Manitoba Crop Pest Update
Issue 8: July 8, 2020

Manitoba Agriculture

Summary

Insects: Armyworms are being found at high levels in many cereal and forage grass fields in the Eastern, Interlake, Central, and Southwest regions. High levels of grasshoppers continue to be found and controlled in some areas.

Diseases: Hot and humid, these are prime conditions for disease development in several crops. Keep in mind that many fungicides are protectants

Weeds: Most second pass herbicide has been applied, and the window is closing rapidly for post-emergent herbicide application due to staging of the crops and weeds but also the pre-harvest interval of some herbicides. Alternatives to herbicides may start to be the best way to minimize seed set of uncontrollable weeds.

Entomology

Armyworms

High levels of armyworms have been found in cereals and forage grasses in many areas of Manitoba. Insecticide applications for armyworms have occurred in the Eastern region, Interlake, Central region and Southwest region.

Scouting for larvae in small grains and forage grasses: A common method of scouting for larvae is to check several areas of the field, and determine the number of larvae per square foot. Larvae hide during the day, which makes assessing levels more difficult. Notched leaves may be a sign that armyworms or other defoliators are or have been present. During the day, at each stop shake the plants and look on the soil for armyworm larvae. Also look under plant debris, lumps of soil, and in soil cracks. Lodged plants provide a favourable habitat for moth concealment and egg laying.

How long does it take for armyworms to go through their stages? When temperatures are averaging between 25 and 30C it takes between 16 and 19 days for armyworms to go through their larval stages.

Duration in days of the immature stages of the armyworm at constant temperatures

Stage	17°C	21°C	25°C	29°C	31°C
Egg	10.4	6.0	4.0	3.3	3.5
Larva	39.9	25.5	18.7	16.3	18.8
- Instar 1	7.3	4.5	3.3	2.5	2.5
- Instar 2	4.5	2.8	2.0	1.5	1.8
- Instar 3	4.8	3.1	2.1	1.7	2.0
- Instar 4	5.1	3.2	2.2	2.0	2.5
- Instar 5	6.0	3.8	2.7	2.3	4.0
- Instar 6	12.8	8.3	6.5	6.4	2.0
- Instar 7					6.0
Pupa	24.0	16.5	11.5	8.8	

Reference: Guppy, J.C. 1969. The Canadian Entomologist. 101: 1320-1327.

- The duration of each immature stage decreased as temperatures got warmer from 10°C to 29°, but at 31°C this trend was usually reversed.
- At temperatures from 17 - 29°C larvae always developed through 6 instars, but at 10°C and 31°C a 7th instar occurred.

More information on the biology, monitoring, economic thresholds and management options for armyworms can be found at:
https://www.gov.mb.ca/agriculture/crops/insects/true-armyworm.html

Pea aphids

Pea aphids are starting to be found in field peas, but so far levels have been generally below economic levels. There has been only 1 report so far regarding insecticide application for aphids in field peas.

Timing of scouting for aphids in peas: Field Peas should be checked for aphid levels at the beginning of flowering. Take 180° sweeps or check at least 5, 8-inch (20 cm) plant tips along four well-spaced stops in the field. Counts should be at least 50 m (150 ft.) apart and observations should be made well into the centre of the field.

Economic thresholds for pea aphids: The economic threshold in peas is 2 to 3 aphids per 8-inch (20 cm) plant tip, or 9 to 12 aphids per sweep, at flowering. If the economic threshold is exceeded, a single application of insecticide when 50% of plants have produced some young pods will protect the crop against yield loss and be cost-effective. Research in Manitoba has shown that insecticides applied when pods first form protects pea yield better than earlier or later applications. Control at the early pod stage provides protection through the pod formation and elongation stages, which are very sensitive to aphid damage.

