2012
Montana Statewide Spring Canola Variety Trial

MONTANA STATE UNIVERSITY
College of AGRICULTURE & MONTANA AGRICULTURAL EXPERIMENT STATION

Table of Contents:

Montana Statewide Spring Canola Variety Trial, 2012

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Table 1. Sponsor contact information for seed sources of the twelve varieties tested in the 2012 Montana Statewide Spring Canola Variety Trial.

SPONSOR	VARIETY	TYPE	HERBICIDE RESISTANCE	CONTACT
Croplan Genetics	HyClass 947	H	RR	Mr. Paul S. Gregor
	HyClass 955	H	RR	Croplan Genetics
	HyClass 988	H	RR	525 55th Street SE
				Minot, ND 58701
				PH: 701-852-3566
				FX: 701-852-3036
				EM: psgregor@landolakes.com
Bayer CropScience	InVigor L120	H	LL	Mr. Jordan Varberg
	InVigor L130	H	LL	Hybrid Canola Marketing & Development Agronomist
	InVigor L150	H	LL	Bayer CropScience
				1524 Walnut Street
				Grand Forks, ND 58201
				PH: 701-755-2700
				FX: 701-795-5118
				EM: jordan.varberg@bayer.com
DeKalb	DKL 30-03	H	RR	Barbara Kultzner
	DKL 30-42	H	RR	Monsanto Company
	DKL 51-45	H	RR	1428 N. Locan Avenue
	DKL 55-55	H	RR	Fresno, CA 93737
	DKL 70-70	H	RR	PH: 559-453-0740
				FX: 559-453-0740
				EM: barbara.u.kutzner@monsanto.com
Montana Specialty Mills, LLC	Gem Industrial Rapeseed	OP	Imidazoline	Mike Waring
				Montana Specialty Mills, LLC
				PO Box 2208
				Great Falls, MT 59403
				PH: 406-761-2338
				FX: 406-761-7926
				EM: mike.waring@mtspecialtymills.com

Type: Hy - Hybrid, OP - Open-pollinated

Herbicide Resistance: RR - Roundup, LL - LibertyLink, CL - Clearfield Canola varieties or other varieties resistant to imidazoline herbicides

Montana State University, College of Agriculture, Montana Agricultural Experiment Station, Department of Research Centers Locations

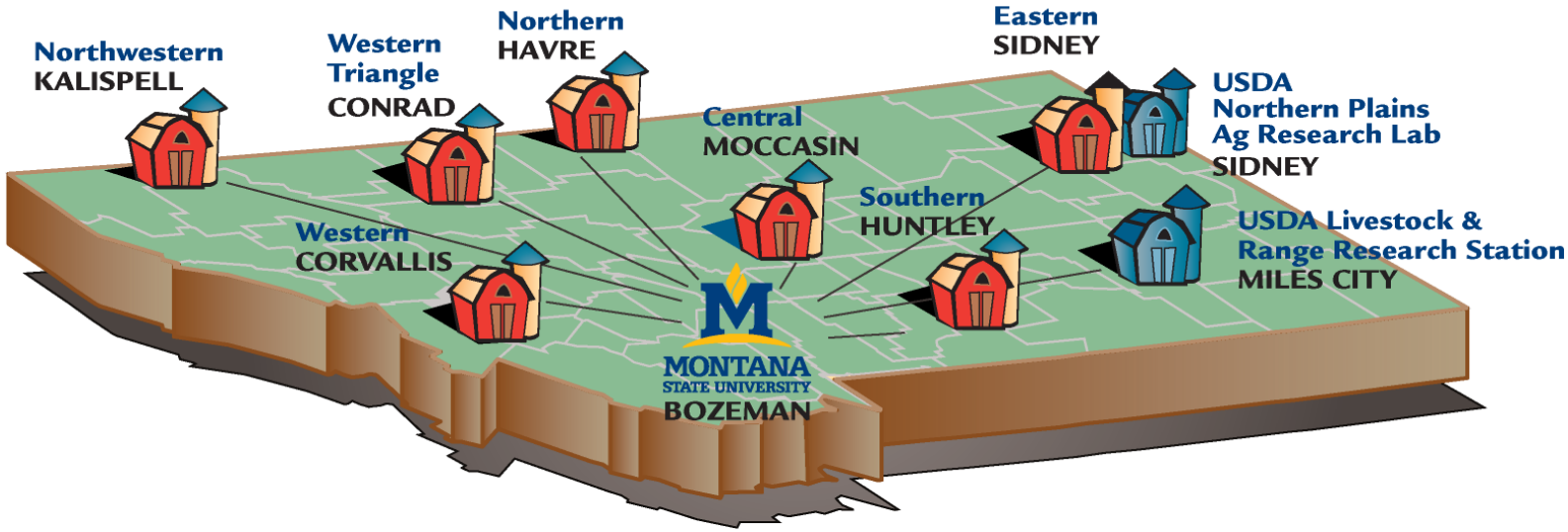

Table 2. Summary of climatic data by location for the 2011 - 2012 crop year (September to August).

	NARC Havre	EARC Sidney	NWARC Kalispell	CARC Moccasin	SARC Huntley	WTARC Conrad
Precipitation (inches)	9.46	13.97	20.16	10.99	8.40	10.29
Mean Temperature (°F)	42.7°F	47.7°F	44.0°F	46.2°F	50.1°F	41.5°F
Last killng frost in spring 2012	May 28	May 12 (29°F)	June 7 (32°F)	May 29 (29°F)	May 26 (32°F)	Apr. 29
First killing frost fall 2012	Oct. 1	Sept. 12 (32°F)	Sept. 12 (27°F)	Oct. 5	Sept. 13 (30°F)	Oct. 2
Frost free period 2012	125 days	124 days	97 days	129 days	110 days	156 days
Growing degree days (base 50) growing season	2361	2236	1914	1712	2175	1330
Maximum summer temperature	98°F (July 10, 24, 25 & August 7)	103.5°F (June 26)	89°F (Aug. 15)	99°F (Aug. 28)	102°F	93°F
Minimum winter temperature	-22°F (Jan. 18)	-16°F	3°F (Feb. 28)	-20° (Jan. 18)	-12°F	-26°F

*In this summary 32° is considered a killing frost.

