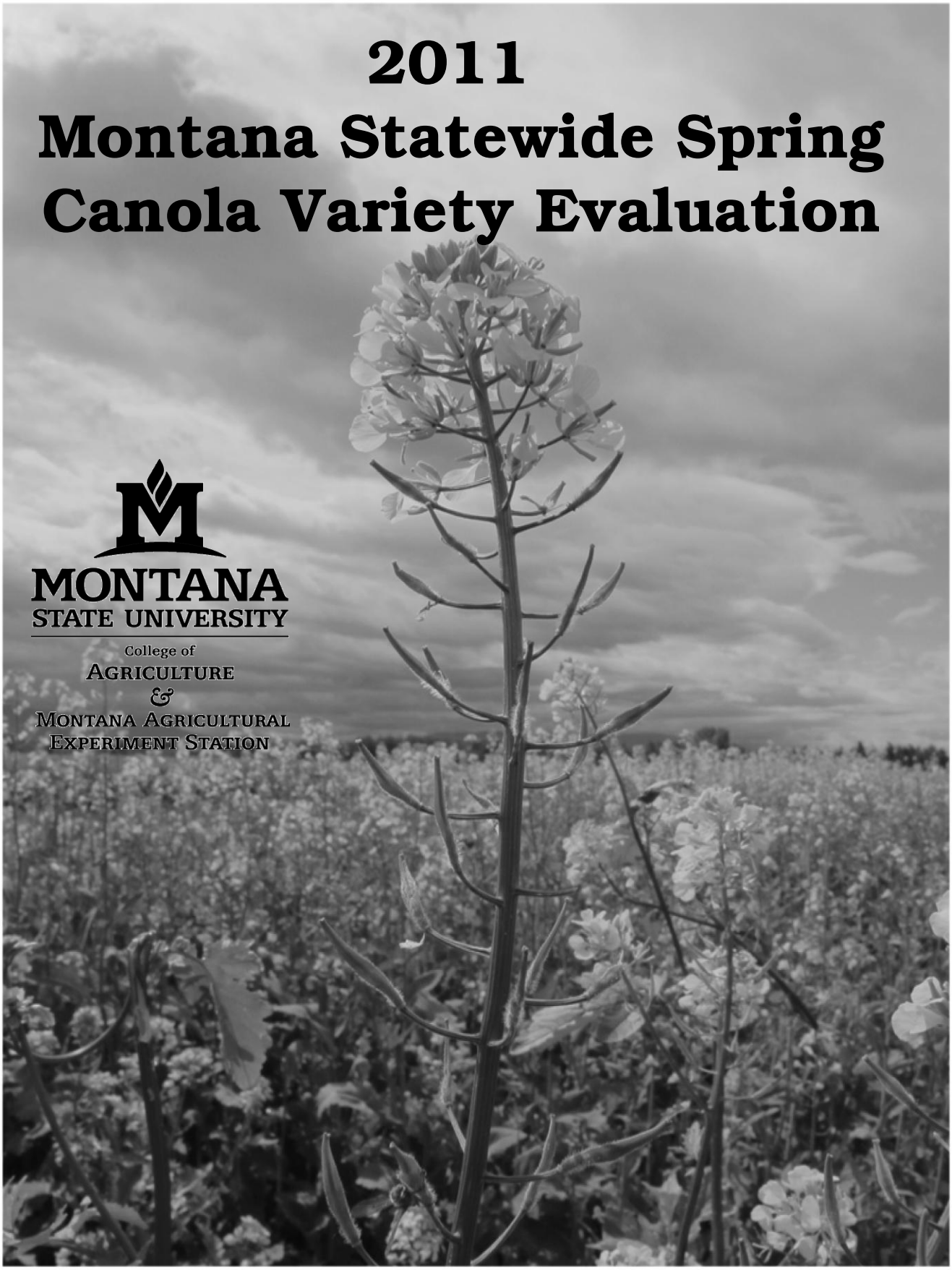
2011
Montana Statewide Spring Canola Variety Evaluation



MONTANA
STATE UNIVERSITY
College of
AGRICULTURE
&
MONTANA AGRICULTURAL
EXPERIMENT STATION

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Montana Statewide Spring Canola Variety Evaluation, 2011

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Table 1. Sponsor contact information for seed sources of the eighteen varieties tested in the 2011 Montana Statewide Spring Canola Variety Evaluation.

SPONSOR	VARIETY	TYPE	HERBICIDE RESISTANCE	CONTACT
Croplan Genetics	HyClass 940	H	RR	Mr. Paul S. Gregor
	HyClass 955	H	RR	Croplan Genetics
	HyClass 947	H	RR	10515 115th St NW
	HyClass 988	H	RR	Thief River Falls, MT 56701
	Oasis CL[1]	OP	CL	PH: 218-964-5168
				FX: 218-964-5185
				EM: psgregor@landolakes.com
Bayer CropScience	InVigor L130	H	LL	Mr. Jordan Varberg
	InVigor L150	H	LL	Hybrid Canola Marketing & Development Agronomist
	InVigor 5440	H	LL	Bayer CropScience
	InVigor 8440	H	LL	1524 Walnut Street
				Grand Forks, ND 58201
				PH: 701-755-2700
				FX: 701-795-5118
				EM: jordan.varberg@bayer.com
DeKalb	DKL 30-42	H	RR	Barbara Kutzner
	DKL 51-45	H	RR	Monsanto Company
	DKL 55-55	H	RR	1428 N. Locan Avenue
	DKL 70-70	H	RR	Fresno, CA 93727
				PH: 559-453-0740
				FX: 559-453-0740
				EM: barbara.u.kutzner@monsanto.com
	DKL 52-41	H	RR	Chengci Chen
Pacific Northwest Canola Research Program	DKL 72-55	H	RR	Central Agricultural Research Center
The purpose of including these varieties in the evaluation is to complete a multi-year, multi-station data set.	HyClass 921	H	RR	52583 U.S. Hwy 87
	Arriba (UISC00.3.8.DE)	OP	NA	Moccasin, MT 59462
	UISC00.3.1.17	OP	NA	PH: 406-423-5421
				FX: 406-423-5422
				EM: cchen@montana.edu

