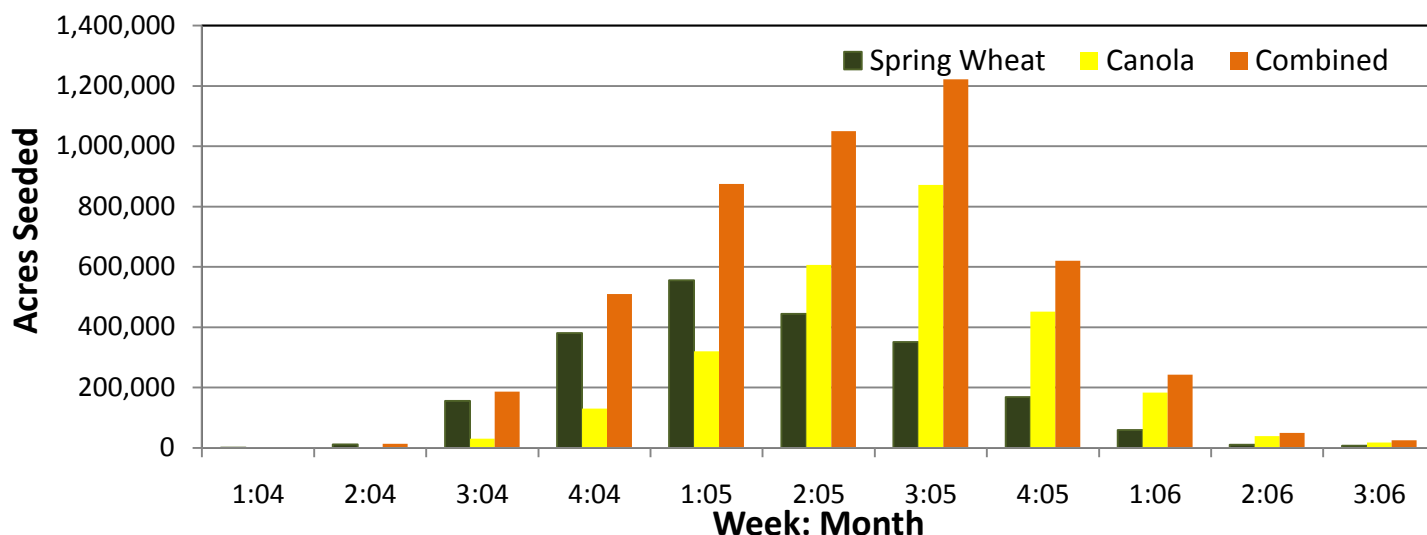


Optimizing Stand Establishment in less than Optimal Conditions

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With the delayed seeding situation, optimizing seeding operations are imperative in establishing crops for 2011 to achieve maximum yield potential. Remember, planting date is only one of many yield influencing factors. The following are tips to utilize the other factors to assist in maximizing seedling emergence and establishment.

Avoid “Mudding” It In – manage crop residue, drive on firm fields, and leave the drowned out spots to dry up. Early seeding favours higher yields, but does not guarantee them. Most farmers have the machinery capacity to ‘catch up’ quickly once soil conditions improve and fields can be confidently seeded. The following information from MASC (2005-2010) shows how quickly major crops like spring wheat and canola can be planted.



On average 47% of the spring wheat crop is planted in the first two weeks and 56% of canola crops planted in the second and third week of May. Farmers have planted 60% of the province’s wheat crop, and 42% of the canola crop, in a single week given good working conditions.

Increase Your Rate of Germination/Emergence - Delayed emergence is equivalent to seeding date delays, resulting in an equal reduction in yield. Determining soil temperature can indicate how quickly seed will germinate/emerge and can assist in crop seeding sequencing.

Soil temperatures should be measured and seeding targeted when the soil temperature at seeding depth reaches or exceeds the required minimum (Table 1). Measure temperature at the desired seeding depth, and when soil is at its coolest (early morning) and warmest (late afternoon). Targeting a shallower seeding depth can place seeds in warmer soil, which could result in faster germination.

