

2021

Montana Statewide Spring Canola Variety Trial



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Montana Statewide Spring Canola Variety Trial 2021

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INTRODUCTION

Canola yields in Montana increased at a rate of 5 bu/ac/yr from 2017 to 2020, owing in part to the development of new canola hybrids better suited to Montana growing conditions. Still, Montana canola yields are consistently below national averages. Selection of varieties adapted to local growing conditions is one way close the yield gap with other states. Performance of 31 canola hybrids was evaluated at six locations in Montana (Moccasin, Sidney, Havre, Kalispell, Corvallis, and Conrad) under both dryland and irrigated conditions.

OBJECTIVES

The objective of the 2021 Montana Statewide Spring Canola Variety Trial was to evaluate the agronomic performance of available canola hybrids and breeding lines submitted by commercial entities at research locations across the state. The information obtained from these trials is intended to provide canola growers in Montana with reliable, unbiased information regarding which canola hybrids are best suited to their specific growing conditions.

METHODS

In spring 2021, 31 canola varieties (*Brassica napus*) with six herbicide tolerance systems (including two cultivars with no herbicide tolerance) were submitted by ten sponsors ([Table 1](#)). The seed was distributed to six Montana State University agricultural research centers ([Figure 1](#)): Central Ag near Moccasin (CARC), Eastern Ag near Sidney (EARC), Northern Ag near Havre (NARC), Northwestern Ag near Kalispell (NWARC), Western Ag near Corvallis (WARC), and Western Triangle Ag near Conrad. Different combinations of hybrids were tested at each location, although 10 cultivars were established at every location.

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 density (COUNT), canopy height (HT), flowering date (FLWR), lodging (LDGE), shattering (SHTTR), grain yield (YLD), test weight (TWT), and oil content (OIL). Lodging and shatter were ranked either on a 0 to 5 scale (Havre) or a 0 to 100 scale (all other locations). Similarly, plant densities 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 when seed amount did not prevent measurement of moisture content. 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 4-10](#). Least Significant Difference (LSD) values were not presented due to an abnormally high percentage of missing data at several locations, preventing the use of standard analytical procedures (one-way analysis of variance) and reliable LSD calculations. Rather, an analytical approach deemed more appropriate for unbalanced datasets (linear mixed modelling with Tukey pairwise comparisons) was employed, where a probability value (*p*-value) exceeding 0.05 indicates statistical equivalence. The variety or varieties with the *highest* plant count, canopy height, yield, test weight, and oil and the *lowest* Julian flowering date, lodging, and shatter scores are considered top-performers. The value of the top-performer

within a given column is **bolded and underlined**. If the difference between the value of the top-performer(s) and that of a given variety within the same column is not significant by Tukey pairwise comparisons ($p > 0.05$), then the latter is **bolded**, indicating no real difference between this variety and the top performer. Because a low number of observations tends to elevate standard error values for individual treatments (cultivars), top-performers with missing data were not always statistically different from other cultivars, even when differences were detected among treatments. That is, differences detected among treatments did not always involve the top-performer (e.g., yield data [Tables 8-9](#)).

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 typically applied for weed control either pre-plant or pre-emergence, depending on 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 31 cultivars were tested at all six locations ([Table 1](#)). Only these 10 cultivars are considered in comparisons discussed in the next paragraph.

NCC101S, DG 200CL, and DKTFLL21SC were among the top performers for establishment in 3 out of 3 trials where differences were detected. NCC101S was among the top performers for flowering date in 6 out of 6 trials where differences were detected. BY 5125CL, CP7130LL, CP7144LL, DG 761TM, and DKTF91SC were among the top performers for canopy height in 4 out of 4 trials where differences were detected. BY 6211TF and DG 761TM experienced significantly more lodging than the top performer in the only trial where differences were detected (Kalispell). DG 760TM and DG 761TM experienced significantly more shattering than the top performers at Moccasin and Havre, respectively, the only locations where shattering differences were detected. BY 5125CL was outperformed by the top yielder at 3 of 5 locations where yield differences were detected. NCC101S was outperformed by the top performers for oil content at 4 of 4 locations where differences were detected. Finally, DKTFLL21SC and NCC101S were among the top performers for test weight at 4 of 4 locations where differences were detected.