Type: Hy - Hybrid, OP - Open-pollinated

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

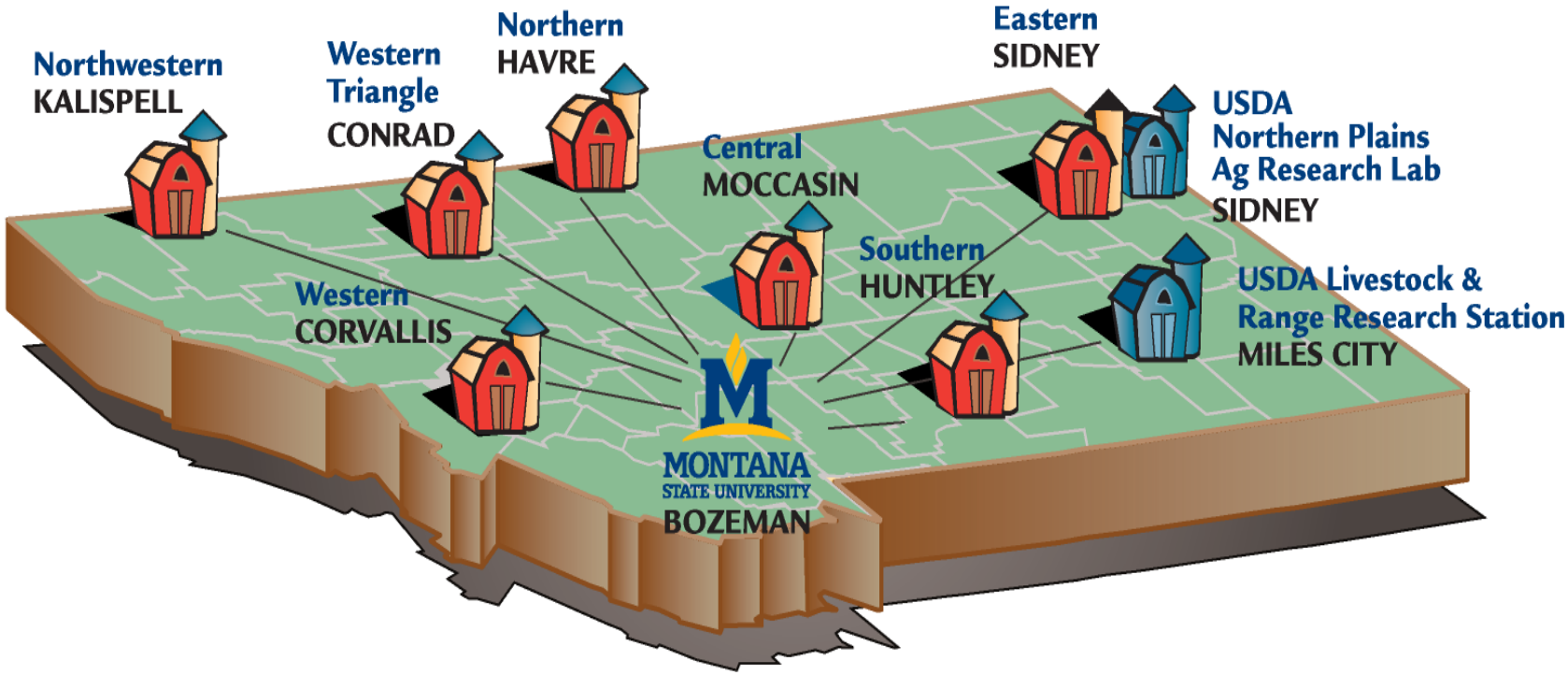

Figure 1. Map of Montana State University Research Centers

Participating centers include: Northern (Havre), Northwestern (Kalispell), Western Triangle (Conrad), Central (Moccasin), Southern (Huntley), Eastern (Sidney).

Table 2. Summary of climatic data by location for the 2010 - 2011 crop year (September to August).

	NARC Havre	NWARC Kalispell	WTARC Conrad	SARC Huntley	EARC Sidney
Precipitation (inches)	15.45"	22.98"	15.23"	12.23"	22.73"
Mean Temperature (°F)	40.3°F	41.2°F	40.8°F	46.2°F	42.46° F
Last killing frost in spring* 2011	May 14 (31° F)	May 18 (29°F)	May 18 (32°F)	May 5	May 2 (27° F)
First killing frost fall 2011	Sep 20 (32° F)	Sep 29 (29°F)	Oct 15 (32°F)	Sep 17	Sept 14 (31° F)
Frost free period 2011	129 days	134 days	150 days	139 days	134 days
Growing degree days (base 50) May 1-Oct. 31, 2011	2,339	1,593	1,285	2,223	2,199
Maximum summer temperature	101° F (July 19)	89°F (Aug 22)	97°F (July, 17)	100°F (July 19, July 26, Aug 1, Aug 28)	97°F
Minimum winter temperature	–37° F (Feb 1 & Feb 2)	–16°F (Feb 1 & Feb 2)	-24°F (Feb. 26)	–22°F (Feb 9)	–31° F

Introduction

Objective

The objective of the Montana Statewide Spring Canola Variety Evaluation is to evaluate the agronomic performance and fatty acid constituents of available canola varieties and breeding lines, submitted by commercial and university entities, at six research locations throughout the state. The information obtained from the evaluation is intended to provide canola growers in Montana with reliable, unbiased information about which canola varieties are best suited to their specific region.

Procedures

In 2011, eighteen spring canola entries were submitted by four sponsors (Table 1). The seed was distributed to six agricultural research centers: Northern (Havre), Northwestern (Kalispell), Western Triangle (Conrad), Central (Moccasin), Southern (Huntley) and Eastern (Sidney), for testing during the 2011 growing season (Figure 1). All entries were treated with Prosper 400, Prosper FX, Helix XTra or Acceleron seed treatments to assist with insect and disease management during stand establishment.

Test protocol and management guidelines were provided to personnel at each location. The entries were seeded at a rate of 6.5 lb/ac into research plots, arranged in a randomized complete block design with four replications. Fertilizer and pesticide applications are noted in each location table.

Data was collected on: plant count per square foot and/or plant stand as a percentage of plant coverage per plot, days to flowering and maturity, plant height, percent pod shatter, lodging (visually estimated on a score from 0 to 9 with 0 equal to no lodging and 9 representing all plants laying flat), plot yield, seed moisture at time of harvest, test weight, oil and protein content, and fatty acid constituents. The data are presented by location in the following report.

