations. Apply when quack grass is 8 inches (20 cm) tall and has 3 to 4 actively growing leaves. Apply spring or fall.
360 to 1020	Apply when quack grass has 3 to 4 new leaves for long term control of heavy infestations. Use high rate for sod-bound quack grass (left undisturbed for at least 2 years).

DO NOT apply fall treatments if a hard frost has occurred (-5°C) or if plants are drought stressed. Spread straw to allow regrowth and good spray coverage.

Cultivation prior to application will result in reduced control. DO NOT cultivate between harvest and treatment when using fall applications. If using spring applications on fields which have been fall-tilled, delay application until the quack grass has reached the 4 to 5 leaf stage. (This will occur 1 to 4 weeks later on fall-tilled fields than in undisturbed fields).

Cultivation after application usually will improve control of quack grass. Wait a minimum of 3 days after application before cultivating. If growing conditions are poor (cold or dry), particularly in the fall, waiting longer than 5 days may improve control.

3. Dandelion control (other than Preharvest):

Apply up to and including dandelion bloom for best results.

Rate (g ae per acre)	Dandelion Growth Stage
360	Less than 6 inches (15 cm) diameter. Allow 3 or more days after treatment before tillage.
540 to 720	Greater than 6 inches (15 cm) diameter. Use higher rate when infestations are heavy.

4. Canada thistle control in fallow, shelterbelts and post-harvest:

Rate (g ae per acre)	Weed Staging
360	Rosettes at least 6 inches (15 cm) in diameter, treated in late summer, following tillage in spring and early summer (up to August 1). Allow thistles to regrow for 5 weeks following last tillage. Wait a minimum of 10 days after application before tillage. Treatment after a mild frost is possible if leaves are green and pliable and plants are actively growing.
690 to 1020	Bud stage or beyond. Allow at least 5 days after application before tillage. -or- Post-harvest treatment. Allow 8 to 10 inches (20 to 25 cm) of new growth before application. Must be sprayed at least 2 weeks prior to killing frost. Straw should be removed or evenly spread to allow for proper regrowth and spray coverage.

5. Alfalfa Control (other than Preharvest):

Rate (g ae per acre)	Weed Staging
540 to 720	Fall control of alfalfa in early bud to full bloom stage. Use high rate when alfalfa populations are high or when perennial grasses are present. Allow at least 5 days before tillage. See tank mix section for minimum tillage or spring applications. Apply with 23 to 135 L per acre water.

6. Other perennial weed control in fallow, shelterbelts and post-harvest:

(Refer to individual product labels for detailed application information.)

Foxtail Barley:

- Control from seedling to heading (all products) at 360 to 720 g ae per acre. Late fall applications may provide better control of established foxtail barley plants than spring applications.

Yellow toadflax: 360 g ae per acre.

Other Perennial weeds*: 1020 to 1750 g ae per acre

*** Perennial weeds such as absinthe, blue grass spp., smooth brome grass, cattail, curled dock, field bindweed (bloom stage or beyond), hemp dogbane, hoary cress, poison ivy, purple loosestrife, perennial sow-thistle, and yellow nutsedge applied at the early heading to early bud stage.**

7. Patch treatments of perennial weeds in wheat, oats, barley, corn, soybean, forage legumes and forage grasses:

(Refer to individual product labels for detailed application instructions)

Rate (g ae per acre)	Weed
360 to 1020	Quack grass 8 in (20 cm) tall
690 to 1020	Canada thistle bud or beyond
1750	Milkweed bud to bloom
1020 to 1750	Other perennial weeds*
36.5 to 73	Spot treatment rates for hand held equipment (per 10 L water**)

*** Perennial weeds such as absinthe, blue grass spp., smooth brome grass, cattail, curled dock, field bindweed (bloom stage or beyond), hemp dogbane, hoary cress, poison ivy, purple loosestrife, perennial sow-thistle, and yellow nutsedge applied at the early heading to early bud stage.**
**** Use the low rate for quack grass and the high rate for all other perennials.**

8. Preharvest perennial weed control:

DO NOT apply to any crops grown for seed.

Note: As of January 1, 2020 www.keepingitclean.ca indicates that grain from crops treated with this product prior to harvest may have market access concerns. Please see introduction for more information AND *consult potential grain buyers before using this product*.

Not all glyphosate products are registered for Preharvest applications on all crop species listed below. Refer to specific glyphosate labels for a list of registered uses and crop species.

RATES:

- **Prior to the harvest of annual grains (see staging chart below for specific crops):** 360 g ae per acre.
- **Prior to the final cut of forages to be removed from production:** 360 to 720 g ae per acre.
- **Weeds controlled with preharvest applications:**

Quack grass 4-5 green leaves	Canada thistle and perennial sow-thistle at bud stage or beyond	Common milkweed at bud to bloom stage	Toadflax at bud to full bloom stage	Dandelion from rosette to full bloom stage
X	X	X	X	X

- **Crop Staging for Preharvest applications:**
  - Apply to crops (except forage) when grain moisture is less than 30 percent. The following chart lists visual symptoms that can be used as guidelines to when 30 percent grain moisture has been reached.

Crop*	Visual Guide to Proper Application Stage
Wheat, barley*, oats*, canaryseed***†	Hard dough stage – a thumbnail impression remains on seed.
Canola, mustard‡***†	Pods are green to yellow and most seeds are yellow to brown.
Flax (and solin - low linolenic acid flax)	Majority (75 to 80% of bolls) are brown.
Lentil	Lowermost pods (bottom 15%) are brown and rattle when shaken.
Pea	Majority (75 to 80%) of pods are brown.
Chickpea**†, lupin**†, faba bean**†, dry bean	Stems are green to brown in colour; pods are mature (yellow to brown in colour); 80% to 90% leaf drop (original leaves).
Camelina***†	When 95% of pods have changed colour, seed is firm and less than 40% of seed is green.
Soybean	Stems are green to brown in colour and pod tissue is brown and dry in appearance (80 to 90% leaf drop).
Forage	3 to 7 days prior to the last cut before rotation or forage renovation. DO NOT apply to forage stands that are to be maintained.

*** Registered for application to barley grown for malt and tame oats grown for milling; however, many millers and malsters are not accepting glyphosate treated oats or malt barley. Contact malt barley or milling oats buyers prior to application to confirm acceptance of glyphosate-treated grain.**
**** Preharvest applications on these crops are registered with *Roundup Transorb HC, Roundup WeatherMax, R/T 540, Advantage Glyphosate 540, Stonewall 540* and *StartUp* only.**
***** Preharvest applications on these crops are registered with *RoundUp Weather Max* only.**
‡ Yellow/white, brown, oriental mustard only.
† *NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply glyphosate to chickpea, lupin, faba bean, canaryseed, camelina or mustard do so at their own risk*.

9. For use in glyphosate tolerant canola:

Weeds, Staging and Rates:

***Genuity* (original) glyphosate tolerant canola:**

All applications must be made within the cotyledon to 6 leaf stage. Temporary yellowing may occur if applied at the 4 to 6 leaf stage of the crop.

Not all glyphosate products are registered for use on glyphosate tolerant canola at all rates listed. Refer to individual product labels for specific uses and rates.

Single application of 120 g ae per acre:

- ***Weeds controlled at all stages unless indicated otherwise:***
  - *Annual grasses:* barnyard grass, green foxtail, volunteer cereals, wild oats.
  - *Annual broadleaves:* annual smartweed spp.**, chickweed, corn spurry, cow cockle*, hemp-nettle, kochia, lamb's-quarters, night-flowering catchfly*, redroot pigweed, Russian thistle, shepherd's-purse*, stinkweed, volunteer canola (except glyphosate tolerant varieties), wild mustard, wild tomato.

Single application of 180 g ae per acre:

- ***All stages of the weeds listed above plus:***
  - *Annual broadleaves:* cleavers, flixweed, wild buckwheat, stork's-bill, narrow-leaved hawk's-beard.
  - *Perennial weeds suppressed:* Canada thistle, dandelion, perennial sow-thistle, and season long quack grass control.

Split application of 180 g ae per acre plus 180 g ae per acre:

- ***Additional flushes of the weeds listed above plus:***
  - *Annual broadleaves:* round-leaved mallow
  - *Season long control of following perennials:* Canada thistle, foxtail barley, and perennial sow-thistle.

Single application of 270 g ae per acre:

- ***All weeds in single applications above plus:***
  - *Season long control of following perennials:* Canada thistle and perennial sow-thistle.

*** Low rates can be used only up to the 3 leaf stage of the crop otherwise use the high rate.**
**** Low rates can be used only when annual smartweed is in the 4 to 6 leaf stage.**
NOTE: A maximum of 360 g ae per acre per season is allowed in glyphosate tolerant canola

Second Generation Glyphosate Tolerant (*TruFlex* and *Optimum GLY*) canola varieties only:
TruFlex Canola: *Roundup* brands, *R/T 540*, *Matrix*, and *Startup* only.
Optimum GLY canola: *Credit 45*, *Credit Xtreme*, *Crush'r 540*, *Matrix*, *Shotgun 540*, and *Stonewall* only.
Apply from emergence to first flower stage (50 percent of plants in field have no more than 1 flower) for rates up to one or two applications of the 360 g ae per acre rate. The maximum timing at the 720 g ae per acre rate is the 6 leaf stage.

Single application of 120 to 180 g ae per acre:

- ***Weeds controlled at all stages unless indicated otherwise:***
  - *Annual grasses:* barnyard grass, green foxtail, volunteer cereals, wild oats.
  - *Annual broadleaves:* annual smartweed (incl. lady's-thumb)**, chickweed, cleavers, corn spurry, cow cockle*, flixweed, hemp-nettle, kochia, lamb's-quarters, narrow-leaved hawk's-beard, night-flowering catchfly*, pigweed (redroot), Russian thistle, shepherd's-purse*, stinkweed, stork's-bill, volunteer canola (except glyphosate tolerant varieties), wild buckwheat, wild mustard, wild tomato.
  - *Perennial weeds suppressed:* Canada thistle, dandelion, perennial sow-thistle, and season long quack grass control.

Split application of 180 g ae per acre plus 180 g ae per acre:

- ***Additional flushes of the weeds listed above plus:***
  - *Annual broadleaves:* round-leaved mallow
  - *Season long control of following perennials:* Canada thistle, foxtail barley, and perennial sow-thistle.

Single application of 270 g ae per acre:

- ***All stages of the weeds listed above plus:***
  - *Season long control of following perennials:* Canada thistle and perennial sow-thistle.

Single application of 360 g ae per acre:

- ***All weeds above plus:***
  - *Grasses:* foxtail barley, yellow foxtail, wild proso millet.
  - *Broadleaves:* biennial wormwood (2 to 8 leaf), cocklebur, common milkweed†, nightshade (eastern black), pigweed (smooth), ragweed (common), smartweed (Pennsylvania).

Split application of 360 g ae per acre plus 360 g ae per acre at least 2 weeks apart and prior to 50 percent bloom:

- ***Additional flushes of the weeds listed above plus:***
  - *Season long control of following:* Dandelion, common milkweed (15 to 60 cm), field bindweed, waterhemp (up to 18 leaf stage).

Single application of 720 g ae per acre (maximum 6 leaf stage of *TruFlex* canola):

- ***All weeds above.***

† Supression only.

*** Low rates can be used only up to the 3 leaf stage of the crop otherwise use the high rate.**

**** Low rates can be used only when annual smartweed is in the 4 to 6 leaf stage.**

NOTE: A maximum of 720 g ae per acre per season is allowed in* TruFlex *glyphosate tolerant canola.

10. For use in glyphosate tolerant corn and soybean:

Weeds, Staging and Rates:

All applications must be made within the following crop growth stages.

- ***Corn:*** up to and including 8 leaf stage
- ***Soybean:*** first trifoliate leaf through flowering.

Not all glyphosate products are registered for use on glyphosate tolerant corn and soybeans at all rates listed. Refer to individual product labels for specific uses and rates.

- **Single application of 360 g ae per acre controls the following weeds:**
  - Barnyard grass
  - Foxtail (green, yellow)
  - Proso millet
  - Quack grass
  - Volunteer barley and wheat
  - Wild oats
- ***Broadleaves:***
  - Biennial wormwood
  - Canada thistle
  - Chickweed
  - Cleavers
  - Corn Spurry
  - Cocklebur
  - Common milkweed (suppression only)
  - Common ragweed
  - Flixweed
  - Kochia
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Night-flowering catchfly
  - Nightshade (Eastern black)
  - Perennial sow-thistle
  - Pigweed (smooth, redroot)
  - Round-leaved mallow
  - Russian thistle
  - Shepherd's-purse
  - Smartweed spp.
  - Stinkweed (suppression only)
  - Stork's-bill
  - Velvetleaf
  - Volunteer canola (except glyphosaste tolerant varieties)
  - Wild mustard
  - Wild buckwheat
  - Wild tomato

  *** Registered for control in glyphosate tolerant soybean only with Roundup products and R/T 540 only.**
- ***Second applications of 360 g ae per acre controls the following weeds:***
  - ***Late flushes of heavy infestations of the above weeds plus control of:***
    - Common milkweed
    - Field bindweed
    - Round-leaved mallow
    - Yellow nutsedge
- **Single application of 720 g ae per acre in glyphosate tolerant soybean from the first trifoliate to flowering stage and corn up to and including 6 leaf stage:**
  - ***Heavy infestations of the annual weeds listed above plus control of:***
    - Field bindweed
    - Common milkweed
    - Canada thistle
    - Perennial sow-thistle
    - Yellow nutsedge
- **Single application of 1020 g ae per acre in glyphosate tolerant soybean (*Roundup Ready 2 Yield* soybeans only) from the first trifoliate to flowering stage**
  - ***Weeds listed above plus control of:***
    - Volunteer alfalfa
    - Smooth bromegrass

    **** The single application rate in glyphosate tolerant corn and soybean is not labeled for all glyphosate products. Refer to individual glyphosate labels for the registration status of this rate usage in glyphosate tolerant soybean and corn.**

11. Tank Mixes:

Tank mix partners may be mixed at all label rates and include recommended adjuvants unless otherwise noted. Not all glyphosate products are registered for all tank mix options below. Refer to individual glyphosate labels for registered tank mixes, glyphosate rates and registered crop species.

	Rate per Acre
Preseeding before all crops†††	*Aim*
Preseeding canola††	Bromoxynil – all bromoxynil products at the highest rate indicated on the Bromoxynil page
Preseeding cereals***	2,4-D (108 to 273 g ae)*
	Bromoxynil - *Pardner* (0.51 L), *Koril* (0.48), *Brotex* (0.6 L)
	MCPA♦ (0.2 to 0.4 L)*
	Bromoxynil/MCPA* - *Buctril M* (0.2 to 0.4 L), *Logic M* (0.25 to 0.5 L)

	Rate per Acre
Preseeding corn (field and sweet), flax	MCPA♦♦ (0.2 to 0.4 L)*♦
	Bromoxynil/MCPA* - *Buctril M* (0.2 to 0.4 L), *Logic M* (0.25 to 0.5 L)
Preseeding field pea, lentil†, chickpea†	MCPA Amine♦♦ (0.2 to 0.28 L)*♦
Preseeding canaryseed & seedling forage grasses♦♦♦	Bromoxynil/MCPA* - *Buctril M* (0.2 to 0.4 L), *Logic M* (0.25 to 0.5 L)
Preseeding or prior to emergent of soybeans (all varieties)	Imazethapyr (*Pursuit*)
Chem fallow	2,4-D (235 g ae)*
	Dicamba (0.12 L)*
	Bromoxynil - *Pardner* (0.51 L), *Brotex*(0.6)
Canada thistle control following harvest or in fallow	Dicamba (240 g acid equivalent per acre)**
Alfalfa control in spring/fall	2,4-D (235 to 470 g ae)*

*** Volunteer glyphosate tolerant canola control: Tank mixes of 2,4-D at 108 to 160 g ae per acre, MCPA and Bromoxynil/ MCPA will control volunteer glyphosate tolerant canola up to the 4 leaf stage and 2,4-D at 212 to 320 g ae per acre will give control up to the 6 leaf stage. Earlier application will result in more consistent control. Dicamba at 0.12 L per acre will not control glyphosate tolerant canola.**
**** See re-cropping restrictions for Dicamba with fall applications.**
***** 2,4-D tank-mixes in cereals are registered for winter wheat, wheat, barley, and rye; Bromoxynil tank-mixes in cereals are registered on wheat, oats and barley; bromoxynil/MCPA and MCPA tank-mixes registered on cereals include wheat, barley oats and rye.**
† Under drought conditions, deep seeding and/or brief rain showers after seeding may cause injury to emerging seedlings in sprayer overlaps. NOT for use with *Credit 45, Disruptor, Smoke,* or *Sharda Glyphosate*.
†† *Roundup WeatherMax, R/T 540, Roundup Transorb, Disruptor 540, Startup* only.
††† *Credit 45, Credit Xtreme* only.
♦ Rates based on 500 g/L formulations. All formulation concentrations are registered unless indicated otherwise.
♦♦ Use only amine formulations of MCPA prior to corn, lentil, chickpea and field peas.
♦♦♦ Forage grasses include brome grass, crested wheatgrass, intermediate wheat grass, slender wheatgrass, tall wheatgrass, Russian wildrye, timothy, orchard grass, creeping red fescue, meadow fescue, meadow foxtail, tall fescue, meadow bromegrass, streambank wheatgrass and reed canarygrass.

Tank mixes in glyphosate tolerant crops:

- ***Tank mixes or rates listed may not occur on all product labels. Refer to individual product labels for registered tank-mixes.***
  - ***Soybean:***
    - *Assure II* (101 to 154 mL per acre)
    - *Pursuit* (65 to 85 mL per acre)
  - ***Corn:***
    - *AAtrex* (0.63 to 0.84 L per acre)
    - 2,4-D single application (108 to 212 g ae per acre)*
    - 2,4-D split application (108 g ae per acre followed by 80 to 108 g ae per acre)*
      *** 2,4-D applications to corn may result in serious injury to some corn hybrids. Consult corn seed provider for varietal tolerance to 2,4-D applications. Apply prior to 4 leaf stage of corn.**

Note: The above mixes are those listed on the glyphosate labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. See the general guidelines for mixing pesticides for more information.

Application Information:

- **Water Volume:**
  - ***Ground:*** Use 20 to 40 L per acre in most situations; use of the lower volume may improve control when hard water (Ca or Mg) or iron (Fe) ions are present (See Effects of Growing Conditions below). For certain crop situations, perennial weeds and tank mixes may require up to 120 L per acre of clean low ion water.
  - ***Aerial:*** Use 8.1 to 20 L per acre for registered preharvest uses only (see Aerial Application below). Minimum 20 L per acre for preseed, fallow, glyphosate tolerant crops and post-harvest treatments with *Roundup WeatherMax* only.

  Refer to specific weed control situations or labels for more information on water volumes and adjuvants.
- **Nozzles and Pressure:** Use 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets for ground applications and ***ASABE coarse*** droplets for aerial applications.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
glyphosate	POST (foliar), Preharvest	EPSP Amino Acid Synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf & grass	9

Effects of Growing Conditions:

Best results are achieved under relatively warm sunny conditions when weeds are actively growing. Frost which kills more than 40 percent of the above ground tissue will reduce control. Control will also be reduced if foliage is heavily covered with dust. "Hard water" or water containing calcium (Ca), magnesium (Mg) or iron (Fe) ions will reduce the activity of glyphosate products proportional to the level hardness. Reducing application water volume and /or adding ammonium sulphate at 1.2 kg per acre (99 percent dry) or 2.4 L per acre (49 percent solution) will reduce the negative effects of low levels of hard water ions. If water is extremely hard (greater than 700 ppm or 40 grains), another water source should be found. Dirty water or water with suspended soil or organic matter will reduce control.

Restrictions:

- **Rainfall:** DO NOT apply if rainfall is forecast for the time of application, as weed control may be reduced. Consult manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated crop areas for 12 hours after application. DO NOT enter treated non-crop areas until sprays have dried.
- **Grazing Interval:** All portions of forage and crops treated with glyphosate products may be fed to livestock.
- **Re-cropping Interval:** No restrictions.
- **Aerial Application:** DO NOT apply *Credit 45, Crush'R Plus, Glyforce WDG, Matrix, Shotgun 360* brands of glyphosate to cropland by air.
  - All other glyphosate products listed in the "Product names, Company, Formulation and Packaging" chart are registered for aerial application for certain pre-harvest treatments. Not all crop species listed in the pre-harvest section are registered for aerial glyphosate application. Consult manufacturer for current aerial pre-harvest registration status.
  - ONLY *Roundup WeatherMax* may be applied by air when fields are too wet to access by ground sprayer (flooded) for preseed burndown, fallow treatment, or application to glyphosate tolerant crops (canola, corn, soybean).
  - Aerial applicators of *Roundup WeatherMax* for use prior to seeding, in glyphosate tolerant crops and to fallow must have successfully completed a *Roundup* herbicide aerial application training course provided by Bayer.
- **Storage:** May be stored below 0°C.
- **Equipment:** DO NOT mix, store or apply this product in galvanized steel or unlined steel (except stainless steel) containers or spray tanks.
- **Buffer Zones:**

Application method	Uses	Buffer Zones (metres††) Required for the Protection of:	
		Aquatic habitats	Terrestrial habitat
Ground *	Annual crops	1	2
Aerial	Preharvest only**	25	55
	Glyphosate tolerant canola only†	5	40
	Preseed, fallow, glyphosate tolerant crops (corn, soybeans)†	30	70

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

**** *Roundup Transorb HC, Roundup WeatherMax, R/T 540, Disruptor 540, StartUp* only.**

† *Roundup WeatherMax* only when conditions are too wet for access by ground sprayer.

†† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat. Glyphosate is very toxic to non-target plants.

Sprayer Cleaning:

Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:

***Roundup Transorb HC, Roundup WeatherMax, Glyforce WDG, Destroyer 540, Disruptor 540, Stonewall 540, R/T 540*:**

 Caution – Poison

***Disruptor 540, Roundup TransorbHC, Roundup WeatherMax, R/T 540, Stonewall 540*:**

 Warning – Eye and Skin Irritant

All other products:

 Caution – Skin and Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

GoldWing

Herbicide Group
4 - MCPA Ester
14 - pyraflufen-ethyl

Company:

Nufarm Agriculture (PCP#32112)

Formulation:

13.5g/L pyraflufen-ethyl and 420g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10.7 L, 85.5 L

Crops and Staging:

For application from prior to seeding through to 3 days after planting and prior to the emergence of:

- Barley
- Buckwheat
- Canaryseed
- Chickpea
- Corn (field, sweet)
- Dry beans
- Faba bean
- Field pea
- Flax
- Lentils
- Lupins
- Oats
- Proso (crown) or pearl millet
- Rye (spring and winter)
- Triticale
- Wheat (spring, durum, winter)

Weeds, Rates and Staging:

Unless otherwise stated, apply to emerged, young, actively growing weeds that are less than 5 cm tall or across.

***GoldWing* at 133 mL† per acre controls:**

- Annual sow-thistle*
- Canada fleabane*
- Cleavers
- Cow cockle*
- Dandelion*
- Flixweed*
- Kochia
- Lamb's-quarters
- Mallow
- Mustards (except dog and tansy)
- Narrow-leaved hawk's-beard
- Night-flowering catchfly
- Redroot pigweed
- Stinkweed
- Volunteer canola (all varieties)
- Wild buckwheat*
- Wild mustard*

***GoldWing* at 266 mL† per acre provides control or suppression of the weeds above plus control of the following weeds:**

- Canada fleabane
- Cow cockle
- Flixweed
- Goat's-beard*
- Wild buckwheat

*** Suppression only.**

† ***GoldWing* applied alone requires the addition of a non-ionic surfactant (*Nufarm Enhance, Agral 90*) at 0.25 L per 100 L of spray solution.**

Maximum TWO APPLICATIONS of Goldwing *at the 133 mL per acre rate,* Conquer II *or* Blackhawk *(maximum 3.67 grams per acre of the pyraflufen active) WITHIN A TWO YEAR TIME SPAN.*

Maximum of ONE APPLICATION of Goldwing *at the high (266 mL per acre) rate, and other products with the pyraflufen-ethyl active above (maximum 3.67 grams per acre of the pyraflufen-ethyl active) WITHIN A TWO YEAR TIME SPAN.*

Application Information:

- **Water Volume:** Minimum 20 to 40 L per acre. Higher water volumes may provide better performance.
- **Nozzles & Pressure:** Use 30 to 40 psi (210 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE medium*** droplets while maintaining good coverage of foliage. Keep booms lower than 60 cm from crop canopy.
- **Screens:** Use 50 mesh filter screens or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4
pyraflufen	POST (foliar) with little soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:

Extreme growing conditions such as drought or near freezing temperatures prior to, at and following time of application may reduce weed control. Wet foliage at the time of application may result in reduced weed control.

Tank Mixes:

Herbicides:

- Glyphosate (label rates)

Note: The above mixes are those listed on the *GoldWing* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No specific recommendation. May be up to 8 hours. Contact the manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated crop to livestock within 7 days of application. DO NOT cut for hay within 30 days of treatment. Withdraw meat animals from treated fields 3 days prior to slaughter and feed untreated feed.
- **Pre-harvest Interval:** N/A when used prior to emergence.
- **Re-cropping Interval:** Any crop may be seeded one month after application.
- **Aerial Application:** Apply by ground equipment only.
- **Storage:** Store in original containers in a cool, secure, dry place. DO NOT freeze.
- **Buffer Zones:**

Crop	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Canary seed	1	1	1
All other labelled crops	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones may be reduced when using drift reduction measures. See the Buffer Zone Calculator on the Pest Management Regulatory Agency website.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Tank Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. The addition of detergent may improve the effectiveness of tank cleanout, especially when tank mixed.

Hazard Rating:


Caution –Skin Irritant

Potential Skin Sensitizer

Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Grazon XC / Aspect

Herbicide Group
4 - picloram, 2,4-D

Company:
Corteva Agriscience (*Grazon XC* – PCP#31642; *Aspect* – PCP#31641)

Formulation:
97.5 g/L picloram and 360 g ae/L 2,4-D formulated as a solution.
- Container sizes - 2 x 10 L and 110 L

Note: Available only through selected retail outlets.

Crops and Staging:
Grazon XC: Permanent grass pasture and rangeland. Apply in spring or early summer.
Aspect: For use on roadsides and other rights of way.
Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.

Weeds, Rates and Staging:
Note: Maximum ONE APPLICATION of these products or other product containing picloram per year.
Note: DO NOT prolong application for longer than 24 hours after mixing as product may degrade in the tank.
Broadcast (multi-nozzle) application:

- ***Apply* Grazon XC *or* Aspect *at 1.0 L per acre for season long control ONLY:***
  - Canada thistle
  - Common yarrow
  - Dandelion
- ***Apply* Grazon XC *or* Aspect *at 1.9 L per acre: for control of the above weeds and the following weeds:***
  - Burdock
  - Clovers (red, sweet)
  - Dock
  - Fleabane
  - Goldenrod
  - Leafy spurge*†
  - Plantain
  - Ragweed (common)
  - Prickly lettuce
  - Toadflax*†
  - Vetch
  - Wild carrot

  *** For control of leafy spurge and toadflax, use a recommended surfactant (such as any non-ionic surfactant) at the rate of 250 mL per 100 L of water). If maximum rainfastness is desired increase the rate to 375 mL per 100 L of water.**
  † Research has shown that annual applications may be required for up to 4 years to achieve a high level of sustained control of leafy spurge.
- ***Apply* Grazon XC *or* Aspect *at 2.5 L per acre for control of the following woody species:***
  - Aspen
  - Balsam poplar$^{\Delta}$
  - Birch
  - Western snowberry$^{\Delta}$
  - Wild rose
  - Willow
- ***Apply* Aspect *only at 4.65 L per acre for control of the species above plus the following woody species**:***
  - Alder
  - Cedar
  - Maple
  - Pine
  - Poplar
  - Spruce

Handheld application:**

- ***Single nozzle wand (foliar):*** Apply *Aspect* at 2.7 L per 1000 L of water for application to the fully developed foliage and stems of woody plants prior to the development of fall coloration.
- ***Basal Bark Treatments:*** Mix a dilute solution in a ratio of 1 part *Aspect* to 1.5 parts water (or ethylene glycol under freezing conditions) for use in the following applications.
  - ***Cut Stump Treatment:*** Apply the dilute solution above to the outer edge of the freshly cut surface of a stump.
  - ***Frill or Girdle Treatment:*** Apply the dilute solution to the frills or exposed cambium from a girdling of a tree stem.
  - ***Tree Injection Treatment:*** Apply the dilute solution above by injecting through the bark to the cabium (wood-bark interface at intervals of 7.5 cm.

$^{\Delta}$ Suppression
**** For faster burndown of coniferous species use a recommended surfactant (such as *Gateway Adjuvant*, or *Xiameter OFX-0309 Fluid*, or any non-ionic surfactant) at the rate of 0.25 L per 100 L of water. If maximum rainfastness is desired, increase the rate to 0.375 L per 100 L of water.**

Application Information:

- **Water volume*:**
  - ***Ground:*** 40 to 80 L per acre.
  - ***Aerial:*** 8.1 to 20 L per acre.

  * Use higher water volumes for when foliage is dense. Higher water volumes provide more reliable control.
- **Nozzles and Pressure:** Use nozzles that will deliver coarse droplets in a uniform pattern. Maximum 30 psi (207kPa) by ground or air when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.
- Drift of even small amounts of *Grazon XC* or *Aspect* onto sensitive plants or areas where sensitive crops may be grown can cause injury. DO NOT apply under conditions prone to drift (i.e. high winds, dead calm and temperature inversions).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
picloram	POST (foliar) with residual soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

IMPORTANT: Picloram is a very persistent and water-soluble herbicide. Treated soil should not be moved from the treated area. DO NOT apply to soils that are permeable, have sinkholes, or lie over limestone bedrock. DO NOT apply to soils whose surfaces are composed of fractured rock or unconsolidated gravel. Application to these sites may allow the movement of herbicide to underlying water sources or aquifers. When applying *Grazon XC* over sandy soils ensure that aquifers are not within 1.8 m of the soil surface. If shallow aquifers are present, DO NOT APPLY *Grazon XC*. *Grazon XC* must not be applied on range and pasture acres that are irrigated. DO NOT compost or mulch clippings or manure from grass treated with *Grazon XC* unless being reapplied to the treated area.

Effects of Growing Conditions:

Nothing listed on the *Grazon XC* label. Avoid application when pasture and target weeds are under stress from drought, flooding, extreme heat or cold, as injury to grass or unacceptable control may result. Avoid application when temperatures exceed 28°C.

Tank Mixes:

None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Restrictions:

- **Rainfall:** DO NOT apply if rainfall is forecast. No specific time frame is indicated on the label. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT re-enter pastures within 12 hours of application.
- **Grazing Restrictions:** DO NOT graze areas treated with *Aspect* at a rate of greater than 2.5 L per acre. DO NOT allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. DO NOT harvest forage or cut hay within 30 days of application. Feed livestock untreated forage for 7 days prior to moving onto land that produce broadleaf crops; otherwise, urine or manure may contain picloram. See restrictions in "How it Works" section above.
- **Re-cropping Interval:** Legumes may not be established in a pasture for several years after treatment. If legumes are essential in a pasture, DO NOT use *Grazon XC*. DO NOT break up treated pasture and plant to sensitive broadleaf crops for at least 5 years after application.
- **Aerial Application:** May be applied by air. DO NOT apply during periods of dead calm. DO NOT apply when wind speed is greater than16 km per hour at flying height at the site of application.
- **Storage:** Store product in original containers in a secure, dry, cool area. DO NOT freeze. Combustible – DO NOT store near open flame or heat sources.

- **Buffer Zones:** Handheld or backpack application do not require a buffer zone. Those listed below are for ***ASABE coarse*** droplets only. See the label for nozzles delivering coarser droplets.

Application method	Rate (L per acre)	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Field sprayer	*Aspect* up to 1.0 on ROW	1	1	70**
	Grazon XC and *Aspect* up to 2.5 on R&P and ROW	2	1	
	Aspect only at 4.65 on ROW	4	2	**
Fixed wing aircraft	*Aspect* at 1.0 on ROW	85	50	**
	Grazon XC up to 2.5 on R&P	65	20	500
	Grazon XC up to 2.5 on ROW	225	125	800
	Aspect up to 1.9 on ROW	125	70	**
	Aspect only at 4.65 on ROW	300	150	**
Helicopter	*Aspect* at 1.0 on ROW	40	30	**
	Grazon XC up to 2.5 on R&P	40	15	300
	Grazon XC up to 2.5 on ROW	95	50	700
	Aspect up to 1.9 on ROW	60	35	**
	Aspect only at 4.65 on ROW	125	60	**

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**

**** For applications to rights-of-way using *Aspect*, buffer zones for protection of sensitive terrestrial habitats are not required; however, the best available application strategies that minimize off-site drift should be used.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- º Heavy rains can move this product from its application site down slope toward sensitive areas. DO NOT load or mix near wells, dugouts or other water bodies.

Sprayer Cleaning:

A combination of 'Method A' and 'Method B' found in the introduction, including the use of a commercial tank cleaner or ammonia, is recommended immediately after application is finished. See label for further details.

Hazard Rating:

 Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Heat Brands / Detail (IVM)

Herbicide Group 14 - saflufenacil

Company:
BASF Canada

Formulation:
***Heat WG* (PCP#29368):** 70% saflufenacil formulated as a water soluble granule.
- Container size - 8 x 844 g containers per case

Merge sold separately.

-or-

***Heat LQ* (PCP#31468), *Detail* (PCP#32773):** 342 g/L saflufenacil formulated as a suspension concentrate.
- Container sizes:
  - *Heat LQ* - 1 x 1.73 L plus 2 x 8.1 L *Merge* adjuvant, or tote containing 4 x 10.79 L *Heat LQ* packaged with 1 x 400 L *Merge*
  - *Detail* - 1.38 L

Crops, Rates and Staging:
***Heat Brands* – Prior to the seeding of, or following seeding and prior to the emergence of the following crops, fallow or post-harvest:**
Note: Must be applied as part of a tank mix with glyphosate from 180 to 360 g ae per acre (see glyphosate for specific product rates).

Crop	Rate (per acre)	
	Heat WG (g)	*Heat LQ* (mL)
Barley, canaryseed, chickpea, corn (field and sweet*), field pea, oats, wheat (spring, winter and durum)	10.4 to 28.4	21.4 to 59
Seedling forage grasses grown for seed** (bromegrass, creeping red fescue, timothy)	10.4 to 28.4	21.4 to 59
Faba bean	10.4 to 28.4	21.4 to 59
Lentil†	10.4	21.4
Soybean†*	10.4 to 14.6	21.4 to 29.5
Fallow and post-harvest	10.4 to 28.4	21.4 to 59

*** Some varieties may be more sensitive to *Heat* and injury may occur**
† DO NOT use rates higher than 10.4 grams per acre of *Heat WG* or 21.4 mL per acre of *Heat LQ* or injury could result.
***** NOTE: Since this use registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility of herbicide performance. Application to this crop is at the risk of the user.***
***** NR, not registered.**
Note: Crop injury may occur in lentil when *Heat* is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.

Add either *Merge* or *Amigo* adjuvant or *MSO Concentrate* (sold separately for *Heat WG*) at 0.2 to 0.4 L per acre.

***Heat Brands* – Harvest Aid/Desiccation:**
Apply 14.4 to 28.4 grams per acre of *Heat WG* or 43 mL per acre of *Heat LQ* to speed the rate of dry-down of the following crops and green weedy material. *Merge* adjuvant or *MSO Concentrate* (sold separately for *Heat WG*) must be added spray solutions of both formulations at 0.2 to 0.4 L per acre. Use the high rate of *Heat WG* as well as the high rate of adjuvant for both products when not mixing with glyphosate. The required delay before harvest of each crop is indicated below.

Crop	Pre-Harvest Interval (Days after application)	Application Stage
Barley (for feed only)	3	Hard dough stage (Zaddok's growth stage 87) <30% seed moisture
Canola (all types), Mustard†	3	Apply when 65 to 80% of seeds have changed colour.

Crop	Pre-Harvest Interval (Days after application)	Application Stage
Chickpea	2	Desi – Apply when most seeds turned yellow/brown Kabuli – Apply when most seeds turned white/tan
Field pea	3	A majority of the pods are brown (70 to 80%)
Faba bean††	2	Apply when 80% of lower pods have turned black, middle pods have turned yellow/tan, and top green pods have firm seed.
Flax	3	Apply when 75% of bolls have turned colour.
Red lentil varieties only*	3	Lower most pods (15%) are brown and rattle when shaken
Dry bean	2	Stems are green to brown, pods are mature (yellow to brown), and 80 to 90% of leaves have dropped
Soybean	3	
Sunflower	7	The backs of flower heads and bracts are turning yellow, and seed moisture is 20 to 30%.
Triticale	3	Hard dough stage (Zaddok's growth stage 87) <30% seed moisture
Wheat	3	Hard dough stage (Zaddok's growth stage 87) <30% seed moisture

*** Glyphosate must be added when applying *Heat* pre-harvest in red lentil varieties. Stand alone applications of *Heat* are not registered on red lentil varieties.**

† All classes including brown, Oriental, canola quality Brassica juncea, Brassica juncea varieties with the Clearfield trait, and yellow.

†† *Heat LQ* only.

Heat (*WG* or *LQ*) may be tank mixed with glyphosate on barley (feed only), canola (all types), chickpeas, faba beans, flax, field pea, red lentil, dry beans, mustard†, soybeans and wheat for additional pre-harvest weed control. When tank mixing with glyphosate, it is recommended to apply *Heat WG* at 20.4 grams per acre or *Heat LQ* at 42.8 mL per acre. DO NOT tank mix with glyphosate when the harvested grain is to be used for seed.

Maintenance of Bare Ground in Industrial Sites:

Apply *Detail* at rates of 58.7 to 117.4 mL per acre for non-residual broadleaf control and 176 mL per acre for residual control of broadleaf weeds. Add *Merge* adjuvant or *Hasten NT* adjuvant at 0.5 L per 100 L.

DO NOT apply *Detail* to land to be used for cropland as injury may result.

Avoid applying to areas with heavy vehicle traffic and/or fine dusty surfaces that can blow after treatment, since material moving from treated areas may injure neighboring sensitive crops.

Weeds, Rates and Staging:

Heat Brands – Apply up to the 8 leaf stage unless otherwise indicated to control the weeds controlled by glyphosate plus rapid burndown of:

- Canada fleabane†
- Cleavers (4 whorl-stage)**
- Common ragweed†
- Dandelion***
- Kochia (up to 15 cm)
- Lamb's-quarters
- Flixweed
- Narrow-leaved hawk's-beard (up to 8 cm)
- Pigweed (redroot)**†
- Ragweed (common)
- Round-leaved mallow
- Stinkweed**
- Volunteer canola**†
- Wild buckwheat **†
- Wild mustard**

*** All varieties**

**** Applications at the 28.4 grams per acre rate of *Heat WG* or 59 mL per acre rate of *Heat LQ* will also provide suppression of the emergence of these weeds following application.**

***** Top growth burndown of perennial plants, control of spring germinating plants.**

† *Heat LQ* will control indicated weeds when applied for pre-harvest weed management in wheat and barley.

Detail (for bare ground maintenance of industrial sites only): Unless otherwise noted below, apply to young and actively growing weeds that are less than 15 cm in height or width.

- ***Weeds controlled:***
  - Bindweed, field†
  - Canada fleabane*
  - Canada thistle†
  - Chickweed (common*)
  - Cocklebur (common*)
  - Cow cockle
  - Dandelion†
  - Fleabane (hairy)
  - Flixweed
  - Groundsel (common)
  - Henbit (suppression)
  - Knotweed (prostrate)
  - Kochia* (including Group 2 and 9 resistant)
  - Lamb's-quarters*
  - Mustard, (tumble, wild*)
  - Nightshade, (black*, cutleaf/wild tomato, Eastern black, hairy)
  - Pigweed, (redroot*, smooth*, prostrate*)
  - Prickly Lettuce††
  - Purslane (common*)
  - Ragweed (common* giant*)
  - Round-leaved mallow
  - Russian thistle*
  - Shepherd's-purse
  - Smartweed (Pennsylvania*, lady's-thumb*)
  - Sow-thistle (annual, spiny annual)
  - Sow-thistle (perennial††)
  - Stinkweed*
  - Sunflower (common*)
  - Velvetleaf*
  - Volunteer canola
  - Wild Buckwheat*

*** Apply *Detail* at 176 mL per acre for both post-emergence and residual control of emerging weeds (PRE).**
† Control of seedling stage and suppression of perennial growth stage.
†† Top growth burn down control.

Application Information:

- **Water volume:**
  - ***Preseed, pre-emergent, fallow or post-harvest by ground only (*Heat Brands *only):*** 20 to 40 L per acre.
  - ***Harvest aid/desiccation (*Heat Brands *only):***
    - ***Ground:*** 81 L per acre stand alone or 40 L per acre when tank mixed with glyphosate
    - ***Aerial:*** 20 L per acre.
  - ***Bare ground maintenance (*Detail *only):*** Minimum 80 L per acre for proper coverage.
- Higher volumes are required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** classification droplets. Low drift nozzles may require higher pressures for proper performance. Higher pressures may be required to penetrate dense plant stands.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
saflufenacil	POST (foliar) with slight soil activity, or Preharvest	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14

Effects of Growing Conditions:

Rainfall shortly after application can result in slight injury to the crop. See the 'Restrictions' section below for more details. Warm, moist growing conditions promote active weed growth. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Note: Crop injury may occur in lentil when *Heat* is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.

Herbicides:

- ***Preseed, pre-emergent, fallow or post-harvest:*** Glyphosate (180 g to 360 g ae per acre)*
  *** must be mixed with glyphosate.**
- ***Harvest Aid/Desiccation:*** Glyphosate (360 g ae per acre)†
  † NOT for use on crops to be used for seed. Mixes with glyphosate for harvest aid uses are for ground boom application only. DO NOT apply by air.
- ***Bare ground maintenance (*Detail *only):***
  - *Arsenal PowerLine* (1.21 L per acre)
  - Glyphosate (328 to 1750 g ae per acre)

  For both mixes, include adjuvants recommended for *Detail* above.
  (see glyphosate for product concentrations and equivalent application rates)

Fungicides: None registered

Insecticides: None registered

Note: The above mixes are those listed on the *Heat* (*WG* or *LQ*) or *Detail* labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall shortly after product application can result in slight injury to the crop. Lentils will be more susceptible to injury on coarse textured (sandy or gravely) and low organic matter soils. Injury will appear usually as burning on the outer edges of the leaves. Lentils will grow out of injury symptoms, and yield will not be impacted at recommended rates.
- **Restricted Entry Interval:**
  - ***Heat Brands:*** DO NOT enter treated fields for at least 12 hours.
  - ***Detail:*** DO NOT allow others to enter treated sites until sprays have dried. DO NOT allow military personnel to enter treated sites for 2 days.
- **Pre-harvest Interval (*Heat Brands* only):**
  - ***Preseed and pre-emergent:*** Leave 60 days between application and harvest.
  - ***Harvest Aid/Desiccant:*** Refer to table in 'Crops, Rates and Staging' section.
- **Grazing Interval:**
  - ***Preseed and pre-emergent:*** DO NOT graze or cut cereal crops for feed within 30 days of application or chickpea, corn, field pea, lentil and soybean within 60 days.
  - ***Harvest aid/Desiccant:*** DO NOT graze or feed dry bean, lentil or soybean. Treated field pea may be grazed or used as feed.
- **Re-cropping Interval:**

Crop	Application Rate (per acre) and Timing		
	Spring Application		Fall Application
Heat WG rate	10.4 g	up to 28.4 g	up to 28.4 g
Heat LQ rate	21.4 mL	up to 59 mL	up to 59 mL
Barley	PB	PB	1
Canary seed	PB	PB	1
Canola	1	1	1
Chickpea	PB	PB	1
Corn	PB	PB	1
Dry bean	1	1	2
Flax	1	1	1
Lentil	PB	1	1
Mustard	1	1	2
Oat	PB	PB	1
Field pea	PB	PB	1
Soybean	PB	1	1
Spring wheat (including durum)	PB	PB	1
Triticale	1	1	1
Winter wheat	PB	PB	1

PB = May be planted back in the same season
1 = May only be planted the season following application
2 = May only be planted the second season following application

- **Aerial Application:** *Heat Brands* may be applied by aircraft for desiccation use only. DO NOT apply by air for any other use.
- **Storage:** Store in dry, cool storage. May be frozen.
- **Buffer Zones:**

Hand-held wand or backpack sprayer and spot treatment do not require the buffers below.

Application method	Crop	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat
Heat Brands – Ground only*	Lentil, soybean	3
	All other crops	10
Detail – Ground only*	Bare ground maintenance (excluding rights-of-way**)	20

Application method	Crop	Buffer Zones (metres†) Required for the Protection of Terrestrial Habitat
Heat Brands –Fixed wing airplane	All desiccation uses	175
Heat Brands –Helicopter	All desiccation uses	150

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Buffer zones for protection of terrestrial habitats are not required for use on rights-of-way, including roadside and railroad ballasts, rail and hydro rights-of-way, utility easements and roads.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.
- DO NOT apply in areas where surface water from the treated area can run off to adjacent cropland, streams

Sprayer Cleaning:
Heat and *Detail* can cause injury to sensitive crops at very low concentrations. Sprayers used to apply this product should be flushed out immediately after each day of use.
Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Possible Skin Irritant
Refer to the Introduction for an explanation of the symbols.

Heat Complete*

Herbicide Group
14 - saflufenacil
15 - pyroxasulfone

**** Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Company:
BASF Canada

Formulation:
The *Heat Complete* package contains the following components:
***Heat LQ* (PCP#31468):** 342 g/L saflufenacil formulated as a suspension concentrate.
- Container size - 1 x 1.73 L

-plus-
***Zidua SC* (PCP#32542):** 500 g/L pyroxasulfone formulated as a suspension concentrate.
- Container size - 1 x 3.89 L

-plus-
***Merge adjuvant* (PCP#24702):** Container size - 2 x 8.1 L

Crops, Rates and Staging:
Prior to the seeding of, or following seeding and prior to the emergence of, the following crops:

Crop	Rate (per acre)	
	Heat LQ (mL)	*Zidua SC* (mL)
Corn, field peas, chickpeas	22 to 43	49 to 97
Lentils†	22	49
Soybeans*	22 to 29	49 to 65

† DO NOT use rates higher than 22 mL per acre of *Heat LQ* or 49 mL per acre of *Zidua SC* or injury could result.
***Some varieties may be more sensitive to *Heat Complete* and injury may occur.**
Note: Crop injury may occur in lentils when *Heat Complete* is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.
Add *Merge* adjuvant at 0.2 to 0.4 L per acre.

Weeds, Rates and Staging:

Apply up to the 8 leaf stage unless otherwise indicated to control the weeds controlled by glyphosate plus rapid burndown of:

- Canada fleabane
- Cleavers* (up to 4 whorls)
- Dandelion (up to 15 cm)**
- Flixweed
- Foxtail (green and yellow)$^{\Delta\Delta}$
- Kochia†* (up to 15 cm)
- Lamb's-quarters*
- Narrow-leaved hawk's-beard (up to 8 cm)
- Perennial sow-thistle***$^{\Delta}$
- Prickly lettuce***$^{\Delta}$
- Ragweed (common, giant)***
- Redroot pigweed*
- Round-leaved mallow
- Shepherd's-purse***
- Smartweed (lady's-thumb)***
- Stinkweed*
- Volunteer canola (all types)*
- Waterhemp* (prior to emergence)
- Wild buckwheat*
- Wild mustard*
- Wild oats$^{\Delta\Delta}$

† **Includes Group 2 and glyphosate-resistant biotypes.**
* **Residual suppression (may be rate dependent).**
** **Top growth burndown control only of perennial plants; control of spring-germinating plants.**
*** **Burndown control is rate-dependent.**
$^{\Delta}$ **Top growth burndown control only.**
$^{\Delta\Delta}$ **Prior to emergence; residual suppression by *Zidua* component only.**

Application Information:

- **Water volume:** 20 to 40 L per acre. Higher volumes are required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
saflufenacil	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective Broadleaf	14
pyroxasulfone	PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Preseed and pre-emergent:*** Glyphosate (180 g to 360 g ae per acre)*
  * **must be mixed with glyphosate.**

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall shortly after product application can result in slight injury to the crop. Lentils will be more susceptible to injury on coarse textured (sandy or gravely) and low organic matter soils. Injury will appear usually as burning on the outer edges of the leaves. Lentils will grow out of injury symptoms, and yield will not be impacted at recommended rates.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Grazing Interval:** DO NOT graze or cut labeled crops for feed within 60 days of application.
- **Re-cropping Interval:** All crops 1 year after spring, pre-seed or pre-emergent application.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a cool, dry place. Avoid freezing. If frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*	Lentils	5	3	3
	Soybeans	5	3	4
	Corn, field peas	5	3	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.
† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

Heat Complete can cause injury to sensitive crops at very low concentrations. Sprayers used to apply this product should be flushed out immediately after each day of use.

Refer to Method B in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

 Caution – Possible Skin Irritant

 Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Himalaya Pass

Herbicide Group 2 - flucarbazone, florasulam

This product is a prepackaged tank mix of Himalaya *(see Flucarbazone) and* Battlefront *(see Florasulam). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.*

Company:

AgraCity

Formulation:

The *Himalaya Pass* package contains the following components:

***Himalaya* (PCP#33370):** 66% flucarbazone formulated as water dispersible granules.

- Container size - 2 x 695 g

-plus-

***Battlefront* (PCP#33003):** 50 g/L florasulam formulated as a suspension concentrate.

- Container size - 6.4 L

Crops and Staging:

Spring wheat (NOT including durum): Apply to the soil surface up to 1 day prior to seeding.

Weeds and Staging:

Apply 8.7 g per acre of *Himalaya* plus 40 mL per acre of *Battlefront* plus 180 to 360 g ae per acre of glyphosate for control of weeds controlled by the component products and glyphosate at 180 g ae per acre plus:

- Dandelion (top growth control, up to 6 leaf)

DO NOT apply *Himalaya Pass* more than once per season or follow the application of *Himalaya Pass* or other flucarbazone product.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:

Herbicides: Glyphosate IPA or DMA salts only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Hurricane

Herbicide Group
6 - bentazon
14 - acifluorfen

Company:
UPL AgroSolutions Canada (PCP#32662)

Formulation:
320 g/L of bentazon and 160 g/L of acifluorfen formulated as a soluble liquid.
- Container size - 2 x 10 L

Crops and Staging:
Soybean: 1 to 2 trifoliate stage

Weeds and Staging:
Unless otherwise noted below, apply to small, actively growing weeds up to the 6 leaf stage to control.
- **Weeds controlled up to the 6 leaf stage:**
  - Common ragweed
  - Lamb's-quarters*
  - Palmer amaranth
  - Pigweed (redroot, smooth, green)
  - Waterhemp
  - Velvetleaf** (up to 4 leaf stage)

  *** Suppression only.**
  **** Use AMS (or UAN) as the additive when velvetleaf is a target weed.**

Rate:
Apply at 710 mL per acre with one of the following additives: ammonium sulfate (AMS), crop oil concentrate, or UAN (liquid 28-0-0) at the rates specified below:

Additive	Application Rate of Additive (per acre)
AMS Crop oil concentrate UAN solution	1.13 kg 0.5 to 0.95 L 1.9 to 3.8 L
Merge adjuvant	200 to 400 mL per 40 L of water unless stated otherwise on the tank mix partner label
Sure-Mix surfactant	0.5 L per 100 L of spray mixture (0.5% v/v)

NOTE: DO NOT apply more than 0.9 kg of bentazon (from all sources) per acre per calendar year.
NOTE: If the combined temperature and relative humidity exceed 100 (e.g. temperature of 30°C plus 70 percent relative humidity = 100), use the lower additive rates.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 40 to 80 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Use a minimum of 40 psi (275 kPa) spray pressure.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bentazon	POST (foliar)	PSII Inhibitor/ Membrane Disruptor	Little (Apoplast)	Broadleaf only	6
acifluorfen	POST (foliar)	PPO Inhibitor/ Membrane Disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:
Soybeans may exhibit leaf speckling, yellowing, bronzing or burning, but plants generally outgrow this condition within 10 days. New growth is normal and crop vigor is not reduced.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- *Assure II* with *Merge* or *Sure-Mix*
- *Basagran* (up to 235 mL per acre) with crop oil concentrate, AMS, or UAN
- *Pinnacle* with non-ionic surfactant and AMS or UAN
- *Poast Ultra* with *Merge* or *Assist Oil Concentrate*
- *Pursuit* with non-ionic surfactant and AMS or UAN
- Glyphosate products (see label for specific products) (only apply to glyphosate tolerant soybeans)
- *Liberty* with crop oil concentrate (only apply to glufosinate tolerant soybeans)
- *Clethodim* products with *Amigo*

Fungicides: None registered.

Insecticides: None registered.

Fertilizers:

- Ammonium sulfate (AMS)
- UAN (liquid 28-0-0)

NOTE: the above tank mixes are those listed on the *Hurricane* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 48 hours.
- **Pre-harvest Interval:** No specific preharvest interval is indicated on the label.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay.
- **Re-cropping Interval:** The label has no restrictions on crops that may be planted the following season.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a dry place. DO NOT store below 4°C or above 37°C. This product is a reducing agent and should not be mixed or stored in close proximity to strong oxidizing agents.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial habitat:
	Terrestrial habitat
Ground*	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance is measured from the downwind edge of the boom to sensitive areas.**

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:


Caution – Poison


Warning – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Image

Herbicide Group
2 - imazamox

Company:
Sharda Cropchem (PCP#33914)

Formulation:
120 g/L imazamox formulated as a solution.
- Container sizes - 4 x 5.33 L, 85.3 L

Crops and Staging:
CLEARFIELD Wheat

Weeds, Rates and Staging:
Note: Maximum ONE APPLICATION of these or any other products containing imazamox in a year.

***Image* at 51 mL per acre plus a non-ionic surfactant at 0.25 L per 100 L of spray solution will control up to the 4 leaf stage:**
- Lamb's-quarters†
- Stinkweed
- Volunteer wheat (not CLEARFIELD varieties)
- Wild mustard

***Image* at 68 mL per acre plus a non-ionic surfactant at .25 L per 100 L of spray solution will control the weeds above plus:**
- **Grasses – 1 to 4 main stem leaves, early until tillering:**
  - Barnyard grass
  - Foxtail (green, yellow)
  - Japanese brome†
  - Persian darnel
  - Volunteer barley
  - Volunteer canaryseed
  - Volunteer oats
  - Wild oats
- **Broadleaf weeds – cotyledon to 4 leaf stage:**
  - Cleavers†
  - Cow cockle
  - Green smartweed
  - Lamb's-quarters
  - Redroot pigweed
  - Round-leaved mallow†
  - Russian thistle†
  - Shepherd's-purse
  - Volunteer canola (not CLEARFIELD varieties)
  - Wild buckwheat†

† **Suppression only.**

Refer to the product label for complete mixing instructions for this product and its mixes, including registered adjuvants. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** or larger droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar) with slight soil activity	ALS Amino Acid inhibitor	Toward growth areas of the plant (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:
DO NOT spray if temperatures of +5°C or lower are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:
Unless otherwise indicated, *Image* and tank mix partners are applied at all label rates and include adjuvants indicated in "Rates" above.

Herbicides:
- 2,4-D ester (227 g ae per acre) + non-ionic surfactant at 0.25 L per 100 L spray solution
- *Curtail M* (maximum 0.81 L per acre) + non-ionic surfactant at 0.25 L per 100 L spray solution
- *Frontline A* (41 mL per acre) + *Frontline B* (283 mL per acre) + non-ionic surfactant at 0.25 L per 100 L spray solution*
- MCPA ester (227 to 255 g ae per acre) + *Image* at 51 mL per acre only non-ionic surfactant at 0.25 L per 100 L spray solution*

*** Apply at 3 to 6 leaf stage of crop, not including tillers.**

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
NOTE: the above mixes are those listed on the *Image* labels only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 3 hours of application may reduce product efficacy.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Wheat grain and straw can be harvested 79 days after treatment.
- **Grazing Restrictions:** DO NOT treated crop within 14 days or cut for hay within 42 days of application.
- **Re-cropping Interval:** Winter wheat may be seeded 3 months after application. Barley, canaryseed, canola, chickpea, field corn, field peas, flax, lentil, oats, sunflower, and spring wheat may be seeded the first spring after application and tame mustard (condiment types only) the second season after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above. Contact manufacturer for additional information on recropping intervals. Check any tank mix partners for additional recropping restrictions.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C .
- **Buffer Zones:** Avoid spraying in situations where drift may occur.

Application method	Buffer Zones (metres†) Required for the Protection of:
	Terrestrial and Aquatic Habitat
Field sprayer	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

No specific hazards.

Imazamox

Herbicide Group 2 - imazamox

Company:

BASF Canada (*Solo ADV II*)
ADAMA Canada (*Davai 80 SL*)
Corteva Agriscience (*Amity WDG*)
Agracity (*Samurai*)
Sharda Cropchem (*Next*)
Nufarm Agriculture (*Venim*)
Albaugh (*Dakota*)
Viking (*Viking Imazamox*)

Formulation:

***Solo ADV II* (PCP#33720):** 25 g/L imazamox formulated as a solution.

- Container size - 2 x 6.5 L or 3 x 4.33 L

***Amity WDG* (PCP#33180), *Samurai* (PCP#33033), *Next* (PCP#33620), *Dakota* (PCP#34698), *Viking Imazamox* (PCP#34777):** 70% imazamox formulated as a water dispersible granule.

- Container sizes:
  - 4 x 117.5 g water soluble bags
  - *Samurai* - 470 g

***Davai 80 SL* (PCP#32929):** 80 g/L imazamox formulated as a solution.

- Container sizes - 2 x 8 L, 96 L

***Venim* (PCP34394):** 350 g/L imazamox formulated as a solution.

- Container size - 2 x 3.66 L

Crops and Staging:

CLEARFIELD sunflower (*Solo ADV II, Next*, *Venim* and *Dakota* only): 2 to 8 leaf stage.
CLEARFIELD canola (*Amity WDG*, *Next* and *Dakota* only): 2 to 6 leaf stage.
CLEARFIELD lentil:

- ***Solo ADV II* and *Davai 80SL:*** 1 to 9 node stage.
- ***Next, Samurai, Venim*, *Dakota*, and *Viking Imazamox:*** 2 to 6 leaf stage.
- Davai 80 SL: 1 to 9 node stage

CLEARFIELD oilseed mustard (*Brassica juncea*) (*Amity WDG, Dakota* and *Next* only): 2 to 6 leaf stage.
Imidazolinone (IMI) tolerant chickpeas (*Solo ADV II* only): 1 to 6 node stage.
Dry bean (*Davai 80SL,* and *Venim* only): Emergence to 3 expanded trifoliate leaves stage.
Field Pea (*Davai 80SL, Samurai, Next*, *Dakota*, *Venim* and *Viking Imazamox* only): 1 to 6 leaf stage.
Soybean (*Solo ADV II, Next, Venim* and *Davai 80SL* only): Cotyledon to 4 leaf (3 expanded trifoliates) stage*.
Note: Temporary crop yellowing may be observed shortly after application in CLEARFIELD canola. Not all dry bean varieties have been tested for tolerance to *Davai 80SL*, test new varieties on a small area for tolerance before widespread use.

Weeds, Rates and Staging:

MAXIMUM ONE APPLICATION of these or any other products containing imazamox in a year.
For all products except *Solo ADV II*, add one of the following adjuvants:

- *Merge*, methylated soybean oil (*MSO*) or *Surjet* at 0.5 mL per 100 L of spray solution
- *Carrier adjuvant* at 0.25 mL per 100 L of spray solution.

***Note:** Various manufacturers may support different adjuvants with their products. Check the label or with the manufacturer which adjuvant they support.*

***Next/Samurai/Amity/Dakota WDG/Viking Imazamox* at 8.5 grams per acre plus recommended adjuvant above will control up to the 4 leaf stage:**

- Lamb's-quarters†
- Stinkweed
- Volunteer wheat (not CLEARFIELD varieties)
- Wild mustard

***Solo ADV II* at 325 mL per acre (no adjuvant required) or *Next/Samurai/Amity/Dakota WDG/Viking Imazamox* at 11.7 grams per acre, *Davai 80 SL* at 100 mL per acre or *Venim* at 23 mL per acre plus recommended adjuvant above will control:**

The weeds above plus:

Grasses - 1 to 4 main stem leaves, early until tillering:

- Barnyard grass
- Foxtail (green, yellow)
- Japanese brome†
- Persian darnel
- Volunteer barley
- Volunteer canaryseed
- Volunteer oats
- Wild oats

Broadleaf Weeds - cotyledon to 4 leaf stage:

- Cleavers†
- Cow cockle
- Flixweed*
- Green smartweed
- Lamb's-quarters
- Redroot pigweed
- Round-leaved mallow†
- Russian thistle
- Shepherd's-purse
- Stork's-bill*
- Volunteer canola (not CLEARFIELD varieties)
- Wild buckwheat†

† **Suppression only.**

* ***Davai 80SL* and *Venim* only.**

Refer to the product label for complete mixing instructions for this product and its mixes, including registered adjuvants. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE (S572.1) medium*** or larger droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens (*Solo WDG, Davai 80SL, Samurai, Next, Venim* and *Mizuna* only).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar) with slight soil activity	ALS Amino Acid inhibitor	Toward growth areas of the plant (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C or lower are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Unless otherwise indicated, imazamox and tank mix partners are applied at all label rates and include adjuvants indicated in "Rates:" above.

Herbicides:

- ***Field peas only:***
  - *Samurai, Viking Imazamox* and *Dakota* (11.7 g per acre) only
    - *Basagran Forte* or *Boa** (362 mL per acre) plus *UAN 28%* (800 mL per acre)
- ***Field peas, soybeans and dry beans:***
  - *Davai 80 SL* at 81 mL per acre only
    - Imazethapyr (*Phantom* only at 26.3 mL per acre) + non-ionic or methylated seed oil adjuvant
  - *Davai 80 SL* at 100 mL per acre only
    - *Basagran Forte* (500 mL per acre) + *UAN 28%* (800 mL per acre)
- ***Dry beans only***
  - *Dakota* (11.7g per acre) only
    - *Basagran Forte* (510 mL per acre) + *UAN 28%* (800 mL per acre)
- ***CLEARFIELD canola***
  - *Amity WDG* at 11.7 g per acre only
    - *Lontrel XC* (51 mL per acre) + *Surjet* or *Merge* at 0.5 L per 100 L of spray solution
- ***Clearfield lentils, Clearfield sunflowers, and soybeans***
  - *Solo ADV II* at 325 ml/acre only
    - *Caziva Ultra Q, Assure II* or *Yuma GL Liquid EC* (150 - 300 mL/acre)

* ***Samurai* only.**

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the Imazamox labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 3 hours of application may reduce product efficacy.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for hay/silage/green-feed unless otherwise indicated below.
  - ***Clearfield Canola or Oilseed Quality Mustard:*** 20 days following application.
  - ***Field Pea:*** 30 days following application of *Davai 80SL* or *Venim* or within 20 days of application for *Next, Samurai* and *Viking Imazamox*.
  - ***Clearfield Lentil:*** 20 days following application of *Solo ADV II, Davai 80SL, Next, Venim* and *Viking Imazamox*.
  - ***Soybeans:*** 20 days following application of *Solo ADV II* only.
- **Pre-harvest Interval:**
  - ***Clearfield Sunflower:*** 70 days after application.
  - ***Clearfield Canola, Clearfield Oilseed Quality Mustard, Clearfield Lentil, Field Pea and Soybeans:*** 60 days after application.
  - ***Dry Bean:*** 75 days after application.
- **Re-cropping Interval:**
  - ***Solo ADV II, Amity WDG, Next* or *only:*** Winter wheat may be seeded 3 months after application.
  - ***All products:*** Barley, canaryseed, canola, chickpea, field corn, field pea, flax, lentil, oats, sunflower, and spring wheat (including durum) may be seeded the first spring after application and tame mustard (condiment types only) the second season after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above. Contact manufacturer for additional information on recropping intervals. Check any tank mix partners for additional recropping restrictions.
    Note: *Where less than 125 mm of accumulated rainfall is received between June 1 and September 1 in the year of application, or additionally for the brown soil zone where less than 15 mm is received in any single month through June, July and August, regardless of total rainfall during that time, delay planting canaryseed, canola (non-CLEARFIELD), flax, tame oats or, winter wheat and durum wheat by an additional year. If the same drought conditions as described above occur in either the year of application or the year following, delay planting tame mustard by an additional year.*
    - *As with other herbicides that break down through microbial activity, additional conditions that may slow breakdown and increase the risk of follow crop injury are soil pH of less than 6.5, organic matter of less than 3 percent, very sandy soils and prolonged cold.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C.
- **Buffer Zones:** Avoid spraying in situations where drift may occur.

Application method	Buffer Zones (metres†) Required for the Protection of:
	Terrestrial and Aquatic Habitat
Other imazamox products	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method C' in the general sprayer cleaning section in the introduction.

Hazard Rating:

Davai 80SL, Venim: Caution – Poison and Eye Irritant

Solo ADV II: Caution – Skin Irritant

Amity WDG, Samurai, Next:

Warning – Eye Irritant

Warning – Contains the Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Imazamox / Bentazon

Herbicide Group
2 - imazamox
6 - bentazon

Company:

BASF Canada (*Viper ADV*)
ADAMA Canada (*Python*)
AgraCity (*Boa Pro, Taipan*)
Sharda CropChem (*Benz*)
NuFarm Agriculture (*Ransack*)

Formulation:

***Viper ADV* (PCP#30626), *Benz* (PCP#33830):** 20 g/L imazamox and 429 g/L bentazon formulated as a solution.

- Container sizes - 2 x 8.1 L, 129 L

***Ransack* (PCP#34931):** 20.6 g/L imazamox and 440 g/L bentazon formulated as a solution.

- Container sizes - 2 x 8.1 L, 97.2 L

The *Python* package contains the following components:
***Python A* (PCP#33279):** 80 g/L imazamox formulated as a solution.

