

2016 Montana Statewide Spring Canola Variety Trial



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Cover photo courtesy of Northwestern Agricultural Research Center

Montana Statewide Spring Canola Variety Trial, 2016

Project Leaders:

Brooke Bohannon

Research Associate, NWARC, Kalispell

Bob Stougaard

Professor of Agronomy, NWARC, Kalispell

Project Personnel:

Chengci Chen

Professor of Cropping Systems, EARC, Sidney

Yesuf Mohammed

Research Associate, EARC, Sidney

Peggy Lamb

Research Scientist, NARC, Havre

Angela Sebelius

Research Associate, NARC, Havre

Gadi V.P. Reddy

Associate Professor of Entomology, WTARC, Conrad

John H. Miller

Research Associate, WTARC, Conrad

Table 1. Sponsor contact information for the varieties tested in the 2016 Montana Statewide Spring Canola Variety Evaluation.

SPONSOR	VARIETY	HERBICIDE RESISTANCE	CONTACT
Bayer CropScience	InVigor L130	LL	Jordan Varberg
	InVigor L140P	LL	P.O. Box 12014 T.W. Alexander Dr.
	InVigor 5440	LL	RTP, NC 27709 PH: 701-775-2700 EM: jordan.varberg@bayer.com
Brett Young	6074 RR	RR	Rene Mabon
	6080 RR	RR	Box 99 ST Norbert Postal Station
	BY16-768	RR	Winnipeg, MB Canada R3V1L5 PH: 204-261-7932 EM: rene.mabon@brettyoung.ca
Cibus	C1511	SU	Jameson Hall
	C1516	SU	6455 Nancy Ridge Dr.
	C5507	SU	San Diego, CA 92121
	C5522	SU	PH: 858-450-0008
	C5513	SU	EM: jhall@cibus.com
Croplan by Winfield	HyClass 930	RR	Paul S. Gregor
	HyClass 955	RR	10515 115th St NW
	HyClass 970	RR	Thief River Falls, MN 56701
	HyClass 972	RR	PH: 218-964-5168 EM: psgregor@landolakes.com
Monsanto	DKL 30-20	RR	Jeff Herrmann
	G35153	RR	800 N. Lindbergh Boulevard, Mailzone E3NC
	G49720	RR	St. Louis, MO 63167
	DKL 70-10	RR	PH: 314-694-2723
	G49733	RR	EM: jeffrey.e.herrmann@monsanto.com
NuSeed	GT50	RR	Ross Hakes
	NCH13G046	RR	115 3rd Street N Brechenridge, MN 56520 PH: 218-643-2410 EM: ross.hakes@us.nuseed.com
University of Idaho	Arriba	NA	Jim Davis
	Cara	NA	875 Perimeter Drive MS 2339
	Empire	NA	Moscow, ID 83844 PH: 208-885-7760 EM: jdavis@uidaho.edu

Figure 1.

