

2023

Montana Statewide Spring Canola Variety Trial




MONTANA
STATE UNIVERSITY

College of
AGRICULTURE
&
MONTANA AGRICULTURAL
EXPERIMENT STATION

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Montana Statewide Spring Canola Variety Trial 2023

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¹ **Cover photo credit.** 2023 spring canola plots at Northern Agricultural Research Center, Havre, MT.

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INTRODUCTION

The number of entries submitted to the Montana Statewide Spring Canola Variety Trial by commercial seed suppliers has increased steadily in recent years, reflecting a strong interest in agronomic performance data for canola in Montana. In 2023, performance of 28 canola hybrids was evaluated at five locations in the state (Moccasin, Sidney, Havre, Kalispell, and Conrad) under both irrigated (Sidney) and dryland conditions (all other locations).

OBJECTIVES

The objective of the 2023 Montana Statewide Spring Canola Variety Trial was to evaluate the agronomic performance of available canola hybrids and breeding lines submitted by commercial entities at testing locations across the state. The information obtained from these trials is intended to provide canola growers in Montana with unbiased information regarding which canola hybrids are best suited to their specific growing conditions.

METHODS

In spring 2023, 28 canola varieties (*Brassica napus*) with six herbicide tolerance systems (including two cultivars with no herbicide tolerance) were submitted by nine sponsors (Table 1). Originally, 36 entries from 11 sponsors were scheduled for testing. However, seed from eight cultivars did not arrive by the trial deadline. Ultimately, seed from 28 hybrids was distributed to five testing locations, (Figure 1). Testing was carried out by staff and faculty of Montana State University Agricultural Research Centers (ARCs). Testing sites included Central ARC (CARC) near Moccasin, Eastern ARC (EARC) near Sidney, Northern ARC (NARC) near Havre, Northwestern ARC (NWARC) near Kalispell, and Western Triangle ARC (WTARC) near Conrad. Different combinations of hybrids

were tested at each location, although 10 cultivars were tested at all five locations. Plots were seeded at 9 PLS/ft², with a goal of 6 established plants/ft². Seed was treated prior to seeding with Lumiderm[®] or Helix XTra[®] for control of flea beetle. Select varieties were also treated with Prosper[®] Evergol[®]. Varieties were grown in small plots ranging from 70 to 100 ft² and were replicated four times in a randomized complete block design. Hybrids were compared for plant count (plants per square feet; ft²), canopy height (inches), flowering date (Julian day of year), lodging (%), shattering (%), seed yield (pounds per acre; lb ac⁻¹), test weight (pounds per bushel; lb bu⁻¹), and oil content (%). Lodging (Kalispell) and pod shatter (Kalispell, Moccasin) were ranked on a 0 to 100 scale, and plant counts were either ranked on a 0 to 100 scale based on cover (Sidney) or seedlings were counted within a known area (all other locations). Grain yield was adjusted to 8.5% moisture. Seeding and harvest dates, fertilizer and pesticide applications, row spacing, tillage systems, and field crop histories were recorded for each location (Table 2). Meteorological and soils data were also recorded (Table 3).

INTERPRETING RESULTS

Performance data are presented by location in Tables 4-9. The Least Significant Difference (LSD) values are presented, allowing pairwise comparisons between treatment means (varieties). If the difference between two treatment values within a column exceeds the LSD value, the entries are considered statistically different from one another for that particular response variable. If the difference does not exceed the LSD value, the entries are considered statistically equal. The LSD value is replaced with 'NS' for 'non-significant' when the probability value (P-Value) exceeds 0.05. In past years, LSDs were replaced with 'NS' when coefficients of variation (CVs) of seed yield exceeded 15% and were assumed to reflect yield data of

poor quality. However, in 2023, it was observed that CVs were elevated due to dry conditions at pod fill rather than issues of data quality. Thus, in 2023, yield LSDs were reported 'as is' regardless of CVs. Within columns where P-Values are less than 0.05 and LSDs are not equal to 'NS', the value of the 'top performer' is bolded and underlined. The variety or varieties with the highest plant count, canopy height, yield, test weight, and oil content and the lowest Julian flowering date, lodging, and shatter scores are considered top performers. If the difference between the value of the top performer(s) and that of given variety within the same column does not exceed the LSD, then the latter is bolded, indicating statistical equivalence to the top performer. That is, a bolded yield value, for example, is equivalent to a bolded and underlined yield value, despite being arithmetically lower. Note that all hybrids at a given location were established in the same trial and weeds were managed uniformly across herbicide tolerance systems. In other words, imidazolinone herbicides were not used for in-crop weed control in plots containing Clearfield® hybrids; nor glufosinates for in-crop weed control on Liberty Link® hybrids; nor glyphosate on Roundup Ready® hybrids. Rather, glyphosate was applied for weed control either pre-plant or pre-emergence, depending on the location ([Table 2](#)) and weeds were controlled during the growing season by means of hand-weeding and/or alternative chemicals, not by means of herbicides paired to tolerance systems represented in the trial.