- Container size - 4 L

-plus-
***Python B* (PCP#33282):** 480 g/L bentazon formulated as a solution.

- Container size - 2 x 7.26 L

The *Boa Pro* and *Taipan** packages contains the following components:
***Samurai* (PCP#33033):** 70% imazamox formulated as a water dispersible granule.

- Container size - 470 g

-plus-
***Boa* (PCP#33011):** 480 g/L bentazon formulated as a solution.

- Container size - 2 x 7.5 L

All products require the addition of:
BASF 28% UAN (28-0-0) is required, but sold separately.

- Container sizes - 2 x (2 x 8 L), 128 L drums

*** This product is a co-pack based on a supported mix of the higher rate of Boa by the manufacturer, but not supported on individual labels.**

Crops and Staging:

All products:
Field pea: 3 to 6 above-ground nodes (3 to 6 true leaves).
***Viper ADV, Benz, Python* and *Ransack* only:**
Dry bean (black, cranberry, great northern, navy, pinto, pink, red Mexican†): Imazamox/Bentazon plus additional *Basagran Forte* (see tank mix section) from the fully expanded first trifoliate leaf to the second trifoliate fully expanded.
Even though Imazamox/Bentazon is registered for all the dry bean types above, tolerance may vary between varieties (esp. navy). Test new varieties on a small area for tolerance before widespread use.
Soybean: Emergence to 3 fully expanded trifoliate leaves.
***Viper ADV, Benz* and *Ransack* only:**
Faba bean: 3 to 6 above-ground nodes (3 to 6 true leaves).
Alfalfa (seedling or established) for seed forage and hay†: Apply *Viper ADV*, *Benz* or *Ransack* plus additional *Basagran Forte* (see tank mix section) to seedling alfalfa after the third trifoliate stage or to established alfalfa before flower and prior to canopy closure.
***Viper ADV* only:**
Established and seedling clover (alsike, red, sweet) and sainfoin for seed production only†: Seedling clover and sainfoin tolerant after the third trifoliate stage otherwise apply prior to flowering but before the crop canopy closes.
***Benz* only:**
Established and seedling clover (alsike and red) for seed production only†: Seedling clover tolerant after the third trifoliate stage otherwise apply prior to flowering but before the canopy closes.
***Ransack* only:**
Established and seedling clover (alsike, and red) and sainfoin for seed production only†: Seedling clover and sainfoin tolerant after the third trifoliate stage otherwise apply prior to flowering but before the crop canopy closes.

† NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

NOTE: Applications under hot, humid conditions may result in temporary leaf yellowing, leaf flecking, bronzing or burning. The crop usually outgrows this condition within 10 days and new tissues will not be affected.

Weeds and Staging:

Grasses - 1 to 4 main stem leaves or until early tillering.

- Barnyard grass
- Foxtail (green, yellow)
- Japanese brome*
- Persian darnel
- Volunteer barley
- Volunteer canaryseed
- Tame oats
- Volunteer wheat (including durum, not CLEARFIELD varieties)
- Wild oats

Broadleaf Weeds - cotyledon to 4 leaf stage.

- Biennial wormwood[§§]
- Bird Rape**
- Cleavers*[†]
- Cocklebur**
- Cow cockle
- Flixweed[§§]
- Flower-of-an-hour**
- Green smartweed
- Kochia*[†§]
- Lamb's-quarters
- Pigweed (prostrate[††]*, redroot)
- Round-leaved mallow*[§]
- Russian thistle[§]
- Shepherd's-purse
- Stinkweed
- Sow-thistle (spiny annual)[††*§]
- Stork's-bill[††*]
- Velvetleaf**
- Volunteer canola (including CLEARFIELD varieties)
- Volunteer lentils (including CLEARFIELD lentils)[§]
- Wild buckwheat*
- Wild mustard[†]

*** Suppression only.**
**** *Taipan* only.**
[†] Including Group 2 resistant biotypes.
[††] *Viper ADV* and *Ransack* requires the addition of *Basagran Forte* (see tank mix section) for activity on these weeds in dry beans and alfalfa only.
[§] *Viper ADV*, *Ransack, Taipan* and *Benz* only.
[§§] *Python* only.

Rates:

Viper ADV, Benz, Ransack: 400 mL per acre.
Ransack: 300 mL per acre for volunteer canola (non-imidazolinone tolerant, coyledon to 3 - leaf stage).
Python: *Python A* at 0.1 L per acre and *Python B* at 0.36 L per acre.
Boa Pro: *Samurai* at 11.7 g per acre and *Boa* at 362 mL per acre.
Taipan: *Samurai* at 11.7 g per acre and *Boa* at 725 mL per acre.
All Products: Add *28 percent BASF UAN* (sold separately) at 0.81 L per acre.
Failure to include *UAN* will result in significantly reduced product performance. DO NOT use any other adjuvants, additives or fertilizers as injury may result.
DO NOT apply Imazamox/Bentazon more than once or follow Imazamox/Bentazon with any related products containing Imazamox in the same year.
DO NOT apply to any crop other than those registered as severe injury will result. Refer to the product label for complete mixing instructions for this product. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Apply in 40 L per acre. High water volumes are required for adequate coverage, particularly when weed densities are high or weed staging is large.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar)	ALS Amino Acid inhibitor	Symplast	Broadleaf & grass	2
bentazon	POST (foliar)	PSII Inhibitor/Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C or less are forecast within 3 days of application. Under cool or dry conditions, control of some weeds may be severely reduced. DO NOT apply to crops stressed from hail damage, flooding, drought, hot, humid weather, widely fluctuating temperatures, prolonged cold or injury from previous herbicides, as crop injury may result.

Tank Mixes:

***Viper ADV, Benz* and *Ransack* only for dry bean (types above) and alfalfa:**

- *Basagran Forte* (145 mL per acre) plus UAN as above.

***Roundup* Ready Soybean:**

- Glyphosate (360 to 720 mL per acre). UAN is not required for control of weeds listed on the glyphosate label.

Restrictions:

- **Rainfall:** Rain within 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze, or cut for feed/hay within 20 days of application to alfalfa. DO NOT graze or cut for feed any other listed crop.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvest.
- **Re-cropping Interval:** Winter wheat may be seeded 3 months after application. Barley, canaryseed, canola, chickpea, field corn, field pea, flax, lentil, oats, sunflower, and spring wheat (including durum) may be seeded the first season after application and tame mustard (condiment types only) the second season after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above. Contact manufacturer for additional information on recropping intervals.
  Note: *Where less than 125 mm of accumulated rainfall is received between June 1 and September 1 in the year of application, or additionally for the brown soil zone where less than 15 mm is received in any single month through June, July and August, regardless of total rainfall during that time, delay planting canaryseed, canola (non-CLEARFIELD), flax, tame oats, winter wheat and durum wheat by an additional year. If the same drought conditions as described above occur in either the year of application or the year following, delay planting tame mustard by an additional year.*
  - *As with other herbicides that break down through microbial activity, additional conditions that may slow breakdown and increase the risk of follow crop injury are soil pH of less than 6.5, organic matter of less than 3 percent, very sandy soils and prolonged cold.*
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C.
- **Buffer Zones:** Avoid spraying in situations where drift may occur. Leave at least 11 metres between the outside edge of the sprayed area and sensitive non-target areas such as shelterbelts, hedgerows, wetlands, woodlots, vegetated ditch banks, ponds, streams, and sloughs. Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction.

Hazard Rating:

Warning – Poison

Warning – Contains the Allergen Soy

Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Imazamox / Imazethapyr

Herbicide Group
2 - imazamox, imazethapyr

Company:

BASF *(Odyssey NXT)*
AgraCity (*Ninja*)
ADAMA Canada (*Quasar*)*
Sharda Cropchem (*Judo*)*
Viking (*Viking Skien*)
*** Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

Ninja **(PCP#32995),** ***Judo*** **(PCP#33949),** ***Viking Skien*** **(PCP#34866):** 35% imazamox and 35% imazethapyr formulated as a dispersible granule.

- Container size - 8 x 86.5 g water soluble packs. Adjuvant sold separately.

Odyssey NXT II **(PCP#33678):** 35% imazamox and 35% imazethapyr formulated as a dispersible granule.

- Container size - 2 x 692 g jugs per 80 acre case. One case will also include 2 x 8.1 L jugs of *Merge*.

The *Quasar* package contains the following components:
Davai 80 SL **(PCP#32929):** 80 g/L imazamox formulated as a solution.

- Container size - 6.47 L

-plus-
Phantom **(PCP#30017):** 240 g/L imazethapyr formulated as a solution.

- Container size - 2.08 L

Crops and Staging:

Crop	Leaf Stage
Field pea$^{\Delta}$, faba bean$^{\Delta\Delta\Delta}$	1 to 6 nodes/true leaf stage
CLEARFIELD sunflower$^{\Delta\Delta\Delta}$	2 to 8 leaf
CLEARFIELD lentil$^{\Delta\Delta\Delta}$, CLEARFIELD sunflowers$^{\Delta\Delta\Delta}$	1 to 9 above ground nodes
Dry beans^{Q}	Emergence to the second trifoliate leaf
Soybean$^{\Delta\Delta}$	1 to 3
Fenugreek (grain**, seed or forage)$^{\Delta\Delta\Delta}$, alfalfa*$^{\dagger\Delta\Delta\Delta}$, bird's-foot trefoil*$^{\dagger\Delta\Delta\Delta}$, seedling clover (red, alsike and sweet)*$^{\Delta\Delta\Delta}$, seedling sainfoin*$^{\Delta\Delta\Delta}$	1 to 4

*** Seed production only.**
**** Including grain production for human consumption (*Odyssey NXT* only)**
† Seedling and established.
$^{\Delta}$ *Viking Skien* is registered on field peas only.
$^{\Delta\Delta}$ *Odyssey NXT II* and *Quasar* only.
$^{\Delta\Delta\Delta}$ *Odyssey NXT II* only.
^{Q} *Quasar* only.

Temporary crop yellowing may be observed shortly after application in field pea and faba bean.

Weeds, Rates and Staging:

Merge adjuvant (sold separately for *Ninja, Judo* and *Viking Skien*; included in *Odyssey NXT II*) must be used at a rate of 0.5 L per 100 L of spray solution.

At 17.3 grams per acre, *Odyssey NXT II* and *Ninja* or *Quasar* at 80 mL per acre of *Davai 80SL* plus 26 mL per acre of *Phantom* will control:

- **Grasses - 1 to 4 main stem leaves, until tillers are visible:**
  - Barnyard grass^{S}
  - Green foxtail
  - Persian darnel^{NQ}
  - Volunteer cereals (wheat excluding CLEARFIELD varieties^{S}, barley^{S}, oats)
  - Wild oats
  - Yellow foxtail††
- **Broadleaf Weeds - cotyledon to 4 leaf stage unless otherwise indicated:**
  - Chickweed
  - Cleavers (up to 4 whorls)^{NQ}
  - Flixweed^{NQ}
  - Green smartweed
  - Hemp-nettle*^{NQ}
  - Lamb's-quarters***
  - Redroot pigweed
  - Russian thistle$^{\dagger NQ}$
  - Shepherd's-purse^{NQ}
  - Stinkweed
  - Stork's-bill^{NQ}
  - Volunteer canola (not CLEARFIELD varieties)^{S}
  - Volunteer tame mustard (not CLEARFIELD oilseed *(B. juncea)* varieties)^{NQ}
  - Wild buckwheat*^{S}
  - Wild mustard

*** Suppression only in field peas and CLEARFIELD lentils.**
**** Suppression only in field peas, not controlled in CLEARFIELD lentils.**
***** Suppression only.**
† Suppression only in CLEARFIELD lentils. Not labelled for control in peas with *Ninja*.
†† *Quasar* only.
^{NQ} NOT including *Quasar*.
^{S} Suppression only with *Quasar*.

Note: DO NOT apply *Imazamox/Imazethapyr* more than once or follow it with any other product containing imazamox or imazethapyr in the same year.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 40 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets or larger.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazamox	POST (foliar) with slight soil activity	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf & grass	2
imazethapyr	POST (foliar) with some soil activity	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

Herbicides†:

- **In field peas, CLEARFIELD lentils, and soybeans only:**
  - *Poast Ultra* (130-190 mL per acre).
- **In field peas, CLEARFIELD lentils, faba beans and soybeans:**
  - *Caziva Ultra Q, Assure II* or *Yuma* (154-304 mL per acre).

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

† **Note: The above mixes are those listed on the *Odyssey NXT II* label only. No tank mixes are listed on the *Ninja* and *Viking Skien* labels.** Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 3 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated canola or soybean or cut for hay. Field pea may be fed to livestock 30 days after application. DO NOT harvest forage or cut for hay.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvesting faba bean, field pea, and lentil. DO NOT harvest dry beans within 75 days of application (*Quasar* only).
  DO NOT apply within 85 days of harvesting soybean.
- **Re-cropping Interval:** Field pea, lentil, CLEARFIELD canola, oats**, barley, field corn*, chickpea**, soybean and spring wheat may be seeded the first full season after application. Flax**, canola**, canaryseed**, durum wheat and sunflower** may be seeded the second full season after application. The manufacturers recommend that a field bio-assay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above.
  - ***Note:*** *Where less than 125 mm of accumulated rainfall is received between June 1 and September 1 in the year of application, or additionally for the brown soil zone where less than 15 mm is received in any single month through June, July and August, regardless of total rainfall during that time, delay planting tame oats by an additional year. If the same drought conditions as described above occur in either the year of application or the year following, delay planting non-CLEARFIELD canola by an additional year.*
  - ***Note:*** *As with other herbicides that break down through microbial activity, the breakdown of Imazamox/Imazethapyr may be slowed or delayed by environmental conditions such as drought, excessive cold and/or acid soils (pH less than 6.5) resulting in an increased risk of injury to rotational crops. The most tolerant crops are CLEARFIELD canola and legume crops, then cereals. Contact manufacturer for additional information on re-cropping interval.*

  *** Field corn is not listed as a registered recrop option on the *Ninja* or *Quasar* labels.**

  **** Not listed as a recrop option following *Quasar* application.**
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry place above 5°C.

- **Buffer Zones:** Avoid spraying in situations where drift may occur.

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats of Depths	Terrestrial habitat
Ground*	11	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method C' in the general sprayer cleaning section in the introduction.

Hazard Rating:
Warning – Eye and Skin Irritant

Warning – Contains Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Imazamox / Quizalofop

Herbicide Group
1 - quizalofop
2 - imazamox

This product is a prepackaged tank mix of Imazamox *(see Imazamox) and* Quizalofop *(see quizalofop). Information listed is restricted to Crop, Weeds and Rates. For other detailed information on the effect of growing conditions, and restrictions for the component products see the product pages listed above.*

Company:
BASF Canada (*Solo Ultra Q*)
ADAMA Canada (*Davai Q Plus)*

Formulation:
The *Solo Ultra Q* package contains the following components:
***Solo ADV II* (PCP#33720):** 25 g/L imazamox formulated as a solution with built in adjuvant.
- Container size - 2 x 6.5 L jugs

***Caziva Ultra Q* (PCP# 34282):** 96 g/L quizalofop-p-ethyl formulated as an emulsifiable concentrate.
- Container size - 6.16 L

-or-
The *Davai Q Plus* package has the following components:
***Davai 80 SL* (PCP#32929):** 80 g/L imazamox formulated as a solution.
- Container size - 4 L

***ADAMA Quizalofop* (PCP#34935):** Quizalofop-p-ethyl 100 g/L formulated as an emulsifiable concentrate.
- Container size - 5.9 L

Crops and Staging:
CLEARFIELD sunflower*: 2 to 8 leaf stage.
CLEARFIELD lentil: 2 to 9 node stage.
Soybean: Cotyledon to 4 leaf stage
Dry bean:** emergence to 2nd trifoliate leaf.
Field pea:** 1 to 6 trule leaf stage.
*** *Solo Ultra Q* only.**
**** *Davai Q Plus* only.**

Weeds Staging:
Weeds controlled by *Solo ADV* and *Davai 80 SL* (see Imazamox) plus the grasses controlled by *Caziva Ultra Q* (see quizalofop) at 0.2 L per acre and *ADAMA Quizalofop* at 0.194 L per acre and the stages indicated on the component product pages plus:
- Annual Brome (Downy, Japanese)
- Foxtail barley
- Volunteer corn

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Rates:
***Solo ADV*:** 325 mL per acre
***Caziva Ultra Q*:** 154 mL per acre
***Davai 80 SL*:** 100 mL per acre
***ADAMA Quizalofop*:** 194 mL per acre

Tank Mixes:
Herbicides:
- *Quizalofop* (may be added to top up to a total of 300 mL per acre)

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.
See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Imazethapyr

Herbicide Group 2 - imazethapyr

Company:
BASF Canada (*Pursuit 240* – PCP#23844)
AgraCity (*Kamikaze* – PCP#30127)
ADAMA Canada (*Phantom* – PCP#30017)
Viking (*Viking Imazethapyr* – PCP#34747)

Formulation:
240 g/L imazethapyr formulated as a solution.
- Container size - 2 x 3.3 L jugs per case

Crops and Staging:
All products: DO NOT use in the brown or dark brown soil zones (except for use in dry bean and alfalfa under irrigated brown soils); rotational crops may be severely injured due to carry over in these soils.

Crop	Stage
Field pea	May be applied up to the sixth above-ground node stage (6 true leaves).

***Pursuit, Phantom* and *Viking Imazethapyr* only:**

Crop	Stage
Dry bean (pinto, pink and red varieties only)	Up to and including the second trifoliate leaf stage
Soybean (Manitoba only)	Up to and including the third trifoliate leaf stage
Seedling alfalfa (forage or seed production)*	Apply after the first trifoliate leaf stage.
Established alfalfa (seed production only)**	Apply before alfalfa reaches 12 inches (30 cm) in height.
Chickling vetch *(Lathyrus)* grown for seed	Apply at the 5 to 7 leaf stage.

*** Apply only to seedling alfalfa that will remain in production for at least 3 years following application. Apply only once during the life of the alfalfa stand.**
**** DO NOT apply in the last year of established alfalfa stands.**

Weeds and Staging:
In field peas and soybean. Apply up to the 4 leaf stage, unless otherwise indicated:
- Chickweed
- Cleavers
- Green foxtail
- Hemp-nettle
- Redroot pigweed
- Shepherd's-purse
- Smartweed
- Stinkweed
- Volunteer canola (not CLEARFIELD varieties)
- Wild buckwheat†
- Wild mustard
- Wild oats† (2 to 4 leaf stage)

In seedling and established alfalfa:

- Common groundsel*†
- Green foxtail†
- Green smartweed *
- Redroot pigweed
- Shepherd's-purse*†
- Stinkweed
- Volunteer canola (not CLEARFIELD varieties)
- Wild mustard

In dry bean:

- Hairy nightshade (up to 6 leaf stage)

*** Seedling alfalfa only.**
† Suppression only.

Rates:

85 mL per acre.

A non-ionic surfactant with at least 80 percent active ingredient (*Agral 90*, *Agsurf II, Surf 92*) should be added at a rate of 0.25 L per 100 L of spray solution. DO NOT over apply imazethapyr, as crop injury may result.

DO NOT apply imazethapyr more than once per season or follow imazethapyr with other products containing imazethapyr in the same year. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 40 to 160 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets or larger.

How it Works:

Refer to "How Do Herbicides Work" in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
imazethapyr	POST (foliar)	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

DO NOT spray if temperatures of +5°C are forecast within 3 days of application. Treat crops during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or harvest seedling alfalfa within 14 days of treatment. DO NOT graze or harvest field peas for feed within 30 days. DO NOT graze other treated crops or cut for feed prior to crop maturity.
- **Pre-harvest Interval:** DO NOT apply within 60 days of harvesting field peas or chickling vetch, within 75 days of harvesting dry beans, or within 85 days of harvesting soybeans.
- **Re-cropping Interval:** Rotate to barley, spring wheat (not durum), lentils, alfalfa, field pea or CLEARFIELD canola the year following application. The manufacturer recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crop other than those listed above. However, yield losses within the test strips may not be noticed unless the yield can be compared to an untreated area seeded adjacent to the imazethapyr-treated strip. In case of crop failure, only field peas or CLEARFIELD canola may be replanted in the year of application.
  - *NOTE: Breakdown of imazethapyr may be slowed or delayed by environmental conditions such as drought, excessive cold and/or acid soils (pH less than 6.5) resulting in an increased risk of injury to rotational crops. The most tolerant crops are CLEARFIELD canola and legume crops, then cereals. Contact manufacturer for additional information on re-cropping intervals.*
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. If the product is exposed to temperatures below 0°C, thaw the product completely and shake the container vigorously prior to use.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	1	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured is metres from the downwind edge of the spray boom to sensitive habitat.

- **Other Products:** DO NOT apply within 15 m of shelterbelts, water bodies, wetlands, and woodlots.

Sprayer Cleaning:

There are no specific sprayer cleaning directions on the product label. The use of 'Method C' in the general section on sprayer cleaning in the introduction is recommended for other products with similar chemistry. Contact the manufacturer for more information.

Hazard Rating:

Caution – May Cause Skin Irritation

Caution – May Cause Eye Damage

Refer to the Introduction for an explanation of the symbols.

Inferno Trio

Herbicide Group
2 - florasulam, flucarbazone,
14 - carfentrazone-ethyl

Company:

UPL AgroSolutions Canada (PCP#33273)

Formulation:

***Inferno Trio* (PCP#33273):** 141 g/L flucarbazone, 50 g/L florasulam, and 175 g/L carfentrazone-ethyl formulated as a suspension concentrate.

- Container size - 4 x 3.24 L

Crops and Staging:

Spring wheat (NOT including durum): Apply to the soil surface from one week before seeding until crop emergence.

Weeds, Rates and Staging:

Inferno Trio: Apply 40 mL per acre

- Will control the following weeds:
  - Cleavers
  - Cocklebur
  - Dandelion (S)
  - Flixweed†
  - Hemp-nettle (S)
  - Green foxtail
  - Kochia (including glyphosate-resistant)
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard (S)
  - Redroot pigweed*
  - Russian thistle
  - Shepherd's-purse
  - Stinkweed
  - Wild buckwheat
  - Wild mustard
  - Wild oats (S)
  - Volunteer canola*

Inferno Trio: Apply 40 mL per acre plus 180 g ae per acre of glyphosate IPA, DA or K+ salts (see glyphosate) to control:

- *Will control weeds above in addition to the weeds controlled by glyphosate at 180 g ae per acre (see glyphosate) and the weeds above plus:*
  - Barnyard grass
  - Chickweed
  - Corn spurry
  - Cow cockle
  - Dandelion**
  - Eastern black nightshade
  - Kochia (including glyphosate-resistant)
  - Night-flowering catchfly
  - Round-leaved mallow
  - Smartweed (green, Pennsylvania)
  - Stork's-bill
  - Wild tomato
  - Velvetleaf

(S) Suppression.
*** Control of weeds that emerge within 7 days following application.**
**** Top-growth only.**

NOTE: These products applied alone, without glyphosate, requires the addition of a non-ionic surfactant such as Ag-Surf, Agral 90, ProSurf, *etc. at 2.5 L per 1000 L of spray mixture.*

NOTE: DO NOT apply more 6 g ai per acre of flucarbazone (the equivalent of 1 application) per growing season.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. Use a spray pressure of 30 to 50 psi (207 to 345 kPa) pressure.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flucarbazone	POST (foliar – emerged weeds) PRE (soil activity)	ALS Amino Acid Inhibitor	Toward Areas of Growth (Symplast)	Broadleaf & grass	2
florasulam	POST (foliar) with little soil activity	ALS Amino Acid Inhibitor	Toward Areas of Growth (Symplast)	Broadleaf only	2
carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:

DO NOT apply to soils with organic matter less than 2.5 percent or soil pH greater than 8. Unacceptable crop injury may occur if applied to soils saturated with water. Unacceptable crop injury symptoms and reduced weed control may be observed under temperature extremes, drought, low fertility, or plant disease.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Pre-Emergent or Post-Plant Pre-Emergent*** - Glyphosate IPA, DA or K+ salts only

Note: The above mixes are those listed on the *Inferno Trio* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields.
- **Pre-harvest Interval:** Leave 80 days between application and harvest.
- **Re-cropping Interval:** The following crops may be planted 11 months after an application of *Inferno Trio*:

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Spring Wheat Barley Canola Field Pea*	Wheat (spring, durum) Barley Canola Field Pea Field Bean Flax Soybean Sunflower	Wheat (spring, durum) Barley Canola Field Pea Flax Soybean Sunflower	Spring Wheat

*** Field pea may be grown the year following flucarbazone application providing the following conditions are all met:**

1. **Soil pH must be below 7.5**
2. **Organic matter must be above 4 percent, and**
3. **Precipitation must be equal to or above 10-year average (minimum 100 mm within 60 days of application in year of application)**

- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place.

- **Buffer Zones:**
  - ***Inferno Trio:***

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only*	5	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured is metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Residues of these active ingredients in the spray tank can cause severe injury to sensitive crops at very low concentrations. Sprayers should be cleaned out immediately before using another product.

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

When mixing with other pesticides, combine the method above with the method required for the tank mix partner if it is different from above.

Hazard Rating:


Warning – Contains the Allergen Sulphites


Caution – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Infinity

Herbicide Group
6 - bromoxynil
27 - pyrasulfotole

Company:
Bayer (PCP#28738)

Formulation:
37.5 g/L pyrasulfotole and 210 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container size - 2 x 6.7 L jugs per case

Crops and Staging:
The following crops may be treated when at the 1 leaf stage of growth until the flag leaf is just visible but still rolled:
- Barley
- Perennial ryegrass* (seedling & established, grown for seed or forage)
- Red fescue and bromegrass* (established, grown for seed or forage)
- Timothy (seed production only)
- Triticale
- Wheat (spring, durum, winter)

**** NOTE: Since the uses on forage grasses were registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply this use do so at their own risk.***

Weeds, Rates and Staging:
At 0.33 L per acre the following weeds are controlled at the 1 to 6 leaf stage unless otherwise noted:
- Annual sow-thistle
- Chickweed
- Canada fleabane (seedlings up to 10 cm)*
- Canada thistle† (up to 30 cm)
- Cleavers (1 to 3 whorls)
- Cleavers (4 to 6 whorls)*
- Dandelion† (up to 25 cm across††)
- Flixweed (up to 10 cm)
- Hemp-nettle
- Kochia (up to 10 cm)
- Lamb's-quarters
- Narrow-leaved hawk's-beard (up to 10 cm before bolting)
- Pale smartweed
- Ragweed (common, giant†*)
- Perennial sow-thistle†
- Redroot pigweed
- Round-leaved mallow*‡
- Russian thistle (up to 10 cm)
- Shepherd's-purse
- Spreading atriplex (up to 10 leaf)†*
- Stinkweed
- Stork's-bill (up to 8 leaf)***
- Volunteer canola**
- Volunteer soybean*
- Wild buckwheat
- Wild mustard

† Suppression only.
†† Spring seedlings and overwintered rosettes.
‡ Suppression alone or control with the addition of AMS*.
*** Add 200 g of active ammonium sulphate per acre (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid; or 0.4 L per acre of 49 percent solution).**
**** All herbicide tolerant varieties.**
***** Only when mixed with 2,4-D + ammonium sulphate.**

DO NOT apply *Infinity* or other products containing pyrasulfotole or bromoxynil more than once in the same year.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 19 L per acre
  - ***Aerial:*** Minimum 11.4 L per acre

  Higher water volumes should be used under dense crop and weed canopies to ensure thorough coverage of the target weeds.
- **Nozzles and Pressure:** Maximum 40 to 45 psi (275 to 310 kPa) with conventional flat fan nozzles. Use nozzles and pressure designed to deliver proper coverage with ***ASABE medium*** droplets. Angle ground sprayer nozzles forward at a 45° angle to improve coverage of vertical leaf targets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little (Apoplast)	Broadleaf only	6
pyrasulfotole	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar and root (Apoplast) Somewhat systemic (has soil residues)	Broadleaf only	27

Effects of Growing Conditions:

For best results, apply to emerged, young, actively growing weeds according to the weed stages listed. Under stressed conditions and/or heavy crop canopy, early application will result in improved weed control. Weeds growing under adverse environmental conditions such as drought will be less susceptible herbicide effects.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Wheat (spring, winter, and durum), barley and triticale:***
  - *Liquid Achieve*
- ***Wheat (spring and durum) and barley only:***
  - *Puma Advance*
  - 2,4-D Ester (113 g ae per acre) + Ammonium sulphate (see Rates:)

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: DO NOT mix with fertilizers other than those indicated above.

Note: The above mixes are those listed on the *Infinity* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for hay within 25 days of application.
- **Pre-harvest Interval:** Leave at least 50 days for wheat and triticale and 45 days for barley from application to harvest of grain or straw.
- **Re-cropping Interval:** Alfalfa, barley, canaryseed, canola, field corn (Manitoba only), flax, potatoes, soybeans (Manitoba only), sunflowers, tame oats, and wheat (durum, spring) may be seeded the year following application. Field peas may be grown the season following application in black, grey-wooded and dark brown soil zones. DO NOT plant field peas the season following Infinity use in the brown soil zone where organic matter content is below 2.5 percent and where soil pH is above 7.5. Lentils may be seeded the second season after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store product in original containers in a secure, dry area, away from other pesticides, food or feed above –20°C. If stored over winter, shake or mix well before using.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	5
Fixed wing airplane	10	1	375
Helicopter	10	1	225

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

The manufacturer recommends a cleanout process similar to "Method A" using a combination of water and ammonia solution rinses.

For additional information, Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:

 Warning – Poison

 Warning – Eye and Skin Irritant

 Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Infinity FX

Herbicide Group
6 - bromoxynil
27 - pyrasulfotole
4 - fluroxypyr

Company:

Bayer

Formulations:

Co-pack*:

***Infinity* (PCP #28738):** 37.5 g/L pyrasulfotole and 210 g/L bromoxynil formulated as an emulsifiable concentrate.

- Container size - 13.4 L

***FX* (PCP #32006):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container size - 6.5 L

-or-

***Infinity FX* (PCP#33248):** 31.1 g/L pyrasulfotole, 174.3 g/L bromoxynil and 72 g/L fluroxypyr formulated as an emulsifiable concentrate.

- Container sizes - 8.1 L, 129.6 L, 405 L

**** Note: This formulation is no longer manufactured but some still remains in the distribution system. This product may be removed from future editions when supplies are exhausted.***

Crops and staging:

Spring Wheat, Durum, Barley: Apply at the 2 leaf stage of growth until the flag leaf is just visible but still rolled.

Weeds, Rates, Staging:

At the *Infinity* 335 mL per acre and *FX* 160 mL or *Infinity FX* at 405 mL per acre, the weed species controlled by the *Infinity* label plus the following.

- Cleavers (1 to 9 whorls)*
- Chickweed (up to 8 leaf stage)
- Hemp-nettle (up to 8 leaf stage)
- Kochia (up to 15 cm in height)
- Round-leaved mallow (1 to 6 leaf stage)
- Volunteer flax (up to 12 cm)

*** Ammonium sulphate at 200 g of active ingredient per acre may be added for improved broad leaf control (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid; or 0.4L per acre of 49 percent liquid).**

Application Information

- **Water Volume**
  - ***Ground:*** Minimum of 19 L per acre . Higher water volumes should be used under dense crop and weed canopies to ensure thorough coverage of the target weed.
- **Nozzles and Pressure:** Maximum 40 to 45 psi (275 to 310 kPa) with conventional flat fan nozzles. Use nozzles and pressure to deliver proper coverage with ***ASABE medium*** droplets. Angle ground sprayer nozzles forward at a 45° angle to improve coverage of vertical leaf targets.

Tank Mixes

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides :

- ***Spring wheat, durum, and barley:***
  - 2,4-D ester + AMS
  - *Liquid Achieve*
  - *Puma Advance*
- ***Spring wheat and durum:***
  - *Horizon NG*
  - *Varro*
- ***Spring wheat and barley:***
  - *Axial*

Fertilizers: DO NOT mix fertilizers other than those indicated above
Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction.
As of December 2024 this memo will no longer be recognized by Health Canada.
Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.
See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Hazard Rating:

 Warning – Poison
Eye and Skin Irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Insight Liquid SC

Herbicide Group 14 - tiafenacil

Company:

Gowan Canada

Formulation:

***Insight Liquid SC* (PCP#34689):** 339 g/L tiafenacil formulated as a suspension concentrate.

- Container size – 6 x 2.4 L, 4 x 4.8 L

Crops and Staging:

Spring Wheat, Field Corn: For burndown of emerged weeds prior to seeding or after seeding but prior to crop emergence.
Fallow and non-crop areas

Weeds, Rates and Staging:

Unless otherwise noted below, apply to young and actively growing weeds that are up to 12.5 cm in height.
Weeds Controlled:

- Kochia
- Lamb's-quarters
- Prickly lettuce*
- Redroot Pigweed
- Russian thistle
- Volunteer canola
- Waterhemp*
- Wild buckwheat
- Wild oat

*** Suppression**

Rate:

30-60 mL per acre.
Add *MSO surfactant* at 1 L per 100 L of spray solution.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASAE medium to coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tiafenacil	POST (foliar)	PPO inhibitor / membrane disruptor	Little movement due to rapid cell leakage	Non-selective	14

Effects of Growing Conditions:

Burndown activity may be slowed or reduced under cloudy and/or foggy or cooler weather conditions, or when weeds are growing under drought or other stress conditions.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: None
Insecticides: None
Fungicides: None
Fertilizers: None
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** No restrictions on the label.
- **Grazing:** Not applicable.
- **Re-cropping:**
  - ***Field corn, spring wheat (including durum):*** 0 days after application.
  - ***Soybeans:*** 14 days after application.
  - ***All other crops:*** May be seeded the year following application (270 days).
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT allow product to freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction.

Hazard Rating:

No specific hazard indicated.

Intruvix*/Intruvix II

Herbicide Group
2 - tribenuron
4 - dicamba
14 - carfentrazone-ethyl

Intruvix is a a prepackaged tank mix of the equivalent of Express FX (Intruvix A) and the equivalent of Aim EC (Intruvix B). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Company:
FMC Corporation

Formulation:
The *Intruvix* package contains the following components:

***Intruvix A* (PCP#33462):** 60.87% dicamba and 6.52% tribenuron-methyl formulated as a water dispersible granule.
- Container size - 3.72 kg

***Intruvix B* (PCP#33530):** 240 g/L carfentrazone-ethyl formulated as an emulsifiable concentrate.
- Container size - 1.2 L

NOTE: Intruvix *is purchased alone but must be tank mixed with glyphosate before use.*

***Intruvix II* (PCP#34898)**: 43.75% dicamba, 4.69% tribenuron-methyl and 11.25% carfentrazone-ethyl formulated as a wettable granule.
- Container size – 2.58 kg.

Crops and Staging:
For application to fallow, post-harvest and 1 day prior to seeding barley, oats or wheat (spring, durum, winter).

Weeds and Staging:
The combination of weeds controlled by *Intruvix A* (see *Express FX*), *Intruvix B* (see *Aim EC*) and glyphosate.

Rates:
Intruvix A: 46.5 grams per acre. DO NOT apply more than 46.5 grams per acre per year.
***Intruvix B*:** 15 mL per acre
-or-
Intruvix II: 64.5 g per acre
Must be tank mixed with glyphosate.
Intruvix/Intruvix II may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Weeds Controlled up to 8 cm:
- Canada fleabane
- Common ragweed
- Narrow-leaved hawk's beard
- Scentless chamomile*

Weeds Controlled up to 10 cm:
- Black nightshade
- Carpetweed
- Cocklebur
- Common waterhemp
- Eastern black nightshade
- Hairy nightshade
- Jimsonweed
- Kochia
- Morning glory
- Pennsylvania smartweed
- Prostrate pigweed
- Purslane (common)
- Round-leaved mallow
- Shepherd's purse
- Smooth pigweed
- Tall waterhemp
- Tansy mustard
- Tumble pigweed
- Velvet leaf

Weeds Controlled up to 15 cm:
- Cleavers
- Dandelion
- Downy brome
- Flixweed
- Giant foxtail
- Green foxtail
- Hemp nettle
- Lady's thumb
- Lamb's-quarters
- Persian darnel
- Redroot pigweed
- Russian thistle
- Tansy mustard
- Tumble pigweed
- Stinkweed
- Volunteer barley
- Volunteer canola
- Volunteer flax
- Volunteer wheat
- Wild mustard
- Wild oats

Weeds Controlled up to 3-leaf:

- Cow cockle

Weeds Controlled up to 5-leaf:

- Wild buckwheat

Weeds Controlled up to Rosette:

- Canada thistle*
- White cockle*

Intruvix/Intruvix II tank-mixed with glyphosate (0.9 L/acre 360 g/L active equivalent)

Weeds Controlled up to 15 cm:

- Annual bluegrass
- Annual sowthistle
- Crabgrass (large and smooth)
- Narrow-leaved vetch
- Prickly lettuce
- Shepherd's purse

*** Suppression only.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre. Higher spray volumes are required for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with *ASABE standard S572*.1 droplets by ground. Low drift nozzles may require higher pressures for proper performance.
- Optimum *Intruvix/Intruvix II* spray clouds should be 450 microns with fewer than 10% of the droplets being 200 microns or smaller.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Tribenuron	POST (foliar)	ALS Amino Acid Inhibitor	Toward growth areas of plant (symplast)	Broadleaf only	2
Dicamba	POST (foliar) with slight soil activity	Synthetic auxin	Moves throughout the plant (symplast)	Broadleaf only	4
Carfentrazone-ethyl	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:

Weed control is optimized when the product is applied to actively growing weeds. Warm, moist growing conditions promote active weed growth and enhance the activity of *Intruvix/Intruvix II* by allowing maximum foliar uptake and contact activity. Weeds hardened off by environmental stress such as cold weather, drought stress or excessive heat may not be adequately controlled or suppressed, and regrowth may occur.

Intruvix/Intruvix II applied to pre-seed to fields that are stressed by severe conditions such as drought, low fertility, saline soils, waterlogged soils (soils at or near field capacity), disease or insect damage may result in crop injury. Drought, disease or insect damage following application may also result in crop injury, grade or yield loss.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Glyphosate (182 g ae per acre).

DO NOT use with tank additives that alter the pH of the spray solution.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Restrictions:

- **Rainfall:** If rain occurs soon after application, control may be reduced. Environmental conditions that slow the drying of the spray mixture on the foliage may increase the time required for absorption.
- **Re-entry:** DO NOT re-enter treated fields for 24 hours.
- **Preharvest Interval:** Not applicable.
- **Grazing:** None established.
- **Re-cropping:** Spring wheat (including durum), winter wheat, spring barley and oats the year after treatment. Fields treated with Intruvix II in the spring may be seeded to any crop the following season.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Not for use or storage in or around the home. Store in original containers only. Keep container tightly closed. Store in a cool, dry place. Store this product away from food or feed.
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method (A, B, C)' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Danger – Poison
Warning – Contains the allergens milk and sulfites
Refer to the Introduction for an explanation of the symbols

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

IPCO Bifecta EZ

Herbicide Group
5 - metribuzin
14 - flumioxazin

Company:
Interprovincial Cooperative Limited (*IPCO Bifecta EZ* - PCP#34589)

Formulation:
347 g/L metribuzin and 77.6 g/L flumioxazin formulated as a suspension concentrate.
- Container size – 2 x 10 L

Crops and Staging:
Apply before planting, during planting, within 3 days of planting - but before the crop emerges, or in the fall prior to seeding the crop indicated.

Crop	Application Rate (per acre)	
	Spring/Early Summer	Fall (Post-Harvest/Burndown)
Soybean	356 mL	356 mL
Lentils, Field peas, Spring wheat	356 mL	356 mL to 506 mL
Post-Harvest/Fall Burndown	N/A	506 mL
Fallow Cropland	506 mL	N/A
Bare Ground in Non-Crop Areas of Farm	506 mL	506 mL

DO NOT apply to fine-textured soils such as clays.
DO NOT use on muck soil.
DO NOT apply to fields with greater than 5% organic matter.
Injury may occur if:
- ***IPCO Bifecta EZ* is applied to sandy soils with less than 2% organic matter.**
- ***IPCO Bifecta EZ* is applied to soils with pH of 7.5 or greater.**
- **Soybeans are planted less than 1.5 inches deep and lentils, field peas and spring wheat are planted less than 1 inch deep.**

Tillage conducted after application may reduce residual efficacy on target weeds.
DO NOT make more than one application of this product or other products containing metribuzin or flumioxazin per year.

Weeds, Rates and Staging:
Unless otherwise noted below, apply to young and actively growing weeds.
Weeds Controlled:
- Barnyard grass
- Canada fleabane
- Carpetweed**
- Chickweed
- Cleavers
- Cocklebur
- Common ragweed
- Dandelion
- Downy brome
- Foxtail (green, yellow)
- Jimsonweed/Devil's trumpet**
- Kochia
- Lamb's-quarters
- Nightshade (Eastern black, hairy)
- Pigweed (green, prostrate, redroot, Palmer, Waterhemp)
- Russian thistle
- Shepherd's-purse
- Smartweed (green, lady's thumb)
- Velvetleaf
- Volunteer canola*
- Wild buckwheat
- Wild mustard
- Yellow woodsorrel

*** Suppression**
**** Pre-emergent only**

Application Information:
- **Water Volume:**
  - ***Ground only:***
    - ***Soybeans:*** Minimum 60 L per acre.
    - ***Other crops:*** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active Ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metribuzin	PPI (soil active) POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Broadleaf & grass	5
flumioxazin	PRE (surface) with residual soil activity	PPO Inhibitor/ Membrane disruptor	PRE: Upward in plant (Apoplast)	Broadleaf only	14

Effects of Growing Conditions:

Many weather-related factors, including splashing or heavy rains or irrigation or cool conditions at or near crop emergence, may result in soybean injury in treated fields. Application after the soybeans have begun to crack, or are emerged, will result in severe crop injury.

Tank Mixes:

Tank mixes with glyphosate do not require the addition of a surfactant. All other tank mixes must be applied with crop oil concentrate at 0.5 to 1.0 L per acre or a non-ionic surfactant at 0.25% v/v.

Tank mix products applied at label rates unless otherwise indicated.

Herbicides:

- ***All Crops and Fallow:***
  - Glyphosate (*Credit Xtreme* only)
- ***In Soybeans:***
  - *BlackHawk*
  - 2,4-D Ester, *Enlist 1*
  - *Roundup Xtend* (dicamba tolerant soybeans only)
  - *Enlist Duo* (2,4-D tolerant soybeans only)
  - *Phantom 240* (see imazethapyr)
- ***In Field Peas and Lentils:***
  - *GoldWing*
- ***For Spring Wheat:***
  - *BlackHawk*
  - *GoldWing*
  - *Conquer II*
- ***In Fallow:***
  - *BlackHawk*
  - 2,4-D Ester
  - Dicamba
- ***Post-Harvest/Fall Burndown prior to the spring seeding of:***
  - ***Soybeans, field Pea, Lentil, Spring wheat:***
    - *BlackHawk*
  - ***Soybeans only***
    - 2,4-D Ester

Restrictions:

- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** DO NOT harvest soybeans with 100 days of application to soybeans, 70 days of application to field peas, lentils, or 60 days of application spring wheat.
- **Grazing:** MUST NOT be grazed by livestock or cut for greenfeed within 21 days of application or cut for hay within 50 days of application to soybean. DO NOT graze or otherwise cut field peas for feed within 40 days of application. DO NOT graze or otherwise cut wheat for feed within 52 days of application. DO NOT graze or otherwise cut lentils for feed.
- **Re-cropping:**

IPCO BIFECTA EZ Rate (mL per acre)	Crop	**Rotational Interval**
356	Soybean, field corn, chickpea, field pea	Immediately
	Spring Wheat, Lentils [small red and large green varieties]	7 days
	Winter wheat, Durum Wheat	4 months

IPCO BIFECTA EZ Rate (mL per acre)	Crop	**Rotational Interval**
445 to 506	Soybean, field corn, chickpea, field pea	Immediately
	Spring Wheat	7 days
	Winter wheat	4 months
	Lentils [small red and large green varieties]	6 months

All other crops not listed may be seeded after 12 months with a successful field bioassay result.

- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a cool, dry, secure place.
- **Buffer Zones:**

Application method	Spray Buffer Zones (metres)† Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only	5	2	10

See the Key to Product Pages for an explanation of the different habitats.

*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Sprayers used to apply *IPCO Bifecta EZ* should be cleaned out thoroughly each day after use. All nozzles, screens and filters should be removed and cleaned after applying this product. Refer to 'Method A' found in the general sprayer cleaning section in the introduction. See label for detailed cleaning instructions. DO NOT use ammonia with chlorine bleach.

Hazard Rating:


Caution – Poison

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

IPCO Trigon

Herbicide Group
14 - carfentrazone
6 - bromoxynil
13 - clomazone

This product is a prepackaged tank mix of Carfentrazone, Bromoxynil, and Clomazone.
Information listed is restricted to Crops, Weeds, Rates, or any other information specific to the copack.
For other detailed restrictions and other general information on the component products see the product pages listed above and select the most restrictive options.

Company:
Interprovincial Cooperatives Ltd.

Formulation:
The *IPCO Trigon* package contains the following components:

***IPCO C-Zone* (PCP#33580):** 240 g/L carfentrazone formulated as an emulsifiable concentrate.
- Container size - 1.2 L

***IPCO/COOP Brotex 4AT* (PCP#33554/33828 – *IPCO/COOP Octagon*):** 480 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container size - 9.7 L

***IPCO Clomazone* (PCP#33910):** 360 g/L clomazone formulated as a microcapsule suspension.
- Container size - 10 L

Crops and Staging:
Canola: Prior to seeding the crop.

Weeds and Staging:
Weeds controlled by the Bromoxynil + Carfentrazone-ethyl (co-pack) plus:
- Extended suppression of cleavers emergence.

Rates:
Note: Maximum ONE APPLICATION per year of this or other products containing clomazone.
IPCO C-Zone: 15 mL per acre.
IPCO/COOP Brotex 4AT: 118 mL per acre.
IPCO Clomazone: 125 mL per acre.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:
- Glyphosate (label rates).

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Kerb SC

Herbicide Group 3 - propyzamide

Company:
Corteva Agriscience

Formulation:
***Kerb SC* (PCP#30264):** 400 g/L propyzamide formulated as a suspension concentrate.
- Container size - 2 x 10 L

Crops and Staging:
Apply to the following established crops between October 1 and freeze-up or very early spring*. Temperatures should be above freezing at time of application but should not exceed 12°C after application or a reduction in control may be observed. Applications are more effective if followed by a rain. Contact manufacture for specific staging and application guidelines prior to application.

Established alfalfa, bird's-foot trefoil, and established pastures**.

*** Early spring application for seed alfalfa only.**

**** *Severe stand thinning* may occur to pastures consisting primarily of crested wheatgrass, meadow fescue and timothy.**
- **Some thinning (10 to 15 percent) may occur with tall fescue and creeping red fescue.**

Weeds, Rates and Staging:
Apply in late fall or very early spring (seed alfalfa only) prior to the emergence of weeds.

Established grass or grass/legume pastures for control of foxtail barley:
- ***Brown, dark brown or gray wooded soils:*** 0.45 L per acre.
- ***Black soils:*** 0.56 L per acre.

Established Alfalfa† and bird's foot trefoil†:

Weed	Rate (L per acre)
	Kerb SC
Annual grasses, volunteer cereals, wild oats	0.89 L†
Quackgrass, orchardgrass, timothy, chickweed	1.13 to 1.62* L
Dodder (fall application only)	1.62 L

Note that complete control may not be achieved.

*** Maximum 1.13 L per acre with spring application. Low temperatures and adequate moisture following application are needed for efficacy.**

† Including fall application on spring seeded crops.

Caution: DO NOT use on soils with more than 6 percent organic matter. DO NOT apply to soils prone to flooding. DO NOT apply to pastures that contain high proportions of timothy, crested wheat grass or meadow fescue. Consult the manufacturer for other forage grass species sensitivities to Kerb.

Application Information:
- **Water Volume:** 120 to 200 L per acre.
- **Nozzles and Pressures:** Maximum 30 to 40 psi (200 to 275 kPa) with conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
propazomide	PRE (soil active)	Long-chain Fatty Acid Inhibitor/ Membrane & cell wall production	Little (apoplast)	Broadleaf & grass	15

Effects of Growing Conditions:
Dry soil conditions at time of weed emergence may result in reduced control. Approximately 3 inches of total precipitation is required for adequate activation. Best results when soil temperatures are low but above freezing.

Tank Mixes:
None registered.

Restrictions:
- **Rainfall:** Surface applications are most effective if followed by 0.5 to 1 inch (1.25 to 2.5 cm) of rain within 2 days of application. Avoid application when heavy rain is forecast.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 24 hours.
- **Grazing Restrictions:** DO NOT graze or harvest for livestock feed within 90 days of the 1.62 L per acre rate of *Kerb SC*, and 60 days of application for lower rates.
- **Re-cropping Interval:** May be replanted to leafy vegetable crops after 30 days of treatment and root or tuber vegetables within 90 days of treatment. DO NOT re-plant to any other crops within 1 year of treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. DO NOT freeze.
- **Buffer Zones:** DO NOT contaminate domestic or natural water sources or wetlands.

Crop	Buffer zone* (metres†) for terrestrial habitat
Established grass pastures, established grass /legume pastures, alfalfa or trefoil grown for seed	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

Hazard Rating:
Keep out of reach of children
Refer to the Introduction for an explanation of the symbols.

Korrex II

Herbicide Group
2 - florasulam
4 - dicamba

Company:
Corteva Agriscience

Formulation:
The *Korrex II* package contains the following components:
***Korrex II A* (PCP#31405):** 25% florasulam formulated as water dispersible granules.
- Container size - 1 x 0.45 Kg

***Korrex II B* (PCP#31205):** 480 g/L dicamba dimethylamine salt formulated as a solution.
- Container size - 1 x 7.76 L

Crops and Staging:
Barley, Durum, Oats, Spring Wheat, Winter Wheat:
In the fall following harvest of the previous crop or in spring prior to seeding. No later than 48 hours after seeding and prior to crop emergence.

Weeds, Rates and Staging:
Korrex II must be mixed with glyphosate at least 180 g ae per acre or up to 1000 g ae per acre of glyphosate to control the weeds controlled by glyphosate at these rates (see glyphosate for product rates and weeds controlled).
- **Spring and Fall application:**
  - *Korrex II A* at 5.7 grams per acre plus *Korrex II B* at 97 mL per acre
- **Fall application or Summerfallow** (Note: Fall application is generally more effective in control of perennial weeds)**:**
  - *Korrex II A* at 8.1 grams per acre plus *Korrex II B* at 139 mL per acre

Weeds controlled by glyphosate at the rates above plus enhanced control of the following weeds at the 2 to 4 leaf stage unless otherwise indicated:

- Annual sow thistle†
- Cleavers
- Chickweed
- Cow cockle
- Dandelion (seedling, overwintered or mature plants up to 30 cm across)
- Hemp-nettle
- Kochia
- Narrow-leaved hawk's-beard (up to 8 cm tall)
- Perennial sow-thistle**
- Scentless chamomile†
- Shepherd's-purse
- Smartweed (including lady's-thumb)
- Stinkweed
- Volunteer canola*
- Wild buckwheat
- Wild mustard

† Suppression only.
*** Including all herbicide-tolerant canola varieties.**
**** Applications at advanced stages will reduce control.**

Refer to the product labels for complete mixing instructions for these products. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Use a minimum of 20 to 40 L per acre
- **Nozzles and Pressure:** Maximum 22 psi (150 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid inhibitor	Toward Areas of Growth (Symplast)	Broadleaf only	2
dicamba	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

***Korrex II A*:** Warm, moist growing conditions promote active weed growth and enhance activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

***Korrex II B*:** Crop damage (stunting, reduced seed set) can occur if the chemical is applied at any time other than the recommended stage. DO NOT apply to crop under stress from adverse environmental conditions, such as excess moisture, drought and disease. Apply when air temperature is between 10 and 25°C.

Tank Mixes:

Herbicides:

- ***Prior to crop emergence:***
  - *Korrex II* must be mixed with glyphosate* (180 to 1000 g ae per acre – see glyphosate for conversion to product rates).

*** All salt types.**

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Heavy rainfall immediately after application may wash the chemical off the foliage and a repeat treatment may be required. DO NOT apply if rainfall is forecast for the time of application. Consult manufacturer for more detail on the time period they support.
- **Restricted Entry Interval:** No specific re-entry period is indicated on the label. Other products with similar component indicated a minimum re-entry period of 12 hours.
- **Pre-harvest Interval:** DO NOT harvest crops for 60 days from application.
- **Grazing Restrictions:** Livestock may graze the treated area 7 days after application.
- **Re-cropping Interval:** Registered crops may be seeded any time after treatment. Preseed fields treated with *Korrex II* in the spring season can be seeded the following year to barley, canola, chickpeas, corn, field beans, flax, *Juncea* canola, lentils, mustard (brown, oriental, yellow), oats, peas, potato (except seed potato), soybeans, sunflower, wheat or fields can be summerfallowed. Fields treated with *Korrex II* for fall application season after August 1st can be seeded only to registered crops.

- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place in original container.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	5	5	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

***Korrex II A*:** Refer 'Method A' in the general section on sprayer cleaning in the introduction.
***Korrex II B*:** Refer to 'Method B' in the general section on sprayer cleaning in the introduction.
A combination of 'Method A' and 'Method B' is the best option. The use of *All-Clear* or *Clean-Out* sprayer cleaners are also recommended as an alternative to the combination of methods above.

Hazard Rating:

***Korrex II A*:**

 Warning – Eye Irritant

***Korrex II B*:**

 Caution – Poison

 Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Laudis

Herbicide Group 27 - tembotrione

Company:

Bayer (PCP#31721)

Formulation:

420g/L tembotrione formulated as a suspension concentrate.

- Container size - 3.6 L

Crops and Staging:

Corn (field and sweet): 2-leaf up to and including 8-leaf stage.

Weeds and Staging:

Unless otherwise noted below, apply to young and actively growing weeds up to the 6-leaf stage.
Note: Maximum of ONE APPLICATION may be made with this product per year in sweet corn. Maximum of TWO APPLICATIONS at least 10 days apart may be made with this product per year in field corn.

Weeds	Rate (mL per acre)
Common lamb's-quarters, common ragweed, redroot pigweed, velvetleaf	60
Above weeds plus: Kochia	73
Above weeds plus: Canada fleabane (up to 10 cm height or diameter), giant ragweed, green foxtail (up to 2 tillers), waterhemp, wild buckwheat	90

A repeat application at 60 mL per acre will provide control or suppression of late emerging weeds listed above for the same rate. A repeat application at 90 mL per acre will provide control or suppression of late emerging weeds plus control of wild buckwheat and green foxtail.
Add *Hasten Spray Adjuvant* at 0.71 L per acre and UAN (28 percent) at 1.42 L per acre.
Laudis may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Sprayers without drift reduction nozzles should use between 29 to 58 psi (200 to 400 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tembotrione	POST	Pigment inhibitor	Apoplastic and symplastic	Selective- annual broadleaf and grasses in corn	27

Effects of Growing Conditions:

Weed control may be reduced if the application is made when weeds are dust covered or in the presence of heavy dew, fog and mist/rain or when weeds are under stress and not actively growing due to drought, heat, lack of fertility, flooding or prolonged cool temperatures. Under cool and/or dry conditions, activity may be reduced or delayed. If crop is under stress due to abnormal environmental conditions or exhibiting injury from previous herbicide applications, delay application until stress passes and after both crop and weeds have resumed growth.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In field and sweet corn:***
  - *Xtendimax*
  - *Pardner*
- **In field corn only:** *Aatrex Liquid 480*† (follow restrictions on the *Aatrex* page)
- **In corn hybrids with Roundup Ready 2 Technology:**
  - *Roundup Weathermax*
  - *Roundup Transorb*
  - *Roundup Xtend*

† **DO NOT use in sweet corn.**

Fungicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed to livestock for 45 days after treatment.
- **Pre-harvest Interval:** Leave 45 days between application and harvest.
- **Re-cropping Interval:** Winter wheat, soybean, field corn, sweet corn, spring wheat, potato the year after treatment. Dry beans may be seeded 22 months after treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT contaminate water, food or feed by storage or disposal. Keep in original container during storage. Store the tightly closed container away from feeds, seeds, fertilizers, plants and foodstuffs. DO NOT use or store in or around the home.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:
Refer 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
Caution – Poison

Warning – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Lorox L

Herbicide Group 5 - linuron

Company:
Tessenderlo Kerley Inc. (PCP#16279)

Formulations:
480 g/L linuron formulated as a suspension concentrate.
- Container size - 10 L

Crops, Rates and Staging:
Note: *Due to a re-evaluation of the linuron active, many uses have been canceled, either immediately or with an extended phase out period. Canceled uses, relevant to this guide, with an Extended Phase Out Period until November 5, 2024 include* ***dill, coriander, caraway, and sweet white lupins****.*

Note: *Maximum application volume of 16,000 L of product per person per day for any use.*

Pre-emergent surface (not incorporated) applications for use on loam to clay soils only:

	Rate (L per acre)	
	Soil Organic Matter	
	less than 2 percent	from 2 to 5 percent
Sweet white lupins (see note above)	0.85	1.25
Potatoes**	0.72	1.5
Dill† (see note above)	0.53 to 0.77	0.77 to 1.0

*** Must be tank mixed. Refer to specific labels for registered tank mix partners.**

**** Application must be made after all soil disturbance (dragging, hilling) is complete for the season and before the crop emerges.**

† The above rates are for a single application use only. A split pre-emergent/post emergent application of linuron may be made in dill. See "Split Applications" below for specific rates.

If used on sandy soils, severe crop injury may result.

Seed the crop at least 2 inches (5 cm) deep. Make only one application per year to field crops.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Post-emergent applications only:

Crop	Stage	*Lorox L* (L per acre)
Caraway, coriander (see note above)	Apply when in the 2 to 4 leaf stage	0.50 to 0.67
Dill† (see note above)	Apply when dill has at least 2 full leaves developed	0.77 to 1.25
Shelterbelts (caragana, green ash, Siberian and American elm, Manitoba maple, poplar, willow, white spruce, Colorado spruce, Scots pine)	Apply as an overall spray to dormant stock or as a directed spray if buds have broken.	1.82
Short Rotation Intensive Poplar	Apply as a directed spray under plants that have been established for 1 year or more	1.82

† The above rates are for a single application use only. A split pre-emergent/post emergent application of linuron may be made in dill. See "Split Applications" below for specifc rates.

Split Applications:

- This product may also be applied to dill as a split pre/post-emergent application. A pre-emergent surface application of up to 0.51 L per acre, followed by a second post-emergent application, NO SOONER THAN TWO WEEKS AFTER THE FIRST, of up to 0.77 L per acre. Minimum staging for post-emergent applications given above still applies.

Banded Applications:

- This product may also be applied in a narrow band directly over the row in wide-rowed crops if another method is to be used for weed control in between the rows. For band treatment, use proportionately less; for example, for 10 inch band on 30 inch row, use 1/3 of the broadcast rate.

Weeds and Staging:

- **Post-Emergence:**
  - Apply when annual broadleaf weeds are in the 2 to 4 leaf stage and when green foxtail is in the 1 to 3 leaf stage.
  - In shelterbelts, apply when weeds are less than 4 inches (10 cm) tall.
- **When tank mixed with MCPA amine in cereals, the following weeds are controlled:**
  - Buckwheat (tartary, wild)
  - Chickweed
  - Corn spurry
  - Cow cockle
  - Flixweed
  - Green foxtail (suppression possible)
  - Green smartweed
  - Hemp-nettle
  - Lady's-thumb
  - Lamb's-quarters
  - Ragweed (common, giant)
  - Redroot pigweed
  - Shepherd's-purse
  - Stinkweed
  - Stork's-bill
- **Pre-emergent surface treatments and Post-emergent applications in corn and shelterbelts:**
  - Sufficient moisture (1 to 2 inches or 3 to 5 cm) in the form of rainfall or irrigation is necessary within 7 to 10 days of a pre-emergence application or poor weed control will result.
    - Barnyard grass*
    - Common chickweed
    - Common groundsel†
    - Corn spurry†
    - Dandelion (seedlings only)†
    - Foxtail (green, yellow)*
    - Goosefoot
    - Knotweed
    - Kochia†
    - Lamb's-quarters
    - Pigweed (prostrate†, redroot)
    - Plantain (seedlings only)†
    - Purslane
    - Ragweed (common)
    - Shepherd's-purse
    - Smartweed (annual)
    - Sow-thistle (annual, perennial† seedlings only)
    - Stinkweed°
    - Wild buckwheat
    - Wild radish†
    - Witch grass
    - Wormseed mustard

    *** Suppression**

    † Not registered with *Lorox L*.

    ° Not registered with *Linuron 400*.

Application Information:

- **Water Volume:**
  - ***Coriander and caraway:*** 40 L per acre.
  - ***Dill:*** 89 to 178 L per acre
  - ***Pre-emergent surface:*** 81 to 162 L per acre.
  - ***Shelterbelts and short rotation intensive poplar:*** 90 to 180 L per acre.
- **Nozzles and Pressure:** 25 to 40 psi (175 to 275 kPa) when using conventional stainless steel flat fan nozzles for post emergent applications. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with a minimum of ***ASABE medium*** droplets. DO NOT apply using hand held or boomless nozzle systems.
- **Screens:** Use a 50 mesh or coarser line strainers and screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
linuron	PPI (soil active) POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Broadleaf & grass	7

Effects of Growing Conditions:

In post-emergent applications the best weed control occurs when temperatures are moderate, when relative humidity is high and when soil moisture is adequate. Injury to cereals (crop lightening) will occur when the crop is under stress because of drought or disease. This injury is worse when the product is applied at advanced leaf stages. In pre-emergent surface treatments, rainfall or irrigation (1 to 2 inches or 3 to 5 cm) is required to move linuron into the root zone of germinating seeds.

Insufficient moisture will result in poor weed control. Drought conditions after application will result in little to no weed control. If rainfall does not occur within 7 to 10 days of application and prior to crop emergence, a shallow rotary hoeing (0.75 to 1.5 inches per 2 to 4 cm) should be made to mix the top layer of soil to help activation. Avoid covering treated ground with un-treated soil. If unusually heavy rain follows application, severe crop injury may result from herbicide in the root zone of the crop. DO NOT use on sandy soils or severe crop injury will result.

Tank Mixes:

Herbicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label for post-emergent applications; required interval may be up to 8 hours. Pre-emergent applications require rainfall for activation. Contact manufacturer for more information.
- **Restricted Entry Interval:**

Crop	Application timing	Post Application Activity	REI and/or PHI
Caraway, coriander	Post-emergence	Scouting	6 days
		All other tasks	12 hours
Dill (single applications)	Pre-emergence	All tasks	2 days
	Post-emergence	Scouting	9 days
		All other activities	2 days
Dill (split applications)	Pre-emergent:	All tasks	12 hours
	Post-emergence	Scouting	7 days
		All other activities	12 hrs
Potatoes	Pre-emergence	All tasks	4 days
Shelterbelts	Pre-emergence	All tasks	6 days
Sweet white lupins	Pre-emergence	All tasks	3 days

- **Grazing Restrictions:** DO NOT graze treated crops or cut for feed prior to crop maturity.
- **Pre-harvest Interval:** DO NOT harvest caraway, coriander and dill within 60 days of treatment. DO NOT harvest lupins for 80 days after treatment.
- **Re-cropping Interval:** If the intended potato crop fails, fields treated with pre-emergent surface applications of *Lorox L*, may be seeded back only to potatoes. Till the soil thoroughly before reseeding. DO NOT retreat field with a second application of *Lorox L*. No other restrictions 1 year after treatment.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT store liquid Linuron formulations at temperatures below 5°C. *Lorox L* may be frozen.
- **Buffer Zones:**

Crop	Buffer Zones (metres[†]) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Potatoes, shelterbelts	5	1	4
Coriander and caraway	3	1	2
Sweet white lupins, dill	4	1	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

[†] Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to the general section on sprayer cleaning in the introduction.