Oil and protein content and fatty acid constituent analysis was kindly performed by personnel at Southern Agricultural Research Center, Huntley, MT.

Results and Summary

Statewide spring canola variety evaluation trials were grown successfully at five out of six locations. Central Agricultural Research Center (CARC) in Moccasin experienced a crop failure due to heavy early spring rainfall and delayed planting. Thus, the data from CARC is not presented in this report.

Statewide summaries of seed yield, oil content, and oil yield are presented in Tables 3 through 5. The variety 'HyClass 947' had the highest average seed (1,983 lb/ac) and oil (943 lb/ac) yield across all locations. The varieties that were consistently highest yielding at all locations include: HyClass 921, DKL 55-55, 70-07, 30-42, and InVigor L130.

Northern Agricultural Research Center (NARC), Havre

In this dryland environment, canola seed yield ranged from 1,341 to 2,445 lb/ac (Table 6). Seed yield averaged 1,994 lb/ac with eight of the eighteen varieties yielding statistically equivalent to the highest yielding variety, 'HyClass 921' (2,445 lb/ac). The average canola test weight and oil content at NARC were 50.5 lb/bu and 46.5% respectively.

Northwestern Agricultural Research Center (NWARC), Kalispell

In this high rainfall environment, canola seed yield ranged from 1,345 to 2,965 lb/ac (Table 8). Seed yield averaged 2,490 lb/ac with eleven of the eighteen varieties producing yields statistically equivalent to the highest yielding variety, 'DKL 70-07' (2,965 lb/ac). The average canola test weight and oil content at NWARC were 50.4 lb/bu and 44.0% respectively.

Western Triangle Agricultural Research Center (WTARC), Conrad

In this dryland environment, canola seed yield ranged from 950 to 2,170 lb/ac (Table 10). Seed yield averaged 1,861 lb/ac with nine of the eighteen varieties producing yields equivalent to the highest yielding variety, 'HyClass 921' (2,170 lb/ac). The average canola test weight and oil content at WTARC were 51.8 lb/bu and 50.6% respectively.

Southern Agricultural Research Center (SARC), Huntley

In this dryland environment, canola seed yield ranged from 853 to 1,607 lb/ac (Table 12). Seed yield averaged 1,356 lb/ac with fourteen of the eighteen varieties producing yields statistically equivalent to the highest yielding variety, 'InVigor L130' (1,607 lb/ac). The average canola test weight and oil content at SARC were 50.0 lb/bu and 45.4% respectively.

Eastern Agricultural Research Center (EARC), Sidney

Normally a low rainfall (average 14.06" annual precipitation), irrigated environment, EARC received 22.73" of precipitation in the 2010-2011 crop year. Canola seed yield at EARC ranged from 505 to 1,221 lb/ac (Table 14). Seed yield averaged 969 lb/ac with twelve of the eighteen varieties producing yields equivalent to the highest yielding variety, 'DKL 55-55'. The average canola test weight and oil content at EARC were 51.3 lb/bu and 45.7% respectively.

Future Plans

With continued support from the canola industry and research center personnel, multi-location canola evaluations will continue in 2012.

Table 3. Seed Yield (lb/ac) Summary from the Montana Statewide Spring Canola Variety Evaluation, 2011

Variety	NARC Havre	NWARC Kalispell	WTARC[2] Conrad	SARC Huntley	EARC[2] Sidney	Average for Sites
	lb/ac					
Arriba	1864	2016	1547	**1534**	505	1438
DKL 30-42	**2067**	**2636**	**2036**	**1364**	**1100**	1894
DKL 51-45	**2254**	**2671**	1784	**1225**	**1118**	1896
DKL 52-41	**2140**	2128	1788	**1234**	842	1595
DKL 55-55	**2072**	**2940**	**2052**	**1558**	**1221**†	1971
DKL 70-07	**2169**	**2964**†	**2033**	**1399**	**1105**	1931
DKL 72-55	1859	2348	**1980**	**1541**	**1108**	1755
HyClass 921	**2445**†	**2483**	**2170**	**1511**	**1039**	1918
HyClass 940	1841	**2817**	**2067**	**1214**	791	1743
HyClass 947	**2162**	**2844**	**2088**†	**1343**	**1199**	1983†
HyClass 955	**2174**	**2579**	1912	**1543**	**981**	1772
HyClass 988	2019	2219	1895	**1593**	**951**	1620
InVigor 5440	1758	**2856**	**2019**	853	**1061**	1823
InVigor 8440	1828	**2759**	1728	**1380**	**1066**	1794
InVigor L130	**2068**	**2606**	**2038**	**1606**†	**964**	1855
InVigor L150	1921	**2621**	1872	1082	**1156**	1827
Oasis CL[1]	1341	1345	950	1101	565	927
UISC00.3.1.17	2019	1902	1544	**1323**	665	1453
Average	1994	2490	1861	1356	969	1733
LSD (α=0.05)	391.1	518.5	229.1	461.0	280.2	223.1

† Indicates highest yielding variety.

bold Indicates varieties yielding equal to the highest yielding entry in each column based on Fisher's protected LSD at P<0.05.

[1] *Brassica juncea*

[2] Seed yields reported "as was" at harvest - not adjusted to a uniform moisture content. Seed yields are adjusted to 8% moisture content.

Table 4. Oil Content (%) Summary from the Montana Statewide Spring Canola Variety Evaluation, 2011

Variety	NARC Havre	NWARC Kalispell	WTARC Conrad	SARC Huntley	EARC Sidney	Average for Sites
			%			
Arriba	44.2	41.5	49.2	44.0	41.8	44.2
DKL 30-42	46.9	43.8	51.4	45.4	46.3	46.8
DKL 51-45	47.8	44.1	51.4	46.5	47.0	47.4
DKL 52-41	45.4	43.4	50.3	44.5	45.9	45.9
DKL 55-55	47.9	45.4	52.6	46.4	47.7	48.0
DKL 70-07	47.2	44.8	52.9	46.6	47.3	47.8
DKL 72-55	47.4	44.9	52.3	46.7	47.3	47.7
HyClass 921	47.7	45.5	51.8	46.8	47.0	47.8
HyClass 940	47.5	44.5	50.8	44.6	45.1	46.5
HyClass 947	46.5	44.9	52.6	46.9	48.1	47.8
HyClass 955	46.2	44.7	51.7	46.2	48.2	47.4
HyClass 988	45.0	44.8	52.8	46.4	48.0	47.4
InVigor 5440	45.6	43.2	49.2	44.8	44.0	45.4
InVigor 8440	46.1	43.6	49.9	44.4	44.8	45.8
InVigor L130	46.2	43.5	50.5	45.0	45.0	46.0
InVigor L150	47.8	44.0	50.4	44.9	45.4	46.5
Oasis CL[1]	44.6	42.1	40.1	41.8	38.8	41.5
UISC00.3.1.17	46.3	43.2	51.0	44.9	44.6	46.0
Average	46.5	44.0	50.6	45.4	45.7	46.4
LSD (α=0.05)	1.82	1.35	1.22	1.06	1.39	1.46

Percent seed oil content presented on a dry matter basis.