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

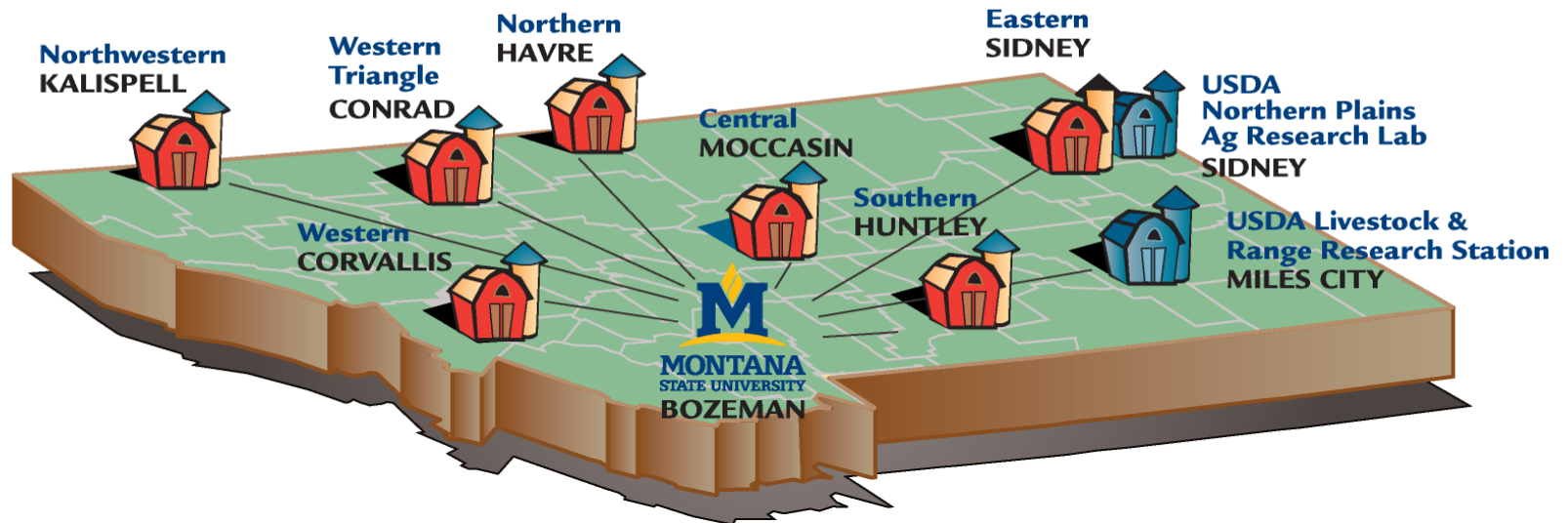


Table 2. Summary of climatic data by location for the 2015-2016 crop year (September through August).

	EARC Sidney	NARC Havre	NWARC Kalispell	WTARC Conrad
Precipitation (inches) Crop year	13.20	18.86	17.32	16.89
Mean Temperature (°F) Crop Year	48	46	45	44
Last killing frost spring 2016	5/15	5/14	5/30	5/12
First killing frost fall 2016	9/13	9/13	9/4	9/13
Frost free period (days) 2016	121	122	97	124
Maximum summer temperature 2016	99	96	91	89
Minimum winter temperature crop year	-14	-15	-2	-12

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

Introduction

Canola acreage in Montana is holding steady and in 2016 61,000 acres were harvested, yielding 91,500,000 lbs. Currently, Montana is ranked third nationally, behind North Dakota and Oklahoma for the number of acres harvested. This report summarizes canola performance from four 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.

Objective

The objective of the Montana Statewide Spring Canola Variety Trial is to evaluate the agronomic performance of available canola varieties and breeding lines submitted by commercial and university entities at four 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 production environment.

Procedures

In 2016, twenty-five spring canola varieties (*Brassica napus*), were submitted by seven sponsors (Table 1). The seed was distributed to four agricultural research centers: Northern (Havre), Northwestern (Kalispell), Eastern (Sidney), and Western Triangle (Conrad) for testing during the 2016 growing season (Figure 1). Test protocol and management guidelines were provided to personnel at each location.

Seeding rates were calculated using the following formula: (10 plants per sqft x TKW x 9.6) / 80% survival. The entries were replicated four times using a randomized complete block design.

Seeding date, field crop history, tillage, fertility program, pesticide application, and harvest date are presented for each location.

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

The variety data are presented by location in Tables 5 through 8. The Least Significant Difference (LSD) values are presented for making pairwise comparisons between treatment means (varieties). If the difference between two treatment values within a column does not exceed the LSD value, it means that the entries are statistically equal for that particular response variable. If the difference exceeds the LSD value, then the entries are statistically different for that particular response variable. 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% ($P > F = 0.05$). This is referred to as "Fisher'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. A large coefficient of variation (CV) indicates a

large amount of variation that could not be attributed to differences in the varieties.

Statewide summaries of variety, yield, and oil content are presented in Tables 3, 4, and 9 through 13.