MCPA

Herbicide Group
4 - MCPA

Company and Formulation

	PCP# (Product Name)				
	Na 300*	Amine 500*	Amine 600*	Ester 500**	Ester 600**
ADAMA					31669
AgraCity					34156
Albaugh		27858	31322	27860	32311
Federated Cooperatives					29001
Interprovincial Cooperative Limited	20306		31327		27802
Nufarm Agriculture			28384		27803
Loveland Products Canada	9858		31432		27804 (*CheckMate*)
Sharda Cropchem Limited				34299	34293

*** Formulated as a solution**
**** Formulated as an emulsifiable concentrate**

Crops, Rates and Staging:
The maximum safe rates for various crops are given below. Higher rates used for harder to control weeds (see "Weeds, Rates and Staging") may cause crop injury. Application rates for individual products may vary from those listed. Refer to the label for product specific use rates. Rates greater than those for harder to control weeds may cause crop injury. When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Crop	Stage	Maximum Rate (L per acre)		
		Amine 500	Amine or Ester 600	Na Salt
Wheat (spring and durum), barley	4 leaf to just before flag leaf emergence.	0.45	0.42 (E)	0.81
Oats	3 leaf to just before flag leaf emergence.††	0.45	0.36	0.81
Spring rye	4 leaf to just before flag leaf emergence.	0.45	0.42	0.81
Flax (NOT solin - low linolenic acid flax)	2 inches (5 cm) in height to prebud stage. Apply at 2 to 4 inches (5 to 10 cm) in height for maximum crop tolerance.	0.4	0.28 (E) or 0.34 (A)	0.71
Winter wheat (WW), fall rye (FR)	In spring, apply from the time growth commences until the early flag leaf stage.	0.45	0.42	0.81
Corn	As a broadcast spray up to 6 to 7 inch (15 to 18 cm) tall or 6 leaf stage. Up to 3 weeks before tasseling as a directed spray using drop nozzles.	0.45	0.37 (Amine only)	0.61
Peas	Vines 4 to 7 inches (10 to 18 cm) long. For short-statured, determinate flowering peas, apply at the early stages within this range.	0.22*	0.17 (Amine only)	0.36*
Cereals underseeded to alfalfa (not Flemish varieties)	Apply when the majority of seedling legumes are in the 1 to 3 trifoliate leaf stage.	0.22	0.19 (Amine only)	0.4
Underseeded alsike, ladino and red clover	Apply when the majority of seedling legumes are in the 1 to 3 trifoliate leaf stage.	0.28	NR	0.4

Crop	Stage	Maximum Rate (L per acre)		
		Amine 500	Amine or Ester 600	Na Salt
Red clover† Seedling (seed and forage) Established† (seed only)	**Seedlings:** 1 to 3 trifoliate stage. DO NOT feed to livestock in the first year. **Established:** Apply at the breaking of dormancy in the spring up to 7.5 cm.	0.23	0.19 (Amine only)	NR
Grass pastures	Spring or fall.	1.42	1.13 (E) or 1.42 (A)	0.71
Seedling forage** grasses (not for seed)	Apply from the 3 leaf stage to the shot blade stage.	0.45**	NR	NR
Established forage** grasses (not for seed)	Apply in the spring up to the shot blade stage or in the fall after harvest.	0.45**	NR	NR

(E) or (A) indicates Ester or Amine formulations. NR = Not Registered
*** The rates given are lower than the registered rates for peas. Less than the maximum label rates are recommended because of crop injury concerns.**
**** MCPA is NOT registered for use on forage grasses grown for forage seed.**
† Nufarm MCPA Amine only.
†† Use the lowest rate of MCPA Amine 600 on oats between the 3 and 6 leaf stage.

Formulation Characteristics:

Formulation	Risk of Vapour Drift	Activity on Weeds	Risk of Crop Injury
LV Ester	Medium	Fast	Medium
Amine	Very Low	Medium	Low
Salts	Very Low	Slow	Very Low

Weeds, Rates and Staging:

Apply at lower rates when weeds are small (2 to 4 leaf stage) and actively growing. Higher rates are needed when weeds are larger, in heavy populations, or growing under stressful conditions (excessively cold, hot, dry or wet).

NOTE: The following rates are a general range for all products. Rate ranges for individual products may differ slightly. Consult the product label for specific rates for each application.

+ Not controlled by Na salt formulations

Susceptible weeds:

- ***Amine 500 formulations – 0.28 to 0.45 L per acre***
- ***Amine and Ester 600 formulations – 0.24 to 0.36 L per acre***
- ***Na formulations – 0.5 to 0.81 L per acre.***
  - Burdock
  - Cocklebur
  - Flixweed (late fall applications or small seedlings)
  - Kochia
  - Lamb's-quarters
  - Mustards (except dog and tansy)
  - Prickly lettuce
  - Ragweed
  - Russian pigweed
  - Shepherd's-purse
  - Stinkweed
  - Wild radish
  - Wild sunflower

Harder to control weeds:

- ***Amine 500 formulations – 0.45 to 0.71 L per acre.***
- ***Ester 600 formulations – 0.42 to 0.61 L per acre.***
- ***Na formulations – 0.81 to 1.1 L per acre.***
  - Annual sow-thistle
  - Biennial wormwood
  - Bluebur+
  - Common peppergrass
  - Curled dock
  - Flixweed (overwintered rosettes prior to bolting)
  - Goat's-beard+
  - Goosefoot+
  - Hemp-nettle (suppression only)
  - Mustard (including dog, tansy and tumble)
  - Plantain
  - Purslane+
  - Redroot pigweed
  - Smartweed (annual)
- **Top growth control only (rates as for harder to control weeds):**
  - Blue lettuce
  - Bindweed (field, hedge)
  - Canada thistle
  - Corn spurry+
  - Dandelion+
  - Gumweed
  - Field horsetail+
  - Hoary cress
  - Leafy spurge
  - Perennial sow-thistle
  - Russian thistle+

Application Information:

- **Water Volumes:**
  - ***Cereals, flax, pastures, forage grasses:*** 40 to 81 L per acre.
  - ***Peas:*** Minimum 61 L per acre.
  - ***Cereals Underseeded to Forage Legumes:*** 61 to 81 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Best weed control occurs when temperatures are above 21°C (daytime) or 10°C (night time) and humidity is above 70 percent. DO NOT apply if temperature exceeds 27°C. If applying to flax, injury and a delay in maturity may result from application under hot or humid conditions. Extremely hard water may reduce performance or cause problems in spraying the product.

Tank Mixes:

Herbicides:

- ***In Wheat and barley:***
  - Linuron and *Sencor* (500 amine only).
- ***In Oats:***
  - Linuron (500 amine only)
  - Not all brands are labelled for tank mixing. Check the product label prior to use for registered mixes and rates. Follow all precautions and restrictions on both labels.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: Liquid nitrogen (28-0-0) may be used in place of water as a carrier with certain amine formulations for application in spring to winter wheat or fall rye.

Note: The above mixes are those listed on the MCPA labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours of MCPA Na salt, 4 hours of MCPA amine, or 2 hours of MCPA Ester application will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze within 7 days of application.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** Some products may be applied by air to specific crops. Check the label for detailed instructions.
- **Storage:** MCPA Ester may be frozen. DO NOT freeze MCPA amine or MCPA sodium salt.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Crop	Application method	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Cereals, Flax	Ground*	1	1	4
	Fixed wing aircraft	1	0	60
	Helicopter	1	0	50

Crop	Application method	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Legume forages	Ground*	1	1	4
	Fixed wing aircraft	1	1	25
	Helicopter	1	1	25
Pastures	Ground*	1	1	4
	Fixed wing aircraft	15	0	60
	Helicopter	15	0	50

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Warning – Poison
Refer to the Introduction for an explanation of the symbols.

MCPB / MCPA

Herbicide Group 4 - MCPB, MCPA

Company:

Interprovincial Cooperative Limited (*Clovitox Plus* – PCP#24336)
Nufarm Agriculture (*Tropotox Plus* – PCP#8211)
Loveland Products Canada (*Topside* – PCP#22003)

Formulation:

375 g/L MCPB present as a sodium (Na) salt and 25 g/L MCPA present as potassium (K) or sodium (Na) salt and formulated as a solution.

- Container size - 10 L

Crops, Rates and Staging:

Registered for all products:

- ***Apply 1.11 to 1.72 L per acre. Apply only that needed to control the target weeds:***

Crop	Stage
Pea	3 to 6 expanded leaves.
Clover (alsike, ladino, red, white Dutch, wild white)	Monofoliate to 3 trifoliate leaf stage (with or without a cover crop).
Oats, wheat, rye or barley (alone or as a companion crop)	2 leaf to flag leaf stage.
Field corn	45 cm high to the start of tasseling – use drop nozzles.
Established pasture	After grazing or cutting when weeds have regrown to a susceptible stage.

Seedling Forage Grasses:

- ***Apply at 1.11 to 1.42 L per acre from the 2 to 4 leaf stage:***
  - Bromegrass (smooth, meadow)
  - Fescue (altai, red, meadow, tall)
  - Green needlegrass
  - Reed canarygrass
  - Timothy
  - Wheatgrass (crested, creeping intermediate, northern, pubescent, slender, stream-bank, tall, western)
  - Wild rye (altai, Russian)

Registered for *Tropotox Plus* and *Clovitox Plus* only:

- Seedling alfalfa for seed production* at the 3 to 6 trifoliate stage.

NOTE: Seedling alfalfa vigour may be reduced in the year of treatment, however, the crop recovers and yield will not normally be affected.

Since this use is registered under the User Requested Minor Use Label Expansion program, the manufacturers assume no responsibility for herbicide performance. Users of this treatment on seedling alfalfa do so at their own risk.

Maximum ONE APPLICATION per year of these and other products containing the active ingredients MCPA/MCPB.

Weeds, Rates and Staging:

Weeds	Stage	Rate (L per acre)
Lamb's-quarters, mustards (ball, wild, wormseed), stinkweed	Seedlings	1.11
Annual sow-thistle*, hemp-nettle*, redroot pigweed, ragweed, shepherd's-purse, volunteer rapeseed (including canola), wild radish*	Seedlings	1.72
Curled dock, perennial sow-thistle**, plantain	Rosette	1.72
Bull thistle	Rosette to early bud	1.72
Buttercup (creeping, tall), field bindweed	In spring during rapid growth	1.72
Canada thistle	6 inches (15 cm) to early bud	1.72
Horsetail*	6 inches (15 cm)	1.72

*** Suppression only**
**** Top growth control only**

Application Information:

- **Water Volume:**
  - ***Clovitox Plus:*** 71 to 91 L per acre.
  - ***Tropotox Plus, Topside:*** 61 to 81 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
MCPB & MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Damage to peas or seedling forage legumes may occur if the crop is sprayed when under drought or disease stress. Under extremely hot or humid conditions, crop injury may be severe. DO NOT apply when temperatures are over 27°C. Best activity on weeds occurs in warm weather.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:**
  - ***Field com:*** A Restricted Entry Interval of 9 days after application is required.
  - ***For all other registerd crops:*** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze crop treated with *Topside* or cut for hay. DO NOT graze or cut seedling forage grasses in the year of treatment. Cereals treated with Tropotox or *Clovitox* may be used for grazing or cut for greenfeed or hay 30 days after application. Forage legumes and peas treated with *Clovitox* may be used for animal feed 30 days after application. Withdraw meat animals from fields treated with *Tropotox* or *Clovitox* at least 3 days before slaughter.
- **Re-cropping Interval:** A minimum rotational crop plant back interval of 12 months must be observed for all crops other than those registered for use with MCPA or MCPB. Phenoxy herbicides can persist in soils for weeks, particularly if dry or cool weather persists. DO NOT seed sensitive crops immediately after spraying.
- **Aerial Application:** *Clovitox* may be applied by air to established pasture and cereal crops (not underseeded to clover).
- **Storage:** DO NOT freeze.

- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:
Clovitox Plus:
Danger – Poison
Danger – Corrosive to Eyes
***Tropotox Plus & Topside*:**
Caution – Poison
Tropotox Plus:
Warning – Contains the Allergen Caseinate (Milk)
Refer to the Introduction for an explanation of the symbols.

Mecoprop-p

Herbicide Group 4 - mecoprop-p

Company:
Loveland Products Canada (*Mecoprop-P* – PCP#27891)

Formulation:
150 g/L mecoprop-p present as potassium salt formulated as a liquid.

Crops and Staging:
Spring wheat (including durum), barley and oats: 3 leaf to flag leaf stage.

Weeds, Rates and Staging:
Apply *Mecoprop-P* at 2.2 to 2.8 L per acre to weeds from the 2 to 4 leaf stage. Use the high rate for weeds in an advanced stage of growth.

- Black medic
- Canada thistle (top growth control only)
- Chickweed
- Cleavers
- Clover (volunteer)
- Corn spurry
- Lamb's-quarters
- Plantain
- Wild mustard

Application Information:
- **Water Volume:** 81 to 121 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
mecoprop	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Apply in warm weather under good growing conditions. Avoid spraying in very hot weather or in drought conditions.

Tank Mixes:
None registered.

Restrictions:
- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Grazing Restrictions:** DO NOT graze or feed treated crop to livestock prior to crop maturity.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:
Caution – Poison
Refer to the Introduction for an explanation of the symbols.

Metolachlor

Herbicide Group 15 - metolachlor

Company:
Syngenta Canada (*Dual II Magnum* – PCP#25729)
UPL AgroSolutions Canada (*Komodo* – PCP#33599)
Sharda Cropchem (*Metallica* – PCP#34054)
AgraCity (*Stallion* – PCP#34334)

Formulation:
915 g/L s-metolachlor and r-metolachlor formulated as an emulsifiable concentrate.
- Container size - 2 x 10 L

Crops and Staging:
Pre-plant incorporated.
Pre-emergent: In areas with good rainfall or under irrigation, Metolachlor may be applied as a pre-emergence surface treatment. At least 0.5 inches of water (1.25 cm) is required within 10 days of application for proper activity.
Refer to product label for more specific information on timing and rates of applications for each crop type.

- Corn (field, sweet, silage)
- Dry beans (navy, kidney, pinto)*†
- Potatoes
- Soybeans*
- Sweet white lupins

*** Beans should be planted at least 4 cm deep to avoid crop injury. Dry bean varieties vary in their tolerance to metolachlor. Test a limited acreage on all new varieties first.**

Weeds, Rates and Staging:

Pre-emergent and Pre-Plant Incorporated Treatments: Apply 0.47 to 0.7 L per acre prior to weed emergence.

- Barnyard grass
- Foxtail (green, yellow)
- Nightshade (American, Eastern black)
- Redroot pigweed*
- Yellow nutsedge**
- Waterhemp (in soybeans, high rate only)*†
- Witch grass

*** Suppression only.**

**** Pre-plant incorporated treatment only.**

Use higher rates on heavy textured soils or when high populations of weeds are expected.

DO NOT apply to soils with less than 1 percent or greater than 10 percent organic matter.

Maximum ONE APPLICATION per year of this or other products containing the active ingredient s-metolachlor.

† ***NOTE:*** *Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance.* ***Users of this product for these uses do so at their own risk.***

Application Information:

- **Water Volume:** A minimum of 60 L per acre.
- **Nozzles:** Use 30 to 45 psi (200 to 300 kPa) when using conventional flat fan nozzles.
- **Screens:** Use 50 mesh screens.
- **Incorporation:** Apply to a firm seed bed free of large clods or lumps. If using tandem disks, set disks to work the soil at a depth of 4 inches (10 cm) and operate at a speed of 6 km per hourr (4 miles per hour). If using an S-tine cultivator, set the implement to work the soil to a depth of 4 inches (10 cm) and operate at a speed of 10 km per hour (6 miles per hour). Incorporation equipment should include rolling or western harrows.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metolachlor	PPI, PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

A moderate rainfall or equivalent irrigation (0.5 inches) is required within 10 days to activate pre-emergent surface treatments. If rain does not occur, a shallow cultivation or use of a rotary hoe is necessary. Drought conditions that persist after any application may reduce annual grass control. On sandy soils, heavy rainfall following application may cause leaching of *Dual II Magnum*, resulting in reduced weed control.

Tank Mixes:

Herbicides:

- ***In Corn:*** *AAtrex* and glyphosate in both PPI and pre-emergent applications.
- ***In Soybeans:*** *Sencor*, and glyphosate, in both PPI and pre-emergent applications.

Fertilizers: May be applied with liquid fertilizer. May be impregnated onto dry bulk fertilizers (except nitrate fertilizers, superphosphate fertilizers or limestone).

Insecticides: None registered.

Note: The above mixes are those listed on the *Dual II Magnum* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** When applying as a pre-emergent surface treatment, 0.5 inches (1.25 cm) of rain or irrigation is required after application for proper activity.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated immature crop or cut for hay. In corn, immature means before ear emergence.
- **Pre-harvest Interval:** DO NOT harvest corn within 80 days of post-emergent application.
- **Re-cropping Interval:** In the year of treatment, seed only corn, soybeans, white beans, potatoes, snap beans, lima beans, peas, sweet white lupins, or (a minimum of 4.5 months after application) winter cereals.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:** Leave a buffer zone of 29 metres between last spray swath and the edge of important wildlife habitats such as wetlands, sloughs and water bodies.

Sprayer Cleaning:
No detailed cleaning procedures are indicated on the label. Use a commercial all purpose spray sprayer cleaning product for adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:
 Warning – Eye Irritant

 Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Metribuzin

Herbicide Group 5 - metribuzin

Company:
Bayer (*Sencor 75 DF, Sencor 480 F*)
UPL AgroSolutions Canada (*Tricor 75 DF, Tricor LQ*)
ADAMA Canada (*Squadron; Squadron II**)
Sharda CropChem Canada (*Buzzin 70 WDG; Mextrix SC; Meter 75DF*)
Agracity (*Meteor*)

*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulations:
***Sencor 75 DF* (PCP#17242); *Squadron* (PCP#32081); *Tricor 75 DF* (PCP#30661); *Meter 75DF* (PCP#33932); *Meteor* (PCP#34370):** 75% metribuzin formulated as a dispersible granule.

- Container sizes:
  - ***Sencor 75 DF, Tricor 75 DF*** - 4 x 2.5 kg
  - ***Squadron*** - 4 x 5 kg
  - ***Meter 75DF*** - 2.5 kg
  - ***Meteor*** - 2 x 5 kg

***Buzzin 70 WDG* (PCP#32756):** 70% metribuzin formulated as wettable granule.

- Container size - 2.5 kg

***Metrix SC* (PCP#32876), *Tricor LQ* (PCP#33911), *Sencor 480 F* (PCP#26280):** 480 g/L metribuzin formulated as suspension concentrate.

- Container sizes:
  - ***Metrix SC*** - 4 x 5 L
  - ***Tricor LQ*** - 2 x 9.46 L
  - ***Sencor 480 F*** - 5 L

Crops and Staging:
Barley and wheat (spring and durum only, except *Sencor 480 F* which is spring only): Post-emergence (POST) 2 to 5 leaf stage.

Chickpea*: Up to 2.5 inches (6 cm) in height, when vines have 1 to 3 above ground nodes.

Note: application past recommended growth stage may result in severe crop injury.

Faba bean, lentil†, soybean*:** Preplant incorporated (PPI) (only in a tank mix with *Treflan EC*).

Lentil*: Single or split post-emergent applications** - up to 6 inches (15 cm) of vine length. For maximum crop tolerance, apply at the 1 to 4 above ground node stage.

Peas (field only): Preplant incorporated (PPI) (when tank mixed with *Rival* or *Treflan EC*). Post-emergence (single or split applications**) - up to 6 inches (15 cm) of vine length. For short-statured, determinate flowering peas, apply at the early stages within this range.

Potato (except Belleisle or Tobique)*:** Pre-emergence (PRE) in sprinkler irrigation systems (apply only in a tank mix with *Eptam Liquid EC* for both systems).

Potato (except Atlantic, Belleisle, Eramosa, Tobique and red-skinned or early maturing varieties)*:** Early post-emergence (up to 4 inches or 10 cm in height).

Shelterbelts: PPI only in a tank mix with *Treflan EC* (except *Squadron II*).

† Fall application only.

*** DO NOT use on lentils, peas or chickpeas seeded less than 2 inches (5 cm) deep or in soils with less than 4 percent organic matter.**

**** Under certain field or weather conditions a split application may provide better weed control and crop tolerance than single applications. The first application should be made at the cotyledon to 2 leaf stage of the weeds. The second application should be made when a second flush of weeds have emerged or if weeds which were more advanced at the time of the first application have started to show regrowth. The split applications are normally 7 to 10 days apart.**

*****Consult manufacturer or seed supplier for varietal tolerances to metribuzin applications in soybean and potato.**

Crops and Rates:

Crop		Rates		
		75 WDG forms (g per acre)	*Buzzin* (g per acre)	*Metrix SC/Tricor LQ/ Sencor 480 F* (mL per acre)
Barley		80 to 152	87 to 163	112 to 222
Chickpea		111	119	167
Faba bean - spring PPI†	Coarse soils	111 to 152	119 to 163	172 to 222
	Medium to Fine soils	152 to 222	163 to 238	222 to 344
Faba bean - fall PPI†	Coarse soils	152 to 192	163 to 206	222 to 283
	Medium to Fine soils	192 to 222	206 to 238	283 to 344
Lentil	Single POST app	111	119	172
	Split POST app	60 to 80 (each)	61 to 82 (each)	85 to 112 (each)
Pea (field only) - spring PPI†	Coarse soils	152	163	222
	Medium to Fine soils	152 to 192	163 to 206	222 to 283
Pea (field only), lentils - fall PPI†	Coarse soils	192	206	283
	Medium to Fine soils	190 to 222	206 to 238	283 to 344
Pea (field)	Single POST app	111 to 152	119 to 163	172 to 222
Pea (field only)	Split POST app	60 to 80 (each)	61 to 82 (each)	85 to 112 (each)
Potato	PPI or PRE* (PPI application tank mixed with *Eptam*)	152 to 222	163 to 238	222 to 344
Potato (+ *Eptam*)	PRE through sprinkler irrigation system*	152 to 304	163 to 325	222 to 445
Potato	POST	152	163	222
Potato	PRE or Early POST through split application*	Maximum 605	–	Maximum 911
Spring wheat (including durum)		80 to 111	87 to 119	112 to 172
Soybean (spring PPI only†):	Coarse soils	111 to 152	119 to 163	172 to 222
	Medium to Fine soils	152 to 222	163 to 238	222 to 344
Shelterbelts†	PPI	162	173	243

*** See labels for details.**
† Only in tank mix with liquid trifluralin only.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Post-emergence applications should be made when weeds are small – 2 inches (5 cm) in height or diameter.
Split applications (post-emergence on lentils and peas) – 1st application at cotyledon to 2 leaf stage of weeds.
The 2nd application (if necessary) 7 to 10 days after the first.
The following rates are based on the 75 WDG formulations. Check the table in Crops and Rates for corresponding rates for other formulations.

- **Post-emergence at 81 grams per acre:**
  - ***Weeds controlled in spring wheat, barley, field pea and suppressed in lentil:***
    - Chickweed
    - Green smartweed
    - Hemp-nettle* (suppression in all crops)
    - Lamb's-quarters
    - Stinkweed
    - Volunteer canola
    - Wild mustard
  - ***Additional weeds controlled in spring wheat and barley only:***
    - Lady's-thumb
    - Redroot pigweed

- **Post-emergence at 111 grams per acre:**
  - ***Weeds controlled in spring wheat, barley, field pea, and suppressed in lentil and chickpea:***
    - Ball mustard
    - Corn spurry
    - Hemp-nettle
    - Tartary buckwheat
  - ***Additional weeds controlled in spring wheat and barley only:***
    - Common groundsel
    - Night-flowering catchfly
    - Wormseed mustard
- **Post-emergence at 152 grams per acre:**
  - ***Weeds controlled in spring wheat and barley:***
    - Henbit
    - Russian thistle
  - ***Weeds controlled in potatoes only:***
    - ***Weeds listed for 111 grams per acre rate above plus:***
      - Lady's-thumb
      - Redroot pigweed
      - Shepherd's-purse
- **Preplant Incorporated in faba beans, lentils, field pea and soybean (see "Crops and Rates:" above). Must be applied in tank mix with *Treflan EC* or *Rival* (see trifluralin page for rates*):**
  - ***Weeds controlled by either Rival or Treflan EC plus:***
    - Corn spurry (with *Rival* in peas only)
    - Green smartweed
    - Hemp-nettle
    - Kochia (with *Rival* in peas only)
    - Russian thistle (with *Treflan* only - not in faba bean)
    - Shepherd's-purse
    - Stinkweed
    - Volunteer canola
    - Wild mustard

    *** Use the high rate for best control.**

Application Information:

- **Water Volume:**
  - ***Preplant incorporated:*** 40 L per acre.
  - ***Post-emergence applications:***
    - *Cereals* - 40 L per acre.
    - *Lentils, peas, chickpeas* - 70 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. If using conventional flat fan nozzles use a maximum of 30 to 40 psi (200 to 275 kPa) with opening no smaller than 6502, 8002 or TK2. Angle nozzles 45° forward to achieve better coverage of vertical weed targets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.
- **Incorporation:** All plant growth and stubble should be thoroughly worked into the soil before treatment. Apply directly to the soil surface. Two incorporations are required at right angles for thorough mixing. The first incorporation must be made within 24 hours of spraying. For fall applications, it is preferred that both incorporations be done in the fall. The second incorporation may be delayed until spring to conserve crop residue; however, both incorporations must be done the recommended depth.
- Incorporate with a tandem disc, discer or field cultivator (Vibrashank type). Set equipment to work at a depth of 3 to 4 inches (8 to 10 cm). Operate disc implements at 4 to 6 miles per hour (7 to 10 km per hour), cultivators at 6 to 8 miles per hour (10 to 13 km per hour).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metribuzin	PPI (soil active) POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Broadleaf & grass	5

Effects of Growing Conditions

Crop height reductions or yellowing may occur if high temperatures occur within 48 hours of application. Cold, cloudy weather or frost within 3 days of application will also aggravate injury. If frost occurs, allow 4 to 5 days for crop to recover prior to applying metribuzin. Heavy rainfall soon after application to peas, lentils and chickpeas can result in stand reduction on soils with less than 4 percent organic matter and to spring wheat and spring barley on soils with 3 percent organic matter.

Tank Mixes:

Herbicides:

- ***In spring wheat or barley:*** Dicamba, MCPA amine or 2,4-D amine.
- ***In potatoes (post emergent) Tricor 75 DF only:*** *Prism SG**
- ***In potatoes (preplant incorporated):*** *Eptam Liquid EC* (Required).
- ***In faba beans, soybeans, lentils, shelterbelts (preplant incorporated):*** *Treflan EC* (Required).
- ***In peas (preplant incorporated):***
  - *Treflan EC* (spring or fall application). Required.
  - *Rival* (preplant incorporated (fall application). Required.
  - All products – *75 WDG forms* at 77 grams per acre** plus 0.19 L per acre MCPA sodium salt (300 g/L).

*** Consult manufacturer or seed supplier for varietal tolerances to metribuzin and *Prism* tank-mix applications in potato.**

**** See corresponding rates for other formulations in the chart in "Crops and Rates"**

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the metribuzin labels only.

Allow 5 days between application of metribuzin and application of other pesticides.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours after application.
- **Grazing Restrictions:** DO NOT graze treated cereal crops within 30 days of application, or peas, chickpeas or lentils within 70 days of application.
- **Pre-harvest Interval:** DO NOT harvest barley, wheat or potatoes within 60 days of application. DO NOT harvest lentils, chickpeas, or field peas within 70 days of application. DO NOT harvest chickpeas within 40 days of application.
- **Re-cropping Interval:** Preplant incorporated treatments may leave a residue in the soil that will affect succeeding crops when using higher rates of product. DO NOT seed canola, onions, celery, peppers, cole crops, lettuce, spinach, red beets, turnips, pumpkin, squash, cucumbers or melons the year after treatment. Fall seeded crops may be injured when seeded the same year as preplant or post-emergence applications of these products.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:			
	Aquatic Habitats of Depths			Terrestrial habitat
	Less than 1 m	1 to 3 m	Greater than 3 m	
Ground only*	5	2	1	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured is metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Use 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Metsulfuron

Herbicide Group 2 - metsulfuron

Company:

FMC Corporation (*Ally* – PCP#20214)*
FMC Corporation (*Ally Toss-N-Go* – PCP #24388)
Albaugh (*Plotter* – PCP#34619)
AgraCity (*MPower Pro* – PCP#31118)

***Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

60% metsulfuron methyl formulated as a water dispersible granule.

- Container size - 122 g
- Mpower Pro - 80 g

Crops and Staging:

Wheat (spring and durum), barley: 2 leaf up to emergence of the flag leaf.

Established forage grasses for forage or seed production*:

- Apply from the 2 leaf to flag leaf stage and before canopy is dense enough to prevent thorough leaf coverage.
  - Crested wheatgrass*
  - Intermediate wheatgrass*
  - Creeping red fescue*
  - Orchardgrass*
  - Timothy*†

† **Fall application *Ally* or *Plotter* only.**

NOTE - Since applications to forage grasses have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to forage grasses is at the risk of the user.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Apply up to 3 grams per acre to control weeds at the 2 to 4 leaf stage unless otherwise indicated.
A rate of 2 to 3 grams per acre may be used when mixing with certain other herbicides (See Tank Mixes).
Add a non-ionic surfactant such as *Agral 90*, *Ag-Surf II*, *Companion*, *Super Spreader* or *Citowett Plus* at 0.2 L per 100 L spray volume.

Weeds controlled:

- Ball mustard
- Bluebur
- Chickweed
- Common groundsel
- Corn spurry
- Cow cockle
- Flixweed
- Hemp-nettle
- Pigweed (prostrate, redroot)
- Scentless chamomile
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Stinkweed
- Stork's-bill
- Tartary buckwheat
- Volunteer canola*
- Wild mustard

Weeds suppressed:

- Canada thistle**
- Lamb's-quarters (up to 3 in (8 cm))
- Russian thistle
- Sow-thistle (annual, perennial)**
- Toadflax
- Wild buckwheat (up to 3 leaf)

*** CLEARFIELD varieties will be controlled only with the addition of 2,4-D or MCPA.**
**** Apply when thistles are less than 6 inches (15 cm) tall.**

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** No application pressures are recommended by the manufacturer. Typical application pressures for standard flat fan nozzles are from 35 to 40 psi (240 to 275 kPa). Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver proper coverage with ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh nozzle screens and in-line filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron	PRE	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:

Metsulfuron may injure crops stressed by heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day/night temperatures, drought, or water-saturated soils, either before or after application. Weed control will be reduced under dry, cold conditions.

Tank Mixes:

DO NOT mix the soluble bags with liquid fertilizers, substances that contain boron or substances that release free chlorine. Mixing the water soluble bags with any of these compounds will result in an insoluble substance in the tank.

Herbicides:

- ***In wheat:***
  - *Puma Advance*
- ***In wheat and barley:***
  - 2,4-D Amine or Ester (170 to 227 g ae per acre – refer to 2,4-D), plus surfactant*.
  - MCPA Amine or Ester (0.23 to 0.38 L per acre – 600 g/L formulation), plus surfactant.
- ***In creeping red fescue:***
  - *Assure II* (0.2 to 0.3 L per acre) plus *Sure-Mix* adjuvant*.

    *** Use with the 3 grams per acre rate only.**

Consult tank mix partner labels for additional crop staging and variety restrictions.

Insecticides: None registered.

Fungicides: None registered.

Fertilizer: None registered.

Note: The above mixes are those listed on the *Ally* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rain within 4 hours of application of tank mixes with 2,4-D amine, 2 hours of application of tank mixes with 2,4-D ester, will reduce weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** No restrictions.
- **Re-cropping Interval:**
  - ***Caution:***
    - DO NOT apply more than 3 grams per acre per year.
    - DO NOT use on highly variable soils that have large gravely or sandy areas, eroded knolls, or calcium deposits.
    - Metsulfuron residues can persist for long periods, potentially limiting re-cropping options. Degradation of metsulfuron is dependent on the pH, moisture, and temperature of the soil. Refer to the label for details on rotation and minimum re-cropping intervals.
    - The following re-cropping intervals, based on soil pH, should be considered as guidelines only. Metsulfuron residues may affect crops for a longer period of time than outlined in the following table. Add 12 months to recommendations if less than 5 inches (130 mm) of rainfall in brown and dark brown soils or less than 10 inches (250 mm) rainfall in black or grey wooded soils in any year following application.

      Minimum Re-Cropping Interval (Months)

Soil PH	Barley, Wheat	Oat*	Canola*	Flax*	Lentils	Canary Seed	Yellow Mustard
less than 7.0	10	10	10 (22)	10 (22)	34	48	48
7.0 -7.9	10	10 (22)	22 (34)	34	48	48	48

      *** Figures in brackets refer to re-cropping intervals in brown and dark brown soil zones.**
    - On black and grey wooded soils with pH of 7.5 or less, fescue may be planted 10 months after application and alfalfa, red clover, peas and flax may be planted 22 months after application. DO NOT use on soils with pH greater than 7.9.
    - Effects of metsulfuron residues on crops other than those listed in the table have not been fully evaluated. Because of the length of re-cropping restrictions and the lack of information on many rotational crops, land previously treated with metsulfuron cannot be rotated to crops other than those listed until a field biosassay confirms that residues of metsulfuron are not present. Consult the label for additional instructions on how to perform a field bioassay. Failure to follow these instructions could result in injury to subsequent crops.

- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**
  - Handheld or backpack applications do not require a buffer.

Use	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat**
	Less than 1 m	Greater than 1 m	
Cropland	1	1	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Terrestrial buffers are not required for transport and utility rights-of-way**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Metsulfuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to apply metsulfuron should be flushed out immediately after metsulfuron is used. All nozzles, screens and filters should be removed and cleaned after applying this product. Refer to 'Method B' found in the general sprayer cleaning section in the introduction. DO NOT use ammonia with chlorine bleach.

Hazard Rating:


Caution – Poison


Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Muster

Herbicide Group 2 - ethametsulfuron

Company:

FMC Corporation (PCP#21555)

Formulation:

75% ethametsulfuron-methyl formulated as a wettable granule.

- Container size - 320 g (4 x 80 g water soluble bags).

Crops, Rates and Staging:

NOT for use on yellow mustard (*Brassica alba*).

Crop	Rate (g/acre)	Stage
Canola	8 to 12	Minimum 2 leaf stage (main stem) to the start of bolting.
Mustards: brown & oriental condiment as well as oilseed quality (*Brassica juncea*)	8	4 leaf stage but prior to bolting.
Ethiopian mustard (*Brassica carinata*)		
Sunflower	8 to 12	2 to 8 leaf stage (15 to 45 cm)

Muster applied alone requires the addition of *Agral 90*, *Agsurf II*, or *Citowett* at 0.2 L per 100 L of spray solution. When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Weeds, Rates and Staging:

Apply from the cotyledon to 6 leaf stage. Stinkweed must be sprayed in the 1 to 4 leaf stage

At the 8 grams per acre rate:

- Flixweed *
- Green smartweed
- Hemp-nettle
- Stinkweed **
- Wild mustard

The 12 grams per acre rate controls above weeds plus:

- Redroot pigweed **
- Stinkweed

*** Spring seedlings only.**

**** Suppression with *Muster* alone but control with *Assure II* plus *Sure-Mix* or a *Poast Ultra* plus *Merge* tank mix where permitted.**

Application Information:

- **Water Volume:** 40 L per acre.
- **Equipment, Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets. Sprayer must be equipped with continuous agitation. Maintain the spray boom at 24 inches or less above the crop canopy.
- **Screens:** Use a 50 mesh or coarser nozzle screen and in-line filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
ethametsulfuron	POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:

DO NOT apply to crops that are stressed by severe conditions such as drought, low fertility, saline soils, waterlogged soils (soils at or near field capacity), disease or insect damage as crop injury may result. Less than acceptable control will occur in fields where high weed populations exist and where stressful environmental conditions prevail (drought, cold weather). Heavy rainfall soon after application may result in visual crop injury or possible yield reduction. Thin crop stands or application prior to the 2 leaf stage of canola or 4 leaf stage of brown condiment mustard and oriental mustard (condiment and oilseed types), sandy soils or soils with low organic matter may increase the severity of the injury.

Tank Mixes:

DO NOT mix the soluble bags with liquid fertilizers, substances that contain boron or substances that release free chlorine. Mixing the water soluble bags with any of these compounds will result in an insoluble substance in the tank.

Herbicides:

- ***Canola, brown and oriental mustards (Brassica juncea only):***
  - *Assure II* plus *Sure-Mix* adjuvant.
- **Canola only:**
  - *Poast Ultra* plus *Merge* adjuvant.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered. DO NOT mix soluble bags with liquid fertilizers.

Note: The above mixes are those listed on the *Muster* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 to 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed crop to livestock within 60 days of application. DO NOT graze treated sunflowers.
- **Pre-harvest Interval:** Leave 60 days from application to harvest.
- **Re-cropping Interval:** DO NOT sow wheat, barley, oats or flax within 10 months of application. DO NOT seed canola, lentils, peas, faba beans, tame mustard, alfalfa, canaryseed, dry beans, fescues or red clover within 22 months of application. All other crops must not be sown until a successful "field bioassay" is performed at 22 months after application. Growers may experience reduced yields if other crops are grown without following these guidelines.

- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Crop (By ground only*)	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Canola, Sunflower, Ethiopian Mustard	4	2	55
Mustard (Condiment and Oilseed types)	3	2	40

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Sprayers used to apply *Muster* should be flushed out immediately after *Muster* is used. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
None indicated.

Navius FLEX / TruRange

Herbicide Group
2 - metsulfuron
4 - aminocyclopyrachlor

Company:
Envu Canada (*Navius FLEX* – PCP#30922; *TruRange* – PCP#33964)

Formulation:
39.5% aminocyclopyrachlor and 12.6% metsulfuron formulated as a water dispersible granule.
- Container size - 8 x 1.361 kg

Crops and Staging:
Navius FLEX: Rangeland or non-crop areas (i.e. rights-of-way, roadsides, industrial sites, fence lines and other non-crop areas).
***TruRange*:** Rangeand and permanent pastures only.
DO NOT use in residential or recreational areas, where bystanders could be exposed during or after application.
DO NOT apply to cropland or land expected to be converted to cropland in the foreseeable future.
Note: *The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.*
Avoid application of this product in areas where the roots of desirable trees and/or shrubs may extend unless injury or loss can be tolerated. Root zone areas of desirable trees or vegetation are affected by local conditions and can extend well beyond the tree canopy.

Weeds, and Staging:
For best results, apply to young, actively growing weeds. For woody species, apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

After the granules have fully dispersed, add surfactant. Either one of the following:
- Non-ionic surfactants (i.e. *Agral 90, Agsurf II*, or *Citowett*) at 0.25 L per 100 L (25 mL per 10 L) of spray solution.
- *Merge* or a crop oil concentrate (oil-surfactant blends such as *Assist*, *Score*, etc.) at 1 L per 100 L (100 mL per 10 L).

Weeds controlled at 68 grams per acre:

- Bluebur
- Buckwheat (tartary, wild*)
- Canada goldenrod†
- Canada thistle
- Chickweed
- Common groundsel
- Common tansy
- Common yarrow
- Corn spurry
- Cow cockle
- Dandelion
- Flixweed
- Giant buttercup†
- Hemp-nettle
- Knapweed (diffuse, spotted)
- Kochia
- Lamb's-quarters*
- Leafy spurge
- Mustard (ball, wild)
- Orange hawkweed
- Ox-eye daisy
- Pigweed (prostrate, redroot)
- Rough cinquefoil†
- Russian thistle
- Scentless chamomile
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Sow-thistle (annual, perennial)
- Stinkweed
- Stork's-bill
- Sweet clover (white, yellow)
- Toadflax*
- Volunteer canola (except CLEARFIELD varieties)
- White cockle
- Wild carrot
- Yellow star-thistle

<u>Woody Species:</u>

- Smooth sumac
- Western snowberry
- Wild rose

Weeds controlled at 135 grams per acre:

- *The weeds listed above plus the following Woody Species up to 2.5 metres unless otherwise indicated:*
  - Manitoba maple (Box Elder)
  - Green ash
  - Chokecherry (up to 3 metres)
  - Pin cherry (up to 3 metres)
  - Plains cottonwood
  - Poplar (balsam, black)
  - Trembling aspen (up to 3 metres)
  - Willow (sandbar/ditchbank, pussy)
  - Hackberry
  - Balsam fir (up to 2 metres)
  - Spruce (black, white, Norway – up to 2 metres)

Weeds controlled at 202 grams per acre:

- *The species listed above plus the following Woody Species to 2 metres tall unless otherwise indicated:*
  - Pine (Eastern white, jack, red)
  - Balsam fir (up to 3 metres)
  - Spruce (black, white, Norway – up to 3 metres)

*** Suppression only.**

† Season long control only.

DO NOT apply more than a total of 270 grams per acre per season or apply *Escort* to the same site in the same year as *Navius FLEX/TruRange*. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information

- **Water Volume:**
  - ***Ground:*** No specific carrier volumes are indicated for ground application but volumes could be up to 162 L per acre for herbaceous weeds and up to 810 L per acre is recommended for foliar application to woody species. See the label for details.
  - ***Aerial:*** Apply in 12 to 20 L per acre of water.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron-methyl	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
aminocyclopyrachlor	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity. Weeds stressed by moisture or temperature extremes (heat or cold) may be less susceptible and incomplete weed kill may result. Residual control of weeds germinating after application occurs when *Navius FLEX/TruRange* is carried into the root zone by rainfall. DO NOT apply during periods of intense rainfall or to soil saturated with water. Brush hardened off by cold weather and drought stress may not be controlled.

Restrictions:

- **Rainfall:** Rain within 4 hours may reduce effectiveness.
- **Restricted Entry Interval:** DO NOT re-enter treated areas until sprays have dried.
- **Re-cropping Interval:** No recropping interval is indicated. Conduct a bioassay when converting pasture to annual crop land to determine tolerance to potential residues in the soil. The following restrictions apply to all plant materials, or manure from animals fed material, from areas treated with *Navius FLEX/TruRange* within the previous 18 months:
  - DO NOT apply to land used for growing susceptible crops. Manure may only be applied on rangeland.
  - DO NOT use as mulch or compost and do not apply directly on or around desirable plants.
  - Must only be used on-farm.

- **Grazing Restrictions:** No grazing or haying restrictions for non-lactating or lactating animals (including cattle, horses, sheep, and goats) when used as directed. Grazing animals do not have to be moved off the pasture or rangeland before, during or after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**
  - ***Contact the Saskatchewan Ministry of Environment or Manitoba Sustainable Development Department for additional permitting requirements.***
  - Hand-held or backpack sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat**
	Less than 1 m	Greater than 1 m	
Ground	5	2	45
Fixed wing aircraft	250	100	800
Helicopter	80	45	800

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** For ground vehicle mounted booms, buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Terrestrial buffers are not required for transport and utility rights-of-way. Aquatic buffers still apply.**
† Distance is measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Navius FLEX/TruRange can cause severe injury to sensitive plants at very low concentrations. Use 'Method A' in the introduction to clean sprayers immediately after using *Navius FLEX/TruRange* or directions on the label.

Hazard Rating:

Warning – Contains the Allergens Milk and Sulfites
Refer to the Introduction for an explanation of the symbols.

Nicosulfuron

Herbicide Group 2 - nicosulfuron

Company:

Corteva Agriscience (*Accent *, Accent IS*)
Sharda Cropchem Canada (*Nicosh*)
** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Accent* (PCP#32884), *Nicosh* (PCP#33227):** 75% nicosulfuron formulated as a water dispersible granule.

- Container sizes:
  - *Accent* - 133.6 g (4 x 33.4 g water soluble bags per pouch)
  - *Nicosh* - 33.4 g package

***Accent IS* (PCP#34410):** 54.55% nicosulfuron formulated as a water dispersible granule.

  - • Container size - 6 X 270 g

Crops and Staging:*

Field corn: 1 to 8 leaf stage (six visible collars), coleoptile (short, blunt leaf) is counted as the first leaf.
Sweet corn**: 1 to 6 leaf stage (4 visible collars).
*** Note:** ***Since applications to field and sweet corn in western Canada have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to corn is at the risk of the user.***
**** Note:** ***Nicosulfuron* is registered for use on all sweet corn varieties but tolerance may vary depending on variety. Krispy King, Jubilee and Jubilee Supersweet are the only varieties that have been tested for tolerance in western Canada. Test on small areas planted to other varieties for tolerance prior to widespread use.**

Weeds and Staging:

Weeds	Staging
Barnyard grass, foxtail (green, yellow*), witchgrass	1 to 6 leaves (up to 2 tillers)
Quackgrass	3 to 6 leaves (with extended leaf 4 to 8 inches (10 to 20 cm) long)
Wild oats	3 to 6 leaves

*** Suppression only.**

The best control and yield response is achieved by applying at the earlier end of the leaf stage ranges.

Rates:

***Accent, Nicosh*:** 13.5 grams per acre. Add a non-ionic surfactant (*Citowett Plus, Agsurf* or *Agral 90*) at 0.2 L per 100 L of spray solution.
***Accent IS*:** 18.5 grams per acre. Add one of the following adjuvants: non-ionic surfactant at 0.2 L per 100 L of spray solution; *Merge, Surjet* or *Sure-Mix* at 0.5 L per 100 L of spray solution, *Adapt Oil Concentrate* at 1 L per 100 L of spray solution. Non-ionic surfactants may be applied with 28% liquid urea ammonium nitrate (UAN) at 2 L per acre for improved performance on certain weeds.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 40 L per acre; optimum 56 to 77 L per acre.
- **Nozzles and Pressure:** 25 to 40 psi (175 to 275 kPa) when using conventional flat fan nozzles tilted forward at a 45° angle. Low drift nozzles may require higher pressures for proper performance. Use nozzles and pressures designed to deliver proper coverage with ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
nicolsulfuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Grasses	2

Effects of Growing Conditions:

Poor weed control or crop injury may result if at the time of application, plants are under stress from disease, insect or nematode injury, carryover of herbicide from a previous years application, abnormally hot or cold weather, drought, water-soaked soils, hail damage or frost. Delay application until stress passes and both corn and weeds have resumed growth. When corn is injured by frost, wait 48 to 72 hours after normal growing conditions have resumed before applying nicosulfuron. Stress conditions after application may also result in injury or poor weed control.

Tank Mixes:

Herbicides:

- *Pardner* (0.4 L per acre) plus surfactant.

Fertilizers: DO NOT mix with fertilizers.
Insecticides: None registered. *Nicosulfuron* should not be applied to corn that has been treated with organophosphate insecticides. Leave 7 days between the application of *Nicosulfuron* and that of a foliar organophosphate insecticide.
Fungicides: None registered.
Note: The above mixes are those listed on the *Nicosulfuron* labels only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 to 4 hours of application may result in reduced weed control.
- **Restricted Entry Interval Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated corn forage, silage, fodder or grain for at least 30 days.
- **Pre-harvest Interval:** Leave at least 30 days in field corn and 40 days in sweet corn from application to harvest.
- **Re-cropping Interval:** Spring cereals, canola, field pea, flax, corn, potato, dry beans†, sunflower, alfalfa may be seeded 10 months from application For all other crops a field bioassay is recommended before planting.
  † Since not all dry bean varieties have been tested for rotational crop tolerance, the first planting of each variety to previously treated fields should be limited to a small area to confirm tolerance prior to widespread recropping.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store product in original container in a secure, dry area away from other pesticides, food or feed.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial habitat
Ground only*	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
***Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
†Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.
Leave a 5 m buffer between the last spray path and woodlots or shelterbelts. Leave a 22 m buffer before wetland areas or water bodies.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
***Accent, Nicosh*:**


Caution – Eye Irritant

***Accent IS*:**


Warning – Contains the allergens milk and sulfates

Keep out of reach of children. Avoid breathing spray mist. Avoid contact with skin, eyes and clothing.
Refer to the Introduction for an explanation of the symbols.

Ninja Master

This product is a prepackaged tank mix of* Ninja *(see 'Imazamox/Imazethapyr') and* Independence *(see Clethodim). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above and select the most restrictive.

Herbicide Group
1 - clethodim
2 - imazamox, imazethapyr

Company:
AgraCity

Formulation:
The *Ninja Master* package contains the following components:
***Ninja* (PCP#32995):** 35% imazamox + 35% imazethapyr formulated as a water dispersible granule.
- Container size - 4 x 692 g

-plus-

***Independence* (PCP#32851):** 240 g/L clethodim formulated as an emulsifiable concentrate.
- Container size - 8 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Field pea	1 to 6 true leaf stage	75

Weeds, Rates and Staging:
Weeds controlled by *Ninja* (see Imazamox/Imazethapyr) at 17.3 grams per acre plus the weeds controlled by *Independence* (see Clethodim) at 50 mL per acre.
Ninja Master requires the addition of *Assassin* or *Merge* adjuvant at 0.5 L per 100 L of spray solution, and which must be purchased separately.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

OcTTain XL

Herbicide Group
4 - fluroxypyr, 2,4-D

Company:

Corteva Agriscience (*OcTTain XL* – PCP#30077)
Interprovincial Cooperative Ltd. (*CO-OP OcTTain XL* – PCP#33892, *IPCO OcTTain XL* – PCP#33891)
Sharda Crop Chem (*OSim Plus* – PCP#34712)
ADAMA Canada (*Rush 24 All In* – PCP#34878)

Formulation:

90 g/L fluroxypyr plus 360 g/L 2,4-D LV ester as an emulsifiable concentrate.

- Container sizes - 2 x 9 L, 108 L, 576 L
- *Rush 24 All In* - 2 x 8.9 L, 106.8 L, 427.2 L

Crops and Staging:

Spring wheat (including durum), barley: 4 leaf up to the emergence of the flag leaf.

Winter wheat†: Apply to winter wheat in the spring from the 3 tiller stage to just before the flag leaf stage.

Forage grasses for seed production only*:

- *Seedling and established grasses at the 4 leaf up to the emergence of the flag leaf.*
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red, tall)
  - Timothy
  - Wheatgrass (crested, intermediate)

**** Note:** Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance.* ***Those who apply these uses do so at their own risk.***

† ***OcTTain XL, IPCO OcTTain XL* and *OSIM Plus* only.**

Rangeland, pasture, industrial vegetation management only (i.e. rights-of-way, roadsides, permanent perennial grass cover areas and industrial vegetation management areas): Based on weed timing (Corteva *OcTTain XL*, *OSIM Plus* and *RUSH 24 ALL IN* only). When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, and Staging:

The following weeds are controlled at the 2 to 4 leaf stage, unless otherwise specified:

- ***OcTTain XL, OSIM Plus* and *RUSH 24 ALL IN* at 0.45 L per acre controls:**
  - Bluebur
  - Burdock
  - Cleavers(1 to 8 whorl)
  - Clover (sweet)
  - Cocklebur
  - Common chickweed (up to 8 cm or 3 inches)†
  - Field horsetail*
  - Flixweed
  - Goat's-beard
  - Hemp-nettle (2 to 6 leaf)
  - Hoary cress*
  - Kochia
  - Lamb's-quarters
  - Mustards (except dog or green and grey tansy mustard)
  - Plantain
  - Prickly lettuce
  - Ragweed
  - Redroot pigweed†
  - Round-leaved mallow (1 to 6 leaf)
  - Shepherd's-purse
  - Sow-thistle (perennial)†*
  - Stinkweed
  - Stork's-bill (1 to 8 leaf)
  - Sunflower (annual)
  - Vetch
  - Volunteer canola
  - Volunteer flax (1 to 12 cm)
  - Wild radish
  - Wild mustard
  - Wild buckwheat (1 to 6 leaf)
- ***OcTTain XL , OSIM Plus* and *RUSH 24 ALL IN* at 0.45 L per acre plus 2,4-D ester (LV700 at 81 mL per acre or LV600 at 95 mL per acre) controls:**
  All weeds listed above plus:
  - Annual sow-thistle†
  - Blue lettuce*
  - Canada thistle†*
  - Dandelion**
  - Docks
  - Field bindweed*
  - Field peppergrass
  - Gumweed
  - Hairy galinsoga
  - Hedge bindweed
  - Leafy spurge*
  - Mustard (dog and tansy)
  - Oak-leaved goosefoot
  - Perennial sow-thistle†*
  - Redroot pigweed
  - Russian thistle
  - Smartweed (including lady's-thumb)
  - Tartary buckwheat
  - Wild buckwheat (1 to 8 leaf)

- **Rangeland or non-crop areas (i.e. rights-of-way, roadsides, permanent perennial grass cover areas and industrial vegetation management areas):**
  - **Corteva *OcTTain XL, OSIM Plus* and *RUSH 24 ALL IN* only at 0.65 L per acre:**
    - ***All weeds listed above plus:***
      - Kochia (up to 50 cm) suppression
  - **Corteva *OcTTain XL, OSIM Plus* and *Rush 24 All In* only at 1.25 L per acre:**
    - ***All weeds listed above plus:***
      - Kochia (up to 50 cm) control

† **Suppression only.**
*** Top growth only.**
**** Spring rosettes only.**

Make only ONE APPLICATION per year of any of these products or other products containing the same active ingredients. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. All other uses minimum 40 L per acre.
  - ***Aerial:*** 12 to 20 L per acre.
- **Nozzles and Pressure:** Maximum 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

The activity these products are influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought, heat or cold stress) or if extremely heavy infestations exist.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

The following mixes may be used with each of the combinations above unless noted otherwise.

- ***In spring wheat (including durum) and barley:***
  - Tralkoxydim*
- **In spring wheat (including durum) only:**
  - Clodinafop 240 EC (93 mL per acre)
  - Fenoxaprop
  - *Simplicity OD*†
  - *Simplicity GoDRI*

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered. DO NOT mix with liquid fertilizers.
*** Temporary crop injury or reduced wild oats control may occur with this tank mix.**
† ***OcTTain XL* without additional 2,4-D ester only.**
Note: The above mixes are those listed on the *OcTTain XL* labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated area within 12 hours.
- **Re-cropping Interval:** Alfalfa, barley, canola, corn, dry beans, flax, forage grasses, lentils, mustard, oats, peas, potatoes, rye, soybeans, sunflowers and wheat may be grown the year after application. There are no re-cropping restrictions the second year after application.
- **Re-cropping Interval *RUSH 24 ALL IN*:** Barley, canola, flax, forage grasses, lentils, mustard, oats, peas, rye and wheat may be grown the year after application. There are no re-cropping restrictions the second year after application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Grazing Restrictions:** DO NOT permit lactating dairy animals to graze cereal fields within 7 days of application. DO NOT harvest cereal crops for forage or cut hay within 30 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. DO NOT feed or cut forage grasses for hay.
- **Aerial Application:** *OcTTain XL, CO-OP OcTTain XL, IPCO OcTTain XL* and *OSIM Plus*. May be applied by air. Rangeland and industrial uses by ground only.
- **Storage:** Avoid freezing. If frozen, bring to room temperature and agitate before use. These products are combustible. DO NOT store near heat or open flame.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Field sprayer (annual crops)	1	0	3*
Field sprayer (range, pasture, IVM)	1	1	5**
Fixed wing aircraft	5	0	95
Helicopter	3	0	80

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** For ground vehicle mounted booms, buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

**** Buffer zones for the protection of terrestrial habitats are not required for use on rights-of-ways including rail, utility and road.**

† Distance is measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

 Caution – Poison

 Caution – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Odyssey Ultra Q

Herbicide Group
1- quizalofop
2- imazamox, imazethapyr

This product is a prepackaged tank mix of Odyssey NXT II (see Imazamox/Imazethapyr) and Caziva UIltra Q (see quizalofop). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
BASF Canada

Formulation:
The *Oyssey Ultra Q* packages contain the following components:
***Odyssey Ultra NXT II* (PCP#33678):** 35% imazamox and 35% imazethapyr formulated as a dispersible granule.
- Container size - 1 x 692 g jug

***Caziva Ultra Q* (PCP#34282):** 96 g/L quizalofop-p-ethyl formulated as an emulsifiable concentrate.
- Container size - 6.16 L

***Merge* adjuvant (PCP#24702):** Container size - 1 x 8.1 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Field pea	1 to 6*	60
CLEARFIELD lentil	1 to 9*	60
Soybean	1 to 3	85
Faba bean	1 to 6	80

*** Above-ground nodes.**

Weeds, Rates and Staging:
At 17.4 grams per acre *Odyssey Ultra NXT II* and 154 mL per acre *Caziva Ultra Q* controls the weeds controlled by *Odyssey NXT II* plus the additional grass weeds below from the 1 to 6 leaf stage (main stem) up to 2 tillers

- Annual brome (Japanese, Downy)
- Foxtail barley
- Quackgrass (suppression)
- Volunteer corn
- Volunteer Clearfield wheat (including spring and durum)
- Yellow foxtail

Odyssey Ultra Q requires the addition of *Merge* adjuvant at 0.5 L per 100 L of spray solution.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Herbicides:
- Quizalofop (top up to a total quizalofop rate of 0.30 L per acre)

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Olympus

Herbicide Group
2 - propoxycarbazone-sodium

Company:
Bayer

Formulation:
***Olympus* (PCP#32755):** 70% propoxycarbazone-sodium formulated as a wettable granule.
- Container size - 463 g

Crops and Staging:
Spring, durum, and winter wheat: Apply pre-seed or prior to crop emergence.

Weeds and Rates:
Weeds controlled up to 15 cm in height unless otherwise indicated:

Preplant surface or postplant preemergence	***Olympus:*** 5.8 grams per acre **Glyphosate*:** 180 to 360 grams ae per acre	**Weeds controlled by glyphosate at the rates given plus:** • Canada fleabane (up to 8 cm)$^{\Delta}$ • Canola, volunteer† (1-leaf stage to 4 leaf stage) • Cleavers$^{\Delta}$ • Common ragweed$^{\Delta}$ • Downy brome$^{\dagger\Delta}$ • Flixweed$^{\Delta}$ • Green foxtail$^{\Delta}$ • Hemp-nettle$^{\Delta}$ • Japanese brome (up to and including the 2 leaf stage) • Kochia$^{\Delta\Delta}$ (except glyphosate tolerant biotypes) • Lady's-thumb$^{\Delta}$ • Lamb's-quarters$^{\Delta}$ • Persian darnel$^{\Delta}$ • Redroot pigweed$^{\Delta}$ • Russian thistle$^{\Delta}$ • Stinkweed$^{\Delta}$ • Volunteer barley$^{\Delta}$ • Volunteer flax$^{\Delta}$ • Volunteer wheat$^{\Delta}$ • Wild buckwheat (up to 8 cm in height and up to 3 leaf stage)$^{\Delta}$ • Wild mustard$^{\Delta}$ • Wild oats$^{\Delta}$ • Foxtail Barley (seedling to heading)**†

*** including all salts**
**** 360 g ae per acre of glyphosate is required for control of foxtail barley**
† For more consistent control of subsequent flushes, follow an application of *Olympus* + glyphosate with an in-crop application of *Varro*. Refer to the *Varro* label for additional weeds controlled.
$^{\Delta}$ Controlled by glyphosate alone at 180 to 275 g ae per acre.
$^{\Delta\Delta}$ Controlled by glyphosate alone at 360 g ae per acre.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 20 L per acre
  - ***Aerial:*** Minimum 10 L per acre *(Note: There are restrictions on aerial application – see the note under Restrictions below)*
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets or larger. The use of 80° or 110° flat fan nozzles is recommended for optimum spray coverage. DO NOT use flood jet nozzles, controlled droplet application equipment or Sprafoil equipment.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
propoxycarbazone-sodium	POST and PRE (has soil activity)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Pre-seed and Pre-Emergent:***
  - Glyphosate

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered. DO NOT mix soluble bags with liquid fertilizers.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 71 days after treatment.
- **Pre-harvest Interval:** Leave 71 days between application and harvest.
- **Re-cropping Interval:** Barley, canola, dry beans, field peas, flax, lentils, oats, and soybeans may be grown in the season following appplication.
- **Aerial Application:** *Note* – while *Olympus* may be applied by aerial application, due to the requirement that it be mixed with glyphosate, this aerial option is only available for certain glyphosate products and then only when the field to be treated is too wet to support ground based sprayers. (See glyphosate)
- **Storage:** Store in a cool, dry place.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	1
Fixed wing aircraft	1	0	20
Helicopter	1	0	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:


Warning – Contains the Allergen Milk

Refer to the Introduction for an explanation of the symbols.

OnDeck

Herbicide Group
27 - tolpyralate
6 - bromoxynil

Company:
Corteva Agriscience

Formulation:
***OnDeck* (PCP#34709):** 18.7 g /L tolpyralate and 186.6 g/L bromoxynil formulated as an emulsifiable concentrate.
- Container size - 2 x 6.475 L case, 414.4 L tote

Crops, and Staging:
Wheat (spring, durum, winter) and barley: 1-leaf stage to jointing. Winter wheat applications can be made in the fall or spring.

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds at the 1-6 leaf stage.
Weeds Controlled:
- Annual smartweed (lady's-thumb)
- Chickweed
- Cleavers (4 whorls)[1]
- Foxtail (green[4], yellow)
- Hemp-nettle
- Kochia (up to 10 cm)[2]
- Lamb's-quarters (up to 8 leaf)
- Redroot pigweed
- Volunteer canola
- Wild buckwheat (4 leaf)[3]
- Wild mustard

[1]For control of cleavers up to the 6-whorl stage, apply at 435 mL per acre or the standard rate with a recommended adjuvant.
[2]Apply at 325 mL per acre for control of lighter populations of kochia (<100 plants per m^2) up to 10 cm in size. For control of kochia in heavier populations up to 15 cm in size, apply at 435 mL per acre or the standard rate with a recommended adjuvant.
[3]Apply at 325 mL per acre for control of light populations of wild buckwheat (<25 plants per m^2) up to the 4-leaf stage. For control of wild buckwheat in heavier populations up to the 6-leaf stage, apply at 435 mL per acre or the standard rate with a recommended adjuvant.
[4]Apply at 325 mL per acre for control of green foxtail up to the 4-leaf stage. For control of green foxtail up to the 6-leaf stage, apply at 435 mL per acre or the standard rate with a recommended adjuvant.

Rate:
Standard rate: 325 mL per acre
High rate: 435 ml per acre
Maximum of one application per year.
OnDeck Herbicide can be applied in tank-mix with Methylated Seed Oil, Crop Oil Concentrateor High Surfactant Oil Concentrate-type adjuvants at a minimum rate of 5L per 1000L of spray solution for enhanced weed control when weed populations are high, weed staging is advanced or when weeds are stressed due to environmental conditions. Apply 5-10 L of adjuvant per 1000 L of spray solution.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20-80 L per acre. Recommended 40 L per acre.
  - ***Aerial:*** 20 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets by ground or by air.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tolpyralate	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar and root (Apoplast)	Broadleaf and grasses	27
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disrupter	Little (Apoplast)	Broadleaf only	6

Effects of Growing Conditions:
Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

For best results, ensure thorough spray coverage of target weeds. Under certain environmental conditions slight delay on barley development can be present; the delay is transient and will not have an impact on yield.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- ***Post-Emergent:***
  - MCPA ester 600 (189 to 235 mL per acre)
  - 2,4-D Ester 700 (202 to 445 mL per acre)
  - Simplicity GoDRI
  - Simplicity OD
  - Trondus
  - Pinoxaden
  - Horizon NG
  - Flucarbazone
  - Traxos
  - Varro

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: OnDeck Herbicide may be applied in spray solutions containing liquid nitrogen fertilizer at up to 0.51 L per acre. Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Preharvest Interval:** Do not harvest the treated mature crop within 50 days after application
- **Grazing:** Livestock may be grazed on treated crops 30 days following application. Do not cut the treated crop for hay or silage within 30 days after application.
- **Re-cropping:** The following crops may be grown 10 months after application: alfalfa, barley, bean (dry), canola, grass (grown for seed or forage), lentils, oats, field peas, potato (not for seed), sorghum, soybean, sunflower. Winter wheat or rye (annual and fall) may be seeded 3 months after application. Corn may be replanted immediately.
- **Aerial Application:** May be applied fixed-wing or by rotary aircraft**.**
- **Storage:** Store this product away from food or feed. Store in original containers in a secure, dry heated storage. Do not allow contamination of seeds, plants, fertilizers or other pesticides. Do not contaminate food, feedstuffs or domestic water supplies. If containers are damaged or spill occurs, use the product immediately or contain the spill with absorbent materials and dispose of waste.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1	
Ground*	1	1	1
Fixed wing aircraft	10	1	25
Helicopter	10	1	25

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the Introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:


Warning – Poison


Eye irritant and skin irritant

Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Optica Trio

Herbicide Group
4 - MCPA, mecoprop-p, dichlorprop

Company:
Loveland Products Canada (PCP#29662)

Formulation:
160 g/L MCPA + 130 g/L mecoprop-p + 310 g/L dichlorprop-p formulated as a solution
- Container size - 10 L

Crops and Staging:

Crop	Stage
Barley, oats, spring wheat (including durum)	2 to 5 leaf
Winter wheat	Spring application only; up to 12 inches (30 cm) high (top leaf extended)

Weeds, Rates and Staging:
Weeds controlled at the 2 to 3 leaf stage unless otherwise indicated.

Apply at 0.61 L per acre to control:
- Lamb's-quarters
- Stinkweed
- Volunteer canola
- Wild mustard

Apply at 1.0 L per acre to control the weeds listed above plus:
- Canada thistle*
- Chickweed (Common)
- Cleavers (1 to 2 whorls)
- Kochia
- Lady's-thumb (suppression)
- Ragweed (Common)
- Redroot pigweed
- Wild buckwheat

* **Top growth control only.**

DO NOT apply *Optica Trio* more than once or follow application with any related product in the same year.

Application Information:
- **Water Volume:** Minimum 20 L per acre.
- **Nozzles and Pressure:** 30 to 43 psi (200 to 300 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets or larger.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dichlorprop, mecoprop-p, MCPA	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Less than satisfactory control may result if weeds are not actively growing such as under conditions that are extremes of hot or cold, dry or wet weather prior to spraying.

Tank Mixes:
Herbicides:
- ***Spring wheat (including durum):***
  - *Signal* (93 mL per acre) plus supplied adjuvant.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Optica Trio* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT feed treated crops to milking animals or harvest for forage within 7 days of application. Meat animals grazing treated crops must be removed 3 day prior to slaughter.
- **Pre-harvest Interval:** No pre-harvest interval indicated on label when *Optica Trio* is used alone.
- **Re-cropping Interval:** No information provided on label. Contact manufacturer for information.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Keep from freezing.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Caution – Poison

Danger – Corrosive to Eyes

Refer to the Introduction for an explanation of the symbols.

Option 2.25 OD

Herbicide Group 2 - foramsulfuron

For use in Manitoba only.