Pea aphid on alfalfa

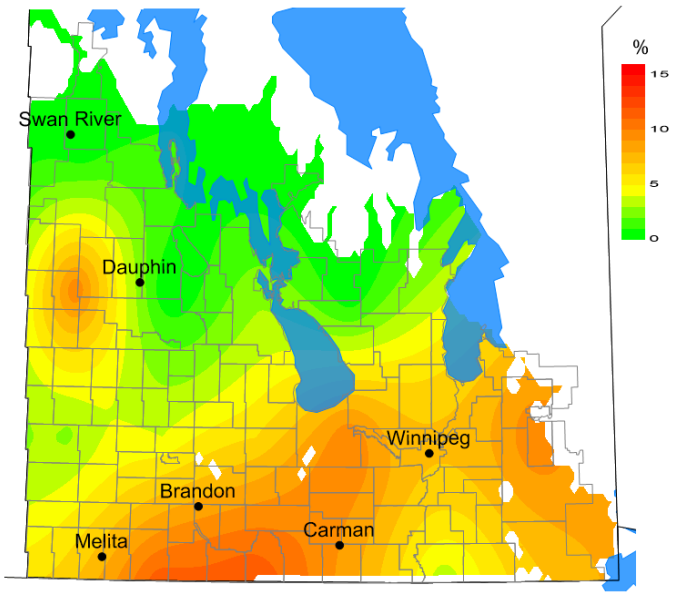
The following table relates the yield loss in peas for average aphid counts per sweep or per 20-cm tip of a field pea stem when about 25 percent of the crop has begun to flower.

Aphids per sweep	Aphids per tip	% yield loss
7	1	3.4
10	2	4.9
12	3	6.1
15	4	7.1
16	5	8.0
18	6	8.8
20	7	9.6
21	8	10.3

Wheat midge

Emergence of wheat midge can be estimated by measuring the accumulated temperature units, known as degree-days, above a base temperature needed for the development of the insect. For wheat midge, a base temperature of 5 degrees celsius is used. Emergence of adults often occurs earlier in the southern part of Manitoba than the more northern wheat growing areas of Manitoba.

Emergence of adult wheat midge has begun, but predicted emergence is less than 15%. No high populations of wheat midge have been reported in Manitoba yet this year.



Wheat midge emergence based on weather data up to July 5, 2020

Timing of scouting for wheat midge: Wheat heads are most susceptible to damage when egg laying occurs during heading, Zadoks growth stages 51 (ear just visible) to 59 (ear fully emerged). Damage declines dramatically when egg-laying occurs after anthers are visible. The period of scouting for wheat midge is from the time wheat heads emerge from the boot leaf until anthers are visible on the heads.

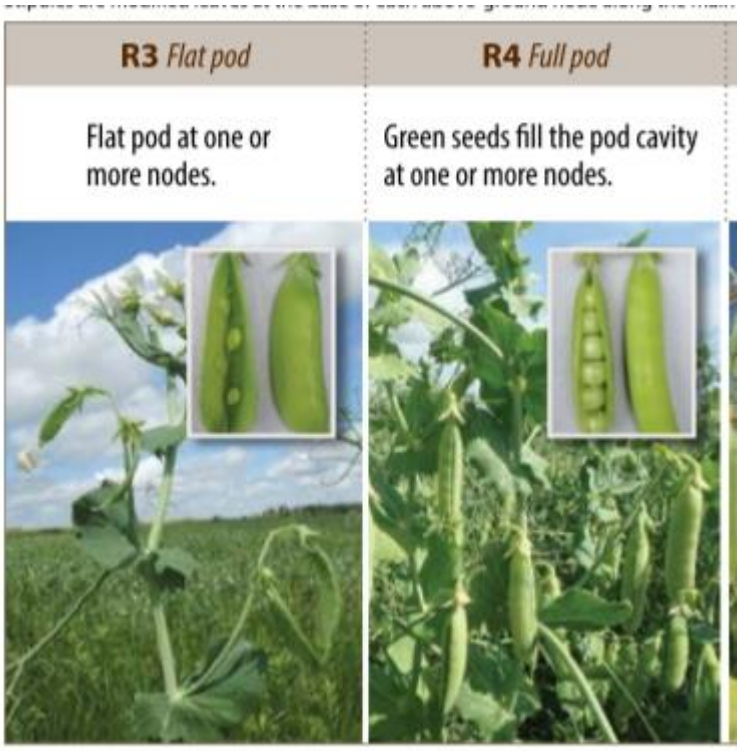
More information on the biology, monitoring, economic thresholds and management options for wheat midge can be found at:
https://www.gov.mb.ca/agriculture/crops/insects/wheat-midge.html

Plant Pathology

Update on Disease Spraying in peas: Growers looking to spray a late first pass of fungicide on their peas for Mycosphaerella blight or a second pass, need to keep the following in mind. It is important to know what growth stage your peas are at. Manitoba Pulse and Soybean Growers have a great staging guide that will help you in this decision making process.
https://www.manitobapulse.ca/2018/10/field-pea-growth-staging-guide/

If your peas are at the **R3 growth stage** or earlier then you are still outside the pre-harvest interval. At the stage the pods are still flat. Then spraying is warranted if disease and weather conditions are favorable for disease development.