No shattering or lodging was observed at Sidney, Conrad, or Corvallis. Yield CV% values were unfavorably high at 4 of 6 locations, owing mainly to severe drought stress, even at irrigated locations. Insect (Moccasin, Sidney) and bird pests (Corvallis) were also reported, though performance impacts were minimal.

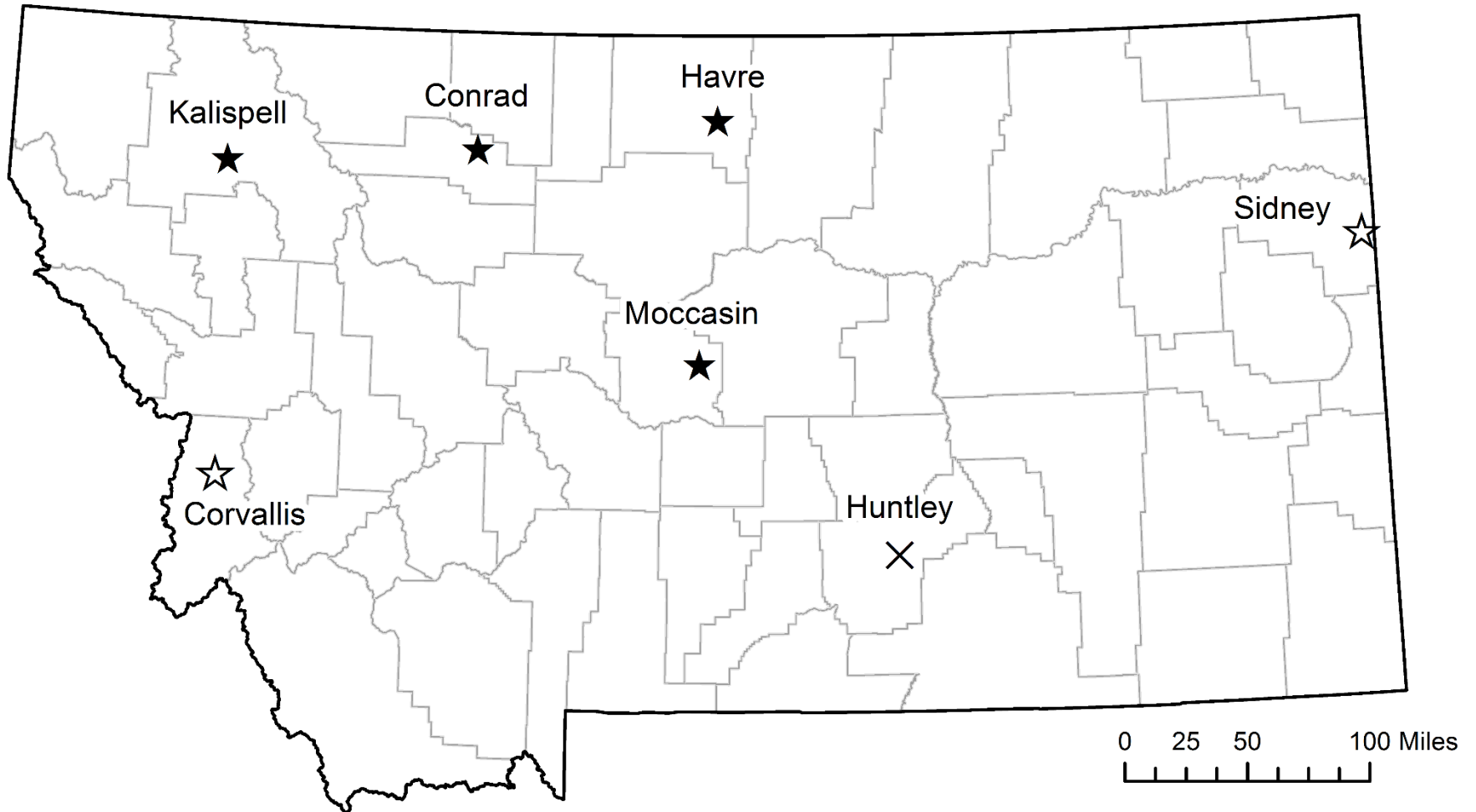
Yield data are summarized for all locations in [Table 4](#). Cultivar performance at each location is summarized in [Tables 5-10](#).

FUTURE PLANS

With continued support from the canola industry and research center personnel, multi-location canola evaluations will continue in 2022.