Company:

Bayer

Formulations:

***Option 2.25 OD* (PCP#27424):** 22.5 g/L foramsulfuron formulated as an oil-dispersion.

- Container size - 6.3 L jug

Crops and Staging:

Field corn at the 1 to 8 leaf stage or 5 to 6 visible collars

Weeds and Staging:

Annual Grasses:

Weed	Leaf Stage
Barnyard grass	1 to 6 (to early tillering)
Foxtail (green and yellow), Proso millet	2 to 5 (to early tillering)

Broadleaf Weeds:

Weed	Leaf Stage
Chickweed, common	4 to 6
Lamb's-quarters	4 to 8
Mustard, wild	5 to 7
Mustard, wormseed	5 to 9
Nightshade, eastern black	1 to 5
Pigweed, redroot	1 to 7
Ragweed, common*	2 to 4

*** Suppression only.**

Rates:

***Option 2.25 OD*:** 0.63 L per acre plus 28 percent UAN (liquid 28-0-0) at 1.0 L per acre.
NOTE: *Option 2.25 OD* should be tank mixed with *Banvel II* at 121 mL per acre for enhanced control of broadleaf weeds and the management of Group 2 resistant weed biotypes.
Add *Option 2.25 OD* to a half full tank, followed by *Banvel II*, then 28 percent UAN.

Application Information:

- **Water Volume:** 60 L per acre
- **Nozzles and Pressure:** Use 25 to 40 psi (175 to 275 kPa) when using conventional 80° or 110° flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** or larger droplets.
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
foramsulfuron	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

Under optimum conditions weed growth ceases within 1 to 3 days and yellowing of the growing point occurs in 5 to 10 days. Warm moist conditions provide for the best activity. Activity may be reduced or delayed if applied under cool and/or dry conditions or in the presence of heavy dew, fog, mist or rain or if weeds are dust covered. If the crop or weeds are under stress due to environmental conditions, delay application until the both crop and weeds have resumed active growth.

Tank Mixes:

Herbicides: *Banvel II* (121 mL per acre)*
Insecticides: Avoid application to corn that has been treated with organophosphorous insecticides.
Fungicides: None registered.
Fertilizers: DO NOT use any fertilizers or additives other than 28 percent UAN (1 L per acre), recommended*.
*** *Option 2.25 OD* should be applied to corn in Manitoba as a tank-mixture with *Banvel II*. UAN 28 percent is required. See 'Rates' section above.**
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields until residues have dried.
- **Grazing Restrictions:** DO NOT graze treated corn crops or cut for forage within 45 days of application.
- **Pre-harvest Interval:** Leave 70 days between application and harvest of grain.
- **Re-cropping Interval:** The following crops may be grown the season following application: alfalfa, barley, bean (dry common), canola, clover (red), corn (field and sweet), oats, pea, potato, soybean, timothy, spring wheat. Winter wheat may be seeded 4 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Keep dry.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones for ground applications can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Option 2.25 OD residues in the spray tank can cause severe injury to sensitive crops at very low concentrations. Sprayers should be cleaned out immediately before using another product. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Eye Irritant


Warning – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Overdrive

Herbicide Group
4 - dicamba
19 - diflufenzopyr

Company:

BASF Canada (PCP#30065)

Formulation:

20% diflufenzopyr and 50% dicamba sodium salts formulated as water dispersible granules.

- Container size - 4 x 3.4 kg

Crops and Staging:

Established permanent grass pasture, non-cropland sites and rangeland. DO NOT apply *Overdrive* on annual crops or newly seeded grasses.

Note: *The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow.*

Weeds and Staging:

- Biennial wormwood
- Canada thistle*
- Dandelion**
- Kochia (up to 15 cm)
- Lady's-thumb
- Lamb's-quarters
- Leafy spurge**
- Perennial sow-thistle (2 to 10 leaf)
- Ragweed (common)
- Redroot pigweed
- Sweet clover*
- Velvetleaf
- Vetch*
- Volunteer canola (up to 4 leaf)
- Waterhemp
- Wild buckwheat

*** Top growth control.**
**** Top growth suppression.**

Rates:

115 grams per acre.

Merge Adjuvant at the rate of 0.25 L per 100 L of spray solution or a non-ionic surfactant at 0.25 L per 100L of spray solution plus ammonium nitrate (UAN 28 percent) at 1.25L per 100L of spray solution must also be added. Use of an anti-foam agent is suggested.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 89 L per acre. Use higher water volumes when treating dense or tall vegetation.
- **Nozzles and Pressure:** Maximum 20 psi (150 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of application equipment and pressure that is designed to deliver an even coverage of ***ASABE coarse*** droplets that are less prone to drift. Non-target broadleaf plants are very sensitive to *Overdrive* drift. Avoid conditions that are conducive to drift. (See introduction for drift control suggestions).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
dicamba	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
diflufenzopyr	POST (foliar)	Auxin transport inhibitor	To growth areas of the plant (Symplast)	Broadleaf only	19

Effects of Growing Conditions:

DO NOT spray if temperatures are expected to exceed 27°C. DO NOT spray in high humidity or fog. DO NOT spray if wind velocity exceeds 8 km per hour. Established grasses growing under stress conditions can exhibit various injury symptoms that may be more pronounced if herbicides are applied.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Heavy rain within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT permit lactating dairy animals to graze fields within 7 days after application. DO NOT harvest forage or cut hay within 30 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place.
- **Buffer Zones:**
  - Hand-held or backpack sprayer and spot treatment DO NOT require a buffer zone from sensitive habitat, but efforts should be made to minimize exposure to sensitive plants and open water or wetlands.

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Freshwater habitat	Terrestrial habitat
Field sprayer*	15	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Poison


Caution – Eye Irritant, Potential Skin Sensitizer


Warning – Contains the Allergen Sulfites

Refer to the Introduction for an explanation of the symbols.

Oxbow

Herbicide Group
4 - dichlorprop
6 - bromoxynil

Company:
Nufarm Agriculture Inc.

Formulation:
***Oxbow* (PCP#34883):** 435 g/L dichlorprop + 174 g/L bromoxynil formulated as an emusifiable concentrate
- Container size – 2 x 9.71L, 116.5L, 466L

Crops and Staging:
Spring wheat, durum, barley: 3-leaf to prior to the flag-leaf stage

Winter wheat: Apply in the spring from early tillering to prior to flag-leaf stage

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds up to the 4 leaf stage

Weeds Controlled:
- Bluebur
- Broadleaf plantain
- Chickweed
- Cocklebur
- Common ragweed
- Cow cockle
- False cleavers (4 whorl)
- Green smartweed
- Kochia (1-12 leaf)
- Lady's-thumb
- Lamb's-quarters (8 leaf)
- Pale smartweed
- Redroot pigweed*
- Russian thistle 5 cm high (2-12 leaf)
- Stinkweed (8 leaf)
- Tartary buckwheat (8 leaf)
- Wild buckwheat (8 leaf)
- Wild mustard (8 leaf)

*** Suppression only.**

Rate:
Oxbow: 0.5-0.65 L/acre. Use the high rate when the field has heavy weed pressure

Application Information:
- **Water Volume:**
  - ***Ground:*** 20-40 L/acre.
  - ***Aerial:*** Minimum 12-16 L/acre. Use higher volume for heavy crop canopy, or when the majority of weeds are cow cockle, smartweed, or pigweed.
- **Nozzles and Pressure**: Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE coarse droplets at a minimum by ground or air.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disrupter	Little (Apoplast)	Broadleaf only	6
Dichlorprop	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Best weed control when weeds are actively growing when adequate soil moisture is present and warm temperatures prevail. Applications made under dry conditions may result in reduced control. Crops under stress from adverse environmental conditions such as frost, drought, or water saturated soils may be injured. Do not apply when daytime temperatures exceed 27^{o}C.

Tank Mixes:

Tank mix partners applied at label rates and include recommended adjuvants unless otherwise noted.

Herbicides: None registered on product label.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control. Avoid application when heavy rain is forecast.
- **Re-entry:** DO NOT re-enter treated fields for 24 hours.
- **Preharvest Interval:** Leave 60 days between application and harvest.
- **Grazing:** MUST NOT be grazed or fed to livestock for 40 days after treatment. Do not harvest forage or cut for hay within 30 days after application.
- **Re-cropping:** Grow all major crops the year after treatment.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Oxbow will solidify at temperatures below -20^{o}C but will become useable at temperatures above 0^{o}C
- **Buffer Zones:**

Application method	Buffer Zones (metres †) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	1
Fixed wing aircraft	10	1	30
Rotary wing aircraft	10	1	30

See the Key to Product Pages for an explanation of the different habitats.

*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaningin introduction.

Hazard Rating:

Danger – Poison
Skin Irritant
Potential skin sensitizer
Refer to the Introduction for an explanation of the symbols.

Paradigm PRE

Herbicide Group
2 - florasulam
4 - halauxifen

Company:
Corteva Agriscience (PCP#31304)

Formulation:
20% halauxifen present as methyl ester and 20% florasulam formulated as a water dispersible granule.
- Container size - 4 x 600 g jugs per case

Crops and Staging:
Pre-seed and Post Harvest Applications:
- Prior to the planting of wheat (winter, spring and durum), oats and barley (or a maximum of 48 hours after seeding).
- Must be used in combination with a mixture of glyphosate at 180 to 1020 g ae per acre.

Weeds, Rates and Staging:
Apply to actively growing weeds at the 1 to 8 leaf stage unless otherwise specified. Mix with glyphosate at 180 to 1020 g ae per acre.
Apply *Paradigm PRE* at 7.5 grams per acre when applied in a spring burndown or prior to winter wheat seeding in the fall in a mix with glyphosate to control or suppress the following weeds in addition to those weeds controlled by glyphosate at 180 g ae per acre (see glyphosate page):
- Canada thistle (suppression up to 30 cm)
- Chickweed
- Cleavers (1 to 9 whorl stage)
- Dandelion (seedlings and spring rosettes up to 15 cm across)
- Lamb's-quarters
- Mustard (wild)
- Shepherd's-purse

Apply *Paradigm PRE* at 10 grams per acre in a fall burndown or prior to winter wheat seeding in the fall in a mix with glyphosate to control or suppress the following weeds in addition to the weeds controlled by glyphosate at 180 g ae per acre (see glyphosate page):
The weeds controlled or suppressed above plus:
- American dragonhead (up to bud stage or 15 cm)
- Barnyard grass (up to 5 leaf, 2-tiller)
- Buckwheat, wild
- Canada thistle (suppression up to 30 cm)
- Cow cockle
- Dandelion (seedlings, rosettes and mature plants up to 30 cm across)
- Henbit (up to 8 leaf or 15 cm)
- Kochia* (up to 15 cm)
- Night-flowering catchfly§ (up to bolting, 15 cm in height)
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Scentless chamomile§ (up to the bud stage)
- Smartweed (green)
- Sow-thistle, annual§
- Sow-thistle, perennial§ (up to 6 leaf)
- Stork's-bill
- Velvet leaf (up to 5-leaf)
- Volunteer alfalfa (up to 25 cm)
- Volunteer canola (all varieties)
- White cockle§ (spring seedlings and over-wintered plants up to the bud stage)

§ Suppression only.
*** Light to moderate infestation (up to 150 plants per square metre).**

Application Information:
- **Water Volume:** Minimum 20 to 40 L per acre. Use the higher volume when there is a heavy crop canopy or weeds are at an advanced stage.
- **Nozzles and Pressure:** Use 30 to 40 psi (200 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE S572.1 coarse*** droplets while maintaining good coverage of foliage.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
florasulam	POST (foliar)	ALS Amino Acid inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Weeds and crops must be actively growing. Extreme growing conditions such as drought or near freezing temperature prior to, at or following time of application may reduce weed control. Allow 5 days from application until tillage. Soil disturbance caused by seeding may reduce control.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Preseed Burndown (Fall or Spring):***
  - Glyphosate IPA, DMA or K+ formulations from 180 to 1020 g ae per acre (see glyphosate page for weeds controlled and conversion to product rates)

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze livestock within 7 days of application. DO NOT cut for silage or hay within 21 days of application.
- **Pre-harvest Interval:** DO NOT harvest crops within 60 days of application.
- **Re-cropping Interval:** Registered crops above can be planted any time after application. Alfalfa, barley (spring), canola (including oilseed quality *B. juncea*), corn, dry bean, fababean, field pea, flax, mustard (oriental, brown and yellow), oats, soybeans, sunflower can be seeded a minimum of 10 months after treatment (typically the first season following spring application) or fields can be summerfallowed. Lentils may be grown 22 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a heated, dry place in original container.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction using All Clear Tank Decontaminator as the detergent component.

Hazard Rating:


Caution – Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Permit WG

Herbicide Group
2 - halosulfuron

Company:
Gowan Canada (PCP#31210)

Formulation:
72.6% halosulfuron methyl ester formulated as water dispersible granules.
- Container size - 567 g

Crops and Staging:
Pre-emergent surface†:
- ***Dry beans*:*** Apply 14.2 to 19 grams per acre after seeding but prior to soil cracking.

Post-emergent foliar†:
- ***Dry beans*:*** Apply 14.2 to 28.3 grams per acre at the 2 to 4 trifoliate leaves, prior to flowering. Maximum of one application per year.
- ***Corn (sweet, popcorn):*** Apply 19 to 28.3 grams per acre up to the 10 to 12 leaf stage. A second application of 19 grams per acre may be applied with drop nozzles if needed, avoiding contact with the whorl. Maximum of two applications per year.
- ***Corn (Field):*** Apply 19 to 37.6 grams per acre up to the 10 to 12 leaf stage. A second application of up to 37.6 grams per acre may be applied with drop nozzles if needed. Maximum of two applications per year.
- ***Proso (Crown) millet:*** Apply 14 to 19 grams per acre from the 2 leaf up to prior to head emergence. Maximum one application per year.

*** Note: not all varieties have been tested for tolerance. For untested varieties apply to a small area to determine tolerance prior to use on a large scale.**

† Applications to emerged weeds require the addition of a non-ionic surfactant with 80 percent or greater active ingredient content at the lowest labelled rate for the surfactant regardless of crop stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
Weeds controlled with pre-emergent soil applications of 14 to 19 grams per acre unless otherwise indicated:
- Annual sunflower
- Canada fleabane
- Chickweed (common)
- Cocklebur
- Common groundsel
- Corn spurry
- Creeping yellow cress
- Flower-of-an-hour
- Fringed (Northern) willowherb
- Hairy galinsoga
- Jimsonweed
- Lamb's-quarters
- Plantain (broadleaf)
- Pigweed (redroot, smooth)
- Prickly lettuce
- Purslane*
- Ragweed (common)
- Round-leaved mallow
- Shepherd's-purse
- Smartweed (Lady's-thumb, Pennsylvania)
- Spiny amaranth
- Stinking mayweed
- Wild mustard
- Wild radish
- Velvetleaf
- Volunteer canola (except CLEARFIELD varieties)
- Yellow nutsedge**

*** Suppression only**

**** Requires a rate of 28.3 to 37.6 grams per acre rate for suppression based on the maximum rate for each crop.**

Weeds controlled from the 3 leaf stage (unless otherwise indicated) to the maximum weed height indicated:

Weed	Maximum Weed Height (cm)	
	14 to 19 g/acre	28.3 to 37.6 g/acre
Annual sunflower	31	38
Bindweed (Hedge)*	5	10
Cocklebur	23	36
Common milkweed*	13	31
Corn spurry	5	10
Creeping yellowcress	5	10
Fleabane (Philadelphia)	8	8
Flower-of-an-hour	8	31
Hairy galinsoga	5	10

Weed	Maximum Weed Height (cm)	
	14 to 19 g/acre	28.3 to 37.6 g/acre
Horsetail*	5	10
Pigweed (redroot, smooth)	8	15
Ragweed (common)	23	31
Ragweed (giant)	8	15
Shepherd's-purse	5	10
Smartweed (Lady's-thumb, Pennsylvania)	5	10
Spiny amaranth	8	15
Wild mustard	8	15
Wild radish	8	15
Velvetleaf	23	31
Volunteer canola (except CLEARFIELD varieties)	8	-
Yellow nutsedge	8 to 15	8 to 31

*** Suppression only.**

Application Information:

- **Water Volume:** Minimum 40 to 55 L per acre. Use the higher volume when there is a heavy crop canopy or weeds are at an advanced stage.
- **Nozzles and Pressure:** Use 40 psi (275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE medium*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
halosulfuron	PRE, POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:

Moisture is necessary to activate the herbicide in soil for effective weed control. Dry weather following applications may reduce effectiveness. Extremes in environmental conditions such as temperature, moisture, soil conditions, and cultural practices may affect activity.

Optimum activity is experienced between 12 to 24° C when weeds are actively growing. Weeds may not be actively growing and as a result reduced activity will occur when temperatures are below 8° C or above 27° C.

Tank Mixes:

Herbicides:

- ***In dry beans:***
  - *Eptam Liquid EC* (1.72 to 2.12 L per acre) as pre-plant incorporated tank mix – see *Eptam Liquid EC* page for incorporation instructions.
- ***In field corn only:***
  - 2,4-D (label rates)
  - *Accent* (label rates)
  - *AAtrex* (label rates)
  - Dicamba (label rates)
  - Glyphosate in glyphosate tolerant corn only (label rates)

Insecticides: None registered.
NOTE: The application of foliar organophosphate insecticides to treated crops can increase the risk of crop injury.
Fungicides: None registered.
Fertilizers: UAN or high grade ammonium sulfate (21-0-0) may be used if a tank mix partner requires it as an additive.
DO NOT use liquid fertilizer as a spray carrier.
Note: The above mixes are those listed on the *Permit WG* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Activity of foliar applications may be reduced if rainfall or irrigation occurs within 4 hours. Pre-emergent surface applications will benefit from some rainfall but excessive rainfall (greater than 1 inch or 2.5 cm) shortly after application may result in injury, especially when seeding is shallow.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or cut corn for livestock greenfeed within 30 days of the last application. Allow 30 days for sweet corn and 65 days for popcorn or grain corn from the last application to foliage and the harvesting of silage. Proso (crown) millet may be grazed immediately after treatment. DO NOT cut proso (crown) millet for hay within 37 days of application or feed straw within 50 days of application.
- **Pre-harvest Interval:** DO NOT harvest dry beans within 30 days of post-emergent applications. DO NOT harvest proso (crown) millet within 50 days of application. There is no pre-harvest interval indicated for grain corn.
- **Re-cropping Interval:** Delay seeding the following crops for the interval indicated:
  - ***Dry common beans*** – no delay required
  - ***Field corn*** - 1 month
  - ***Cereals (wheat barley and oats)*** - 2 months
  - ***Potatoes, peas forage legumes and soybeans*** - 1 year
  - ***Canola and sunflowers*** - 2 years
  - Refer to label for all other crops including vegetable field crops.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place in original container.
- **Buffer Zones:**

Crop	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Proso (Crown) millet	10	4	15
Dry beans	10	5	20
Corn (sweet, pop)	15	5	30
Corn (field)	15	10	40

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

- Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:

Refer to Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Poison


Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Pinoxaden

Herbicide Group 1 - pinoxaden

Company:

Syngenta Canada (*Axial* with built in adjuvant; *Trondus* plus *Adigor Adjuvant*)
ADAMA Canada (*Brazen II* plus *Cohere Adjuvant*)
Nufarm Agriculture (*Epic* adjuvant sold separately; *Epic II* adjuvant sold seperately)
Interprovincial Cooperatives (*CO-OP Avant, IPCO Avant* plus *IPCO MSO Adjuvant*)
Sharda CropChem (*Pina* with built in adjuvant)
Advantage Crop Protection (*Advantage Pinoxaden*)
AgraCity (*Ace 50* with built in adjuvant)
Viking (*Viking Pinoxaden* with built in adjuvant))

Formulation:

***Axial* (PCP# 30431), *Pina* (PCP#34640), *Ace 50* (PCP#34668), *Viking Pinoxaden* (PCP#34956):** 50 g/L pinoxaden formulated as an emulsifiable concentrate.

- Container sizes - 2 x10 L, or 80 L, 400 L (*Axial* only)
- *Ace 50* - 2 x 10 L, 120 L, 480 L, 1000 L

***Brazen II* (PCP#33551); *Epic* (PCP#33603); *CO-OP Avant* (PCP#34378); *IPCO Avant* (PCP#34377); *Trondus* (PCP#33448); *Epic II* (PCP#34423); *Advantage Pinoxaden* (PCP#34865):** 100 g/L pinoxaden formulated as an emulsifiable concentrate.
-plus-
***Cohere Adjuvant* (PCP#33552 - for use with Brazen II); *IPCO MSO Adjuvant* (with *CO-OP/IPCO Avant* - PCP#33757 - for use with *CO-OP/IPCO Avant*); Adigor Adjuvant (PCP#28151 - for use with *Trondus*):** various blends of methylated seed oil and ethoxylated alcohols.

- Container sizes:
  - *Brazen II, CO-OP/IPCO Avant* - 9.71 L + *Cohere Adjuvant, IPCO MSO Adjuvant* 11.3 L
  - *Epic* - 2 x 9.72 L, 77.7 L (adjuvant sold separately)
  - *Trondus* - 9.7 L, 77.6 L + *Adigor Adjuvant* - 11.3 L, 90.4 L
  - *Advantage Pinoxaden* - 2 x 9.7 L (adjuvant sold seperately)

Crops and Staging:

All products:
Spring wheat* and durum (Epic, Epic II, Advantage Pinoxaden, CO-OP/IPCO Avant only), winter wheat (Axial and Pino only) and barley*,** – all products; winter wheat – Axial and Pina only; durum wheat - Epic, CO-OP Avant and Advantage Pinoxaden only: Up to the emergence of the flag leaf.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

***Axial* only:**
Forage grasses and legumes for seed production only:***

- Apply to seedling grasses at the 2 to 5 leaf stage:
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red)
- Apply to seedling legume forages at the 2 to 5 leaf stage.

****** NOTE:** Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Application is at the risk of the user.*

Weeds, Rates, and Staging:

Apply from the 1 to 6 leaf up to the emergence of the 4th tiller. Apply at the 2 to 3 leaf stage for optimum control.
***Brazen II, CO-OP/IPCO Avant, Epic, Epic II, Advantage Pinoxaden or* at 160 mL plus *Cohere Adjuvant (Brazen II)* at 283 mL per acre, *Carrier Adjuvant* (*Epic, Epic II, Advantage Pinoxaden* - sold separately) or *IPCO MSO Adjuvant* (*CO-OP/IPCO Avant*) at 500 mL per 100 L to control:**

- Persian darnel†

***Axial, Pina, Viking Pinoxaden* or *Ace 50* at 0.5 L per acre (no adjuvant required)* or *Brazen II, CO-OP/IPCO Avant, Epic, Epic II, Advantage Pinoxaden* or *Trondus* at 243 mL per acre plus a recommended adjuvant.**

- ***Adjuvants: Cohere Adjuvant (Brazen II)* or *Adigor Adjuvant (Trondus)* at 283 mL per acre, *Carrier Adjuvant* (*Epic, Epic II, Advantage Pinoxaden* - sold separately) or *IPCO MSO Adjuvant* (*CO-OP/IPCO Avant*) at 500 mL per 100 L:**
  - **Controls the weeds above plus:**
    - Barnyard grass
    - Foxtail (green, yellow)
    - Proso millet
    - Volunteer oats
    - Volunteer canary seed
    - Wild oats

*** DO NOT mix with any other adjuvant other than what is provided in the formulation.**
† *Brazen II, Epic, Epic II, Advantage Pinoxaden* and *CO-OP/IPCO Avant* only.
Maximum ONE APPLICATION per year of these or other products containing the active ingredient pinoxaden.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
  - ***Aerial:*** 12 L per acre.
- **Nozzles and Pressure:** 40 to 45 psi (275 to 310 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1

Effects of Growing Conditions:

DO NOT apply to crops that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury may result.

Weed control may be reduced if pinoxaden is applied under stress conditions such as drought, heat, insufficient fertility, flooding or prolonged cool temperatures.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Bromoxynil/MCPA (*Buctril M* and *Mextrol 450* only)†
- *Curtail M*
- Fluroxypyr + MCPA (*Trophy* only)†
- *Infinity*
- MCPA Ester† (0.34 to 0.45 L per acre - 500 g/L form)
- Florasulam/fluroxypyr + MCPA Ester§
- *Pixxaro* (*Axial* and *Ace 50* only)
- *Refine SG* + MCPA Ester***† (12 grams per acre + 0.23 to 0.28 L per acre)
- Thifensulfuron/tribenuron (*Refine SG* only)**

*** Always consult the label of the broadleaf herbicide prior to use.**
**** Addition of surfactants other than those included in or with pinoxaden are not required.**
***** Suppression only of green foxtail.**
† A reduction in barnyard grass control may be observed.
§ Check label for specific products.

Insecticides: None registered.

Fungicides:

- Propiconazole (*Tilt* only).

Fertilizers: None registered.

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Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of treatment may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave at least 60 days between treatment and harvest of grain and straw.
- **Grazing Restrictions:** DO NOT graze livestock within 7 days or cut for hay within 30 days of application.
- **Re-cropping Interval:** No restrictions the year following treatment. DO NOT seed any crops in the year of treatment following application (emergency re-crop).
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. May be frozen.

- **Buffer Zones:** Buffers are not required for hand-held and backpack applications.

Application method	Buffer Zones (metres†) Required for the Protection of Terrestrial habitat
Ground only*	1
Aerial by airplane or helicopter	25

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Caution – Poison


Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Pixxaro

Herbicide Group 4 - halauxifen, fluroxypyr, MCPA

Company:
Corteva Agriscience

Formulation:
The *Pixxaro* package contains the following components:
***Pixxaro A* (PCP#31303):** 16.25 g/L halauxifen and 250 g/L fluroxypyr present as ester and formulated as an emulsifiable concentrate.
- Container sizes - 1 x 4.9 L (case), 2 X 9.8 L (case - MCPA sold separately), 4 x 9.8 L (pallet)

***Pixxaro B/Plus M Ester 600* (PCP#29622):** 600 g/L MCPA Ester formulated as an emulsifiable concentrate.
- Container sizes - 1 x 9.45 L (case), 75.1 L (pallet)

Crops and Staging:
Wheat (spring, durum, winter) and barley: 3 leaf stage to just prior to emergence of the flag leaf.
Timothy, seedling and established for seed production only*: In the spring when weeds are actively growing at the 1 to 8 leaf stage.
*** NOTE:** Since applications to field and timothy have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. ***Application to timothy is at the risk of the user.***

Weeds and Staging:
Apply to actively growing weeds up to 10 cm high or wide unless otherwise specified:
- **Weeds controlled:**
  - American dragonhead† (up to bud stage)
  - Barnyard grass (up to 5 leaf, 2-tiller)
  - Burdock (prior to 4 leaf)
  - Canada thistle (up to 30 cm)*
  - Chickweed†††
  - Cleavers (1 to 9 whorl)
  - Cocklebur
  - Cow Cockle (up to 8 leaf or 15 cm)
  - Dandelion (rosettes up to 30 cm in diameter)*
  - Field horsetail*
  - Fleabane, Canada†
  - Flixweed
  - Hemp-nettle†††
  - Henbit† (up to bud stage)
  - Kochia†
  - Lamb's-quarters†††
  - Marshelder (false ragweed)
  - Mustard (ball, wild)
  - Nightshade†† (black, hairy and cutleaf/wild tomato)
  - Plantain, common
  - Prickly lettuce
  - Ragweed (common††, giant†††)
  - Redroot pigweed†††
  - Round-leaved mallow††
  - Shepherd's-purse (up to 20 cm)
  - Smartweed (green, lady's-thumb)*
  - Sow-thistle, annual* (up to 4 leaf)
  - Sow-thistle, perennial*††
  - Stinkweed
  - Stork's-bill†††
  - Velvetleaf (up to 5 leaf stage)
  - Vetch
  - Volunteer alfalfa (up to 25 cm)
  - Volunteer canola†††
  - Volunteer flax†
  - Wild buckwheat†††
  - Wild radish
  - Wild sunflower (annual)

*** Suppression only.**
† Up to 15 cm in height.
†† 1 to 6 leaf only.
††† 1 to 8 leaf stage.

Rates:

***Pixxaro A*:** 125 mL per acre.
***Pixxaro B*:** 235 to 283* mL per acre. Use the 283 mL per acre* rates for improved control of heavy infestations or larger redroot pigweed or smartweeds.
*** Note: Additional MCPA Ester must be purchased separately above what is indicated in "Container Size:" above to achieve this higher rate.**

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 to 80 L per acre.
  - ***Aerial:*** Minimum 12 L per acre.
- **Nozzles and Pressure:** Use 30 to 40 psi (200 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
MCPA	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Weeds and crops must be actively growing. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- ***Spring wheat (including durum) and barley:***
  - Fenoxaprop 120 EC (0.31 L per acre)
  - *Liquid Achieve*
  - *Puma Advance* (0.41 L per acre)
- ***Spring Wheat and Barley:***
  - *Axial*
- ***Spring Wheat (including durum):***
  - *Simplicity OD/Simplicity GoDRI*
  - Clodinafop 240 EC (93 mL per acre plus adjuvant)
  - *Horizon NG* (376 mL per acre)
  - *Traxos*

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***Wheat and barley:*** DO NOT graze livestock within 7 days of application. DO NOT cut for silage or hay within 21 days of application.
  - ***Timothy:*** DO NOT cut treated fields for hay/forage. DO NOT graze treated fields. DO NOT feed seed screenings and aftermath (straw, stubble) to livestock.
- **Pre-harvest Interval:** DO NOT harvest crops within 60 days of application.

- **Re-cropping Interval:** Winter wheat and fall rye may be seeded 3 months after application. Alfalfa, barley, canola, corn, dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types), faba bean, flax, field peas, mustard, oats, soybean, spring wheat, sunflower and timothy may be seeded the first spring following application. Lentils may be grown the second season after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store over winter in a heated, dry place in original container.
- **Buffer Zones:** Spot treatments using hand held equipment DO NOT require a buffer zone.

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Field sprayer*	Cereals	1	0	1
	Timothy	1	1	2
Aerial (Fixed wing)	Cereals	4	0	70
	Timothy	5	1	80
Aerial (Helicopter)	Cereals	1	0	55
	Timothy	5	1	65

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** The buffer zones for this product can be modified based on weather conditions and spray equipment configuration by accessing the 'Buffer Zone Calculator' on the Pesticides portion of the Canada.ca website.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Check the cleanout requirements of pesticides mixed with this product. Additional cleanout measures may need to be integrated into those provided here.

Hazard Rating:

***Pixxaro A*:**


Warning – Skin and Eye Irritant


Caution – Potential Skin Sensitizer

***Pixxaro B*:**


Warning – Poison

Refer to the Introduction for an explanation of the symbols.

Poast Ultra*

Herbicide Group 1 - sethoxydim

** **Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Company:

BASF Canada (PCP#24835)

Formulation:

450 g/L sethoxydim formulated as an emulsifiable concentrate.

- Container size - 2 x 7.7 L

Crops, Rates and Staging:

Crops are tolerant at all growth stages. However, the Preharvest interval outlined in the "Restrictions:" section must be followed to avoid unacceptable residues of sethoxydim in harvested crops.

To a maximum of 0.13 L per acre: Borage

To a maximum rate of 0.19 L per acre: Chickpea

To a maximum rate of 0.23 L per acre: Tame buckwheat

To a maximum rate of 0.26 L per acre:

- Alsike clover**
- Caraway
- Cicer milkvetch**
- Coriander
- Dill
- Safflower
- Sainfoin**
- Solin (low linolenic acid flax)
- Sweet clover**

**** Seedling stands.**

To a maximum rate of 0.45 L per acre:

- Alfalfa
- Alsike clover*
- Canola
- Chickling vetch
- Cicer milkvetch*
- Creeping red fescue (for seed only)
- Dry beans (kidney, pinto, white)
- Dry field peas
- Faba beans
- Fenugreek
- Flax (NOT including low linolenic acid flax)
- Lentil
- Lupin
- Mustard
- Potatoes
- Sainfoin*
- Shelterbelts
- Soybeans
- Sunflower
- Sweet clover*

*** Established stands.**

Weeds, Rates and Staging:

Optimum yield response occurs when weeds are controlled early.

Weeds and Stages	Staging	Rate (L per acre)
Green or yellow foxtail, barnyard grass, volunteer corn, Persian darnel, proso millet, witchgrass	1 to 6 leaf	0.13
Wild oats, volunteer wheat, oats and barley	1 to 6 leaf stage except for low rate (See footnote*)	0.13* or 0.19
Quackgrass suppression	1 to 3 leaf stage	0.19
Quackgrass (season long control)	1 to 3 leaf stage	0.45
Foxtail barley suppression	prior to tillering	0.45

*** Use the low rate in canola, flax and peas only under the following conditions:**

- **when wild oats, volunteer wheat and volunteer barley are from 1 to 4 leaves (best results prior to tillering)**
- **under ideal growing conditions (adequate moisture, good fertility and moderate temperatures (15 to 28°C). DO NOT apply under stress conditions.**
- **with water volumes between 20 to 40 L per acre.**

***Merge Adjuvant* (sold separately):** Must always be used with *Poast Ultra*. When *Poast Ultra* is applied alone use *Merge* at 0.5 L to 1.0 L per 100 L of total spray solution. When applying to quackgrass and/or foxtail barley use *Merge* at 1.0 L per 100 L of spray solution. See the tank mix section for *Merge* rates for tank mixing. *Merge* should be added at rates of 0.10 to 0.20 L per acre when applied by air.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre - 40 L to 81 L per acre if crop or weed growth is dense, and when spraying quackgrass.
  - ***Aerial:*** 10 to 20 L per acre.
- **Nozzles and Pressure:** Use 40 to 45 psi (275 to 300 kPa) with conventional 80° or 110° flat fan nozzles tilted forward at an angle of 45°. Low drift nozzles may require higher pressures for proper performance. Contact the herbicide manufacturer regarding the suitability of low drift nozzles for use with this product. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
sethoxydim	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward areas of growth (Symplast)	Grass only	1

Effects of Growing Conditions:

Most effective control is achieved when grasses are actively growing. Weeds stressed by drought, flooding, hot or prolonged cool temperatures (<15°C) and poor fertility are more difficult to control. Use the higher of the recommended rates for grasses stressed for less than 20 days. DO NOT apply to grasses stressed more than 20 days because of lack of moisture. Control may be reduced if temperatures are below 15°C. Subsequent tillering may occur under stress conditions or if fertility is low.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: The following tank mixes can be applied with 0.13 to 0.19 L per acre of *Poast Ultra*.

Merge Adjuvant (sold separately): Use at 0.75 to 1.0 L of *Merge* per 100 L of mixed spray solution for most mixes except when mixing with *Pursuit* use 1.0 L per 100 L of solution.

- ***In Flax:***
  - *Buctril M* (including solin).
  - *Logic M* (including solin).
  - MCPA Ester (up to 0.38 L per acre - 600 g/L formulations)
  - The above tank mixes may reduce grass control, especially under adverse weather conditions.
- ***In Canola:***
  - *Muster*
- ***In Liberty Link Canola only:***
  - *Poast Ultra* (0.09 L per acre) plus *Liberty* (1.08 L per acre)
- ***In Field Pea:***
  - ***Poast Ultra (0.19 L per acre) plus Merge (0.4 L per acre) may be tank mixed with:***
    - *Pursuit* (40 mL per acre) to control:
      - Chickweed
      - Cleavers
      - Hemp-nettle (peas only)
      - Redroot pigweed (light infestations only)
      - Smartweed
      - Stinkweed
      - Volunteer canola (non-CLEARFIELD varieties)
      - Wild buckwheat (light infestations only)
      - Wild mustard
        - The company does not provide guidelines for weed densities under light infestations. When in doubt, use the higher rate below or contact the manufacturer.
    - *Pursuit* (85 mL per acre) for all weeds on the *Pursuit* label.

Check label directions for mixing order and additional timing restrictions for broadleaf partners.

Allow 4 days between application of *Poast Ultra* and application of herbicides other than those registered for tank mixing. Allow 5 days between application of *Sencor* and *Poast Ultra*. Allow 14 days for regrowth when applied in sequence with a grass control herbicide.

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Poast Ultra* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for feed prior to crop maturity. Forage legumes may be cut after the specified
- **Preharvest interval:**

Preharvest Interval (Days)	Crop
30	Forage legumes (excluding alfalfa)
60	Dry peas, fenugreek, flax
65	Lentil, chickpea
70	Canola, chickling vetch, alfalfa, borage
76	Mustard
80	Potato, dry bean, soybean, faba bean, lupin
85	Buckwheat
86	Solin
90	Safflower
105	Sunflower

- **Re-cropping Interval:** DO NOT plant cereals or grass within 14 days of application.
- **Aerial Application:** May be applied by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Crop	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
Ground*	All	1	0	2
Fixed wing airplane	Food or feed crops	1	0	70
	Shelter-belts	5	0	150
Helicopter	Food or feed crops	1	0	60
	Shelter-belts	1	0	85

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† **Distance from downwind edge of spray boom and non-target area.**

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Empty and clean spray tank using this method if an oil film accumulates.

Hazard Rating:


Caution – Poison


Caution – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Predicade

This product is a prepackaged tank mix of Predicade Broadleaf *(equivalent to* Barricade II*),* Predicade Grass *(equivalent to* Varro*), and* MCPA Ester 600*. Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.*

Herbicide Group
2 - thifensulfuron/ tribenuron, thiencarbazone
4 - fluroxypyr, MCPA

Company:
FMC Corporation

Formulation:
The *Predicade* package contains the following components:
***Predicade Broadleaf* (PCP#31713):** 25% thifensulfuron methyl and 25% tribenuron methyl formulated as a soluble granule.
- Container size - 486 g

***Predicade Grass* (PCP#31735):** 10 g/L thiencarbazone-methyl formulated as a suspension concentrate.
- Container size - 8 L

***Perimeter II* (PCP#30094):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 3.4 L

***Albaugh MCPA Ester 600* (PCP#32311), ADAMA MCPA Ester 600 (PCP#34073), Nufarm MCPA Ester 600 (PCP#27803):** 600 g ae/L MCPA Ester formulated as an emulsifiable concentrate.
- Container size - 7.6 L

Crops and Staging:
Spring wheat (including durum):
Apply from the fully emerged 3 leaf to 6 leaf stage, with a maximum of three tillers, and before the first node can be felt in the stem. DO NOT apply beyond 35 days of seeding.
Winter wheat:
Spring application from the 3 tiller stage and before the first node can be felt in the stem. DO NOT apply after the presence of the first node as crop injury may occur.

Rates:
***Predicade Broadleaf*:** 12 grams per acre
***Predicade Grass*:** 200 mL per acre
Perimeter II: 85 mL per acre
***MCPA Ester 600*:** 190 mL per acre

Weeds and Staging:
Weeds controlled by *Barricade II* and *Varro* plus:
- Dandelion (spring and fall rosettes, up to 15 cm in diameter)
- Scentless chamomile
- Volunteer canola (all varieties) – 2 to 4 leaf
- White cockle

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Primextra II Magnum

Herbicide Group
15 - metolachlor
5 - atrazine

Company:
Syngenta Canada (PCP#25730)

Formulation:
400 g/L of s-metolachlor and 320 g/L of atrazine formulated as a liquid.
- Container size - 2 x 10 L

Crops and Staging:
Pre-plant incorporated or pre-emergent in corn. Pre-emergent applications of *Primextra II Magnum* require at least 0.5 inches of water (1.25 cm) within 10 days of application for proper activity.

Weeds and Staging:
Apply prior to the emergence of weeds. Weeds that have emerged prior to application will not be controlled.
- Barnyard grass
- Buckwheat
- Foxtail (green, yellow)
- Lamb's-quarters
- Nightshade (American, Eastern black)
- Pigweed (prostrate, redroot)
- Purslane
- Ragweed
- Smartweed (lady's-thumb)
- Wild mustard
- Witch grass
- Yellow nutsedge*

*** Herbicide must be incorporated for best control.**

Rates:

Weed Populations	Rate (L per acre)
Light infestations	1.2
Medium infestations	1.4
Heavy infestations	1.6

DO NOT apply *Primextra II Magnum* to:
- soils with less than 1 percent organic matter content
- soils with more than 10 percent organic matter content.

It is recommended that any products containing atrazine not be used in areas treated with this product during the previous season.

Application Information:
- **Water Volume:** 61 L per acre.
- **Pressure:** 30 to 45 psi (200 to 300 kPa).
- **Nozzles:** Flat fan.
- **Screens:** Use 50-mesh nozzle and main plumbing screens.
- **Incorporation:**
  - Incorporate using S-tine or C-tine cultivators or tandem disk. DO NOT incorporate deeper than 4 inches (10 cm).
  - To ensure that the product remains in the top 2 inches (5 cm) of soil, apply to a firm seedbed free of large clods or lumps. If using tandem disks, set disks to work the soil at a depth of 4 inches (10 cm) and operate at a speed of 6 km per hour (4 miles per hour). If using an S-tine cultivator, set the implement to work the soil to a depth of 4 inches (10 cm) and operate at a speed of 10 km per hour (6 miles per hour).

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
atrazine	PPI, PRE (surface) with residual soil activity	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (Apoplast)	Primarily broadleaf	5
metolachlor	PPI, PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Extended periods of dry soil conditions may result in reduced weed control. Moderate rainfall (0.5 inch) after application will enhance activity. Heavy rainfall following application of *Primextra II Magnum* may dilute the metolachlor deeper than 2 inches (5 cm) and result in reduced weed control, particularly on light textured soils.

Tank Mixes:

Herbicides: None registered.

Fertilizers: May be tank mixed with liquid fertilizer for pre-plant incorporated applications. Conduct a compatibility test by performing a jar test prior to mixing the products in the tank. May be impregnated onto dry bulk fertilizers (except nitrate or superphosphate fertilizers or limestone).

Note: The above mixes are those listed on the *Primextra* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Moderate rainfall shortly after application will enhance activity. Heavy rainfall reduces weed control by leaching the chemical out of the top few centimeters of soil. Inadequate rainfall after application (within 10 days) will cause reduced weed control.
- **Restricted Entry Interval:** DO NOT re-enter treatment area within 12 hours of application.
- **Grazing Restrictions:** DO NOT graze or cut corn for feed before ear emergence.
- **Re-cropping Interval:** This product contains atrazine. All crops except corn and triazine-tolerant canola may be affected the year following the use of atrazine. Other more sensitive crops may be affected two or more growing seasons after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a dry place.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic habitat	Terrestrial habitat
Ground only*	29	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- DO NOT mix or load this product within 30 metres of any sensitive aquatic habitats

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Ratings


Caution Poison


Caution – Eye Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Prominex

Herbicide Group 4 - halauxifen, clopyralid, fluroxypyr

Company:
Corteva Agriscience (PCP#34021)

Formulation:
4.7 g/L halauxifen , 97.8 g/L clopyralid and 122.2 g/L fluroxypyr formulated as a micro emulsion.
- Container size - 2 x 8.3 L, 99.4 L

Crops and Staging:
Spring wheat (including durum), winter wheat and barley: from 3 leaf stage to just prior to flag leaf emergence.

Weeds, Rates and Staging:
Apply 414 mL per acre 1 to 8 leaf stage, unless otherwise specified.

Weeds controlled:
- American dragonhead (up to bud and 15 cm)
- Barnyardgrass (up to 5-leaf, 2-tiller)
- Canada fleabane (up to 15 cm)*
- Canada thistle (rosette to pre-bud)
- Chickweed
- Cleavers (1 to 9 whorl)
- Common ragweed (up to 6 leaf)
- Cow cockle (up to 8 leaf and 15 cm)
- Flixweed (up to 8 leaf and 8 cm)
- Hemp-nettle
- Henbit (up to bud stage and 15 cm)
- Giant ragweed
- Kochia (up to 15 cm)
- Lamb's-quarters
- Nightshade (eastern black, hairy, cutleaf - up to 6 leaf)
- Pigweed, redroot
- Round-leaved mallow (up to 6 leaf)
- Shepherd's-purse (to bolting and 20 cm)
- Stork's-bill
- Velvetleaf (up to 5 leaf)
- Volunteer alfalfa (up to 25 cm)
- Volunteer flax (up to 15 cm)
- Wild buckwheat.

Weeds suppressed:
- Annual sow-thistle (up to 5 leaf)
- Wild mustard (1 to 4 leaf, up to 10 cm)

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 80 L per acre.
  - ***Aerial*:** Minimum 12 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** or larger droplets. Use a spray pressure of 30 to 40 psi (207 to 275 kPa) pressure when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance.

How it Works:
Refer to 'How Do Herbicides Work' in the Weed Control Section.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
clopyralid	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Extreme growing conditions such as drought or near freezing conditions prior to, at or following time of application may reduce weed control and increase risk of crop injury at all stages of growth. Under conditions of low crop and high weed density, control may be reduced.

Tank Mixes:

Herbicides:

- ***In all crops:***
  - MCPA ester
  - 2,4-D ester
- ***In wheat (spring, winter and durum):*** Alone or in mixture with 2,4-D or MCPA
  - *Simplicity OD* or *GoDRI,*
- ***In wheat (spring and durum only):*** Alone or in mixture with MCPA
  - *Horizon NG*
  - *Traxos*
- ***In wheat (spring and durum only) and barley:*** Alone or in mixture with 2,4-D or MCPA
  - *Liquid Achieve SC*
  - *Puma Advance*
- ***In wheat (spring NOT durum) and barley:*** Alone or in mixture with MCPA
  - Pinoxaden *(Axial, Trondus)*

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels for tank mix instructions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for at least 12 hours.
- **Preharvest Interval:** DO NOT harvest within 60 days of application.
- **Grazing Restrictions:** Livestock may be grazed 7 days after application. DO NOT cut the treated crop for hay or silage within 21 days of application.
- **Re-cropping Interval:** Spring wheat, barley, oats, canola, corn, soybeans, flax, field peas, mustard, timothy can be grown 10 months after application. Very dry soil conditions following application can result in a risk of injury to soybeans or field peas. If severe drought conditions are experienced during the months of June to August inclusive (less than 140 mm of rainfall) in the year of application, delay seeding of soybeans and field peas until 22 months after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in original containers in a secure, dry heated storage.
- **Buffer Zones:** Avoid spraying in situations where drift may occur. DO NOT apply during periods of dead calm.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic habitat		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	2
Fixed wing aircraft	10	1	125
Helicopter	5	1	95

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Tank Cleaning:

This product utilizes a combination of 'Method A' and 'Method B' for cleanout requiring the use of All Clear Spray Tank Decontaminator for the tank plus ammonia for nozzles screens and filters for the second rinse. Refer to the general section on sprayer cleaning in introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Ratings

 Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Prospect

Herbicide Group
4 - halauxifen
14 - carfentrazone

Company:
Corteva Agriscience (PCP#33635)

Formulation:
15 g/L halauxifen plus 27.97 g/L carfentrazone formulated as an emulsifiable concentrate.
- Container size - 2 x 10.8 L case

Crops and Staging:
Prior to seeding canola, flax, mustard (Oriental, brown, yellow), soybeans, field peas, field corn, spring wheat, durum wheat and barley.

Weeds and Staging:
Alone *Prospect* will control the following broadleaf weeds from the 1 to 8 leaf stage unless otherwise indicated:
- American dragonhead (up to bud stage and 15 cm in height)
- Barnyard grass (up to 5 leaf, 2-tiller stage)
- Canada fleabane (up to 8 leaf and less than 10 cm in height)
- Chickweed
- Cleavers (up to 25 cm in size)
- Cow cockle (up to 8 leaf and 15 cm in height)
- Dandelion (suppression of rosettes up to 15 cm)
- Flixweed (up to early stem extension and 10 cm)
- Hemp-nettle
- Henbit (up to bud stage and 15 cm in height)
- Lamb's-quarters
- Nightshade, Eastern black
- Redroot pigweed
- Round-leaved mallow (up to 6 leaf)
- Shepherd's-purse (up to bolting and 20 cm high)
  Stinkweed (suppression up to the bud stage)
- Velvetleaf (up to the 5-leaf stage)
- Volunteer alfalfa (up to 25 cm tall)
- Waterhemp (up to 5 cm tall)
- Wild buckwheat (suppression)

Prospect plus glyphosate 180 g ae per acre will control the weeds above plus the weeds controlled by glyphosate at 180 g ae per acre plus the following from 1 to 8 leaves unless otherwise indicated:
- Dandelion (rosettes up to 15 cm)
- Flixweed (up to early stem extension and 20 cm)
- Kochia*
- Lady's-thumb
- Stinkweed (up to the bud stage)
- Volunteer canola (all varieties up to 5 leaf)
- Wild buckwheat (up to 6 leaf)

*** Light to moderate infestations of kochia (up to 150 plants per square metre; up to 15 cm in height).**

Rates:
***Prospect* Alone:** 135 mL per acre plus a methylated seed oil at 0.5 L per 100 L.
***Prospect* plus glyphosate:** Rates above plus at least 180 g ae per acre or up to 1020 g ae per acre of glyphosate. Adjuvant is not required when mixing with glyphosate. See glyphosate page for weeds controlled at higher glyphosate rates.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets by ground. Sprayers without drift reduction nozzles should use between 30 to 40 psi (200 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
carfentrazone	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14

Effects of Growing Conditions:
Prospect must be applied prior to seeding of the crop, in tank-mix with glyphosate, to the main flush of actively growing broadleaf and grassy weeds. Warm, moist growing conditions promote active weed growth and enhances activity by allowing maximum foliar uptake and activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. For best results, ensure thorough spray coverage of target weeds.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: Glyphosate.
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Prospect* label only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Preharvest Interval:** Canola may be harvested 60 days or more after application.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 21 days after treatment.
- **Re-cropping Interval:** Fields previously treated with *Prospect* can be seeded after a minimum of 10 months to spring wheat, barley, oats, canola, field corn, soybeans, sunflowers, flax, field peas, potatoes (except seed potatoes), mustard, alfalfa, dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types) and timothy or fields can be summerfallowed. Lentils can be planted 22 months after application of *Prospect Herbicide*. Fall rye and winter wheat can be planted 3 months after application of *Prospect Herbicide*.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in a secure, dry heated storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic habitat		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Ratings

 Warning – Contains the Allergen Soy
Refer to the Introduction for an explanation of the symbols.

Quinclorac

Herbicide Group
4 - quinclorac (broadleaf)
26 - quinclorac (grass)

Company:

BASF Canada (*Facet L*)
Farmers Business Network Canada (*Clever*)
Advantage Crop Protection (*Ingenious*)

Formulation:

***Clever* (PCP#31365); *Ingenious* (PCP#32213):** 75% percent quinclorac formulated as a water dispersible granule (WDG).

- Container size - 10 x 1 kg bags

***Facet L* (PCP#31539):** 180 g/L quinclorac formulated as a solution.

- Container size - 2 x 9.07 L

Crops, Rates and Staging:

Merge adjuvant (purchased separately) must be used at 0.5 to 1 L per 100 L of spray solution to control for all products and rates.

Pre-emergent surface:

Facet L at 227 to 280 mL per acre may be mixed with or without glyphosate and applied prior to the seeding of canola.

Post-emergent:

Quinclorac 75 percent WDG at 54.6 grams per acre or *Facet L* at 227 mL per acre may be applied post-emergence to:

- Barley - 1 to 4 leaf (prior to tillering)* (*Facet L* only may be used on barley for human consumption).
- Canola (all varieties) - Up to 6 leaf for *Facet*; 2 to 6 leaf for Quinclorac 75% WDG formulations.

Quinclorac 75 percent WDG only at 54.6 grams per acre acre may be applied post-emergence to:

- Mustard (brown, oriental and oil quality *Brassica juncea*) - 2 to 6 leaf.

Quinclorac at 54.6 to 66.7 grams per acre or *Facet L* at 227 to 280 mL per acre may be applied post-emergence to:

- Canaryseed - 3 to 5 leaf *†.
- Spring wheat (including durum) - 1 to 5 leaf.

*** Not for use on crops for human consumption.**

† Not for use on crops for livestock consumption.

DO NOT apply products that contain quinclorac more than once every two years. When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Pre-emergent surface:

Facet L applied at 227 mL per acre will control emerged weeds listed below, plus suppression of secondary flushes of cleavers emerging from seed.

Facet L applied at 280 mL per acre will control emerged weeds listed below, plus plus control of secondary flushes of cleavers and green foxtail emerging from seed.

Post-emergent:

Apply *Quinclorac* at 54.6 to 66.7* grams per acre or *Facet L* at 227 to 280* mL per acre plus *Merge* adjuvant (purchased separately) at 1 L per 100 L of spray solution to control:

Grasses:

- Barnyard grass (1 to 5 leaves)
- Green foxtail* (1 to 5 leaves, up to 2 tillers)

Broadleaves:

- Cleavers (1 to 3 whorls), (1 to 6 whorls for *Facet L* when tank mixed with *Liberty 150SN*)
- Volunteer flax (1 to 8 cm)
- Sow-thistle (annual and perennial – 2 to 6 leaf)**

*** Use the high rate for heavy infestations of green foxtail only. For clarification of what constitutes a heavy infestation contact the manufacturer.**

**** Suppression only.**

DO NOT apply products that contain quinclorac more than once every two years.

Early treatment of weeds is important to maximize crop yield potential by eliminating early weed competition. Refer to broadleaf tank mix partner for additional timing restrictions.

Application Information:

- **Water Volume:** Minimum 45 L per acre.
- **Nozzles & Pressure:** 40 to 60 psi (275 to 425 kPa) when using standard flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage ***ASABE fine*** droplets or larger. Flat fan nozzles may be tilted forward 45 degrees to improve coverage on vertical surfaces (i.e. grasses).
- **Screens:** Use 50 mesh or coarser on both nozzle and primary plumbing screens

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Quinclorac	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
		Cellulose Synthesis Inhibitor	Throughout the plant (Symplast)	Grass only	26

Effects of Growing Conditions:

DO NOT apply to crop that is under stress from conditions such as frost, hail, flooding, drought or extremes in temperature. Cool weather may delay weed control and if prolonged may result in poor weed control.

Tank Mixes:

Herbicides: When mixing with broadleaf partners a slight reduction in green foxtail control may result. If spraying for green foxtail, use the high rate of Quinclorac. Add *Merge* adjuvant at 1 L per 100 L spray solution for all tank mixes.

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

In spring wheat (including durum) only:

- 2,4-D amine or ester (160 to 212 g ae per acre)
- *Buctril M*
- MCPA amine or ester (0.34 to 0.45 L per acre - 500 g/L formulations)
  - Refer to individual product labels for application details such as staging and varietal restrictions.

In canola only:

- Pre-emergent surface – *Facet L* at 227 to 280 mL per acre may be mixed with glyphosate at 180 to 325 g ae per acre (see glyphosate page for product rates).
- Post-emergent - Quinclorac 75 percent WDG at 25 grams per acre or *Facet L* at 170 to 227 mL per acre may be mixed with:
  - Glyphosate at rates registered in glyphosate tolerant canola varieties only
  - *Ares SN* in CLEARFIELD canola varieties only (*Facet L* only).
- Post-emergent in *Liberty Link* canola Quinclorac 75 percent WDG at 25 grams per acre or *Facet L* at 113 to 227 mL per acre may be mixed with:
  - *Liberty 150SN* - up to 1.62 L per acre
  - *Liberty 150SN* - up to 1.35 L per acre, plus clethodim (*Centurion* only) at 50 to 75 mL per acre (*Facet L* only).

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

Note: Allow 4 days between the application of Quinclorac and any other chemical not listed as a tank mix.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours after application.
- **Grazing Restrictions:** DO NOT graze or cut for feed within 77 days of application. DO NOT graze canaryseed or use for consumption by livestock. DO NOT graze or cut treated canola crops for feed. Canola meal may be fed.
- **Pre-harvest Interval:** DO NOT harvest wheat or canaryseed within 77 days of application. DO NOT harvest canola or mustard within 60 days of application. DO NOT harvest spring barley within 80 days of application.
- **Re-cropping Interval:** In case of crop failure, only barley, canola or spring wheat (including durum) may be reseeded the same year. Barley, canola, field peas, oats, sunflowers and wheat may be grown the year after application. Flax and lentils may be grown the second year after application. On low organic matter soils or under dry conditions, flax and lentils should not be grown until the third year after application. DO NOT use Quinclorac on land where potatoes or vegetables are grown.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen. Should product freeze, warm to room temperature before using.

- **Buffer Zones:**

Application method	Application Rate		Buffer Zones (metres†) Required for the Protection of:	
	75WDG (g/acre)	*Facet L* (mL/acre)	Aquatic habitat	Terrestrial habitat
Wheat, canaryseed	67	270	10	4
Canola, mustard**, barley, wheat, canaryseed	55	227	10	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** 75% WDG formulations only.**
† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
Caution – Poison

Caution – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Quizalofop

Herbicide Group 1 - quizalofop

Company:
AMVAC (*Assure II*)
Gowan Canada (*Yuma GL Liquid EC*)
Interprovincial Cooperative Limited (*COOP/IPCO Contender II*)
AgraCity (*Quiz*)
Nufarm Agriculture (*Idol*)
ADAMA (*Leopard, ADAMA Quizalofop*)
Sharda (*Elegant 10EC*)
WinField United (*Marshall**)
BASF (*Caziva Ultra Q* – only available in *Odyssey Ultra Q* or *Solo Ultra Q* packs)
Viking (*Viking Quizalofop*)

* ***Note:*** *The marked product is no longer manufactured but some may remain in the distribution system. This product will be removed from future editions when supplies are exhausted.*

Formulation:
Assure II **(PCP#25462),** ***Yuma GL*** **(PCP#30100),** ***COOP/IPCO Contender II*** **(PCP#33961/PCP#33960),** ***Quiz*** **(PCP#33481),** ***Idol*** **(PCP#33906),** ***Elegant 10EC*** **(PCP#33617),** ***Marshall*** **(PCP#33681),** ***Caziva Ultra Q*** **(PCP#34282),** ***Viking Quizalofop*** **(PCP#34759):** 96 g/L quizalofop-P-ethyl formulated as an emulsifiable concentrate.

- Container sizes:
  - *Assure II* + *Sure-Mix* Adjuvant - 8 L + 8 L, 96 L + 96 L, or 500 L + 500 L
  - *Yuma GL Liquid EC, Elegant 10EC, Viking Quizalafop* - 2 x 8 L *(adjuvant purchased separately)*
  - *COOP/IPCO Contender II* + *IPCO MSO Adjuvant* - 8 + 8 L
  - *Quiz* - 2 x 8 L, 96 L, 500 L (adjuvant purchased separately)
  - *Idol* - 2 x 8 L (Carrier adjuvant sold separately)
  - *Marshall* - 2 x 10 L (adjuvant sold separately)
  - *Caziva Ultra* - see *Odyssey Ultra Q* and *Solo Ultra Q*

Leopard **(PCP#33715) and** ***ADAMA Quizalofop*** **(PCP#34935):** 100 g/L quizalofop-P-ethyl formulated as an emulsifiable concentrate.

- Container size - 2 x 7.8 L

Crops and Staging:

Annual Crops: Where there is no leaf stage restriction do not apply beyond the pre-harvest interval listed in the table:

Crop	Preharvest Interval (Days)	Max Leaf Stage
Camelina*	64	
Canola	64	
Chickpea	85	
Dry bean*†	30	
Ethiopian mustard (*Brassica carinata*)*	64	
Faba bean*§	30	
Flax or solin (low linolenic acid flax)	82	
Hemp (for fibre, seed, or oil)*	73	6 leaf (up to 25 cm)
Lentil§	65	
Oriental mustard (condiment types and oilseed quality *Brassica juncea*)	64	
Pea (field)§	65	
Soybean§	80	
Sunflower*††§	60	8 leaf
Yellow and brown mustard	64	

† **NOTE: While Quizalofop has been registered for use on all dry field bean types not all types have been tested for tolerance. When using Quizalofop on a new dry bean type or variety for the first time evaluate tolerance on a small area first before applying large acreages and check with seed supplier for variety sensitivity.**

†† ***Assure II, CO-OP/IPCO Contender II, Elegant, Marshall*** **and** ***Yuma GL Liquid EC*** **only.**

§ ***Caziva Ultra Q*** **for use on marked crops only.**

Forage Crops (seed production only):

- ***Seedling or Established:*** Alfalfa, clover (alsike, red, sweet)*, sainfoin*, bird's-foot trefoil*, creeping red fescue.
- ***Seedling only:*** Clover (white)*
- ***Established only:*** Cicer milkvetch*

**** NOTE: Since applications to these crops have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to these crops is at the risk of the user.***

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Apply Quizalofop according to weed stage below to the maximum rates of 0.3 L per acre for all crops except Ethiopian mustard (*B. carinata*) where the maximum rate is 0.2 L per acre.

Add one of the following registered adjuvants to the spray tank when applying:

- ***Assure II*** **only:** *Sure-Mix* or a Methylated Seed Oil (MSO) type adjuvant (0.5 L per 100 L of spray solution), *LI700* (0.25 to 0.5 L per 100 L of spray solution), or *Merge* (0.5 to 1.0 L per 100 L of spray solution)
- ***COOP/IPCO Contender II:*** *Merge* or *IPCO MSO Adjuvant* (0.5 to 1.0 L per 100 L of spray solution), *Sure-Mix* (rates above), *LI 700* (0.25 to 0.5 L per 100 L of spray solution) or *Liberate MSO Adjuvant* (rates above)
- ***Yuma GL Liquid EC*** **or** ***Quiz:*** *Merge* or *XA Oil Concentrate* (0.5 to 1.0 L per 100 L of spray solution), or *MSO adjuvant* or *Sure-Mix* (0.5 L per 100 L of spray solution)
- ***Viking Quizalofop:*** *Merge* (0.5 to 1.0 L per 100 L of spray solution), or *Sure-Mix* (0.5 L per 100 L of spray solution)

Use the higher rate *of XA Oil Concentrate* when wild oats or quackgrass are present in the field or when growing conditions are poor.

Weed	Stage	Rate (L per acre)	
		96 g/L forms	Leopard and ADAMA Quizalofop
Green foxtail	2 leaf to early tillering	0.15	0.148
Volunteer wheat, barley, oats*	2 leaf to early tillering		
Volunteer corn	2 to 6 leaf stage		
Wild oats	1 to 5 leaf (without tillers)		

Weed	Stage	Rate (L per acre)	
		96 g/L forms	Leopard and ADAMA Quizalofop
Wild oats*	up to 2 tillers	0.20	0.194
Barnyard grass, yellow foxtail, proso millet, old witchgrass	2 leaf to early tillering		
Quack grass suppression	2 to 6 leaf stage		
Foxtail barley	3 to 4 leaf max 3 tillers		
Downy† and Japanese†† brome	2 to 5 leaf stage		
Quack grass season long control	2 to 6 leaf stage	0.30	0.291

*** Best results are likely to occur if applications are made before tillering begins. Apply at the 2 to 3 leaf stage for optimum control.**
† Except *Quiz*, *Idol* and *Viking Quizalofop*.
†† Except *Elegant*.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre. Up to 162 L per acre of water may be used under heavy populations to improve coverage.
  - ***Aerial:*** Minimum 10 L per acre to a maximum of 20 L per acre.
- **Nozzles and Pressure:** 30 to 40 psi (210 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
quizalofop-p-ethyl	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward areas of growth (Symplast)	Grass only	1

Effects of Growing Conditions:

Crop injury may occur if crops are stressed because of drought or flooding. Less than acceptable weed control may be expected if weeds are under stress because of drought, flooding or cool weather.

Tank Mixes:

Herbicides:

- ***In Canola:***
  - *Muster* (8 to 12 grams per acre) plus adjuvant.
- ***Glufosinate tolerant canola (Liberty Link) only:***
  - *Liberty 150 SN** (0.54 to 1.6 L per acre) plus *Sure-Mix, LI 700* or MSO adjuvants, including *Liberate** or *IPCO MSO*.
- ***In Dry Bean (Pinto, Pink, Great Northern, Small Red):***
  - *Basagran* (label rates with Quizalofop at 0.25 L per acre plus *Sure-Mix* adjuvant).
- ***In Oriental Mustard (B. juncea condiment and oilseed):***
  - *Muster* (8 grams per acre plus Quizalofop at 0.15 to 2.0 L per acre plus adjuvant). DO NOT use on yellow mustard as injury will result.
- ***In Soybean:***
  - *Pinnacle* (2.2 to 3.3 grams per acre).
  - *Pinnacle* (2.2 to 3.3 grams per acre) plus *Basagran Forté* (label rates) plus Quizalofop (0.25 L per acre) plus *Sure-Mix* adjuvant.
- ***In Tribenuron Tolerant Sunflowers:***
  - *Express SG* (6 grams per acre) plus *Sure-Mix* or *Merge*** adjuvants.
- ***In Established creeping red fescue for seed:***
  - *Ally* (label rates) plus Quizalofop (0.2 to 0.3 L per acre) plus adjuvant.
- Allow 24 hours after application before applying a broadleaf herbicide. If the broadleaf herbicide is applied first, wait 7 days before application of Quizalofop.

Insecticides: None registered.
Fungicides: None registered.
Fertilizers: None registered.

Note: The above mixes are those listed on the Quizalofop labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** 4 days for camelina and 12 hours for all other crops.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for feed in the year of treatment.
- **Pre-harvest Interval:** See 'Crops and Staging' chart above.
- **Re-cropping Interval:** No restrictions the year after treatment.
- **Aerial Application:** May be applied by air when used alone.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**

Rates (L per acre)	Application method	Buffer Zones (metres†) Required for the Protection of:		
		Aquatic Habitats of Depths		Terrestrial habitat
		Less than 1 m	Greater than 1 m	
All rates	Ground *	1	0	3
Up to 0.15	Winged aircraft	0	0	70
	Helicopter	0	0	55
Up to 0.20	Winged aircraft	0	0	85
	Helicopter	0	0	70
Up to 0.30	Winged aircraft	1	0	125
	Helicopter	1	0	100

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones for ground applications can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

Cleanout is recommended but no specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Leopard:


Caution – Poison

Other Products:


Danger – Corrosive to Eyes

Skin Irritant, Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Reclaim II / ClearView

Herbicide Group
2 - metsulfuron
4 - aminopyralid, 2,4-D

Company:
Corteva Agriscience

Formulations:
***Reclaim II A* (PCP#30062); *ClearView* (PCP#29752):** 52.5% aminopyralid + 9.45% metsulfuron methyl formulated as a water dispersible granule.
- Container size - 1.84 kg

***Reclaim II B* (PCP#30063):** 660 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 2 x 6.48 L

NOTE: Limited availability through selected retail outlets.