Introduction

Canola acreage in Montana is on the rise. In 2012 Montana ranked third nationally for the number of acres harvested (48,000 acres). This report summarizes canola variety performance from the six Montana Agricultural Research Centers and is presented in table form. It is advised to pay special attention to the results of those trials grown with similar practices and environments to your own. In addition to location it is important to review variety performance over time. Variety trial data can be found at: www.ag.montana.edu/nwarc/research/.

Objective

The objective of the Montana Statewide Spring Canola Variety Trial 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 these trials is intended to provide canola growers in Montana with reliable, unbiased information regarding which canola varieties are best suited to their specific growing area.

Procedures

In 2012, one industrial rapeseed and eleven spring canola entries were submitted by four sponsors (Table 1). The seed was distributed to six agricultural research centers: Northern (Havre), Eastern (Sidney), Northwestern (Kalispell), Central (Moccasin), Southern (Huntley) and Western Triangle (Conrad), for testing during the 2012 growing season (Figure 1).

Test protocol and management guidelines were provided to personnel at each location. The entries were seeded at a rate of 6.5 lb/A and replicated using a randomized complete block design. Fertilizer and pesticide applications are noted in each location's table.

Data was collected on: days to 50 percent flower, number of plants per square foot or percent of stand coverage per plot, plant height, percent shatter and percent lodging (visually estimated on a score from 0 to 100 with 0 equal to none and 100 equal to completely shattered or lodged), yield, test weight, oil and protein content, and fatty acid constituents.

The data are presented by location in the following report, Tables 7 through 24. The Least Significant Difference (LSD) values are for making pairwise comparisons between treatment means (varieties). LSD values are derived from statistical analysis and only apply to the values within the column in which they appear. If the difference between two treatment values within a column does not exceed the LSD value, it means that that the varieties are statistically equal or there is no varietal difference for the specific measurement. If the difference exceeds the LSD value, then the varieties are statistically different. When using the LSD values to make pairwise comparison of treatment means, it is recommended to do so only if the probability values for treatment is less than 5% (Pr>F=0.05). This is referred to as "Fischer's" protected LSD. Using a probability level of 5 percent means that there is a 5 percent probability that the treatment differences are not statistically significant. Or stated another way, there is a 95 percent probability that the treatment differences are statistically significant. Large critical values (CVs) indicate a large amount of variation that could not be attributed to differences in the varieties.

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

Results and Summary

Three research centers (Eastern, Central and Southern) experienced hot dry conditions throughout the growing season. These unfavorable

conditions for canola, a cool season crop, resulted in yield reductions (Table 3).

The following results and summaries are for informational purposes only. The presentation of data for the varieties tested does not imply approval or endorsement by MSU-MAES.

Statewide summaries of yield, oil content and oil yield are presented in Tables 3 through 6.

Northern Agricultural Research Center (NARC), Havre

In this dryland environment, canola seed yields ranged from 1,382 to 1,887 lb/A (Table 7). Seed yield averaged 1,654 lb/A with seven of the varieties yielding statistically equivalent to the highest yielding variety, 'DeKalb 55-55' (1,887lb/A). The average canola test weight and oil content at NARC were 52lb/bu and 42.6% respectively.

Eastern Agricultural Research Center (EARC), Sidney

Despite the use of irrigation, canola seed yields were greatly reduced due to a late seeding date and very high temperatures and low precipitation during flowering and through harvest. There were no statistical difference between treatments in plant stand, percent shatter, yield or oil yield according to Fischer's protected LSD value at p=0.05. Canola seed yield averaged 306 lb/A compared to a three year average of 1,330 lb/A.

Northwestern Agricultural Research Center (NWARC), Kalispell

In this high rainfall environment (20.16" crop year), canola seed yields ranged from 1,394 lb/A to 2,575 lb/A (Table 13). Seed yield averaged 2,214 lb/A with seven of the varieties producing yields equivalent to the highest yielding variety 'InVigor L150'. The average canola test weight was 48 lb/bu and oil content averaged 47.2 percent.

Central Agricultural Research Center (CARC), Moccasin

CARC experienced drought conditions, precipitation 4.27" below the long term average, and temperatures that were 5^{o}F above the normal. These unfavorable conditions resulted in reduced yields. Seed yield averaged 176 lb/A (Table 16). There were no statistical difference between treatments in plant stand, percent shatter, yield, oil content, oil yield or protein content according to Fischer's protected LSD value at p=0.05.

Southern Agricultural Research Center (SARC), Huntley

Canola yields at SARC were greatly reduced in 2012 due to drought conditions. The average annual temperature was 5^{o} F above the normal, while annual precipitation was 4.97" lower. Yields averaged 383 lb/A and ranged from 126 lb/A to 703 lb/A (Table 19). The 2012 average yield of 383 lb/A was 1,048 lb/A below the previous three year average of 1,430 lb/A (Table 4). Four of the entries yielded statistically equivalent to the highest yielding variety, DeKalb 55-55. Test weights and oil content averaged 38 lb/bu and 36.9% respectively.

Western Triangle Agricultural Research Center (WTARC), Conrad

In this dryland, no till, recrop environment, canola seed yields ranged from 1,398 lb/A to 2,073 lb/A (Table 22). Seed yield averaged 1,796 lb/A with eight of the varieties yielding statistically equivalent to the highest yielding variety, 'HyClass 955'. Test weights and oil content averaged 48 lb/bu and 49% respectively.

Future Plans

With global canola demand increasing and Montana acreage increasing, coupled with continued support from the canola industry and research center personnel, multi-location canola evaluations will continue in 2013.

Table 3. Seed Yield (lb/A) Summary from the Montana Statewide Spring Canola Variety Evaluation - 2012.

Variety	NARC[3] Havre	EARC[2] Sidney	NWARC[3] Kalispell	CARC[2] Moccasin	SARC[3] Huntley	WTARC[2] Conrad
	lb/A					
DKL 30-03	**1844**	282	2107	170	**603**	**1947**
DKL 30-42	**1727**	376	1611	199	**649**	**1792**
DKL 51-45	**1690**	189	1896	189	**546**	**1767**
DKL 55-55	**1887**	407	**2462**	231	**703**	**2001**
DKL 70-07	**1674**	342	**2552**	173	304	**1774**
HyCLASS 955	**1774**	403	**2197**	190	471	**2073**
HyCLASS 947	**1685**	281	**2359**	186	327	**2013**
HyCLASS 988	**1656**	332	**2430**	120	143	1594
Gem[1]	1382	108	1394	90	243	1398
InVigor L130	1552	290	**2528**	161	243	**1856**
InVigor L150	1470	266	**2575**	170	126	1613
InVigor L120	1513	390	**2457**	214	239	**1729**
Mean	1654	306	2214	176	383	1796
CV	10.0	38.6	12.8	31.1	31.4	14.7
LSD	237.5	199.9	406.9	91.3	172.8	379.1
Pr>F	0.0035	0.1279	<.0001	0.1640	<.0001	0.0349

Bold indicates highest yielding variety. **Bold** indicates varieties yielding equal to hightest yielding variety. EARC, CARC no statistical difference in yield

[1] industrial rapeseed

[2] Seed yields reported "as is" at harvest - not adjusted to a uniform moisture content.