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

Results and Summary

Northern Agricultural Research Center (NARC), Havre

Plant densities average of 3.7 plants/sqft (Table 5), indicating that a lower percent survival should be used when calculating seeding rates for environments similar to Havre. Yields averaged 35.6 bu/A and ranged from 23.8 to 45.6 bu/A, with seven varieties yielding statistically equivalent to the highest yielding variety 'G49773'. Test weight averaged 48.4 lb/bu and oil content averaged 48.2 percent.

Northwestern Agricultural Research Center (NWARC), Kalispell

Plant density exceeded the targeted population with an average of 14.9 plants/sqft (Table 6). Yields averaged 41.5 bu/A and ranged from 25.0 to 56.6 bu/A. Three varieties yielded statistically equivalent to the highest yielding variety, 'HyClass 972'. Test weight averaged 49.4 lb/bu and oil content averaged 49.3 percent.

Eastern Agricultural Research Center (EARC), Sidney

The average plant density was 6.3 plants/sqft (Table 7). Yields averaged 31.1 bu/A and ranged from 15.5 to 38.4 bu/A. Twelve varieties yielded statistically equivalent to the highest yielding variety, 'HyClass 955'. Average test weight and oil content were 49.4 lb/bu and 44.5 percent, respectively.

Western Triangle Agricultural Research Center (WTARC), Conrad

Plant density averaged 8.1 plants/sqft (Table 8). Yields averaged 20.3 bu/A and ranged from 13.5 to 25.0 bu/A. Thirteen varieties yielded statistically equivalent to the highest yielding variety, 'HyClass 930'. Test weight averaged 47.7 lb/bu and oil content averaged 45.5 percent.

Future Plans

With global canola demand and Montana acreage increasing, coupled with continued support from the canola industry and research center personnel, multi-location canola evaluations will continue in 2017.

Table 3. Yield (bu/A) summary from the Montana statewide spring canola variety trial - 2016.

Variety	NARC Havre	NWARC Kalispell	EARC Sidney	WTARC Conrad
6074 RR	37.2	38.9	28.8	21.7
6080 RR	37.5	40.3	32.3	21.2
Arriba	23.8	25.0	16.5	15.4
BY16-768	37.1	41.7	27.3	19.2
C1511	34.6	45.0	35.8	17.2
C1516	29.2	44.1	31.8	18.9
C5507	31.2	43.9	30.5	18.0
C5513	30.6	30.3	28.0	17.9
C5522	28.1	42.9	27.7	20.2
Cara	25.6	31.0	15.5	13.5
DKL30-20	40.5	31.3	36.1	24.7
DKL70-10	38.3	43.6	37.0	22.3
Empire	34.1	35.5	30.3	16.4
G35153	38.7	46.5	35.5	23.2
G49720	39.5	49.8	35.8	19.6
G49733	45.6	37.1	36.5	24.6
GT50	26.7	35.7	24.7	15.4
HyClass 930	42.1	43.5	31.4	25.0
HyClass 955	44.0	43.3	38.4	22.5
HyClass 970	40.0	45.6	35.8	24.0
HyClass 972	40.5	56.6	34.5	24.2
InVigor 5440	40.0	47.1	34.0	22.9
InVigor L130	36.3	52.6	32.5	21.1
InVigor L140P	39.9	51.2	30.7	22.4
NCH13G046	28.3	34.6	30.4	16.5
Mean	35.6	41.5	31.1	20.3
CV	11.5	15.8	15.7	18.6
LSD	5.8	9.3	6.9	5.3
Pr>F	0.0001	0.0001	0.0001	0.0001

Bold indicates highest yielding cultivar.

Bold indicates variety yielding statistically equivalent to highest yielding cultivar.

Table 4. Percent oil content summary from the Montana statewide spring canola variety trial - 2016.