TRIAL LOCATIONS

Figure 1. Spring canola variety testing locations in 2021. Trials were established in irrigated (open symbols) and dryland (closed symbols) systems. Testing at Huntley was discontinued (x) in 2021. [\[TOC\]](#)



CULTIVAR LIST

Table 1. 2021 cultivar list grouped by genetic modification status, herbicide resistance, and source, with shatter and disease resistance traits indicated. [\[TOC\]](#)

GM STATUS	¹ HERB RESIST	SOURCE	CULTIVAR	² RESISTANCE					
				S	BL	CR	FS		
Non-GM	None	University of Idaho	Empire	Y	-	-	-		
		Photosyntech	³ NCC101S	Y	MR	-	-		
		BrettYoung Seeds	³ BY 5125CL	N	R	R	-		
			Meridian Seeds, LLC	CS2500 CL	N	R	-	-	
				CS2700 CL	N	R	R	-	
			Dyna-Gro Seed	³ DG 200CL	N	R	-	R	
GM	LL	WinField United	³ CP7130LL	-	-	-	-		
			³ CP7144LL	-	-	-	-		
		Meridian Seeds, LLC	CS4000 LL	Y	R	R	-		
		BASF Corporation	InVigor L233P	Y	R	-	-		
			InVigor L234PC	Y	R	-	-		
			InVigor L340PC	Y	R	-	-		
			InVigor L345PC	Y	R	-	-		
			InVigor L357P	Y	R	-	-		
		LL & TF	Bayer Crop Science (Dekalb)	³ DKTFLL21SC	Y	R	-	-	
			BASF Corporation	InVigor LR344PC	Y	R	-	-	
		RR	WinField United	CP930RR	Y	R	-	-	
				CP9919RR	Y	R	-	-	
		TF	BrettYoung Seeds	³ BY 6211TF	Y	R	-	-	
				Nuseed	NC155 TF	N	R	-	-
					NC401 TF	N	R	-	-
					NC471 TF	N	R	-	-
			Dyna-Gro Seed	³ DG 760TM	Y	R	-	R	
				³ DG 761TM	Y	R	-	R	
			WinField United	CP9978TF	Y	R	-	-	
			Meridian Seeds, LLC	CS2600 CR-T	Y	R	R	-	
				CS3000 TF	Y	R	R	-	
			Star Specialty Seed	StarFlex	Y	R	-	-	
		Bayer Crop Science (Dekalb)	³ DKTF91SC	Y	R	-	-		
			X19D94214	Y	R	-	-		

¹CL = Clearfield, LL = Liberty Link, RR = Roundup Ready, TF = TruFlex; ²S = Shatter, BL = Blackleg, CR = Clubroot, FS = Fusarium; ³Tested at all six locations

Shatter/disease ratings provided by seed suppliers: Y = Yes, N = No, R = Resistant, MR = Moderately Resistant

MULTI- LOCATION SUMMARIES

Management Information

Table 2. 2021 spring canola variety trial management information by location. [\[TOC\]](#)

MANAGEMENT	MOCCASIN (CARC)	SIDNEY (EARC)	HAVRE (NARC)	KALISPELL (NWARC)	CORVALLIS (WARC)	CONRAD (WTARC)
Irrigation (inches)	None	2.68	None	None	4.2	None
Tillage	no-till	conventional	no-till	conventional	conventional	conventional
Row Spacing (inches)	12	7	12	6	6	12
Seeding Date	4/30/2021	4/29/2021	4/28/2021	4/28/2021	4/28/2021	-
Harvest Date	8/4/2021	7/28/2021	8/5/2021	8/13/2021	8/19/2021	8/28/2021
Harvest Type	direct cut	direct cut	direct cut	direct cut	direct cut	direct cut
Previous Crop	foxtail millet	spring wheat	spring wheat	barley	chickpea	fallow
Fertilizer	46-0-0-21 @ 100 lb/ac	80-26-0-0 @ 100 lb/ac	50-15-0-20 @ 100 lb/ac	75-30-35-10 @ 100 lb/ac	46-0-0-0 @ 100 lb/ac	11-52-0-0 @ 40 lb/ac
Pesticide	preplant burndown RT3 @ 32 floz/ac on 4/16; Stinger (clopyralid) at 8 floz/ac on 5/27; Grizzly Too @ 2 floz/ac on 6/7; Mustang Maxx @ 3 floz/ac on 7/14	Sonalan HFP @ 48 floz/ac on 4/2; Mustang Maxx @ 4 floz/ac on 5/26, 6/1, and 6/10; Assure II @ 12 floz/ac on 6/1	Mustang Maxx @ 4 floz/ac on 5/29	Stinger (clopyralid) on 6/2; Quadris on 6/17	Glufosinate preplant burndown, Stinger (clopyralid) @ 1/3 pt/ac on 5/25	-
Pests	early and late season flea beetle; late season grasshoppers	early season flea beetle	-	-	birds	-