RESULTS & DISCUSSION

The following results are for informational purposes only. The presentation of data for the hybrids evaluated does not imply approval or endorsement by Montana State University. Just 10 of the 28 cultivars were tested at all five locations ([Table 1](#)). Only these 10 cultivars are considered in comparisons discussed in the next paragraph.

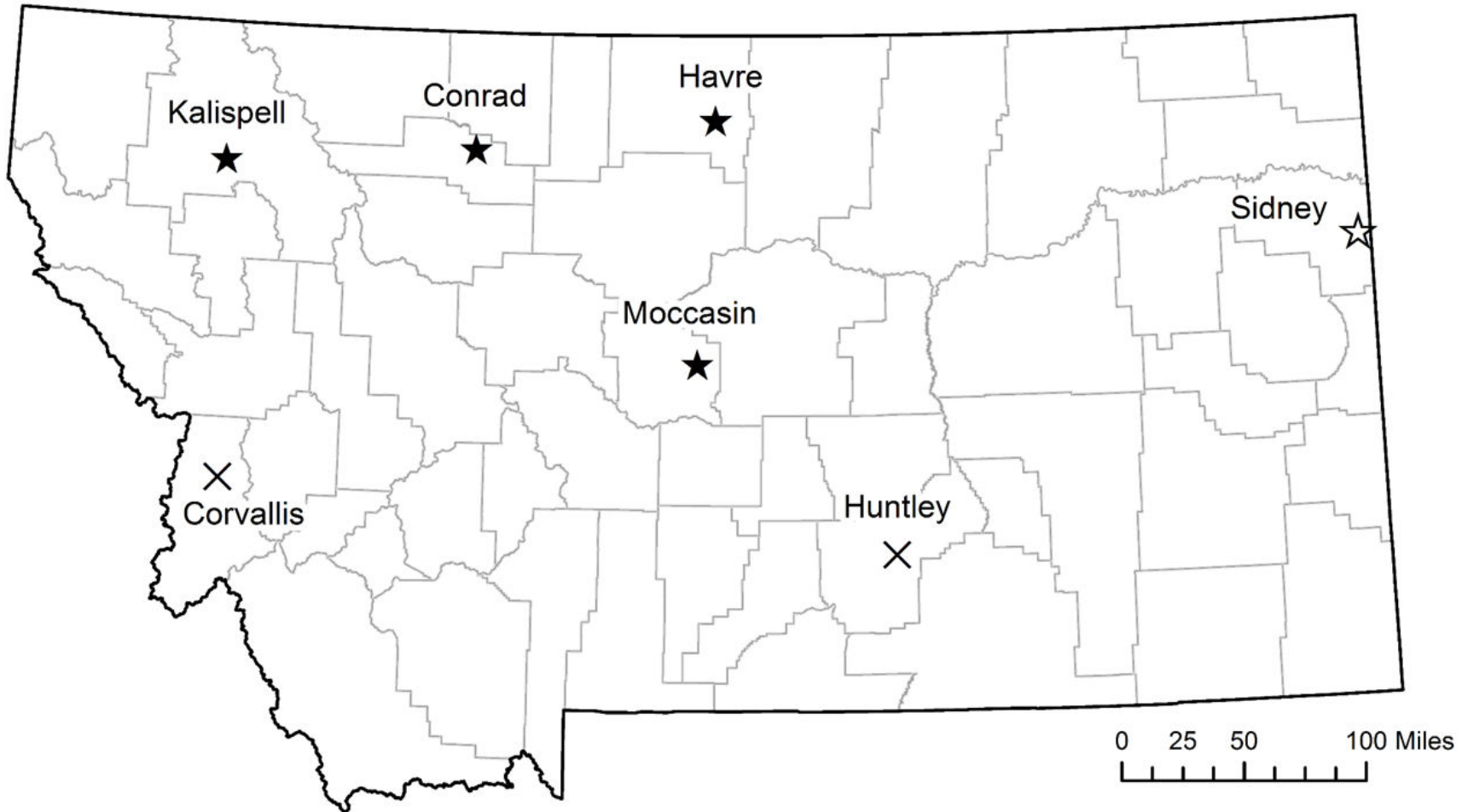
Cultivars CP7250LL and CP9978TF were among the top performers for plant density in 3 out of 3 trials where differences were detected. CP9221TF, NC155 TF, and NCC1825/8-S were among the top performers for flowering date in 5 out of 5 trials. CP7130LL was among the top performers for canopy height in 4 out of 5 trials where differences were detected. CP7130LL, CP9221TF, and CP9978TF experienced significantly more lodging than the top performer in the only trial where differences were detected (Kalispell). CP7130LL, NC471 TF, and NCC101S experienced significantly more shattering than the top performers at Moccasin and Kalispell, the only locations where shattering differences were detected. CP9221TF and CP9978TF were among the top yielding cultivars in 3 of 5 trials. CP7250LL and NC471 TF were outperformed by top yielders in all trials. NCC1825/8-S was among the top yielders in 4 of 5 trials and was a top performer for test weight at 5 of 5 testing locations. NC471 TF was a top performer for oil content at 2 of 5 locations where differences were detected. No shattering or lodging was observed at Sidney, Conrad, or Havre. Despite in-crop insecticide treatments at Sidney, NC155 TF, NC471 TF, StarFlex, and NCC101S experienced disproportionate damage from flea beetle at the seedling stage, perhaps impacting seed yield. DK902TF, DKTF99SC, DKTFLL21SC, InVigor L340PC, and InVigor L345PC were not tested at all locations, however, it is worth noting that these cultivars also experienced disproportionate flea beetle damage at Sidney. Seed yield data are summarized for all locations in [Table 4](#). Cultivar performance at each location is summarized in [Tables 5-9](#).