[3] Seed yields adjusted to 8% moisture content.

Table 4. Seed Yield (lb/A) Summary 2009 - 2012 from the Montana Statewide Spring Canola Variety Trial.

Year	NARC[3] Havre	EARC[2] Sidney	NWARC[3] Kalispell	CARC[2] Moccasin	SARC[3] Huntley	WTARC[2] Conrad
	lb/A					
2009 (n = 15)	2047	1867	2367	538	1347	1781
2010 (n = 20)	1207	1153	1613	1204	1589	1517
2011 (n = 19)	1994	969	2490	NA	1356	1861
2012 (n = 12)	1654	306	2214	171	383	1796
4 Year Average	1726	1074	2171	638	1169	1739

[2] Seed yields reported "as is" at harvest - not adjusted to a uniform moisture content.

[3] Seed yields adjusted to 8% moisture content.

Table 5. Oil Content (%) Summary from the Montana Statewide Spring Canola Variety Trial - 2012.

Variety	NARC Havre	EARC Sidney	NWARC Kalispell	CARC Moccasin	SARC Huntley	WTARC Conrad
			%			
DKL 30-03	42.9	41.1	48.0	35.6	38.5	49.5
DKL 30-42	42.0	40.9	46.8	35.2	38.2	47.8
DKL 51-45	43.8	42.2	47.1	39.3	37.5	48.6
DKL 55-55	42.8	43.4	47.6	39.2	38.5	50.1
DKL 70-07	41.4	42.9	47.9	37.2	38.3	49.2
HyCLASS 955	42.9	44.2	47.6	38.2	35.1	50.1
HyCLASS 947	44.7	43.8	48.6	40.0	36.5	49.9
HyCLASS 988	41.3	41.9	46.7	37.4	34.2	48.7
Gem[1]	42.4	38.3	46.3	39.0	37.2	46.9
InVigor L130	42.2	40.1	46.3	39.1	35.6	47.6
InVigor L150	42.0	38.9	47.1	36.7	34.6	47.8
InVigor L120	42.3	41.5	46.5	38.4	38.8	47.5
Mean	42.6	41.6	47.2	37.9	36.9	49.0
CV	3.25	3.66	1.25	5.66	6.40	2.05
LSD	1.99	2.76	0.85	3.71	3.40	1.43
Pr>F	0.0724	0.0056	<.0001	0.2325	0.0601	0.0001

[1] industrial rapeseed

Percent seed oil content reported on a dry matter basis.

Table 6. Oil Yield Summary from the Montana Statewide Spring Canola Variety Trial - 2012

Variety	NARC Havre	EARC Sidney	NWARC Kalispell	CARC Moccasin	SARC Huntley	WTARC Conrad
	lb/A					
DKL 30-03	822	119	1011	62	235	964
DKL 30-42	754	159	757	68	249	856
DKL 51-45	769	81	893	79	203	859
DKL 55-55	840	179	1172	94	271	1003
DKL 70-07	720	148	1223	68	116	878
HyCLASS 955	787	179	1045	77	167	1040
HyCLASS 947	781	161	1146	53	119	1005
HyCLASS 988	705	141	1136	48	50	776
Gem1	608	26	648	38	91	656
InVigor L130	677	117	1172	67	88	884
InVigor L150	640	105	1211	66	43	771
InVigor L120	664	139	1142	88	92	822
Mean	731	131	1046	67	144	876
CV	10.9	39.2	13.1	38.8	34.8	15.6
LSD	114.4	93.2	197.2	44.2	71.8	196.6
Pr>F	0.0031	0.1349	<.0001	0.367	<.0001	0.0124

[1] industrial rapeseed

2012 Montana Statewide Canola Variety Trial at Northern Agricultural Research Center, Harvre, MT.

Seeding Date:	4/20/2012	Soil Type:	Hillon Clay Loam	Harvest Date:	7/31/2012
Seeding Rate:	6.5 lb/A 12" rows	Soil Test:	NA		
Previous Crop:	Winter Wheat	Fertilizer:	50-15-0-20 broadcast at seeding		
Tillage:	No Till	Herbicide:	None		
Irrigation:	None	Insecticide:	Mustang Max 4oz/A		

Table 7. Performance of canola varieties tested at NARC, Havre, MT - 2012.

Variety	Flowering Days	Stand no/sqft	Height inches	Shatter %	Lodging %	Yield lb/A	TWT lb/bu	Oil Content %	Oil Yield lb/A	Protein Content %
DKL 30-03	50	11	43	8	NA	**1844**	52	42.9	822	27.0
DKL 30-42	51	5	39	6	NA	**1727**	52	42.0	754	27.5
DKL 51-45	50	6	40	11	NA	**1690**	52	43.8	769	25.9
DKL 55-55	52	10	42	5	NA	**1887**	52	42.8	840	27.6
DKL 70-07	54	8	43	6	NA	**1674**	52	41.4	720	29.0
HyCLASS 955	52	7	40	8	NA	**1774**	52	42.9	787	26.9
HyCLASS 947	52	10	44	13	NA	**1685**	52	44.7	781	25.8
HyCLASS 988	55	13	46	6	NA	**1656**	51	41.3	705	28.8
Gem[1]	51	11	37	11	NA	1382	52	42.4	608	26.9
InVigor L130	53	8	43	8	NA	1552	53	42.2	677	26.9
InVigor L150	56	11	40	8	NA	1470	53	42.0	640	27.5
InVigor L120	55	7	42	10	NA	1513	52	42.3	664	26.8
Mean	52	9	41	8	NA	1654	52	42.6	731	27.2
CV	2.5	21.7	5.1	39.8	NA	10.0	0.4	3.25	10.9	5.17
LSD	1.9	2.7	3.1	4.7	NA	237.5	0.3	1.99	114.4	2.02
Pr>F	<.0001	<.0001	<.0001	0.0430	NA	0.0035	<.0001	0.0724	0.0031	0.0866

Yields and test weights adjusted to 8% moisture.

