Project Title: Statewide Spring Canola Variety Evaluation -2010

Project Leader: Heather Mason

Project Personnel: James Thompson, Brooke Bohannon

Objective: To evaluate seed yield and agronomic performance of twenty canola varieties in northwestern Montana.

Results:

Twenty varieties of canola (Table 1) were seeded at 5 lb/ac (0.5 in depth) to a Creston sandy loam soil under dryland conditions. Plots were seeded May 6, 2010 using a double disc plot seeder. Fertilizer (27-30-120-24) was broadcast and incorporated prior to planting. The plots were direct combine harvested on September 7, 2010.

Time to flowering for canola varieties averaged 53 days after planting (June 28), with the crop reaching harvest maturity approximately 55 days later (August 22), a total of 108 days after planting. Average plant height was 45.0 in, ranging from 40.3 in (Hyola 357 Magnum) to 49.0 in (InVigor 624). Lodging was minimal in most plots, while shatter averaged 34.5% ranging from 17.5% (InVigor 5440) to 60% (UISC0038DE).

Differences in seed yield and test weight were significant among varieties included in the evaluation. On average, canola yielded 1,607 lb/ac, and test weights were 50.6 lb/bu. The three highest yielding varieties were Hyola 357 Magnum (39.5 bu/ac), DKL30-42 (38.7 bu/ac) and DKL 72-55 (37.9 bu/ac). Differences in oil yield and content among varieties were also significant. Oil yield ranged from 506 lb/ac (UISCOO38DE) to 948 lb/ac (DKL30-42), with an average of 737 lb/ac. Average oil content was 45.7%, ranging from 43.4% (Hyola 357 Magnum) to 48.5% (HyClass 947-RR).

Varieties differed in monounsaturated fat (oleic acid) and polyunsaturated fats (linoleic and α- linolenic acid). HyClass varieties were highest in oleic acid. Most InVigor varieties were high in omega 6 fatty acids (linoleic acid). Differences in the saturated fat stearic acid were detected among varieties, while none were apparent for palmitic acid (also a saturated fat).

Summary:

Overall canola yields were down from 2009 (2,489 lb/ac). An increase in shatter and lodging, as well as above average precipitation and cooler temperatures may have been a factor in the 2010 yields. In addition diamond back moths were observed in the crop. 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. Seed yield and agronomic characteristics of varieties grown in the 2010 Statewide Canola Variety Evaluation, Northwestern Agricultural Research Center, Kalispell, MT

Variety	Seed Yield	Seed Yield	Oil Yield	Test Weight	Protein Content	Oil Content	Moisture	Shatter	Days to Flower	Harvest Maturity	Plant Height	Lodging
	bu/ac	*lb/ac*	*lb/ac*	*lb/bu*	*%*	*%*	*%*	*%*	*days after planting*	*days after planting*	*in*	*0 to 9*
Hyola 357 Magnum	**39.5** ++	1920	836	48.7	26.4	43.4	11.8	20.0	51	107	40.3	3
DEKALB DKL30-42	**38.7** +	1971	948	50.9	24.0	48.0	9.8	22.5	51	105	45.5	2
DKL 72-55	**37.9** +	1917	929	50.7	24.5	48.4	9.8	35.0	52	107	47.5	1
DEKALB DKL51-45	**37.9** +	1910	923	50.5	23.7	48.4	9.5	42.5	51	105	45.3	2
InVigor 624	**36.3** +	1908	860	52.7	25.9	44.9	14.2	27.5	57	112	49.0	1
HyClass 947-RR	**35.0** +	1776	863	50.8	23.4	48.5	11.3	30.0	52	106	43.8	2
UISC003117	**34.2** +	1708	799	50.0	24.5	46.7	10.5	37.5	51	110	46.3	4
HyClass 940-RR	**33.5** +	1677	777	50.2	25.2	46.2	10.4	57.5	51	105	45.8	1
InVigor 5440	**33.4** +	1752	761	52.5	25.7	43.5	15.2	17.5	56	108	48.8	0
Exp 988-RR	**32.6** +	1594	721	49.4	24.3	45.1	16.7	27.5	56	113	46.0	2
InVigor 642	**32.5** +	1650	-	50.9	-	-	15.5	25.0	56	107	45.3	0
DEKALB DKL 52-41	**31.6** +	1578	731	50.0	26.1	46.2	11.6	47.5	52	106	46.8	3
InVigor 8440	29.2	1448	654	49.7	25.3	45.1	14.0	22.5	53	110	45.0	2
InVigor 5550	28.1	1477	660	52.6	25.8	44.7	15.2	35.0	53	106	46.5	1
03IL1561	26.4	1335	600	50.5	25.3	44.4	11.8	55.0	53	110	47.0	4
USC0135	25.4	1272	564	50.2	26.3	44.3	13.3	35.0	52	107	45.3	3
HyClass 921-RR	24.6	1280	587	52.2	24.9	45.8	15.6	25.0	52	111	41.8	1
Nexera 105RR	23.9	1221	544	51.0	26.1	44.4	15.2	32.5	57	108	41.3	2
UISC0038DE	23.7	1138	506	48.1	25.5	44.2	11.8	60.0	52	106	43.5	5
Average	31.8	1607	737	50.6	25.2	45.7	12.8	34.5	53	108	45.0	2
F test	**	**	**	**	**	**	**	**	**	**	**	**
LSD (α=0.05)	8.92	441.8	197.2	1.65	0.65	1.25	2.80	17.82	0.6	3.7	4.20	1.4