Variety	NARC Havre	NWARC Kalispell	EARC Sidney	WTARC Conrad
6074 RR	49.2	50.1	45.9	46.4
6080 RR	49.0	49.9	46.4	46.3
Arriba	47.2	48.0	36.9	45.3
BY16-768	49.6	50.1	46.9	46.2
C1511	45.6	48.5	41.0	43.8
C1516	45.6	47.9	42.7	44.2
C5507	47.7	50.0	46.7	45.0
C5513	47.5	49.9	46.1	46.0
C5522	48.4	50.7	45.1	45.6
Cara	48.0	48.1	40.0	45.4
DKL30-20	49.7	50.7	47.7	47.0
DKL70-10	48.2	49.9	46.4	45.6
Empire	47.8	48.1	43.3	44.8
G35153	50.2	49.2	45.9	46.3
G49720	48.6	48.7	46.2	46.0
G49733	49.4	50.1	45.1	47.0
GT50	45.6	48.0	40.0	41.7
HyClass 930	50.7	50.5	47.7	47.7
HyClass 955	50.3	49.8	46.7	47.1
HyClass 970	48.4	50.9	46.9	46.5
HyClass 972	47.8	49.6	45.5	45.6
InVigor 5440	48.1	49.1	43.6	45.4
InVigor L130	48.3	49.1	44.3	45.8
InVigor L140P	48.1	49.1	44.0	45.1
NCH13G046	45.4	46.1	41.7	42.1
Mean	48.2	49.3	44.5	45.5
CV	1.7	2.6	4.0	2.0
LSD	1.2	1.8	2.5	1.3
Pr>F	0.0001	0.0001	0.0001	0.0001

2016 Montana Statewide Canola Variety Trial, Northern Agricultural Research Center, Havre.

Seeding Date: 4/23/2016	Harvest Date: 8/5/2016
Julian Date: 114	Julian Date: 218
Seeding Rate: 10 plnt/sqft 12" rows	Soil Type: Telstad CL
Previous Crop: Winter Wheat	Soil Test: 25-26-350-79
Tillage: No-till	Fertilizer: 50-15-0-20
Herbicide: PP: Sonolan	Insecticide: None
Irrigation: None	Fungicide: None

Table 5. Agronomic data from the statewide canola variety trial, Havre, MT - 2016.

Cultivar	Herbicide system	PLNT sqft	FLWR Julian	HT in	LOD %	SHTTR %	YLD ¹ bu/A	OIL ¹ %	TWT ¹ lb/bu
6074 RR	RR	3.4	167	46.0	0.0	6.3	37.2	49.2	48.6
6080 RR	RR	3.4	166	44.4	0.0	8.8	37.5	49.0	47.9
Arriba	none	3.5	167	36.5	0.0	3.0	23.8	47.2	49.2
BY16-768	RR	3.6	165	42.2	0.0	11.3	37.1	49.6	47.7
C1511	SU	3.4	167	45.4	0.0	2.0	34.6	45.6	48.4
C1516	SU	2.7	169	46.3	0.0	2.0	29.2	45.6	49.6
C5507	SU	3.0	168	47.0	0.0	3.0	31.2	47.7	46.3
C5513	SU	3.5	170	46.9	0.0	16.3	30.6	47.5	48.5
C5522	SU	3.7	168	43.9	0.0	5.3	28.1	48.4	46.6
Cara	none	3.1	167	39.0	0.0	0.8	25.6	48.0	48.0
DKL30-20	RR	3.6	165	42.2	0.0	11.3	40.5	49.7	48.9
DKL70-10	RR	4.0	167	45.3	0.0	2.8	38.3	48.2	48.5
Empire	none	3.4	166	39.3	0.0	3.0	34.1	47.8	49.4
G35153	RR	3.2	166	43.5	0.0	1.0	38.7	50.2	48.1
G49720	RR	3.9	166	42.9	0.0	0.8	39.5	48.6	48.1
G49733	RR	4.5	166	44.8	0.0	4.0	45.6	49.4	48.6
GT50	RR	3.5	167	39.3	0.0	1.0	26.7	45.6	48.6
HyClass 930	RR	4.4	165	42.6	0.0	5.0	42.1	50.7	47.9
HyClass 955	RR	3.9	165	39.6	0.0	2.0	44.0	50.3	48.3
HyClass 970	RR	4.3	166	42.3	0.0	0.8	40.0	48.4	48.0
HyClass 972	RR	4.0	167	43.9	0.0	0.8	40.5	47.8	49.5
InVigor 5440	LL	3.6	167	44.1	0.0	3.0	40.0	48.1	49.2
InVigor L130	LL	3.9	167	42.0	0.0	3.0	36.3	48.3	49.1
InVigor L140P	LL	4.9	168	44.6	0.0	0.0	39.9	48.1	48.7
NCH13G046	RR	3.8	167	41.5	0.0	0.8	28.3	45.4	49.2
Mean		3.7	167	43.0	0.0	3.9	35.6	48.2	48.4
CV		31.1	0.4	5.9	0.0	93.3	11.5	1.7	0.7
LSD		ns	0.9	3.6	.	5.1	5.8	1.2	0.5
Pr>F		0.8028	0.0001	0.0001	1.0	0.0001	0.0001	0.0001	0.0001