Oil yield and protein content presented on a dry matter basis.

Bold indicates highest yielding variety. **Bold** indicates varieties yielding equal to hightest yielding variety.

[1] industrial rapeseed

TWT: test weight, NA denotes data not available or not observed.

Table 8. Fatty acid constituents of oil from canola varieties tested in the Montana Statewide Canola Variety Trial at NARC, Havre, MT - 2012.

	Palmitic Acid	Stearatic Acid	Oleic Acid	Linoleic Acid	α-Linolenic Acid
Variety	C16:0	C18:0	C18:1	C18:2	C18:3
DKL 30-03	4.2	2.5	65.4	19.3	5.4
DKL 30-42	4.5	2.7	66.8	18.4	5.2
DKL 51-45	4.4	2.6	65.7	19.5	6.0
DKL 55-55	4.1	2.5	66.2	18.7	5.1
DKL 70-07	4.2	2.8	66.9	17.9	4.8
HyCLASS 955	4.2	2.4	63.4	19.1	6.0
HyCLASS 947	4.0	2.4	65.3	18.7	5.9
HyCLASS 988	4.1	2.9	65.4	18.3	5.8
Gem[1]	2.7	2.0	9.7	12.8	4.7
InVigor L130	4.2	2.4	63.8	18.8	6.1
InVigor L150	4.2	2.4	61.3	19.6	6.7
InVigor L120	4.3	2.9	63.9	18.2	7.1
Mean	4.1	2.5	60.3	18.3	5.7
CV	2.58	3.92	2.18	2.82	5.69
LSD	0.15	0.14	1.89	0.74	0.47
Pr>F	<.0001	<.0001	<.0001	<.0001	<.0001

[1] industrial rapeseed

Table 9. Seed Yield (lb/A) Summary by Entry 2009 - 2012, NARC, Havre, MT.

	2009	2010	2011	2012
		Yield (lb/A)		
InVigor 5440 LL	2304	1355	1758	.
InVigor 5550 LL	2281	1372	.	.
InVigor 5630 LL	2269	.	.	.
InVigor 8440 LL	2105	1235	1828	.
InVigor L150	.	.	1921	1470
InVigor L130	.	.	2068	1552
InVigor L120	.	.	.	1513
OasisCL	.	955	1341	.
XCEED 8571 CL	.	1120	.	.
HyCLASS 921 RR	.	1202	2445	.
HyCLASS 940 RR	2097	979	1841	.
HyCLASS 924 RR	1906	.	.	.
HyCLASS 947 RR	.	1288	2162	1685
HyCLASS 988 RR	.	1407	2019	1656
HyCLASS 955 RR	.	.	2174	1774
DKL 30-42 RR	2320	1250	2067	1727
DKL 52-41 RR	1908	1146	2140	.
DKL 72-55 RR	2234	1343	1859	.
DKL 51-45 RR	.	1403	2254	1690
DKL 70-07 RR	.	.	2169	1674
DKL 55-55 RR	.	.	2072	1887
DKL 30-03 RR	.	.	.	1844
Hyola 357 Magnun	2073	1222	.	.
IS 3057 RR	1873	.	.	.
IS 7145 RR	2119	.	.	.
UISC00.1.3.5	1909	1295	.	.
UISC00.3.1.17	1681	1200	2019	.
UISC00.3.8.DE	.	919	1864	.
03.IL.5.6.1	.	1038	.	.
Gem	.	.	.	1382
Oscar	1629	.	.	.
Mean	2047	1207	1994	1654
LSD (p=0.05)	210.9	253.0	391.1	237.5

2012 Montana Statewide Canola Variety Trial at Eastern Agricultural Research Center, Sidney, MT.

Seeding Date:	5/8/2012	Soil Type:	Savage Silty Clay	Herbicide:	2.5 pts Sonalan/A
Seeding Rate:	6.5 lb/A 12" rows	Soil Test:	NA	Insecticide:	NA
Previous Crop:	NA	Fertilizer:	54-138-0 fall 2011 application	Harvest Date:	8/17/2012
Tillage:	Conventional				
Irrigation:	0.7" on 5/15, 0.8" on 5/22, 1.6" on 7/3, 1.2" on 8/7				

Table 10. Performance of canola varieties tested at Sidney, MT, 2012.

Variety	Flowering Days	Stand no/sqft	Height inches	Shatter %	Lodging %	Yield lb/A	TWT lb/bu	Oil Content %	Oil Yield lb/A	Protein Content %
DKL 30-03	24	83	28	18	0	282	50	41.1	119	30.7
DKL 30-42	24	82	28	23	0	376	50	40.9	159	30.1
DKL 51-45	24	80	28	27	0	189	50	42.2	81	28.9
DKL 55-55	24	81	29	27	0	407	50	43.4	179	28.6
DKL 70-07	25	87	32	27	0	342	49	42.9	148	29.2
HyCLASS 955	25	84	32	25	0	403	51	44.2	179	28.2
HyCLASS 947	25	85	30	25	0	281	49	43.8	161	28.2
HyCLASS 988	26	89	33	23	0	332	48	41.9	141	28.6
Gem[1]	25	76	27	10	0	108	49	38.3	26	30.8
InVigor L130	26	84	30	30	0	290	51	40.1	117	30.9
InVigor L150	28	88	33	37	0	266	51	38.9	105	31.7
InVigor L120	26	88	33	33	0	390	49	41.5	139	30.0
Mean	25	84	30	25	0	306	50	41.6	131	29.6
CV	4.2	6.3	8.1	35.6	0	38.6	2.0	3.66	39.2	3.86
LSD	1.8	8.9	4.2	15.3	0	199.9	1.7	2.76	93.2	2.08
Pr>F	0.0037	0.186	0.0523	0.1389	0	0.1279	0.0154	0.0056	0.1349	0.0166

Yield is reported "as is" at harvest - not adjusted to a uniform moisture.

Oil yield and protein content presented on a dry matter basis.

[1] industrial rapeseed

TWT: test weight, NA denotes data not available or not observed.

Table 11. Fatty acid constituents of oil from canola varieties tested in the Montana Statewide Canola Variety Trial at EARC, Sidney, MT - 2012.