Meteorological and Soils Information

Table 3. 2021 soil and meteorological data by location. [\[TOC\]](#)

METEOROLOGICAL & SOILS	MOCCASIN (CARC)	SIDNEY (EARC)	HAVRE (NARC)	KALISPELL (NWARC)	CORVALLIS (WARC)	CONRAD (WTARC)
2021 Apr thru Aug Precip (inches)	8.08	5.39	5.3	8.85	5.82	5.45
Long-Term Average Precip & Period of Record (inches)	10.2 (1911-2020)	9.53 (1949-2020)	7.95 (1916-2020)	8.65 (1989-2020)	5.65 (1988-2020)	7.15 (1989-2020)
Last Killing Frost in Spring (< 32°F)	5/22/2021	5/11/2021	5/23/2021	5/19/2021	5/29/2021	5/27/2021
First Killing Frost in Fall (< 32°F)	10/11/2021	10/19/2021	9/17/2021	9/17/2021	9/13/2021	10/12/2021
Frost-free Period (days)	142	161	117	120	103	138
2-wk Avg. Air Temp Beginning at First Flowering (°F)	71	-	-	-	73.1	-
Max Summer Temperature (°F)	98.2	102.9	101.8	-	98.6	94
Date of Max Summer Temperature	6/16/2021	7/19/2021	6/16/2021	-	7/31/2021	7/1/2021
Soil Type	Danvers-Judith clay loam	Savage silty clay	Telstad-Joplin loam	Creston silt loam	Burnt Fork loam	Scobey-Kevin clay loam
Elevation (feet)	4250	1939	2668	2956	3597	3700
Note(s)	severe drought stress	-	-	none to very limited shatter	-	-

Yield Summary

Table 4. 2021 yield summary by location. [\[TOC\]](#)

¹ HERB RESIST	CULTIVAR	MOCCASIN (CARC)	² SIDNEY (EARC)	HAVRE (NARC)	KALISPELL (NWARC)	² CORVALLIS (WARC)	CONRAD (WTARC)
None	Empire	-	-	12.7	-	-	10.9
	NCC101S	2.9	13.4	14.4	68.0	1.2	10.6
CL	BY 5125CL	2.0	8.2	12.6	60.6	0.4	9.0
	CS2500 CL	1.7	-	13.6	-	-	12.8
	CS2700 CL	2.1	-	13.1	-	-	11.9
	DG 200CL	3.7	8.9	17.0	61.4	1.8	9.8
LL	CP7130LL	2.2	12.4	15.6	64.0	0.5	11.4
	CP7144LL	3.6	11.0	15.3	59.9	1.7	16.2
	CS4000 LL	3.6	-	14.8	-	-	13.7
	InVigor L233P	-	10.3	14.7	64.7	-	16.4
	InVigor L234PC	-	11.3	13.6	66.0	-	16.6
	InVigor L340PC	-	11.8	14.0	70.7	-	17.8
	InVigor L345PC	-	11.2	20.6	71.1	-	19.3
	InVigor L357P	-	-	-	65.1	-	-
LL & TF	DKTFLL21SC	2.7	8.7	17.0	67.5	0.6	13.6
	InVigor LR344PC	-	14.6	15.7	59.3	-	15.7
RR	CP930RR	2.6	8.1	18.0	61.1	-	15.2
	CP9919RR	2.6	11.3	14.3	55.9	-	14.6
TF	BY 6211TF	4.0	12.8	13.8	60.4	1.8	14.4
	CP9978TF	3.0	10.7	13.8	52.8	-	16.1
	CS2600 CR-T	2.7	-	16.6	-	-	15.5
	CS3000 TF	-	-	15.8	-	-	-
	DG 760TM	3.1	11.3	15.5	60.0	0.7	16.1
	DG 761TM	3.1	11.5	13.6	58.0	1.0	9.0
	DKTF91SC	2.5	12.4	16.4	60.8	1.2	12.9
	NC155 TF	-	13.6	-	-	-	-
	NC401 TF	2.8	8.9	-	69.8	-	-
	NC471 TF	2.5	13.0	-	67.3	-	-
	NC527CR TF	2.2	-	-	-	-	-
	StarFlex	-	10.0	14.9	-	-	13.7
	X19D94214	2.3	12.8	13.2	66.2	-	11.1