If your pods are at the **R4 growth stage**, which means that green seeds fill the pod cavity, then spraying is not recommended for two reasons. Number one is that you are within 30 days of the pre-harvest interval for a number of fungicide products and two, at this stage even if disease does set in it generally does not effect the yields of the peas in the same way as if the disease moved in at early R2- R3 Growth Stage. In some instances if it moves in late it can actually help with the drydown of the peas.



From MPSG Field pea Growth Stage Guide.

Weeds

Making last ditch herbicide applications

For a number of reasons, there are still some spray decisions that are being made. Here are some considerations:

1. Is this economics or revenge? Will the yield loss and seedbank increase be worth the cost of the herbicide application and any potential crop injury?
2. Is there a herbicide that will actual kill/hurt the target weed at its current growth stage? Kochia, lamb's-quarters, redroot pigweed, wild buckwheat, the list is endless of weeds that are harder to kill as they mature. It's a combination of the plant absorbing less herbicide and requiring a larger dose because the plant is larger.
3. Will the herbicide cause yield loss? For instance, late applications of MCPA and 2,4-D are known to cause head deformation, sterility and yield losses.
4. What is the pre-harvest interval for the herbicide? https://keepingitclean.ca/phi/spraytoswath is a great tool to calculate the minimum number of days required between application of a pesticide and swathing or harvesting the crop. It's July, so there is real potential that in 30 to 45 days there will be a lot of harvest happening depending on the weather. A 60 day PHI is too long for those crops.
5. Can the problem be managed in a different way? Tillage, mowing, silaging, is there another solution that may solve more problems than it causes?
6. Would a properly timed pre-harvest weed control herbicide application be more effective? If the weed has been there that long, does it need to be sprayed now, or closer to when the crop is mature?

Nightshade Identification

I was sent the circled picture, wondering if it might be a nightshade, except they are used to seeing hairy nightshade and this is a little different. Luckily I had a similar plant growing at the office. I sent back the other pictures to make sure they agreed that we were looking at the same thing, and the blooms confirmed that we have a nightshade – this one is eastern black.

Waterhemp Surveillance

Now is the time that I start to hear more concerns of wild plants that fit the description of waterhemp. Waterhemp leaves can look like smartweed if you are just taking a quick glance. The smartweed leaf is more pointed, and there is the ochrea at the node, which is a consistent identifier. Smartweed is unlikely to grow as tall as waterhemp, and the green to white blossoms on smartweed are very different than the dioecious inflorescences on waterhemp. It just takes a little closer look to see all that.

Waterhemp leaf – top right, smartweed leaf – bottom right – can appear similar at first glance.

Integrated Weed Management

I like to make that suggestion that herbicides are not always the answer to weed control issues. When we talk about herbicide resistance, I say flippantly that there is no known resistance to iron. Some sunflower growers were struggling to find herbicides this spring for weed control and this picture demonstrates that tillage alone will not always been an answer for weed control. This makes it clear that we need to continue to work towards more weed control options in some crops.

Forecasts

Bertha Armyworm. A network of pheromone-baited traps are monitored across the Canadian prairie provinces in June and July to determine levels of bertha armyworm adult moths, and forecast risk of there potentially being economic levels of larvae somewhere in the region. The traps do not determine risk for the field specifically that the trap is in, but can estimate regional risks, which can help prioritize scouting for larvae.

So far all cumulative trap counts are still in the low risk category. The highest trap counts is 222 near Kilarney.