Crops and Staging:
Rights of way, industrial and non-crop areas (*ClearView* only), rangeland and pastures - Apply in spring or early summer.
Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow. Avoid use in these situations.

Weeds, Rates and Staging:
Application timing is critical for weed control. For optimum weed control apply when weeds are emerged, young and actively growing in the vegetative stage for proper translocation and systemic weed activity.
Maximum of 49 g ae (active ingredient) per acre of *Reclaim II* (equivalent of 93 g product per acre) or other product containing aminopyralid (*Restore II, Milestone, Clearview, Sightline*) per season. Treated areas should not receive more than 49 g ae per acre a product containing aminopyralid the year after initial treatment.
Add a surfactant such as *Gateway*, or non-ionic adjuvant such as *Ag-surf, Agral 90*, or *Cittowet Plus* at 0.2 L per 100 L of spray solution after adding *Reclaim II/ClearView* components.

Weeds controlled by *Clearview* at 55 g per acre:
- Bluebur
- Buckwheat (tartary, wild[§])
- Bull thistle
- Canada fleabane
- Canada goldenrod[§]
- Canada thistle*[§§]
- Chickweed
- Clover
- Common groundsel
- Common ragweed
- Common tansy
- Corn spurry
- Cow cockle
- Dandelion (*Clearview*[†§§§], *Reclaim II*[††])
- Field scabious
- Flixweed
- Hemp-nettle
- Horse-nettle
- Knapweed (spotted)
- Lamb's-quarters[§]
- Musk or nodding thistle
- Mustard (ball, wild)
- Narrow-leaved hawk's-beard
- Oxeye daisy (pre-bud)
- Pigweed (prostrate)
- Russian thistle
- Scentless chamomile[†]
- Shepherd's-purse
- Smartweed (green, lady's-thumb)
- Sow-thistle (perennial)
- Stinkweed
- Stork's bill
- Sweet clover
- Tall buttercup
- Volunteer canola
- Yellow star-thistle

Shrubs
- Western snowberry (buckbrush)

***Reclaim II A* at 55 g per acre plus *Reclaim II B* at 0.69 L per acre; or *Clearview* at 55 g per acre plus 2,4-D Amine 340 to 445 g ae per acre at provides season long control of the weeds above, plus the weeds controlled by 340 to 445 g ae of 2,4-D, plus the following weeds unless indicated otherwise:**
- *Weeds controlled or suppressed by* Clearview *above plus:*
  - Absinthe
  - Biennial wormwood (*Reclaim II* only)
  - Canada goldenrod
  - Dandelion[††]
  - Gumweed (topgrowth)
  - Hawkweed
  - Knapweed (Russian)
  - Pasture sage
  - Tumbleweed (*Reclaim II* only)
  - Wild strawberry[††]

  Shrubs
  - Silverberry (wolf willow)

Weeds controlled by *Clearview* at 69 g per acre:

- *Weeds controlled by* Clearview *above plus:*
  - Absinthe[§]
  - Canada thistle[†§§§*]
  - Cudweed
  - Curled dock
  - Fireweed
  - Hoary alyssum
  - Perennial pepperweed
  - Western (perennial) ragweed
  - Pasture sage[§§]
  - Prairie sage[†]
  - Pussy toes
  - Volunteer alfalfa
  - Wild carrot
  - Wild strawberry[††]

  Shrubs
  - Prairie wild rose[§§§]
  - Western snowberry (buckbrush)[†]

***Reclaim II A* at 69 g per acre plus *Reclaim II B* at 0.69 L per acre; or *Clearview* at 69 g per acre plus 2,4-D Amine 340 to 445 g ae per acre at provides season long control of the weeds above plus the weeds controlled by 340 to 445 g ae of 2,4-D plus the following weeds unless indicated otherwise:**

- *Weeds controlled by* Clearview *above plus:*

  Shrubs
  - Shrubby cinquefoil[††]

Weeds controlled by *Clearview* at 81 g per acre:

- *Weeds controlled by* Clearview *above plus:*
  - Baby's-breath
  - Black henbane
  - Canada thistle*[††]
  - Cleavers
  - Pasture sage[†]
  - Wild caraway
  - Wild parsnip

  Shrubs
  - Prairie wild rose[††]
  - Silverberry (wolf willow)[††]
  - Western snowberry (buckbrush)[††]

***Reclaim II A* at 81 grams per acre plus *Reclaim II B* at 0.69 L per acre; or *Clearview* at 81 g per acre plus 2,4-D Amine 340 to 445 g ae per acre at provides season long control of the weeds controlled by *Clearview* above plus the weeds controlled by 340 to 445 g ae of 2,4-D plus the following weeds unless indicated otherwise.**

Weeds controlled by *Clearview* at 93 g per acre:

- *Weeds controlled by* Clearview *above plus:*
  - Absinthe
  - Knapweed (Brown, diffuse**)
  - Hawkweed (orange[†], yellow)***
  - Hoary cress
  - Hound's-tongue
  - Mullein
  - Prairie sage[††]
  - Prickly lettuce
  - Purple loosestrife
  - Yarrow[§]

  Shrubs
  - Shrubby cinquefoil[††]

Weeds controlled by *Reclaim II A* at 93 grams per acre plus *Reclaim II B* at 0.69 L per acre; or *Clearview* at 93 g per acre plus 2,4-D Amine 340 to 445 g ae per acre at provides season long control of the weeds controlled by *Clearview* above plus the weeds controlled by 340 to 445 g ae of 2,4-D plus the following weeds unless indicated otherwise.

[§] Season long suppression only.
[§§] Suppression up to 12 months from application.
[§§§] Suppression up to 24 months from application.
[†] Controlled up to 12 months from application.
[††] Controlled up to 24 months after application. DO NOT retreat again in year after treatment.
*** Removal of competing vegetation may result in new Canada thistle shoots emerging.**
**** Apply when plants are actively growing with the optimum time of application occurring from rosette to the bolting stages of development or in the fall. Use of the highest application rate improves or extends the duration of control.**
***** Apply to plants in the bolting stage of development.**

Individual plant or Spot/Strip Applications:

- ***Clearview:*** 1.35 to 2.3 grams plus 20 mL surfactant such as *Gateway, Ag-Surf, Agral 90* or *Citowett* per 10 L of spray solution.
- ***Reclaim II:*** 2.3 grams of *Reclaim II A* plus 17 mL of *Reclaim II B* plus 20 mL of surfactant such as *Gateway Adjuvant, Ag-Surf, Agral 90* or *Citowett Plus* per 10 L of spray solution.

Application Information:

- **Water Volume:**
  - ***Ground:*** 80 L per acre minimum.
  - ***Aerial:*** 20 L per acre minimum. For better coverage apply at 50 L per acre.
- **Nozzles and Pressure:** Use a combination of application equipment and pressures that will apply ***ASABE coarse*** droplets in a uniform pattern. Drift of even small amounts of *Reclaim II* into sensitive plants or areas where sensitive crops may be grown can cause injury. DO NOT apply under conditions prone to drift (i.e. high winds, dead calm, or temperature inversions).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron-methyl	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf only	2
aminopyralid	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Application should be avoided when pasture and targeted weeds are under stress of drought, excess moisture, extreme heat or cold or other environmental stresses. Target weeds must be actively growing. Avoid applications when temperatures exceed 28°C.

Tank Mixes:

Herbicides:

- ***Reclaim II:*** *Grazon XC* (1.0 L per acre)
- ***Clearview:***
  - ***Permanent grass areas:*** 2,4-D
  - ***Bare ground only:***
    - Glyphosate (a surfactant is required)
    - *Arsenal*

Note: The above mixes are those listed on the *Reclaim II* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours.
- **Grazing Restrictions:**
  - ***Clearview alone:*** Grazing not restricted for livestock or lactating dairy animals.
  - ***Reclaim II:*** DO NOT allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated areas and feed untreated feed for at least 3 days before slaughter. DO NOT harvest forage or cut hay within 30 days of application.
  - ***Both products:*** Allow 3 days of grazing on untreated pasture or feed untreated hay before transferring livestock to areas where sensitive broadleaf crops may be grown, since feces and urine may contain the herbicide.
- **Re-cropping Interval:** DO NOT apply to pastures where legumes are an essential component. DO NOT break up treated pasture and plant to sensitive broadleaf crops for at least 3 years after application. Conduct a field bioassay prior to planting.
- **Aerial Application:** May be applied by air.
- **Storage:** Store product in original, labeled containers in a secure, dry, cool area. DO NOT freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic habitat	Terrestrial habitat
Ground*	10	15
Fixed wing airplane	80 to 175**	250 to 750**
Helicopter	70 to 150**	175 to 650**

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

**** Distance varies depending on spray droplet size. Consult the *Clearview/Reclaim II* labels to determine buffer zone size when applying by air.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

- DO NOT apply this product directly to any water body or mix or load near water or wells. DO NOT apply when heavy rains are forecast or on moderate to steep slopes toward sensitive areas or to light soils with shallow water table. Contact the provincial environment department for additional permits to apply near water.

Sprayer Cleaning:
Refer to 'Method A' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product such as *All Clear* or *Clean Out* spray cleaner. The inclusion of detergent in 'Method B' may provide improved cleaning. Contact the manufacturer for more information.

Hazard Rating:
Clearview/Reclaim II A:

 Caution – Eye Irritant

Reclaim II B:

 Caution – Poison

 Warning – Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Reflex*

Herbicide Group 14 - fomesafen

** For use only in the Red River Valley of Manitoba.*

Company:
Syngenta Canada (PCP#24779)

Formulation:
240 g/L fomesafen formulated as a solution.
- Container size - 10 L

Crops and Staging:
Apply *Reflex* at 235 mL per acre at the 1 to 2 trifoliate leaf stage of the following crops:
- **Soybeans:** Apply only as a tank mix with *Basagran* at 0.71 L per acre plus *Agral 90* at 1 L per 1000 L of spray solution or as a mix with glyphosate at registered rates in glyphosate tolerant soybean.
- **Dry beans*:** Apply only as a tank mix with *Basagran* at 0.71 L per acre per acre plus *Agral 90* at 1 L per 1000 L of spray solution.

**** NOTE - Since applications to dry beans in the Red River Valley has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to dry beans is at the risk of the user.***

DO NOT use before the 1st trifoliate leaf stage or increased risk of crop injury may result.

Maximum ONE APPLICATION EVERY TWO CONSECUTIVE YEARS of *Reflex* or other products containing the active ingredient fomesafen.

Weeds, Rates and Staging:
Broadleaf weeds controlled by *Basagran* at the 0.71 L per acre rate or glyphosate at registered rates in glyphosate tolerant soybeans plus improved control of the following weeds up to the 4-leaf stage:
- Cocklebur
- Eastern black nightshade
- Lady's-thumb
- Lamb's-quarters*
- Ragweed (common)
- Redroot pigweed
- Volunteer canola
- Wild mustard
- Velvetleaf (3 leaf)

*** Suppression only**

Application Information:
- **Water Volume:** Minimum 81 L per acre. Increase water volume to 142 L per acre for fields with heavy weed densities or with weeds at the upper limit of their recommended stage.
- **Pressure:** 275 kPa (40 psi). Increase pressure to 420 kPa (60 psi) for fields with heavy weed densities or with weeds at the upper limit of their recommended stage.
- **Nozzles:** Use nozzles capable of delivering appropriate pressures and volumes.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fomesafen	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:
Weed control and crop tolerance may be reduced under certain stress conditions such as cold temperatures, excess moisture, drought and injury from hail or previous herbicide applications.

Tank Mixes:
Herbicides:

- **Dry beans and soybeans:**
  - *Basagran* (0.71 L per acre)
- **Glyphosate tolerant soybeans only:**
  - *Glyphosate* (360 to 720 g ae per acre)

Fungicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the *Reflex* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:
- **Rainfall:** Within 4 hours may reduce control.
- **Grazing Restrictions:** DO NOT graze treated crop or cut for hay. There is insufficient data to support such use.
- **Pre-harvest Interval:** Leave at least 84 days from application to harvest.
- **Re-cropping Interval:** Winter wheat may be sown 4 months after application. Spring wheat, dry beans, soybeans and field corn may be grown the year following an application.
  - These re-cropping restrictions refer only to the Red River Valley of Manitoba. Use outside this is region is not registered as re-cropping options have not been determined.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool place away from food or feed. Store above 0°C. Storing *Reflex* below 0°C can negatively affect product quality.
- **Buffer Zones:** Leave a buffer zone of at least 15 metres between the last spray swath and the edge of sensitive terrestrial areas such as shelterbelts, hedgerows and shrublands as well as aquatic areas such as ponds, streams, rivers, prairie potholes and sloughs. DO NOT apply when winds are greater than 15 km per hour.

Sprayer Cleaning:
No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:
 Danger – Corrosive to Eyes

Refer to the Introduction for an explanation of the symbols.

Restore II / Milestone

Herbicide Group
4 - aminopyralid, 2,4-D

Company:
Corteva Agriscience

Formulation:
***Restore II* (PCP#30632):** 50 g/L aminopyralid and 400 g/L 2,4-D both present as amine salts formulated as a solution.
- Container size - 2 x 9.7 L

***Milestone* (PCP#28517):** 240 g/L aminopyralid formulated as a solution.
- Container size - 2 x 10 L

Note: Limited availability through selected retail outlets.

Maximum of 49 g ae (active ingredient) per acre of *Restore II* (97 L product per acre) or other products containing aminopyralid (*Reclaim II, Milestone, Clearview, Sightline*) PER SEASON.

Crops and Staging:
Industrial and non-crop areas (*Milestone* only), rangeland and pastures (*Restore II* and *Milestone*): Apply in spring or early summer.

Note: The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow. Avoid use in these situations.

Weeds, Rates and Staging:
Apply when weeds are young and actively growing in the vegetative stage for control unless indicated otherwise.

Note: the use of the highest rate structure improves level and duration of weed control and is recommended when weed populations are dense.

***Milestone* at 120 mL per acre (2.9 mL per 10 L of water for backpack sprayers) will control:**
- Bull thistle
- Buttercup (hairy, tall)
- Canada goldenrod†††
- Canada fleabane
- Canada thistle††
- Curled dock†††
- Horse-nettle
- Nodding thistle
- Ox-eye daisy (pre-bud)
- Perennial sow-thistle
- Ragweed (common, western†††)
- Scentless chamomile†††
- Spotted knapweed
- Sulphur cinquefoil†††
- Yellow star-thistle (rosette through bolting)

***Restore II* at 0.57 L per acre or *Milestone* at 120 mL per acre plus 2,4-D Amine at 340 g ae per acre will control:**
- *Weeds controlled by* Milestone *above plus weeds controlled by 2,4-D at 340 g ae per acre (see 2,4-D page):*
  - Canada goldenrod*
  - Curled dock (< 4 leaf)*
  - Gumweed*††
  - Hawkweeds*
  - Scentless chamomile*

***Milestone* at 154 mL per acre (3.8 mL per 10 L of water for backpack sprayers) will control:**
- *Weeds controlled by* Milestone *at 120 mL per acre above plus:*
  - Absinth (wormwood)†††
  - Clover
  - Cudweed
  - Curled dock
  - Fleabane, hairy
  - Scentless chamomile
  - Tansy ragwort
  - Western ragweed

***Restore II* at 0.86 L per acre or *Milestone* at 154 mL per acre plus 2,4-D Amine at 340 g ae per acre will control:**
- *Weeds controlled by* Milestone *at 154 mL per acre above, plus weeds controlled by 2,4-D at 340 g ae per acre (see 2,4-D page):*
  - Absinth (wormwood)*
  - Canada goldenrod††**
  - Dandelion††*
  - Hawkweeds**
  - Heal-all**
  - Smartweed (green and Pennsylvania)**
  - Sulphur cinquefoil††**

***Milestone* at 202 mL per acre (5.0 mL per 10 L of water for backpack sprayers) will control:**
- *Weeds controlled by* Milestone *at 154 mL per acre above plus:*
  - Absinth (wormwood)
  - Clover
  - Common tansy†††
  - Dandelion†††
  - Fireweed*
  - Hawkweed, orange (bolting)*
  - Knapweed††† (diffuse, Russian)
  - Mullein*
  - Prickly lettuce
  - Purple loosestrife
  - Tall ironweed
  - Yarrow, Common†††

***Restore II* at 0.97 L per acre or Milestone at 202 mL per acre plus 2,4-D Amine at 340 g ae per acre will control:**

- *Weeds controlled by* Milestone *at 202 mL per acre above, plus weeds controlled by 2,4-D at 340 g ae per acre (see 2,4-D page):*
  - Biennial wormwood††**
  - Bindweed (field and hedge)††**
  - Blue Lettuce††**
  - Burdock††**
  - Canada goldenrod††**
  - Dandelion††**
  - Gumweed††**
  - Hoary cress††**
  - Leafy spurge††**
  - Mouse-eared chickweed††**
  - Western snowberry ††*
  - Yellow rocket††**

*** *Milestone* or *Milestone* + 2,4-D only**
**** *Restore II* only.**
† Top growth control only.
†† Season long control.
††† Suppression only.

Individual plant or spot/strip applications:

- ***Milestone:*** See rates above. Apply to target plant so that it is evenly covered with spray solution but not to the point of runoff. Use higher rate when growing conditions are less than favourable or when plant foliage is tall and dense.
- ***Restore II:*** 14-24 mL of Restore II per 10 L of spray solution. Thoroughly and uniformly wet the foliage of all target plants but not to the point of runoff. Use the higher rate when growing conditions are less than favorable or when plant foliage is tall and dense.

Application Information:

- **Water volume:**
  - ***Ground:*** 80 L per acre minimum.
  - ***Aerial:*** 20 L per acre minimum
- **Nozzles and Pressure:** Use a combination of application equipment and pressures that will apply ***ASABE coarse*** droplets in a uniform pattern.
  - Drift of even small amounts of *Restore II* into sensitive plants or areas where sensitive crops may be grown can cause injury. DO NOT apply under conditions prone to drift (i.e. high winds, dead calm, or temperature inversions).
  - Avoid applications closer that the drip line or outer edge of the canopies of trees or injury may occur to the tree.

NOTE: Use closed handling systems when using bulk containers and/or if handling more than 663 L of product per day. Handheld applications are limited to 20 L of product per day. Respirators must be worn if applying more than 12.5 L per day using handheld equipment.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
aminopyralid	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Application should be avoided under conditions of drought or other environmental stress.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Restore II:*** none registered.
- ***Milestone:***
  - ***Permanent grass stands:*** 2,4-D amine (340, 437, & 583 gae/acre respectively or 150, 190 & 260 mL per 10 L of water respectively for backpacks)
  - ***Bare ground only:***
    - *Arsenal* (1.2 L/acre)
    - Glyphosate (rates as per glyphosate page up to 1750 g ae per acre)
    - *Torpedo EZ* (356 to 492 mL per acre)
    - *Torpedo EZ* plus glyphosate (rates above)

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT re-enter treated areas for 12 hours.

- **Grazing Restrictions:**
  - ***Milestone alone:*** Grazing not restricted for livestock or lactating dairy animals.
  - ***Restore II:*** DO NOT allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. DO NOT harvest forage or cut hay within 30 days of application.
  - ***Both products:*** Allow 3 days of grazing on an untreated pasture (or feed untreated hay) before transferring livestock to areas where sensitive broadleaf crops may be grown.
- **Re-cropping Interval:** DO NOT use if legumes are essential in a pasture. DO NOT break up treated pasture and plant to sensitive broadleaf crops for at least 3 years after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store product in original, labelled containers in a secure, dry, cool area. DO NOT freeze.
- **Buffer Zones:**
  - Handheld equipment is exempt from the buffer zones indicated below when implementing Early Detection and Rapid Response (EDRR) measures on isolated plants or patches. DO NOT apply to water.

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground *	10	10
Fixed wing airplane	80 to 175**	80 to 175**
Helicopter	70 to 150**	70 to 150**

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
**** Distance varies depending on spray droplet size. Consult the *Restore II* label to determine buffer zone size when applying by air.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

  - DO NOT apply this product directly to any water body or mix or load near water or wells. DO NOT apply when heavy rains are forecast or on moderate to steep slopes toward sensitive areas or to light soils with shallow water table. Contact the provincial environment department for permits to apply near water.

Sprayer Cleaning:

'Method A' found in the general sprayer cleaning section in the introduction.

Hazard Rating:

 Danger – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Restore NXT

Herbicide Group
4 - aminopyralid
4 - florpyrauxifen

Company:
Corteva Agriscience (PCP #34730)

Formulation:
80 g/L aminopyralid and 6.36 g/L florpyrauxifen present as solution concentrate.
- Container size – 2 x 10 L jug

Note: Limited availability through selected retail outlets.

Crops, and Staging:
Permanent grass pasture and rangeland. Apply in spring or early summer.
Note: The use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Weeds, Rates and Staging:
Apply to young weeds that are actively growing at time of application. Post emergence applications should be made before bud stage or early flowering, unless otherwise specified. Only weeds present at the time of application will be controlled.
A surfactant is required with Restore NXT. Add a surfactant such as Gateway adjuvant or an NIS at 2.5 L to 5L per 1000L of spray solution or methylated seed oil (MSO) at 5L to 10L per 1000L of spray solution of spray solution after adding Restore NXT.
Note: Maximum of one application of this or other products containing (aminopyralid) per year.

***Restore NXT* at 304 mL per acre will control:**
- Canada fleabane (bolting up to 20 cm)
- Canada thistle*
- Common waterhemp (up to 3 leaf and 8 cm)
- Spotted knapweed*
- Velvetleaf (up to 3 leaf and 8 cm)

***Restore NXT* at 352 mL per acre will control the weeds above plus:**
- Canada fleabane
- Canada goldenrod*
- Common ragweed
- Curled dock*
- Ox-eye daisy (pre-bud)
- Perennial sowthistle
- Scentless chamomile*
- Spotted knapweed
- Sulphur cinquefoil (pre-bud)*
- Tall buttercup
- Thistle (bull, Canada, musk or nodding, plumeless)

***Restore NXT* at 352 mL per acre plus 340 grams ae per acre 2,4-D will control all the weeds by 352 mL per acre of *Restore NXT* alone and all the weeds listed on the 2,4-D label at 340 grams ae per acre plus:**
- Annual sow thistle
- Bluebur, burdock (less than 4 leaf)
- Blue lettuce***
- Bull thistle***
- Buttercup, gumweed***
- Canada goldenrod
- Canada thistle**
- Cocklebur
- Common plantain
- Curled dock (less than 4 leaf)
- Flixweed
- Goat's beard
- Hoary cress***
- Orange hawkweed
- Peppergrass
- Perennial sow thistle***
- Prickly lettuce
- Ragweeds
- Scentless chamomile
- Stinging nettle
- Spotted knapweed
- Sweet clover

***Restore NXT* at 453 mL per acre will control:**
- *Weeds controlled by* Restore NXT *at 352 mL per acre above plus:*
  - Absinth wormwood*
  - Canada goldenrod*
  - Clover
  - Cudweed
  - Curled dock
  - Poison hemlock
  - Scentless chamomile
  - Tansy ragwort

***Restore NXT* at 453 mL per acre plus 437 grams ae per acre 2,4-D will control all the weeds by 453 mL per acre of *Restore NXT* alone and all the weeds listed on the 2,4-D label at 437 grams ae per acre plus:**
- absinth wormwood**
- dandelion**

***Restore NXT* at 607 mL per acre will control:**

- *Weeds controlled by* Restore NXT *at 453 mL per acre above plus:*
  - Absinth wormwood
  - Annual sowthistle (up to 3 cm)
  - Canada goldenrod*
  - Cleavers (up to 10 cm) lamb's quarters (prior to bud stage)
  - Common tansy*
  - Common tansy**
  - Common yarrow*
  - Dandelion*
  - Diffuse knapweed (bolting)*
  - Fireweed
  - Mullein
  - Orange hawkweed (bolting)***
  - Prickly lettuce
  - Purple loosestrife*
  - Russian knapweed (bud to flowering)*
  - Scotch thistle
  - Wild caraway
  - Wild parsnip

***Restore NXT* at 607 mL per acre plus 583 grams ae per acre 2,4-D will control all the weeds by 607 mL per acre of *Restore NXT* alone and all the weeds listed on the 2,4-D label at 583 grams ae per acre plus:**

- common tansy**

***Suppression only.**
****Season long control**
*****top growth control**
******seasonal and 12 month control**

Individual plant or spot strip applications: 15 mL of Restore NXT plus 50 mL (0.5% v/v) of surfactant (surfactant such as Gateway adjuvant, MSO, NIS (such as Ag-Surf, Agral 90 or Citowett Plus)) per 10 L of spray solution. Thoroughly and uniformly wet the foliage of all target plants but not to the point of runoff.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 80 L per acre.
  - ***Aerial:*** 12 L per acre minimum. For better coverage apply at 20 L per acre.

Nozzles and Pressure: Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE coarse droplets by ground or by air.

- For applications by air: Reduce drift caused by turbulent wingtip vortices. Nozzle distribution along the spray boom length MUST NOT exceed 65% of the wing- or rotorspan. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.
- Do not apply during periods of dead calm or when wind velocity and direction pose a risk of spray drift. Do not spray when the wind is blowing towards a nearby sensitive crop, garden, terrestrial habitat (such as shelter-belt).
- Avoid application within the dripline (outermost edge of the tree canopy) of desirable coniferous and deciduous trees unless injury can be tolerated.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Aminopyralid	POST (foliar) also has soil activity	Synthetic auxin	Throughout the plant (Symplast)	Broadleaf only	4
Florpyrauxifen	POST (foliar)	Synthetic auxin	Throughout the plant (Symplast)	Broadleaf only	4

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- Permanent pasture and rangeland: 2,4-D

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction

Restrictions:

- **Rainfall:** Avoid application when heavy rain is in the forecast. Contact manufacturer for more information.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Grazing:** The following restrictions for livestock or lactating dairy animals grazing in treated areas must be followed:
  - Forage: Grazing/feeding is permitted on the day of application (0 days)
  - Hay: Allow 7 days after application to cut or feed hay.
  - Allow 3 days of grazing on an untreated pasture (or feed untreated hay) before transferring livestock to areas where sensitive broadleaf crops may be grown.
  - Do not transfer livestock from treated grazing areas onto broadleaf crop areas without first allowing 3 days of grazing on untreated grass pasture.
- **Re-cropping:** DO NOT use if legumes are essential in a pasture. DO NOT break up treated pasture and plant to sensitive broadleaf crops for at least 3 years after application.
  - Aerial Application: May be applied by aircraft.
  - Storage: Store this product away from food or feed. Store product in original, labelled containers in a secure, dry, cool area. DO NOT freeze.
  - **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1	
Ground*	5	3	10
Fixed wing aircraft	275	150	225
Helicopter	125	75	150

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative filter strip between the treated area and the edge of the water body.

Sprayer Cleaning:

Refer to 'Method A,' in the general section on sprayer cleaning in the Introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

None listed.

Revenge E

Herbicide Group
2 - tribenuron
14 - carfentrazone

This product is the equivalent of a prepackaged tank mix of* Revenge *(see Carfentrazone) and* MPower Extra *(see Tribenuron). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
AgraCity

Formulation:
The *Revenge E* package contains the following components:
***Revenge* (PCP#33716):** 240 g/L carfentrazone formulated as an emulsifiable concentrate.
- Container size - 4.8 L

-plus-
***MPOWER Extra* (PCP#33143):** 75% tribenuron formulated as water dispersible granules.
- Container size - 2 x 320 g

Crops and Staging:
Spring wheat, durum wheat, barley: Apply to the soil surface up to 1 day prior to seeding.

Weeds and Staging:
Apply *Revenge* at 30 mL per acre plus *MPOWER Extra* at 4 g per acre plus glyphosate (sold separately) at 180 to 360 g ae per acre to control the combined weeds controlled by the component products.

Application Information:
- **Water volume:**
  - ***Ground:*** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use 30 to 50 psi (200 to 345 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets
- **Screens:** Use a 50 mesh or coarser screen and filter system.

Tank Mixes:
Herbicides: Glyphosate (IPA, DMA, K+)
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Reward

Herbicide Group
22 - diquat

Company:
Syngenta Canada (PCP#26271)

Formulation:
240 g/L diquat formulated as a solution.
- Container size - 4 x 3.78 L

Use:
For use in farm dugouts and other clear, slow moving water bodies to control water weeds, such as:
- Canada water weed
- Coontail
- Duckweed
- Flowering rush
- Pond weeds
- Water milfoil

Offers temporary control of certain species of algae.
High levels of suspended organic matter or clay particles in water will reduce control.
NOTE: A permit must be obtained from Saskatchewan Water Security Agency or Manitoba Sustainable Development for application of pesticides directly to or within a set distance of water bodies that are not wholly contained within a private parcel of land.

Timing:
Mid-May through late June when water weeds or algae are actively growing. Apply before weeds have developed a heavy mat of growth for effective control.

Rates:
Dugouts less than 5 feet (1.5 m) deep: Apply *Reward* at 7.4 L per acre.
- At this rate, 2.2 L of *Reward* will treat a dugout that is 160 feet by 80 feet (49 m x 24.4 m).

Dugouts more than 5 feet (1.5 m) deep: Apply *Reward* at 10.1 to 11.8 L per acre.
- At these rates, a dugout that is 160 feet by 80 feet (49 m x 24.4 m) will require 3.0 to 3.5 L of *Reward*. Milfoil can be controlled in early stages by 3.7 L per acre in early stages of growth.

Application:
- Dilute 1 part *Reward* with 4 parts clean water.
- Spray over the water surface, inject below the water surface or pour directly onto the water surface from a moving boat or for small water bodies, apply from the banks. See label for detailed instructions. Note: *Reward* is bound rapidly to soil, so material must enter the water directly to be effective.

How it Works:
Reward is a non-volatile fast acting herbicide for the control of water weeds. Control of susceptible weeds generally occurs within 1 to 2 weeks. *Reward* is inactivated upon contact with soil, mud or lake bottoms. Therefore, it has no residual herbicidal effect.

Restrictions:
- **Grazing Restrictions:** DO NOT use water for animal consumption for 24 hours after application.
- **Irrigation:** DO NOT use water for irrigation for 5 days after application.
- **Domestic Use:** DO NOT use water for human consumption for 5 days after application. DO NOT swim in water for 24 hours after treatment.
- **Storage:** DO NOT freeze.
- **Environment:** If weed growth is dense, protect fish by not treating more than one-fourth of dugout at a time.

Equipment Clean Out:
Refer to 'Method C' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

Warning – Poison


Caution – Skin Irritant, Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Rexade

Herbicide Group
2 - pyroxsulam
4 - haulaxifen, 2,4-D

Company:
Corteva Agriscience

Formulation:
***Rexade A* (PCP #32520):** 5% halauxifen and 15% pyroxsulam formulated as water dispersible granules.
- Container size - 1 x 1.62 kg jug

***Rexade B* (PCP #32294):** 660 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 1 x 8.58 L jug

Crops and Staging:
Wheat (Spring, Durum, Winter): From the 2 leaf stage up to the emergence of the flag leaf.

Weeds, Rates and Staging:
Use *Rexade A* at 40.5 grams per acre and *Rexade B* at 215 mL per acre for control or suppression of following weed species.

Weeds controlled:

- ***Grasses: 1 to 5 leaf stage unless otherwise indicated.***
  - Barnyard grass
  - Brome, Japanese (1 to 6 leaf stage)
  - Brome, Downy (2 to 6 leaf, 4 tillers)[§]
  - Foxtail (green[§], yellow)
  - Wild oats (up to 4 leaf, 2 tiller)
- ***Broadleaves:***
  - American dragonhead (up to bud stage and 15 cm in height)
  - Annual sow-thistle[§] (up to 5 leaf)
  - Annual (wild) sunflower
  - Bluebur
  - Burdock
  - Canada fleabane (up to 15 cm height)
  - Canada thistle (up to 30 cm tall, pre bud stage)[§]
  - Chickweed, common (up to 10 cm)
  - Cleavers[†] (1 to 9 whorl)
  - Cocklebur
  - Corn spurry (up to 2 whorl stage, <10 cm in height)
  - Cow cockle
  - Dandelion (seedlings and overwintered rosettes, up to 20 cm)[§]
  - Flixweed (up to 10 cm)
  - Hemp-nettle[†]
  - Henbit (up to bud stage, 15 cm tall)
  - Kochia**[†§]
  - Lamb's-quarters[†]
  - Mustard (except dog and green tansy)
  - Night-flowering catchfly[§] (up to bolting stage, up to 15 cm height)
  - Plantain
  - Prickly lettuce
  - Ragweed (common, giant)
  - Redroot pigweed[†]
  - Round-leaved mallow (up to 6 leaf stage, < 10 cm height)
  - Russian thistle
  - Smartweed (1 to 5 leaf stage)
  - Shepherd's purse (up to 30 cm tall)
  - Stinkweed (up to 30 cm tall)
  - Stork's-bill (up to 8 leaf stage)
  - Sweet clover
  - Velvetleaf (up to 5 leaf stage)
  - Volunteer alfalfa (up to 25 cm height)
  - Volunteer canola (1 to 6 leaf stage)
  - Volunteer flax (up to 15 cm height)
  - Volunteer sunflower
  - White cockle (up to bud stage, less than 15 cm height)[§§]
  - Wild buckwheat
  - Wild radish

[§] Suppression only.
[§§] Season long control.
**** Light to moderate infestations (suppression of up to 150 plants per m^2, up to 15 cm in height control of up to 50 plants per m^2, up to 10 cm in height when tankmixed with 2,4-D).**
[†] Including group 2 resistant biotypes.

Application Information:
- **Water volume:**
  - ***Ground:*** 20 to 40 L per acre
  - ***Aerial:*** 12 L per acre
- **Nozzles and Pressure:** Use boom pressure of 235 kPa or less. Use nozzles and pressure designed to produce ***ASABE coarse*** droplets. To reduce drift caused by turbulent wingtip vortices, the nozzle distribution along the spray boom length must not exceed 65 percent of the wing or rotor span.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxsulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2
halauxifen	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4
2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- 2,4-D ester up to an additional 70 g ae per acre (see 2,4-D).

Insecticides: None registered.

Fungicide: None registered.

Fertilizers: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated field until 12 hours post-application.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for hay within 7 days of application.
- **Pre-harvest Interval:** DO NOT harvest treated crops for 50 days after application.
- **Re-cropping Interval:** Fields can be re-seeded 11 months with spring barley, spring wheat, oats, canola, flax, brown and yellow mustard, canola quality *Brassica juncea*, field peas and soybeans or fields can be fallowed. Sunflowers can be planted 10 months and lentils 22 months after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in original containers in dry well ventilated storage. Store in heated storage. If the product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Freshwater Habitat of Depths:		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground sprayer	1	**1**	2
Fixed wing aircraft	5	**1**	90
Helicopter	5	**1**	75

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

Rexade A:


Caution – Eye Irritant

Rexade B:


Caution – Poison


Warning – Skin Irritant

Potential Skin Sensitizer

When handling more than 400 L of *Rexade B* (2,4-D) per day use a close transfer system.

Refer to the Introduction for an explanation of the symbols.

Rezuvant*/Rezuvant XL

Herbicide Group
1 - pinoxaden
4 - halauxifen, fluroxypyr

Rezuvant *is the equivalent of a prepackaged tank mix of* Pixxaro A *and* Axial *(see pinoxaden).*
Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.
** **Note:** This product is no longer manufactured but inventories may still remain in distribution. This product may be removed from future editions.*

Company:
Corteva Agriscience

Formulation:
The *Rezuvant* package contains the following components:
***Rezuvant A* (PCP#33262):** 16.2 g/L halauxifen and 250 g/L fluroxypyr present as ester and formulated as an emulsifiable concentrate.
- Container sizes - 4.9 L, 2 x 9.8 L

***Rezuvant B* (PCP#33277):** 50 g/L pinoxaden formulated as an emulsifiable concentrate.
- Container sizes - 2 x 10 L, 80 L

***Rezuvant XL* (PCP#34045):** 4.2 g/L halauxifen, 104.2 g/L fluroxypyr, 50 g/L pinoxaden co-formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9.7 L, 116.4 L

Crops and Staging:
Wheat (spring, winter) and barley: 3 leaf stage to just prior to emergence of the flag leaf.

Weeds and Staging:
Apply to actively growing weeds up to 10 cm high or wide unless otherwise specified:
- ***Grass weeds controlled by* Axial *plus the following broadleaf weeds from 1 to 8 leaf stage, unless otherwise indicated:***
  - American dragonhead (up to bud stage†)§
  - Chickweed
  - Cleavers (1 to 9 whorl)
  - Cow cockle (8 leaf†)§
  - Fleabane, Canada†
  - Flixweed (up to 8 leaf & 8 cm)
  - Hemp-nettle
  - Henbit (up to bud stage†)§
  - Kochia†
  - Lamb's-quarters
  - Nightshade (eastern, black, hairy and cutleaf/wild tomato)††
  - Ragweed (common††, giant)
  - Redroot pigweed
  - Round-leaved mallow††
  - Russian thistle*§
  - Shepherd's-purse (to bolting or 20 cm)
  - Sow-thistle, annual* (to 5 leaf)
  - Stork's-bill
  - Velvetleaf (1 to 5 leaf stage)
  - Volunteer alfalfa (to 25 cm)
  - Volunteer flax†
  - Wild buckwheat
  - Wild mustard (to 4 leaf or 10 cm)§§

*** Suppression only.**
† Up to 15 cm in height.
†† 1 to 6 leaf stage.
§ *Rezuvant XL* only.
§§ Suppression with *Rezuvant* and control with *Rezuvant XL*.

Rates:
Note: Maximum of ONE APPLICATION of this or other products containing pinoxaden per year.
Rezuvant A: 125 mL per acre
-plus-
***Rezuvant B*:** 500 mL per acre
-or-
Rezuvant XL: 486 mL per acre
Rezuvant/Rezuvant XL is intended to be used with the addition of MCPA Ester 600 at the rate of 188 to 290 mL per acre. MCPA Ester 600 is not included in the *Rezuvant* packages and must be purchased separately.
Addition of surfactant is NOT required. Use the spray suspension as soon as it is prepared. Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water volume:**
  - ***Ground:*** Minimum 20 to 40 L per acre
  - ***Aerial:*** 12 L per acre
- **Nozzles and Pressure:** Use boom pressure of 200 to 275 kPa. Use nozzles and pressure designed to produce ***ASABE coarse*** droplets. To reduce drift caused by turbulent wingtip vortices, the nozzle distribution along the spray boom length must not exceed 65 percent of the wing or rotor span.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward areas of growth (symplast)	Grasses only	1
fluroxypyr	POST (foliar)	Synthetic auxin	Moves throughout plant (symplast)	Broadleaf only	4
halauxifen	POST (foliar)	Synthetic auxin	Moves throughout plant (symplast)	Broadleaf only	4

Effects of Growing Conditions:

Extreme growing conditions such as drought or near freezing temperature prior to, at or following time of application may reduce weed control and increase the risk of crop injury at all stages of growth. If foliage is wet at the time of application, control may be decreased. Under conditions of low crop and high weed density, control may be reduced.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Wheat (spring, winter) and barley:***
  - MCPA 600 ester (188 to 280 mL per acre).
  - 2,4-D 700 ester (174 to 214 mL per acre).

Insecticides: None registered.

Fungicide: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the *Rezuvant/Rezuvant XL* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated crops within 7 days of application. DO NOT cut the treated crop for hay or silage within 30 days after application.
- **Pre-harvest Interval:** DO NOT harvest treated crops for 60 days after application.
- **Re-cropping Interval:** Fields can be re-seeded after a minimum of 10 months with spring wheat, barley, oats, canola, corn, soybeans, sunflowers, flax, field peas, potatoes (except seed potatoes), mustard, alfalfa, dry bean (*Phaseolus vulgaris* species including pinto, kidney and white types) and timothy or fields can be summer fallowed. Lentils can be planted 22 months after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. Avoid freezing. If frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Freshwater Habitat of Depths:		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground sprayer	1	**1**	3
Fixed wing aircraft	5	**1**	100
Helicopter	5	**1**	90

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

This product utilizes a combination of 'Method A' and 'Method B' for cleanout requiring the use of All Clear Spray Tank Decontaminator for the tank plus ammonia for nozzles screens and filters for the second rinse. Refer to the general section on sprayer cleaning in introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

Rezuvant A:

 Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Rezuvant B:

 Danger – Eye and Skin Irritant

Rezuvant XL:

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Rimsulfuron

Herbicide Group 2 - rimsulfuron

Company:

Corteva Agriscience (*Prism SG*)
Sharda Cropchem Canada (*Sharda Rimsulfuron*)
Albaugh (*Hinge*)

Formulation:

***Prism SG* (PCP#30057); *Hinge* (PCP#34352):** 25% rimsulfuron formulated as a water soluble granule.

- Container size - 480 g

***Sharda Rimsulfuron* (PCP#32932):** 25% rimsulfuron formulated as a water dispersible granule.

- Container size - 480 g

Crops and Staging:

Irrigated potato*: prior to flower initiation. Potato tolerance differs by variety. Limit first use to a small area of each variety prior to widespread adoption in the field. Delay cultivation for 7 to 10 days after application.

Field Corn in the Red River Valley of Manitoba only (*Hinge* and *Sharda Rimsulfuron* only):**

- ***Pre-emergent surface:*** Apply to the soil surface after seeding but before the emergence of the crop and weeds.
- ***Post emergent**:*** Coleoptile leaf (spike) to 3 leaves (2 collars visible) or 20 cm in height - leaf extended.

**** NOTE: Since application to irrigated potato in western Canada has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to irrigated potato in western Canada is at the risk of the user.***

***** NOTE: Corn hybrids with heat unit ratings of less than 2500 CHU have shown sensitivity to* Rimsulfuron. *DO NOT make post-emergent applications to corn varieties with less than 2500 CHU or in areas with less than 2500 CHU on average. Some corn hybrids with CHU ratings of greater than 2500 may also be injured by* Rimsulfuron. *Consult with corn seed suppliers on which varieties are sensitive to* Rimsulfuron.**

Weeds, Rates and Staging:

Note: Maximum of 6 grams per acre of the active ingredient rimsulfuron per acre (this equates to 24 g Rimsulfuron products per acre) PER YEAR.

24 grams per acre controls the following weeds at the stage indicated:

Weeds	Weed Stage
Barnyard grass, foxtail (green, yellow*)	Pre-emergence
Barnyard grass, foxtail (green, yellow), witch grass	1 to 6 leaf, maximum 2 tillers
Quackgrass	3 to 6 leaf (less than 10 inches or 25 cm leaf extended)
Lamb's-quarters*, redroot pigweed	4 to 6 leaf (less than 4 inches or 10 cm tall or across)

*** Suppression.**

Add a recommended non-ionic surfactant such as *Citowett Plus*, *Agsurf II*, or *Agral 90* at 0.2 L per 100 L spray solution.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** 25 to 40 psi (175 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
rimsulfuron	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

Apply when the temperature 24 hours before and after application is between 5°C and 28°C. Temperatures beyond this range increase the potential for crop injury. Rapid fluctuations in temperature will stress the crop (greater than a 20°C difference within 24 to 36 hours). Allow 48 to 72 hours for the crop to acclimatize before spraying if severe temperature fluctuations occur.

Crop injury may result if applications are made when potatoes are stressed by abnormally hot, humid, or cold weather conditions, frost, low fertility, drought, water saturated soil, compacted soil, previous pesticide applications, disease or insect damage. If potatoes have been injured by frost, wait 48 to 72 hours after normal growing conditions have resumed before applying.

Warm, moist conditions after application promote good weed control while cool and/or dry conditions may reduce or delay activity. Weeds hardened off by cold weather or drought stress may not be controlled.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Within 2 to 4 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 30 days from application to harvest.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay.
- **Re-cropping Interval:** Field corn may be planted any time after application. Winter wheat may be planted 4 months after application. Barley, canola*, chickpeas*, clover (red)*, corn (including sweet and seed*), dry bean*, faba bean*, field pea*, flax*, lentil*, oats*, potato, soybean*, sorghum*, wheat (spring, winter, durum*) and sunflowers* may be planted the year after application. For all other crops, a field bioassay is recommended before planting.
  ***Prism SG* only.**
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- DO NOT apply in areas where surface water from the treated area can run off to adjacent cropland, streams, irrigation water or wells.

Sprayer Cleaning:

Refer to 'Method A' found in the general sprayer cleaning section in the introduction. Check the label or contact the manufacturer for more specific sprayer cleaning information information.

Hazard Rating:

Warning – Eye Irritant

Warning – Contains the Allergen Sodium Sulfite

Refer to the Introduction for an explanation of the symbols.

Roundup Xtend*/Roundup Xtend 2

Herbicide Group
9 - glyphosate
4 - dicamba

***Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Company:

Bayer

Formulation:

***Roundup Xtend* (PCP#32274)*:** 240 g ae/L glyphosate and 120 g/L dicamba both present as monoethanolamine salts, formulated as a solution.

- Container size - 2 x 10 L

***Roundup Xtend 2* (PCP#33502)*:** 317 g ae/L glyphosate present as the monoethanolamine salt plus 159 g/L dicamba present as the diglycolamine salt, formulated as a solution.

- Container size - 10 L, 450 L

Roundup Xtend and *Roundup Xtend 2* also contain ingredients within the formulation to reduce volatility (i.e. *VaporGrip Technology*).

Crops and Staging:

Glyphosate+dicamba tolerant (RR2 Xtend) soybean:

- ***Pre-plant or pre-emergence***: Apply any time prior to the emergence of the crop.
- ***Post-emergence:*** Apply once or twice, at least two weeks apart, up to the early flower stage (R1).

Corn hybrids with Roundup Ready 2 Technology:

- ***Pre-emergence:*** Apply prior to the emergence of the crop.
- ***Post-emergence:*** Spike to 5-leaf stage

Note: The use of this chemical may result in contamination of groundwater, particularly in areas where soils are permeable (e.g. sand, loamy sand and sandy loam soils) and/or the depth to the water table is shallow. Avoid use in these situations.

Weeds, Staging and Rates:

Apply to small actively growing weeds that are less than 4 inches (10 cm) in height or width. Early applications when the weeds are small reduce early season weed competition and provide maximum yield potential.

Note: DO NOT add acidifying buffering agents, acidic pH adjusting agents or adjuvants other than agriculturally approved NIS to the spray solution. DO NOT add ammonium sulfate (AMS), AMS-containing adjuvants, water conditioners, or sprayable fluid fertilizers.

Roundup Xtend (L per acre):	*Roundup Xtend 2* (L per acre)	Weeds controlled:		
1.0	0.77	**Annual broadleaf weeds:** Buckwheat (tartary, wild) Chickweed Cleavers Corn spurry Cow cockle Flixweed Hemp-nettle Narrow-leaved hawk's-beard Night-flowering catchfly Kochia Lamb's-quarters	Mustard, wild Pigweed, redroot Shepherd's-purse Smartweed (green, lady's-thumb) Stinkweed Stork's-bill Russian thistle Volunteer canola (non glyphosate-tolerant) Wild tomato	**Annual grass weeds:** Barnyard grass Green foxtail Volunteer barley Volunteer wheat Wild oats **Perennial weeds:** Canada thistle* Dandelion (suppression only) Foxtail barley* Quackgrass Sow-thistle (perennial)*

Roundup Xtend (L per acre):	*Roundup Xtend 2* (L per acre)	Weeds controlled:
1.5	1.14	*All weeds listed above plus:* **Annual broadleaf weeds:** Biennial wormwood (2 to 8 leaf stage) Bur cucumber (up to 18 leaf stage)* Cocklebur Canada fleabane (post-emergent up to 8 cm) Eastern black nightshade Narrow-leaved vetch Pigweed (smooth) Prickly lettuce Ragweed (common) Round-leaved mallow* Smartweed (Pennsylvania) Sow-thistle (annual) Stork's-bill Velvetleaf Volunteer flax **Annual grass weeds:** Annual blue grass Downy brome Persian darnel Yellow foxtail Proso millet **Perennial weeds:** Common milkweed* Dandelion (pre-emergent to crop) Dandelion ** Field bindweed* Foxtail barley Yellow nutsedge*
2.0	1.52	*All weeds listed above plus:* Mustard (hare's ear, Indian, tumble, wormseed) Russian pigweed Ragweed (false, giant) **Short term residual activity on annual broadleaf weeds:** Lamb's-quarters Redroot pigweed Ragweed (common) Velvetleaf (suppression only) Wild buckwheat

*** Single application provides suppression. Sequential applications provide control. For sequential applications, ensure the crop has not advanced beyond the recommended growth stage. The sequential application should be applied at least two weeks after the first application.**

**** Control with a single application prior to seeding in the spring. The addition of 360 g ae per acre of addition glyphosate (see tank mixes) will improve control of heavy infestation and plants over 15 cm (6 inches) across.**

***NOTE: The 2 L per acre rate of* Roundup Xtend*, or the 1.52 L per acre rate of* Roundup Xtend 2 *to be used only once in a growing season. DO NOT exceed the maximum season total of 4 L per acre of* Roundup Xtend *or 3 L per acre of* Roundup Xtend 2.**

Application Information:

DO NOT allow herbicide solution to mist, drip, drift or splash onto desirable vegetation because severe injury or destruction to desirable broadleaf plants could result. Apply when air temperature is between 10 and 25°C. DO NOT spray when the temperature is expected to exceed 30°C.

When applying *Roundup Xtend* adjacent to sensitive crops, apply as a pre-plant, pre-emergent or early post-emergent treatment to avoid potential drift onto the sensitive crops.

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use only spray nozzles that produce ***ASABE S-572.1Extremely Coarse (XC) to Ultra Coarse (UC)*** spray qualities and minimal amounts of fine spray droplets. ***DO NOT use conventional flat fan nozzles that produce Medium or Fine spray qualities***. Adjust pressure for selected nozzles to maintain XC to UC spray qualities. Use at least 30 psi (200 kPa) to ensure proper pattern overlap and check this visually.

DO NOT apply during a temperature inversion because off-target movement potential is high. Temperature inversions increase drift potential because fine droplets may remain suspended after application and move in unpredictable directions with light and variable wind. (See 'Avoiding Spray Drift' in introduction for more information on how to avoid drift.)

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
glyphosate	POST (foliar)	EPSP Amino Acid Synthesis Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	9
dicamba	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Reduced control may result if treatments are made during poor growing conditions such as drought stress, disease or insect damage, or if weeds have been mowed, grazed or cut. Heavy dust on foliage or a crop or weed canopy covering smaller weeds may also reduce control. Extremely cool or cloudy weather following treatment or prolonged drought conditions may slow activity of this product and delay the visual effects of control.

Tank Mixes:

DO NOT add acidifying buffering agents, acidic pH adjusting agents or adjuvants other than agriculturally approved NIS to the spray solution. DO NOT add ammonium sulfate (AMS), AMS-containing adjuvants, water conditioners, or sprayable fluid fertilizers. Non-ionic surfactant (minimum 70 percent active) may be added to the spray solution at 0.25 L per 100 L of spray solution.

Herbicides:

- Glyphosate *(Roundup brands*) – top up of total glyphosate to a maximum of 720 g ae per acre.

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours following application.
- **Pre-harvest Interval:** 7 to 10 days for soybean forage and 13 to 15 days for soybean hay.
- **Grazing Restrictions:** DO NOT permit lactating dairy animals to graze fields within 7 days after application. DO NOT harvest forage or cut hay within 30 days after application. Withdraw meat animals from treated fields at least 3 days before slaughter.
- **Re-cropping Interval:** A plant back interval of 120 days is required for those crops not on the label.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store above -10°C to keep product in solution. If the product freezes and crystals form, place in a warm room (20°C), allow the product to reach room temperature and roll or shake periodically until crystals have re-dissolved.
- **Buffer Zones:**

Method of application	Buffer Zones (metres†) required for the protection of:	
	Aquatic Habitat	Terrestrial Habitat
Field sprayer	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A or B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

No specific hazards indicated. Wear chemical resistant clothing, gloves and footwear to load mix and cleanup. Avoid direct inhalation of spray mist.

Samurai Master

Herbicide Group
1 - clethodim
2 - imazamox

This product is a prepackaged tank mix of* Samurai *(see Imazamox) and* Independence *(see Clethodim). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above and select the most restrictive.

Company:
AgraCity

Formulation:
The *Samurai Master* package contains the following components:
***Samurai* (PCP#33033):** 70% imazamox formulated as a water dispersible granule.
- Container size - 4 x 470 g

-plus-
***Independence* (PCP#32851):** 240 g/L clethodim formulated as an emulsifiable concentrate.
- Container size - 8 L

Crops and Staging:

Crop	Leaf Stage	Days to Harvest
Field pea	1 to 6 true leaf stage	75

Weeds and Staging:
Weeds controlled by *Samurai* at 11.7 grams per acre plus the weeds controlled by *Independence* at 50 mL per acre
Samurai Master requires the addition of *Assassin* or *Merge* adjuvant at 0.5 L per 100 L of spray solution, and which must be purchased separately.
Note: Maximum of ONE APPLICATION of this or other products containing imazamox per year.

Tank Mixes:
None registered.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Select Plus

Herbicide Group
1 – clethodim, quizalofop

Company:
UPL AgroSolutions Canada (*Select Plus* – PCP#34744 & *Amigo* – PCP#22644)

Formulation:
240 g/L of clethodim and 120 g/L of quizalofop-p-ethyl formulated as an emulsifiable concentrate
- Container size – 3 L *Select Plus* + 9 L *Amigo*

Crops and Staging:
Crops are tolerant at all growth stages at maximum rate, but pre-harvest intervals must be observed to prevent excess residue in the grain (see "Restrictions" section below).
Crops:
- Alfalfa (grown for seed)
- Canola
- Chickpea
- Dry bean
- Faba bean
- Field pea
- Flax
- Lentil
- Mustard, condiment (brown, oriental, yellow)
- Soybean

Weeds, Rates and Staging:

Apply *Select Plus* at 51 to 76 mL per acre+ *Amigo Adjuvant* at 5L per 1000 L solution.
Unless otherwise noted below, apply to young and actively growing weeds that are at 2 to 6 leaf stage (prior to tillering)

Weeds Controlled:

- Barnyard grass
- Fall panicum
- Foxtail barley*
- Green foxtail
- Japanese brome*
- Persian darnel**
- Proso millet
- Smooth crabgrass**
- Volunteer barley
- Volunteer canary grass
- Volunteer corn
- Volunteer oat
- Volunteer wheat
- Wild oat
- Witchgrass
- Yellow foxtail

*Apply at 76 mL per acre to control at 2 to 6 leaf plus 3 tillers.
**Control only at 76 mL per acre rate

Application Information:

- **Water Volume:**
  - ***Ground:*** 22.5 to 45 L per acre
  - ***Aerial:*** minimum of 11 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASAE S572.1 droplets by ground or air.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clethodim	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Towards regions of growth (Symplast)	Grasses only	1
quizalofop-p-ethyl	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward regions of growth (Symplast)	Grasses only	1

Effects of Growing Conditions:

Select Plus will be less effective when plants are stressed by the lack of moisture, excessive moisture, low temperatures and/or very low relative humidity. Regrowth by tillering may occur if application is made under any of the above stress conditions.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***In glufosinate ammonium tolerant canola:***
  - Interline at 1.08 to 1.6 L per acre
  - Interline at 1.35 L per acre + Facet L at 113 mL per acre
- ***In canola:***
  - Lontrel 360
- ***In flax:***
  - Buctril M
  - Logic M
  - Curtail M
  - Lontrel 360 at 227 to 336 mL per acre
  - MCPA Ester 600 at 283 mL per acre
- ***In field pea:***
  - Odyssey at 11.7 to 17.4 grams per acre

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the Introduction.

Restrictions:

- **Rainfall:** Within 1 hour of application may reduce control.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** Canola, mustard – 64 days; dry bean, chickpea, faba bean, lentil – 65 days; field peas – 75 days; soybeans – 80 days; flax - 82 days
- **Grazing:** DO NOT graze treated fields.
- **Re-cropping:** No restrictions. A 30-day plant back interval should be observed for all unlabeled crops.
- **Aerial Application:** DO NOT apply to alfalfa by air.
- **Storage:** DO NOT freeze. Store this product away from food or feed. Store in a cool, dry place.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1	
Field sprayer	1	1	2
Fixed wing aircraft	3	1	40
Helicopter	1	1	40

See the Key to Product Pages in the introduction for an explanation of the different habitats.
***Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy. †Distance is measured from the downwind edge of the boom to sensitive areas.**

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the Introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:
None.

Sentrallas

Herbicide Group
2 - thifensulfuron-methyl
4 - fluroxypyr

Company:
FMC of Canada distributed by Loveland Canada

Formulation:
***Sentrallas* (PCP# 32143):** 30 g/L thifensulfuron-methyl plus 150 g/L fluroxypyr formulated as a suspension.
- Container size - 2 x 8 L jug

Crops and Staging:
Spring wheat, durum, barley and oats: 2-leaf to the emergence of the flag leaf.
Winter wheat: Apply in the spring from the 3-tiller to just before the emergence of the flag leaf.

Weeds and Staging:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.
Weeds controlled:
- Annual smartweed (green, lady's-thumb)
- Cleavers (1 to 4 whorls)
- Common chickweed (1 to 6 leaf)
- Cow cockle
- Corn spurry
- Hemp-nettle
- Kochia
- Lamb's-quarters
- Redroot pigweed
- Russian thistle
- Stinkweed
- Wild buckwheat (1 to 5 leaf)
- Wild mustard

Rate:
0.2 L per acre
Maximum ONE APPLICATION of this or other products containing (thifensulfuron-methyl/fluroxypyr) per year.
Note: This product may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre.
  - ***Aerial:*** 10 to 20 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground or ***ASABE coarse*** droplets by air. Sprayers without drift reduction nozzles should use between 30 to 40 psi (210 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thifensulfuron-methyl	POST	ALS amino acid synthesis inhibitor	Toward areas of growth (symplast)	Broadleaf	2
fluroxypyr	POST	Synthetic auxin	Moves throughout plant (symplast)	Broadleaf	4

Effects of Growing Conditions:

Sentrallas herbicide activity is influenced by weather conditions. Optimum activity requires active crop and weed growth. Temperature is best between 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost occurring 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions, e.g. drought, heat or cold stress, or if weeds have initiated flowering, or if heavy infestations exist. Application to crops that are stressed by severe weather conditions, frost, low fertility, water-logged soil (soil at or near field capacity), disease or insect damage before or after application may result in crop injury. Under certain conditions, such as heavy rainfall, prolonged cool weather, frost or wide fluctuations in day/night temperatures, temporary lightening in crop colour, and occasionally, a slight reduction in crop height may occur.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***All registered crops:***
  - MCPA Amine or Ester
- ***Wheat (spring, durum, winter) and barley:***
  - 2,4-D Amine or Ester
- ***Spring wheat (excluding durum), winter wheat and barley:***
  - *Axial*
  - *Axial* plus MCPA Ester
- ***Wheat (spring, durum, winter):***
  - *Simplicity*
  - *Simplicity* plus MCPA Ester
  - *Varro*
  - *Varro* plus MCPA Ester
- ***Wheat (spring and durum only):***
  - *Horizon NG*

Insecticides: None registered.

Fungicide: None registered.

Fertilizers: None registered.

Use only water as a carrier. Other carriers may accelerate the breakdown of *Sentrallas* and reduce its effectiveness.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours of application may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 60 days from application to harvest.
- **Grazing Restrictions:** DO NOT graze or feed to livestock for 7 days after treatment.
- **Re-cropping Interval:** Alfalfa, barley, canola, corn, dry beans, flax, forage grasses, lentils, mustard, oats, peas, potatoes, rye, soybeans, sunflowers or wheat can be seeded the year after treatment.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. Avoid freezing. If frozen, bring to room temperature and agitate before use.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5
Fixed wing aircraft	4	1	200
Helicopter	1	1	175

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' found in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:

Warning – Contains the Allergen Soy

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Shieldex 400SC

Herbicide Group 27 - tolpyralate

Company:
ISK Biosciences Corporation, distributed in Canada by Gowan Canada (PCP#32943)

Formulation:
400 g/L tolpyralate formulated as a suspension concentrate.
- Container size - 6 x 1.2 L

Crops and Staging:
Corn: up to 50 cm tall or up to and including 6 leaf collars (V6), whichever is more restrictive.

Weeds, Rates and Staging:
Apply to actively growing weeds less than 10 cm tall:

Broadleaf Weeds	30.4 mL per acre	40.5 mL per acre
Green pigweed	S	S
Cocklebur	S	C
Lamb's-quarters	S	C
Redroot pigweed	S	C
Smooth pigweed	C	C
Purslane	S	S
Ragweed (common, giant)	S	S
Shepherd's-purse	S	S
Smartweed (Pennsylvania)	S	S
Waterhemp	C	C

Apply to grasses less than 10 cm tall or before tillering:

Grasses	30.4 mL per acre	40.5 mL per acre
Barnyard grass	S	S
Foxtail (yellow)	S	S
Green foxtail	S	C

C = Control S = Suppression

MSO Concentrate (sold separately): Apply 1 percent v/v or 10 L MSO Concentrate per 1000 L of spray mixture.
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:

- **Water volume:** 57 to 190 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASAE medium*** or larger droplets.
- **Screens:** Use 50-mesh (or coarser) filter screen.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tolpyralate	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar and root (Apoplast) Somewhat systemic (has soil residues)	Broadleaf only	27

Effects of Growing Conditions:

Poor weed control or crop injury may result from applications made to plants under stress from abnormally hot or cold weather; environmental conditions such as drought, water-saturated soils, hail damage or frost; disease, insect or nematode injury; or prior herbicide or carryover from a previous year's herbicide application.

Tank Mixes:

Herbicides:

- Atrazine (227 g ai per acre) – DO NOT apply atrazine if corn is greater than 30 cm tall.

Fertilizers: Use 12.5 to 25 L per 1000 L spray solution of a high-quality urea ammonium nitrate (UAN) such as 28 percent N or 32 percent N or 8.4 to 20.4 kg per 1000 L of a spray grade ammonium sulphate (AMS), recommended.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfast in 1 hour.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated corn forage or silage for 21 days after application.
- **Pre-harvest Interval:** DO NOT apply to field corn within 85 days of harvest.
- **Re-cropping Interval:** The following crops may be grown 9 months after application: alfalfa, barley, bean (dry), canola, grass (grown for seed or forage), oats, pea, potato, sorghum, soybean, sunflower, spring wheat. Winter wheat or rye (annual and fall) may be seeded 3 months after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** To prevent contamination, store this product away from food or feed.
- **Buffer Zones:** Avoid spraying in situations where drift may occur. DO NOT apply during periods of dead calm.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones may be reduced when using drift reduction measures. See the Buffer Zone Calculator on the Pest Management Regulatory Agency website.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Tank Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

None listed.

Sightline

Herbicide Group
4 – aminopyralid, fluroxypyr
2 - metsulfuron

This product is the equivalent of a pre-packaged tank mix of Clearview plus fluroxypyr. Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
Corteva AgriScience

Formulation:
The *Sightline* package contains two components:
- ***Sightline A* (PCP#30409):** 52.5% aminopyralid + 9.45% metsulfuron methyl formulated as a water dispersible granule.
  - Container size -1.84 kg
- ***Sightline B* (PCP#30063):** 333 g/L fluroxypyr formulated as an emulsifiable concentrate.
  - Container size - 6.72 L

NOTE: Limited availability through selected retail outlets.

Crops and Staging:
Rangeland, permanent pasture, industrial sites and other non-crop areas.

Weeds and Staging:
Weeds controlled by the comparable rates listed for *Clearview* from 55 to 93 g per acre plus:
- Suppression of kochia from 2 to 8 leaves when *Sightline B* is applied at 0.17 L per acre.
- Control of kochia from 2 to 8 leaves when *Sightline B* is applied at 0.34 L per acre.

Rate:
Note: *Maximum of one application of this or other products containing (list other relevant active ingredients) per year. Areas treated for 24 month control should be treated no more than once every two years.*
***Sightline A*:** 55 to 93 g per acre (one package treats 20 to 33 acres.
-plus-
***Sightline B*:** 0.17 to 0.34 L per acre (one package treats 20 to 40 acres).
Add Gateway, *Agral 90, Agsurf II,* or *Citowett Plus* at 0.2 L per 100 L of spray solution.
Sightline A may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 44 L per acre. The manufacturer suggests 81 L per acre minimum.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:
Bare ground locations:
Glyphosate
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: the above Tank Mixes are those listed on the *Sightline* label only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats of Depths	Terrestrial habitat
Ground*	10	15

See the Key to Product Pages for an explanation of the different habitats.
*** Buffer zones can be reduced by 70% when using shrouds and by 30% when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Signal FSU

Herbicide Group
1 - clodinafop
2 - thifensulfuron/tribenuron
4 - fluroxypyr

Company:

Nufarm Agriculture

Formulation:

The *Signal FSU* package contains the following components:
***Signal F* (PCP#31434):** 112 g/L clodinafop propargyl and 217 g/L fluroxypyr ester formulated as an emulsifiable concentrate.

- Container size - 8 L

***Boost* (PCP#30377):** 50% thifensulfuron methyl and 25% tribenuron methyl formulated as a water dispersible granule.

- Container size - 320 g

***NuFarm Enhance Adjuvant* (PCP#29952):** Container size - 4 L

Crops and Staging:

Wheat (spring, durum) only: 2 leaf up to the emergence of the 4th tiller.