PLNT: plant, FLWR: 50% flowering, HT: height, LOD: lodging, SHTTR: shatter, YLD: yield, TWT: test weight, ns: nonsignificant.

¹ adjusted to 8% moisture.

RR: roundup ready, LL: liberty link, SU: sulfonylurea.

Bold indicates highest yielding cultivar.

Bold indicates variety yielding statistically equivalent to highest yielding cultivar.

2016 Montana Statewide Canola Variety Trial, Northwestern Agricultural Research Center, Kalispell.

Seeding Date: 5/3/2016	Harvest Date: 9/14/2016
Julian Date: 124	Julian Date: 258
Seeding Rate: 10 plnt/sqft 6" rows	Soil Type: Creston SiL
Previous Crop: Barley	Soil Test: 116-22-250-46
Tillage: Conventional	Fertilizer: 125-30-30-20
Herbicide: PPI: Trust 2 pt/A	Insecticide: Warrior II 1.92floz/A
Herbicide: Stinger 1/3pt/A	Fungicide: Endura 6 oz/A
Irrigation: None	

Table 6. Agronomic data from the statewide canola variety trial, Kalispell, MT - 2016.

Cultivar	Herbicide system	PLNT sqft	FLWR Julian	HT in	LOD %	SHTTR %	YLD ¹ bu/A	OIL ¹ %	TWT ¹ lb/bu
6074 RR	RR	15.7	180	54.5	12.5	1.5	38.9	50.1	49.9
6080 RR	RR	15.2	180	54.4	13.8	1.0	40.3	49.9	49.0
Arriba	none	15.7	179	45.7	55.0	1.0	25.0	48.0	49.7
BY16-768	RR	13.9	180	54.6	8.8	1.0	41.7	50.1	48.1
C1511	SU	12.7	180	51.9	14.3	1.0	45.0	48.5	49.0
C1516	SU	13.3	181	55.7	2.8	1.3	44.1	47.9	50.6
C5507	SU	16.7	180	54.2	20.0	1.0	43.9	50.0	48.0
C5513	SU	16.1	181	56.0	18.8	1.0	30.3	49.9	49.8
C5522	SU	15.1	180	55.6	12.5	1.0	42.9	50.7	47.7
Cara	none	13.4	180	51.5	40.0	1.0	31.0	48.1	49.5
DKL30-20	RR	15.9	177	52.0	41.3	2.3	31.3	50.7	49.4
DKL70-10	RR	15.3	180	51.6	31.3	1.0	43.6	49.9	49.0
Empire	none	15.5	179	50.2	41.3	1.0	35.5	48.1	50.1
G35153	RR	10.6	179	49.4	37.5	1.0	46.5	49.2	49.4
G49720	RR	16.3	180	50.1	30.5	1.0	49.8	48.7	49.6
G49733	RR	14.8	180	51.1	47.5	1.0	37.1	50.1	49.4
GT50	RR	19.3	180	49.7	16.8	1.0	35.7	48.0	50.3
HyClass 930	RR	15.2	179	49.3	36.3	1.0	43.5	50.5	48.9
HyClass 955	RR	16.7	179	47.4	31.3	1.0	43.3	49.8	49.3
HyClass 970	RR	14.3	180	51.7	17.0	1.0	45.6	50.9	49.0
HyClass 972	RR	14.9	180	53.3	5.8	1.0	56.6	49.6	50.2
InVigor 5440	LL	17.3	180	57.8	10.0	1.0	47.1	49.1	50.0
InVigor L130	LL	10.5	180	55.3	7.8	1.0	52.6	49.1	49.6
InVigor L140P	LL	14.1	180	50.7	25.5	1.0	51.2	49.1	48.9
NCH13G046	RR	13.8	180	49.9	52.5	1.0	34.6	46.1	51.1
Mean		14.9	180	52.1	25.2	1.1	41.5	49.3	49.4
CV		25.2	0.2	6.5	46.8	40.3	15.8	2.6	0.9
LSD		ns	0.6	4.8	16.6	ns	9.3	1.8	0.6
Pr>F		0.4287	0.0001	0.0002	0.0001	0.0923	0.0001	0.0001	0.0001