FUTURE PLANS

With continued support from the canola industry and research center personnel, multi-location canola evaluations will continue in 2024.

TRIAL LOCATIONS

Figure 1. Spring canola variety testing locations in 2023. Trials were established in irrigated (☆) and dryland (★) systems. Testing at Huntley and Corvallis was discontinued (×) in 2021 and 2023, respectively. [\[TOC\]](#)



CULTIVAR LIST

Table 1. 2023 cultivar list grouped by seed source, with shatter, herbicide, and disease resistance traits indicated, as well as testing location. [\[TOC\]](#)

Source	Cultivar	Resistance ^{1,2}							
		Shatter	Herbicide	Disease	Conrad	Havre	Sidney	Moccasin	KalisPELL
BASF	InVigor L233P	+	LL	BL	√	√	√		√
	InVigor L340PC	+	LL	BL+CR	√	√	√		√
	InVigor L343PC	+	LL	BL+CR	√	√	√		√
	InVigor L345PC	+	LL	BL+CR	√	√	√		√
	InVigor L350PC	+	LL	BL+CR	√	√	√		√
	InVigor LR354PC	+	RRL	BL+CR	√	√	√		√
Bayer Crop Science (DEKALB)	DK902TF	+	TF	BL+CR			√		
	DKTF99SC	+	TF	BL			√		
	DKTFLL21SC	+	TFLL	BL			√		
BrettYoung Seeds	BY 5125CL	-	CL	BL+CR		√		√	√
	BY 6211TF	+	TF	BL		√	√		√
	BY 6217TF	+	TF	BL+CR			√		√
DL Seeds Inc.	DL225372LL	+	LL	BL+CR		√		√	√
	DL225373LL	+	LL	BL+CR		√		√	√
	DL225389LL	+	LL	BL+CR		√		√	√
	DL225595TF	+	TF	BL+CR		√		√	√
	DL225634TF	+	TF	BL+CR		√		√	√
Nuseed	NC155 TF	-	TF	BL	√	√	√	√	√
	NC471 TF	-	TF	BL	√	√	√	√	√
	NC527CR TF	-	TF	BL+CR	√	√	√	√	√
Photosyntech	NCC101S	+	None	BL	√	√	√	√	√
	NCC1825/8-S	+	None	BL	√	√	√	√	√
Star Specialty Seed	StarFlex	+	TF	BL	√	√	√	√	√
Wilbur Ellis Company LLC.	7361RC	-	TF	BL+CR	√	√		√	
WinField United	CP7130LL	+	LL	BL+CR	√	√	√	√	√
	CP7250LL	+	LL	BL+CR	√	√	√	√	√
	CP9221TF	+	TF	BL+CR	√	√	√	√	√
	CP9978TF	+	TF	BL	√	√	√	√	√