Weeds and Staging:

Grass weeds:

Weed	Stage
Barnyard grass	1 to 5 leaf prior to tillering
Green and yellow foxtail	1 to 5 leaf stage, prior to emergence of 3rd tiller
Volunteer canaryseed, wild oats	1 to 6 leaf, maximum 3 tillers
Volunteer oats	3 to 6 leaf, maximum 3 tillers

Broadleaf weeds:

- Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.
  - Annual smartweed (green, lady's-thumb)
  - Ball mustard
  - Chickweed (1 to 6 leaf)
  - Cleavers (1 to 4 whorls)
  - Common groundsel
  - Corn spurry
  - Cow cockle
  - Flixweed
  - Hemp-nettle
  - Kochia (2 to 8 leaf)
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Redroot pigweed
  - Russian thistle
  - Shepherd's-purse
  - Stinkweed
  - Tartary buckwheat
  - Volunteer canola (not CLEARFIELD varieties)
  - Volunteer flax (up to 12 cm)
  - Volunteer sunflower
  - Wild buckwheat (1 to 3 leaf)
  - Wild mustard

Weeds suppressed:

- Canada thistle, sow-thistle (less than 6 inches (15 cm) tall or across and prior to budding)
- Scentless chamomile
- Stork's-bill (2 to 6 leaf)

Rate:

***Signal F*:** 0.2 L per acre.
***Boost*:** 8 grams per acre.
***Enhance Adjuvant*:** 0.25 L per 100 L of total spray solution.
Maximum ONE APPLICATION per year of *Signal FSU* or other products containing clodinafop, thifensulfuron, tribenuron, or fluroxypyr. Thifensulfuron/tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing. Refer to the product label for complete mixing instructions.

Application Information:

- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use 29 to 40 psi (200 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage. Keep booms lower than 60 cm from crop canopy.
- **Screens:** Use of 50 mesh screens or coarser are required.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
clodinafop	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1
thifensulfuron/ tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

Application to crops stressed by extreme weather conditions such as frost, hail, saturated soils or drought as well as low fertility, insect damage or disease pressure may result in crop injury and/or reduce weed control. Crop and weeds that are growing rapidly produce optimum activity. The optimum temperature range for the best activity is between 12 to 24°C. Activity will be reduced below 8°C and above 27°C.

Tank Mixes:

Herbicides:

- ***In wheat (spring and durum) only:***
  - 2,4-D Ester (up to 113 g ae per acre)
  - MCPA Ester (up to 190 mL of a 600 g/L form per acre)

Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the *Signal F* and *Boost* labels only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Grazing Restrictions:** DO NOT graze or feed treated crop to livestock within 3 days of application.
- **Re-cropping Interval:** Barley, canola, field peas, flax, forage grasses, lentils, mustard, oats, rye and registered crops may be seeded the season after application.
- **Aerial Application:** DO NOT apply by aircraft.
- **Storage:** Store in a cool, dry place in original container. Shake well before using. If frozen, warm liquid component gradually to 10°C and shake well to reconstitute component before use.
- **Buffer Zones:**

Crop	Buffer Zones (metres[†]) Required for the Protection of:	
	Aquatic Habitats	Terrestrial habitat
Ground only	15	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
[†] Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Tank Cleaning:

Thifensulfuron/tribenuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Thifensulfuron/tribenuron should be drained and flushed out immediately after use.

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. The addition of detergent will enhance cleanout.

Hazard Rating:

***Signal F*:**

 Danger – Skin Irritant

Caution – Eye Irritant

***Boost*:**

 Warning – Skin and Eye Irritant

***Nufarm Enhance Adjuvant*:**

 Caution – Skin Irritant

 Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Simazine

Herbicide Group 5 - simazine

Company:

Syngenta Canada (*Princep Nine-T*)
Loveland Products Canada (*Simazine 480*)

Formulations:

***Princep Nine-T* (PCP#16370):** 90% simazine formulated as a water dispersible granular.

- Container size - 5 kg

***Simazine 480* (PCP#23181):** 480 g/L simazine formulated as a solution.

- Container size - 2 x 10 L

Crops and Staging:

Established alfalfa or bird's-foot trefoil (*Princep Nine-T* only):

DO NOT use in year of seeding. Apply after final cut in fall until freeze-up. DO NOT apply to the same field more than three consecutive years. Residues may build up with yearly applications.

Corn (field, sweet): Apply one week prior to seeding and incorporate to a depth of 1 inch (2.5 cm), or apply no later than 4 days after seeding corn. Rainfall is required to activate herbicide.

Established shelterbelts (elm (American, Siberian), caragana, green ash, Manitoba (boxelder) maple): Apply in fall or early spring before weeds begin growth. Injury may occur to shelter belts growing under saline conditions.

DO NOT apply to frozen ground

Weeds and Staging:

Simazine is applied prior to the emergence of the weeds and kills them when they are exposed to the treated layer of soil.

- Barnyard grass
- Lamb's-quarters
- Perennial species starting from seed
- Purslane
- Ragweed
- Smartweed (including lady's-thumb)
- Volunteer clovers
- Wild buckwheat
- Wild oats
- Yellow foxtail

Rates:

- **Forage crops:**
  - ***Princep Nine-T:*** 0.45 kg per acre.
- **Corn:***
  - ***Princep Nine-T:*** 0.61 to 0.81 kg per acre.
  - ***Simazine 480:*** 1.4 to 3.4 L per acre.
- **Shelterbelts:**
  - ***Princep Nine-T:*** 1.8 kg per acre.
  - ***Simazine 480:*** 3.8 to 5.7 L per acre.

*** Rate of application to corn is dependent on soil texture. Refer to specific labels for correct application rates on corn.**

Application Information:

- **Water Volume:** Minimum 121 L per acre. In shelterbelts, use a minimum of 202 L per acre.
- **Nozzles and Pressure:** For conventional flat fan nozzles use a maximum pressure of 30 to 45 psi (200 to 300 kPa). Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** Use 50 mesh or coarser nozzle screens and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
simazine	PPI (soil active)	PSII Inhibitor/ Membrane disruptor	Upward soil applied (Apoplast)	Broadleaf & grass	5

Effects of Growing Conditions:

When applying to forage stands, dry soil conditions at the time of weed emergence may result in reduced weed control.

Tank Mixes:

None registered.

Note: The above mixes are those listed on the simazine labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Moderate rainfall after application enhances activity.
- **Restricted Entry Interval:** DO NOT enter treated areas for 12 hours following application.
- **Grazing Restrictions:** In forage stands, allow 30 days between application and grazing, 60 days between application and cutting for feed. DO NOT graze or cut corn for feed prior to ear emergence.
- **Re-cropping Interval:** Simazine is persistent and residues may persist for several years depending on soil pH, available soil moisture, number of yearly applications, and the sensitivity of the following crop. Simazine will break down in soil more slowly under conditions of high pH and/or low rainfall. Corn will tolerate soil residues of simazine and may be planted the year of application. Navy beans, onions, peas may be injured 12 month after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze *Simazine 480*. *Princep Nine-T* may be frozen. Store in a cool, dry place.
- **Buffer Zones:**

Crops	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Alfalfa	1	1	4
Bird's-foot trefoil, sweet corn	1	1	5
Field corn	1	1	10
Shelter-belts	2	1	20

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:

Simazine 480: Caution – Poison

Refer to the Introduction for an explanation of the symbols.

Simplicity

Herbicide Group 2 - pyroxsulam

Company:
Corteva Agriscience

Formulation:
***Simplicity 30 OD* (PCP#28887):** 30 g/L pyroxsulam formulated as an oil-dispersion.
- Container size - 2 x 8 L (plus water conditioner 2 x 1.5 L)

***Simplicity GoDRI* (PCP#31916):** 21.5% pyroxsulam formulated as a water dispersible granule.
- Container size - 4 x 2.24 kg

Crops and Staging:
Wheat (spring and durum):
- ***Simplicity OD:*** 3 leaf stage until prior to the emergence of the flag leaf.
- ***Simplicity GoDRI:*** 2 leaf stage until the emergence of the flag leaf.

Winter wheat:
- ***Fall:*** 1 to 3 leaf stage.
- ***Spring:*** 2 to 7 leaf plus 4 tillers.

Rye (*Simplicity GoDRI* only): Apply to actively growing rye (fall and spring-seeded) from the 2 leaf stage until the 1st node can be felt at the base of the stem.

Triticale (*Simplicity GoDRI* only): Apply to actively growing triticale from the 3 leaf stage until the 1st node can be felt at the base of the stem.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
When applied alone, add a 90 percent active non-ionic surfactant such as *Agral 90, AgSurf* or *Sentry* at 0.25 L per 100 L of spray solution.
- Adjuvant purchased separately.

See the *Simplicity* or *Simplicity GoDRI* labels for additional adjuvant requirements.

Shake *Simplicty 30 OD* jug well before adding to spray tank.

Wild oats (less than 75 plants per sqm):

Simplicity 30 OD at 0.15 L per acre or Simplicity GoDRI at 21 grams per acre:
- Wild oats (less than 75 plants per sqm)
- Japanese brome (1 to 4 leaf, 2 tiller – whichever comes first).

Simplicity 30 OD at 0.20 L per acre or Simplicity GoDRI at 28 grams per acre:

The weeds controlled above plus those listed below.

- ***Grasses:***

Weed	Stage
Wild oats, Persian darnel*	up to the 4 leaf, 2 tillers
Barnyard grass, yellow foxtail, green foxtail*	1 to 5 leaf
Japanese brome (under sub-optimal growing conditions)	1 to 6 leaf
Downy brome†	1 to 6 leaf, up to 4 tillers

- ***Broadleaves:***
  - Canada thistle* (up to 30 cm, before budding)
  - Cleavers (up to 6 whorl)
  - Cow cockle (up to 8 leaf)
  - Common chickweed (up to 10 cm)
  - Corn spurry (up to 2 whorl or 10 cm tall)
  - Dandelion* (rosettes <20 cm diameter)
  - Field violet (up to 6 leaf)*
  - Flixweed (up to 10 cm)
  - Hemp-nettle (1 to 8 leaf)
  - Night-flowering catchfly (up to rosette stage)*
  - Redroot pigweed (1 to 8 leaf)
  - Round-leaved mallow (up to 6 leaf or 10 cm)
  - Russian thistle* (up to 10 cm)
  - Shepherd's-purse (up to 30 cm)
  - Smartweed (1 to 5 leaf)
  - Stinkweed (up to 30 cm)
  - Volunteer canola (1 to 6 leaf)**
  - White cockle* (<20 cm up to first flower)
  - Wild buckwheat (1 to 4 leaf)*

*** Suppression only.**

**** Not CLEARFIELD varieties.**

† Control with fall application in winter wheat; suppression only in spring applications on both winter and spring wheat.

Winter wheat (*Simplicity* alone) for downy brome suppression use the following adjuvant:
- *Merge* at 0.5 L per 100 L of spray (spring application only). See the *Simplicity* or *Simplicity GoDRI* labels for additional adjuvant requirements.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre.
  - ***Aerial:*** 12 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. See the label for detailed instructions on aerial application.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxsulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

DO NOT apply to crops that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury may result and/or weed control may be reduced.

Tank Mixes:

Herbicides:

- The addition of an adjuvant to *Simplicity OD* is not required in tank mixes unless the adjuvant is required by the tank mix partner. Consult the *Simplicity GoDRI* label for added requirements.

Tank-Mix Partner	Product Rates
2,4-D Ester	280 g ae per acre
Buctril M (bromoxynil + MCPA)	0.4 L per acre
Curtail M	0.6 L per acre
Exhilarate A + MCPA Ester 600	10 g per acre + 189 mL per acre
Exhilarate A + MCPA Ester 600 + Lontrel XC	10 g per acre + 189 mL per acre + 52 mL per acre
MCPA Ester (600 formulation)	0.23 to 0.38 L per acre
OcTTain XL	0.45 L per acre
*Pixxaro***	40 acres per case
Prestige XC	27 acres per case
Stellar/ Stellar XL	40 acres per case
Thumper (bromoxynil + 2,4-D)	0.4 L per acre

Fungicides:

- *Tilt** (label rates)
- *Stratego**(label rates)
- MCPA + *Tilt* *
- MCPA + *Stratego**

Fertilizers: None registered

*** High rate of *Simplicity GoDRI* only**

**** *Simplicity GoDRI* only.**

Note: The above mixes are those listed on the *Simplicity OD* or *Simplicity GoDRI* labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours may reduce control.
- **Pre-harvest Interval:** Leave 60 days between treatment and harvest.
- **Grazing Restrictions:** Must NOT be grazed or fed to livestock for 7 days after treating crop.
- **Re-cropping Interval:**
  - ***Both products:*** Barley, condiment and oilseed quality brown mustard (*B. juncea* types), canola, chickpea, dry bean, flax, lentil, oats, field pea, potato, spring wheat, soybean, sunflower and yellow mustard may be seeded 11 months following treatment.
  - **Simplicity GoDri *only:*** Field corn, sunflower and potatoes after 10 months.

- **Aerial Application:** May be applied by air.
- **Storage:** *Simplicity 30 OD* will freeze at -10°C. DO NOT freeze; store above -9°C. Allow product to warm above 7°C before using and thoroughly mix the product prior to use. *Simplicity GoDRI* is not affected by freezing. Keep *Simplicity GoDri* away from fire or open flame, or other source of heat.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	2
Helicopter	1	1	60
Fixed wing aircraft	1	1	70

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Equipment used to apply *Simplicity* should not be used to apply other pesticides to sensitive crops without thorough cleaning. To avoid subsequent injury to crops other than cereals, all spraying equipment must be thoroughly cleaned both inside and out, as follows:

4. Immediately after spraying drain the sprayer tank. Any contamination on the outside of the spraying equipment should be removed by washing with clean water.
5. Rinse inside of tank with clean water and flush through booms and hoses using at least one tenth of the spray tank volume. Drain tank completely.
6. Add *All Clear* tank cleaner at 0.5 L per 100 L of water while filling the tank ½ full with clean water. Agitate for at least 15 minutes ensuring the cleaning solution comes in contact with interior surfaces. Flush the boom and hoses with the cleaning solution and be sure to remove caps at the end of booms to allow cleaning solution to reach all areas of the boom. Leave the spray solution in the sprayer for an extended period if possible (eg. overnight). Thoroughly drain the sprayer.
7. Remove nozzles and screens and clean separately with *All Clear* cleaning solution (50 mL in 10 L water).
8. Rinse the tank with clean water and flush through the booms and hoses using at least one tenth of the spray tank volume. Drain tank completely.

Refer to the general section on sprayer cleaning in the introduction. for additional information on sprayer cleaning.

Hazard Rating:

Simplicity 30 OD:


Warning – Poison


Warning – Contains the Allergen Soy


Caution – Eye and Skin Irritant, Potential Skin Sensitizer

Simplicity GoDri:


Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Smoulder

Herbicide Group
2 - metsulfuron
14 - saflufenacil

Company:
BASF Canada

Formulations:
The *Smoulder* package contains the following components:
***Smoulder* (PCP#33943):** 64.6% active ingredient saflufenacil plus metsulfuron-methyl 5.4% formulated as a water dispersible granule.
- Container size - 907 g

-plus-
***Merge* (PCP#24702):** 50% surfactant/50% solvent blend adjuvant.
- Container size - 2 x 8.1 L

Crops and Staging:
Barley, wheat (including durum, spring, and winter): Pre-seed, post harvest

Weeds and Staging:
Broadleaf weeds (up to 8-leaf except where indicated):
- ***Weeds controlled:***
  - Kochia (up to 15 cm in height)
  - Canada Fleabane
  - Canada Thistle (up to 15 cm)†*
  - Cleavers (up to 4-whorl stage)
  - Dandelion (up to 15 cm)*
  - Flixweed*
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Redroot pigweed
  - Round-leaved mallow
  - Stinkweed
  - Volunteer canola**
  - Wild buckwheat
  - Wild mustard

† Season-long top growth control.
*** When tank mixed with glyphosate will provide rapid burndown control of these weeds in addition to those weed listed under *Smoulder* applied alone.**
**** Provides control of secondary flushes of volunteer canola (except CLEARFIELD varieties) in addition to burndown control of volunteer canola (all HT types).**

Rates:
Smoulder: 11.3 grams per acre
-plus-
Merge: 0.2 to 0.4 L per acre
Use higher rates of *Merge* is recommended for higher weed densities and when the environmental conditions at the time of herbicide application may negatively impact herbicide uptake. Maximum ONE APPLICATION per year.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Low drift nozzles may require higher pressures for proper performance. DO NOT apply in periods of dead calm.
- **Screens:** Use 50 mesh or coarser screen and filter system.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
saflufenacil	POST (foliar) with slight soil activity or preharvest	PPO Inhibitor/ Membrane disrupter	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14
metsulfuron-methyl	POST (foliar) also has soil activity	ALS Amino Acid Inhibitor	Toward growth area (Symplast)	Broadleaf only	2

Effects of Growing Conditions:
Limited or reduced residual control can be observed on high organic matter soils (>8 percent soil organic matter). Heavy rainfall or irrigations soon after application may result in residual crop injury of possible yield reduction. DO NOT use on variable soils that have large gravelly or sandy areas, eroded knolls or calcium deposits, or crop injury could result. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides: *Smoulder* should be tank mixed with glyphosate at 180 to 360 g ae per acre.
Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated areas for 12 hours following application.
- **Grazing Restrictions:** DO NOT cut as feed (hay or silage) or graze within 30 days of application.
- **Pre-harvest Interval:** 60 days when used as a pre-seed application.
- **Re-cropping Interval:** DO NOT seed treated fields to barley or wheat (spring, durum winter) within 24 hours of application. Canola (all types), faba beans, field corn, CLEARFIELD lentils, peas and soybeans may be seeded 11 months after application. Flax can be seeded 11 months after application in all regions except in the brown soil zone, where a minimum 22 month recropping interval must be observed. Oats may be seeded anytime in the following season. Fields treated in the fall with post-harvest application may be seeded in the spring to wheat (spring or durum), spring barley or oats.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store this product away from food and feed. Store the product in original, tightly closed container, in a cool, dry, secure, well-ventilated area.
- **Buffer Zones:**

Crops	Buffer Zones (metres[†]) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	3

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
[†] Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. See the label for product specific cleaning details.

Hazard Rating:


Caution – Possible Skin Irritant


Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Sortan IS

Herbicide Group 2 - rimsulfuron

Company:
Corteva Agriscience (PCP#32627)

Formulation:
20% rimsulfuron formulated as a water dispersible granule.
- Container size - 1.2 kg

Crops and Staging:
Field corn:
- Pre-emergent
- Post-emergent up to 5 leaf (3 visible collars).

Weeds and Staging:
Maximum 30.4 grams per acre of *Sortan IS* or 6.1 grams per acre of the active ingredient rimsulfuron PER YEAR.

Pre-emergent surface: 30.4 grams per acre controls the following weeds emerging from seed:
- Barnyard grass
- Foxtail (green, yellow*)
- Lady's-thumb*
- Proso millet
- Shepherd's-purse
- Sow-thistle (annual)*
- Volunteer canola (NOT CLEARFIELD varieties)
- Volunteer wheat (NOT CLEARFIELD varieties)

*** Suppression only.**

Post-emergent: *Sortan IS* applied alone requires the addition of a non-ionic surfactant such as *Agral 90, Agsurf II* or *Cittowet Plus* at 0.2 L per 100 L of spray solution.
- *The weeds listed above plus the following:*

Weed	Maximum leaf stage	Rate	
		15.2 g per acre	30.4 g per acre
Barnyard grass	1 to 4 leaf		✓
Foxtail (green, yellow*)	1 to 4 leaf		✓
Lamb's-quarters*	2 to 4 leaf		✓
Redroot pigweed	2 to 4 leaf	✓	✓
Shepherd's-purse	Cotyledon – 4 leaf		✓
Volunteer canola (NOT CLEARFIELD varieties)	Cotyledon – 5 leaf	✓	✓
Volunteer soybeans	Up to the 1st trifoliate	✓*	✓
Volunteer wheat (NOT CLEARFIELD varieties)	Up to 1 tiller	✓	
Wild buckwheat	up to 4 leaf	(If mixed with glyphosate)	✓
Wild oats*	2 leaf to 1 tiller		✓
Witchgrass	1 to 4 leaf		✓
Quackgrass	3 to 6 leaf		✓

*** Suppression only.**

Post-emergent: 22.8 grams per acre for more consistent control under heavier weed populations.
- Redroot pigweed (cotyledon to 4 leaves)
- Wild buckwheat (when tankmixed with glyphosate in *Roundup* ready corn only) cotyledon to 4 leaves

Application Information:
- **Water Volume:** Minimum 40 to 77 L per acre. Higher water volumes may provide better performance.
- **Nozzles and Pressure:** Use 25 to 40 psi (175 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE medium*** droplets while maintaining good coverage of foliage.
- **Screens:** Use 50 mesh filter screens or larger.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
rimsulfuron	POST (foliar)	ALS Amino Acid Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

Apply ONLY when the temperature in the 24 hours before AND after application ranges between 5°C and 30°C. Temperatures outside this range increase the risk of crop injury. For optimum residual control, rainfall is required within 3 to 5 days after application for activation.

Tank Mixes:

Herbicides: Glyphosate (360 g ae per acre) – pre-emergent; post-emergent (glyphosate tolerant corn only).
Insecticides: None Registered.
Sortan IS should not be applied to corn that has been treated with organophosphate insecticides. Leave 7 days between the application of *Sortan IS* and that of a foliar organophosphate insecticide.

Note: The above mixes are those listed on the *Sortan IS* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 to 4 hours may reduce the efficacy of post emergent treatments. A modest rainfall after pre-emergent applications will improve control of emerging seedlings.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT feed (silage, grazing, greenfeed, grain) treated crop to livestock within 30 days of application.
- **Pre-harvest Interval:** DO NOT apply within 30 days of harvest for feed or grain.
- **Re-cropping Interval:** Winter wheat may be seeded 4 months after application. Corn may be seeded any time after application. Barley, canola, chickpea, corn (seed or sweet), dry beans, faba beans, field pea, flax, lentil, oats, potatoes, soybean, sunflower and wheat (spring, durum) may be grown the year after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in away from other fertilizers, food or feed. Freezing will not impair effectiveness.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones may be reduced when using drift reduction measures. See the Buffer Zone Calculator on the Pest Management Regulatory Agency website.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Warning – Contains the Allergens Milk and Sulfites


Warning – Contains Phenol

Refer to the Introduction for an explanation of the symbols.

Steadfast IS

Herbicide Group 2 - rimsulfuron & nicosulfuron

Company:
Corteva Agriscience (PCP#33369)

Formulation:
12.5% rimsulfuron and 25% nicosulfuron formulated as a water dispersible granule.
- Container size - 6 x 540 g case

Crops and Staging:
Field corn: Emergence to V4 (4 visible collars)

Weeds and Staging:
Green foxtail, wild oats: 1 to 4 leaves (up to early tillering)
Volunteer wheat*: 1 to 3 leaves (up to early tillering)
Volunteer canola*: Cotyledon – 5 leaves
*** NOT Clearfield varieties.**

Rates:
Apply at 16 to 27 g per acre as a broadcast spray, with a recommended non-ionic surfactant such as *Agral 90, Agsurf II*, or *Citowett Plus* at 0.2 percent L per 100 L of spray solution (0.2 percent v/v). Use higher rates for dense weed populations or late weed growth stages for more consistent control.

Make only one application of *Steadfast IS* or other product containing rimsulfuron or nicolsulfuron per year.

Steadfast IS will degrade in acidic or highly alkaline water. Mix no more than can be used in one day. If spraying is interrupted, thoroughly re-agitate the spray mixture before resuming spraying.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre. Optimum water volume is 55 to 80 L per acre.
- **Nozzles and Pressure:** Use a spray pressure of 25 to 40 psi (175 to 275 kPa). Flat fan nozzles are recommended. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Low drift nozzles may require higher pressures for proper performance.
- **Screens:** Use 50 mesh filter screens or larger.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
rimsulfuron, nicosulfuron	POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf & grasses	2

Effects of Growing Conditions:
Apply ONLY when the temperature in the 24 hours before AND after application ranges between 5°C and 30°C. Temperatures beyond this range increase the potential for crop injury.

WARNING: Crop injury, including bleaching, may result if application is made to corn that has been stressed by abnormally hot, humid or cold weather conditions, frost, low fertility, drought, water saturated soil, compacted soil, previous pesticide applications, disease or insect damage. If corn has been injured by frost, wait 48 to 72 hours before applying.

Dry conditions following application may reduce the soil residual activity. If an activating rainfall is not received before germination of susceptible weeds, weed control will be reduced. DO NOT cultivate corn within 7 days before or after an application.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: Glyphosate – 360 g ae per acre when applied to **glyphosate tolerant corn only**. No surfactant required when tank mixed with glyphosate.

Fungicides: None registered.
Insecticides: None registered. DO NOT tank mix with an organophosphorus insecticide or apply an organophosphorus insecticide within 7 days before or after an application of *Steadfast IS*.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 to 4 hours may reduce control.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated corn forage, silage, fodder or grain for at least 30 days after application.
- **Pre-harvest Interval:** Leave 30 days between application and harvest.
- **Re-cropping Interval:** Winter wheat may be seeded 4 months after application. Spring and durum wheat, oats, barley, soybean, canola, field pea, lentil, flax, corn, potato, dry bean*, sunflower and alfalfa may be seeded 10 months after application.
  * Since not all dry bean varieties have been tested for tolerance to *Steadfast IS*, first planting of each variety to previously treated field should be limited to a small area to confirm tolerance prior to general field scale.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** To prevent contamination store this product away from food or feed. Not for use or storage in or around the home. Keep container closed. Keep product container away from moisture.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:


Warning – Contains the Allergens Milk and Sulfites
Refer to the Introduction for an explanation of the symbols.

Strim MTZ

Herbicide Group
5 - metribuzin
15 - metolachlor

Company:
UPL AgroSolutions Canada (PCP#33753)

Formulation:
405 g/L S-metolachlor/R-enantiomer and 135 g/L metribuzin formulated as an emulsifiable concentrate.
- Container size - 2 x 10.5 L, 375 L

Crops and Staging:
Potato:
- Pre-plant incorporated
- Pre-emergent*
  ***DO NOT use on the varieties Belleisle, Tobique, or Superior as crop injury may result. Potato varieties may vary in their tolerance to *Strim MTZ*.**

Weeds and Staging:
This product is most effective when applied prior to weed emergence and provides early season residual control.
Weeds controlled:
- Barnyard grass
- Common chickweed
- Common ragweed
- Dandelion (seedling)
- Eastern black nightshade*
- Foxtail (green, yellow)
- Green smartweed
- Lady's-thumb
- Lamb's-quarters
- Redroot pigweed
- Velvetleaf
- Wild mustard
- Witchgrass
- Yellow nutsedge (S)**

(S) Suppression only.
*** Pre-emergent gives better control than PPI.**
**** PPI treatment only.**

Rates:
Note: Maximum of ONE APPLICATION of this product per year.
Pre-plant incorporated: 1.17 to 1.21 L per acre
Pre-emergent: 1.17 to 1.58 L per acre
For improved burndown of any potentially emerged, small annual weeds, the following additives may be used:
- Liquid UAN (28-0-0) or liquid ammonium phosphate (10-34-0) at 5 L per 100 L of spray solution
- Crop oil concentrate at 1 L per 100 L of spray solution
- Non-ionic surfactant at 0.1 L per 100 L of spray solution.

DO NOT use on soils that are less than 1 percent or greater than 10 percent organic matter content.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum of 40 L per acre for PPI treatment; 60 to 120 L per acre for pre-emergent applications.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with nozzle tips no finer than 6502, 8002, or TK2. Sprayers should use between 30 to 45 psi (200 to 300 kPa).
- **Screens:** Use screens no finer than 50 mesh in nozzle and in-line strainers. A 16 mesh screen is recommended for the filter inlet side of the pump.
- **Equipment:** Sparge tube, jet or mechanical agitation is required. Return line agitation is not sufficient. A pump must be of sufficient capacity to provide adequate volume through the by-pass and/or jet agitation system to provide sufficient agitation even while the booms are operating.
- **Incorporation:** Avoid deep incorporation. Incorporate with implements which provide uniform, shallow incorporation. A single incorporation is satisfactory, however a second incorporation will generally improve herbicide soil blending and improve weed control (particularly on coarse soils).

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metribuzin	PPI, PRE (soil active)	PSII Inhibitor/ Membrane disruptor	Little foliar; upward soil applied (apoplast)	Broadleaf & grass	5
S-metolachlor	PPI, PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Rain is required within 10 days of a pre-emergent application. In areas of low rainfall, follow pre-emergence application by light irrigation of 0.3 to 0.4 inches (0.7 to 1.27 cm). Dry weather conditions as well as excessive rainfall or irrigation following application may reduce weed control. On sandy soils, heavy rainfall following an incorporated treatment may cause leaching of the herbicide.

If heavy rain occurs soon after application, plant injury may result, especially in poorly drained areas where water may stand for several days.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides: None registered.

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: 28-0-0 or 10-34-0 as adjuvants as indicated above.

Note: the above tank mixes are those listed on the *Strim MTZ* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** A small amount of rainfall or irrigation is required following application.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated immature crops or cut for hay.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** DO NOT plant canola the year after application. DO NOT plant fall seeded wheat, oats, or rye in the same season as application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store away from food or feed.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitat	Terrestrial habitat
Ground only*	29	10

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details.

Hazard Rating:


Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Tandem

Herbicide Group
2 - pyroxsulam
4 - fluroxypyr

This product is the equivalent of a prepackaged tank mix of Tandem A and Tandem B (See Fluroxypyr*). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.*

Company:
Corteva Agriscience

Formulation:
The *Tandem* package contains the following components:
***Tandem A* (PCP#29985):** 30 g/L pyroxsulam formulated as an oil-dispersion.
- Container size - 8 L jug

***Tandem B* (PCP#29965):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 4.84 L jug

Crops and Staging:
Spring wheat (including durum): 3 leaf stage until the first node can be felt in the stem (up to 6 leaf plus 2 tillers).
Winter wheat: Apply in the spring from the 3 tiller stage to just before the flag leaf stage.
When tank-mixing always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:
***Tandem A* at 200 mL per acre plus *Tandem B* at 121 mL per acre:**
- ***The weeds controlled by* Simplicity *at the high application rate plus the following broadleaf weeds:***

Weed	Maximum Application Stage
Hemp-nettle†, kochia, stork's-bill*	8 leaves or whorls
Volunteer flax	12 cm

*** Suppression only.**
**** Not CLEARFIELD varieties.**
† NOTE Group 2 resistant biotypes only controlled to the 6 leaf stage.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:
- ***In spring wheat (including durum):***
  - 2,4-D Ester 700 (0.24 to 0.32 L per acre)
  - *Curtail M*
  - MCPA Ester (0.24 to 0.38 L per acre) (600 g ae/L forms)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Tandem* label only.
Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions (different from the components):

- **Aerial Application:** May be applied by air.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	3
Helicopter	3	1	80
Fixed wing aircraft	5	1	95

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

See component products for more information on additional restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Telar XP

Herbicide Group 2 - chlorsulfuron

Company:

Envu Canada (PCP #30036)

Formulation:

75% chlorsulfuron, presented as a water dispersible granule.

- Container size - 10 x 500 g

Crops and Staging:

Non-crop areas where vegetation is not desirable such as utility rights of ways, roadsides, industrial sites, railroads and storage areas. DO NOT apply to crop land.
The use of this chemical may result in contamination of any body of water, including irrigation that may be used on crops.

Weeds and Staging:

For best results apply *Telar XP* Herbicide post-emergence to young (less than 10 cm tall or across) annual weeds; biennial and perennial weeds. Weeds should be actively growing at time of application.
DO NOT allow spray mixture to remain in tank for more than 24 hours before spraying or the effectiveness may be reduced.
Residual control of weeds germinating after spray application is achieved when *Telar XP* Herbicide is carried into the root zone by rainfall. For best results, sufficient rainfall to move *Telar XP* 5 to 7 cm deep into the soil is required after application, before weeds develop an established root system and grow beyond the seedling stage.
Add Adjuvant: non-ionic surfactant (i.e *Agral 90, Agsurf II*, or *Hasten NT*) at 0.1%v/v (0.1 L per 100 L of spray solution).
Weeds controlled at 6 grams per acre + 2,4-D amine 500 at 0.32 to 0.45 L per acre or 2,4-D Ester LV 700 at 0.25 to 0.32L per acre:

- Annual smartweed (green, lady's-thumb)
- Annual sunflower
- Common tansy
- Cow cockle
- Flixweed
- Hemp-nettle
- Lambs-quarters
- Mustard (ball, wild)
- Narrow-leaved hawk's-beard (spring seedlings)
- Plantain
- Prickly lettuce
- Ragweed (common)
- Redroot pigweed
- Russian Pigweed
- Russian thistle
- Scentless chamomile
- Shepherd's-purse
- Stinkweed
- Stork's-bill
- Sweet clover
- Volunteer rapeseed

Weeds controlled at 12 grams per acre:

- Annual smartweed (green, lady's-thumb)
- Common chickweed
- Common groundsel
- Corn spurry
- Cow cockle
- Flixweed
- Hemp nettle
- Lamb's-quarters
- Prickly lettuce
- Redroot Pigweed
- Scentless chamomile
- Shepherd's-purse
- Stinkweed
- Stork's-bill
- Volunteer rapeseed
- Wild mustard

Weeds controlled at 16 grams per acre:
Weeds listed above plus:

- Wild carrot

Weeds controlled at 28 grams per acre:
Weeds listed above plus:

- Canada thistle*
- Dandelion*
- Goldenrod*
- Horsetail
- Perennial sow-thistle
- Russian thistle
- Sow thistle
- Sweet clover
- Wild rose*
- Wild strawberry*

Note: Broadleaf weed control in non-crop land (where vegetation is not desirable). This rate of *Telar XP* may cause severe injury for certain grass species.

Weeds controlled at 49 grams per acre:
Weeds listed above plus:

- Canada thistle
- Narrow-leaved hawk's-beard
- Wild buckwheat
- Willow*

*** Suppression only.**

Application Information:

- **Water Volume:**
  - ***Ground:*** 81 to 162 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets. Sprayers without drift reduction nozzles should use between 30 to 40 psi (210 to 275 kPa). Low drift nozzles may require higher pressures for proper performance.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
chlorsulfuron	POST (foliar) also has soil activity	ALS Inhibitor	Toward areas of growth (symplast)	Broadleaf only	2

Effects of Growing Conditions:

Telar XP controls susceptible annual weeds by both foliar and root uptake. Best control of emerged annual weeds is obtained when weeds are actively growing. Warm, moist growing conditions promote active weed growth and enhance activity; weeds stressed by moisture or temperature extremes may be less susceptible and incomplete weed kill may result. Residual control of weeds germinating after spray application is achieved when the product is carried into the root zone by rainfall. For best results, sufficient rainfall to move *Telar XP* 5 to 7 cm deep into the soil is required after application, before weeds develop an established root system and grow beyond the seedling stage.

Tank Mixes:

Herbicides:

- ***Telar XP at 12, 16, 28 or 49 grams per acre with non-selective herbicides***
  - 2,4-D Amine
  - Atrazine
  - *Hyvar X*
  - *Hyvar X-L*
  - *Karmex DF*
  - *Krovar I*
  - *Princep*
  - *Velpar*

Adding ingredients in the correct order is critical for optimum performance. Check label of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Avoid application when heavy rain is forecast.
- **Restricted Entry Interval:** DO NOT enter treated areas for 12 hours after application.
- **Grazing Restrictions:** DO NOT graze or cut treated areas for forage as research does not support this use.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in cool, dry place. Keep away from other pesticides, fertilizer, food or feed. Store in original container.

- **Buffer Zones:** Hand-held or backpack sprayer and spot treatment DO NOT require a buffer zone:

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Field Sprayer	5	3	75

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' found in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water. See the label for product specific cleaning details. DO NOT use ammonia with chlorine bleach.

Hazard Rating:

Caution – Poison


Warning – Contains the Allergens Milk and Sulfites
Refer to the Introduction for an explanation of the symbols.

Thifensulfuron

Herbicide Group 2- thifensulfuron

Company:
FMC Corporation (*Pinnacle SG Toss-n-Go*)
Albaugh (*Volta*)

Formulation:
***Pinnacle SG* (PCP#29349):** 50% thifensulfuron methyl as a water soluble granule.
- Container size - 240 g

***Pinnacle SG Toss-n-Go* (PCP#30741):** 50% thifensulfuron methyl as a water soluble granule.
- Container size - 8 x 12 g water soluble pouches

***Volta* (PCP#33178):** 75% thifensulfuron methyl as a water dispersible granule.
- Container size - 324 g

Crops and Staging:
Pinnacle SG* and *Pinnacle SG Toss-n-Go* and *Volta:
- ***Soybean:*** First fully expanded trifoliate leaf to before soybeans have initiated flowering.

***Pinnacle SG* and *Pinnacle SG Toss-n-Go* only:**
- ***Camelina (Thifensulfuron tolerant varieties only)†:*** After camelina is established up to 60 days prior to harvest.

***Volta* only:**
- ***Barley, wheat (including durum and winter), oats:*** 2 leaf up to flag leaf stage. NOT for crops underseeded to a forage.

NOTE:** ***Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

Weeds, Rates and Staging:
In soybeans or thifensulfuron tolerant camelina*: Apply up to weeds 4 inches (10 cm) tall or wide.
- ***Pinnacle SG, Pinnacle SG Toss-N-Go* at 3.3 grams per acre or *Volta* at at 2.2 g per acre will control:**
  - Lady's-thumb
  - Redroot pigweed
  - Wild mustard
- ***Pinnacle SG, Pinnacle SG Toss-N-Go* at 4.8 grams per acre or *Volta* at 3.2 g per acre will control the weeds above plus:**
  - Lamb's-quarters
  - Velvetleaf *

In cereals only at *Volta* at 8 g per acre will control the weeds above plus:

- Annual smartweed (green)
- Chickweed (1 to 6 leaf)
- Corn spurry
- Cow cockle
- Hemp-nettle
- Russian thistle
- Stinkweed
- Volunteer canola (not CLEARFIELD or SU tolerant varieties)
- Wild buckwheat (1 to 3 leaf)

† ***Pinnacle* only.**

*** Soybeans only: The addition of 28-0-0 liquid fertilizer at 4 L per 100 L of spray solution or 2.4 kg of 46-0-0 dry urea fertilizer may improve control of velvetleaf. Refer to the product label for complete mixing instructions.**

Thifensulfuron requires the addition of a non-ionic surfactant such as *Agral 90*, *Agsurf II*, or *Citowett* at 1 L per 1000 L of spray solution. Oil surfactant blends such as *Assist* at 0.4 to 0.8 L per acre, or *Sure-Mix* at 0.5 L per 100 L of spray solution may be used as adjuvants (check label for use rates). A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum of 45 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thifensulfuron	POST	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2

Effects of Growing Conditions:

Thifensulfuron applied to crops that have been under stress before application may result in crop injury. Stress conditions within 3 days after application may also result in crop injury.

Weeds under stress conditions at the time of application may not be adequately controlled.

Stress conditions are severe weather conditions, frost, low fertility, drought, water-saturated soils, and disease or insect damage.

Injury symptoms in soybean can be crop discoloration (yellowing, purpling or reddening of leaf veins), or stunting.

Tank Mixes:

Herbicides:

- ***In soybeans only:***
  - *Assure II* (0.2 L per acre) plus *Sure-Mix** adjuvant.
  - *Basagran* (0.71 or 0.91 L per acre) plus *Assist* adjuvant*.
  - *Basagran Forté* (0.71 or 0.91 L per acre)*.
  - *Assure II* (0.25 L per acre) plus *Basagran Forté* (0.71 or 0.91 L per acre) plus *Sure-Mix* adjuvant*.
- ***In cereals only:***
  - MCPA Amine at 500 g ae per acre (0.4 L per acre of a 500 g/L formulation) plus surfactant as above.

*** Refer to appropriate labels for thifensulfuron and adjuvant rates of application.**

Fungicides: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Up to 25 mm of rain beginning 1 hour or more after spraying will not reduce the effectiveness of thifensulfuron.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Pre-harvest Interval:** Leave 60 days from application to harvest.
- **Grazing Interval:** DO NOT graze treated crops or cut for hay.
- **Re-cropping Interval:** DO NOT plant any crop other than soybean, tomatoes, thifensulfuron tolerant camelina, CLEARFIELD canola, wheat or barley for 30 days after application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in closed original container in a dry area away from food or feed.

- **Buffer Zones:**
  - Hand-held or backpack sprayers, inter-row hooded sprayers and spot treatments are exempt from buffer zone requirements.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	0	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Thifensulfuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray thifensulfuron should be flushed out immediately after use. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:

⚠ Warning – Contains the Allergen Milk/Sufites

Thifen:Triben (2:1) + Fluroxypyr + 2,4-D

Herbicide Group
2 - thifensulfuron & tribenuron
4 - fluroxypyr & 2,4-D

This product is a prepackaged tank mix of the equivalent of thifensulfuron/tribenuron and fluroxypyr and 2,4-D. Information listed is restricted to Crop, Weeds and Rates.
For other detailed information on the component products see the product pages listed above.

Company:

Loveland Products Canada (*Retain SG*)
AgraCity (*Foxxy Pro RX*)
Viking (*Viking Avesta*)

Formulations:

The *Retain SG* package contains the following components:
***Retain A* (PCP#30129):** 33.35% thifensulfuron + 16.65% tribenuron formulated as a water soluble granule.
- Container size - 486 g

***Retain 333 B* (PCP#32845):** 333 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 2.6 L

Loveland Products Canada 2,4-D Ester 700 (PCP#27818): 660 g/L 2,4-D ester formulated as an emulsifiable concentrate.
- Container size - 6.8 L

-or-
The *Foxxy Pro RX* package contains the following components:
***MPOWER RX* (PCP#33520):** 50% thifensulfuron and 25% tribenuron formulated as a water dispersible granule.
- Container sizes - 320 g, 16 x 320 g

***Foxxy* (PCP#32952):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes - 4.8 L, 77 L

***2,4-D Ester 700 II* (PCP#34808):** 660 g ae/L 2,4-D Ester formulated as an emulsifiable concentrate.
- Container sizes - 6.8 L, 109 L

-or -
The *Viking Avesta* package contains the following components:
***Viking Navik* (PCP#34791):** 50% thifensulfuron and 25% tribenuron formulated as a water dispersible granule.
- Container size - 320 g

***Viking Fluroxypyr* (PCP#34778):** 180 g/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 9.6 L

***Viking 2,4-D Ester 700* (PCP#34813):** 660 g ae/L 2,4-D Ester formulated as an emulsifiable concentrate.
- Container Size 9.8L

Crops and Staging:

Wheat (spring, durum) and barley: 4 leaf to flag leaf stage.
Winter Wheat*: In spring from the 3 tiller stage until the emergence of the flag leaf.
* ***Retain SG* only.**

Weeds and Staging:

Apply from the seedling to 4 leaf or whorl stage (unless otherwise indicated) of the following weeds:

- Weeds controlled by thifensulfuron/tribenuron (2:1) plus 2,4-D ester as well as:
  - ***Retain SG:*** cleavers*
  - ***Foxxy Pro RX:*** cleavers, kochia (2 to 8 leaf), volunteer flax (up to 12 cm), stork's-bill suppression (1 to 8 leaf)

  *** Not Group 2 resistant biotypes**

Rates:

Retain SG:

- ***Retain A*:** 12 grams per acre.
- ***Retain 333 B:*** 70 mL per acre.
- **Loveland Products Canada 2,4-D:** 0.2 L per acre.

Foxxy Pro RX:

- ***MPOWER RX:*** 8 grams per acre.
- ***Foxxy:*** 240 mL per acre.
- ***2,4-D 700 ester 700 II*:** 245 mL per acre.

Viking Avesta:

- ***Viking Navik:*** 8 grams per acre.
- ***Viking Fluroxypyr:*** 242 mL per acre.
- ***Viking 2,4-D 700 ester:*** 245 mL per acre

Add *Agral 90*, *Agsurf II*, or *Citowett Plus* at 0.2 L per 100 L of spray solution.

Thifensulfuron and tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Tank Mixes:

None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

See component products for more information on restrictions, application details and handling. Use the most limiting restrictions across all components for the mix.

Thifen / Triben (25:25) + Fluroxypyr

Herbicide Group
2 - thifensulfuron, tribenuron
4 - fluroxypyr

Company:

FMC Corporation (*Barricade II*)
AgraCity (*Foxxy R*)
Viking (*Viking Brevik*)

Formulation:

The *Barricade II* package contains the following components:
***Barricade SG* (PCP#29544):** 25% thifensulfuron methyl plus 25% tribenuron methyl formulated as a water soluble granule.
- Container size - 486 g

***Perimeter II* (PCP#30094):** 333 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 3.4 L

The *Foxxy R* and *Foxxy RCK* packages contain the following components:
***Rumour* (PCP#33574):** 25% thifensulfuron methyl plus 25% tribenuron methyl formulated as a water soluble granule.
- Container sizes:
  - *Foxxy R* - 2 x 320 g, 12 x 320 g
  - *Foxxy RCK* - 2 x 486 g, 36 x 486 g

***Foxxy* (PCP#32952):** 180 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container sizes:
  - *Foxxy R* - 2 x 6.4 L, 77 L
  - *Foxxy RCK* - 2 x 9.6 L, 230 L

The *Viking Brevik* package contains the following components:
***Viking Risor* (PCP#34792):** 25% thifensulfuron methyl plus 25% tribenuron methyl formulated as a water soluble granule.
- Container size - 2 x 486 g

***Viking Fluroxypyr* (PCP#34778):** 180 g ae/L fluroxypyr formulated as an emulsifiable concentrate.
- Container size - 12.8 L

Crops and Staging:

Barley, oats (*Barricade II* only) and spring wheat (including durum) only: 2 leaf until first node can be felt at the base of the stem.
Oats (*Barricade II* + MCPA Ester mix only): 3 leaf until first node can be felt at the base of the stem.
Winter wheat: In the spring from the 3 tiller stage until the emergence of the flag leaf.

Weeds and Staging:

Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.
Weeds controlled:

- Annual smartweed (green, lady's-thumb)
- Canada thistle (less than 6 inches (15 cm) tall or across and prior to budding)*
- Cleavers[§]
- Common chickweed (1 to 6 leaf)**
- Cow cockle
- Flixweed**
- Hemp-nettle
- Kochia (seedling to 8 leaf/10 cm**)
- Lamb's-quarters
- Narrow-leaved hawk's-beard**
- Night-flowering catchfly**
- Redroot pigweed
- Round-leaved mallow (1 to 5 leaf)**
- Russian thistle**
- Shepherd's-purse (up to 20 cm)**
- Sow-thistle (perennial)**
- Stinkweed
- Stork's-bill[§§]***
- Volunteer canola (not Group 2 tolerant varieties)
- Wild buckwheat (1 to 8 leaf)
- Wild mustard
- Volunteer flax (up to 12 cm)***

***Suppression only.**
**** *Barricade II* only.**
***** *Barricade II* and *Foxxy RCK* only.**
[§] Cleavers from the 1 to 6 whorl stage with *Barricade II* and 1 to 4 whorls with *Foxxy R*.
[§§] Stork's-bill from the 1 to 6 leaf with *Barricade II* and 1 to 8 leaf with *Foxxy RCK*.

Rate:

For *Barricade II:*

- ***Barricade SG:*** 12 grams per acre
- ***Perimeter II:*** 85 mL per acre

-or-

For *Foxxy R, Viking Brevik:*

- ***Rumour, Viking Risor:*** 12 grams per acre
- ***Foxxy, Viking Fluroxypyr:*** 160 mL per acre

-or-

For *Foxxy RCK*:

- ***Rumour:*** 12 grams per acre
- ***Foxx***y: 240 mL per acre

Add *Agral 90*, *Agsurf II*, *Citowett Plus*, *Enhance, HiActivate, Liberate* or *Super Spreader* at 0.2 L per 100 L of spray solution.

Thifensulfuron and tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Maximum of ONE APPLICATION per year of this or other products containing thifensulfuron or fluroxypyr.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 L per acre.
  - ***Aerial:*** 10 to 20 L per acre.
- **Nozzles and Pressure:** Flat fan nozzles are recommended. Sprayers without drift reduction nozzles should use between 30 to 40 psi (210 to 275 kPa). Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground or ***ASABE coarse*** droplets by air.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thifensulfuron, tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to registered crops that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Under certain conditions (heavy rainfall, prolonged cool weather, frost conditions, and wide fluctuations in day/night temperatures), lightening in crop colour and reduction in crop height may occur.

Tank Mixes:

Herbicides:

Tank mix partners are applied at all their label rates and stages and include recommended adjuvants unless otherwise noted.

- ***All crops*:**
  - MCPA Ester* (190 mL per acre)
- ***Spring wheat including Durum**:***
  - *Horizon NG*
  - *Simplicity OD*
  - *Simplicity OD* + MCPA Ester
  - *Traxos* + MCPA Ester* (190 mL per acre)

*** Rate for MCPA Ester 600. Minimum and maximum staging for MCPA applies.**

**** *Barricade II* only.**

Fertilizers: None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall within 1 hour of application may reduce efficacy.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Grazing Restrictions:** MUST NOT be grazed or fed to livestock for 7 days after treatment.
- **Re-cropping Interval:** Alfalfa, barley, corn, canola, dry beans, faba bean, flax, forage grasses, lentil, mustard, oats, peas, potatoes, rye, soybeans, sugar beets, sunflowers, wheat or fields can be fallowed the year after treatment.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in a cool, dry place. Avoid freezing. If frozen, bring to room temperature and agitate before use. DO NOT store near heat or open flame.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	15
Fixed wing aircraft	5	0	125
Helicopter	3	0	100

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Follow the sprayer cleaning instructions on the thifensulfuron/tribenuron page. The addition of a wetting agent (detergent) will also aid the cleaning process. Refer to the general section on sprayer cleaning in the introduction for additional information.

Hazard Rating:

Danger – Poison

Warning – Contains the Allergens Milk and Sulfites

Refer to the Introduction for an explanation of the symbols.

Thifensulfuron / tribenuron (2:1 ratio)

Herbicide Group 2 - thifensulfuron, tribenuron

Company:

FMC Corporation (*Refine SG*)
AgraCity (*MPOWER RX*)
Nufarm Agriculture (*Boost*)
Albaugh (*Draft*)
Viking (*Viking Navik*)

Formulation:

***Refine SG* (PCP#28285):** 33.35% thifensulfuron methyl plus 16.65% tribenuron methyl formulated as a water soluble granule.

- Container size - 486 g

***Boost* (PCP#30377), *Draft* (PCP#31904), *MPOWER RX* (PCP#33520), *Viking Navik* (PCP#34791) = 75% WDG formulations:** 50% thifensulfuron methyl plus 25% tribenuron methyl formulated as a water dispersible granule.

- Container size - 320 g

Crops and Staging:

Apply from 2 leaf to the flag leaf stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions

- **Cereals:**
  - Barley
  - Oat
  - Wheat (including durum spring and winter)
- **Sulfonylurea (SU) tolerant canola – 2 to 5 leaf and prior to bolting (*Draft* only).**
- **Seedling or established forage grasses for forage or seed production:***
  - Bromegrass (meadow, smooth)
  - Fescue (creeping red, tall)
  - Kentucky bluegrass**
  - Orchardgrass
  - Wheatgrass (crested, intermediate, northern, pubescent, slender, streambank, tall, western)

**** NOTE: Since the use of this product on forage grasses is registered under the User Requested Minor Use registration system, the manufacturer assumes no responsibility for herbicide performance. Users of this product on forage grass do so at their own risk.***

**** Established stands only.**

Weeds and Staging:

Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.

- **Weeds controlled:**
  - Annual smartweed (green, lady's-thumb)
  - Ball mustard
  - Chickweed (1 to 6 leaf)
  - Common groundsel
  - Corn spurry
  - Cow cockle
  - Flixweed
  - Hemp-nettle
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Redroot pigweed
  - Russian thistle
  - Shepherd's-purse
  - Stinkweed
  - Tartary buckwheat
  - Volunteer canola (CLEARFIELD varieties controlled with 2,4-D or MCPA mixes in cereals or grass crops only)
  - Volunteer sunflower
  - Wild buckwheat*
  - Wild mustard
- **Weeds suppressed:**
  - Canada thistle (less than 6 inches or 15 cm tall or across)**
  - Cleavers (1 to 3 whorls)
  - Round-leaved mallow (2 to 6 leaf)
  - Scentless chamomile
  - Sow-thistle (less than 6 inches or 15 cm tall or across)**
  - Stork's-bill (2 to 6 leaves)
  - Toadflax (less than 6 inches or 15 cm tall)

*** *Refine SG:* up to 5 leaf stage; 75% WDG formulations: up to 3 leaf stage only.**

**** Prior to budding.**

Rate:

***Refine SG*:** 12 grams per acre.

75% WDG formulations: 8 grams per acre.

Add *Agral 90*, *AgSurf II**, *Citowett Plus*, *HiActivate**, *Liberate*, *Nufarm Enhance*, or *Super Spreader** surfactants at 0.2 L per 100 L of spray solution.

**** Refine SG* only.**

Maximum of ONE APPLICATION per year of thifensulfuron/tribenuron or other products with the same active ingredients.

Thifensulfuron/tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing. Refer to the product label for complete mixing instructions.

A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 22 L per acre.
  - ***Aerial (Refine SG only):*** Minimum 10 L to maximum 20 L per acre.
- **Nozzles and Pressure:** Use 30 to 40 psi (210 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thifensulfuron/ tribenuron	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

DO NOT apply to wheat, barley or oats that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result.

Under certain conditions (heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day/night temperatures) lightening in crop colour and reduction in crop height may occur.

Tank Mixes:

Herbicides:

- Tank mix partners applied at all label rates. Recommended adjuvants are used unless otherwise noted.

Tank Mix Partner	Crops				
	Spring wheat	Winter wheat	Durum	Barley	Oats
2,4-D amine or ester (160 to 212 g ae per acre)*†	✓	✓	✓	✓	
Curtail M (0.61 L per acre)†	✓			✓	
Fenoxaprop 120 EC (0.16 to 0.31 L per acre)	✓		✓	✓	
Fenoxaprop 120 EC (0.16 to 0. 31 L per acre) plus MCPA Ester (0.23♦ or 0.34 L per acre)*	✓		✓	✓	
Fluroxypyr (*Perimeter II* at 63 mL per acre only)†	✓		✓	✓	
Fluroxypyr + 2,4-D (*Flurox-24* only)†	✓ΔΔ		✓ΔΔ	✓ΔΔ	
MCPA amine or ester (0.23♦ or 0.28 to 0.45 L per acre)*†	✓	✓	✓	✓	✓
Simplicity 30 OD (0.15 to 0.20 L per acre) †	✓Δ		✓Δ		

† **Marked tank mixes require the addition of a non-ionic surfactant. Unmarked mixes do not require additional adjuvant beyond what is provided for by the tank mix partner.**

Δ ***Refine SG* only.**

ΔΔ ***Boost* and *MPOWER R* only.**

*** 500 g ai/L formulation.**

♦ **Tank mix with 0.23 L per acre to control CLEARFIELD canola at the 2 to 4 leaf stage.**

- ○ Check the above tank mix partner(s) respective labels for additional staging and varietal restrictions.

Fertilizers: None registered.

Note: The above mixes are those listed on the Thifensulfuron/tribenuron (2:1) labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall of 1 inch (25 mm) or more beginning within 1 hour of application of *Refine SG* or 4 hours for 75% WDG formulations may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours following application.
- **Grazing Restrictions:** Must NOT be grazed or fed to livestock for 7 days after treatment.
- **Re-cropping Interval:** No restrictions the year after treatment. Canola, flax, lentil and alfalfa may be planted 2 months after application.
- **Aerial Application:** *Refine SG* may be applied by air. DO NOT apply 75% WDG formulations by air.
- **Storage:** Store in a cool, dry place. May be frozen.

- **Buffer Zones:**
  - ***Refine SG:***

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	0	15
Fixed wing airplane	1	0	125
Helicopter	1	0	100

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

  - ***75% WDG formulations (Ground equipment only):***
    - Leave a 15 metre buffer zone between last spray swath and sensitive upland or aquatic habitats such as shelterbelts, wetlands, sloughs and woodlots.

Sprayer Cleaning:

Thifensulfuron/tribenuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray thifensulfuron/tribenuron should be drained and flushed out immediately after use.
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. If mixing with another pesticide with different cleaning measures, those measures should be integrated into 'Method A' (e.g. addition of detergent).

Hazard Rating:

75% WDG formulations:

 Warning – Eye and Skin Irritant

***Refine SG*:**

 Warning – Contains the Allergen Milk

Refer to the Introduction for an explanation of the symbols.

Thifensulfuron / tribenuron (2:1) + MCPA Ester

Herbicide Group
2 - thifensulfuron & tribenuron
4 - MCPA

These products are prepackaged tank mix of Refine SG *and* MCPA Ester.
Information listed is restricted to Crop, Weeds and Rates and Tank mixes. For other detailed information on the component products see the product pages listed above.

Company:

FMC Corporation (*Refine M*)
Loveland Products Canada (*BroadSide*)

Formulation:

***Refine SG* (PCP#28285):** 33.35% thifensulfuron methyl + 16.65% tribenuron methyl; formulated as a water soluble granule.
- Container size - 486 g

***MCPA Ester* (*Refine M* – PCP#32311, *Broadside* – PCP#27804):** 600g/L MCPA formulated as an emulsifiable concentrate.
- Container size - 1 x 7.6 L of MCPA Ester

Crops and Staging:

Barley, wheat (including durum and winter) and oats: fully expanded 3rd leaf to the flag leaf stage.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled or suppressed by *Refine SG* plus 'Susceptible Weeds' controlled by MCPA Ester, plus:
- Dandelion (rosettes, less than 15 cm in diameter)
- Volunteer canola (2 to 4 leaf)

Rates:
***Refine SG*:** 12 grams per acre
MCPA 600 Ester: 0.19 L per acre
Refer to the product labels for complete mixing instructions.
A general guide to mixing can be found in the introduction.

Tank Mixes:
Herbicides: None Registered.
Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.
See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Thunderhawk

Herbicide Group
2 - florasulam
4 - MCPA Ester
14 - pyraflufen-ethyl

This product is a prepackaged tank mix of Thunderhawk A *(equivalent of* Goldwing*) and* Thunderhawk B *(equivalent of florasulam). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.*

Company:
Nufarm Agriculture

Formulation:
The *Thunderhawk* package contains the following components:
***Thunderhawk A* (PCP#33687):** 13.5 g/L pyraflufen-ethyl and 420 g ae/L MCPA Ester formulated as a emulsifiable concentrate.
- Container size - 10.7 L

-plus-
***Thunderhawk B* (PCP#33717):** 50 g/L florasulam formulated as a suspension concentrate.
- Container size - 3.2 L

Crops and Staging:
Spring wheat (NOT including durum), barley, oats: Apply to emerged weeds prior to seeding or just after seeding, but prior to crop emergence. Applications can be made up to a maximum of 2 days after seeding.

Weeds and Staging:
Weeds controlled or suppressed by the component products.

Rates:
Thunderhawk A: 134 mL per acre
Thunderhawk B: 40 mL per acre
Note: If Thunderhawk *is applied alone without glyphosate, add an non-ionic surfactant at 0.25 percent L per 100 L of spray solution.*
Refer to the product labels for complete mixing instructions. A general guide to mixing can be found in the introduction.

Tank Mixes:
Herbicides: Glyphosate
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Topline

Herbicide Group
2 - florasulam
4 - MCPA

This product is a prepackaged tank mix of Florasulam and MCPA.
Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
ADAMA Canada (*Topline*)

Formulation:
The *Topline* package contains the following components:
***Florasulam SC* (PCP#30814):** 50 g/L florasulam formulated as a suspension concentrate.
***Checkmate MCPA Ester 600* (PCP#27804):** 600 g/L MCPA Ester formulated as an emulsifiable concentrate.

- Container sizes -
  - ***Florasulam SC*:** 1.6 L
  - ***Checkmate MCPA Ester*:** 9.33 L

Crops and Staging:
Spring wheat (including durum), barley and oats: 2 to 6 leaf stage.
When tank-mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:
Broadleaf weeds controlled at the 2 to 4 leaf stage:

- Ball mustard
- Burdock**
- Chickweed
- Cleavers
- Flixweed**
- Hemp-nettle♦
- Lamb's-quarters
- Prickly lettuce**
- Ragweed (common)
- Redroot pigweed♦
- Russian pigweed**
- Shepherd's-purse
- Smartweed
- Stinkweed
- Sunflower (annual)**
- Volunteer canola*
- Wild mustard
- Wild buckwheat

Broadleaf weeds suppressed:

- Canada thistle
- Dandelion***♦
- Narrow-leaved hawk's-beard
- Plantain†
- Stork's-bill
- Sow-thistle (annual)
- Sow-thistle (perennial)†

*** Including all herbicide-tolerant canola varieties.**
**** Up to the 4 leaf stage of development.**
***** Seedlings and overwintered rosettes less than 15 cm (6 inches).**
♦ For improved control of this weed add an additional 47.5 mL per acre of *MCPA LV600*.
† Top growth control.

Rate:
***Florasulam SC*:** 40 mL per acre
-plus-
***MCPA 600 Ester*:** 0.23 L per acre
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Tank Mixes:
None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Topramezone

Herbicide Group 27 - topramezone

Company:

AMVAC (*Impact* – PCP#28141)
BASF Canada (*Armezon* – PCP#30131)

Formulation:

336 g/L topramezone formulated as a suspension.

- Container sizes:
  - *Armezon* - 0.6 L
  - *Impact* - 0.6 L

Crops and Staging:

Corn (field†, seed, sweet††): From the 1 to 7 leaf stage
† Including both conventional and herbicide tolerant varieties.
†† NOTE: Tolerance of sweet corn varieties to topramezone and its mix partners may be variable. When tolerance is unknown, check with the supplier of seed and/or apply to a small area first to assess tolerance.

Weeds and Staging:

The following weeds are controlled with topramezone unless otherwise indicated:
Topramezone MUST BE applied in tank mix with one of the herbicide options indicated in "Tank Mixes:"

- ***Grass weeds below from the 1 to 4 leaf stage:***
  - Barnyard grass*
  - Foxtail (green, yellow)*
- ***Broadleaf weeds below from the 1 to 8 leaf stage:***
  - Chickweed (common)*
  - Kochia (up to 10 cm)**
  - Lamb's-quarters*
  - Lady's-thumb*
  - Nightshade (eastern black)
  - Pigweed (redroot, green)
  - Ragweed (common)
  - Velvetleaf*
  - Volunteer canola (up to 8 leaf) including glyphosate-tolerant varieties**
  - Wild mustard

*** Suppression only.**
**** *Armezon* only. All types including glyphosate-resistant varieties.**

Rates:

15 mL per acre
Must be applied with (when not mixed with glyphosate) either:

- *Merge* adjuvant (0.5 L per 100 L of spray solution)

-or-

- *Hasten NT* spray adjuvant (0.25 L per 100 L of spray solution)

-or-

- *MSO Concentrate with Leci-Tech* (1 L per 100 L of of spray solution) plus UAN (1.25 L per 100 L of spray solution)

-or-

- *Destination MSO* (0.25 L per 100 L of spray solutions plus UAN (1.25 L per 100 L of spray solution)

-or-

- *Assist* (or *XA Oil concentrate*) (1.25 L per 100 L of spray solution) plus UAN (liquid 28-0-0) (1.25 L per 100 L of spray solution)

For control of secondary flushes of volunteer canola, a sequential application of *Armezon* at 15 mL per acre may be applied before the corn exceeds the 7 leaf stage. The sequential application of *Armezon* may be applied with glyphosate at 360 g ae per acre or with *Merge* at 0.5 percent v/v.
Note: MAXIMUM of 10.2 g ai per acre of topramezone per season.

Application Information:

- **Water Volume:** Minimum 81 L per acre.
- **Nozzles and Pressure:** Use 20 to 40 psi (140 to 276 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE medium*** droplets while maintaining good coverage of foliage.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
topramezone	POST (foliar)	HPPD Pigment Inhibitor	Little (Apoplast) some uptake by roots	Broadleaf & grass	27

Effects of Growing Conditions:
When weeds are stressed because of drought, flooding, hot or cool temperatures, weeds are not actively growing, control may be reduced.

Tank Mixes:
Herbicides:
Topramezone must be mixed with one of the following:

- ***Field and Sweet Corn:***
  - *AAtrex* (0.42 L per acre) (DO NOT use Merge with this mix in sweet corn)
- ***Field corn only:***
  - *Frontier Max* (0.3 L per acre) + *AAtrex* (rates above)
- ***Glyphosate tolerant corn only:***
  - Glyphosate (360 g ae per acre, no adjuvant required) (see glyphosate page for details)
  - Glyphosate + *AAtrex* (rates above)
  - Glyphosate + *AAtrex* (rates above) + *Frontier Max* (rates above)

Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the topramezone label only.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** DO NOT apply if heavy rain is forecast. Contact manufacturer for more information.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze treated fields or cut for feed within 45 days of application.
- **Pre-harvest Interval:** Leave 45 days between application and harvest.
- **Re-cropping Interval:**
  - ***After two applications of* Armezon *(30 mL per acre total):*** Field corn only may be seeded to treated areas after a crop failure. Winter wheat may be seeded four months following application. Spring wheat, canola (all types), and field corn may be seeded the following year.
  - ***After one application of* Armezon *or* Impact *(15 mL per acre total):*** Field corn only may be seeded to treated areas after a crop failure. Winter wheat may be seeded a minimum four months after application. Spring wheat, (all types), field corn, navy (white) bean, soybean, lentils, pea, canola, potato, flax (*Impact* only), sunflower (*Impact* only) and alfalfa may be seeded the following crop year. Check tank mix options for additional reseeding restrictions. Conduct a field bioassay (a test strip grown to maturity) the year before growing any other crop.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool (above 5°C), dry area. If product is frozen, bring to room temperature and agitate before use.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

- Spray when winds are under 16 km per hour, but not dead calm.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:
 Warning – Contains the Allergen Soy
Refer to the Introduction for an explanation of the symbols.

