Project Title: Statewide Spring Canola Variety Evaluation

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Project Objective: To evaluate seed yield and agronomic performance of eighteen canola varieties, two brown mustards and a yellow mustard, in northwestern Montana.

Results:

Eighteen varieties of canola (Table 1) were seeded at 6.5 lb/a (0.5 in depth) to a Creston sandy loam soil under dryland conditions. Plots were seeded April 25, 2011 using a double disc plot seeder. Fertilizer (150-30-120-24) was broadcast and incorporated prior to planting. The plots were direct combine harvested on August 30, 2011.

Time to flowering for canola varieties averaged 66 days after planting (July 1), with the crop reaching harvest maturity approximately 47 days later (August 17), a total of 113 days after planting. Average plant height was 54 in, ranging from 51 to 62 in. Lodging and shatter were minimal in most plots.

Differences in seed yield and test weight were significant among varieties included in the evaluation. On average, canola yielded 2,435 lb/ac, and test weights were 50.8 lb/bu with eleven of the eighteen varieties yielding statistically equivalent to the highest yielding varieity 'DKL 55-55'. The three highest yielding varieties were 'DKL 55-55' (58.6 bu/ac or 2,940 lb/ac), 'DKL 70-07' (58.4 bu/ac or 2965 lb/ac) and 'HyClass 947' (56.5 bu/ac or 2,846 lb/ac). Differences in oil content and yield among varieties were also significant. Average oil content was 44.1%, ranging from 41.5% (Arriba) to 45.5% (HyClass 921). Oil yield ranged from 824 lb/ac (UISC00.3.1.17) to 1335 lb/ac (DKL55-55), with an average of 1126 lb/ac.

Varieties differed in saturated fat (palmitic acid), monounsaturated fat (oleic acid an omega-9 fatty acid) and polyunsaturated fats (linoleic acid an omega-6 fatty acid and α- linolenic acid an omega-3 fatty acid). NX4 106RR was the highest in oleic acid.

The data for the mustard varieties are separate from the canola data (Table 1). As expected, mustard varieties were lower yielding than canola. Oasis CL, a canola quality brown mustard, had a similar oil content and fatty acid profile as *B. napus* canola varieties (Table 2).

Summary:

Overall canola yields were up from 2010 (1,607 lb/ac) and similar to the yields from 2009 (2,489 lb/a). No disease problems were noted.

Future Plans:

With continued variety development and release, further canola evaluations will be conducted in order to identify varieties best suited to our growing region.

Table 1. Performance of canola varieties and breeding lines tested in the 2011 Montana Statewide Canola Variety Evaluation at Northwestern Agricultural Research Center, Kalispell, MT