Table 1. Highest cumulative counts of bertha armyworm (*Mamestra configurata*) in pheromone-baited traps for five agricultural regions in Manitoba as of July 7, 2020

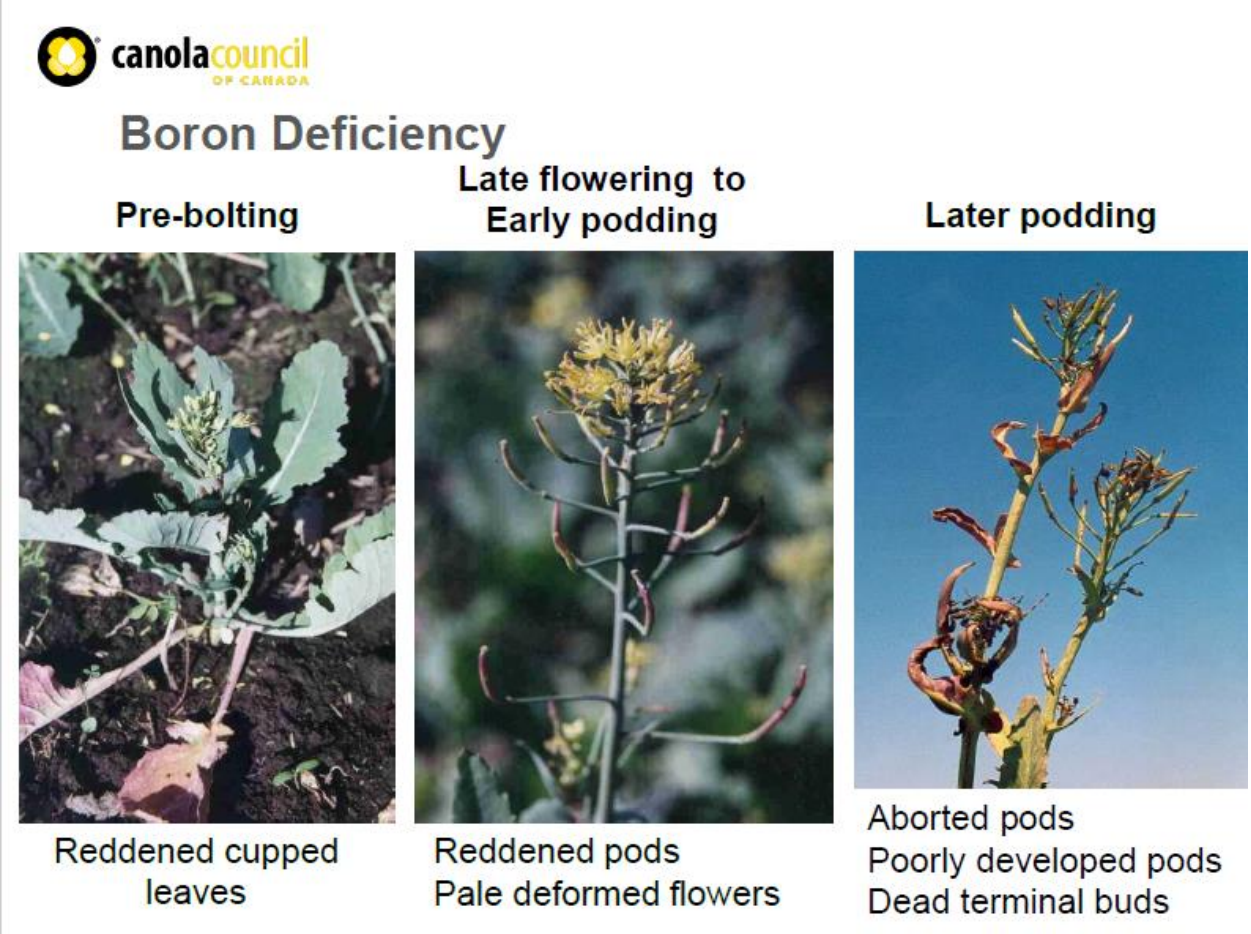
Region	Nearest Town	Trap Count
Northwest	Swan Valley	103
	Durban	63
	Benito	43
	Minitonas	32
Southwest	Foxwarren	71
	Minto	40
	Elgin	30
	Deloraine	21
Central	Kilarney	222
	Dunrea	173
	Glenboro	104
	Somerset	91

0-300 = low risk
300-900 = uncertain risk
900-1,200 = moderate risk
1,200+ = high risk

Eastern	Tourond	129
	Lac du Bonnet	31
	Stead	27
	Beausejour	20
Interlake	Teulon	94
	Warren	76
	Balmoral	72
	Gunton	64

Soil Fertility

Boron is usually supplied in suffient quantities to crops, primarily through mineralization of soil organic matter during the growing season. A few well-documented B deficiencies in canola have been found in the Prairies – most notably in the jack spruce dominated grey wooded sandy soils in the Carrot River region in northern Saskatchewan (see photos below). Soil sampling for boron is as reliable as predicting the rainfall, so consider tissue testing. Under hot, dry conditions, organic matter mineralization may be reduced. In Ontario, greenhouse studies found boron supplementation of canola tended to reduce the number of aborted pods under such conditions.



