2018-2019 Winter Canola Performance Trial Results

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Production Season

Conditions throughout the 2018-2019 canola production season were considered favorable and created expectations of higher than average yields for the crop heading towards harvest. However, challenging conditions late in the season and during harvest resulted in average to below-average yields. These yields, paired with lower acreage harvested, resulted in substantially lower production compared to previous years. Regardless, there is still promise for winter canola in the southern Great Plains as growers realize the benefits that canola provides to Oklahoma production systems, especially the rotational and weed management advantages.

Growers that planted during the last week of September were able to take advantage of a full soil moisture profile and timely early season rains. Lingering drought in certain regions or excessive moisture in others limited the opportunity for timely planting. While intentions were to plant in October, excessive precipitation resulted in planting much later than normal. These later plantings failed to establish stands on several acres is the primary cause of the greatly diminished acres in 2018-2019.

Frequent rainfall and mild conditions allowed canola planted in late September and early October to develop a good root system and, at minimum, the four to six leaves needed to successfully overwinter. Even where planting was delayed, canola had time to develop an adequate root system prior to the first major frost event. Therefore, winter kill was not common in 2018-2019. The primary concern heading into winter was regionalized areas of flooding, which diminished stands during early season growth.

Winter conditions were mainly favorable. As with most Oklahoma winters, periods of rapid warming and cooling did exist, which typically does not favor winter canola. Very few major cold snaps were experienced and colder conditions were mostly associated with prolonged periods of cooling in the days prior. Early spring remained cool and recommencement of growth was delayed. Throughout much of the spring the canola crop was two to four weeks behind expected growth stage. This delayed growth resulted in a prolonged flowering period and favored larger and fuller racemes. The impact of areas with excessive moisture in the late fall and early winter were found with these larger and heavier reproductive structures. Widespread incidence of stem cracks and stem rot (termed “canola crud”) were found in many regions. In areas with good stands, little to no impact was noted, while areas with poor stands experienced a significant amount of lodging (noted in the variety trials).

Compared to previous seasons, pest pressure across the state was significantly lower. Very little early season Lepidoptera activity was noted, which has been a major pest in previous years. Throughout reproductive growth, very little activity from aphids was observed. Due to wet and mild conditions, the incidence of cinch bugs was lower than normal. Blackleg incidence was higher than the previous years, primarily due to the wetter-than-average conditions during the fall. However, as with previous years, yield losses associated with the infection remain relatively unknown. Higher incidence of Sclerotinia was noted through fields but only negligible yield loss was noted. Weeds continued to be the primary pest throughout the region but this varied field to field. In fields with good stands, limited weed pressure was noted due to the amount of vegetative growth produced by the canola plant. In thinner stands, wild mustards and broadleaves were the primary culprit due to the higher precipitation. These were easily controlled in fields with access to glyphosate, but in conventional canola fields these continue to be a challenge to control in-season.

Conditions during dry-down and harvest were the most challenging. Small windows existed in some regions in the state where growers successfully swathed canola prior to harvest. This was critical, as much of the crop matured unevenly this year and swathing allowed for a more consistent harvest. Those growers that did not get the crop swathed had to rely on natural drying to occur with a standing crop. Warmer conditions in May did allow the crop to dry, but was accompanied by additional precipitation. This contributed to the delayed harvest, with some reports indicating a finished crop standing for weeks prior to harvest. These conditions resulted in a high amount of crop loss through continued lodging with high winds and heavy rain as well as high rates

of shatter loss prior to and during harvest. At the time of writing this report, final results for yields have not been finalized, but initial findings indicated between 10,000 and 20,000 acres of canola were harvested with average yields ranging from 20 to 25 bushels per acre.

Interpreting the data

Details of trial establishment and management for each location are noted above the production tables. Least significant differences (LSD) for yield are listed at the bottom of the summary tables. Differences between cultivars are significantly different only if they are equal to or greater than the LSD value. If a given cultivar out-yields another cultivar by as much or more than the LSD value, then the confidence is 95 percent the yield discrepancies are due to actual differences between cultivars. With only 5 percent probability,that the differences are due to chance alone. For example, if cultivar X yielded 500 pounds per acre more than cultivar Y, then it is significantly different only if the LSD value is 500 or less. If the LSD value is 501 pounds per acre or greater, then we are less confident that cultivar X outperformed cultivar Y under the conditions of the test. Additionally, in the summary tables, the highest yielding cultivar appears in bold text, and all cultivars that are not significantly different than the highest yielding cultivar are highlighted in gray.

