The Effect of Seeding Date on Three Varieties of Industrial Hemp in Manitoba

Project duration - May 2017 – September 2017
Objectives - To understand the effect of seeding date by variety on industrial hemp grain yields.
Collaborators - Hemp Genetics, Parkland Industrial Hemp Growers, Manitoba Harvest

Results

- The greatest mortality was observed for Seeding Date 3 which followed a series of large rain events, affecting all varieties (Figure 1). Overall, variety was significant for seedling mortality with CRS-1 having the greatest mortality at 73%, followed by CanMa at 60% and Finola at 47%.
- Overall average grain yield for the trial was 871 kg/ha and ranged from 313-1427 kg/ha (Figure 2)
- The earliest seeding date in Melita resulted in the greatest grain yield.
- Seeding between May 31 and June 16 did not significantly increase grain yield.
- Seeding at June 23 significantly reduced grain yield.
- Overall height was negatively impacted by seeding date with the exception of Date 3.
- There was a significant interaction between test weight and variety with longer season varieties showing a negative relationship between seeding date and test weight (figure). Test weight Finola (early season) was not affected by seeding date while both CRS1 (mid season) and CanMa (late season) were affected.

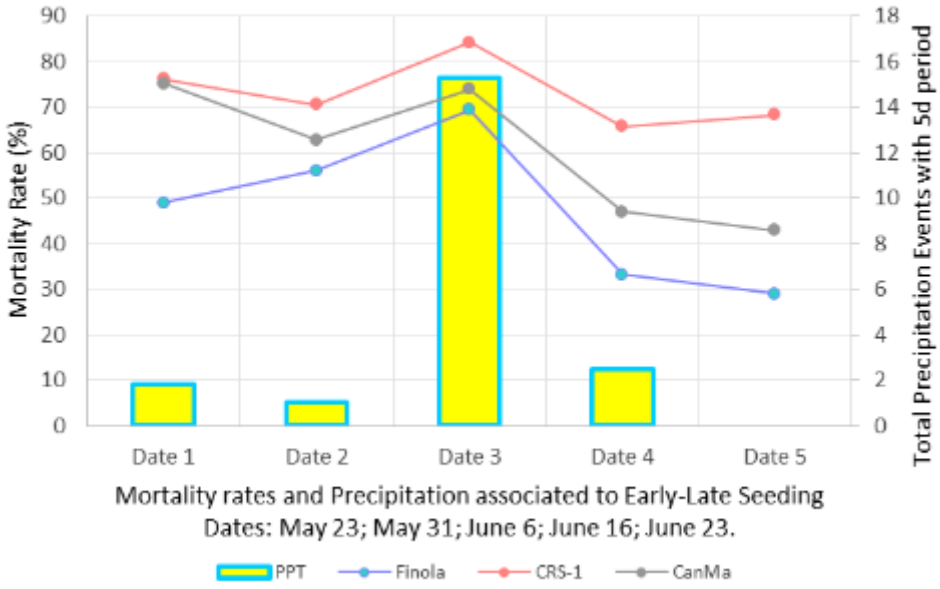

Figure 1. Mortality levels associated to seeding date and total precipitation events (within 5d period of seeding date)