Excess water, nutrient loss, yield potential and rescue applications

Substantial areas of western Manitoba have suffered high levels of rainfall and some questions arise regarding whether to make applications to account for lost nutrients. This process involves assessing the risk of nutrient loss, primarily nitrogen (N), gauging the remaining yield potential and the likelihood of a profitable response to applications.

This is outlined in some detail in: https://www.gov.mb.ca/agriculture/crops/soil-fertility/wet-soils-influence-soil-fertility.html The basics are:

1. N losses as nitrate occur as:
    - leaching below the rooting depth: a 1" rain may wet to 10" depth in a coarse sand but only 3" in a clay. Nitrate N would then be diluted through that volume. More rain will dilute and move N deeper.
    - Denitrification under standing water or waterlogged conditions – and with warm soil temperatures may range from 4-16 lb N/ac for each day of waterlogging.

2. Yield potential is reduced when waterlogging occurs: roots are deprived of oxygen and do not take up nutrients, particularly the macronutrients. Some other

nutrients may even build to toxic levels (Fe and Mn). The effect on canola is well detailed in this summary https://www.canolawatch.org/wp-content/uploads/2014/07/Waterlogging-effects-on-canola.pdf
The Canola Growers Manual indicates waterlogging at the rosette to bolting stage may limit yield potential to 70% (after 3 days), 55% (after 7 days) and 50% 9after 14 days). With such yield loss, few inputs may warrant application.

3. Supplemental N rates should not be based on full N loss and replacement to original application levels. For cereal and canola crops consider the following suggestions:

- Where N losses are estimated to be high and yield potential is still good – apply up to ½ 2/3 of original targeted N rate (note that some crops will have advanced beyond a stage where yield can be influenced with N additions)
- Apply up to 1/3 of original targeted N rate if estimated losses are moderate but yield potential is good – or if estimated losses are high but potential yield is only fair.
- There is a real lack of documented results on these salvage operations in cereals and canola. If applying supplemental N, leave check strips and record yields. I would be very interested in any data generated.

This situation is exactly the circumstance that Y-drop applicators were developed for use in corn. These are common occurrences in Iowa and Missouri, where there is sufficient growing season for corn to recover and make good use of replacement N.

Sulphur deficiency in corn

In well-drained sands some cases of sulphur (S) deficiency have been observed. S is slowly mobile in the plant so the whole plant appears lime green with striping of upper leaves (photos below). Identification at this stage is helpful, since the deficiency may be corrected with directed applications of ammonium thiosulphate liquid, such as with Y-drops. Sometimes the corn simply roots into deeper positioned S in the soil profile. Tissue sampling is justified, since application of N alone may make the sulphur deficiency worse. And zinc deficiency also displays striping, but generally at a younger stage and with striping confined closer to the whorl.

Sulphur deficiency and response to applied S behind flag in field.

Identification Quiz:

Question: Some have been noticing these at the top of some of their cereals. What are they? They are often found where armyworms had been noted. Could there be a connection?

Answer: These are pupal cases of a parasitic wasp called *Cotesia*. Armyworms would be one of the insects they would parasitize.

Question: What is this weed at the edge of a field? So I called the person and asked "Was the plant sticky?"

Answer: Based on the answer...night flowering catchfly. It's the waxy substance on the blooms especially that feels sticky and makes it easy to differentiate at this point.

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To **report observations** on insects, plant pathogens, or weeds that may be of interest or importance to farmers and agronomists in Manitoba, please send messages to the above contacts.

To be placed on an **E-mail list** so you will be notified immediately when new Manitoba Crop Pest Updates are posted, please contact John Gavloski at the address or numbers listed above.