The results of these tests should be representative of what would occur throughout the state but are more indicative of the environmental conditions and management practices similar to those under the testing conditions. This is due to the amount of influence that soil type, winter conditions, soil moisture, diseases and insects can have on yield.

Methods

All test locations contained both conventional and glyphosate-resistant cultivars, unless otherwise noted. Plots were 5 feet wide by 20 feet long and seeded at the rate of 3.3 pounds per acre. All plots were planted at 7.5-inch spacing, indifferent of tillage practices in the trial. Soil sample results are indicated on each table. All pest management practices were carried out in accordance with Oklahoma State University Cooperative Extension recommendations. Entire plots were either swathed and harvested or directly harvested (indicated on each table) at maturity.

Additional information

Partial funding for these trials and the results of the trials were provided by USDA NIFA-SACC program, Oklahoma Agricultural Experiment Stations, and support from the private companies participating in the trials.

A copy of this publication as well as additional variety information and current recommendations for winter canola management in the southern Great Plains can be found at: canola.okstate.edu.

The authors would like to thank the following individuals for their cooperation in gathering information for this current report:

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David Nowlin- Caddo County
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Rick Nelson- Garfield County
Troy Gosney- Major County
Courtney May- Ottawa

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Erich Wehrenberg- North Central Research Station (Lahoma)
Michael Pettijohn- South Central Research Station (Chickasha)

Winter canola performance trial at the North Central Research Station at Lahoma, Oklahoma.

Table 1. Overview of cultivars used in the 2018-2019 Oklahoma winter canola tests.

Company	*Entry*	*Hybrid or Open Pollinated*	*Herbicide Resistant*	*SU Residual Tolerant*
Kansas State University	Riley	OP	N	N
	Surefire	OP	N	Y
	KSR 4723	OP	Glyphosate	N
	KSR 4765	OP	Glyphosate	N
	KSR 4767	OP	Glyphosate	N
Lima Grain				
	Advocat	H	N	N
	Architect	H	N	N
Photosyntech				
	MH16HIC231	-	N	-
	MH16HIC001	-	N	-
RuBisCo				
	Mercedes	HYB	N	N
	Inspiration	HYB	N	N
Croplan				
	CP115WRR	OP	Glyphosate	Y
	CP225WRR	OP	Glyphosate	Y
	CP320WRR	OP	Glyphosate	N

Table 2. Conventional winter canola cultivars tested at the North Central Research Station at Lahoma during the 2018-2019 season.

Lahoma, Major County Conventional

Cooperator: Erich Weinburg
Soil test: pH- 6.3, P-98ppm, K- 214ppm
Previous crop: Wheat

County educator: Troy Gosney
Tillage: Conventional tillage
Harvest type: Direct Cut

Company	*Cultivar*	*Yield (lbs/ac)*	*Harvest Moisture*	*Test Weight (lbs/bu)*	*Lodging rating[1] (1-5)*	*Shatter rating[1] (1-5)*	*Oil content (%)*	*Protein content (%)*
Rubisco	Mercedes	2,705	10.2	50.0	1.3	1.8	42.1	21.3
Rubisco	Inspiration	3,050	7.9	51.3	1.3	1.0	41.6	21.1
Photosyntech	MH16HIC231	2,604	8.5	50.1	1.0	1.3	41.4	21.0
Photosyntech	MH16HIC001	3,027	8.1	50.4	1.5	1.0	41.3	20.9
KSU Breeding	Riley	2,134	7.6	50.9	1.3	1.0	40.7	22.7
KSU Breeding	Surefire	2,270	7.8	50.9	1.5	1.3	39.6	23.3
Lima Grain	Advocat	3,072	13.0	48.3	1.8	1.5	42.8	20.6
Lima Grain	Architect	**3,412**	9.0	50.4	1.8	1.5	42.6	20.7
Average		2,784	9.0	50.3	1.4	1.3	41.5	21.5
CV		15.7	20.17	14.83				
LSD(0.05)		601.3						

[1]Lodging and shatter rating on a 1 to 5 scale, with 1 being minimal or non-existent and 5 being severe or a complete loss.
Top yielding cultivar appears in bold. Shaded values indicate yields not significantly different from the highest yielding cultivar.