¹TF = TruFlex; LL = Liberty; CL = Clearfield; TFLL = TruFlex + Liberty Link; RRL = Roundup Ready + Liberty Link

²BL = Blackleg; CR = Clubroot

MULTI- LOCATION SUMMARIES

Management Information

Table 2. 2023 spring canola variety trial management information by location. [\[TOC\]](#)

Management	Moccasin (CARC)	Sidney (EARC)	Havre (NARC)	Kalispell (NWARC)	Conrad (WTARC)
Irrigation (inches)	none	3.2	none	none	none
Tillage	no-till	Conventional	no-till	Conventional	light disc till
Row Spacing (inches)	12	10	12	6	9
Seeding Date	3-May-23	5-May-23	3-May-23	28-Apr-23	3-May-23
Harvest Date	16-Aug-23	7-Aug-23	3-Aug-23	24-Aug-23	17-Aug-23
Harvest Type	direct cut	direct cut	direct cut	direct cut	direct cut
Previous Crop	spring barley	sugar beet	spring barley	spring barley	spring barley
Fertilizer	68-26-0	80-26-0	50-15-0-20	60-35-35	20-1-0
Pesticide	RT3 pre-plant @ 24 floz/ac; Mustang Maxx seedling @ 3 floz/ac; Mustang Maxx bolting @ 4 floz/ac; Assure II @ 12 floz/A	Sonalan 10G, Preplant @ 9.5 lbs/ac; Mustang Maxx, 5/23, 5/30, 6/6, @ 4.3 oz/ac	RT 3 16 oz/ac pre-plant; Mustang Maxx. 2 oz/ac @ 4 leaf and bolting stages; hand weeded in-season	Hand weeded, Some Lambsquarter weed pressure in plots	Hand weeded, almost 0 weed pressure in plots
Pests	early and late season flea-beetle (controlled)	early season flea-beetle (controlled)	early season flea-beetle (controlled)	early season flea-beetle, no control applied	early season flea-beetle, no control applied

Meteorological and Soils Information

Table 3. 2023 soil and meteorological data by location. [\[TOC\]](#)

Meteorological and Soils	Moccasin (CARC)	Sidney (EARC)	Havre (NARC)	Kalispell (NWARC)	Conrad (WTARC)
2023 Precip. Apr thru Aug (inches)	12.00	15.26	7.22	6.70	7.81
Long-Term Avg. Precip. Apr thru Aug (inches)	8.80, 20-yr	13.92 in, 74-yr	7.95, 108-yr	9.85 in, 50-yr	10.06, 16-yr
Last Killing Frost in Spring (< 32°F)	28-Apr-23	2-May-23	28-Apr-23	28-Apr-23	27-Apr-23
First Killing Frost in Fall (< 32°F)	6-Oct-23	6-Oct-23	6-Oct-23	7-Oct-23	6-Oct-23
Frost-free Period (days)	161	157	161	162	162
2-Wk Avg. Air Temp. Beginning at First Flower (°F)	58.9	-	60.1	60.0	-
Max Summer Temperature (°F)	95.9	101.5	102.9	99.0	98.8
Date of Max Summer Temperature	24-Jul-23	24-Jul-23	25-Jul-23	18-Aug-23	24-Jul-23
Soil Type	Danvers-Judith clay loam	Savage silty clay	Telstad clay loam	Creston silt loam	Scobey clay loam
Elevation (ft)	4250	1949	2680	2910	3706

Yield Summary

Table 4. 2023 seed yield summary by location. [\[TOC\]](#)