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
DKL 30-03	4.0	2.3	64.3	20.3	10.1
DKL 30-42	4.3	2.5	63.6	20.4	9.9
DKL 51-45	4.3	2.3	64.7	20.6	10.5
DKL 55-55	4.0	2.3	65.5	18.8	9.9
DKL 70-07	3.8	2.4	62.7	19.1	9.3
HyCLASS 955	4.1	2.3	65.0	18.8	9.5
HyCLASS 947	3.7	2.3	64.1	19.6	10.4
HyCLASS 988	4.1	2.5	63.3	19.6	9.4
Gem[1]	3.8	2.3	27.9	15.9	8.7
InVigor L130	4.4	2.5	63.8	19.7	9.7
InVigor L150	4.1	2.3	60.7	21.1	10.5
InVigor L120	4.1	2.6	63.0	19.3	10.0
Mean	4.1	2.4	61.5	19.5	9.8
CV	2.44	5.57	3.75	4.46	6.06
LSD	0.18	0.24	4.19	1.58	1.08
Pr>F	<.0001	0.1290	<.0001	0.0008	0.0747

[1] industrial rapeseed

Table 12. Seed Yield (lb/A) Summary by Entry 2009 - 2012, EARC, Sidney, MT

Entry	2009	2010	2011	2012
	Yield (lb/A)			
InVigor 5440 LL	2638	1232	1061	.
InVigor 5550 LL	2139	1279	.	.
InVigor 5630 LL	1720	.	.	.
InVigor 8440 LL	1769	1630	1066	.
InVigor L150	.	.	1156	266
InVigor L130	.	.	964	290
InVigor L120	.	.	.	390
OasisCL	.	472	565	
XCEED 8571 CL	828	.	.	.
HyCLASS 921 RR	1751	1352	1039	.
HyCLASS 940 RR	1947	1016	791	.
HyCLASS 924 RR	1664	.	.	.
HyCLASS 947 RR	.	1370	1199	281
HyCLASS 988 RR	.	1057	951	332
HyCLASS 955 RR	.	.	981	403
DKL 30-42 RR	2075	1533	1100	376
DKL 52-41 RR	1744	1077	842	.
DKL 72-55 RR	2220	1268	1108	.
DKL 51-45 RR	.	1218	1118	189
DKL 70-07 RR	.	.	1105	342
DKL 55-55 RR	.	.	1221	407
DKL 30-03 RR	.	.	.	282
Hyola 357 Magnum RR	1760	1037	.	.
IS 3057 RR	1949	.	.	.
IS 7145 RR	1819	.	.	.
UISC00.1.3.5	1501	1112	.	.
UISC00.3.1.17	1924	807	665	.
UISC00.3.8.DE	.	.	505	.
Gem	.	.	.	108
Oscar	1256	.	.	.
Exp Line 624	.	1212	.	.
Exp Line 642	.	1246	.	.
Mean	1867	1153	969	306
LSD (p=0.05)	473.0	452.0	280.2	199.9

2012 Montana Statewide Canola Variety Trial at Northwestern Agricultural Research Center, Kalispell, MT.

Seeding Date:	4/11/2012	Soil Type:	Kalispell Sandy Loam	Harvest Date:	8/21/2012
Seeding Rate:	6.5 lb/A 6" rows	Soil Test:	57-6-55-42 pH 7.1		
Previous Crop:	Alfalfa	Fertilizer:	138-0-75-14 spring application		
Tillage:	Conventional	Herbicide:	NA		
Irrigation:	None	Insecticide:	NA		

Table 13. Performance of canola varieties tested at Kalispell, MT, 2012.

Variety	Flowering Days	Stand no/sqft	Height inches	Shatter %	Lodging %	Yield lb/A	TWT lb/bu	Oil Content %	Oil Yield lb/A	Protein Content %
DKL 30-03	75	7	51	1	0	2107	49	48.0	1011	23.2
DKL 30-42	76	3	46	0	0	1611	49	46.8	757	24.1
DKL 51-45	74	8	49	1	3	1896	47	47.1	893	23.3
DKL 55-55	75	8	53	0	1	**2462**	49	47.6	1172	23.4
DKL 70-07	77	7	53	0	0	**2552**	49	47.9	1223	23.2
HyCLASS 955	75	9	51	0	1	**2197**	49	47.6	1045	23.2
HyCLASS 947	76	6	54	0	5	**2359**	49	48.6	1146	22.6
HyCLASS 988	77	10	58	0	0	**2430**	49	46.7	1136	23.8
Gem[1]	76	9	45	1	5	1394	48	46.3	648	24.3
InVigor L130	75	6	53	0	0	**2528**	48	46.3	1172	24.2
InVigor L150	77	7	54	0	3	**2575**	49	47.1	1211	23.9
InVigor L120	75	5	53	0	1	**2457**	48	46.5	1142	24.5
Mean	76	7	52	0.3	1	2214	48	47.2	1046	23.6
CV	1.7	30.7	3.3	NA	NA	12.8	3.3	1.25	13.1	1.52
LSD	1.9	3.1	2.5	1.80	5.6	406.9	2.3	0.85	197.2	0.52
Pr>F	0.0145	0.0040	<.0001	0.6077	0.5431	<.0001	0.7308	<.0001	<.0001	<.0001

Yields and test weights adjusted to 8% moisture.

Oil yield and protein content presented on a dry matter basis.

Bold indicates highest yielding variety. **Bold** indicates varieties yielding equal to hightest yielding variety.

[1] industrial rapeseed

TWT: test weight, NA denotes data not available or not observed.

Table 14. Fatty acid constituents of oil from canola varieties tested in the Montana Statewide Canola Variety Trial at NWARC, Kalispell, MT - 2012.

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
DKL 30-03	3.8	2.3	68.6	18.8	8.7
DKL 30-42	4.1	2.3	64.8	18.5	8.9
DKL 51-45	4.1	2.3	66.0	19.9	9.5
DKL 55-55	4.0	2.4	68.8	18.5	8.2
DKL 70-07	3.9	2.4	66.6	18.6	8.9
HyCLASS 955	4.0	2.4	66.4	18.8	8.3
HyCLASS 947	3.6	2.3	69.7	18.7	8.3
HyCLASS 988	4.0	2.8	68.6	17.0	8.3
Gem[1]	2.6	1.8	6.8	11.3	8.0
InVigor L130	4.1	2.5	66.3	17.5	9.8
InVigor L150	3.7	2.3	64.5	19.0	9.5
InVigor L120	3.8	2.6	63.7	18.3	9.6
Mean	3.8	2.4	61.7	17.9	8.8
CV	4.02	3.50	3.31	3.16	6.20
LSD	0.22	0.12	2.94	0.81	0.79
Pr>F	<.0001	<.0001	<.0001	<.0001	<.0001

[1] industrial rapeseed

Table 15. Seed Yield (lb/A) Summary by Entry 2009 - 2012, NWARC, Kalispell, MT.