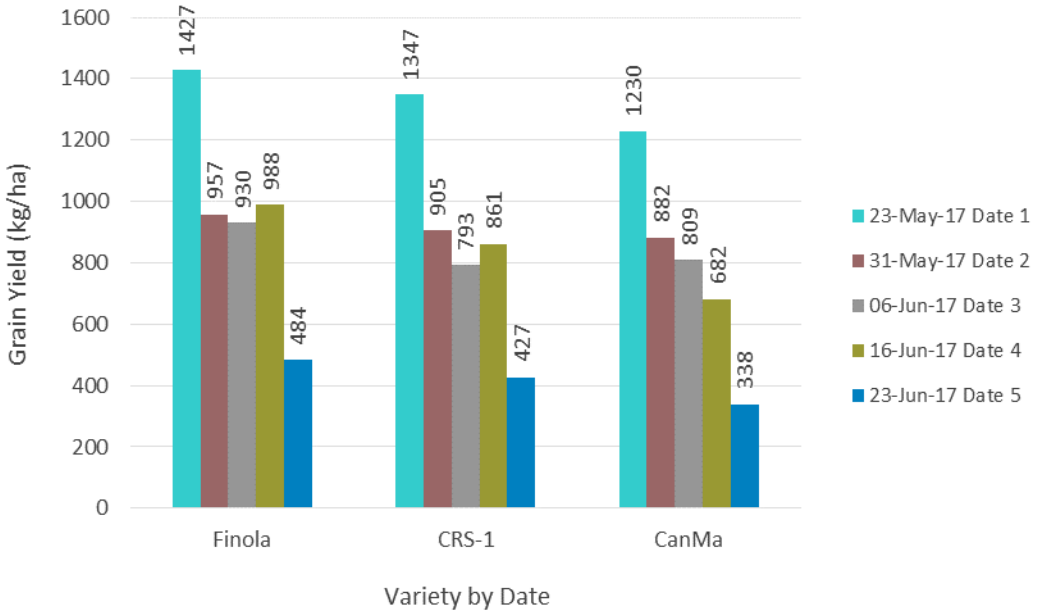

Figure 2. Effect of seeding date by variety on grain yield (kg/ha) for hemp planted at Melita Manitoba, 2017.

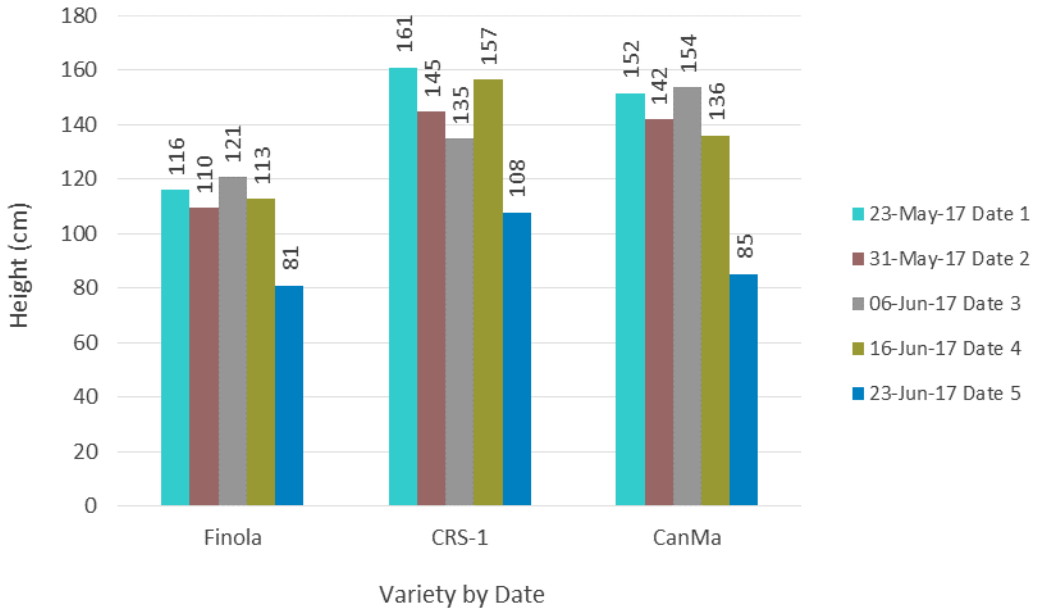

Figure 3. Effect of seeding date by variety on plant height (cm) for hemp planted at Melita Manitoba, 2017.

