Report on 2016 Study:

Evaluation of OP lines and varieties for suitability for commercial production in Manitoba

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Prepared for Manitoba Canola Growers Association by:

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The study consisted of evaluating 10 entries (8 OP varieties, plus 2 WCC/RRC checks) on 7 locations in 4 replications per location. Eight varieties were sourced from different breeders with interest in OP development. The inclusion of the WCC/RRC checks allowed a relative comparison with the commercial hybrids currently sold on the market in Western Canada.

The varieties used in the study:

ENTRY	**NAME**	Company	Comment
1	**5440**	Bayer	WCC/RRC check
2	**45H29**	Dupont Pioneer	WCC/RRC check
3	**AC Excel**	AAFC	Old registered conventional variety, currently grown in MB
4	**A05-6NI**	Univ. Alberta	Clearfield experimental line, recommended for registration
5	**72P01 CL**	Univ. Alberta	Clearfield variety, registered in Canada
6	**AlfaGold**	Univ. Alberta	Clearfield variety, registered in Canada
7	**PSL 11**	Parsons Seed	Experimental conventional line, not registered in Canada
8	**PSL 385**	Parsons Seed	Experimental conventional line, not registered in Canada
9	**PSL 427**	Parsons Seed	Experimental conventional line, not registered in Canada
10	**PSL 120**	Parsons Seed	Experimental conventional line, not registered in Canada

The locations and contract research organization (CRO) used in the study:

Location	CRO	Comment
Carman	UofM	Very good site
Winnipeg	UofM	Very good site until the end, geese damage, data not useful
Portage	UofM	Severely water stressed, one replication not useful, high variation (lower precision)
Beausejour	PESAI	Severely water stressed, site cancelled
Arborg	PESAI	Water stressed, not able to control the late flushes of weed, high variation, data not used
Melita	WADO	Water stressed, on replication not used, data OK
Minto	AgQuest	Very good site

Due to water stress and related issues (late flushes of weeds, etc..) the site in Beausejour was cancelled, Arborg did not generate useful data. The site in Winnipeg was damaged just before harvest, producing data that could not be used. Four out of seven sites produced useful data, which is normal considering the conditions in 2016.

RESULTS AND COMMENTS

Yield in bu/ac and percentage of the WCC/RRC check (average of 5440/45H29)

ENTRY	NAME	Carman		Melita		Minto		Portage		Average	
1	5440	46.1	**96.8%**	49.8	**100.2%**	77.5	**108.4%**	29.4	**91.3%**	50.7	**99.2%**
2	45H29	49.1	**103.2%**	49.6	**99.8%**	65.4	**91.6%**	35.0	**108.7%**	49.8	**100.8%**
3	AC Excel	35.8	**75.2%**	39.9	**80.3%**	44.2	**61.8%**	23.9	**74.2%**	35.9	**72.9%**
4	A05-6NI	36.8	**77.3%**	41.4	**83.2%**	43.9	**61.5%**	29.1	**90.2%**	37.8	**78.0%**
5	72P01 CL	33.4	**70.1%**	37.2	**74.8%**	47.6	**66.7%**	27.9	**86.5%**	36.5	**74.5%**
6	AlfaGold	41.1	**86.5%**	37.8	**76.0%**	59.2	**82.9%**	28.0	**87.0%**	41.6	**83.1%**
7	PSL 11	42.4	**89.1%**	41.1	**82.6%**	55.8	**78.0%**	24.4	**75.7%**	40.9	**81.4%**
8	PSL 385	39.3	**82.6%**	39.1	**78.6%**	59.2	**82.9%**	32.2	**100.1%**	42.5	**86.1%**
9	PSL 427	35.6	**74.9%**	42.9	**86.2%**	46.2	**64.7%**	25.3	**78.5%**	37.5	**76.1%**
10	PSL 120	37.1	**77.9%**	37.3	**75.0%**	53.6	**75.0%**	25.6	**79.5%**	38.4	**76.9%**
	*CV**	*5.3%*		*8.7%*		*9.3%*		*13.8%*			

*CV is the coefficient of variation, indicates the precision of the experiment. The lower value indicates lower error (higher precision). Usually data from trials with CV higher than 15% is not used.

The best yielding OP varieties yielded 83-86% of the check (i.e. around 15% lower than the check). That would put these OP varieties at 10-20% below the majority of commercial hybrids.

All OP varieties collected for the study yielded better than AC Excel, the only conventional OP variety currently commercially grown in Manitoba.

Note that the majority of new hybrids tested in the public coop trials do not exceed the average of the checks.

Agronomic and quality data (average of all locations)

ENTRY	NAME	OIL		PROTEIN		GLUCS		DTM		Height	Lodging
		%	+/- ck	%	+/- ck	µmol/g	+/- ck	Days to mature		cm	(1-5)
1	5440	47.1	**-1.0**	42.0	**-0.3**	11.8	**-0.3**	92.6	0.2	115.2	2.2
2	45H29	49.0	**1.0**	42.7	**0.3**	12.3	**0.3**	92.3	-0.2	113.3	3.2
3	AC Excel	46.5	**-1.6**	44.1	**1.8**	11.4	**-0.6**	91.5	-0.9	103.8	3.1
4	A05-6NI	47.6	**-0.5**	42.4	**0.1**	8.4	**-3.7**	89.6	-2.8	93.5	3.4
5	72P01 CL	46.1	**-1.9**	42.6	**0.2**	11.0	**-1.0**	89.0	-3.4	101.0	3.3
6	AlfaGold	46.6	**-1.4**	45.5	**3.2**	12.5	**0.4**	94.8	2.3	110.3	2.6
7	PSL 11	47.3	**-0.8**	43.6	**1.3**	11.1	**-0.9**	91.4	-1.1	101.9	2.8
8	PSL 385	47.2	**-0.8**	43.2	**0.9**	11.2	**-0.9**	95.8	3.3	121.8	2.6
9	PSL 427	46.6	**-1.5**	44.7	**2.4**	13.2	**1.2**	89.1	-3.3	98.1	3.2
10	PSL 120	45.8	**-2.3**	42.7	**0.4**	13.8	**1.8**	95.6	3.2	113.1	2.9

Oil – highlighted values will meet the current requirements for registration.
Protein – none of the entries seems to have a problem meeting the requirements for registration.
Glucosinolates – the lower the better, only the last two varieties are marginally not meeting the requirements for registration.

Saturates – entries 4 and 7 meet the requirements for variety registration. Entry 8 has 0.1% higher level than the allowable limit.

Days to maturity (DTM) relative to the checks ranges from -3.4 days earlier to 3.3 days later and all seem to be adapted for the growing conditions in Manitoba. The highest yielding variety is also the tallest and latest maturing.

Lodging is scored on 1 to 5 scale, 1 being the best (no lodging) and 5 the worst (flat). None of the varieties showed excessive lodging as compared to the WCC/RRC checks (5440 outstanding, 45H29 moderate to strong).

The study did not include blackleg testing which is a requirement. No significant blackleg symptoms were observed in any of the trials.

In conclusion, the varieties tested in the study showed good adaptation for the Manitoba growing conditions. The best yielding varieties are yielding up to 20% lower than the commercial hybrids. Oil content was one of the shortfalls of several varieties. This is not unusual as the varieties were not bred specifically for W. Canadian market. Still, several products are meeting the requirements for registration.

The data provides a base for an economic model comparison between growing OP varieties vs hybrids.

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