Entry	2009	2010	2011	2012
		Yield (lb/A)		
InVigor 5440 LL	2434	1893	2856	.
InVigor 5550 LL	2310	1599	.	.
InVigor 5630 LL	2519	.	.	.
InVigor 8440 LL	2524	1540	2759	.
InVigor L150	.	.	2621	2575
InVigor L130	.	.	2606	2528
InVigor L120	.	.	.	2457
OasisCL	.	638	1345	.
XCEED 8571 CL	.	846	.	.
HyCLASS 921 RR	.	1381	2483	.
HyCLASS 940 RR	2576	1718	2817	.
HyCLASS 924 RR	2310	.	.	.
HyCLASS 947 RR		1841	2844	2359
HyCLASS 988 RR	.	1756	2219	2430
HyCLASS 955 RR	.	.	2579	2197
DKL 30-42 RR	2578	2011	2636	1611
DKL 52-41 RR	2539	1642	2128	.
DKL 72-55 RR	2518	1954	2348	.
DKL 51-45 RR	.	1940	2671	1896
DKL 70-07 RR	.	.	2964	2552
DKL 55-55 RR	.	.	2940	2462
DKL 30-03 RR	.	.	.	2107
Hyola 357 Magnum RR	2526	1996	.	.
IS 3057 RR	2226	.	.	.
IS 7145 RR	2442	.	.	.
UISC00.1.3.5	2102	1354	.	.
UISC00.3.1.17	1835	1756	1902	.
UISC00.3.8.DE	.	1183	2016	.
03.IL.5.6.1	.	1388	.	.
Gem	.	.	.	1394
Oscar	2061	.	.	.
Exp Line 624	.	2040	.	.
Exp Line 642	.	1786	.	.
Mean	2367	1613	2490	2214
LSD (p=0.05)	263.5	450.0	518.5	406.9

2012 Montana Statewide Canola Variety Trial at Central Agricultural Research Center, Moccasin, MT.

Seeding Date:	4/11/2012	Soil Type:	Judith Clay	Harvest Date:	8/13/2012
Seeding Rate:	6.5 lb/A 11" rows	Soil Test:	NA		
Previous Crop:	Winter Wheat	Fertilizer:	70 lbs N		
Tillage:	No Till	Herbicide:	1.75 pt/A Prowl preplant, 10 oz/A Assure II		
Irrigation:	None	Insecticide:	NA		

Table 16. Performance of canola varieties tested at Moccasin, MT, 2012.

Variety	Flowering Days	Stand no/sqft	Height inches	Shatter %	Lodging %	Yield lb/A	TWT lb/bu	Oil Content %	Oil Yield lb/A	Protein Content %
DKL 30-03	72	4	29	0	NA	170	NA	35.6	62	29.8
DKL 30-42	72	3	27	0	NA	199	NA	35.2	68	30.2
DKL 51-45	72	3	27	0	NA	189	NA	39.3	79	29.3
DKL 55-55	72	4	30	0	NA	231	NA	39.2	94	30.1
DKL 70-07	73	5	32	0	NA	173	NA	37.2	68	31.1
HyCLASS 955	73	4	29	0	NA	190	NA	38.2	77	30.6
HyCLASS 947	73	4	30	0	NA	186	NA	40.0	53	30.6
HyCLASS 988	75	3	31	0	NA	120	NA	37.4	48	30.3
Gem[1]	73	4	24	0	NA	90	NA	39.0	38	29.3
InVigor L130	72	4	31	0	NA	161	NA	39.1	67	30.1
InVigor L150	75	4	30	0	NA	170	NA	36.7	66	31.4
InVigor L120	73	3	29	0	NA	214	NA	38.4	88	31.7
Mean	73	4	29	0	NA	176	NA	37.9	67	30.4
CV	1.1	21.8	6.4	0	NA	31.1	NA	5.66	38.8	4.31
LSD	1.3	1.4	3.1	0	NA	91.3	NA	3.71	44.2	2.66
Pr>F	0.0004	0.0958	0.0026	0	NA	0.1640	NA	0.2325	0.367	0.4575

Yield is reported "as is" at harvest - not adjusted to a uniform moisture.

Oil yield and protein content presented on a dry matter basis.

[1] industrial rapeseed

TWT: test weight, NA denotes data not available or not observed.

Table 17. Fatty acid constituents of oil from canola varieties tested in the Montana Statewide Canola Variety Evaluation at CARC, Moccasin, MT - 2012.

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
DKL 30-03	4.6	3.1	57.0	22.5	6.1
DKL 30-42	4.7	3.1	62.3	21.2	4.8
DKL 51-45	4.5	3.1	63.9	20.1	6.4
DKL 55-55	4.4	3.1	66.3	18.7	5.8
DKL 70-07	4.4	3.4	70.5	17.9	5.4
HyCLASS 955	4.4	3.1	67.7	19.4	5.5
HyCLASS 947	4.3	3.1	68.9	18.4	6.1
HyCLASS 988	4.5	3.3	65.4	18.4	6.6
Gem[1]	4.0	3.1	46.1	15.2	5.2
InVigor L130	4.4	3.0	66.3	19.4	6.6
InVigor L150	4.4	3.0	62.7	20.7	7.2
InVigor L120	4.3	3.1	66.2	19.0	7.3
Mean	4.4	3.1	63.4	19.3	6.1
CV	6.36	4.74	13.50	11.56	6.73
LSD	0.49	0.26	14.83	3.86	0.71
Pr>F	0.3625	0.0540	0.1401	0.0801	<.0001

[1] industrial rapeseed

Table 18. Seed Yield (lb/A) Summary by Entry 2009 - 2012, CARC, Mocassin, MT.