Bold = top-performer within a column; **Bold** = statistically equivalent to top-performer by Tukey pairwise comparisons ($p > 0.05$)

¹CL = Clearfield; LL = Liberty Link; RR = Roundup Ready; TF = TruFlex; ²Irrigated

INDIVIDUAL LOCATION SUMMARIES

Central Ag Research Center, Moccasin, MT

Table 5. 2021 Spring canola variety trial, CARC, Moccasin, MT. [\[TOC\]](#)

CULTIVAR	COUNT (ft ²)	FLWR (DOY)	HT (in)	LDGE ----- (%) -----	SHTTR	YLD (bu/ac)	¹ TWT (lb/bu)	¹ OIL (%)
BY 5125CL	4.0	175.5	26.0	0.0	55	2.0	47.5	49.1
BY 6211TF	6.0	174.3	28.7	0.0	45	4.0	51.8	46.9
CP7130LL	4.7	174.8	27.8	0.0	30	2.2	51.1	46.9
CP7144LL	5.0	176.0	28.2	0.0	20	3.6	49.3	46.7
CP930RR	5.1	173.5	26.8	0.0	25	2.6	50.7	49.8
CP9919RR	5.0	173.5	26.2	0.0	55	2.6	49.2	46.9
CP9978TF	4.8	173.8	27.8	0.0	30	3.0	51.4	46.6
CS2500 CL	5.2	174.8	28.2	0.0	25	1.7	-	46.5
CS2600 CR-T	5.7	175.0	26.3	0.0	25	2.7	50.7	50.2
CS2700 CL	5.5	176.0	27.4	0.0	55	2.1	48.8	49.8
CS4000 LL	4.3	175.0	28.2	0.0	30	3.6	51.8	48.3
DG 200CL	5.9	175.8	26.4	0.0	40	3.7	50.6	46.0
DG 760TM	4.8	174.3	28.4	0.0	70	3.1	51.5	47.4
DG 761TM	6.7	175.0	26.0	0.0	50	3.1	51.0	47.2
DKTF91SC	5.6	174.5	25.8	0.0	40	2.5	49.7	48.5
DKTFLL21SC	6.5	173.8	26.8	0.0	40	2.7	51.1	47.8
NC401 TF	5.6	174.8	26.7	0.0	30	2.8	52.2	46.3
NC471 TF	6.7	175.0	27.4	0.0	25	2.5	49.9	49.0
NC527CR TF	4.0	174.0	27.3	0.0	75	2.2	50.5	50.5
NCC101S	6.5	172.5	26.5	0.0	35	2.9	52.1	42.3
X19D94214	6.0	174.8	27.4	0.0	40	2.3	50.2	49.5
Mean	5.4	174.6	27.1	0.0	40	2.8	50.6	47.7
CV%	15.7	0.3	5.4	-	40	23.5	-	-
P-Value	<0.001	<0.001	0.135	-	<0.001	<0.001	-	-

Bold = top performer within a column

Bold = equivalent to top performer by Tukey pairwise comparisons ($p > 0.05$)

¹Insufficient seed from individual plots. Seed from multiple plots was combined to take a single reading.

Eastern Ag Research Center, Sidney, MT

Table 6. 2021 Spring canola variety trial, EARC, Sidney, MT. [\[TOC\]](#)