Cultivar	Moccasin	Sidney	Havre	Kalispell	Conrad
	(CARC)	(EARC)	(NARC)	(NWARC)	(WTARC)
----- (lb ac ⁻¹) -----					
7361RC	1127	-	1213	-	634
BY 5125CL	1044	-	904	2153	-
BY 6211TF	-	2380	1120	1962	-
BY 6217TF	-	1587	-	1761	-
CP7130LL	1134	2585	1050	2116	1076
CP7250LL	1098	2231	905	2047	882
CP9221TF	1271	2405	<u>1499</u>	2086	834
CP9978TF	1411	2698	1308	2162	1124
DL225372LL	1176	-	538	1567	-
DL225373LL	830	-	250	1209	-
DL225389LL	1370	-	1041	1780	-
DL225595TF	1032	-	694	1428	-
DL225634TF	867	-	711	1341	-
DK902TF	-	2248	-	-	-
DKTF99SC	-	2502	-	-	-
DKTFLL21SC	-	2058	-	-	-
InVigor L233P	-	2682	1164	1982	1119
InVigor L340PC	-	2261	1288	2076	922
InVigor L343PC	-	<u>2772</u>	1458	2317	1108
InVigor L345PC	-	2122	1156	<u>2520</u>	<u>1367</u>
InVigor L350PC	-	1873	941	2319	491
InVigor LR354PC	-	2392	969	2169	830
NC155 TF	1150	1816	1315	2093	731
NC471 TF	1065	2098	1194	1710	623
NC527CR TF	1260	2345	1205	1988	941
NCC101S	1311	1251	1294	2123	724
NCC1825/8-S	<u>1449</u>	2556	1427	1909	1035
StarFlex	1206	2246	1017	1948	598
Average	1165	2243	1069	1948	884.6
CV	18.43	12.22	10.07	13.02	31.68
LSD	305.2	387.7	151.9	357.8	466.1
Pr(>F)	0.006	< 0.001	< 0.001	< 0.001	0.036

Bold = top performer(s) within a column

Bold = equivalent to top performer(s) within a column

INDIVIDUAL LOCATION SUMMARIES

Central Ag Research Center, Moccasin, MT

Table 5. 2023 Spring canola variety trial, CARC, Moccasin, MT. [\[TOC\]](#)

Cultivar	Plant Count (ft ²)	Flower Date (julian)	Canopy Height (inches)	Pod Shatter (%)	Seed Yield (lb ac ⁻¹)	Test Weight (lb bu ⁻¹)	Oil Content (%)
7361RC	6.3	173	54	25	1127	52.5	39.6
BY 5125CL	7.2	173	53	28	1044	52.6	42.4
CP7130LL	8.9	172	53	15	1134	53.2	37.2
CP7250LL	8.2	173	49	5	1098	52.6	39.6
CP9221TF	6.3	170	48	10	1271	53.0	38.0
CP9978TF	8.3	172	52	8	1411	52.6	39.2
DL225372LL	7.4	174	51	0	1176	51.8	43.2
DL225373LL	6.6	174	54	8	830	50.5	41.6
DL225389LL	6.9	173	53	3	1370	52.5	44.5
DL225595TF	6.8	174	57	3	1032	51.5	41.8
DL225634TF	6.7	174	58	5	867	53.4	39.6
NC155 TF	7.9	170	47	10	1150	54.2	37.2
NC471 TF	7.4	171	54	15	1065	53.8	40.9
NC527CR TF	7.0	172	53	18	1260	52.2	40.8
NCC101S	5.9	170	45	10	1311	52.6	34.6
NCC1825/8-S	6.8	170	45	3	1449	54.8	37.0
StarFlex	6.0	172	50	5	1206	52.9	42.0
Average	7.1	172	51	10	1165	52.7	40.0
CV	15	0.301	4.9	47	18.43	0.882	3.29
LSD	1.5	0.737	3.6	6.6	305.2	0.662	1.87
Pr(>F)	0.006	< 0.001	< 0.001	< 0.001	0.006	< 0.001	< 0.001

Bold = top performer(s) within a column

Bold = equivalent to top performer(s) within a column

Eastern Ag Research Center, Sidney, MT

Table 6. 2023 Spring canola variety trial, EARC, Sidney, MT. [troc](#)