PLNT: plant, FLWR: 50% flowering, HT: height, LOD: lodging, SHTTR: shatter, YLD: yield, TWT: test weight, ns: nonsignificant.

¹ adjusted to 8% moisture.

RR: roundup ready, LL: liberty link, SU: sulfonyleurea.

Bold indicates highest yielding cultivar.

Bold indicates variety yielding statistically equivalent to highest yielding cultivar.

2016 Montana Statewide Canola Variety Trial, Eastern Agricultural Research Center, Sidney.

Seeding Date:	5/9/2016	Harvest Date:	8/18/2016
Julian Date:	130	Julian Date:	231
Seeding Rate:	10 plnt/sqft 12" rows	Soil Type:	William CL
Previous Crop:	Sugar Beets	Soil Test:	NA
Tillage:	Conventional	Fertilizer:	None applied
Herbicide:	PP: Prowl H2O 3pt/A + Quest 2qts/100gal water	Insecticide:	Sevin SLR Plus 1qt/A
Irrigation:	5.83"	Fungicide:	None

Table 7. Agronomic data from the statewide canola variety trial, Sidney, MT - 2016.

Cultivar	Herbicide system	PLNT sqft	FLWR Julian	HT in	LOD %	SHTTR %	YLD ¹ bu/A	OIL ¹ %	TWT ¹ lb/bu
6074 RR	RR	6.6	180	32.0	.	.	28.8	45.9	49.4
6080 RR	RR	8.2	179	30.9	.	.	32.3	46.4	48.6
Arriba	none	7.2	176	26.1	.	.	16.5	36.9	47.9
BY16-768	RR	6.4	177	31.9	.	.	27.3	46.9	49.0
C1511	SU	7.3	180	36.3	.	.	35.8	41.0	49.0
C1516	SU	7.5	181	35.9	.	.	31.8	42.7	49.6
C5507	SU	7.5	181	38.0	.	.	30.5	46.7	48.7
C5513	SU	6.9	181	38.4	.	.	28.0	46.1	49.5
C5522	SU	6.3	181	36.1	.	.	27.7	45.1	47.1
Cara	none	4.7	178	28.9	.	.	15.5	40.0	51.0
DKL30-20	RR	7.5	177	35.0	.	.	36.1	47.7	50.3
DKL70-10	RR	6.2	177	30.7	.	.	37.0	46.4	49.3
Empire	none	6.0	172	28.5	.	.	30.3	43.3	49.4
G35153	RR	5.0	176	32.6	.	.	35.5	45.9	50.2
G49720	RR	5.0	175	31.6	.	.	35.8	46.2	49.1
G49733	RR	6.7	178	31.5	.	.	36.5	45.1	50.2
GT50	RR	5.7	176	25.2	.	.	24.7	40.0	51.5
HyClass 930	RR	5.5	174	30.4	.	.	31.4	47.7	47.7
HyClass 955	RR	5.5	175	31.6	.	.	38.4	46.7	47.4
HyClass 970	RR	4.6	178	29.9	.	.	35.8	46.9	49.5
HyClass 972	RR	6.8	179	34.0	.	.	34.5	45.5	49.6
InVigor 5440	LL	6.6	178	33.0	.	.	34.0	43.6	50.0
InVigor L130	LL	5.8	178	35.0	.	.	32.5	44.3	49.8
InVigor L140P	LL	6.9	179	31.0	.	.	30.7	44.0	49.9
NCH13G046	RR	5.5	175	31.4	.	.	30.4	41.7	50.8
Mean		6.3	178	32.2	.	.	31.1	44.5	49.4
CV		35.5	0.2	10.3	.	.	15.7	4.0	3.9
LSD		ns	0.6	4.7	.	.	6.9	2.5	ns
Pr>F		0.7779	0.0001	0.0001	.	.	0.0001	0.0001	0.2131