CULTIVAR	COUNT (%)	FLWR (DOY)	HT (in)	LDGE - - - - (%) - - - -	SHTTR	YLD (bu/ac)	TWT (lb/bu)	OIL (%)
BY 5125CL	85	172.0	32.4	0.0	0.0	8.1	53.3	42.5
BY 6211TF	85	169.0	34.0	0.0	0.0	12.8	54.0	40.9
CP7130LL	91	172.5	34.5	0.0	0.0	12.5	55.7	38.5
CP7144LL	91	173.0	37.3	0.0	0.0	11.0	54.6	38.0
CP930RR	82	169.4	30.8	0.0	0.0	8.1	52.5	44.3
CP9919RR	76	169.0	31.2	0.0	0.0	11.3	52.7	38.8
CP9978TF	83	168.5	31.6	0.0	0.0	10.7	53.6	40.6
DG 200CL	91	173.0	35.6	0.0	0.0	8.9	52.9	38.4
DG 760TM	85	170.5	30.1	0.0	0.0	11.3	54.0	42.7
DG 761TM	90	172.3	33.1	0.0	0.0	11.5	54.4	41.0
DKTF91SC	89	169.8	31.2	0.0	0.0	12.4	53.5	43.4
DKTFLL21SC	78	169.9	30.3	0.0	0.0	8.7	54.1	41.9
InVigor L233P	78	172.0	32.8	0.0	0.0	10.3	53.6	39.3
InVigor L234PC	85	171.3	33.5	0.0	0.0	11.3	54.9	41.0
InVigor L340PC	86	171.5	30.8	0.0	0.0	11.8	54.5	39.2
InVigor L345PC	80	170.5	35.0	0.0	0.0	11.2	54.3	38.8
InVigor LR344PC	90	172.0	36.4	0.0	0.0	14.6	52.8	42.0
NC155 TF	88	169.0	33.1	0.0	0.0	13.6	55.2	38.3
NC401 TF	83	171.9	34.4	0.0	0.0	8.9	54.0	38.4
NC471 TF	94	171.3	36.0	0.0	0.0	13.0	54.3	42.7
NCC101S	95	167.4	29.4	0.0	0.0	13.4	54.6	35.3
StarFlex	84	169.0	31.3	0.0	0.0	10.0	54.2	43.5
X19D94214	94	169.0	32.2	0.0	0.0	12.8	54.0	42.1
Mean	86	170.6	32.9	0.0	0.0	11.2	54.0	40.5
CV%	11	0.8	7.6	-	-	26.8	1.3	3.0
P-Value	0.310	<0.001	0.001	-	-	0.202	<0.001	<0.001

Bold = top performer within a column

Bold = equivalent to top performer by Tukey pairwise comparisons ($p > 0.05$)

Northern Ag Research Center, Havre, MT

Table 7. 2021 Spring canola variety trial, NARC, Havre, MT. [TOC](#)

CULTIVAR	COUNT (ft ²)	FLWR (DOY)	HT (in)	LDGE ----- (0-5) -----	SHTTR -----	YLD (bu/ac)	TWT (lb/bu)	OIL (%)
BY 5125CL	4.6	169.5	33.4	0.0	0.6	12.6	49.4	41.3
BY 6211TF	4.7	167.8	32.6	0.0	0.3	13.8	50.2	37.8
CP7130LL	4.3	169.0	37.0	0.0	1.7	15.6	51.6	37.1
CP7144LL	5.2	169.0	36.7	0.0	0.6	15.3	51.1	37.8
CP930RR	3.9	166.5	34.9	0.0	1.7	18.0	49.7	41.9
CP9919RR	4.0	166.8	30.6	0.0	0.6	14.3	48.6	36.6
CP9978TF	4.4	167.3	33.2	0.0	0.1	13.8	49.7	36.2
CS2500 CL	4.5	168.5	35.4	0.0	2.6	13.6	49.2	41.9
CS2600 CR-T	3.7	167.5	33.8	0.0	1.1	16.6	49.0	41.1
CS2700 CL	4.8	169.8	36.3	0.0	3.7	13.1	49.3	41.7
CS4000 LL	3.5	170.0	37.7	0.0	1.7	14.8	51.6	37.7
CS3000 TF	4.2	167.0	31.9	0.0	0.3	15.8	51.2	39.2
DG 200CL	4.6	168.0	32.7	0.0	0.6	17.0	48.1	38.1
DG 760TM	4.0	168.0	32.4	0.0	1.1	15.5	50.2	38.4
DG 761TM	4.3	169.0	36.9	0.0	5.0	13.6	50.3	38.1
DKTF91SC	3.9	167.3	34.5	0.0	0.3	16.4	49.5	40.0
DKTFLL21SC	4.4	166.8	34.5	0.0	0.3	17.0	50.6	39.1
Empire	4.0	167.3	30.9	0.0	1.7	12.7	51.6	38.2
InVigor L233P	5.8	168.5	34.3	0.0	0.0	14.7	50.5	39.4
InVigor L234PC	3.6	168.8	34.2	0.0	0.0	13.6	49.9	41.0
InVigor L340PC	4.1	169.5	34.2	0.0	0.0	14.0	51.3	38.0
InVigor L345PC	3.8	168.8	38.2	0.0	0.0	20.6	51.1	38.5
InVigor LR344PC	4.5	168.8	34.5	0.0	0.1	15.7	48.6	41.6
NCC101S	5.4	165.3	34.5	0.0	0.1	14.4	51.3	30.3
StarFlex	4.5	167.5	33.5	0.0	0.6	14.9	51.1	39.7
X19D94214	4.8	168.3	35.3	0.0	1.7	13.2	49.5	40.1
Mean	4.4	168.1	34.4	0.0	1.0	15.0	50.2	38.9
CV%	11.5	0.4	5.4	-	101	8.2	0.8	1.8
P-Value	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001