Tordon 22K

Herbicide Group
4 - picloram

Company:
Corteva Agriscience (PCP#9005)

Formulation:
240 g/L picloram acid present as a potassium salt, formulated as a solution.
- Container size - 10 L

Note: *Available only through selected retail outlets.*

Crops and Staging:
Apply at any stage of permanent grass pastures, rangeland and non-cropland.
NOTE: It is strongly recommended that this product be applied by a licensed applicator.

Weeds, Rates and Staging:
For the control of biennial and deep-rooted perennial weeds listed below:

Weed	Rate L per acre	Backpack (mL of *Tordon 22K* per 100 M^2)*
Scentless chamomile	0.445	11
Knapweed (diffuse, spotted)	0.91	22
Canada thistle, pasture sage, poverty weed, Russian knapweed, perennial sow-thistle or *Low plant densities of:* Leafy spurge, field bindweed, toadflax	1.8	45
Leafy spurge, field bindweed, toadflax	3.6†	90†

† **NOTE: This rate is only registered for spot application treating a maximum of one acre out of every two acre area at this rate.**
*** Mix with 18 litres of water and the spray solution over 100 square metres.**

For best results, applications should be made when perennial weeds have fully developed, green leaves. Application in late summer (or periods of dry weather) when plants are not actively growing may result in unsatisfactory control.

Application Information:
- **Water Volume:** 160 to 325 L per acre without spray running off foliage.
- **Nozzles and Pressure:** Maximum 150 to 350 kPa (20 to 50 psi) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of application equipment and pressure that is designed to deliver an even coverage of coarse droplets that are not prone to drift. Non-target broadleaf plants are very sensitive to *Tordon 22K* drift.
- Avoid conditions that are conducive to drift. (See introduction for drift control suggestions).

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
picloram	POST (foliar) also has soil activity	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

IMPORTANT: *Tordon 22K* is a very persistent and water-soluble herbicide. Treated soil should NOT be moved from the treated area. DO NOT apply to soils that are permeable, have sinkholes, or lie over limestone bedrock. DO NOT apply to soils whose surfaces are composed of fractured rock or unconsolidated gravel. Application to these sites may allow the movement of herbicide to underlying water sources or aquifers. If shallow aquifers are present, DO NOT apply *Tordon 22K*. This product is moderately toxic to fish. DO NOT apply to any water bodies or in areas where the runoff from treated areas will reach fish-bearing waters.

Tordon 22K must not be applied on range and pasture acres that are irrigated. DO NOT compost or mulch clippings from grass treated with *Tordon 22K*.

Effects of Growing Conditions:

Avoid application when pasture and target weeds are under stress from drought, flooding, extreme heat or cold, as injury to grass or unacceptable control may result. Avoid spraying if temperatures exceed 28°C.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Rain within 6 hours of application may cause poor results. Heavy rainfall may dissolve and carry *Tordon 22K* away from the target area, or it may leach dissolved *Tordon 22K* out of the root zone or to undesirable locations.
- **Grazing Restrictions:** DO NOT graze lactating dairy animals within 6 weeks after treatment. There are no grazing restrictions for other livestock. DO NOT use manure from animals grazing treated forage to fertilize susceptible plants or crops.
- **Re-cropping Interval:** *Tordon 22K* may persist in the soil for up to 5 years. For this reason *Tordon 22K* may only be applied on permanent grass pastures and rangeland unless applied by an authorized pesticide applicator. Avoid the root zone of desirable trees or shrubs.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:**
  - Hand-held or backpack sprayer and spot treatment DO NOT require a buffer zone from sensitive habitat, but efforts should be made to minimize exposure to sensitive plants and open water or wetlands.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only	4	2	120

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** These distances can be reduced by 30 percent using cones on individual nozzles and by 70 percent using a full shield (shroud, curtain) that extends to the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Tordon 22K can cause severe injury to sensitive crops (especially pulses and other broadleaf crops) at very low concentrations. Spray equipment should be flushed out immediately after spraying *Tordon 22K*. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Poison


Danger – Eye Irritant


May Cause Skin Irritation

Refer to the Introduction for an explanation of the symbols.

Tough EC

Herbicide Group
6 - pyridate

Company:
Belchim Crop Protection Canada

Formulation:
***Tough EC* (PCP#34647):** 600g/L pyridate formulated as an emulsifiable concentrate.
- Container size - 2 x 9.18 L

Crops and Staging:
Pre-seed or pre-emergent burndown: canola, chickpea, corn (field and sweet), and field peas.
Post-emergent:

Crop	Staging
Corn, field and sweet	up to the 8-leaf stage
Chickpea	up to 9-node stage (maximum height of 20 cm or 8 inch)

Repeat applications may be made 10 to 14 days from the first as long as the maximum yearly rate (below) is not exceeded.

Weeds, Rates and Staging:
Note: Maximum of 607 mL per acre per year.
Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 to 6 inches (10 to 15 cm) in height or width.

Weed	Rate mL per acre
False cleavers	202
Black nightshade	304
Redroot pigweed	202 to 405
Lamb's-quarters	304 to 405
Kochia, Wild mustard	405 to 607
Waterhemp*	607

*** Suppression only.**
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum 40 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Pyridate	POST (foliar)	PSII Inhibitor, Site II	Little	Broadleaf only	6

Effects of Growing Conditions:
Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:
- ***In corn (field only):***
  - **Post-Emergent up to the 8-leaf stage:**
    - *Shieldex 400SC*
    - Topramezone
    - Dicamba
    - *Aatrex 480*

Fungicides: None registered.
Fertilizers: None registered.
Insecticides: None registered.
Note: The above mixes are those listed on the *Tough EC* label only.
Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.
Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Avoid application when heavy rain is forecast.
- **Restricted Entry Interval:**
  - ***Corn (field and sweet) and chickpeas:*** Hand set/hand line irrigation (7 days); scouting (3 days); all other activities (12 hours).
  - ***Field peas and canola:*** All other activities (12 hours).
- **Grazing Restrictions:** DO NOT allow animals to graze treated corn forage within 45 days of the last application. DO NOT cut treated corn stover for feed or silage within 100 days of the last application. DO NOT graze or harvest chickpeas for feed that have been treated with a foliar application of *Tough EC* as data is not available to support this use.
- **Pre-harvest Interval:** Field corn (100 days); sweet corn (45 days); chickpeas (60 days); dry peas, lentils and canola (at maturity).
- **Re-cropping Interval:** Not specified.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze. Store in a cool, dry, secure and well-ventilated area.
- **Buffer Zones:** Handheld or backpack applications do not require a buffer.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground only*	1	1	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Let solution stand for an extended period for better results. See the label for product specific cleaning details.

Hazard Rating:


Warning – Skin and Eye Irritant
Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Tralkoxydim

Herbicide Group 1 - tralkoxydim

Company:

Corteva Agriscience (*Liquid Achieve* – PCP#28555 & *Carrier* adjuvant – PCP#30639)
ADAMA Canada (*Bison* – PCP#29256 & *Addit* adjuvant – PCP#29263)
Loveland Products Canada (*Marengo* – PCP#29289 & *Turbocharge B* adjuvant – PCP#29288)
Nufarm Agriculture (*Nufarm Tralkoxydim Liquid* – PCP#32078 & *Carrier adjuvant* – PCP#30639)

Formulation:

400 g/L tralkoxydim formulated as a suspension concentrate.

- Container sizes:
  - *Marengo* - 8 L of tralkoxydim plus 4L *Turbocharge*
  - *Bison* - 8 L of tralkoxydim plus 8 L *Addit* adjuvant
  - *Liquid Achieve* - 2 x 8 L or 96 L of tralkoxydim (adjuvant sold separately)
  - *Nufarm Tralkoxydim Liquid* - 2 x 8 L of tralkoxydim (*Carrier* adjuvant sold separately)

Crops and Staging:

No staging restrictions unless otherwise indicated.

Cereals:

- Barley
- Rye (spring, fall)
- Triticale
- Wheat (spring, durum, winter)

Forage legumes: May be used on wheat and barley crops undersown to the following (if not tank mixed with a broadleaf herbicide).

- Alfalfa
- Bird's-foot trefoil
- Clovers
- Sanfoin

Forage Grasses (seed production only)*:

- ***Under-seeded with a cereal or grown alone (seedling or established)*:***
  - Bromegrass (meadow, smooth , hybrid**)
  - Creeping red fescue
  - Wheatgrass (crested, intermediate, slender**)
- ***Grown alone (seedling only)*:***
  - Wheatgrass (northern, slender, western)

***** ***Liquid Achieve, Nufarm Tralkoxydim Liquid*** **and** ***Bison*** **only.**
****** ***Liquid Achieve*** **only.**

NOTE: Since applications to these crops have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. An application to these crops is at the risk of the user.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Wild oats: 1 to 6 leaf stage (total leaves including tillers), with a maximum of 2 tillers.
Volunteer tame oats: 1 to 6 leaf stage.
Green and yellow foxtail: 1 to 5 leaf stage (total leaves including tillers), with a maximum of 1 tiller.
Barnyard grass, Persian darnel: 1 to 4 leaf stage (total leaves including tillers).
For forage grasses and perennial cereal rye, apply prior to tillering of the above weeds.
Apply at the 2 to 3 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before tillering.

Rates:

0.2 L per acre.
Add *Turbocharge*, *Carrier,* or *Addit* adjuvant at a rate of 0.5 L per 100 L spray solution.
Maximum ONE APPLICATION of these products or other products containing tralkoxydim per season.
Note: If water analysis shows bicarbonate levels are 400 ppm or greater, add 0.9 to 1.8 kg of active ammonium sulphate per 100 L of spray water prior to mixing to eliminate antagonism.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Application in less than 20 L per acre water volume may result in mixing problems or unacceptable crop injury.
  - ***Aerial:*** 12 to 18 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. See the label for detailed instructions on aerial application.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tralkoxydim	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward areas of growth (Symplast)	Grass only	1

Effects of Growing Conditions:

Cereal crops that have set tillers may incur injury (yellowing and/or stunting) if applications are made within 48 hours of freezing temperatures. Cereal crops that have not set tillers may be injured if exposed to temperatures of 4°C or less up to 48 hours before or after application. Tank mixing with a broadleaf weed herbicide under adverse conditions may increase severity of crop injury. Crops under stress from foliar diseases or low fertility are more susceptible to injury from application. Temporary crop injury may occur when tralkoxydim tank mixes (particularly dichloprop/2,4-D ester products, and bromoxynil/MCPA Ester products + additional MCPA Ester) are applied under extreme environmental conditions (dry or wet, cool or hot weather) resulting in crop stress. Control of grasses could be reduced when they are stressed due to drought, heat, lack of fertility, flooding or prolonged cool temperatures.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

DO NOT tank mix tralkoxydim products with a broadleaf herbicide when applying to underseeded forage grasses or legumes.

Tank Mix Partner	Crops						
	Spring wheat	Durum	Winter wheat	Barley	Spring rye	Fall rye	Triticale
2,4-D ester (205 g ae per acre)†	•	•	•	•	•	•	
Bromoxynil†	•	•	•	•		•	•
Bromoxynil + 2,4-D (0.40 L per acre)†*	•	•		•			
Bromoxynil/MCPA Ester†*	•	•	•	•		•	
Curtail M (0.81 L per acre)	•	•		•			
Dichlorprop/2,4-D*	•	•	•	•			
Fluroxypyr + 2,4-D††† (*Attain XC* only), *OcTTain XL*†††	•	•	•	•			
Fluroxypyr + MCPA (*Trophy* only)	•	•		•			
Infinity††	•	•	•	•			
Lontrel (0.11 L per acre) + MCPA Ester (0.38 L per acre - 600 g/L forms)	•	•		•			
MCPA Ester† (0.38 L per acre - 600 g/L forms)	•	•	•	•	•	•	
Prestige XC†††	•	•	•††	•			

† Manufacturers may support different brands of generic products with their product. Check the tralkoxydim product label for specific brands registered.

†† *Liquid Achieve* and *Nufarm Tralkoxydim* only.

††† *Liquid Achieve, Nufarm Tralkoxydim* and *Marengo* only.

*** Tank mixes may result in some temporary initial injury under adverse environmental conditions.**

**** Temporary crop injury can occur if applied prior to the 4 leaf stage. A reduction in wild oats control may occur with this mix.**

DO NOT tank mix tralkoxydim products with herbicides or formulations of herbicides not listed above as loss of grass control may result.

When applying broadleaf herbicides not listed above, in the same field, always apply tralkoxydim first. Apply the broadleaf product no sooner than seven days after application of tralkoxydim.

Insecticides:

- *Matador* (49 mL per acre)
- *Matador* tank mixes with *Bison* may also be combined with bromoxynil or bromoxynil/MCPA Ester products.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the tralkoxydim labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 12 hours.
- **Grazing Restrictions:** Straw from treated grain crops may be fed to livestock. Immature cereal crops may be grazed or cut for hay 16 days after treatment. DO NOT feed or graze forage crops in year of treatment
- **Pre-harvest Interval:** Leave 60 days from application to harvest.
- **Re-cropping Interval:** DO NOT replant treated areas to tame oats or corn for at least 4 weeks after application.
- **Aerial Application:** May be applied by air to cereal crops only. DO NOT apply within 50 m of fish bearing waters and wildlife habitat.
- **Storage:** Store in a dry place. DO NOT freeze.
- **Buffer Zones:**

Application method	Buffer Zones (metres[†]) Required for the Protection of:
	Terrestrial habitat
Ground*	3
Helicopter	80
Fixed wing aircraft	100

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

[†] Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Caution – Skin and Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Travallas

Herbicide Group
2 - metsulfuron, thifensulfuron
4 - fluroxypyr

Company:
FMC Corporation (PCP#31685)

Formulation:
3 g/L metsulfuron methyl; 30 g/L thifensulfuron methyl; and 150 g/L fluroxypyr formulated as suspension concentrate liquid.
- Container size - 2 x 8 L

Crops, Rates and Staging:
Barley, Wheat (spring, durum): 2 leaf to flag leaf stage (prior to head emergence).

Winter Wheat: In the spring up to the flag leaf stage (prior to head emergence).

Weeds and Staging:
- 0.2 L per acre to control or suppress weeds up to 10 cm tall or wide unless otherwise indicated:
  - Canada thistle (maximum 15 cm and prior to bud)*
  - Cleavers (1 to 9 whorl)
  - Common chickweed (1 to 6 leaf)
  - Corn spurry
  - Cow cockle
  - Dandelion (fall or spring germinating rosettes up to 25 cm)
  - Flixweed
  - Hemp-nettle (1 to 8 leaf)
  - Kochia (except fluroxypyr resistant biotypes)
  - Lamb's-quarters
  - Narrow-leaved hawk's-beard
  - Night-flowering catchfly
  - Redroot pigweed
  - Russian thistle
  - Scentless chamomile (up to 10 cm)
  - Shepherd's-purse (up to 20 cm)
  - Smartweed (lady's-thumb, green)
  - Stinkweed
  - Stork's-bill
  - Volunteer canola (except CLEARFIELD varieties)
  - Volunteer flax
  - Wild buckwheat (1 to 8 leaf)
  - Wild mustard
  - White cockle

  *** Suppression only.**

Maximum ONE APPLICATION per year of *Travallas* or other products containing metsulfuron, thifensulfuron or fluroxypyr.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 22 L per acre.
  - ***Aerial:*** Apply between 10 and 20 L per acre of water
- **Nozzles and Pressure:** Use 30 to 40 psi (210 to 275 kPa) if applying without drift reduction nozzles. Drift reduction nozzles may require higher pressures for proper performance. Select the nozzle and pressure combination that produces of ***ASABE coarse*** droplets while maintaining good coverage of foliage. Keep booms lower than 60 cm from crop canopy.
- **Screens:** Use of 50 mesh screens or coarser are required.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
metsulfuron, tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Moves throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:
Application to crops stressed by extreme weather conditions such as frost, hail, saturated soils or drought as well as low fertility, insect damage or disease pressure may result in crop injury and/or reduce weed control. The conditions above as well as wide fluctuations in day/night temperatures or prolonged cool weather may shorten the crop slightly.

Crop and weeds that are growing rapidly produce optimum activity. The optimum temperature range for the best activity is between 12 to 24°C. Activity will be reduced below 8°C and above 27°C.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

Tank Mix Partner	Crop			
	Spring Wheat	Durum	Winter Wheat	Barley
Axial 100 EC	•		•	•
Axial + MCPA (rates as below)	•		•	•
MCPA Ester (up to 113 g ae per acre)	•	•	•	•
Puma Advance	•	•		•
Puma Advance + MCPA Ester (rates as above)	•	•		•
Simplicity OD	•	•	•	
Simplicity OD + MCPA Ester (rates as above)	•	•	•	
Traxos	•	•		
Traxos plus MCPA Ester (rates as above)	•	•		
Varro	•	•	•	
Varro plus MCPA Ester (rates as above)	•	•	•	

Insecticides: None registered.

Fungicides:

- ***In Barley and spring wheat (including durum) only:***
  - *Acapela*

Fertilizers: None registered.

Note: The above mixes are those listed on the *Travallas* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 2 hours will reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze or feed treated crop to livestock within 7 days of application.
- **Pre-harvest Interval:** Leave 60 days between application and harvest.
- **Re-cropping Interval:** Canola, dry beans, faba beans, field corn, field peas, flax, lentils, oats, soybeans, and registered crops may be seeded 10 months after application.
- **Aerial Application:** May be applied by aircraft.
- **Storage:** Store in a cool, dry place in original container. Shake well before using. If frozen, warm gradually to 10°C and shake well to reconstitute component before use.
- **Buffer Zones:**

Crop	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1	1	5
Aerial (fixed wing)	1	1	200
Aerial (helicopter)	1	1	175

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones may be reduced when using drift reduction measures. See the Buffer Zone Calculator on the Pest Management Regulatory Agency website.**

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

- Spray when winds are under 16 km per hour, but not dead calm.

Tank Cleaning:

Thifensulfuron/tribenuron and/or metsulfuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Thifensulfuron/tribenuron and/or metsulfuron should be drained and flushed out immediately after use.

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. When mixing with another pesticide with different cleaning measures, those measures should be integrated into 'Method A' (e.g. addition of detergent).

Hazard Rating:


Caution – Skin Irritant

Potential Skin Sensitizer, Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Traxos

Herbicide Group 1 - pinoxaden, clodinafop

Company:

Syngenta Canada (PCP#29855)

Formulation:

25 g/L pinoxaden and 25 g/L clodinafop propargyl formulated as an emulsifiable concentrate.

- Container sizes - 2 x 10 L, 80 L, 400 L

Crops and Staging:

Spring wheat (including durum) and winter wheat: prior to the emergence of the 4th tiller.

When tank mixing, check broadleaf product description for additional restrictions.

Weeds, Rates and Staging:

0.5 L per acre, no additional adjuvant required.

For control of:

Weed	Stage
Barnyard grass, Persian darnel	1 to 5 leaves prior to tillering
Foxtail (green, yellow)	1 to 5 leaves, maximum 2 tillers
Volunteer canaryseed, volunteer oats, wild oats, proso millet	1 to 6 leaves, maximum 3 tillers

Optimum yield response occurs when weeds are controlled in early stages.

Maximum of ONE APPLICATION per year of *Traxos* or other products containing pinoxaden.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 20 L up to 40 L per acre.
  - ***Aerial:*** Minimum 12 L per acre.
- **Nozzles and Pressure:** 40 to 45 psi (275 to 310 kPa) when using conventional 80° or 110° flat fan stainless steel nozzles tilted forward at an angle of 45°. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.
- **Screens:** Use 50 mesh nozzle screens.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pinoxaden, clodinafop	POST (foliar)	ACCase Lipid synthesis inhibitor	Toward growth areas (Symplast)	Grasses only	1

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Herbicides:

- *Buctril M** (label rates)
- *Curtail M* (0.6 to 0.81 L per acre)
- *Infinity* (0.33 L per acre)
- MCPA 600 ester (0.28 to 0.37 L per acre)
- *Mextrol 450M* (0.5 L per acre)
- *Pulsar* (80 acres per case)
- *Pulsar* (80 acres per case) + MCPA 600 ester (0.23 L per acre)
- *Trophy* (20 acres per case)
    - Refer to the broadleaf herbicide label for crop staging and other information.

Fungicides:

- *Tilt* (0.1 L* to 0.2 L per acre).

Fertilizers: None registered.

*** Aerial application approved.**

Note: The above mixes are those listed on the *Traxos* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze or harvest treated crops for forage within 7 days of application.
- **Pre-harvest Interval:** Leave at least 60 days from application to harvest.
- **Re-cropping Interval:** No restrictions in the year following treatment.
- **Storage:** Store in a cool, dry, ventilated are away from food or feed. Avoid ignition sources. If frozen, thaw and shake well before using.
- **Aerial Application:** May be applied by air.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground	1	0	1
Aerial by airplane or helicopter	1	0	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

Hazard Rating:


Warning – Skin Irritant

Refer to the Introduction for an explanation of the symbols.

TraxosTwo

Herbicide Group
1 - pinoxaden, clodinafop
4 - fluroxypyr, 2,4-D

This product is a prepackaged tank mix of TraxosTwo Grass *(equivalent to* Traxos*) and* TraxosTwo Broadleaf *(equivalent to* OcTTain*). Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and general information on the component products see the product pages listed above.*

Company:
Syngenta Canada

Formulation:
The *TraxosTwo* package contains the following components:

***TraxosTwo Grass Component* (PCP#31674):** 25 g/L pinoxaden and 25 g/L clodinafop-propargyl formulated as an emulsifiable concentrate.
- Container sizes - 10 L, 80 L

***TraxosTwo Broadleaf Component* (PCP#31673):** 90 g/L fluroxypyr plus 360 g/L 2,4-D LV ester formulated as an emulsifiable concentrate.
- Container sizes - 9 L, 72 L

Crops and Staging:
Spring wheat (including durum): 4 leaf stage up to the emergence of the 4th tiller.

Rates:
***TraxosTwo Grass*:** 0.5 L per acre
***TraxosTwo Broadleaf*:** 0.45 L per acre

Weeds and Staging:
Weeds controlled by *Traxos* plus the weeds controlled by *OcTTain XL*.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Triallate

Herbicide Group
15 (formerly Group 8) - triallate

Company:
Gowan Canada *(Avadex Liquid EC, Avadex MicroActiv)*
Advantage Crop Protection Inc. *(Advantage Triallate 10% Granular)*

Formulation:
***Avadex Liquid EC* (PCP#16759):** 480 g/L triallate formulated as an emulsifiable concentrate.
- Container sizes - 2 x 10 L, 115 L, 946 L

***Avadex MicroActiv* (PCP#25112), *Advantage Triallate 10% Granular* (PCP# 34574):** 10% triallate formulated as a granular.
- Container sizes:
  - *Avadex MicroActiv* - 22.7 kg, 451.3 kg
  - *Advantage Triallate 10% Granular* - 454 k

Crops, Rates and Application Timing:
***Avadex Liquid EC* Rates – Spring Treatment**

Crop	Application Timing	Rate (L per acre)	
		Organic Matter	
		4 percent or less	Greater than 4 percent
Spring and durum wheat	Before seeding*	1.0	1.2
	After seeding	1.2	1.4
Barley	Before seeding and after seeding	1.2	1.4

Crop	Application Timing	Rate (L per acre)	
		Organic Matter	
		4 percent or less	Greater than 4 percent
Canola, flax†, mustard	Before seeding	1.4	1.9
Field pea	Before seeding	1.4	1.4

*** DO NOT apply this product before seeding wheat in soils with 4 percent or less organic matter (brown, dark brown or grey wooded soils) where discers are to be used for seeding. If an air seeder is to be used, it must be equipped with a depth control device to ensure accurate seed placement, otherwise crop injury may occur.**
† Excluding Solin (low linolenic acid flax).

Triallate 10% Granular Rates – Fall Treatment

Crop	Rate (kg per acre)		
	Organic Matter		
	Less than 2 percent*	2 to 4 percent	Greater than 4 percent
Spring and durum wheat	4.5	5.7	6.9
Barley, canaryseed††, chickpea** and lentil **	4.5	5.7	6.9
Canola, flax†, mustard, field pea	5.7	6.9	8.9

*** Fall treatments conducted under minimum tillage are not recommended on soils with less than 2 percent organic matter.**
****Avadex MicroActiv only**
† Excluding Solin (low linolenic acid flax).
†† Including hairless varieties for human consumption *Avadex MicroActiv* only.

Triallate 10% granular Rates – Spring Treatment

Crop	Application Timing**	Rate (kg per acre)	
		Organic Matter	
		4 percent or less*	Greater than 4 percent
Spring and durum wheat	Before seeding***	4.5	5.7
	After seeding	5.7	6.9
Barley, canaryseed††, chickpea††† and lentil†††	Before seeding and after seeding (barley and canayseed only)	5.7	6.9
Canola, flax†, mustard, field pea	Before seeding	6.9	8.9

*** Minimum tillage treatments must be applied to fields with at least 2 percent organic matter.**
**** Minimum tillage treatments must be applied 10 to 14 days before seeding or incorporating. For minimum tillage treatments on spring and durum wheat, apply 5.7 kg per acre on soils with 4 percent organic matter or less and 6.9 kg per acre on soils with greater than 4 percent organic matter.**
***** DO NOT apply this product before seeding wheat in soils with 4 percent or less organic matter (brown, dark brown or grey wooded soils) where discers are to be used for seeding. If an air seeder is to be used, it must be equipped with a depth control device to ensure accurate seed placement, otherwise crop injury may occur.**
† Excluding Solin (low linolenic acid flax).
†† Including hairless varieties for human consumption *Avadex MicroActiv* only.
†††Avadex MicroActiv only

Seedling Forage Legumes (under-seeded only):
Apply recommended rates for the companion crop.

- Alfalfa
- Bird's-foot trefoil
- Clover (alsike, red, sweet)

Weeds and Staging:

For control of wild oats prior to their emergence (pre-emergent).

Application Information:

- **Water/Liquid Fertilizer Volume (*Avadex Liquid EC* only):** 45 L per acre.
- **Nozzles and Pressure (*Avadex Liquid EC* only):** maximum 30 psi (200 kPa) when using conventional flat fan nozzles. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets
- **Direct Seeding Systems (minimum tillage systems)**
  - *Triallate 10% granular* herbicides may be applied in the fall or spring into standing stubble. If excessive crop residue exists at the time of application, a vigorous harrowing prior to application can be used to ensure that the herbicide granules make adequate contact with the soil. Under zero-till conditions it is recommended incorporation be conducted with suitable implement such as heavy harrow that allows for shallow incorporation while maintaining a uniform concentrated layer that provides adequate wild oats control.
  - Low disturbance seeding systems will not disturb the soil enough to control emerged weeds; therefore, a pre-seeding burnoff treatment using a herbicide such as glyphosate may be necessary. Ensure that cereals are seeded at least 1.25 cm (1/2 inch) below the treated layer.
    - ***Fall Application:***
      - Applications of *Triallate 10% granular* granules should be made to standing stubble. DO NOT apply to smooth, hard packed soils that may allow granules to drift. If excessive crop residue exists at the time of application, a vigorous harrowing prior to application should be conducted to ensure the granules are in good contact with the soil. Apply after October 1 when the soil begins to cool (less than 4°C) and 3 weeks prior to soil freeze-up. Incorporation using harrow operation following application in the fall is recommended but can be performed in the spring before seeding.
    - ***Spring Application:***
      - Applications of *Triallate 10% granular* granules should be applied and incorporated using harrow operation in spring 10 to 14 days before seeding.
- **Conventional Tillage Systems**
  - ***Fall Application:***
    - Apply *Triallate 10% granular* granules to fields that are in good working condition, without excessive crop residue. Heavy crop residue or lumpy, wet fields may require tillage prior to application. Apply *Avadex MicroActiv* after September 15 until soil freeze-up. Incorporation using a harrow operation following application in the fall is recommended. Only one incorporation is required in the fall. The second incorporation may be done in the fall (before soil freeze-up) or in the spring.
  - ***Spring Application***
    - Apply *Triallate* to fields that are in good working condition, without excessive crop residue. Heavy crop residue or lumpy, wet fields may require tillage prior to application. *Triallate* applications require two incorporations, with the second incorporation at right angles to the first. Incorporation using a harrow operation following application is recommended. Using a seeder that provides soil disturbance equivalent to a cultivator may replace one of the incorporations. The first incorporation should be completed within 48 hours of application and the second incorporation should be delayed an additional 48 hours or more.
    - The liquid formulation must be incorporated into soil that is free of lumps or crop residue. Liquid formulations should be applied to fields with 30 percent or less residue cover. Heavy crop residue or lumpy, wet fields may require tillage prior to application. The liquid formulation is recommended for spring use because soils are left in an erosion prone state if the liquid is fall-applied. The first incorporation of the liquid formulation should be completed as soon as possible after spraying, while the second incorporation may be done any time prior to crop emergence. Incorporation using a harrow operation following application is recommended.
    - Ensure that cereals are seeded at least 1.25 cm (1/2 inch) below the treated layer.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
triallate	PPI (soil active)	Lipid Synthesis Inhibitor (Non-ACCase)	Little movement in plant (Apoplast)	Wild oats	15

Effects of Growing Conditions:

Reduced control may result if prolonged cool conditions or dry soil conditions prevail at the time weeds are emerging. If conditions are dry or wild oats germinate from below the treated zone, the weeds may emerge, but will usually be controlled. Thinning of wheat can occur under conditions of heavy rainfall or if cold soil conditions persist as the crop emerges.

DO NOT apply to fields where crop residue has been burned in the previous 12 months. Efficacy will be reduced.

Tank Mixes:

Herbicides: *Avadex* liquid may be tank mixed with liquid formulations of trifluralin for control of wild oats, green and yellow foxtail in wheat and barley. Apply after seeding but prior to crop emergence. Consult the recommendations for trifluralin for rates in different soil types.

Insecticides: None registered.

Fertilizer: *Avadex Liquid EC* alone, or tank mixed with liquid formulations of trifluralin, may be tank mixed with sprayable liquid fertilizer. Compatibility of the herbicide and sprayable liquid fertilizer should be checked. Follow the instructions on the herbicide label prior to adding the herbicide to the spray tank.

Note: The above mixes are those listed on the *Avadex* labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** At least 0.5 inches (1.5 cm) within 2 weeks of application in the spring is required for maximum performance of the spring treatment.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** DO NOT graze the treated crop or use as hay or feed prior to crop maturity or in year of treatment.
- **Re-cropping Interval:** DO NOT seed tame oats the year after treatment.
- **Aerial Application:**
  - *Avadex Liquid EC*: DO NOT apply by air
  - *Avadex MicroActiv*: Granular formulations may be applied by air with attachments designed for applying low volumes of granules.
- **Storage:** DO NOT freeze liquid formulations. Store granular formulations in a cool, dry place.
- **Buffer Zones:** (Liquid formulations only)

Application method	Buffer Zones (metres†) Required for the Protection of:			
	Aquatic Habitats of Depths			Terrestrial habitat
	Less than 1 m	1 to 3 m	Greater than 3 m	
Ground only*	5	2	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method C' in the introduction for *Avadex Liquid EC*.

Hazard Rating:


Warning – Poison (Liquid Formulation)


Warning – Contains the Allergen Soy (Liquid and Granular), Skin and Eye Irritant (Granular Formulation)

Refer to the Introduction for an explanation of the symbols.

Triallate + Trifluralin

Herbicide Group
3 - trifluralin
15 (formerly Group 8) - triallate

Company:

Gowan Canada (*Fortress MicroActiv* - PCP#19521)
Advantage Crop Protection (*Advantage Triallate 10%-Trifluralin 4%* - PCP#34566)

Formulation:

10% triallate and 4% trifluralin formulated as a granular.

- Container sizes - 22.7 kg, 454 kg

Crops and Staging:

Prior to planting wheat (spring and durum), barley, canola, flax (not including Solin - low linolenic acid flax), mustard.
Pre-plant incorporated: In fall after September 15 until soil freeze-up or in the spring prior to seeding crop.
Surface application: Apply in the fall after October 1 and when soil temperature is less than 4°C at a depth of 2 inches (5 cm). Incorporation using a harrow operation is recommended. Incorporation can be delayed until the following spring.
Some wheat and barley injury may be noted on eroded knolls.
DO NOT apply *Fortress MicroActiv* to fields:

- after snowfall
- with heavy crop residue.

Weeds and Staging:

Pre-emergent control of:

- Foxtail (green, yellow)
- Wild oats

Suppression of:

- Kochia
- Lamb's-quarters
- Redroot pigweed
- Russian thistle
- Wild buckwheat

Rates:

Fall Treatment

Crop	Rate (kg per acre)			
	Organic Matter			
	Less than 2 percent	2 to 4 percent	4 to 6 percent	Greater than 6 percent
Wheat	N.R.*	4.4	5.7	5.7**
Barley	4.4	5.7	5.7	6.9
Canola, flax†, mustard	5.7	5.7	5.7	6.9

*** N.R. - Not Recommended.**
**** For fall incorporated applications (not surface) apply 6.88 kg per acre when organic matter exceeds 8 percent.**
† Excluding Solin (low linolenic acid flax).

Spring Treatment

Crop	Rate (kg per acre)			
	Organic Matter			
	Less than 2 percent	2 to 4 percent	4 to 6 percent	Greater than 6 percent
Wheat	N.R.*	N.R.*	4.4	5.7
Barley	N.R.*	4.4	5.7	6.9
Canola, flax†, mustard	5.7	5.7	6.9	6.9

*** N.R. - Not Recommended.**
† Excluding Solin (low linolenic acid flax).

Application Information:

- May be applied in the fall with or without a fall tillage operation, or in the spring as a pre-plant incorporated treatment. Before application of this product, the soil must be in good working condition. Application to a field that is wet, lumpy, rough or ridged will result in reduced weed control and promote crop thinning.
- *Fall Surface Application:* Where fields are prone to water and/or wind erosion, and tillage is therefore undesirable, fall surface application should be made within 3 weeks of soil freeze-up, when the soil begins to cool (less than 4°C), which typically begins on or around October 1. Application can be made to standing stubble or to previously worked fields with incorporation delayed until spring. Incorporation using a harrow operation is recommended. For best results on heavy wild oats infestations, use the incorporated treatment.
- *Fall Incorporated Application: Fortress MicroActiv* must be applied after September 15 and before soil freeze-up. Application prior to September 15 may result in reduced weed control. Granular *Advantage Triallate 10%- Trifluralin 4%* should be applied when the average soil temperature at the 5 cm depth is 4 degrees C or less and within 3 weeks of soil freeze up. Initial incorporation may be completed within 24 hours of application. Incorporation using a harrow operation is recommended. The second incorporation may be done in the fall (prior to soil freeze-up) or in the spring. Fall incorporation is not recommended on soils where a lack of crop residue cover combined with the required incorporation operation could result in soil erosion.
- *Spring Application:* Can be applied before seeding but must be incorporated within 24 hours of application. The second incorporation must be delayed at least 48 hours after the first and may be performed at any time prior to crop emergence. Incorporation using a harrow operation is recommended.
- ***Incorporation:***
  - Applications require two incorporations, with the second incorporation at right angles to the first. Seeding with a seeder that provides soil disturbance equivalent to a cultivator may replace one incorporation. Incorporate to a maximum depth of 2 inches (5 cm) by setting disk or cultivator implements to cut a maximum of 3 inches (7.5 cm) into the soil.
  - Mixing the product to greater depths will dilute the herbicide, decrease wild oats control, and may cause injury to cereals. If the second incorporation is conducted after seeding, it should be done with harrows or other suitable tillage equipment adjusted so as not to disturb the seed. Harrowing does not provide effective in-corporation if compact soil prevents penetration of harrow teeth, if crop residue accumulates in the harrow sections, or if the harrows bounce.
- ***Seeding Requirements:*** Accurate seeding depth control is critical. Thinning of wheat and barley has been known to occur when seeding depth has been inadequate. Ensure that cereals are seeded below the treated layer (2 to 3 inches or 5 to 7.5 cm). DO NOT seed deeper than 3 inches (7.5 cm). To ensure an even crop stand, increase the usual seeding rate of wheat or barley by 10 percent, especially if soil conditions are cold or dry. See product label for more information.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
trifluralin	PPI (Soil active)	Mitosis Inhibitor/cell division	Little movement in plant (Apoplast)	Broadleaf & grass	3
triallate	PPI (soil active)	Lipid Synthesis Inhibitor (Non-ACCase)	Little movement in plant (Apoplast)	Wild oats	8

Effects of Growing Conditions:

Crop injury can occur on fields where *Fortress MicroActiv* has been applied and heavy rainfall or cold weather occur after seeding but prior to crop emergence. Seeding under warm soil conditions (greater than 10°C and generally after May 15) will ensure optimum crop germination and emergence and will reduce the risk of crop injury. Very dry conditions in spring or prolonged cool soil temperatures at time of wild oats germination will result in reduced control.

Poor results may be expected from incomplete incorporation due to wet, cloddy soil or heavy crop residues. Ridges left at seeding may disrupt the treated layer and allow weed escapes.

Restrictions:

- **Rainfall:** Moisture is required for activation. Rainfall of at least 0.6 inches (1.5 cm) within 2 weeks of seeding is required to ensure optimum results.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hour
- **Grazing Restrictions:** DO NOT graze or cut treated crops for livestock feed prior to crop maturity.
- **Re-cropping Interval:** These products will leave a residue in the soil. Oats, canaryseed, and small seeded forage grasses may be injured if planted within 24 months of application. DO NOT apply on land to be sown to wheat if the land has been treated with trifluralin since June 1 of the previous year.
- **Aerial Application:** May be applied by airplane with attachments designed for applying low volumes of granules.

Hazard Rating:


Warning – Contains the Allergen Soy

May Cause Skin and Eye Irritation

Refer to the Introduction for an explanation of the symbols.

Tribenuron

Herbicide Group 2 - tribenuron

Company:

FMC Corporation (*Express SG*)
AgraCity (*MPOWER Extra*)
UPL AgroSolutions Canada (*Inferno WDG*)*
ADAMA Canada (*Involve 50 WDG*)
Albaugh (*Cleat*)
Sharda Cropchem (*Tribe 75 WDG*)
Viking (*Viking Tribenuron*)
***Note:** This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Formulation:

***Express SG* (PCP#28262):** 50% tribenuron methyl, formulated as a water soluble granule (WSG).

- Container size - 486 g

***Involve 50 WDG* (PCP#33852):** 50% tribenuron formulated as a water dispersible granule (WDG).

- Container size - 480 g

75% WDG formulations (*MPOWER Extra* – PCP#33143, *Inferno WDG* – PCP#30838, *Cleat* – PCP#33327, *Tribe 75 WDG* – PCP# 34345, *Viking Tribenuron* (PCP#34738):
75% tribenuron methyl, formulated as a water dispersible granule (WDG).

- Container sizes:
  - *Inferno WDG, MPOWER Extra and Viking Tribenuron* - 320 g
  - *Cleat* - 324 g
  - *Involve* - 480 g
  - *Tribe 75 WDG* - 80 g

All products are purchased alone but must be used accordingly in combination with a registered tank mix herbicide.

Crops and Staging:

[Δ] NOTE: Injury to pulse crops, forage grasses and forage legumes may occur on coarse-textured soils, low in organic matter (less than 3 percent), or in fields with variable soils, gravely areas, sandy areas or eroded knolls. Avoid planting pulse crops in soils containing more than 50 percent sand.

*** Note:** ***Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.***

Tribenuron + glyphosate:

- ***In the fall (post-harvest) or spring (leave a minimum of 24 hours) prior to the seeding of:***
  Field Crops:
  - Barley
  - Canary seed (birdseed only)[††]
  - Dry bean[††Δ]
  - Faba bean[††Δ]
  - Lupin[††Δ]
  - Oats[††]
  - Pea[††Δ]
  - Soybean[††Δ]
  - SU tolerant canola (*Cleat* only)
  - Wheat (spring, durum, winter[††])

  Forage Crops for Forage and Seed Production*[†Δ]:
  - Alfalfa
  - Alsike clover
  - Bromegrass (meadow, smooth, hybrid)
  - Creeping red fescue
  - Crested wheatgrass
  - Meadow fescue
  - Red clover (forage and seed production)
  - Sainfoin
  - Slender wheatgrass
  - Tall fescue
  - Timothy
  - Yellow sweet clover

  ***Allow at least 24 hours between application and seeding.**
- ***In the fall prior to the seeding of:***
  - *The crops listed above plus:*
    - Canola[†]
    - Flax[†]
    - Field corn[†]
    - Lentil[†Δ]
- ***Fallow:***
  - Allow 10 days between application and tillage (fallow).

Post Emergent on Range and Pasture††: *Express SG* or *Involve 50WDG* plus non-ionic surfactant at 0.2 L per 100 L of spray solution. Stage according to weeds.

Tribenuron tolerant sunflower (eg. *ExpressSun SU7* variety): *Express SG* only plus non-ionic surfactant at 0.2% v/v or *Hasten Adjuvant* at 0.5% v/v from 2 to 8 leaf stage.

Tribenuron + 2,4-D ester:

- ***Fallow***
- ***Wheat (spring and durum), barley†† :*** 3 leaf up to emergence of the flag leaf.

† ***Express SG* only.**

†† ***Express SG* and *Involve 50 WDG* only.**

Weeds, Rates and Staging,

Pre-seeding application and fallow mixed with glyphosate♦:

- **Express SG *or* Involve 50WDG *at 6 grams per acre or 75% WDG tribenuron formulations at 4 grams per acre plus glyphosate (any brand) at 180 g ae per acre (see glyphosate pages for equivalent product rates.)***
  - *Weeds controlled by glyphosate products at the rates above plus:*
    - Canada thistle (rosettes)**
    - Cow cockle *
    - Dandelion (up to 6 inches)
    - Narrow-leaved hawk's-beard
    - Scentless chamomile†**
    - White cockle (rosettes)†**
    - Volunteer canola (including glyphosate tolerant varieties)***

  † ***Express SG* only.**

Fallow♦:

- **Express SG *or* Involve 50WDG *at 6 grams per acre or 75%WDG tribenuron formulations at 4 grams per acre plus 2,4-D ester 170 g (6 oz.) ae per acre (e.g. 0.24 L per acre LV 700 formulation):***
  - *Weeds controlled by 2,4-D ester 170 g (6 oz.) ae per acre plus:*
    - Flixweed♦♦
    - Stinkweed♦♦

Post-emergent in barley and spring wheat (including durum):

- **Involve 50WDG *at 6 g per acre or* Inferno WDG and MPOWER Extra *only at 4 grams per acre plus 2,4-D ester 170 g (6 oz.) ae per acre (e.g. 0.24 L per acre LV 700 formulation);***
  - *Weeds controlled by 2,4-D plus the following weeds up to 4 inches (10 cm) unless otherwise indicated:*
    - Annual sunflower
    - Canada thistle (top growth)
    - Cow cockle
    - Redroot pigweed
    - Wild buckwheat (1 to 3 leaf)**

Post-emergent for control of the emerged weeds below in rangeland and pasture only:

- **Express SG *or* Involve 50WDG *only at 6 grams per acre♦♦♦ at the early bud – pre-bloom stage:***
  - Tall buttercup
  - Narrow-leaved hawk's-beard
- **Express SG *or* Involve 50WDG *only at 12 grams per acre♦♦♦***
  - *The weeds listed above plus:*
    - Dandelion
    - Common tansy
    - White cockle

Post-emergent in Tribenuron Tolerant Sunflowers:

- **Express SG *only at 6 grams per acre plus* Hasten NT *adjuvant at 0.5L per 100L of spray solution or a non-ionic surfactant such as* Agral 90 *or* AgSurf*, at 0.2% v/v (2 L per 1000 L of water) will control:***
  - Lamb's-quarters (up to 9 leaf)
  - Wild buckwheat** (up to 6 leaf)

*** Up to the 3 leaf stage.**

**** Suppression only.**

***** Up to 6 inches.**

♦ Allow 10 days between treatment and tillage.

♦♦ Fall rosettes and spring seedlings.

♦♦♦ Addition of a non-ionic surfactant at 0.2 L per 100 L of spray solution is required.

Tribenuron may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** 22 to 40 L per acre.
- **Nozzles and Pressure:** Use appropriate pressure for nozzle. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets or larger.
- **Screens:** Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf only	2

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of tribenuron. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.

Herbicides:

- ***Prior to seeding registered Field Crops (all products unless otherwise indicated):***
  - Must be mixed with glyphosate
- ***Prior to seeding wheat (spring, durum, winter), barley, oats, dry bean, fababean, field pea, lupin and soybean:***
  - *Aim* + glyphosate (*Express SG* only)
- ***Prior to seeding wheat (spring and durum) (*****Express SG *****only):***
  - *Authority 480*
- ***Prior to seeding wheat (spring or winter, NOT durum), soybean and field pea (*****Express SG *****only):***
  - *Focus* + glyphosate
- ***Prior to seeding Faba Bean, Field Pea, Soybean (*****Express SG *****only):***
  - *Authority 480* + glyphosate.
- ***Fallow:*** All products
  - Must be mixed with either glyphosate or 2,4-D ester
  - *Aim* + glyphosate (*Express SG* only)
- ***In spring wheat (including durum) and barley (*****Inferno WDG *****and* MPOWER Extra *****only):***
  - 2,4-D Ester (170 g ae/acre)
- ***Tribenuron Tolerant Sunflowers (*****Express SG only*****):***
  - *Assure II* plus *Merge* (0.5 to 1.0% v/v) or *Suremix* (0.5% v/v) adjuvants
  - Clethodim (*Select, Centurion, Shadow RTM*) plus *Amigo* (0.5% v/v)
  - *Poast Ultra* plus *Hasten Adjuvant* (0.5% v/v)

Note: The above mixes are those listed on the tribenuron labels only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check product labels for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce control. Check with product manufacturers for specific recommendations.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***75% WDG formulations:*** DO NOT graze treated crops within 30 days of application.
  - ***Express SG:*** Forage may be grazed immediately following application.
- **Pre-harvest Interval:**
  - ***75% WDG formulations:*** Leave 60 days between spraying and harvest of cereals.
  - ***Express SG:*** Leave 70 days between spraying and harvest of sunflower.
- **Re-cropping Interval:** There are no restrictions one year after treatment.
  - ***75% WDG formulations:*** Canola, flax, lentils and alfalfa may be planted 2 months after application.
  - ***Express SG* and *Involve 50 WDG* only:** All registered crop options may be seeded in the spring following a fall application. Canola, flax, and field corn may be planted 2 months after application or in the spring following a fall application (contact FMC for information on timing as it applies to tolerance on canola, lentil and field corn).
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen.

- **Buffer Zones:**
  - Handheld or backpack sprayers do not require a buffer zone.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Fallow, preseed, range and pasture	0	0	3
Tribenuron tolerant sunflowers	1	0	4

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Tribenuron can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Tribenuron should be flushed out immediately after use. Refer to 'Method A' in the general section on sprayer cleaning in the introduction.

This ammonia rinse process should be done twice for the WDG formulations. See the labels of the various products for specific instructions. The addition of detergent may improve cleanout, especially when mixing with other products.

Hazard Rating:

***Express SG, Involve 50WDG* and *Viking Tribenuron*:**

 Warning – Eye Irritant

Potential Skin Sensitizer

***MPOWER Extra* and *Inferno WDG*:**

 Caution – Eye and Skin Irritant

All products:

 Warning – Contains the Allergens Milk and Sulfites

Refer to the Introduction for an explanation of the symbols.

Tridem

Herbicide Group
2 - pyroxsulam, florasulam
4 - fluroxypyr

Company:
Corteva Agriscience

Formulation:
The *Tridem* package contains the following components:
***Tridem A* (PCP#33290):** 21.5% pyroxsulam formulated as a water dispersible granule.
- Container sizes - 0.84 kg, 5.04 kg

-plus-
***Tridem B* (PCP#33440):** 5 g/L florasulam and 100 g/L fluroxypyr formulated as a suspension concentrate.
- Container sizes - 2 x 8.1 L, 97.2 L

-plus-
Bindem Utility Modifier:
- Container sizes - 2.4 L, 2 x 7.1 L

Crops and Staging:
Spring wheat, durum wheat, winter wheat: 3 leaf to just prior to flag leaf emergence

Weeds and Staging:
- **Grass weeds controlled (1 to 6 leaf, prior to 4th tiller):**
  - Wild oats†
  - Japanese brome††
- **Broadleaf weeds controlled:**
  The 'susceptible' broadleaf weeds controlled by 2,4-D (see 2,4-D page) plus:
  - Cleavers◆
  - Chickweed
  - Cow cockle
  - Hemp-nettle*
  - Kochia◆
  - Narrow-leaved hawk's-beard*
  - Redroot pigweed*
  - Shepherd's-purse
  - Smartweed
  - Sow-thistle (annual, perennial)*
  - Stinkweed
  - Stork's-bill (1 to 8 leaf)
  - Volunteer canola◆◆
  - Volunteer flax
  - Wild buckwheat

*** Suppression only.**
† For low wild oats populations (less than 75 plants per square metre).
†† For control of Japanese brome from the 1 leaf to 4 leaf, 2 tiller stage under good growing conditions.
◆ Including Group 2 resistant biotypes.
◆◆ Except CLEARFIELD varieties.

Rates:
Tridem A: 21 grams per acre +
Tridem B: 405 mL per acre
When tank mixed with 2,4-D 700 ester and MCPA ester at rates in the 'Tank Mix' section below, additional surfactant is NOT required; however, Bindem Utility Modifier *included in the case is required at 60 mL per acre.*

Application Information:
- **Water Volume:**
  - ***Ground only:*** 20 to 40 L per acre.
- **Nozzles and Pressure:** Use appropriate pressure for nozzle. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets or larger.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxsulam	POST (foliar)	ALS Amino Acid Inhibitor	Toward growth areas (Symplast)	Broadleaf and grass	2
florasulam	POST (foliar) with little soil activity	ALS Amino Acid Inhibitor	Toward growth areas of plant (Symplast)	Broadleaf only	2
fluroxypyr	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to registered crops that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance.

Tank Mixes:

Herbicides:

- 2,4-D Ester 700 (215 to 250 mL per acre)
- MCPA Ester 600 (185 mL to 360 mL per acre)

Fungicides:

- *Stratego 250EC*
- *Tilt 250 E*

Fertilizers: None registered.

Insecticides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfast within 2 hours of application.
- **Preharvest Interval:** DO NOT harvest the treated crop for grain within 60 days of application.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing:** DO NOT graze for 7 days or silage/hay for 30 days following application.
- **Re-cropping Interval:** Fields previously treated with *Tridem* can be seeded the following year to wheat, barley, canola, corn, dry common beans, flax, lentils, mustard (brown, oriental and/or yellow) oats, peas, potatoes (except seed potatoes), soybeans, or sunflower.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in a secure, dry, well ventilated, heated storage.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:	
	Aquatic Habitats of Depths	Terrestrial habitat*
Ground only*	1	2

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to the combination of 'Method A' and 'Method B' found in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:

 Warning – Eye and Skin Irritant

Refer to the Introduction for an explanation of the symbols.

Trifluralin

Herbicide Group 3 - trifluralin

Company:

Gowan Canada (*Treflan Liquid EC, Treflan MicroActiv*)
Nufarm Agriculture (*Rival*)
Loveland Products Canada (*Bonanza*)
Advantage Crop Protection (*Advantage Trifluralin 480 EC, Advantage Trifluralin 10%*)
Sharda Cropchem Limited (*Bonita, Thrill*)

Formulation:

Bonanza 480 EC **(PCP#28289):** 480 g/L trifluralin formulated as an emulsifiable concentrate.
- Container sizes - 9.45 L, 205 L

Bonanza 10G **(PCP#22744):** 10% trifluralin formulated as a granular.
- Container sizes - 22.7 kg, 500 kg bags

Rival EC **(PCP#18612):** 500 g/L trifluralin formulated as an emulsifiable concentrate.
- Container sizes - 2 x 9 L

Rival 10G **(PCP#18926):** 10% trifluralin formulated as a granular.
- Container sizes - 454 kg bags

Treflan Liquid EC **(PCP#23933):** 480 g/L trifluralin formulated as an emulsifiable concentrate.
- Container sizes - 9.45 L, 115 L

Treflan MicroActiv **(PCP#21742):** 10% trifluralin formulated as a granular.
- Container size - 454 kg bags

Advantage Trifluralin 480 EC **(PCP# 34590):** 480 g/l trifluralin formulated as an emulsifiable concentrate
- Container size - 9.45 L

Advantage Trifluralin 10% **(PCP# 34572):** 10% trifluralin formulated as a granular
- Container size - 454 kg

Thrill **(PCP#34592):** 480 g/L trifluralin formulated as an emulsifiable concentrate
- Container size

Bonita **(PCP#34924):** 10% trifluralin formulated as a granular.
- Container size - 22.7 kg

Crops and Staging:

Certain formulations are not registered for all the crops listed here. Refer to the specific product label for details. All products are for pre-plant incorporated use only.

Fallow use in the brown soil zone of Saskatchewan, or fall application in all soil zones. (Granular products only): Spring wheat (including durum). Apply to fallow fields in May, June, or July for weed control during both years of a fallow-wheat rotation, or in the fall (September or October) or spring prior to seeding.

DO NOT apply following harvest when the previous crop was treated with another trifluralin product (*Treflan*, *Rival* or *Bonanza* products). This includes application the previous summer or fall. DO NOT apply trifluralin following harvest or to fallow when the previous year's crop was an oilseed, barley or pulse crop treated with a deep incorporated, spring or fall applied trifluralin product.

Green and Yellow Foxtail Control in Cereals:
- Liquids applied in spring only (after seeding but prior to crop emergence) - spring wheat (including durum), barley. Granulars applied in fall only (after September 1 but before freeze-up) - spring wheat (including semi-dwarf and durum).

Broadleaf and Grassy Weed Control in other crops:
- ***Spring applied liquid or granular formulations:***
  - Canola, pea, sunflower, safflower (liquid formulations), dry bean*, mustard, faba bean, alfalfa, sainfoin, sweet clover, soybean, forage legumes (cicer milk-vetch, seedling alsike clover, red clover, bird's-foot trefoil).
- ***Fall applied granular formulations:*** Canola, pea, sunflower, dry bean, mustard, faba bean, soybean, barley, lentils and flax.
- ***Trifluralin liquids only:*** prior to planting shelterbelt transplants (elm, caragana, green ash, Scots pine).

* *Advantage 480EC, Thrill* - black, white or kidney only

Weeds:

Fallow use in the brown soil zone of Saskatchewan or fall application in all soil zones (Granular products only):

- ***Fallow Year:***
  - Barnyard grass
  - Cow cockle
  - Green foxtail
  - Lamb's-quarters
  - Persian darnel
  - Redroot pigweed
  - Russian thistle*
  - Wild buckwheat
  - Wild oats
- ***Crop Year:***
  - Green foxtail
  - Lamb's-quarters
  - Wild buckwheat*
  - Wild oats*

*** Suppression only**

Green and Yellow Foxtail Control in Cereals:

- Foxtail (green, yellow)

Broadleaf and Grassy Weed Control in other crops:

- Barnyard grass
- Brome (downy, Japanese)
- Chickweed
- Cow cockle
- Foxtail (green, yellow)
- Knotweed
- Lamb's-quarters
- Persian darnel
- Pigweed
- Purslane
- Wild buckwheat*
- Wild oats†*

*** Some plants may escape herbicide treatment but are not competitive with the crop.**

† Suppression only with *Treflan Liquid EC* and *Bonanza 480 EC*.

Rates and Staging:

Fallow use in the brown soil zone of Saskatchewan (granular products only):

- DO NOT apply to sandy soils with less than 1 percent organic matter. Application to severely eroded knolls is not recommended. DO NOT apply to wet soils, soils in poor working condition, soils which contain more than 8 percent organic matter, or soils subject to prolonged periods of flooding.
- Granules may be applied to fallow fields or following harvest, provided crop residues or green growth do not interfere with cultivation (prevent soil mixing).
- Over-application caused by overlapping, improper calibration or non-uniform application may result in reduced crop stand, delayed development or reduced yields.

	Rate (kg per acre)		
Soil Organic Matter (percent)	1 to 3 percent	4 to 8 percent	2 to 8 percent
May	3.85	4.5	
June	3.25	3.85	
July	2.65	3.25	
September to October			2.23*

*** Control of green foxtail only, on soils between 2 to 8 percent organic matter.**

- During the fallow year, susceptible weeds may not be fully controlled until after the second fallow operation has established a uniform layer of treated soil. Control of wild oats in the crop year may be variable depending on wild oats population as well as soil and climatic conditions. Some wild buckwheat may escape but its growth will be slowed and result in limited competition to the wheat crop.

Pre-emergent control of green and yellow foxtail:

- ***Liquids:***

Product	Rates (L per acre)	
	Light and Medium Soil Texture	Heavy Soil Texture
Rival EC	**0.49 to 0.57 L**	**0.65 L**
Treflan Liquid EC, Bonanza 480 EC, Advantage Trifluralin 480EC, Thrill	**0.49 L**	**0.69 L**

- ***Granular products (wheat only):***
  - 2.23 kg per acre in all soil textures with 2 to 8 percent organic matter.

Broadleaf and grassy weed control in other crops:

- For use in canola, pea, sunflower, dry bean, mustard, faba bean, seedling alfalfa (spring only), seedling sweet clover (spring only), soybean.

Product	Soil Type			
	Light soils with less than 6 percent organic matter		Medium to heavy soils with 6 to 15 percent organic matter	
	Spring	Fall	Spring	Fall
Rival EC	0.65 L/acre	0.89 L/acre*	0.89 to 1.13 L/acre	1.13 to 1.37 L/acre*
Bonita, Rival 10G	3.43 kg/acre**	4.45 kg/acre	4.45 to 5.67 kg/acre**	5.67 to 6.88 kg/acre
Treflan Liquid EC, Advantage Trifluralin 480EC, Thrill	0.69 L/acre	0.93 L/acre*	0.93 to 1.21 L/acre	1.21 to 1.37 L/acre*
Bonanza 10G , Treflan Microactiv	Not registered	4.45 kg/acre	Not registered	5.67 to 6.88 kg/acre
Bonanza 480 EC	0.69 L/acre	0.93 L/acre*	0.93 L/acre	1.17 L/acre*

*** Although liquid formulations are registered for fall application, this use is not recommended as tillage requirements before and after application will predispose fields to erosion.**

**** Spring applications of granular formulations are recommended for Manitoba only.**

For use in barley (fall only), apply:

Product	Soil Type					
	2 to 4 percent organic matter		4 to 6 percent organic matter		6 to 10 percent organic matter	
	Light Soil Texture*	Medium to Heavy Soil Texture**	Light Soil Texture*	Medium to Heavy Soil Texture**	Light Soil Texture*	Medium to Heavy Soil Texture**
Rival 10G, Bonanza 10G, Treflan Microactiv, Advantage Trifluralin 10%, Bonita	3.44 kg/acre	3.44 kg/acre	4.45 kg/acre	4.45 kg/acre	4.45 kg/acre	5.67 kg/acre

*** Light textured soils can be defined as sandy to sandy-loam.**

**** Medium to heavy textured soils can be defined as loam to clay.**

For use in flax or lentils (fall only), apply:

Product	Soil Type			
	Soils with 2 to 6 percent organic matter		Soils with 6 to 15 percent organic matter	
	Light Soil Texture*	Medium-Heavy Soil Texture**	Light Soil Texture*	Medium-Heavy Soil Texture**
Rival 10G, Bonanza 10G, Treflan Microactiv , Advantage Trifluralin 10%, Bonita	4.45 kg/acre	4.45 to 5.6 kg/acre***	5.67 kg/acre	5.67 to 6.88 kg/acre
Bonanza 480 EC	0.93 L/acre	0.93 L/acre	1.17 L/acre	1.17 L/acre
Treflan Liquid EC, Advantage Trifluralin 480EC, Thrill	0.93 L/acre	1.21 L/acre	1.21 L/acre	1.21 to 1.38 L/acre
Rival EC	0.89 L/acre	1.13 L/acre	1.89 L/acre	1.13 to 1.38 L/acre

*** Light textured soils can be defined as sandy to sandy-loam.**

**** Medium to heavy textured soils can be defined as loam to clay.**

***** Rates vary among products. Refer to product label for specific information.**

Application:

Liquid Formulations:

- ***Water Volume:*** **Minimum 40 L per acre.**
- ***Nozzles and Pressure:*** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE medium*** droplets or larger.

Dry Granular Formulations: Use equipment capable of metering granular herbicides and applying in an even layer over the surface of the soil. Close applicator lid after filling to avoid prolonged exposure to direct sunlight.

Incorporation:

Fallow use in the brown soil zone of Saskatchewan:

- Apply granules to the soil surface and incorporate immediately, in the same operation if possible. DO NOT delay incorporation more than 24 hours after application. Use a deep tillage cultivator, field cultivator or disc implement set to work 2 to 3 inches (5 to 8 cm) deep, and operating at 8 to 10 km per hour. Granules should not be incorporated when soil is crusted, lumpy or too wet for good mixing action.
- ***May to July:*** A second incorporation at the same depth and at an angle to the first should be done when weed growth requires it. Wait at least one week before making the second incorporation. After completing two fallow incorporations, additional operations with a rod weeder, shallow tillage or fall herbicide application may be required to control remaining weed growth.
- ***September to October:*** A second incorporation may be done in the fall a minimum of 3 days later. Alternatively, to conserve crop residues cover through the winter, the second incorporation can be completed in the spring at the same depth and at an angle to the first incorporation. When both incorporations take place in the fall, shallow spring tillage should be completed in the spring. If a discer or air seeder is used for seeding, separate spring tillage may not be necessary.
  - *NOTE: Fall application is not recommended on soils where a lack of crop residue cover combined with the required incorporation would leave the soil vulnerable to erosion.*
- ***Spring (In the year of seeding):*** Apply granules and incorporate immediately, in the same operation if possible. DO NOT delay the first incorporation longer than 24 hours after application. The second incorporation must be delayed a minimum of 3 days following the first incorporation. When applied to cold soils, wait 14 days before making second incorporation. The second incorporation should be done at an angle to the first incorporation, and at the same depth. If a discer or air seeder is used for seeding, the seeding operation can be used as the second incorporation.

Green and yellow foxtail control in cereals:

- ***Liquid formulations:*** Apply and incorporate in spring just after seeding. Incorporate to a depth of 1 to 1.5 inches (2 to 4 cm) into a bare soil free of crop residues (80 percent black when viewed from above) using diamond or tine type harrows operated at a speed of 6 miles per hour (9 km per hour). Incorporate twice, with the second incorporation at right angles to the first. The first incorporation should be performed immediately in the same direction of application. Both incorporations should be done within 24 hours of application. When tank mixing liquid formulations with *Avadex BW*, follow the same incorporation procedure.
- ***Granular formulations:*** May be applied to standing or pre-worked stubble. Very heavy trash fields should be worked prior to application to allow product penetration to the soil surface. Incorporate with cultivators or disc implements only. Perform the first tillage operation within 24 hours of application. Incorporate at a working speed of 5 to 8 miles per hour (8 to 13 km per hour) and to a depth of 2 to 3 inches (5 to 8 cm). Wait a minimum of 5 days, then incorporate a second time at right angles to the first. This second incorporation may be delayed until the following spring. Subsequent working should be no deeper than 2 to 3 inches (5 to 8 cm).

Broadleaf and grassy weed control in other crops:

- Granular formulations are recommended for use in fall or spring as a pre-plant incorporated treatment on broadleaf crops listed on the product label. The liquid formulations should be used only on soils free of lumps and relatively free of crop residues (75 percent black) and are recommended only for spring use. Granular formulations may be applied to standing or pre-worked stubble. Very heavy crop residues should be worked prior to application to allow product penetration to the soil surface. DO NOT use liquid or formulations of trifluralin as a pre-plant incorporated treatment in barley, as severe injury will result. Only the fall applications of granular formulations are registered for use as pre-plant incorporated treatments in barley. For fall application of granular formulations, work the chemical into the soil between September 1 and freeze-up. Use a discer or field cultivator (vibrating shank-type). Disc implements are preferred on stubble. Set equipment to cut at 3 to 4 inches (8 to 10 cm) depth. The initial incorporation should be done within 24 hours of application.
  The second incorporation should be done at right angles to the first. The second incorporation may be delayed until spring, except when planting barley, flax or lentils; for these crops both incorporations must be done in fall. Delay the second incorporation 5 days for better weed control. This will allow greater release of the chemical onto soil particles and assure more even distribution. Fall application of granular trifluralin on flax, lentils or barley is not recommended on soils prone to erosion, as the 2 fall incorporations necessary in these crops may leave soils vulnerable to wind or water erosion.
- For spring application of liquid and granular formulations, work the chemical into the soil prior to seeding by setting the implement at 3 to 4 inches (8 to 10 cm) cutting depth. The first incorporation must be done within 24 hours of application. The second incorporation must be done at right angles to the first. If incorporating granular trifluralin, delay the second incorporation for 3 days after the first to achieve better weed control.

Seeding:

Fallow use in the brown soil zone of Saskatchewan:

- Allow soil to warm before seeding to reduce risk of injury to crop. Place seed 1.25 to 2.5 inches (3 to 6 cm) deep. If spring seedbed preparation is required, set cultivator 2 inches (5 cm) deep. To reduce the risk of wheat injury, use good quality seed and agronomic practices that will promote good growing conditions. Avoid deep seeding, loose seedbeds and seeding into cold soils. If extended dry periods were present after a fallow application, a 10 percent increase in seeding rate is recommended.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
trifluralin	PPI (Soil active)	Mitosis Inhibitor/ cell division	Little movement in plant (Apoplast)	Broadleaf & grass	3

Effects of Growing Conditions:

Prolonged drought conditions after a May to July application to fallow may result in higher levels of trifluralin in the soil at the time of seeding.

Injury to flax, barley, wheat or lentils may occur if soil and weather conditions are not conducive to rapid crop emergence (cold or dry soils at the time of seeding and crop emergence).

To minimize crop injury, seed into a firm, moist seed bed using a seeder with good depth control and on row packing. Plant barley no deeper than 2 inches (5 cm). Plant cereals, lentils and flax no deeper than 1.5 inches (4 cm).