[1] *Brassica juncea*

Table 5. Oil Yield (lb/ac) Summary from the Montana Statewide Spring Canola Variety Evaluation, 2011

Variety	NARC Havre	NWARC Kalispell	WTARC Conrad	SARC Huntley	EARC Sidney	Average for Sites
	——————————————————lb/ac——————————————————					
Arriba	814	838	760	**676.5**	211	636
DKL 30-42	**970**	**1158**	**1046**	**617.1**	**509**	**884**
DKL 51-45	**1085**	**1185**	918	**570.9**	**525**	**896**
DKL 52-41	**981**	928	898	**549.4**	386	733
DKL 55-55	**991**	**1334**†	**1080**	**722.0**	**580**†	**943**†
DKL 70-07	**1005**	**1328**	**1076**	**650.6**	**524**	**915**
DKL 72-55	871	**1121**	**1034**	**719.7**	**525**	836
HyClass 921	**1145**†	**1132**	**1123**†	**707.0**	**489**	**915**
HyClass 940	872	**1254**	**1051**	**539.8**	357	814
HyClass 947	**1002**	**1278**	**1099**	**631.8**	**576**	**943**
HyClass 955	**997**	**1156**	988	**713.1**	**473**	834
HyClass 988	914	995	1001	**738**†	**456**	768
InVigor 5440	801	**1237**	993	383.0	**467**	827
InVigor 8440	840	**1204**	861	**611.5**	**479**	818
InVigor L130	950	**1133**	**1028**	**723.3**	434	**853**
InVigor L150	919	**1155**	944	485.8	**524**	**849**
Oasis CL[1]	592	567	382	461.1	220	388
UISC00.3.1.17	933	824	788	**592.5**	295	668
Average	925	1099	948	616.3	446	807
LSD (α=0.05)	177.5	248.3	119.8	208.80	128.6	104.4

† Indicates highest yielding variety.

bold Indicates varieties yielding equal to the highest yielding entry in each column based on Fisher's protected LSD at P<0.05.

Seed oil yield reported on a dry matter basis.

[1] *Brassica juncea*

2011 Statewide Canola Variety Evaluation, Havre, MT

Seeding Date:	04/21/2011	**Soil Type:**	Kevin Clay Loam	**Harvest Date:**	09/01/2011
Seeding Rate:	6.5 lb/ac	**Soil Test:**	99-12-239-19	**Harvest Method:**	Direct Cut
Previous Crop:	Winter Wheat	**Fertilizer:**	50-15-0-20 banded at planting		
Tillage:	No-till	**Herbicides:**	None		
Irrigation:	None	**Insecticides:**	None		

Table 6. Performance of canola varieties and breeding lines tested in the 2011 Montana Statewide Canola Variety Evaluation at Northern Agricultural Research Center, Havre, MT

Variety	Seed Yield	Seed Yield	Test Weight	Oil Content	Oil Yield	Protein Content	Moisture	Days to Flower		Days to Maturity		Stand	Stand	Plant Height	Shatter	Lodging
	lb/ac	*bu/ac*	*lb/bu*	*%*	*lb/ac*	*%*	*%*	*days*	*date*	*days*	*date*	*plants/ft²*	*%*	*in*	*%*	*0 to 9*
Arriba	1,864	36.2	51.4	44.2	814	26.0	6.2	60	Jun 20	100	Jul 30	11.7	91.3	39	0	0
DKL 30-42	**2,067**	41.4	49.9	46.9	970	24.6	5.6	60	Jun 20	99	Jul 29	5.8	92.2	41	0	0
DKL 51-45	**2,254**	45.4	49.6	47.8	1,085	23.9	5.7	60	Jun 20	100	Jul 30	11.0	91.1	43	0	0
DKL 52-41	**2,140**	42.7	50.3	45.4	981	26.6	6.1	61	Jun 21	100	Jul 30	9.8	96.0	41	0	0
DKL 55-55	**2,072**	41.5	49.9	47.9	991	23.9	6.0	60	Jun 20	100	Jul 30	9.8	95.7	44	0	0
DKL 70-07	**2,169**	43.2	50.2	47.2	1,005	24.2	6.1	61	Jun 21	100	Jul 30	10.1	95.0	42	0	0
DKL 72-55	1,859	37.1	50.1	47.4	871	25.1	6.6	61	Jun 21	102	Aug 1	5.6	95.3	38	0	0
HyClass 921	**2,445** †	48.4	51.0	47.7	1,146	23.4	8.5	62	Jun 22	102	Aug 1	8.5	90.5	40	0	0
HyClass 940	1,841	36.6	50.2	47.5	872	24.0	6.0	61	Jun 21	99	Jul 29	10.8	97.4	40	0	0
HyClass 947	**2,162**	43.0	50.3	46.5	1,002	25.4	5.9	61	Jun 21	100	Jul 30	10.9	93.4	45	0	0
HyClass 955	**2,174**	43.0	50.5	46.2	997	25.3	6.3	61	Jun 21	101	Jul 30	10.1	86.6	43	0	0
HyClass 988	2,019	40.4	50.0	45.0	914	26.3	8.0	62	Jun 22	104	Aug 3	9.9	90.8	47	0	0
InVigor 5440	1,758	34.1	51.6	45.6	801	24.3	6.8	63	Jun 23	101	Jul 31	9.4	93.4	42	0	0
InVigor 8440	1,828	36.4	50.2	46.1	840	24.4	6.2	61	Jun 21	100	Jul 30	10.2	95.8	43	0	0
InVigor L130	**2,068**	40.5	51.0	46.2	950	24.8	6.5	61	Jun 21	100	Jul 30	11.4	95.8	45	0	0
InVigor L150	1,921	38.2	50.4	47.8	919	23.3	6.2	62	Jun 22	102	Aug 1	10.5	95.0	48	0	0
Oasis CL[1]	1,341	25.8	51.6	44.6	592	26.0	9.1	55	Jun 15	99	Jul 29	14.0	94.6	43	0	0
UISC00.3.1.17	2,019	40.3	50.2	46.3	933	24.9	6.1	60	Jun 20	102	Aug 1	10.2	95.7	44	0	0
Average	1,994	39.6	50.5	46.5	925	24.8	6.6	61	Jun 21	100	Jul 30	10.0	93.6	43	0	0
LSD (α=0.05)	391.1	7.74	0.68	1.82	177.5	2.02	1.98	1.8		1.6		3.23	8.55 ns	5.2		