Cultivar	Plant Density (0-100)	Flower Date (julian)	Canopy Height (inches)	Beetle Damage (%)	Seed Yield (lb ac ⁻¹)	Test Weight (lb bu ⁻¹)	Oil Content (%)
BY 6211TF	86	171	41	28	2380	54.5	44.3
BY 6217TF	88	177	49	18	1587	53.2	42.7
CP7130LL	94	172	48	6	2585	53.8	43.2
CP7250LL	86	176	46	23	2231	53.9	42.4
CP9221TF	91	170	37	8	2405	53.6	43.5
CP9978TF	94	170	31	13	2698	54.1	45.4
DK902TF	84	170	37	50	2248	54.1	44.5
DKTF99SC	89	171	44	53	2502	54.6	43.7
DKTFLL21SC	85	170	38	65	2058	54.0	44.6
InVigor L233P	91	170	43	14	2682	54.1	43.4
InVigor L340PC	88	172	45	34	2261	53.9	41.8
InVigor L343PC	94	171	46	14	2772	53.4	44.0
InVigor L345PC	86	173	50	31	2122	53.4	42.6
InVigor L350PC	86	176	46	29	1873	52.8	42.8
InVigor LR354PC	93	174	50	10	2392	53.2	43.7
NC155 TF	80	170	39	48	1816	55.4	41.8
NC471 TF	79	171	43	34	2098	54.5	43.1
NC527CR TF	90	170	43	21	2345	53.8	43.8
NCC101S	74	172	35	88	1251	54.4	36.0
NCC1825/8-S	86	170	41	23	2556	55.5	42.2
StarFlex	84	171	39	58	2246	54.2	45.3
Average	87	172	42	32	2243	54.0	43.1
CV	7	0.518	11	56	12.22	0.804	2.2
LSD	8.6	1.26	6.6	25	387.7	1.22	1.34
Pr(>F)	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Bold = top performer(s) within a column

Bold = equivalent to top performer(s) within a column

Northern Ag Research Center, Havre, MT

Table 7. 2023 Spring canola variety trial, NARC, Havre, MT. [\[TOC\]](#)

Cultivar	Plant Count (ft ²)	Flower Date (julian)	Canopy Height (inches)	Seed Yield (lb ac ⁻¹)	Test Weight (lb bu ⁻¹)	Oil Content (%)
7361RC	6.3	165	44.6	1213	52.7	36.1
BY 5125CL	5.4	166	46.6	904	52.7	40.4
BY 6211TF	5.7	166	46.5	1120	53.4	35.4
CP7130LL	5.1	167	49.4	1050	53.5	34.2
CP7250LL	6.8	167	44.1	905	52.7	36.8
CP9221TF	5.8	163	44.3	1499	53.1	35.3
CP9978TF	7.9	165	47.7	1308	53.1	35.3
DL225372LL	6.5	170	43.1	538	52.5	39.0
DL225373LL	5.2	173	39.4	250	53.1	ND
DL225389LL	5.2	166	44.8	1041	52.3	40.7
DL225595TF	6.6	171	46.5	694	52.8	38.6
DL225634TF	4.7	169	50.6	711	53.9	35.8
InVigor L233P	4.6	166	45.8	1164	53.1	38.8
InVigor L340PC	6.5	165	50.0	1288	53.3	38.0
InVigor L343PC	6.4	165	52.1	1458	53.1	39.4
InVigor L345PC	4.7	168	50.6	1156	53.9	36.5
InVigor L350PC	6.0	170	48.6	941	53.0	38.3
InVigor LR354PC	6.8	170	50.2	969	53.4	36.8
NC155 TF	4.6	163	43.4	1315	53.9	32.5
NC471 TF	4.3	164	46.9	1194	53.3	38.2
NC527CR TF	6.0	164	46.0	1205	52.5	37.4
NCC101S	5.7	163	44.0	1294	54.7	29.8
NCC1825/8-S	5.7	163	48.0	1427	54.5	32.6
StarFlex	6.5	165	46.4	1017	52.9	39.4
Average	5.8	166	46.6	1069	53.2	36.7
CV	18.2	0.31	4.25	10.07	0.489	2.08
LSD	1.5	0.726	2.8	151.9	0.367	1.08
Pr(>F)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Underlined = top performer(s) within a column

Bold = equivalent to top performer(s) within a column

ND = No data. Seed yield was too low to obtain oil content measurement

Northwestern Ag Research Center, Kalispell, MT

Table 8. 2023 Spring canola variety trial, NWARC, Kalispell, MT. [TOC](#)