Less than acceptable weed control will result if dry conditions prevail at the time of weed emergence.

Rainfall has no direct effect on products' activity. Flooding (3 to 5 days) will cause rapid breakdown of the product resulting in reduced weed control. Flooding for 3 weeks or more will result in total breakdown of the product resulting in loss of weed control.

Tank Mixes:

Herbicides:

- ***Soybeans:***
  - *Sencor* (*Treflan Liquid EC, Advantage Trifluralin 480 EC* only).

Fertilizers: Liquid product may be applied with liquid fertilizer as a carrier. Before the herbicide is added to the tank, compatibility of the herbicide to liquid fertilizer should be tested following instructions on the herbicide container. Trifluralin liquids may be blended with dry bulk fertilizers (DO NOT mix with nitrate fertilizers). Check label for blending instructions.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the trifluralin labels only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** No restriction. Flooding may reduce weed control.
- **Restricted Entry Interval:** Wait at least 12 hours before entering treated fields.
- **Grazing Restrictions:** DO NOT graze the treated crops or cut for feed prior to crop maturity.
- **Re-cropping Interval:** Oat, canaryseed, and small-seeded grasses may be affected the year after treatment. Corn is sensitive at higher rates of application. Damage to wheat can occur if the crop is seeded into land that has been treated during the previous 21 months with trifluralin products and has received abnormally low amounts of precipitation. Damage is worse if conditions are not conducive to rapid emergence of the wheat (for example, if the crop is seeded deep or if soil conditions remain cool during emergence). Damage tends to be greater on fields treated with granular formulations.
- **Aerial Application:** DO NOT apply by air.
- **Storage:**
  - Granular formulations must be stored in a cool, dry location, out of sunlight.
  - ***Rival EC:*** DO NOT store below 5°C.
  - ***Treflan Liquid EC, Bonanza 480 and Advantage Trifluralin 480EC:*** DO NOT freeze. Crystallization of the active ingredient may occur at less than 5°C. To reconstitute, bring temperature to 15°C and shake well until no crystals are visible. This should be done before adding to the spray tank.

- **Buffer Zones:** (liquid formulations only)

Crop	Buffer Zones (metres†) Required for the Protection of*:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Field crops	80	10	1
Shelterbelts, woody crops	120	20	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:
Refer to 'Method B' in the general section on sprayer cleaning in the introduction for liquid formulations only.

Hazard Rating:
***Bonanza 480 EC, Advantage Trifluralin 480EC*:**

 Warning – Poison

 Warning – Eye and Skin Irritant

All products: Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Triton K

Herbicide Group
2 - tribenuron
4 - dicamba, 2,4-D

Company:
FMC Corporation

Formulation:
The *Triton K* package contains the following components:
***Triton Broadleaf* (PCP#29989):** 58.45% dicamba sodium salt, and 8.25% tribenuron methyl formulated as a water dispersible granule.
- Container size - 1.47 kg

***Nufarm 2,4-D Ester 700* (PCP#27820):** 660 g/L 2,4-D ester formulated as an emulsifiable concentrate.

Crops and Staging:
Spring wheat (including durum), winter wheat and barley: 3 leaves fully expanded to 6 leaves plus 3 tillers. Application outside of this stage range can result in injury to the crop.
Fallow: Stage according to weeds.

Weeds and Staging:
Weeds controlled up to 10 cm tall or across:
- Annual sunflower
- Canada thistle (top growth control)
- Cocklebur
- Cow cockle
- Dandelion ***
- Flixweed**
- Kochia (2 to 10 leaf)
- Lamb's-quarters
- Mustard (ball, hare's-ear, Indian, tumble, wild, wormseed)
- Narrow-leaved hawk's-beard**
- Prickly lettuce
- Redroot pigweed
- Russian pigweed
- Russian thistle
- Shepherd's-purse**
- Stinkweed**
- Sweet clover
- Thyme-leaved spurge
- Volunteer canola
- Wild buckwheat*
- Wild radish

*** 1 to 4 leaf stage.**
**** Fall rosettes and spring seedlings only.**
***** Spring or fall rosettes up to 15 cm in diameter.**

Rate:

***Triton Broadleaf*:** 36.8 grams per acre
2,4-D Ester 700: 243 mL per acre
DO NOT apply more than 36.8 grams per acre of *Triton Broadleaf* per year.
Triton K may degrade if left in the sprayer for an extended period of time. Apply within 24 hours of first mixing.
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the introduction.

Application Information:

- **Water Volume:** Minimum 22 L per acre.
- **Nozzles and Pressure:** Maximum 40 psi (275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ***ASABE coarse*** droplets.
- **Screens:** Use a 50 mesh or coarser screen and filter system

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
tribenuron	POST (foliar)	ALS Amino Acid synthesis Inhibitor	Toward growth areas (Symplast)	Broadleaf	2
dicamba, 2,4-D	POST (foliar)	Synthetic Auxin	Throughout the plant (Symplast)	Broadleaf	4

Effects of Growing Conditions:

DO NOT apply if temperatures are greater than 30°C, if humidity is high, or wind is blowing toward non-target plants as injury from drift may result.

DO NOT apply to wheat, or barley that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result. Under certain conditions (heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day/night temperatures) lightening in crop colour and reduction in crop height may occur.

Kochia control may be reduced during stress conditions or if extremely heavy infestations exist.

Tank Mixes:

None registered.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 4 to 6 hours may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated fields for at least 12 hours.
- **Grazing Restrictions:** Lactating dairy animals MUST NOT graze fields with 7 days of treatment.
- **Re-cropping Interval:** No restrictions the year following application.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. May be frozen.
- **Buffer Zones:**
  - Handheld or backpack sprayers do not require a buffer zone.

Crop	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Cereals	1	0	4
Fallow	1	1	15

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Triton K can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray this product should be flushed out immediately after use. The manufacturer recommends a process similar to 'Method A' in the general section on sprayer cleaning in the introduction. DO NOT use ammonia with chlorine bleach. See label for specific instructions.

Hazard Rating:


Caution – Poison


Warning – Eye and Skin Irritant

Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Tundra

Herbicide Group
1 - fenoxaprop
6 - bromoxynil
27 - pyrasulfotole

Company:

Bayer (PCP#29367)

Formulation:

46 g/L of fenoxaprop-p-ethyl, 87.5 g/L of bromoxynil and 15.5 g/L of pyrasulfotole formulated as an emulsifiable concentrate.

- Container sizes - 8.1 L, 129.6 L, 405 L

Crops and Staging:

Application beyond the maximum rates provided below may result in crop injury.

Crop	Stage
Barley, spring wheat (including durum)	1 to 6 leaves on the main stem plus 3 tillers

Weeds, Rates and Staging:

Apply at the 3 to 4 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before the crop tillers.

Apply 0.81 L per acre to control:

Grass weeds from the 1 to 6 leaf stage up to emergence of 3rd tiller:

- Barnyard grass
- Foxtail (green and yellow)
- Wild oats

Broadleaf weeds from the 1 to 6 leaf stage unless otherwise indicated:

- Canada fleabane (up to 10 cm)*
- Canada thistle† (up to 30 cm)
- Chickweed
- Cleavers (1 to 3 whorls)
- Cleavers (4 to 6 whorls)*
- Dandelion† (up to 25 cm across††)
- Flixweed (up to 10 cm)
- Hemp-nettle
- Kochia (up to 10 cm)
- Narrow-leaved hawk's-beard (up to 10 cm and before bolting)
- Pale smartweed
- Ragweed (common)
- Redroot pigweed
- Round-leaved mallow†
- Russian thistle (up to 10 cm)
- Shepherd's-purse
- Sow-thistle (annual, perennial†)
- Stinkweed
- Stork's-bill (up to 8 leaf)***
- Volunteer canola**
- Wild buckwheat
- Wild mustard

† Suppression only.

†† Spring seedlings and over-wintered rosettes.

*** Add 200 g of active ammonium sulfate per acre (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid; or 0.4 L per acre of 49 percent solution).**

**** Including all herbicide tolerant varieties.**

***** Only when mixed with 2,4-D ester and ammonium sulphate.**

DO NOT apply *Tundra* or other products containing fenoxaprop, pyrasulfotole or bromoxynil more than once in the same year.

Application Information:

- **Water Volume:**
  - ***Ground:*** 18.9 L per acre. Use higher water volumes for dense crop/weed canopies.
  - ***Aerial:*** 11.4 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** classification droplets. Low drift nozzles may require higher pressures for proper performance.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
fenoxaprop	POST (foliar)	ACCase Lipid Synthesis Inhibitor	Toward areas of growth (Symplast)	Grass only	1
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little (apoplast)	Broadleaf only	6
pyrasulfotole	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar & root (Apoplast) – Somewhat systemic (has soil residues)	Broadleaf only	27

Effects of Growing Conditions:

Crop injury may result if applied to a crop that is stressed by severe weather conditions, frost, low fertility, drought, water-saturated soil, disease or insect damage. Weeds growing under adverse environmental conditions such as drought will be less susceptible to *Tundra*. Under stressed conditions and/or heavy crop canopy, early application will result in improved weed control.

Tank Mixes:

Herbicides:

- 2,4-D ester (113 g ae per acre) plus ammonium sulphate (see "Weeds, Rates and Staging:" above)

Fungicides: None registered.

Insecticides: None registered.

Fertilizers: DO NOT mix with fertilizers other than those indicated above.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated areas for 24 hours.
- **Grazing Restrictions:** DO NOT graze or cut cereal crops for hay, within 25 days of application.
- **Pre-harvest Interval:** Leave 65 days from application to harvest.
- **Re-cropping Interval:** Alfalfa, barley, canaryseed, canola, corn (Manitoba only), flax, oats, potato, soybean (Manitoba only), sunflower, tomato (Manitoba only), and wheat (spring, and durum) may be planted the season following application. Field pea may be grown the following year in all black, grey-wooded and dark brown soil zones. DO NOT plant field pea the season following *Tundra* use in the brown soil zone where organic matter content is below 2.5 percent and where soil pH is above 7.5. Lentils may be seeded the second season following application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a dry controlled temperature facility. DO NOT freeze. Shake before using if stored for longer than one year.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	3	1	10
Fixed wing aircraft	20	5	375
Helicopter	20	3	225

See the Key to Product Pages in the introduction for an explanation of the different habitats.

*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method A' in the general section on tank mixing in the introduction.

Hazard Rating:

Caution – Poison

Danger – Corrosive to Eyes and Skin

Warning – Eye Irritant

Potential Skin Sensitizer
Refer to the Introduction for an explanation of the symbols.

Ultra Blazer

Herbicide Group 14 - acifluorfen

Company:

UPL AgroSolutions Canada (PCP#32330)

Formulation:

240 g/L acifluorfen present as a sodium salt and formulated as a solution.

- Container size - 2 x 10 L jug

Crops and Staging:

Soybean: from the 1 to 3 trifoliolate leaf stage. DO NOT apply before the first trifoliolate leaf stage of the soybean. DO NOT apply to soybeans grown on sand or loamy sand soils.

Weeds and Staging:

***Ultra Blazer* applied at 0.5 L per acre plus *Assist* adjuvant at 0.5 L per 100 L of spray solution will control:**

Weed	Maximum Leaf Stage
Common ragweed	8
Redroot pigweed	4

***Ultra Blazer* applied at 1.0 L per acre** will control the weeds above plus the following weeds at the maximum leaf stages listed:**

Weed	Maximum Stage
Canada thistle*	Pre-bud
Cocklebur	4 leaf
Common milkweed*	-
Field bindweed*	-
Hedge bindweed*	-
Lamb's-quarters	2 leaf
Nightshade (eastern black)	6 leaf
Redroot pigweed	6 leaf
Smartweed (including lady's-thumb)	8 leaf
Wild mustard	10 leaf

*** Top growth control only. The plant will grow back from underground roots.**
**** DO NOT add *Assist* adjuvant with the 1.0 L per acre rate as crop injury will result.**
Refer to the product label for complete mixing instructions for this product and its mixes. A general mixing guide can be found in the introduction.

Application Information:

- **Water Volume:** No specific water volume is provided on the label but a minimum of 81 L per acre is implied by the adjuvant rates on the label. Good coverage of weed foliage is required for proper control.
- **Nozzles and Pressure:** Use nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
acifluorfen	POST (foliar)	PPO Inhibitor/ Membrane disruptor	Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:

Soybeans may exhibit speckling, bronzing and/or leaf burn. The trifoliolate leaf emerging at the time of application may be distorted. Soybeans usually outgrow these conditions and continue to grow at a normal rate with no adverse effect on vigour, maturity, or crop yield. It is important to have good spray coverage on the weeds as *Ultra Blazer* works mainly by contact action. Failure to follow the suggested application rate and timing may result in unsatisfactory control.

Tank Mixes:

Herbicides:

- *Ultra Blazer* (0.5 L per acre) plus *Basagran Forté* (0.5 L per acre)
- *Ultra Blazer* (0.255 L per acre) plus *Basagran** or *Basagran Forté* (0.71 L per acre) depending on predominant weed species present.
    - See label for details.

*** Add *Assist* adjuvant at 0.5 L per 100 L of spray solution for *Basagran* tank mix only.**

Fertilizers: None registered. DO NOT add fertilizers to the spray mixture.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the *Ultra Blazer* label only.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 6 hours may reduce weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Pre-harvest Interval:** No specific preharvest interval is indicated on the label.
- **Grazing Restrictions:** DO NOT graze the treated crop or cut for hay.
- **Re-cropping Interval:** The label has no restriction on crops that may be planted the following season.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** DO NOT freeze.
- **Buffer Zones:** Leave a buffer of 15 metres from the last spray pass and sensitive upland areas such as other crops, pastures, rangeland, woodlots or shelterbelts.

Sprayer Cleaning:

Refer to 'Method B' in the general section on sprayer cleaning in the introduction. Sprayers may require cleaning after several tank loads to remove any excessive oil buildup on the inside of the sprayer.

Hazard Rating:


Caution – Poison


Danger – Corrosive to Eyes


Warning – Causes Skin Irritation

Avoid contact with skin. Harmful if inhaled.

Refer to the Introduction for an explanation of the symbols.

Valtera / Chateau

Herbicide Group
14 - flumioxazin

Company:

Valent Canada, Inc. Distributed by Nufarm Agriculture

Formulation:

***Valtera WDG* (PCP#29230)*; *Chateau WDG* (PCP#29231)*:** 51.1% flumioxazin formulated as a water dispersible granule.

- Container sizes:
  - *Valtera WDG* - 2 x 4.54 kg
  - *Chateau WDG* - 4 x 1.13 kg

***Chateau EZ* (PCP#34036); *Valtera EZ* (PCP#33523):** 479.2 g/L flumioxazin formulated as a suspension concentrate.

- *Chateau EZ* - 4 x 910 mL
- *Valtera EZ* - 2 x 4.8 L

*** Note:** *This product is no longer manufactured but inventories still remain in distribution. This product may be removed from future editions.*

Crops, Rates, and Staging:

Maximum ONE APPLICATION per year of *Valtera* or *Chateau* or other products containing flumioxazin.

Pre-seed or pre-emergent:

Spring Application:

Crop	Product	WDG Rate (g per acre)		EZ Rate (mL per acre)	
		Soil Type		Soil Type	
		Coarse soil	Medium soil	Coarse soil	Medium soil
Potato***	*Chateau* only	42.5	42.5	45	45
Soybean*, field corn**	*Valtera* only	56.7	85.0*	60	90
Chickpea, field pea, lentil**, spring wheat (NOT including durum)**, sunflower†	*Valtera* only	56.7	56.7	60	60
Established dormant alfalfa‡ grown for seed and hay or other forage	*Valtera* only	113.0	113.0	120	120
Non-crop use – bare ground application§	*Valtera, Chateau, Payload*	113.0	170.0	120.6	181.3

Fall Application:

Crop	Product	WDG Rate (g per acre)		EZ Rate (mL per acre)	
		Soil Type		Soil Type	
		Coarse soil	Medium soil	Coarse soil	Medium soil
Soybean, field corn	*Valtera* only	56.7	85.0	60	90
Chickpea, field pea, lentil (small red, large green), spring wheat (NOT including durum)**	*Valtera* only	56.7	85.0	60	90
Established dormant alfalfa‡ grown for seed and hay or other forage	*Valtera* only	113.0	113.0	120	120

*** May cause crop injury. Seed soybean at least 1.5 inches (4 cm) deep.**

**** Seed wheat and lentil at least 1 inch (2.5 cm) deep. Apply *Valtera* a minimum of 7 days prior to seeding spring wheat, lentils and field corn. Apply to minimum till soils only.**

***** Potatoes (*Chateau* only): Apply after hilling. A minimum of 2 inches (5 cm) of soil must cover the vegetative portion of the potato or crop injury may result.**

† **Apply *Valtera* a minimum of 30 days prior to planting.**

‡ **Apply to dormant alfalfa with maximum of 15 cm (6 inches) of new growth to minimize crop injury. Application will result in burning of green leaves.** *NOTE: Since this use has been registered under the 'User Requested Minor Use' program, the manufacturer assumes no responsibility for herbicide performance or injury.* ***Use of Valtera WDG on dormant alfalfa is entirely at the risk of the user.***

§ **DO NOT apply to farm paths or roadways or areas with dusty surfaces where dust may blow onto nearby crops as injury may result to those crops.**

If weeds are emerged, apply *Valtera* in a mix with a foliar herbicide (see tank mix section).

***Harvest Aid* (*Valtera* only):** Apply 42.5 to 56.7 grams *Valtera WDG* per acre or 45 to 60 mL per acre *Valtera EZ* per acre when crops are physiologically mature to dry green weed material. Add metholated seed oil (MSO) at 1 L per acre or a non-ion surfactant such as *Nufarm Enhance* at 0.125 to 0.25 L per 100 L of spray solution.

- Chickpea, dry bean, faba bean, field pea, lentil – a minimum of 80 percent of the pods are yellow to tan in colour and 20 percent are yellow in colour. Wait at least 5 days with *Valtera WDG* and 8 days with *Valtera EZ* before harvesting.
- Wheat – 30 percent or less grain moisture. Wait at least 10 days before harvesting.
- Sunflower – 35 percent or less grain moisture. Wait at least 5 days before harvesting.

Note: As of January 1, 2022 www.keepingitclean.ca indicates that grain from crops treated with this product prior to harvest may have market access concerns. Please see introduction for more information AND *consult potential grain buyers before using this product.*

Weeds and Rates:

Apply prior to crop and weed emergence.

***Chateau WDG* applied at 42.5 grams per acre or *Chateau EZ* applied at 45 mL per acre** provides *suppression* of the following weeds:**

- Canada fleabane
- Kochia
- Lamb's-quarters
- Nightshade (Eastern black, hairy)
- Pigweed (green, redroot)
- Ragweed, common

***Valtera WDG* applied at 56.7 to 85.0 grams per acre or *Valtera EZ* applied at 60 to 90 mL per acre provides *control* of the weeds above plus:**

- Annual sow-thistle
- Cleavers*
- Common chickweed
- Dandelion
- Green foxtail*
- Palmer amaranth
- Russian thistle†*
- Volunteer canola* (all varieties)
- Waterhemp
- Wild buckwheat*

***Valtera WDG* and *Payload* applied at 113 to 170 grams per acre or *Valtera EZ* applied at 120.6 to 181.3 mL per acre provides extended control of the weeds above.**

*** Suppression.**

**** Rate for *Chateau* in potato only.**

† *Valtera EZ* only.

DO NOT apply on soils with > 5 percent organic matter, or fine soils. Soils such as clay, clay loam, silty clay or silty clay loam are considered fine textured soils. DO NOT apply to soils composed of more than 90 percent sand and gravel.

The duration of residual control may be reduced at lower rates. Spray within 6 hours of mixing.

Application Information:

- **Water Volume:**
  - ***Preseed or pre-emergent:*** Minimum 40 L per acre (recommended by manufacturer).
  - ***Harvest Aid:*** 57 to 113 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.
- **Screens:** The use of 50 mesh screens is recommended.
- DO NOT perform any tillage operations after application otherwise weed control will be reduced. When applied prior to seeding crops must be direct seeded with minimum disturbance systems.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
flumioxazin	PRE (surface) with residual soil activity, Pre-harvest	PPO Inhibitor/ Membrane disruptor	*PRE:* Upward in plant (Apoplast) *Preharvest:* Little movement due to rapid cell leakage (Symplast)	Broadleaf only	14

Effects of Growing Conditions:

Rainfall is required to activate flumioxazin in the soil. Crop injury may occur when soils are wet and cool following application or soils are poorly drained. Severe injury may occur with flooded soils. Newly emerging foliage can be temporarily injured by heavy rain splashing treated soil on leaves. Heavy crop residues may reduce weed control.

Irrigation: If rainfall is not received after application, 5 to 10 mm of irrigation may be applied to improve weed control activity.
DO NOT apply irrigation to wheat after emergence until the main head is fully emerged.

Tank Mixes:

The following mixes are for *Valtera (WDG* and *EZ)* only.

Herbicides:

- ***Soybean, wheat or bare ground:***
  - Glyphosate (IPA or K salts) 180 to 486 g ae per acre (spring or fall).
    Note: DO NOT mix when applying prior to soybean with *Dual II Magnum* or *Frontier Max* herbicides or injury could occur.
- ***Field pea and chickpea and lentils:***
  - Glyphosate (IPA or K salts) 180 to 360 g ae per acre.
- ***Havest-aid Applications only:***
  - Glyphosate (IPA or K salts) at preharvest rates.

Fertilizers: None registered.

Fungicides: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the *Valtera* (*WDG* and *EZ*) labels only.

Apply mixes according to the most restrictive use limitations for either product.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rain or irrigation shortly after application is required for activation. If rainfall does not occur, irrigation with at least 5 mm of water is recommended before ground crack occurs.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:**
  - ***Alfalfa:*** DO NOT harvest or graze within 25 days of application.
  - ***Field corn:*** DO NOT permit livestock to graze fields within 93 days after application. DO NOT harvest greenfeed or silage within 93 days after application.
  - ***Soybeans:*** DO NOT harvest as greenfeed or permit livestock to graze fields within 21 days after application. DO NOT cut hay/fodder wthin 50 days after application.
  - ***Wheat:*** DO NOT harvest as greenfeed or permit livestock to graze fields within 26 days after application. DO NOT cut hay/fodder within 52 days after application.
  - ***All other crops:*** DO NOT graze, cut or feed treated crops to livestock.
- **Pre-harvest Interval:**
  - ***Desiccation:*** Leave 5 days between application and harvest. Leave 7 days to harvest if mixing with glyphosate.
- **Re-cropping Interval:**
  - ***Valtera Chateau:***

WDG Rate (g per acre)	EZ Rate (mL per acre)	Crops	Re-cropping Interval
42.5 to 56.7 (for harvest aid uses)	45 to 60 (for harvest aid uses)	Winter wheat	7 days
56.7	60	Soybean, field corn, chickpea, field pea	Immediately
		Sunflowers, durum	30 days
		Spring wheat, lentils (small red and large green varieties)	7 days
		Winter wheat	4 months
		Barley	3 months
		Sorghum, dry common beans**, and canola	9 months
		Alfalfa	11 months
		All other crops not listed*	12 months*

WDG Rate (g per acre)	EZ Rate (mL per acre)	Crops	Re-cropping Interval
85	90	Soybean, field corn, chickpea, field pea	Immediately
		Sunflowers	2 months
		Spring wheat	7 days
		Winter wheat	4 months
		Barley	3 months
		Lentils (small red and large green varieties)	6 months
		Sorghum, dry common beans**	9 months
		Alfalfa, and canola	11 months
		All other crops not listed**	12 months*

*** Also requires that a successful bioassay be completed following the given recropping interval.**
**** Note: Not all varieties of dry beans have been tested for recrop tolerance. Test new varieties of dry beans on a small area before attempting large acreages.**

- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in a cool, dry place. DO NOT freeze.
- **Buffer Zones:**

Crops	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Potato, Dry bean desiccation	2	1	5
Chickpea, field pea, soybean, Spring wheat	3	1	10
Bare Ground uses	5	2	25

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance is measured from the downwind edge of the boom to sensitive areas.

Sprayer Cleaning:

Refer to 'Method A' in the general section on sprayer cleaning in the introduction. See product label for further information.

Hazard Rating:

Valtera WDG:


Caution – Poison

Chateau EZ, Valtera EZ:

No specific hazard statement.

Equipment	Maximum amount handled per day of	
	Valtera WDG or *Payload* (kg per day)	*Valtera EZ* (L per day)
Groundboom - open cab	61	63
Groundboom - closed cab (with activated carbon filter)		114
Right-of-way - sprayer	7.0	9.0
Mechanically - pressurized handgun	1.2	2.5
Backpack/manually - pressurized handwand	0.315	0.8

Refer to the Introduction for an explanation of the symbols.

Varro

Herbicide Group 2 - thiencarbazone

Company:
Bayer (PCP#29070)

Formulation:
10 g/L thiencarbazone-methyl formulated as a suspension concentrate.
- Container size - 2 x 8 L

Crops and Staging:
Spring wheat (including durum):
- 1 to 6 main stem leaf stage to a maximum of 3 tillers, and before the first node can be felt in the stem. Under drought conditions, do not apply if there is >35 days between seeding and spraying, as drought hastens crop development.

Winter wheat:
- Spring or fall application from 1 to 6 main stem leaf stage and before the first node can be felt in the stem. DO NOT apply after the presence of the first node as crop injury may occur.

Weeds and Staging:
Grass weeds controlled from 1 to 6 main stem leaves and prior to the emergence of the 3rd tiller unless otherwise indicated:
- Barnyard grass
- Foxtail (green and yellow†)
- Japanese brome† **
- Persian darnel†
- Volunteer canaryseed *
- Wild oats

Broadleaf weeds controlled at the 1 to 6 leaf stage unless otherwise indicated:
- Cleavers (1 to 6 whorls)
- Hemp-nettle
- Lamb's-quarters†
- Pale smartweed
- Pigweed, redroot
- Round-leaved mallow†
- Russian thistle (up to 10 cm)†
- Shepherd's-purse
- Stinkweed
- Volunteer canola (except CLEARFIELD varieties)
- Wild buckwheat
- Wild mustard

*** Up to the emergence of the 2nd tiller.**
**** Prior to tillering.**
† Suppression only.

Rates:
0.2 L per acre
Add ammonium sulphate on spring wheat only for improved weed control. Add 200 grams active ammonium sulphate per acre (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid or 0.4 L per acre of 49 percent solution) to the tank before adding other components.
DO NOT add ammonium sulphate to applications on durum wheat.
For improved weed control in durum wheat add either *Agral 90* or *AgSurf* at 0.25 L per 100 L.

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Use higher water volumes for dense canopies.
  - ***Aerial:*** Minimum 11.3 L per acre.
- **Nozzles and Pressure:**
  - ***Ground:*** For conventional flat fan nozzles use a pressure of 30 to 50 PSI (207 to 345 kPa). Angle nozzles forward 45 degrees for better coverage. Low drift nozzles may require higher pressures for proper performance.
  - ***Aerial:*** Minimum 43 PSI (300 kPa).

  For either ground or aerial, use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thiencarbazone	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2

Effects of Growing Conditions:

DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result. Under drought conditions DO NOT apply to spring or durum wheat if the time from seeding to spraying exceeds 35 days or if temperatures will be 3°C or lower within 3 days of application (before or after).

Tank Mixes:

Add ammonium sulphate to the tank first then *Varro* then the tank mix partner.
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Herbicides:

- ***Wheat (including spring, durum, winter):***
  - *Infinity*
  - *Thumper*
- ***Spring Wheat (including durum):***
  - 2,4-D ester (129 g ae per acre)
  - *Buctril M*
  - *Infinty FX*
  - MCPA Ester (0.23 L per acre – 600 grams per L form)
- ***Spring Wheat (NOT including durum):***
  - *Curtail M* (0.61 L per acre)*
  - *Frontline XL*
  - *Refine SG*
  - *Refine SG* + 2,4-D ester (rates above)
  - *Refine SG* + MCPA Ester (rates above)

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Note: The above mixes are those listed on the *Varro* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 12 hours.
- **Grazing Restrictions:** Must not be grazed within 7 days or cut for livestock feed within 30 days of treatment.
- **Pre-harvest Interval:** DO NOT harvest grain or straw within 60 days of application for spring and durum wheat or within 72 days of application to winter wheat.
- **Re-cropping Interval:** Alfalfa, barley, canaryseed, canola, chickpea, dry bean, field corn, flax, lentil, mustard, oats, pea, soybean, sunflower, timothy, and wheat (durum, spring) may be seeded the year following application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. Keep from freezing. Shake well before using.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	0	1
Fixed wing aircraft	1	0	30
Helicopter	1	0	30

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the introduction. If mixing with other pesticides, combine this method with the method indicated for the tank mix partner.

Hazard Rating:

Warning – Eye and Skin Irritant
Refer to the Introduction for an explanation of the symbols.

Varro FX

Herbicide Group
2 - thiencarbazone
4 - fluroxypyr

Company:
Bayer

Formulation:
***Varro FX* (PCP#34848):** 5 g/L thiencarbazone-methyl + 118 g/L fluroxypyr formulated as an emulsifiable concentrate.

Crops and Staging:
Spring Wheat:
1 to 6 leaves on main stem, plus 3 tillers but PRIOR to jointing (presence of first node)
Winter Wheat:
Apply either in the fall or the spring when the majority of the plants have 1 leaf to full tillering, but PRIOR to jointing (presence of the first node)

Weeds and Staging:
Weeds Controlled:
- Wild oats
- Green foxtail
- Barnyard grass
- Yellow foxtail*
- Persian darnel*
- Volunteer canary seed
- Japanese brome**
- Cleavers, 1 to 9 whorls
- Common chickweed, 1-4 leaf
- Hemp nettle
- Kochia, 2-8 leaf
- Lamb's quarters
- Pale smartweed
- Redroot pigweed
- Round-leaved mallow,*
- Russian thistle*, up to 10 cm tall
- Stinkweed
- Stork's-bill*, 1-8 leaf
- Volunteer canola***
- Wild buckwheat
- Wild mustard
- Volunteer flax****, up to 12 cm

* Suppression only
** Control of spring germinated Japanese brome. Suppression of overwintered Japanese brome. Best results are obtained after a pre-seed or burndown application with glyphosate herbicide.
*** Non ALS tolerant.
**** Including biotypes resistant to Group 2 herbicides that inhibit the ALS enzyme.

Rate:
0.4 L per acre
Refer to the product label for complete mixing instructions. A general guide to mixing can be found in the Introduction.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 18.9 L per acre
  - ***Aerial:*** Minimum 11.3 L per acre
- **Nozzles and Pressure:**
  - ***Ground:*** For conventional flat fan nozzles use a pressure of 30 to 50 PSI (207 to 345 kPa). Angle nozzles forward 45 degrees for better coverage. Low drift nozzles may require higher pressures for proper performance.
  - ***Aerial:*** Minimum 43 PSI (300 kPa). For either ground or aerial, use a combination of nozzles and pressure designed to deliver thorough, even coverage with ASABE medium droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Introduction section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
Thiencarbazone	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Towards regions of growth (Symplast)	Broadleaf & Grass	2
Fluroxypyr	POST (foliar)	Synthetic auxin	Moves through the plant (symplast)	Broadleaf only	4

Effects of Growing Conditions:

DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result. Under drought conditions DO NOT apply to spring or durum wheat if the time from seeding to spraying exceeds 35 days or if temperatures will be 3°C or lower within 3 days of application (before or after).

Tank Mixes:

Herbicides:

- ***In spring wheat:***
  - *Curtail M** at 0.6 to 0.8 L per acre.
- ***In spring and winter wheat:***
  - *Infinity* at 0.34 L per acre.
  - *Thumper* at 0.4 L per acre.
  - *Buctril M* at 0.4L per acre.
  - MCPA ester* at 142 to 227 grams a.e. per acre.
  - *2,4-D ester** at 136 to 227 grams a.e. per acre.
  - *Barricade SG* at 12 grams per acre (plus one of the labelled adjuvants).
  - *Barricade SG* at 12 grams per acre + MCPA Ester 500 or MCPA Ester 600 at 0.23 L per acre or 0.19 L per acre.
  - *Refine SG* at 12 grams per acre (plus one of the labelled adjuvants.)
  - *Refine SG* at 12 grams per acre + MCPA Ester at 113 to 227 grams a.e. per acre.
  - *Refine SG* at 12 grams per acre + 2,4-D Ester at 160 to 214 grams a.e. per acre.

***Refer to tank mix partner for weed/rate chart**

Note: the above Tank Mixes are those listed on the Varro FX label only.

Restrictions:

- **Rainfall:** 1 hour.
- **Re-entry:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** DO NOT harvest spring wheat for grain or straw within 60 days of application. DO NOT harvest winter wheat for grain or straw within 72 days of application.
- **Grazing:** : DO NOT graze the treated crops or cut for forage within 7 days or cut for hay within 30 days of application.
- **Re-cropping:** the following crops can be planted 10 months after application – alfalfa, barley, canola, corn, dry beans, flax, lentils, mustard, oats, field peas, soybeans, sunflowers, rye, timothy, triticale (spring and winter), wheat (spring, winter, durum)
- **Aerial Application:** May be applied by aircraft.
- **Storage:** : Store in a cool, dry place. DO NOT store at temperatures below -20˚C. If frozen, allow to thaw and agitate thoroughly prior to use. Shake well before using. Store this product away from food or feed.
- **Buffer Zones:**

Application method	Crop		Buffer Zones (metres†) Required for the Protection of:				
			Aquatic Habitats of Depths		Estuarine/Marine Habitats of Depths:		Terrestrial habitat
			Less than 1 m	Greater than 1	Less than 1 m	Greater than 1	
Field sprayer	Spring and winter wheat		1	1	1	1	3
Aerial	Spring and winter wheat	Fixed wing	1	1	1	1	55
		Rotary wing	1	1	1	1	55

See the Key to Product Pages in the introduction for an explanation of the different habitats. The spray buffer zones for this product can be modified based on weather conditions and spray equipment configuration by accessing the Spray Buffer Zone Calculator on the Pesticides portion of the Canada.ca website.

† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general section on sprayer cleaning in the Introduction. If mixing with other pesticides, combine this method with the method indicated for the tank mix partner.

Hazard Rating:
Skin, eye, and respiratory irritant.
Refer to the Introduction for an explanation of the symbols.

Velocity m3

Herbicide Group
2 - thiencarbazone
6 - bromoxynil
27 - pyrasulfotole

Company:
Bayer (PCP#29584)

Formulation:
5 g/L thiencarbazone-methyl, 31.3 g/L pyrasulfotole and 175 g/L bromoxynil formulated as a suspension concentrate
- Container sizes - 8.1 L, 129.6 L

Crops and Staging:
Spring wheat (including durum):
- 1 to 6 main stem leaf stage to a maximum of 3 tillers, and before the first node can be felt in the stem. Under drought conditions, do not apply if there is >35 days between seeding and spraying, as drought hastens crop development.

Winter wheat:
- Spring or fall from 1 to 6 leaf stage and before the first node can be felt in the stem. DO NOT apply after the first node is detectable in the stem as crop injury may occur.

Weeds and Staging:
Grass weeds controlled from 1 to 6 main stem leaves and prior to the emergence of the 3rd tiller:
- Barnyard grass
- Foxtail (green and yellow†)
- Canaryseed
- Persian darnel†
- Wild oats
- Japanese brome†

Broadleaf weeds controlled at the 1 to 6 leaf stage unless otherwise indicated:
- Canada fleabane (seedlings 1 to 10 cm)*
- Canada thistle (up to 30 cm)†
- Common chickweed
- Cleavers (1 to 3 whorls)
- Cleavers (4 to 6 whorls)*
- Dandelion (up to 25 cm diameter)†
- Flixweed (up to 10 cm)
- Hemp-nettle
- Kochia (up to 10 cm)
- Lamb's-quarters
- Narrow-leaved hawk's-beard (up to 10 cm and prior to bolting)
- Pale smartweed
- Pigweed, redroot
- Ragweed (common, giant†*)
- Round-leaved mallow
- Russian thistle (up to 10 cm)
- Shepherd's-purse
- Sow-thistle (annual, perennial†)
- Spreading atriplex (1 to 10 leaf)†*
- Stinkweed
- Stork's-bill (1 to 8 leaf)**
- Volunteer canola (all varieties)
- Wild buckwheat
- Wild mustard

† Suppression only.
*** Add ammonium sulphate as per the "Rates:" section below.**
**** Only when mixed with 2,4-D ester + ammonium sulphate (see Tank Mixes).**

Rates:
0.405 L per acre
Add ammonium sulphate on spring wheat only for improved weed control or when tank mixing with 2,4-D or MCPA. Add 200 grams active ammonium sulphate (202 grams per acre of 99 percent dry; 0.5 L per acre of 40 percent liquid or 0.4 L per acre of 49 percent liquid). If using an ammonium sulphate product with a different concentration, adjust the rate accordingly.
DO NOT add ammonium sulphate to applications on durum wheat.
DO NOT apply *Velocity m3* or other products containing thiencarbazone, pyrasulfotole or bromoxynil more than once in the same year.

Application Information:

- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Use higher water volumes for dense canopies.
  - ***Aerial:*** Minimum 11.4 L per acre.
- **Nozzles and Pressure:**
  - ***Ground:*** For conventional flat fan nozzles use a pressure of 30 to 50 PSI (207 to 345 kPa). Angle nozzles forward 45 degrees for better coverage. Low drift nozzles may require higher pressures for proper performance.
  - ***Aerial:*** Minimum 43 PSI (300 kPa).

  For either ground or aerial, use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
thiencarbazone	POST (foliar)	ALS Amino Acid Synthesis Inhibitor	Toward areas of growth (Symplast)	Broadleaf & grass	2
bromoxynil	POST (foliar)	PSII Inhibitor/ Membrane disruptor	Little (apoplast)	Broadleaf only	6
pyrasulfotole	POST (foliar)	HPPD Pigment Inhibitor	Some – both foliar & root (Apoplast) – Somewhat systemic (has soil residues)	Broadleaf only	27

Effects of Growing Conditions:

DO NOT apply to crops or weeds that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury or reduced weed control may result.

DO NOT apply to spring or durum wheat under conditions where the time from seeding to spraying exceeds 35 days or if temperatures will be 3°C or lower within 3 days of application (before or after).

Tank Mixes:

Herbicides:

- 2,4-D ester (113 g ae per acre) + ammonium sulphate* (see Rates).
  *** add ammonium sulphate on spring wheat (NOT durum) only.**

Fungicides: *Tilt*

Insecticides: *Decis, Sevin XLR.*

Note: The above mixes are those listed on the *Velocity m3* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Within 1 hour may reduce control.
- **Restricted Entry Interval:** DO NOT enter treated field for 24 hours.
- **Pre-harvest Interval:** DO NOT harvest grain or straw within 60 days of application to spring and durum wheat or within 72 days of application to winter wheat.
- **Grazing Restrictions:** Must not be cut for livestock feed within 30 days or grazed by livestock within 25 days of treating the crop.
- **Re-cropping Interval:** Alfalfa, barley, canaryseed, canola, field corn (Manitoba only), flax, soybean (Manitoba only), tame oats, and wheat (durum, spring) may be seeded the year following application. Field pea may be grown the following year in all black, grey-wooded and dark brown soil zones. DO NOT plant field pea the season following *Velocity m3* use in the brown soil zone where organic matter content is below 2.5 percent and where soil pH is above 7.5. Lentils may be seeded the second season after application.
- **Aerial Application:** May be applied by air.
- **Storage:** Store in a cool, dry place. Keep from freezing. This product is combustible. DO NOT store near heat or open flame.

- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5
Fixed wing airplane	10	1	375
Helicopter	10	1	225

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:
Refer to 'Method A' in the general sprayer cleaning section in the introduction.

Hazard Rating:
 Warning – Poison

 Danger – Corrosive to Eyes

Skin Irritant, Potential Skin Sensitizer

Refer to the Introduction for an explanation of the symbols.

Velpar DF CU

Herbicide Group 5 - hexazinone

Company:
Tessenderlo Kerley Inc. (PCP#25225)

Formulation:
75% hexazinone formulated as a water dispersible granule.
- Container size - 2 kg

Crops and Staging:
Established alfalfa for forage and seed (established 18 months or longer). Apply in late fall prior to freeze-up when alfalfa is dormant or in early spring before alfalfa growth resumes. If burning or irrigation is to be carried out, do not apply until these operations have been completed.

Crop injury may occur in fields where alfalfa root growth has been restricted by hard pans or other physical barriers to root growth.

Weeds, Rates and Staging:
Application stage is dictated by the crop dormancy listed above.

Apply a minimum of 0.272 kg per acre to control:
- Dandelion
- Sow-thistle
- Quackgrass

Apply 0.544 kg per acre to control:
- *The weeds above plus:*
  - Narrow-leaved hawk's-beard
  - Scentless chamomile

Use the lower rate on medium-textured soils with low organic matter.

DO NOT apply *Velpar DF CU* to:
- soil that is frozen
- Soil with less than 1 percent organic matter content
- Soil that is gravely/rocky, sandy or has exposed subsoil

Application Information:
- **Water Volume:** 81 L per acre.
- **Nozzles and Pressure:** 30 to 40 psi (200 to 275 kPa) when using conventional flat fan nozzles. Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE coarse*** droplets.

How it Works:

Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
hexazinone	PRE (surface) soil active	PSII Inhibitor/ Membrane disruptor	Upward soil applied (Apoplast)	Broadleaf & grass	5

Effects of Growing Conditions:

Adequate soil moisture is required for activation of the product.

Tank Mixes:

None registered.

Restrictions:

- **Rainfall:** Rainfall is beneficial for activation of the product.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 48 hours.
- **Grazing Restrictions:** Leave 30 days between application and grazing harvesting for feed (hay or greenfeed).
- **Re-cropping Interval:** Leave 2 years of between treating alfalfa and the seeding of a crop. A field bioassay is required after 2 years to determine which crops are safe to grow.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** May be frozen.
- **Buffer Zones:**
  Buffers are not required for hand-held and backpack applications.

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	1	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

No specific cleaning procedures are indicated on the label. Based on products with similar chemistry, 'Method B' found in the general sprayer cleaning section in the introduction or a commercial spray sprayer cleaning product, may provide adequate cleaning. Contact the manufacturer for more information.

Hazard Rating:


Danger – Corrosive to Eyes


Caution – Poison


Caution – Skin Irritant


Warning – Contains the Allergen Milk

Refer to the Introduction for an explanation of the symbols.

Voraxor

Herbicide Group 14 - trifludimoxazin & saflufenacil

Company:
BASF Canada

Formulation:
The *Voraxor* package contains the following components:
***Voraxor* (PCP#33968):** 125 g/L trifludimoxazin plus 250 g/L saflufenacil formulated as a suspension concentrate.
- Container size - 1.56 L

***Merge* (PCP#24702):** surfactant blend/solvent.
- Container size - 2 x 8.1 L

Crops and Staging:
Always add *Merge* at 0.2 to 0.4 L per acre.

Crop	Staging	Rate (mL per acre)
Lentils*	Pre-seed or pre-emergent	19.5
Field corn and soybeans	Pre-seed or pre-emergent	19.5 to 40.5
Wheat (durum, spring and winter), barley, peas (dried field), chickpeas and faba beans	Pre-seed or pre-emergent	19.5 to 58
Chemfallow	Apply to actively growing weeds less than 15 cm in height	19.5 to 29

*** Lentils are more susceptible to injury on coarse textured (sandy or gravely) and low organic matter soils. Lentils will typically grow out of injury symptoms, and yield will not be impacted at recommended rates under normal growing conditions.**

Weeds, Rates and Staging:
Apply at 19.5 to 29 mL per acre provides rapid burndown control of broadleaf weeds listed below (up to 8-leaf except where indicated).
Weeds controlled:
- Canada fleabane
- Cleavers (up to 4-whorls)*
- Hemp nettle (4 leaf)
- Kochia (up to 15 cm)*
- Lamb's-quarters*
- Narrow-leaved hawk's-beard (up to 8 cm)
- Redroot pigweed*
- Round-leaved mallow
- Russian thistle (up to 15 cm)
- Shepherd's-purse
- Stinkweed*
- Volunteer canola (all varieties)*
- Wild buckwheat*
- Wild mustard*

*** *Voraxor* applied at a rate of 41.5 to 58 mL per acre will suppress of secondary flushes.**

Application Information:
- **Water Volume:**
  - ***Ground:*** 20 to 40 L per acre. Higher water volumes require for dense weed stands. Weed control improves with the amount of coverage.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets by ground. Low drift nozzles may require higher pressures for proper performance. DO NOT apply in periods of dead calm.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
saflufenacil	POST (foliar) with slight soil activity	PPO Inhibitor/ Membrane disrupter	Little movement due to rapid cell leakage (Symplast)	Non-selective broadleaf	14
trifludimoxazin	PRE (soil active) and POST (foliar)	PPO Inhibitor/ Membrane disrupter	Little movement due to rapid cell leakage (Symplast)	Selective broadleaf and grasses	14

Effects of Growing Conditions:
Warm, moist growing conditions promote active weed growth. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Note: *crop injury may occur in lentil when saflufenacil (see* Heat*) is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.*
Herbicides:

- ***Prior to emergence of all registered crops:***
  - Glyphosate
- ***Prior to the emergence of corn, lentils, peas, chickpeas, faba beans and soybeans:***
  - *Zidua**
  - *Zidua** plus glyphosate

  *** DO NOT apply *Voraxor* or *Zidua SC* to lentils at rates higher than 19.5 or 49 mL per acre, respectively, or crop injury may occur. Crop seeds must be planted 2.5 cm deep.**

Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Rainfall shortly after product application can result in slight injury to the crop.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Pre-harvest Interval:** None.
- **Grazing Restrictions:** Field corn forage and silage, soybeans, field peas and lentils for feed or grazing - 60 days. Wheat and barley forage and hay for feed or grazing - 30 days.
- **Re-cropping Interval:** Following a spring application plant registered crops only. Plant back crops in case of crop failure** - barley, dry field peas, lentils, field corn, soybean, wheat (spring, winter, durum), or when applied after August 1.
  After 3 months after application - winter wheat.
  **** Rate restrictions above apply. A second application cannot be made in the rescue crop.**
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Prevent from freezing. If the product freezes, allow to thaw at room temperature for 24 hours and agitate well prior to use. Store in original container in a cool, secure and well-ventilated area separately from fertilizer, feed or food.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground*	2	1	5

See the Key to Product Pages in the introduction for an explanation of the different habitats.
*** Buffer zones can be reduced by 70 percent when using shrouds and by 30 percent when using cones mounted less than 12 inches from the crop canopy.**
† Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. See the label for product specific cleaning details. Refer to the tank mix partner's product label for any additional cleaning instructions.

Hazard Rating:


Caution – Possible Skin Irritant


Caution – Eye Irritant

Refer to the Introduction for an explanation of the symbols.

Voraxor Complete

Herbicide Group
14 – trifludimoxazin, saflufenacil
15 - pyroxasulfone

This product is a prepackaged tank mix of Voraxor and Zidua SC. Information listed is restricted to Crop, Weeds, Rates and Tank mixes. For other detailed restrictions and other general information on the component products see the product pages listed above.

Company:
BASF Canada

Formulation:
The *Voraxor Complete* package contains three components:
***Voraxor* (PCP#33968):** 125 g/L trifludimoxazin plus 250 g/L saflufenacil formulated as a suspension concentrate
- Container size - 1.56 L

***Zidua SC* (PCP#32542):** 500 g/L pyroxasulfone formulated as a suspension concentrate.
- Container size - 3.89 L

-plus-
***Merge* (PCP#24702):** 50% Surfactant blend plus solvent 50% formulated as a surfactant
- Container size - 2 x 8.1 L

Crops and Staging:
Apply prior to seeding or after seeding but prior to crop emergence.
Add products to the spray tank in the following order: *Zidua SC, Voraxor*, glyphosate, *Merge* adjuvant. If foaming occurs, add an anti-foaming agent.

Crop	Rates (mL per acre)		
	Voraxor	*Zidua SC*	*Merge*
Field pea, field corn, soybeans, chickpeas and faba beans	19.5 to 40.5	49 to 97	200 to 400
Lentil	19.5	49	200 to 400

Field corn, lentils, chickpeas, faba beans and field peas must be planted 2.5cm deep to reduce risk of injury. Soybeans must be planted at least 4 cm deep to reduce risk of injury.

Weeds and Staging:
Broadleaf weeds controlled by *Voraxor* plus the broadleaf and grass weeds controlled by *Zidua SC* at the rates above. Foliar stages are indicated on the *Voraxor* page.

Tank Mixes:
Tank mix partners applied at all label rates and include recommended adjuvants unless otherwise noted.
Note: Crop injury may occur in lentil when *Voraxor Complete* is used in conjunction with certain soil applied/soil active herbicides. Consult with the manufacturer for more guidance.
Herbicides:
Pre- seed, pre-emergence: *Voraxor Complete* must be tank mixed with glyphosate 0.5 to 1 L per acre of 360 g/L equivalent. *Merge* (200 to 400 mL per acre) is **always** required.
Fungicides: None registered.
Insecticides: None registered.
Fertilizers: None registered.
Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:
- **Re-cropping:** In the event of crop failure, only labeled crops may be seeded on fields treated with Voraxor Complete (rate restrictions apply). Winter wheat may be seeded 3 months following application. Barley, canola, dry common beans, peas (dried field), flax, field corn, lentils, mustard, soybean, wheat (spring, durum) may be seeded the year following application.

See component products for more information on restrictions, application details and handling. Unless indicated differently above use the most limiting restrictions across all components for the mix.

Zidua SC

Herbicide Group
15 - pyroxasulfone

Company:
BASF Canada (PCP#32542)

Formulation:
500 g/L pyroxasulfone formulated as a suspension concentrate.
- Container size - 2 x 4.05 L

Crops, Rates and Staging:
Field corn: Pre-plant (up to 30 days), pre-emergence or post-emergent up to 4 leaf
Herbicide-tolerant soybean: Pre-plant, pre-emergence

	Rate per acre by soil texture			
	Coarse	Medium-Fine soil		Fine
		OM ≤ 3%	3% < OM < 7%	
Corn and soybean rates	101 mL/acre	134 mL/acre	169 mL/acre	200 mL/acre

Soil Textures:

Coarse	Medium	Medium-Fine	Fine
Sand Loamy sand Sandy loam	Loam Silt loam Silt	Sandy clay loam Sandy clay Silty clay loam	Silty clay Clay loam Clay

DO NOT apply *Zidua SC* on peat or muck soils and soils with 7 per cent or more organic matter content.

Field peas, faba beans and chickpeas: Pre-plant, pre-emergence at 49 to 97 mL per acre, fall application 73-97 mL per acre.
Lentils: Pre-plant, pre-emergence at 49 to 73 mL per acre, fall application 73 to 97 mL per acre.
Potatoes: After planting and hilling, before crop emergence at 49 to 97 mL per acre.
Sunflowers: Preplant or pre-emergence at 49 to 97 mL per acre.
Herbicide tolerant soybeans: Early post emergence at 73 mL per acre.

Weeds, Rates and Staging:
For corn or herbicide-tolerant soybeans for the pre-emergent control of the following weeds:
Grasses:
- Barnyard grass
- Foxtail (green, yellow)
- Ryegrass (Italian)

Broadleaf Weeds:
- Redroot pigweed
- Waterhemp

Suppression of the following weeds at the lentil, field pea or potato rates above:
- Foxtail (green, yellow)
- Lamb's quarters
- Waterhemp
- Kochia
- Redroot pigweed
- Wild oats

Maximum ONE APPLICATION per season of Zidua SC *or other products containing pyroxasulfone.*
All applications require rainfall for proper activation. (See "Effects of Growing Conditions")
Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found in the introduction.

Application Information:
- **Water Volume:** Minimum of 40 L per acre.
- **Nozzles and Pressure:** Consult nozzle manufacturers' recommendations for spray pressure for specific nozzles.
- **Screens:** Use a 50 mesh filter screen.

How it Works:
Refer to How Do Herbicides Work in the Weed Control Section for an explanation of the concepts used in the table below.

Active ingredient	Timing	Target	Movement	Spectrum	WSSA Group
pyroxasulfone	PRE (surface) with residual soil activity	Long-chain Fatty Acid Inhibitor	Little movement (Symplast)	Broadleaf & grass	15

Effects of Growing Conditions:

Applications to crops under stress due to either inadequate or excess of moisture for normal crop development, cool and hot temperatures, sodic soils, poorly drained soils, hail damage, flooding, pesticide injury, mechanical injury or widely fluctuating temperatures may result in crop injury.

Tank Mixes:

Herbicides:

- ***Field corn:***
  - *Aatrex Liquid 480* (0.85 to 1.25 L per acre)
  - Glyphosate (Pre-seed or pre-emergence only. Glyphosate present as IPA, DA or K+ salt.)
- ***Soybean:***
  - Glyphosate (Pre-seed or pre-emergence only. Glyphosate present as IPA, DA or K+ salt.)
- ***Potatoes:***
  - Glyphosate
  - *Sencor 480 DF*
  - Glyphosate + *Sencor 480 DF*

Note: The above mixes are those listed on the *Zidua* label only.

Off-label tank mixes, as previously permitted under the Pest Management Regulatory Agency (PMRA) Off-label Tank Mix Policy memo of 2009 are no longer allowed under new guidance from PMRA. As of December 20, 2022 only products specifically indicated on product labels may be mixed, or when the labels of two or more products to be mixed include the statement quoted in the introduction. As of December 2024 this memo will no longer be recognized by Health Canada.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found in the introduction.

Restrictions:

- **Rainfall:** Moisture is necessary to activate the active ingredient pyroxasulfone in soil for weed control.
- **Restricted Entry Interval:** DO NOT enter treated fields for 12 hours.
- **Re-cropping Interval:** In the event of crop failure, only labelled crops may be planted in fields treated with *Zidua* (rate restrictions apply). Winter wheat may be planted 4 months following application. For spring applications of *Zidua*, sunflowers, field corn, soybeans, chickpea, faba beans, lentil, field peas, spring wheat (including durum), barley, oats, flax, potato, and canola can be planted the season after application. When *Zidua* is applied in the fall, fields can be planted the following season to all labelled crops, except peanuts. When total seasonal application rates exceed 97 mL per acre, corn, soybean, chickpea, lentil, field peas, flax and potato may be planted the following season.
- **Aerial Application:** DO NOT apply by air.
- **Storage:** Store in original containers in cool, dry, well-ventilated location away from food or feed.
- **Buffer Zones:**

Application method	Buffer Zones (metres†) Required for the Protection of:		
	Aquatic Habitats of Depths		Terrestrial habitat
	Less than 1 m	Greater than 1 m	
Ground *	5	3	1

See the Key to Product Pages in the introduction for an explanation of the different habitats.

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:

Refer to 'Method B' in the general sprayer cleaning section in the introduction. Let solution stand for an extended period for better results. Flush sprayer system with water before reuse. See the label for product specific cleaning details.

Hazard Rating:


Warning – Contains the Allergen Soy

Refer to the Introduction for an explanation of the symbols.

Plant Growth Regulators

Plant growth regulators (PGRs) are chemicals that alter hormonal activity in a plant to modify plant growth and development. Depending on the compound and the plant, PGRs can modify plant growth by affecting shoot growth, branching, flowering, colour of fruit, root growth, leafing and leaf fall, as well as many other uses. PGRs are generally used to improve lodging resistance, promote fruit ripening, and to stimulate flowering in horticulture crops.

Effect of Lodging on Cereal Crops

Yield loss due to lodging depends on cultivar susceptibility to lodging, growth stage, severity of lodging, as well as wind and rain events. The greatest yield loss occurs when lodging happens within 20 days after anthesis. Prior to anthesis, lodged plants are able to right themselves by node bending. Lodging can reduce yield by interfering with photosynthesis and carbohydrate movement in the plant, and due to difficulty harvesting and more unthreshed heads. Grain quality in lodged plants can also be reduced by lower test weight and increased sprouting.

Types of Plant Growth Regulators

There are two main groups of PGRs used on cereal crops: ethylene releasing compounds and gibberellin inhibitors. These PGRs are intended to produce plants with shorter, thicker and stronger stems, and they may be another management tool to reduce lodging.

How Will a Crop Respond to PGR Application?

PGR's are intended to increase crop standability and harvestability by reducing cell elongation and stem length. Plant hormones can affect other hormones, so it is possible for PGRs to have secondary or unintended effects such as increased root growth, increased resistance to environmental stress, or delayed senescence. The effects of PGRs are not well known, there have been reports of PGRs resulting in stem elongation, positively or negatively affecting yield, and increased tiller growth which could increase or decrease yield.

Response to PGRs can be crop species and cultivar specific. Wheat is known to be most responsive to chlromequat chloride, followed by barley with an intermediate response, while oats are the least responsive. Not all cultivars show similar height and lodging responses to PGR application, but more research is needed to identify which cultivars are most likely to have a positive response.

PGRs are most useful in environments where lodging risk is high and the crop has a high yield potential. Consider PGRs in high yielding environments where moisture is abundant and high levels of nitrogen have been applied.

Application Timing

Applying PGRs as the correct time is critical. Before using a PGR, read the label to ensure that you are familiar with the correct stage of application and how to stage a crop correctly.

Manipulator 620

Plant growth regulator

Company:
Taminco US Inc. (PCP#31462); Distributed by Belchim Crop Protection Canada

Formulations:
620 g/L chlormequat chloride formulated as a solution.
- Container sizes - 2 x 10 L, 859 L

Crops, Rates and Stages:
Apply *Manipulator 620* when risk of lodging is high.

Crop*	Application	Rate (L per acre)	Stage
Barley, oats	Single Application	0.93	from beginning of stem elongation to 2 stem nodes detectable
	Split Application	0.46	from 4 leaf stage to 2 stem nodes detectable
Spring wheat (including durum)	Single Application	0.7	1 to 2 node stage
	Split Application	0.3 – First application 0.4 – Second application	2 leaf stage to beginning of stem elongation 1 to 2 node stage
Winter wheat	Single Application	0.7	1 node stage to just before flag leaf emergence
	Split Application	0.4 – First Application 0.3 – Second Application	2 leaf stage 1 node stage to just before flag leaf emergence

*** May be applied to crops under-seeded to clover or grasses. DO NOT apply later than just before flag leaf emergence.**
DO NOT exceed 0.7 L of *Manipulator 620* per acre in a single year for wheat or 0.92 L per acre for oats and barley.

Application Information:
- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre.
  - ***Aerial:*** Minimum 20 L per acre.
- **Nozzles and Pressure:** Use a combination of nozzles and pressure designed to deliver thorough, even coverage with ***ASABE medium*** droplets. Boom height must be 60 cm or less above the crop.

How it Works:
Manipulator 620 affects the production of plant hormones responsible for cell elongation resulting in plants with shorter, thicker stems.

Effects of Growing Conditions:
DO NOT apply *Manipulator 620* to crops under stress from drought, excess moisture or nutrient deficiency. Best results from early morning or evening application.
Applications of *Manipulator 620* may be made under normal seasonal temperatures down to 1° Celsius. DO NOT apply during frost.

Tank Mixes:
None registered.
DO NOT use in a tank mixture with liquid nitrogen fertilizer.

Restrictions:
- **Rainfall:** Within 2 hours may reduce effectiveness. Avoid application when heavy rain is forecast.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** DO NOT graze treated crops or cut for hay.
- **Pre-harvest Interval:** DO NOT apply later than just before flag leaf emergence.
- **Re-cropping Interval:** No restrictions the year after application.
- **Aerial Application:** May be applied by air.
- **Storage:** DO NOT freeze.

- **Buffer Zones:**

Application method	Crops	Buffer Zones (metres†) Required for the Protection of:
		Terrestrial habitat
Ground	All crops	1
Aerial (fixed wing)	Wheat (winter, spring and durum)	10
	Barley, oats	15
Aerial (helicopter)	Wheat (winter, spring and durum)	10
	Barley, oats	10

See page 43 for an explanation of the different habitats.

† **Distance measured as metres from the downwind edge of the spray boom to sensitive habitat.**

Sprayer Cleaning:
Refer to the general section on sprayer cleaning.

Hazard Rating:

Danger – Poison

Refer to the introduction for an explanation of the symbols.

Moddus

Plant growth regulator

Company:
Syngenta

Formulations:
***Moddus* (PCP#33930):** 11.3% Trinexapac-ethyl formulated as an emulsifiable concentrate.

- Container size - 2 x 10 L

Crops and Stages:
Moddus aids in the growth and lodging management of wheat, barley and oats and the growth of perennial ryegrass.

Crop	Application	Rate (L per acre)	Stage
Spring wheat (including durum) and	Single Application	-0.42	BBCH 30 to 39 (pseudo stem erection to ligule of last leaf visible). Due to risk of injury to the crop, avoid overlapping and DO NOT apply to wheat that is environmentally stressed.
	Split Application	-0.21	Make the first application at BBCH 21 to 24 (main shoot and a maximum 4 tillers). Make the second application at BBCH 37 to 39 (flag leaf just visible to ligule of last leaf visible). Due to risk of injury to the crop, avoid overlapping and DO NOT apply to wheat that is environmentally stressed.
Oats	Single application	0.34	BBCH 30 to 39 (pseudo stem erection to ligule of last leaf visible). Due to risk of injury to the crop, avoid overlapping and DO NOT apply to oats that are environmentally stressed.
	Split Application	0.17	Make the first application at BBCH 21 to 24 (main shoot and a maximum 4 tillers). Make the second application at BBCH 37 to 39 (flag leaf just visible to ligule of last leaf visible). Due to risk of injury to the crop, avoid overlapping and DO NOT apply to oats that are environmentally stressed.

Crop	Application	Rate (L per acre)	Stage
Winter wheat	Single Application	0.34 to 0.42	BBCH 30 to 39 (beginning of stem elongation to flag leaf stage). Optimal application timing is at BBCH 30 to 32 (stem elongation up to 2 nodes detectible in stem). Use the higher rate in varieties that are more prone to lodging and in fields that are intensively managed (i.e., high fertility, high seeding rate). DO NOT apply past BBCH 39 (ligule of last leaf visible).
Barley	Single Application	0.42	Optimal application timing is at BBCH 30 to 32 (stem elongation up to 2 nodes detectible in stem). DO NOT apply past BBCH 39 (ligule of last leaf visible). Due to risk of injury to barley, avoid overlapping and DO NOT apply to barley that is environmentally stressed.
	Split Application	0.21	Make the first application at BBCH 21 to 24 (main shoot and a maximum 4 tillers). Make the second application at BBCH 37 to 39 (flag leaf just visible to ligule of last leaf visible).
Perennial ryegrass (turf type only) grown for seed	Single Application	0.69 to 1.38	Before or during stem elongation stage of development (BBCH 30 to 37). **NOTE:** Although this product is effective at any time in this growth stage the BEST timing is early, BBCH 32 (second node on the main stem is detectable). DO NOT apply to perennial ryegrass that is environmentally stressed. DO NOT apply to forage type perennial ryegrass.

Note: Due to risk of injury to the crop, avoid overlapping and DO NOT apply to crops that are or could become stressed, such as by low fertility, high temperatures, drought, frost or diseased or insect-damaged.
Environmental conditions, crop management, and cultural practices that affect plant growth and vigour will influence the response of the crop to MODDUS Plant Growth Regulator applications.

Application Information:

- **Water Volume:**
  - ***Ground:*** Minimum 40 L per acre
  - ***Aerial:*** Minimum 20 L per acre (wheat, oats and barley only)
- **Nozzles and Pressure:**
  - ***Ground:*** Use a hydraulic nozzle with 80° or 110° drift reducing flat fan (e.g. those with a pre-orifice or turbulence chamber) or air induction nozzles with up to. DO NOT use flood type nozzles, controlled droplet application equipment, spray foils or hollow cone nozzles. Use a combination of volume and pressure recommended by the nozzle manufacturer to achieve no finer than ***ASAE medium*** droplets.
- **Screens:** Use 50 mesh or coarser line strainers and screens or 80 mesh with air induction nozzles.

How it Works:

Moddus Plant Growth Regulator aids in the growth and lodging management of wheat, barley and oats and the growth of perennial ryegrass.

Effects of Growing Conditions:

NOTE: Due to risk of injury to the crop, avoid overlapping and DO NOT apply to crops that are stressed or could become stressed following application, such as by low fertility, high temperatures, drought, frost or diseased or insect-damaged. Environmental conditions, crop management, and cultural practices that affect plant growth and vigour will influence the response of the crop to *Moddus* Plant Growth Regulator applications.

Tank Mixes:

None registered.
It is important to check the physical compatibility of tank mixes containing *Moddus* using a jar test following the WAMLEGS mixing order with proportionate amounts of mix partners and water, before mixing in the spray tank.
In some cases, tank mixing a pest control product, such as *Moddus*, with another pest control product or a fertilizer can result in biological effects that could include, but are not limited to, reduced efficacy or increased host crop injury.

Restrictions:

- **Rainfall:** Within 3 hours may reduce effectiveness.
- **Restricted Entry Interval:** DO NOT re-enter treated fields for 12 hours.
- **Grazing Restrictions:** Wheat, barley and oats (hay 30 days); wheat and oats - forage (DO NOT feed forage to livestock or permit livestock to graze).
- **Pre-harvest Interval:** None indicated. Harvest at maturity.
- **Re-cropping Interval:** Wheat, barley and oats (0 days); all other feed and food crops (30 days).
- **Aerial Application:** Wheat, oats and barley may be applied by air. DO NOT apply by air to perennial ryegrass.
- **Storage:** Keep in original container, tightly closed, during storage. Store this product away from food or feed. Store in a cool, dry, well ventilated area and out of the reach of children and animals.
- **Buffer Zones:** None given. Avoid contact with non-target plants. Avoid overspraying water bodies or sensitive habitat.

Sprayer Cleaning:

Refer to 'Method C' in the general section on sprayer cleaning.

Hazard Rating:

 Warning – Eye Irritant

Refer to the introduction for an explanation of the symbols.