PLNT: plant, FLWR: 50% flowering, HT: height, LOD: lodging, SHTTR: shatter, YLD: yield, TWT: test weight, ns: nonsignificant.

¹ adjusted to 8% moisture.

RR: roundup ready, LL: liberty link, SU: sulfonylurea.

Bold indicates highest yielding cultivar.

Bold indicates variety yielding statistically equivalent to highest yielding cultivar.

2016 Montana Statewide Canola Variety Trial, Western Triangle Agricultural Research Center, Conrad.

Seeding Date: 4/21/2016	Harvest Date: 8/16/2016
Julian Date: 112	Julian Date: 229
Seeding Rate: 10 plnt/sqft 12" rows	Soil Type: Scobey CL
Previous Crop: Chemical Fallow	Soil Test: 15-20-318
Tillage: No-till	Fertilizer: 79-22-20-20
Herbicide: PP: RT3 30oz/A	Insecticide: None
Irrigation: None	Fungicide: None

Table 8. Agronomic data from the statewide canola variety trial, Conrad, MT - 2016.

Cultivar	Herbicide system	PLNT sqft	FLWR Julian	HT in	LOD %	SHTTR %	YLD ¹ bu/A	OIL ¹ %	TWT ¹ lb/bu
6074 RR	RR	8.4	173	35.0	.	.	21.7	46.4	47.7
6080 RR	RR	6.8	172	37.5	.	.	21.2	46.3	46.9
Arriba	none	8.4	172	31.8	.	.	15.4	45.3	46.9
BY16-768	RR	7.7	170	35.8	.	.	19.2	46.2	46.4
C1511	SU	8.2	172	34.5	.	.	17.2	43.8	46.9
C1516	SU	8.9	175	34.3	.	.	18.9	44.2	48.7
C5507	SU	7.4	176	36.0	.	.	18.0	45.0	47.5
C5513	SU	8.6	176	35.3	.	.	17.9	46.0	48.0
C5522	SU	7.8	175	34.8	.	.	20.2	45.6	47.3
Cara	none	6.6	173	33.0	.	.	13.5	45.4	46.4
DKL30-20	RR	8.5	167	34.8	.	.	24.7	47.0	48.3
DKL70-10	RR	8.2	171	35.0	.	.	22.3	45.6	47.5
Empire	none	8.1	172	31.3	.	.	16.4	44.8	47.9
G35153	RR	8.0	170	34.0	.	.	23.2	46.3	48.6
G49720	RR	9.0	171	35.0	.	.	19.6	46.0	47.8
G49733	RR	8.9	170	34.8	.	.	24.6	47.0	47.9
GT50	RR	8.5	171	31.3	.	.	15.4	41.7	46.4
HyClass 930	RR	7.3	170	34.0	.	.	25.0	47.7	47.7
HyClass 955	RR	7.2	168	32.5	.	.	22.5	47.1	47.4
HyClass 970	RR	8.6	170	35.0	.	.	24.0	46.5	48.0
HyClass 972	RR	7.3	173	34.0	.	.	24.2	45.6	48.6
InVigor 5440	LL	8.5	173	37.3	.	.	22.9	45.4	48.5
InVigor L130	LL	10.3	172	37.5	.	.	21.1	45.8	48.6
InVigor L140P	LL	9.1	176	37.0	.	.	22.4	45.1	48.5
NCH13G046	RR	7.2	172	32.8	.	.	16.5	42.1	47.4
Mean		8.1	172	34.6	.	.	20.3	45.5	47.7
CV		24.3	0.7	5.6	.	.	18.6	2.0	1.3
LSD		ns	1.6	2.7	.	.	5.3	1.3	0.8
Pr>F		0.8182	0.0001	0.0001	.	.	0.0001	0.0001	0.0001