Seed and oil yields, and test weights are adjusted to 8% grain moisture content.

++ Indicates highest yielding variety.

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

** Effects are significant at p<0.01

- Information not available.

Table 2. Fatty acid composition of varieties grown in the 2010 Statewide Canola Variety Evaluation

Variety	Palmitic Acid C16:0	Stearic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α- Linolenic Acid C18:3
	%	*%*	*%*	*%*	*%*
Hyola 357 Magnum	4.4	2.3	62.6	18.1	8.9
DEKALB DKL30-42	4.4	2.3	**67.4**$^{+}$	17.9	8.5
DKL 72-55	4.3	2.4	67.1	17.2	9.1
DEKALB DKL51-45	4.5	2.2	**68.7**$^{+}$	**18.9**$^{+}$	9.0
InVigor 624	4.4	1.8	64.2	**18.9**$^{+}$	10.4
HyClass 947-RR	4.2	2.3	**69.5**$^{++}$	17.7	8.5
UISC003117	4.2	2.1	61.4	17.2	9.7
HyClass 940-RR	4.2	2.6	**68.6**$^{+}$	16.7	7.9
InVigor 5440	4.3	1.8	63.2	**19.3**$^{+}$	10.9
Exp 988-RR	4.3	2.3	**69.1**$^{+}$	17.7	8.2
InVigor 642	-	-	-	-	-
DEKALB DKL 52-41	4.4	2.0	**68.6**$^{+}$	17.5	9.6
InVigor 8440	4.3	2.4	66.7	17.3	9.2
InVigor 5550	4.4	1.5	62.9	**19.5**$^{++}$	11.9
03IL1561	4.2	1.9	64.1	**19.5**$^{++}$	9.7
USC0135	4.4	2.2	65.4	18.1	9.4
HyClass 921-RR	4.1	1.7	**69.2**$^{+}$	**19.2**$^{+}$	9.8
Nexera 105RR	4.3	2.0	66.2	17.9	10.1
UISC0038DE	4.3	2.2	65.6	**19.3**$^{+}$	9.2
Average	4.3	2.1	66.1	18.2	9.4
F test	*ns*	**	**	**	**
LSD (α=0.05)	0.67	0.38	2.08	0.9	0.87

Fatty Acid Composition reported on a dry matter basis of the whole seed

- Information not available.

$^{++}$ Indicates highest yielding cultivar.

$^{+}$ Indicates cultivars yielding equal to the highest yielding cultivar based on Fisher's protected LSD at the 0.05 probability level.

** Effects are significant at P<0.01, respectively; *ns* denotes non-significant effects.