Table 3. Glyphosate-tolerant winter canola cultivars tested at the North Central Research Station at Lahoma during the 2018-2019 season.

Lahoma, Major County Glyphosate Tolerant

Cooperator: Erich Weinburg
Soil test: pH- 6.3, P-98ppm, K- 214ppm
Previous crop: Wheat

County educator: Troy Gosney
Tillage: Conventional tillage
Harvest type: Direct Cut

Company	*Cultivar*	*Yield (lbs/ac)*	*Harvest Moisture*	*Test Weight (lbs/bu)*	*Lodging rating[1] (1-5)*	*Shatter rating[1] (1-5)*	*Oil content (%)*	*Protein content (%)*
CROPLAN	CP115WRR	2,411	7.0	48.4	2.8	2.0	40.3	23.0
CROPLAN	CP225WRR	2,538	7.2	50.0	3.0	2.0	38.7	22.9
CROPLAN	CP320WRR	**2,755**	6.7	49.4	2.5	1.8	38.8	23.1
KSU Breeding	KSR 4723	2,466	7.1	51.4	2.8	2.3	39.5	22.9
KSU Breeding	KSR 4765	2,508	8.0	50.0	2.5	1.8	40.1	23.0
KSU Breeding	KSR 4767	2,350	6.2	38.7	2.3	2.5	41.9	23.2
Average		2,505	7.0	48.0	2.6	2.0	39.9	23.0
CV		5.6	8.78	9.67				
LSD(0.05)		270.1						

[1]Lodging and shatter rating on a 1 to 5 scale, with 1 being minimal or non-existent and 5 being severe or a complete loss.
Top yielding cultivar appears in bold. Shaded values indicate yields not significantly different from the highest yielding cultivar.

Table 4. Conventional winter canola cultivars tested at the Miami during the 2018-2019 season.

Miami, Ottawa County Conventional

Cooperator: Brent Rendel
Soil test: pH- 5.9, P-74ppm, K- 117ppm
Previous crop: Wheat

County educator: Courtney May
Tillage: No/Minimum Tillage
Harvest type: Direct Cut

Company	*Cultivar*	*Yield (lbs/ac)*	*Harvest Moisture*	*Test Weight (lbs/bu)*	*Lodging rating[1] (1-5)*	*Shatter rating[1] (1-5)*	*Oil content (%)*	*Protein content (%)*
Rubisco	Mercedes	1,933	8.9	50.2	1.00	1.00	42.9	15.9
Rubisco	Inspiration	2,087	8.5	49.6	1.25	1.00	41.1	17.3
Photosyntech	MH16HIC231	**2,339**	8.5	50.0	1.25	1.25	42.6	16.0
Photosyntech	MH16HIC001	2,083	9.1	49.2	1.00	1.00	43.3	15.4
KSU Breeding	Riley	1,927	7.5	49.0	1.25	1.00	42.6	16.8
KSU Breeding	Surefire	2,015	7.9	50.6	1.00	1.25	40.5	18.0
Lima Grain	Advocat	2,207	9.3	47.9	1.50	1.50	44.8	14.7
Lima Grain	Architect	2,250	8.3	49.7	1.00	1.50	43.9	15.1
Average		2,105	8.5	49.5	1.2	1.2	47.7	16.1
CV		7.1	7.21	8.70				
LSD(0.05)		231.6						

[1]Lodging and shatter rating on a 1 to 5 scale, with 1 being minimal or non-existent and 5 being severe or a complete loss.
Top yielding cultivar appears in bold. Shaded values indicate yields not significantly different from the highest yielding cultivar.

