Table 9f. Selected agronomic information for canola desiccation trial at Melita in 2019

Factor/Operations	Melita, MB 2019
Previous Crop	Oat
Variety	L255PC (LL) / 45M35 (RR)
Pre-emergence Herbicide	None
Seeding Date	May-8
Seeding Rate	125 seeds/m^2
Row spacing	24 cm
Fertility (kg N-P_2O_5-K_2O-S/ha)	121-39-22-8 + 2Zn
In-crop Herbicide	297 ml Centurion/ha + 20 g Muster/ha (Jun-6)
Fungicide	none
Insecticide	198 ml Pounce 384 EC/ha (May-27) 133 ml Pounce 384 EC/ha (Jun-6)
Pre-harvest Applications	All treatments (Aug 13)
Harvest date	Aug-23 (all treatments)

10.0 Linseed Coop Evaluation

Project duration: 2018-2020

Collaborators: CDC Saskatchewan, Dr. Helen Booker (flax breeder)

Funding: Manitoba Flax Growers Association, BASF

Objectives

- Flax variety testing of newly registered cultivars (SVPG entries) and experimental lines (FP entries) from the University of Saskatchewan, Crop Development Centre Flax Breeding Program as compared to relevant reference cultivars.

Background

Canada is the world's number 1 producer of flax and its production in North America dates back to the 1800s. Primarily, flax is produced for its fibre or oil, but in Canada, most farmers grow seed flax for oil extraction. Consumption of flax seed by humans has largely increased due to its health benefits of omega 3 oils, high fibre content and presence of anti-carcinogenic compounds known as lignans (Flax Council of Canada, 2015; You et al., 2016). Canadian Flax varieties are mainly developed for improvement of their

oil content and quality. Objectives differ among flax breeding programs but most target to optimize seed yield while maintaining oil content greater than 45%, alpha linoleic acid content greater than 50%, disease resistance, early maturity and resistance to lodging (Hall et al., 2016). Development of flax varieties is a continuing process that makes use of germplasm created by the collaborative efforts of flax breeders and researcher over many years (You et al., 2016). Canadian flax breeding started in the early 1900s, and flax varieties have been released since 1910. Continued development and release of new varieties under varying weather conditions would help expand variety choices by flax farmers as well as increase availability of food, feed and fibre to the ever increasing global population.

Materials and Methods

The coop trial was conducted at Melita, Roblin, Arborg and Carberry in Manitoba. There were other sites across the Canadian Prairies in various soil zones but they will not be discussed in this report. Twenty varieties were arranged in a 4 x 5 alpha lattice design and replicated 3 times. Melita site was seeded at 5/8" depth on May 8th under oats stubble. Fertilizer was banded during seeding at a rate of 108-35-20-7-2Zn actual (N-P-K-S) lb ac^{-1} following recommendations as per soil test results. Chemical weed control included; 0.1 L ac^{-1} Authority, 0.75 L ac^{-1} Roundup and 0.015 L ac^{-1} Aim applied as a burnoff after seeding and 0.12 L ac^{-1} Select + 0.5% v/v Amigo adjuvant and 0.91 L ac^{-1} Basagran applied as post emergence herbicide for control of grasses and some broad leaf weeds.

Additional data other than yield collected from the trial included: emergence date, vigor, height, days to maturity, grain moisture, thousand seed weight, lodging, stem dry down, determinate growth habit. Subsamples were sent back to the Crop Development Centre in Saskatoon for further fatty acid and protein analysis.

Results

Flax yield data presented are for zone 1 and 3, which are characterized by Black and Grey soils in Western Canada. Zone 1 is considered to have a longer growing season compared to zone 3. Locations in zone 1 included; Melita (MB), Redvers (SK) and Indian head (SK) while zone 3 included; Arborg (MB), Roblin (MB), Vegreville (AB), Melfort (SK) and Codette (SK). Flax seed yield data (Table 10.0) from Melita showed that FP entries yielded more seed compared to checks and SVPG varieties. The highest ranked (1st) variety (FP2594) yielded 3030 kg ha^{-1} while the lowest ranked (20th) check (AAC Bright) yielded 2560 kg ha^{-1} in 2019. Overall, seed yield was not much variable as indicated by the low coefficient of variation of 4.4%. Some varieties did not differ in seed yield, for example, CDC Dorado, ND Hammond and FP2589 ranked

13th with 2720 kg ha^{-1}. Check variety CDC Bethune was ranked 11th, similar to SVPG entry AAC Marvelous with 2700.7 kg ha^{-1}. First year entries, FP2590 and FP2593 were both ranked 3rd and yielded 2930 kg ha^{-1}. Similar to Melita results, FP entries were ranked higher compared to SVPG entries and some check varieties at Roblin. Mean seed yield was 520 kg ha^{-1} lower at Roblin compared to Melita and this could be attributed to differences season length between the two sites. Ranking flax varieties based on seed yield is necessary in selecting varieties that are suitable for production in a given environment. It also aides both breeders in deciding the varieties to consider registering for commercial production of continued breeding.

Table 10.0 Flax yield ('00 kg ha^{-1}) and variety ranking from Melita (Zone1) and Roblin (Zone 3) in 2019

ENTRY	Melita	Ranking†	Roblin	Ranking
Checks	**Yield**		**Yield**	
CDC Bethune	27.7	11	22.8	9
AAC Bright	25.6	20	21.2	14
CDC Glas	27	16	19.5	19
SVPG Entries				
CDC Buryu	26.5	18	23.4	8
CDC Dorado	27.2	13	19.3	20
ND Hammond	27.2	13	21.0	15
AAC Marvelous	26.6	17	22.7	12
AAC Prairie Sunshine	27.7	11	21.0	15
CDC Rowland	28.3	8	20.5	17
Topaz	26.5	18	20.5	17
3rd Year Entries				
FP2566	28.6	6	24.4	6
FP2567	27.9	10	22.8	9
FP2573	29.2	5	25.7	2
1st Year Entries				
FP2589	27.2	13	21.9	13
FP2590	29.3	3	24.6	5
FP2591	29.5	2	25.4	3
FP2592	28.2	9	25.2	4
FP2593	29.3	3	25.9	1
FP2594	30.3	1	22.8	9
FP2595	28.5	7	24.2	7
Mean	**27.9**		**22.7**	
C.V. %	**4.4**		**8.9**	
LSD	**2.5**		**3.92**	
No. of Reps	**3**		**3**	

†Ranking of flax varieties and lines based on seed yield from highest to the lowest. Arborg results were not included because of high coefficient of variation in 2019.

Linseed/Flax at late flowering stage on July 10th 2019, Melita

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