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 entry based on Fisher's protected LSD at P<0.05.

[1] *Brassica juncea*

ns denotes non-significant effects.

Table 7. Fatty acid constituents of oil from canola varieties and breeding lines tested in the 2011 Montana Statewide Variety Evaluation at Northern Agricultural Research Center, Havre, MT.

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
			%		
Arriba	4.4	2.3	62.5	20.1	8.5
DKL 30-42	4.1	2.2	65.4	19.3	7.7
DKL 51-45	4.1	2.2	67.0	20.1	8.2
DKL 52-41	3.9	2.6	66.3	17.6	8.2
DKL 55-55	4.0	2.2	67.0	19.4	7.2
DKL 70-07	4.0	2.4	68.2	18.8	7.1
DKL 72-55	3.9	2.3	66.4	18.7	7.5
HyClass 921	4.1	2.1	65.4	19.5	7.8
HyClass 940	3.8	2.7	68.8	17.1	7.1
HyClass 947	3.9	2.1	64.4	19.7	7.9
HyClass 955	4.0	2.1	64.7	19.4	7.9
HyClass 988	4.1	2.6	66.0	18.4	7.4
InVigor 5440	4.0	2.2	62.6	20.0	9.0
InVigor 8440	3.9	2.5	65.9	17.6	8.4
InVigor L130	4.1	2.3	65.4	18.8	8.0
InVigor L150	3.9	2.0	63.7	19.2	8.7
Oasis CL[1]	4.4	2.0	66.5	18.1	5.9
UISC00.3.1.17	4.1	2.2	63.2	20.4	8.6
Average	4.0	2.3	65.5	19.0	7.8
LSD (α=0.05)	0.15	0.11	2.24	0.66 ns	0.46

Fatty acid constituents reported on a dry matter basis of the whole seed.

[1] *Brassica juncea*

ns denotes non-significant effects.

2011 Statewide Canola Variety Evaluation, Kalispell, MT

Seeding Date:	04/26/2011	**Soil Type:**	Sandy Loam	**Harvest Date:**	08/30/2011
Seeding Rate:	6.5 lb/ac in 6-in. rows	**Soil Test:**	NA	**Harvest Methos:**	Direct Cut
Previous Crop:	Barley	**Fertilizer:**	150-30-120-24 spring application		
Tillage:	Conventional	**Herbicides:**	None		
Irrigation:	None	**Insecticides:**	Warrior II at 1.92 oz/ac on 07/21/2011		

Table 8. Performance of canola varieties and breeding lines tested in the 2011 Montana Statewide Canola Variety Evaluation at Northwestern Agricultural Research Center, Kalispell, MT

Variety	Seed Yield	Seed Yield	Test Weight	Oil Content	Oil Yield	Protein Content	Moisture	Days to Flower		Days to Maturity		Stand	Stand	Plant Height	Shatter	Lodging
	lb/ac	*bu/ac*	*lb/bu*	*%*	*lb/ac*	*%*	*%*	*days*	*date*	*days*	*date*	*plants/ft²*	*%*	*in*	*%*	*0 to 9*
Arriba	2,016	39.5	51.1	41.5	838	28.7	5.3	66	Jul 1	115	Aug 19	20		49	10	2
DKL 30-42	**2,636**	52.1	50.6	43.8	1,158	27.3	5.2	65	Jun 30	113	Aug 17	21		51	4	1
DKL 51-45	**2,671**	53.5	49.9	44.1	1,185	26.6	5.4	65	Jun 30	113	Aug 17	14		53	5	1
DKL 52-41	2,128	42.8	49.6	43.4	928	28.7	5.4	67	Jul 2	114	Aug 18	22		51	10	1
DKL 55-55	**2,940**	58.6	50.2	45.4	1,335	26.3	5.3	65	Jun 30	115	Aug 19	15		52	4	1
DKL 70-07	**2,965** †	58.4	50.8	44.8	1,328	26.2	5.2	65	Jun 30	114	Aug 18	16		55	0	1
DKL 72-55	2,348	46.6	50.4	44.9	1,121	27.0	5.1	67	Jul 2	114	Aug 18	21		56	5	1
HyClass 921	**2,483**	48.9	50.8	45.5	1,132	25.7	5.4	66	Jul 1	115	Aug 19	17		55	4	1
HyClass 940	**2,817**	55.8	50.5	44.5	1,254	26.8	5.3	66	Jul 1	112	Aug 16	21		53	8	1
HyClass 947	**2,844**	56.4	50.3	44.9	1,278	26.3	5.4	66	Jul 1	114	Aug 18	16		54	4	1
HyClass 955	**2,579**	51.1	50.5	44.7	1,156	27.0	5.1	66	Jul 5	113	Aug 17	21		54	5	1
HyClass 988	2,219	45.1	49.1	44.8	995	26.4	5.6	68	Jul 3	116	Aug 20	21		52	3	1
InVigor 5440	**2,856**	55.6	51.4	43.2	1,237	27.3	5.5	68	Jul 3	114	Aug 18	20		58	1	1
InVigor 8440	**2,759**	54.5	50.7	43.6	1,204	27.2	5.5	65	Jun 30	112	Aug 16	20		54	3	1
InVigor L130	**2,606**	50.9	51.2	43.5	1,133	27.4	5.4	66	Jul 1	111	Aug 15	22		53	5	1
InVigor L150	**2,621**	51.6	50.8	44.0	1,155	27.3	5.3	69	Jul 4	114	Aug 18	16		61	8	1
Oasis CL[1]	1,345	26.9	49.9	42.1	567	28.6	5.1	64	Jun 29	113	Aug 17	15		54	9	1
UISC00.3.1.17	1,902	37.6	50.6	43.2	824	27.6	5.3	66	Jul 1	114	Aug 18	16		51	5	2
Average	2,490	49.3	50.4	44.0	1,099	27.1	5.3	66	Jul 1	113	Aug 17	19		54	5	1
LSD (α=0.05)	518.5	10.11	0.51	1.35	248.3	0.87	0.22	1.4		2.6		9.0 ns		4.2	6.4	0.3

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 entry based on Fisher's protected LSD at P<0.05.