Bold = top performer within a column

Underlined Bold = equivalent to top performer by Tukey pairwise comparisons ($p > 0.05$)

Northwestern Ag Research Center, Kalispell, MT

Table 8. 2021 Spring canola variety trial, NWARC, Kalispell, MT. [TOC](#)

CULTIVAR	COUNT (ft ²)	FLWR (DOY)	HT (in)	LDGE ----- (%) -----	SHTTR	YLD (bu/ac)	TWT (lb/bu)	OIL (%)
BY 5125CL	10.0	174.3	57.4	33.8	0.0	60.6	51.7	49.4
BY 6211TF	7.6	173.4	58.8	81.7	0.0	60.4	52.2	46.9
CP7130LL	9.8	174.3	58.4	22.5	0.0	64.0	51.6	48.0
CP7144LL	9.0	175.3	55.4	6.3	0.0	59.9	51.3	47.6
CP930RR	9.6	170.3	50.1	9.6	0.0	61.1	51.6	50.4
CP9919RR	8.0	171.3	51.6	63.5	0.0	55.9	51.4	49.0
CP9978TF	8.8	172.6	58.3	39.9	0.0	52.8	51.9	47.0
DG 200CL	10.0	175.8	56.1	8.8	0.0	61.4	51.6	48.3
DG 760TM	9.7	172.7	54.3	30.5	0.0	60.0	52.1	48.0
DG 761TM	9.8	174.8	58.3	60.0	0.0	58.0	52.0	48.4
DKTF91SC	10.3	171.5	55.4	16.3	0.0	60.8	51.4	49.2
DKTFLL21SC	7.9	172.0	56.0	25.1	0.0	67.5	52.1	49.3
InVigor L233P	10.0	173.5	58.7	45.0	0.0	64.7	51.6	47.6
InVigor L234PC	9.3	173.5	56.9	26.3	0.0	66.0	51.5	47.5
InVigor L340PC	9.0	173.5	58.5	27.5	0.0	70.7	51.3	47.6
InVigor L345PC	10.3	174.0	57.8	50.1	0.0	71.1	51.8	48.0
InVigor L357P	8.8	174.5	59.2	13.8	0.0	65.1	52.4	47.5
InVigor LR344PC	7.8	173.8	57.7	36.3	0.0	59.3	51.5	47.6
NC401 TF	8.8	174.0	54.3	6.5	0.0	69.8	52.6	48.5
NC471 TF	8.8	173.5	57.3	6.2	0.0	67.3	51.7	47.4
NCC101S	10.3	170.0	50.2	21.3	0.0	68.0	52.4	44.4
X19D94214	9.5	173.8	54.7	32.5	0.0	66.2	52.0	47.8
Mean	9.2	173.3	56.1	30.1	0.0	63.2	51.8	48.0
CV%	18.2	0.40	4.7	65.0	241	9.1	0.5	2.1
P-Value	0.623	<0.001	<0.001	<0.001	0.292	0.005	<0.001	<0.001

Bold = top performer within a column

Bold = equivalent to top performer by Tukey pairwise comparisons ($p > 0.05$)

Western Ag Research Center, Corvallis, MT

Table 9. 2021 Spring canola variety trial, WARC, Corvallis, MT. [\[TOC\]](#)