Table 1: Minimum Germination Temperatures for Various Crops

	Grain Crops				Oilseed Crops			Pulse Crops		
	Barley	Wheat	Oat	Corn	Canola	Sunflower	Flax	Peas	Soybean	Dry Bean
Temperature (C)	3 - 5	4	5	10	5 - 10	6 - 7	9	4	10	10 - 12

Source: North Dakota State University – Extension Service, Alberta Agriculture & Rural Development, Canola Council of Canada

As seeding dates are pushed back, it may be a natural impulse to seed as many acres, as fast as possible! However, research has consistently shown, uniformity of seed placement (depth) is one of the first things lost once planting speeds exceed 5 mph. So during seeding, continually check to ensure proper depths are achieved.

Plant Quality Seed & Consider a Seed Treatment - Using certified seed with high germination is optimal. If you haven't already tested your seed source, now is the time, as it is the only reliable means of determining germination and disease presence. As well, look for seeds with good test weight, color, size uniformity and no indication of disease (shrivelled, discoloured). If the seed looks questionable and % germination low, sell it into the commodity market and secure better quality product.

In addition to quality seed, seed treatments have been shown to have their largest benefits in cool and wet soils by minimizing seed and soil borne disease concerns. Healthy seedlings, regardless of crop type, can assist in overcoming other early season challenges and protect yield potential.

Target a Plant Stand and Seeding Rate – Good plant stands can spread out the impact of early season challenges and provide extra insurance and compensate for lost plants due to early insects, frost and disease.

Plant stands are calculated based on seeding rate, thousand seed weight and expected seed survival (includes germination and mortality). Table 2 has the following recommendation from MAFRI for plant stands. Use the table and the following equation to determine seeding rates to achieve the plant stands. Note, mortality rates for oilseeds, especially canola are typically much high than cereals.

Table 2: Optimal Plants Stands for Various Crops

	Grain Crops				Oilseed Crops			Pulse Crops		
	Barley	Wheat	Oat	Corn	Canola	Sunflower	Flax	Peas	Soybean	Dry Bean*
Plants/ft2	22-25	23-28	18-23	-	7-14	-	37-56	7-9	-	-
Plants/ac (1000s)	-	-	-	26-30	-	18-22	-	-	180-210	85-100
Mortality Rates (%)	10-15	10-15	10-15	10-15	20-60	10	40-50	5-15	5-10	5-10

*Navy Bean = pinto beans on lower end and navy bean require higher plant stands

Source: MAFRI website (plants stands), MAFRI crop specialists, Canola Council of Canada, Flax Council of Canada, Ontario Ministry of Agriculture, Food and Rural Affairs

Seeding Rate = $\frac{\text{target plant stand per ft}^2 \times 1000 \text{ seed weight (grams)}}{(\text{lbs/ac}) \times \% \text{ expected seed survival} \times 10}$

E.g. FLAX Seeding Rate= $\frac{45 \text{ plants/ft}^2 \times 5 \text{ g (1000 seed weight)}}{(88\% \text{ germination} \times (1- 40\% \text{ mortality})) \times 10}$ = 43 lbs/ac



Ensure Adequate Fertility and Reduce Weed Competition - Supply adequate nutrition (nitrogen, phosphorus, potassium and sulphur) to meet your target yields and limit weeds with a pre-seed burn-off. This will assist in better establishment due to reduced plant competition and increase fertilizer availability for the crop.

FINAL NOTE - Regardless of when planting does begin, it is important to remember that things over-looked during seeding cannot necessarily be made up later in the season; putting a "ceiling" on the crop's yield potential before the plants have even emerged. Now is not time to change crop types, switch into shorter season varieties or to start broadcast seeding. The month of May still has almost 3 weeks left and May is typically when 90% of Manitoba's crop is planted with successfully high yields.