Table 5. Glyphosate-tolerant winter canola cultivars tested at the Miami, Oklahoma during the 2018-2019 season

Miami, Ottawa County Glyphosate Tolerant

Cooperator: Brent Rendel
Soil test: pH- 5.9, P-74ppm, K- 117ppm
Previous crop: Wheat

County educator: Courtney May
Tillage: No/Minimum Tillage
Harvest type: Direct Cut

Company	*Cultivar*	*Yield (lbs/ac)*	*Harvest Moisture*	*Test Weight (lbs/bu)*	*Lodging rating[1] (1-5)*	*Shatter rating[1] (1-5)*	*Oil content (%)*	*Protein content (%)*
CROPLAN	CP115WRR	1,605	8.7	48.9	3.25	1.75	45.2	19.9
CROPLAN	CP225WRR	**1,777**	8.0	54.2	2.75	1.50	44.2	20.0
CROPLAN	CP320WRR	1,725	7.6	51.4	2.75	1.50	42.7	21.1
KSU Breeding	KSR 4723	1,401	7.4	50.3	3.00	2.00	43.5	20.2
KSU Breeding	KSR 4765	1,501	8.3	52.7	2.25	1.50	42.1	20.3
KSU Breeding	KSR 4767	1,445	7.8	51.9	2.50	2.00	42.8	20.3
Average		1,576	8.0	51.6	2.8	1.7	43.4	20.3
CV		9.7	6.05	13.58				
LSD(0.05)		208.1						

[1]Lodging and shatter rating on a 1 to 5 scale, with 1 being minimal or non-existent and 5 being severe or a complete loss.
Top yielding cultivar appears in bold. Shaded values indicate yields not significantly different from the highest yielding cultivar.

Table 6. Open-pollenated winter canola cultivars tested at the South Central Research Station in Chickasha during the 2018-2019 season. Results are part of the National Winter Canola Performance test.

Chickasha National Canola Test

Cooperator: Michael Pettijohn
Soil test: pH- 6.9, P-58ppm, K- 188ppm
Previous crop: Wheat

County educator: David Nowlin
Tillage: Conventional Tillage
Harvest type: Direct Cut

Company	*Cultivar*	*Yield (lbs/ac)*	*Harvest Moisture*	*Test Weight (lbs/bu)*
KSU Breeding	KS4670	1,505	8.0	49.7
KSU Breeding	KS4719	2,129	8.7	49.3
KSU Breeding	KSR4723	842	8.9	50.0
KSU Breeding	KSR4767	1,152	9.4	48.7
KSU Breeding	Surefire	1,584	8.9	50.3
KSU Breeding	Riley	2,112	8.0	48.3
KSU Breeding	Sumner	1,104	8.2	49.9
KSU Breeding	Wichita	1,658	8.8	49.5
Ohlde Seed Farms	Torrington	1,361	8.9	49.5
CROPLAN	CP115WRR	1,427	8.0	47.0
CROPLAN	CP225WRR	2,173	8.1	49.5
CROPLAN	CP320WRR	2,238	8.3	48.8
Star Specialty Seed	Star 915W	1,588	7.8	50.3
Star Specialty Seed	Star 930W	1,065	10.1	50.2
KWS-MOMONT	Quartz	1,558	8.3	50.5

Table 7. Hybrid winter canola cultivars tested at the South Central Research Station in Chickasha during the 2018-2019 season. Results are part of the National Winter Canola Performance test.

Chickasha National Canola Test

Cooperator: Michael Pettijohn
Soil test: pH- 6.9, P-58ppm, K- 188ppm
Previous crop: Wheat

County educator: David Nowlin
Tillage: Conventional Tillage
Harvest type: Direct Cut

Company	*Cultivar*	*Yield (lbs/ac)*	*Harvest Moisture*	*Test Weight (lbs/bu)*
KWS-MOMONT	Hamour	1,514	5.6	33.9
KWS-MOMONT	MH 15AY085	2,365	8.9	50.7
KWS-MOMONT	MH 15HT229	2,810	8.7	48.9
KWS-MOMONT	MH 14ES125	2,600	8.7	48.5
KWS-MOMONT	MH 15HT227	2,971	8.6	47.2
Limagrain	Advocat	2,740	9.5	48.8
Limagrain	Architect	3,285	9.0	48.8
Monsanto	MONSD1	2,051	10.1	51.0
Monsanto	MONSD2	2,325	8.7	49.9
Monsanto	MONSD3	1,627	9.4	49.4
Monsanto	MONSD4	2,513	9.1	49.5
Rubisco Seeds	Phoenix CL	2,897	8.3	49.6
Rubisco Seeds	Plurax CL	2,491	8.9	50.4
Rubisco Seeds	Popular	1,662	8.8	50.3

Winter canola performance trials at the North Central Research Station in Lahoma (left) and in Grant County (right) during the 2019 winter canola tours.

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