[1] *Brassica juncea*

ns denotes non-significant effects.

Table 9. Fatty acid constituents of oil from canola varieties and breeding lines tested in the 2011 Montana Statewide Canola Variety Evaluation at Northwestern Agricultural Research Center, Kalispell, MT

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
			%		
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	4.0	2.4	66.9	20.2	6.7
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	3.7	2.6	69.2	18.2	6.4
HyClass 921	3.9	2.5	70.3	19.0	5.6
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
Oasis CL[1]	4.2	2.2	68.9	18.9	5.0
UISC00.3.1.17	3.9	2.3	69.7	19.3	6.3
Average	4.0	2.5	69.4	19.0	6.2
LSD (α=0.05)	0.17	0.14	1.72	0.61	0.51

Fatty acid constituents reported on a dry matter basis of the whole seed.

[1] *Brassica juncea*

2011 Statewide Canola Variety Evaluation, Conrad, MT

Seeding Date:	05/06/2011	**Soil Type:**	Scobey Clay Loam	**Harvest Date:**	08/30/2011
Seeding Rate:	6.5 lb/ac 5 row with 12" spacing, and harvested 4 rows	**Soil Test:**	41.5 lbs N/ac	**Harvest Method:**	Direct Cut
Previous Crop:	Barley	**Fertilizer:**	50-30-48-20		
Tillage:	Conventional	**Herbicides:**	Prowl H2O 30 oz/ac on 05/05/2011		
Irrigation:	None	**Insecticides:**	Sevin XLR at 1 qt/ac on 06/23/2011		

Table 10. Performance of canola varieties and breeding lines tested in the 2011 Montana Statewide Canola Variety Evaluation at Western Triangle Research Center, Conrad, MT

Variety	Seed Yield	Seed Yield	Test Weight	Oil Content	Oil Yield	Protein Content	Moisture	Days to Flower		Days to Maturity		Stand	Stand	Plant Height	Shatter	Lodging
	lb/ac	*bu/ac*	*lb/bu*	*%*	*lb/ac*	*%*	*%*	*days*	date	*days*	*date*	*plants/ft²*	*%*	*in*	*%*	*0 to 9*
Arriba	1,547	29.3	52.9	49.2	760	20.5		58	Jul 3	107	Aug 21			33		
DKL 30-42	**2,036**	39.0	52.2	51.4	1,046	19.4		57	Jul 2	108	Aug 22			35		
DKL 51-45	1,784	34.6	51.5	51.4	918	19.3		59	Jul 4	106	Aug 20			38		
DKL 52-41	1,788	35.7	50.1	50.3	898	21.3		57	Jul 2	107	Aug 21			37		
DKL 55-55	**2,052**	39.1	52.4	52.6	1,080	18.7		58	Jul 3	107	Aug 21			36		
DKL 70-07	**2,033**	39.1	52.0	52.9	1,076	18.3		59	Jul 4	108	Aug 22			38		
DKL 72-55	**1,980**	38.1	51.9	52.3	1,034	19.4		58	Jul 3	108	Aug 22			37		
HyClass 921	**2,170** †	41.3	52.5	51.8	1,124	19.2		60	Jul 5	108	Aug 22			37		
HyClass 940	**2,067**	39.7	52.1	50.8	1,051	20.1		60	Jul 5	106	Aug 20			38		
HyClass 947	**2,088**	39.6	52.7	52.6	1,099	18.2		60	Jul 5	106	Aug 20			39		
HyClass 955	1,912	36.4	52.6	51.7	988	19.1		59	Jul 4	108	Aug 22			36		
HyClass 988	**1,895**	38.4	49.4	52.8	1,001	17.9		60	Jul 5	107	Aug 21			40		
InVigor 5440	**2,019**	38.7	52.2	49.2	993	20.4		60	Jul 5	108	Aug 22			38		
InVigor 8440	1,728	33.9	50.9	49.9	861	19.8		59	Jul 4	105	Aug 19			37		
InVigor L130	**2,038**	39.4	51.8	50.5	1,028	19.6		59	Jul 4	107	Aug 21			38		
InVigor L150	1,872	35.9	52.1	50.4	944	20.1		60	Jul 5	107	Aug 21			39		
Oasis CL[1]	950	18.5	51.3	40.1	382	28.7		57	Jul 2	105	Aug 19			33		
UISC00.3.1.17	1,544	29.9	51.8	51.0	788	19.9		57	Jul 2	107	Aug 21			32		
Average	1,861	35.9	51.8	50.6	948	20.0		59	Jul 3	107	Aug 21			37		
LSD (α=0.05)	229.1	4.34	1.05	1.22	119.8	1.11		1.6		3.5 ns				2.4		

Grain yield is reported "as was" at harvest - not adjusted to a uniform 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 entry based on Fisher's protected LSD at P<0.05.

[1] *Brassica juncea*

ns denotes non-significant effects.