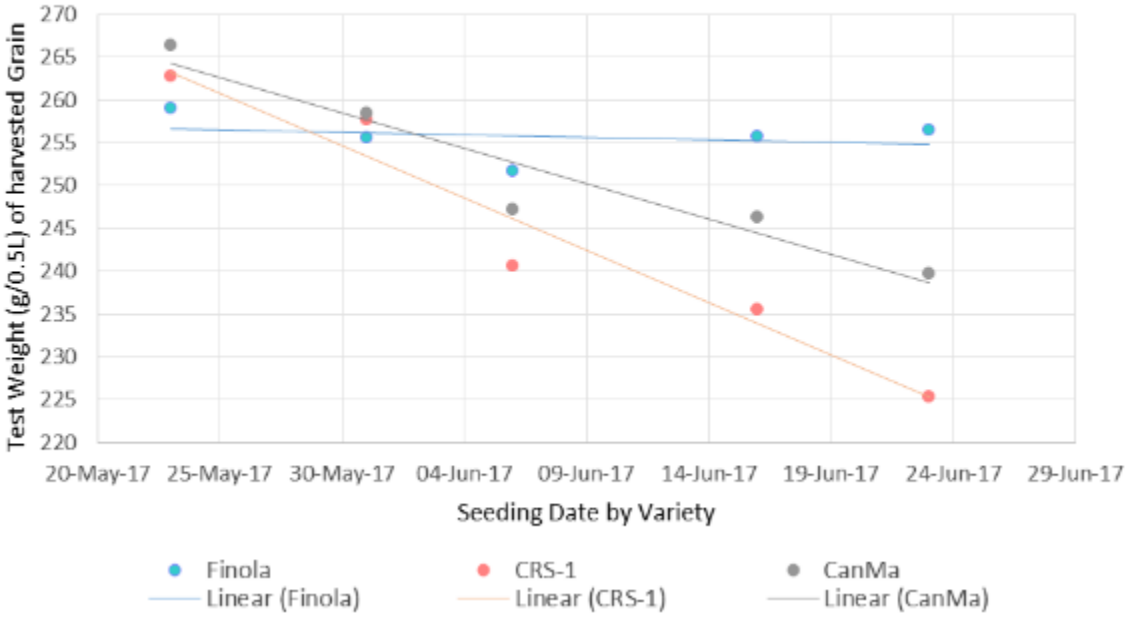

Figure 4. Effect of seeding date by variety on test weight (g/0.5L) for hemp planted at Melita Manitoba, 2017.

Project findings

- There was not a significant effect of seeding date on seedling mortality although there was a general trend of greater mortality for the earlier seeding dates. Despite the mortality levels seed densities were still sufficient, with Finola and CanMa averaging 79 and 59 plants/m2, respectively. The exception may have been CRS-1 which averaged 41 plants/m2. Previous work done by the Diversification Centres (2011-2012) demonstrated that grain yield is typically not affected until densities drop below 40 plants/m2. CRS-1 therefore would have had densities right around the threshold where yield may have been impacted.
- The effect of seeding date appears to be variety dependent. All varieties showed a general reduction in both height and grain yield with no interaction between variety and seeding date. However, there was no statistical advantage or penalty detected for seeding until mid June. These results suggest that early seeding, if establishment risk factors (cold, wet soil conditions) are perceived low and the added height at harvest is not an issue can result in greater yield.
- Quality may also be of concern when choosing to seed late, especially for mid and long season varieties such as CRS-1 and CanMa. In this study both varieties expressed decreasing test weights as seeding date was delayed with CanMa being affected the most. Although there was a decrease in yield for Finola when seeded at the end of June, test weight was not effected by seeding date. CRS-1, and especially CanMa had both lower yield and decreasing test weights as seeding was delayed.

Background

Earlier seeding dates (before May 15) for industrial hemp may result in high plant mortality rates, as well as taller, thicker stems [1]. Limited research is available on the effect of seeding date in Western Canada.

Materials & Methods

Locations:	Melita (Roblin results not included due to high %CV)
Experimental Design:	3 varieties with 5 seeding dates
Main plot:	CanMa (tall, dual purpose-type)
	CRS-1 (medium, dual purpose-type)
	Finola (short, grain-type)
Data collected:	Seeding date
	Emergence date
	Plants/m^2
	Mortality
	Vigor (1 low, 9 high)
	Height (cm)
	% Moisture
	Yield (kg/ha)

Table 1: Agronomic info for all sites

Item	Melita	Roblin
Legal Location	NE 27-3-27W1	NE 20-25-28 W1
Soil Series	Waskada Loam	Erikson Clay Loam
Soil Test (0-24")		
N - lbs/ac	7.2	86
P- ppm	11	10
K - ppm	260.8	183
S - lbs/ac	219.8	184
Burnoff Date	May 23	May 25
Product	Glyphosate/Liberty	RoundUp Transorb
Seed Date	Date 1-May 23 Date 2- May 31 Date 3- June 6 Date 4-June 16 Date 5- June 23	Date 1 – May 24 Date 2 – June 2 Date 3 – June 9 Date 4 – June 28 Date 5 – June 28
Seed Depth	0.75”	0.75”
Spring Fertilizer Application - lbs/ac		

N	120	49
P	35	10
K	25	0
S	10	0
Spring Fertilizer Dates	SB at Seeding	Side-banded at seeding
In-crop Herbicides Date	July 11 for Seed Date 2 - 5	N/A
Product	Koril/Arrow	N/A
Fibre Harvest Date	N/A	Aug 28
Grain Harvest Date	September 7	Sept 27

References

Canadian Hemp Trade Alliance: Production, Seeding Date.
http://www.hemptrade.ca/eguide/production/seeding