CULTIVAR	COUNT (ft ²)	FLWR (DOY)	HT (in)	LDGE - - - - (%) - - - -	SHTTR	YLD (bu/ac)	¹ TWT (lb/bu)	¹ OIL (%)
BY 5125CL	6.5	179.0	34.0	0.0	0.0	0.4	-	-
BY 6211TF	8.1	177.3	33.7	0.0	0.0	1.8	-	-
CP7130LL	8.1	179.0	32.7	0.0	0.0	0.5	-	-
CP7144LL	8.3	179.0	33.7	0.0	0.0	1.7	-	-
DG 200CL	9.2	179.0	32.0	0.0	0.0	1.8	-	-
DG 760TM	7.9	179.0	30.3	0.0	0.0	0.7	-	-
DG 761TM	9.3	179.0	33.2	0.0	0.0	1.0	-	-
DKTF91SC	11.3	177.3	32.7	0.0	0.0	1.2	-	-
DKTFLL21SC	10.3	177.3	31.3	0.0	0.0	0.6	-	-
NCC101S	12.3	172.0	30.8	0.0	0.0	1.2	-	-
Mean	9.1	177.8	32.4	0.0	0.0	1.1	-	-
CV%	18.0	1.0	8.3	-	-	63.9	-	-
P-Value	0.001	<0.001	0.491	-	-	0.043	-	-

Bold = top performer within a column

Bold = equivalent to top performer by Tukey pairwise comparisons ($p > 0.05$)

¹Insufficient seed to perform test

Western Triangle Ag Research Center, Conrad, MT

Table 10. 2021 Spring canola variety trial, WTARC, Conrad, MT. [TOC](#)

CULTIVAR	COUNT (ft ²)	FLWR (DOY)	HT (in)	LDGE ----- (%) -----	SHTTR	YLD (bu/ac)	¹ TWT (lb/bu)	OIL (%)
BY 5125CL	13.8	183.2	34.5	0	0	9.0	51.5	42.6
BY 6211TF	12.8	181.8	34.0	0	0	14.4	-	39.5
CP7130LL	11.8	181.5	37.0	0	0	11.4	51.3	40.2
CP7144LL	14.8	183.8	36.8	0	0	16.2	50.9	42.2
CP930RR	16.0	179.8	33.5	0	0	15.2	-	44.5
CP9919RR	13.3	179.8	32.3	0	0	14.6	-	41.0
CP9978TF	12.5	181.5	34.3	0	0	16.1	50.8	40.2
CS2500 CL	14.0	180.8	36.3	0	0	12.8	51.6	41.0
CS2600 CR-T	15.0	181.3	34.3	0	0	15.5	50.6	44.2
CS2700 CL	15.0	184.5	38.5	0	0	11.9	-	44.4
CS4000 LL	14.3	182.3	37.3	0	0	13.7	-	42.4
DG 200CL	16.3	184.0	35.3	0	0	9.8	-	42.0
DG 760TM	12.0	181.5	36.8	0	0	16.1	51.0	42.1
DG 761TM	16.0	183.0	36.0	0	0	9.0	-	41.7
DKTF91SC	16.3	181.3	35.3	0	0	12.9	-	40.4
DKTFLL21SC	13.0	180.5	31.5	0	0	13.6	51.2	40.8
Empire	16.0	180.8	32.5	0	0	10.9	-	40.5
InVigor L233P	14.8	181.8	35.8	0	0	16.4	51.3	40.9
InVigor L234PC	13.5	180.5	35.3	0	0	16.6	50.3	42.5
InVigor L340PC	16.8	181.5	36.0	0	0	17.8	49.6	41.3
InVigor L345PC	14.0	181.3	36.8	0	0	19.3	50.9	40.1
InVigor LR344PC	15.8	182.8	34.5	0	0	15.7	50.2	40.6
NCC101S	12.8	180.3	31.5	0	0	10.6	51.8	35.7
StarFlex	12.5	180.8	35.3	0	0	13.7	51.5	41.2
X19D94214	16.0	181.5	35.5	0	0	11.1	51.3	42.8
Mean	14.3	181.6	35.1	0	0	13.8	51.0	41.4
CV%	30.3	0.9	6.6	-	-	24.3	0.4	5.1
P-Value	0.974	0.001	0.002	-	-	<0.001	0.009	<0.001

Bold = top performer within a column

Bold = equivalent to top performer by Tukey pairwise comparisons ($p > 0.05$)

¹Not enough seed to perform test on all varieties.