Table 11. Fatty acid constituents of oil from canola varieties and breeding lines tested in the 2011 Montana Statewide Variety Evaluation at Western Triangle Agricultural Research Center, Conrad, MT

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
			%		
Arriba	3.8	2.3	68.5	19.7	8.7
DKL 30-42	3.8	2.1	71.7	19.0	7.3
DKL 51-45	3.9	2.3	73.5	19.1	8.1
DKL 52-41	3.8	2.6	71.1	16.2	8.7
DKL 55-55	3.8	2.2	75.7	18.3	7.1
DKL 70-07	3.6	2.3	74.6	18.0	6.8
DKL 72-55	3.8	2.3	74.1	18.1	7.5
HyClass 921	3.7	2.1	74.3	18.6	7.6
HyClass 940	3.5	2.8	74.8	16.1	6.8
HyClass 947	3.6	2.2	74.9	18.3	7.1
HyClass 955	3.7	2.2	74.2	18.7	7.2
HyClass 988	4.0	3.0	76.6	16.0	6.5
InVigor 5440	4.0	2.4	68.7	18.2	8.5
InVigor 8440	3.8	2.8	72.1	16.7	7.5
InVigor L130	4.0	2.6	73.0	16.9	7.9
InVigor L150	3.4	2.2	70.6	18.4	8.4
Oasis CL[1]	4.9	2.0	64.0	19.7	7.8
UISC00.3.1.17	3.5	2.1	70.1	19.9	8.7
Average	3.8	75.1	72.4	18.1	7.7
LSD (α=0.05)	0.15	0.09	2.06	0.72	0.47

Fatty acid constituents reported on a dry matter basis of the whole seed.

[1] *Brassica juncea*

2011 Statewide Canola Variety Evaluation, Huntley, MT

Seeding Date:	04/25/2011	**Soil Type:**	NA	**Harvest Date:**	08/08/2011
Seeding Rate:	6.5 lb/ac	**Soil Test:**	NA	**Harvest Method:**	Direct Cut
Previous Crop:	Chem Fallow	**Fertilizer:**	75-40-0		
Tillage:	No-till	**Herbicides:**	Sonalan EC at 1 pt/ac & Roundup Ultra, 1 pt/ac on 04/25/2011		
Irrigation:	None	**Insecticides:**	None		

Table 12. Performance of canola varieties and breeding lines tested in the 2011 Montana Statewide Canola Variety Evaluation at Southern Agricultural Research Center, Huntley, MT

Variety	Seed Yield	Seed Yield	Test Weight	Oil Content	Oil Yield	Protein Content	Moisture	Days to Flower		Days to Maturity		Stand	Stand	Plant Height	Shatter	Lodging
	lb/ac	*bu/ac*	*lb/bu*	*%*	*lb/ac*	*%*	*%*	*days*	*date*	*days*	*date*	*plants/ft²*	*%*	*in*	*%*	*0 to 9*
Arriba	**1,534**	30.4	50.4	44.0	677	26.5	7.6	54	Jun 17	94	Jul 26	12.8		36	28	5
DKL 30-42	**1,364**	27.5	49.5	45.4	617	26.7	7.1	54	Jun 17	93	Jul 25	8.5		41	6	1
DKL 51-45	**1,225**	24.4	49.9	46.5	571	26.1	7.3	54	Jun 17	93	Jul 26	11.3		42	13	0
DKL 52-41	**1,234**	24.5	50.5	44.5	549	28.3	7.0	55	Jun 18	94	Jul 26	10.2		39	11	1
DKL 55-55	**1,558**	31.4	49.4	46.4	722	26.7	6.6	54	Jun 17	94	Jul 26	10.8		40	10	1
DKL 70-07	**1,399**	27.7	50.5	46.6	651	25.9	7.5	54	Jun 17	93	Jul 26	11.4		39	21	1
DKL 72-55	**1,541**	30.5	50.6	46.7	720	26.8	7.3	54	Jun 17	93	Jul 26	8.6		41	25	1
HyClass 921	**1,511**	30.3	49.9	46.8	707	25.1	7.4	55	Jun 18	94	Jul 27	11.3		39	20	0
HyClass 940	**1,214**	24.3	49.6	44.6	540	27.5	7.4	55	Jun 17	93	Jul 26	10.5		39	39	1
HyClass 947	**1,343**	26.6	50.5	46.9	632	25.8	7.1	55	Jun 17	94	Jul 27	12.0		41	13	1
HyClass 955	**1,543**	30.5	50.5	46.2	713	26.2	7.2	56	Jun 18	94	Jul 26	11.3		39	29	2
HyClass 988	**1,593**	31.5	50.5	46.4	739	25.4	7.8	56	Jun 19	96	Jul 29	10.8		43	45	0
InVigor 5440	853	17.4	48.6	44.8	383	26.0	7.3	56	Jun 19	94	Jul 27	11.1		42	45	0
InVigor 8440	**1,380**	27.7	49.6	44.4	611	27.3	7.3	55	Jun 18	95	Jul 27	11.3		43	28	1
InVigor L130	**1,607** †	32.1	50.1	45.0	723	26.5	7.5	55	Jun 17	94	Jul 26	11.9		42	16	0
InVigor L150	1,082	21.5	50.4	44.9	486	27.3	7.7	56	Jun 19	94	Jul 27	11.4		44	18	1
Oasis CL[1]	1,101	22.4	49.3	41.8	461	29.5	7.3	54	Jun 16	91	Jul 24	12.7		48	28	0
UISC00.3.1.17	**1,323**	26.3	50.3	44.9	593	27.1	7.3	54	Jun 17	94	Jul 26	12.9		35	9	5
Average	1,356	27.1	50.0	45.4	616	26.7	7.3	55	Jun 17	94	Jul 26	11.2		40	22	1
LSD (α=0.05)	461.0	9.03	1.27	1.06	208.8	1.16	0.68	0.8		1.1		2.21		2.6	21.4	1.5

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 entry based on Fisher's protected LSD at P<0.05.

[1] *Brassica juncea*

ns denotes non-significant effects.

Table 13. Fatty acid constituents of oil from canola varieties and breeding lines tested in the 2011 Montana Statewide Variety Evaluation at Southern Agricultural Research Center, Huntley, MT.