Cultivar	Plant Count (ft ²)	Flower Date (julian)	Canopy Height (inches)	Pod Shatter ----- (%)	Lodging Score -----	Seed Yield (lb ac ⁻¹)	Test Weight (lb bu ⁻¹)	Oil Content (%)
BY 5125CL	12.0	164	52	1.5	1.8	2153	50.6	51.5
BY 6211TF	10.3	163	52	1.0	1.8	1962	51.0	50.5
BY 6217TF	10.8	166	55	1.3	1.0	1761	50.3	53.0
CP7130LL	11.0	164	52	1.8	1.8	2116	49.9	51.1
CP7250LL	11.5	165	50	0.8	1.3	2047	50.6	50.8
CP9221TF	13.0	162	47	1.0	2.3	2086	50.6	50.7
CP9978TF	12.8	163	49	0.3	1.8	2162	50.8	51.3
DL225372LL	10.8	168	50	0.8	1.3	1567	50.2	50.9
DL225373LL	11.0	176	50	0.8	0.8	1209	49.7	48.9
DL225389LL	13.3	164	50	1.3	1.0	1780	50.4	51.3
DL225595TF	10.8	170	51	0.3	1.0	1428	50.0	51.8
DL225634TF	10.0	168	55	0.8	1.0	1341	51.3	49.8
InVigor L233P	9.3	164	52	1.5	1.5	1982	50.4	51.7
InVigor L340PC	11.8	164	51	1.3	1.3	2076	50.5	50.1
InVigor L343PC	9.5	164	52	2.0	1.8	2317	50.6	51.2
InVigor L345PC	10.5	165	53	1.5	1.5	2520	50.6	51.3
InVigor L350PC	11.3	170	55	1.3	1.0	2319	50.4	51.6
InVigor LR354PC	11.0	169	56	0.5	1.3	2169	50.7	52.2
NC155 TF	10.8	162	49	0.5	1.0	2093	50.7	50.4
NC471 TF	11.8	163	49	2.3	1.0	1710	50.9	52.0
NC527CR TF	11.8	163	47	0.0	1.3	1988	49.5	51.4
NCC101S	11.0	162	44	2.5	1.3	2123	50.9	48.2
NCC1825/8-S	10.3	162	45	2.5	1.0	1909	51.3	50.0
StarFlex	14.0	163	49	0.8	1.0	1948	50.7	51.3
Average	11.2	165	51	1.2	1.3	1948	50.5	50.9
CV	23.9	0.417	5.4	90	37	13.02	0.517	1.98
LSD	NS	0.972	3.8	1.5	0.68	357.8	0.368	1.43
Pr(>F)	0.789	< 0.001	< 0.001	0.045	0.003	< 0.001	< 0.001	< 0.001

Bold = top performer(s) within a column

Bold = equivalent to top performer(s) within a column

NS = Not significant

Western Triangle Ag Research Center, Conrad, MT

Table 9. 2023 Spring canola variety trial, WTARC, Conrad, MT. [\[TOC\]](#)

Cultivar	Plant Count (ft ²)	Flower Date (julian)	Canopy Height (inches)	Seed Yield (lb ac ⁻¹)	Test Weight (lb bu ⁻¹)	Oil Content (%)
7361RC	4.2	176	37.3	634	50.9	44.3
CP7130LL	4.8	174	45.7	1076	52.3	40.6
CP7250LL	4.3	176	42.3	882	51.7	41.8
CP9221TF	4.6	172	35.0	834	51.7	42.1
CP9978TF	5.2	173	38.3	1124	51.8	40.9
InVigor L233P	4.5	177	40.7	1119	52.2	41.7
InVigor L340PC	5.2	175	39.7	922	52.2	41.7
InVigor L343PC	4.4	174	41.0	1108	51.3	42.0
InVigor L345PC	5.3	177	46.3	1367	52.5	41.3
InVigor L350PC	4.2	180	42.0	491	52.4	40.6
InVigor LR354PC	3.8	178	42.7	830	52.7	40.1
NC155 TF	5.6	175	36.7	731	52.2	41.6
NC471 TF	3.4	173	39.7	623	51.8	45.2
NC527CR TF	4.6	174	38.0	941	51.1	41.6
NCC101S	4.5	172	32.7	724	52.4	38.6
NCC1825/8-S	4.4	172	38.0	1035	53.3	39.7
StarFlex	4.5	174	38.0	598	51.7	43.2
Average	4.6	175	39.6	884.6	52.0	41.6
CV	28	1.47	9.19	31.68	0.546	1.98
LSD	NS	4.26	6.06	466.1	0.472	1.37
Pr(>F)	0.898	0.041	0.006	0.036	< 0.001	< 0.001

Bold = top performer(s) within a column

Bold = equivalent to top performer(s) within a column

NS = Not significant