Entry	2009	2010	2012
	Yield (lb/A)		
InVigor 5440 LL	632	1476	.
InVigor 5550 LL	556	1404	.
InVigor 5630 LL	572	.	.
InVigor 8440 LL	563	1168	.
InVigor L150	.	.	170
InVigor L130	.	.	161
InVigor L120	.	.	214
OasisCL	.	1210	.
XCEED 8571 CL	.	938	.
HyCLASS 921 RR	.	1341	.
HyCLASS 940 RR	481	1179	.
HyCLASS 924 RR	469	.	.
HyCLASS 947 RR	.	.	185
HyCLASS 988 RR	.	1244	120
HyCLASS 955 RR	.	.	189
DKL 30-42 RR	626	1235	176
DKL 52-41 RR	554	1218	.
DKL 72-55 RR	541	1176	.
DKL 51-45 RR	.	1382	189
DKL 70-07 RR	.	.	172
DKL 55-55 RR	.	.	227
DKL 30-03 RR	.	.	160
Hyola 357 Magnum RR	628	1071	.
IS 3057 RR	736	.	.
IS 7145 RR	543	.	.
UISC00.1.3.5	497	1141	.
UISC00.3.1.17	313	1006	.
UISC00.3.8.DE	.	1069	.
03.IL.5.6.1	.	1217	.
Gem	.	.	90
Oscar	366	.	.
Mean	538	1204	171
LSD (p=0.05)	140.7	291.0	91.3

2012 Montana Statewide Canola Variety Trial at Southern Agricultural Research Center, Huntley, MT.

Seeding Date:	4/18/2012	Soil Type:	Fort Collins Silt Loam	Harvest Date:	8/2/2012
Seeding Rate:	6.5 lb/A 14" rows	Soil Test:	NA		
Previous Crop:	Chem Fallow	Fertilizer:	60-20-0-0 spring application		
Tillage:	No Till	Herbicide:	None		
Irrigation:	None	Insecticide:	Warrior & Mustang Max		

Table 19. Performance of canola varieties tested at Huntley, MT, 2012

Variety	Flowering Days	Stand no/sqft	Height inches	Shatter %	Lodging %	Yield lb/A	TWT lb/bu	Oil Content %	Oil Yield lb/A	Protein Content %
DKL 30-03	54	9	43	50	2	**603**	39	38.5	235	27.0
DKL 30-42	54	7	42	49	1	**649**	42	38.2	249	27.7
DKL 51-45	55	10	45	55	0	**546**	39	37.5	203	26.7
DKL 55-55	55	10	46	40	1	**703**	42	38.5	271	27.1
DKL 70-07	57	11	44	75	1	304	35	38.3	116	27.0
HyCLASS 955	54	10	43	58	0	471	34	35.1	167	26.2
HyCLASS 947	57	12	45	70	1	327	36	36.5	119	26.3
HyCLASS 988	57	11	45	83	4	143	32	34.2	50	25.8
Gem[1]	57	8	43	68	1	243	35	37.2	91	25.7
InVigor L130	58	7	49	73	2	243	46	35.6	88	27.5
InVigor L150	57	11	51	83	2	126	NA	34.6	43	26.9
InVigor L120	57	8	50	83	1	239	36	38.8	92	27.5
Mean	56	9	45	65	1	383	38	36.9	144	26.8
CV	1.3	25.7	4.1	17.8	NA	31.4	–	6.40	34.8	5.21
LSD	1.0	3.4	2.7	16.7	2.6	172.8	–	3.40	71.8	2.00
Pr>F	<.0001	0.0263	<.0001	<.0001	0.1570	<.0001	–	0.0601	<.0001	0.5702

Yields and test weights adjusted to 8% moisture.

Oil yield and protein content presented on a dry matter basis.

Bold indicates highest yielding variety. **Bold** indicates varieties yielding equal to hightest yielding variety.

[1]industrial rapeseed

– unreplicated data due to insufficient sample size.

TWT: test weight, NA denotes data not available or not observed.

Table 20. Fatty acid constituents of oil from canola varieties tested in the Montana Statewide Canola Variety Trial at SARC, Huntley, MT - 2012.

Variety	Palmitic Acid C16:0	Stearatic Acid C18:0	Oleic Acid C18:1	Linoleic Acid C18:2	α-Linolenic Acid C18:3
DKL 30-03	5.1	3.1	61.5	21.7	4.7
DKL 30-42	5.4	3.0	63.7	21.0	4.8
DKL 51-45	5.1	3.3	59.7	23.1	4.8
DKL 55-55	5.0	3.1	60.7	21.6	4.8
DKL 70-07	4.9	3.2	59.8	21.3	4.2
HyCLASS 955	5.1	3.1	52.3	24.9	4.5
HyCLASS 947	5.1	3.5	59.5	23.5	3.8
HyCLASS 988	5.0	3.5	50.8	24.6	4.0
Gem[1]	4.3	2.8	22.9	19.4	3.7
InVigor L130	5.4	3.1	58.6	23.2	4.9
InVigor L150	5.5	3.6	62.8	23.2	3.5
InVigor L120	5.2	3.5	71.2	20.7	4.7
Mean	5.1	3.2	56.9	22.3	4.34
CV	6.46	11.56	15.95	10.08	21.33
LSD	0.47	0.54	13.07	3.24	1.33
Pr>F	0.0032	0.1563	<.0001	0.0413	0.3854

[1] industrial rapeseed

Table 21. Seed Yield (lb/A) Summary by Entry 2009 - 2012, SARC, Huntley, MT.

Entry	2009	2010	2011	2012
		Yield (lb/A)		
InVigor 5440 LL	1484	1772	1420	.
InVigor 5550 LL	1675	1724	.	.
InVigor 5630 LL	.	.	.	.
InVigor 8440 LL	1063	1576	1591	.
InVigor L150	.	.	1577	126
InVigor L130	.	.	1576	243
InVigor L120	.	.	.	239
OasisCL	.	1952	516	.
XCEED 8571 CL	.	1099	.	.
HyCLASS 921 RR	.	1553	1518	.
HyCLASS 940 RR	1255	1385	1170	.
HyCLASS 924 RR	.	.	.	.
HyCLASS 947 RR	.	1569	1634	327
HyCLASS 988 RR	.	1529	1038	143
HyCLASS 955 RR	.	.	1219	471
DKL 30-42 RR	1674	1747	1621	649
DKL 52-41 RR	1239	1285	1139	.
DKL 72-55 RR	1329	1644	1329	.
DKL 51-45 RR	.	1887	1650	546
DKL 70-07 RR	.	.	1360	304
DKL 55-55 RR	.	.	1544	703
DKL 30-03 RR	.	.	.	603
Hyola 357 Magnum RR	1540	1937	.	.
UISC00.1.3.5	1166	1358	.	.
UISC00.3.1.17	1151	1404	1246	.
UISC00.3.8.DE	.	.	1253	.
03.IL.5.6.1	.	.	.	.
Gem	.	.	.	243
Oscar	1242	.	.	.
Mean	1347	1589	1356	383
LSD (p=0.05)	276.3	265.0	323.6	172.8