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
			%		
Arriba	4.7	2.5	66.9	18.3	7.1
DKL 30-42	4.5	2.4	68.1	18.0	6.2
DKL 51-45	4.5	2.3	68.4	18.5	6.9
DKL 52-41	4.1	2.5	67.0	17.6	6.6
DKL 55-55	4.3	2.4	69.2	17.6	6.1
DKL 70-07	4.4	2.4	68.0	17.5	5.8
DKL 72-55	4.2	2.4	69.9	16.8	5.9
HyClass 921	4.4	2.3	67.5	18.7	6.6
HyClass 940	4.3	2.6	69.6	17.3	6.3
HyClass 947	4.2	2.4	69.2	17.7	6.4
HyClass 955	4.3	2.3	66.2	17.8	6.8
HyClass 988	4.4	2.7	68.7	17.2	5.9
InVigor 5440	4.4	2.3	65.7	19.1	7.7
InVigor 8440	4.2	2.5	66.5	17.5	6.9
InVigor L130	4.3	2.4	67.1	18.4	6.7
InVigor L150	4.3	2.3	65.6	18.5	7.2
Oasis CL[1]	4.9	2.3	68.0	18.9	5.6
UISC00.3.1.17	4.6	2.3	65.9	19.2	7.3
Average	4.4	2.4	67.6	18.0	6.6
LSD (α=0.05)	0.12	0.14	2.40	0.66	0.59

Fatty acid constituents reported on a dry matter basis of the whole seed.

[1] *Brassica juncea*

2011 Statewide Canola Variety Trial, Sidney, MT

Seeding Date:	06/02/2011	**Soil Type:**	Savage Silty Clay	**Harvest Date:**	09/08/2011
Seeding Rate:	6.5 lb/ac in 4 12-in rows	**Soil Test:**	NA	**Harvest Method:**	NA
Previous Crop:	Beets	**Fertilizer:**	80 lb/ac liquid 28-0-0		
Tillage:	NA	**Herbicides:**	Sonolan at 2.5 pints/ac on 05/19/2011		
Irrigation:	1.25" on 07/05 and 1.6" on 07/19	**Insecticides:**	Sevin at 1qt/ac on 06/22/2011		

Table 14. Performance of canola varieties grown in the 2011 Montana Statewide Canola Variety Trial at Eastern Agricultural Research Center, Sidney, MT

Variety	Seed Yield	Seed Yield	Test Weight	Oil Content	Oil Yield	Protein Content	Moisture	Days to Flower		Days to Maturity		Stand	Stand	Plant Height	Shatter	Lodging
	lb/ac	*bu/ac*	*lb/bu*	*%*	*lb/ac*	*%*	*%*	*days*	*date*	*days*	*date*	*plants/ft²*	*%*	*in*	*%*	*0 to 9*
Arriba	505	9.7	52.0	41.8	211	28.9		34	Jul 6				90	32	8	3
DKL 30-42	**1,100**	21.2	51.8	46.3	509	27.5		35	Jul 7				85	34	8	1
DKL 51-45	**1,118**	21.7	51.5	47.0	525	27.5		35	Jul 7				90	40	20	4
DKL 52-41	842	16.6	50.7	45.9	386	29.3		38	Jul 10				87	39	12	2
DKL 55-55	**1,221** †	23.8	51.2	47.7	580	27.5		36	Jul 8				78	37	18	3
DKL 70-07	**1,105**	21.4	51.5	47.3	524	27.1		36	Jul 8				93	38	8	1
DKL 72-55	**1,108**	21.6	51.3	47.3	525	28.1		39	Jul 12				92	35	23	1
HyClass 921	**1,039**	20.1	51.7	47.0	489	27.3		38	Jul 10				90	40	18	3
HyClass 940	791	15.5	51.2	45.1	357	28.4		38	Jul 10				88	37	22	3
HyClass 947	**1,199**	23.5	51.0	48.1	576	27.9		35	Jul 7				90	37	20	2
HyClass 955	**981**	19.0	51.7	48.2	473	27.2		38	Jul 10				93	38	22	3
HyClass 988	**951**	19.3	49.3	48.0	456	25.9		40	Jul 12				93	43	10	2
InVigor 5440	**1,061**	20.3	52.3	44.0	467	28.3		41	Jul 13				90	45	15	2
InVigor 8440	**1,066**	21.2	50.3	44.8	479	27.9		36	Jul 8				85	39	18	7
InVigor L130	**964**	18.5	52.2	45.0	434	27.9		40	Jul 12				87	41	8	7
InVigor L150	**1,156**	22.3	51.8	45.4	524	28.7		41	Jul 13				87	45	22	3
Oasis CL[1]	565	11.0	51.7	38.8	220	33.0		31	Jul 3				83	43	22	2
UISC00.3.1.17	665	13.2	50.2	44.6	295	28.5		34	Jul 6				90	36	5	3
Average	969	18.88	51.3	45.7	446	28.2		37	Jul 9				88	39	16	3
LSD (α=0.05)	280.2	5.44	1.08	1.39	128.6	1.15		3.9					8.4 ns	5.8	13.3 ns	1.2

Grain yield is reported "as was" at harvest - not adjusted to a uniform 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 entry based on Fisher's protected LSD at P<0.05.

[1] *Brassica juncea*

ns denotes non-significant effects.

Table 15. Fatty acid constituents of oil from canola varieties and breeding lines tested in the 2011 Montana Statewide Variety Evaluation at Eastern Agricultural Research Center, Sidney, MT.

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
			%		
Arriba	4.7	3.0	66.4	20.5	8.1
DKL 30-42	4.2	2.6	64.3	19.5	9.1
DKL 51-45	4.0	2.5	64.3	20.0	9.9
DKL 52-41	3.9	3.0	64.2	17.4	9.0
DKL 55-55	3.9	2.7	66.0	18.6	8.9
DKL 70-07	3.9	2.7	65.7	18.9	8.6
DKL 72-55	3.8	2.7	65.9	18.9	8.7
HyClass 921	3.8	2.6	64.3	18.8	9.9
HyClass 940	3.9	3.2	66.4	16.7	8.4
HyClass 947	3.8	2.6	64.5	18.8	9.8
HyClass 955	4.0	2.6	64.4	19.1	9.4
HyClass 988	4.0	2.9	64.3	17.6	8.7
InVigor 5440	4.1	2.7	64.8	18.9	10.0
InVigor 8440	4.0	2.9	64.2	17.6	9.3
InVigor L130	4.4	2.7	64.4	18.6	9.8
InVigor L150	3.9	2.5	61.8	19.7	10.5
Oasis CL[1]	4.8	2.7	68.8	22.4	8.1
UISC00.3.1.17	3.9	2.8	63.0	20.9	9.6
Average	4.0	2.7	64.9	19.1	9.2
LSD (α=0.05)	0.18	0.16	2.49	0.73	0.62

Fatty acid constituents reported on a dry matter basis of the whole seed.

[1] *Brassica juncea*