Variety	Herbicide System	Type	Seed Yield	Seed Yield	Test Weight	Oil Content	Moisture	Oil Yield	Protein Content	Days to Flower		Days to Maturity		Stand	Shatter	Lodging	Plant Height
			bu/ac	*lb/ac*	*lb/bu*	*%*	*%*	*lb/ac*	*%*	*days*	*date*	*days*	*date*	*plants/ft²*		*0 to 9*	*in*
DKL 55-55	RR	HY	**58.6 ††**	2940	50.2	45.4	5.3	1335	26.3	65	Jun 30	115	Aug 19	20	4	1	58
DKL 70-07	RR	HY	**58.4**	2965	50.8	44.8	5.2	1328	26.2	65	Jun 30	114	Aug 18	20	0	1	54
HyClass 947	RR	HY	**56.5**	2846	50.3	44.9	5.4	1280	26.3	66	Jul 1	114	Aug 18	22	4	1	54
HyClass 940	RR	HY	**55.8**	2817	50.5	44.5	5.3	1254	26.8	66	Jul 1	112	Aug 16	16	8	1	61
InVigor 5440	LL	HY	**55.6**	2856	51.4	43.2	5.5	1237	27.3	68	Jul 3	114	Aug 18	21	1	1	55
InVigor 8440	LL	HY	**54.5**	2759	50.7	43.6	5.5	1204	27.2	65	Jun 30	112	Aug 16	21	3	1	54
DKL 51-45	RR	HY	**53.5**	2671	49.9	44.1	5.4	1185	26.6	65	Jun 30	113	Aug 17	16	5	1	54
DKL 30-42	RR	HY	**52.1**	2636	50.6	43.8	5.2	1158	27.3	65	Jun 30	113	Aug 17	16	4	1	55
InVigor L150	LL	HY	**51.6**	2621	50.8	44.0	5.3	1155	27.3	69	Jul 4	114	Aug 18	20	8	1	51
HyClass 955	RR	HY	**51.1**	2579	50.5	44.7	5.1	1156	27.0	66	Jul 1	113	Aug 17	22	5	1	53
InVigor L130	LL	HY	**50.9**	2606	51.2	43.5	5.4	1133	27.4	66	Jul 1	111	Aug 15	22	5	1	52
DKL 72-55	RR	HY	49.2	2480	50.4	44.9	5.1	1120	27.0	67	Jul 2	114	Aug 18	14	5	1	53
HyClass 921	RR	HY	48.9	2483	50.8	45.5	5.4	1132	25.7	66	Jul 1	115	Aug 19	21	4	1	51
NX4 106RR	RR	OP	45.4	2350	51.8	43.8	5.5	1029	27.2	70	Jul 5	112	Aug 16	20	4	1	49
HyClass 988	RR	HY	45.1	2219	49.1	44.8	5.6	995	26.4	68	Jul 3	116	Aug 20	17	3	1	56
DKL 52-41	RR	HY	42.8	2128	49.6	43.4	5.4	928	28.7	67	Jul 2	114	Aug 18	21	10	1	53
Arriba	-	OP	39.5	2016	51.1	41.5	5.3	838	28.7	66	Jul 1	115	Aug 19	15	10	2	52
UISC00.3.1.17	-	OP	37.6	1902	50.6	43.2	5.3	824	27.6	66	Jul 1	114	Aug 18	15	5	2	51
Average			48.0	2435	50.8	44.1	5.3	1126	27.1	66	Jul 1	113	Aug 17	19 ns	5 ns	1	54
LSD (α=0.05)			8.39	431.2	0.41	1.13	0.18	206.8	0.74	1.2	1.4	2.2	2.7	9.9	5.0	0.2	3.6
Brown mustard:																	
Oasis CL[1]	CL	OP	26.9	1345	49.9	42.1	5.1	567	28.6	64	Jun-29	113	Aug-17	15	9	1	54
Pacific Gold[1]	-	OP	38.4	2004	52.2	40.2	5.2	804	27.8	63	Jun-28	106	Aug-10	20	8	1	59
Yellow mustard:																	
IdaGold[2]	-	OP	36.5	1972	54.1	25.0	5.2	492	33.5	57	Jun-22	105	Aug-9	21	0	3	57

Seed and test weights are adjusted to 8% moisture content.

Percent grain protein and oil content presented on a dry matter basis.

†† Indicates highest yielding variety.

bold Indicates varieties yielding equal to the highest yielding variety based on Fisher's protected LSD at P<0.05

[1] *Brassica juncea*

[2] *Sinapis alba*

Herbicide System: RR - Roundup, LL - LibertyLink, CL - CLEARFIELD, - indicates no herbicide system available

Type: Hy - Hybrid, OP - Open-pollinated

Table 2. Fatty acid compostion of canola varieties grown in the 2011 Montana Statewide Variety Evaluation at Northwestern Agricultural Reserach Center, Kalispell, MT

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid
	%	%	%	%	%
Arriba	4.5	2.6	68.3	20.2	6.7
DKL 30-42	4.1	2.5	68.5	19.6	6.0
DKL 51-45	4.3	2.4	69.6	19.9	6.7
DKL 52-41	3.7	2.6	69.2	18.2	6.4
DKL 55-55	3.8	2.4	71.0	18.8	5.7
DKL 70-07	4.0	2.5	69.7	19.1	5.2
DKL 72-55	3.9	2.5	70.3	19.0	5.6
HyClass 921	3.9	2.3	69.7	19.3	6.3
HyClass 940	3.8	2.9	73.8	16.9	5.4
HyClass 947	3.9	2.4	70.2	19.2	6.3
HyClass 955	4.0	2.5	70.1	19.0	6.1
HyClass 988	4.0	2.9	71.8	18.0	5.5
InVigor 5440	4.0	2.3	67.7	19.3	7.5
InVigor 8440	3.8	2.6	69.9	17.8	6.4
InVigor L130	3.9	2.4	68.1	18.5	7.1
InVigor L150	3.8	2.2	66.6	19.4	7.4
NX4 106RR	3.9	3.4	81.2	15.3	1.3
UISC00.3.1.17	4.0	2.4	66.9	20.2	6.7
Average	4.0	2.5	70.1	18.8	6.0
LSD (α=0.05)	0.17	0.13	1.70	0.59	0.50
Brown mustard:					
Oasis CL[1]	4.2	2.2	68.9	18.9	5.0
Pacific Gold[1]	2.6	1.0	22.4	16.7	8.9
Yellow mustard:					
IdaGold[2]	1.4	3.4	69.2	13.5	-1.4

Fattyacid Constituents reproted on a dry matter basis of the whole seed.

[1] *Brassica juncea*

[2] *Sinapis alba*