PLNT: plant, FLWR: 50% flowering, HT: height, LOD: lodging, SHTTR: shatter, YLD: yield, TWT: test weight, ns: nonsignificant.

¹ adjusted to 8% moisture.

RR: roundup ready, LL: liberty link, SU: sulfonylurea.

Bold indicates highest yielding cultivar.

Bold indicates variety yielding statistically equivalent to highest yielding cultivar.

Table 9. Yield (bu/A) summary 2010 - 2016 from the Montana statewide spring canola variety trial

Year	NARC	NWARC	EARC	WTARC
2010	24.1	32.3	23.1	30.3
2011	39.9	49.8	19.4	37.2
2012	34.3	44.3	6.1	35.6
2013	23.6	42.2	.	38.6
2014	31.9	73.2	.	22.1
2015	22.8	61.3	.	15.0
2016	35.6	41.5	31.1	20.3
Mean	30.3	49.2	19.9	28.4

Table 10. Percent oil content 2010 - 2016 from the Montana statewide spring canola variety trial

Year	NARC	NWARC	EARC	WTARC
2010	47.5	45.7	47.8	45.4
2011	46.5	45.7	45.4	.
2012	42.6	41.6	36.9	37.9
2013	46.4	46.0	.	44.0
2014	46.0	47.6	.	.
2015	40.1	50.4	.	40.0
2016	48.2	49.3	44.5	45.5
Mean	45.3	46.6	43.6	42.6

Table 11. Canola yield (bu/A) summary 2013 - 2016, Havre, MT.

Variety	2013	2014	2015	2016	Avg.	RANK
HyClass 955	30	31	32	44	34	1
HyClass 930	31	35	28	42	34	2
DKL70-10	.	.	27	38	33	3
InVigor L140P	.	33	24	40	32	4
HyClass 970	.	.	22	40	31	5
InVigor 5440	26	33	21	40	30	6
InVigor L130	25	34	21	36	29	7
6074 RR	.	.	20	37	28	8
Cara	18	27	16	26	22	9
Arriba	16	28	17	24	21	10

Table 12. Canola yield (bu/A) summary 2013 - 2016, Kalispell, MT.

Variety	2013	2014	2015	2016	Avg.	RANK
InVigor L140P	.	84	64	51	67	1
InVigor 5440	63	76	73	47	65	2
HyClass 930	53	82	71	44	62	3
InVigor L130	47	78	60	53	59	4
HyClass 955	49	75	68	43	59	5
HyClass 970	.	.	64	46	55	6
DKL 70-10	.	.	65	44	54	7
6074RR	.	.	65	39	52	8
Cara	29	47	43	31	37	9
Arriba	20	41	55	25	35	10

Table 13. Canola yield (bu/A) summary 2013 - 2016, Conrad, MT.

Variety	2013	2014	2015	2016	Avg.	RANK
HyClass 955	46	41	19	22	32	1
HyClass 930	46	21	16	25	27	2
Arriba	34	37	12	15	25	3
InVigor 5440	45	14	16	23	24	4
InVigor L130	42	15	14	21	23	5
DKL 70-10	.	.	19	22	21	6
HyClass 970	.	.	14	24	19	7
Cara	30	16	10	14	17	8
InVigor L140P	.	17	12	22	17	9
6074RR	.	.	10	22	16	10