2012 Montana Statewide Canola Variety Trail at Western Traingle Agricultural Research Center, Conrad, MT.

Seeding Date:	4/11/2012	Soil Type:	Scoby Clay Loam	Insceticide:	None
Seeding Rate:	6.5 lb/A	Soil Test:	NA	Harvest Date:	8/1/2012
Previous Crop:	Barley	Fertilizer:	50-30-48-20 spring application		
Tillage:	No Till		11-52-0 seed placed		
Irrigation:	None	Herbicide:	None		

Table 22. Performance of canola varieties tested at Conrad, MT, 2012.

Variety	Flowering Days	Stand no/sqft	Height inches	Shatter %	Lodging %	Yield lb/A	TWT lb/bu	Oil Content %	Oil Yield lb/A	Protein Content %
DKL 30-03	66	5	46	0	0	**1947**	49	49.5	964	20.5
DKL 30-42	67	4	42	0	0	**1792**	49	47.8	856	22.1
DKL 51-45	66	4	44	0	0	**1767**	49	48.6	859	21.7
DKL 55-55	67	4	47	0	0	**2001**	49	50.1	1003	20.1
DKL 70-07	71	4	47	0	0	**1774**	49	49.2	878	21.2
HyCLASS 955	68	6	45	0	0	**2073**	48	50.1	1040	19.5
HyCLASS 947	69	5	50	0	0	**2013**	49	49.9	1005	20.5
HyCLASS 988	73	6	54	0	0	1594	47	48.7	776	21.2
Gem[1]	68	5	43	0	0	1398	49	46.9	656	22.4
InVigor L130	68	4	48	0	0	**1856**	50	47.6	884	21.3
InVigor L150	73	5	52	0	0	1613	50	47.8	771	21.9
InVigor L120	70	5 5	51	0	0	**1729**	47	47.5	822	21.6
Mean	69	5	47	0	0	1796	48	49	876	21.2
CV	1.5	45.4	8.3	0	0	14.7	1.2	2.05	15.6	4.48
LSD	1.5	3.1	5.6	0	0	379.1	0.8	1.43	196.6	1.36
Pr>F	<.0001	0.7531	0.0013	0	0	0.0349	<.0001	0.0001	0.0124	0.0033

Yield is reported "as is" at harvest - not adjusted to a uniform moisture.

Oil yield and protein content presented on a dry matter basis.

Bold indicates highest yielding variety. **Bold** indicates varieties yielding equal to hightest yielding variety.

[1] industrial rapeseed

TWT: test weight, NA denotes data not available or not observed.

Table 23. Fatty acid constituents of oil from canola varieties tested in the Montana Statewide Canola Variety Trial at WTARC, Conrad, MT - 2012.

	Palmitic Acid	Stearatic Acid	Oleic Acid	Linoleic Acid	α-Linolenic Acid
Variety	C16:0	C18:0	C18:1	C18:2	C18:3
DKL 30-03	4.0	2.4	68.4	18.0	6.7
DKL 30-42	4.4	2.5	64.5	18.7	6.9
DKL 51-45	4.3	2.5	66.6	19.0	7.9
DKL 55-55	4.2	2.4	67.6	18.4	6.9
DKL 70-07	4.1	2.5	67.2	18.2	6.9
HyCLASS 955	4.2	2.3	67.6	18.4	7.2
HyCLASS 947	4.0	2.2	67.7	18.4	7.3
HyCLASS 988	4.1	2.8	66.3	17.4	7.3
Gem[1]	2.7	1.9	4.9	12.0	6.3
InVigor L130	4.2	2.5	65.8	17.4	7.7
InVigor L150	4.0	2.2	63.7	19.0	8.6
InVigor L120	4.1	2.7	61.8	18.3	8.8
Mean	4.0	2.4	61.0	17.8	7.4
CV	3.42	4.01	3.02	3.04	4.51
LSD	0.19	0.14	2.65	0.78	0.48
Pr>F	<.0001	<.0001	<.0001	<.0001	<.0001

[1] industrial rapeseed

Table 24. Seed Yield (lb/A) Summary by Entry 2009 - 2012, WTARC, Conrad, MT.

Entry	2009	2010	2011	2012
	Yield (lb/A)			
InVigor 5440 LL	1944	1702	2019	.
InVigor 5550 LL	2040	1484	.	.
InVigor 5630 LL	1848	.	.	.
InVigor 8440 LL	1874	1709	1728	.
InVigor L150	.	.	1872	1613
InVigor L130	.	.	2038	1856
InVigor L120	.	.	.	1729
OasisCL	.	1219	950	.
XCEED 8571 CL	.	1380	.	.
HyCLASS 921 RR	1749	1681	2170	.
HyCLASS 940 RR	1960	1466	2067	.
HyCLASS 924 RR	1609	.	.	.
HyCLASS 947 RR	.	1557	2088	2013
HyCLASS 988 RR	.	1575	1895	1594
HyCLASS 955 RR	.	.	1912	2073
DKL 30-42 RR	2049	1553	2036	1792
DKL 52-41 RR	1742	1637	1788	.
DKL 72-55 RR	1810	1540	1980	.
DKL 51-45 RR	.	1606	1784	1767
DKL 70-07 RR	.	.	2033	1774
DKL 55-55 RR	.	.	2052	2001
DKL 30-03 RR	.	.	.	1947
Hyola 357 Magnum RR	1670	1612	.	.
IS 3057 RR	1886	.	.	.
IS 7145 RR	1929	.	.	.
UISC00.1.3.5	1630	1255	.	.
UISC00.3.1.17	1367	1293	1544	.
UISC00.3.8.DE	.	.	1547	.
Gem CL	.	.	.	1398
Oscar	1394	.	.	.
Mean	1781	1517	1861	1796
LSD (p=0.05)	303.0	266.0	229.1	379.1