Canola

TOP NOTCH
FARMING
RESEARCH TRIALS

by SASK OILSEEDS

Overview

In 2023, its inaugural year, SaskOilseeds' Top Notch Farming Trials marked a milestone with a dedicated focus on field-scale research. This investment of levy dollars directly benefits canola farmers by addressing on-farm challenges and questions they may have specific to their farm. By investing in research applicable at the farm level, SaskOilseeds emphasizes its commitment to growing producer prosperity. The program has grown to 6 protocols and 29 sites in 2025. SaskOilseeds works in collaboration with Kayla Slind, Project Lead at the Western Applied Research Corporation (WARC).

The goal of our program is to actively seek input from farmers and agronomists to shape future projects, and cultivate a collaborative network between SaskOilseeds, farmers, agronomists, and research.

Protocol: Boron Applications in Canola

Protocol: Split Nitrogen or Top-Up Nitrogen Application

Protocol: Canola Enhanced Efficiency Nitrogen Fertilizer

Protocol: Canola Seeding Rate and Survivability

Protocol: Sclerotinia Fungicide

Protocol: Blackleg Fungicide

TOP NOTCH FARMING RESEARCH TRIALS

Boron Applications in Canola

Boron (B) is a vital micronutrient for canola, playing several key roles in its growth and development. It is essential for synthesizing pectin, which is crucial for maintaining the structural integrity of plant cell walls. Boron also influences flower and seed development, enhancing pollination and seed set—both vital for achieving high yields. Additionally, it facilitates the movement of sugars and nutrients within the plant, ensuring efficient energy distribution for growth. Adequate levels of boron promote healthy root development, improving water and nutrient uptake. Furthermore, boron helps plants resist abiotic stresses like drought and salinity. A deficiency in boron can lead to poor plant health, lower yields, and compromised quality, highlighting its importance in canola cultivation.

Objective

The objective of this field-scale trial is to assess the effectiveness and cost-efficiency of various boron placements, timings, and rates for canola under different environmental conditions and risk factors.

Treatments

1)	Untreated check
2)	Treated (Boron application)

Boron was applied according to product label recommendations, and treatments were replicated four times, for a total of eight strips and randomized within the field. Apart from the boron application, all strips were managed the same agronomically including seeding, fertility, and pesticide applications.

Data Collection

- Spring soil sample
- Boron application data
- Tissue testing
- Disease assessments
- Yield – weighed separately for each treatment strip using weigh wagon or grain cart scale
- Harvest samples for each plot
- Regular scouting for treatment differences in weed pressure, flowering, maturity, disease pressure, plant health, or plant structure
- Economical breakdown
- Management data
- Weather data

The following footnotes will be referred to for individual site report for this protocol:

[1]SED is a measure of how much variability (same units as mean) you would expect in the difference between sample means if you repeated the experiment several times. The Least Significant Difference (LSD) is approximately 2 times the SED.

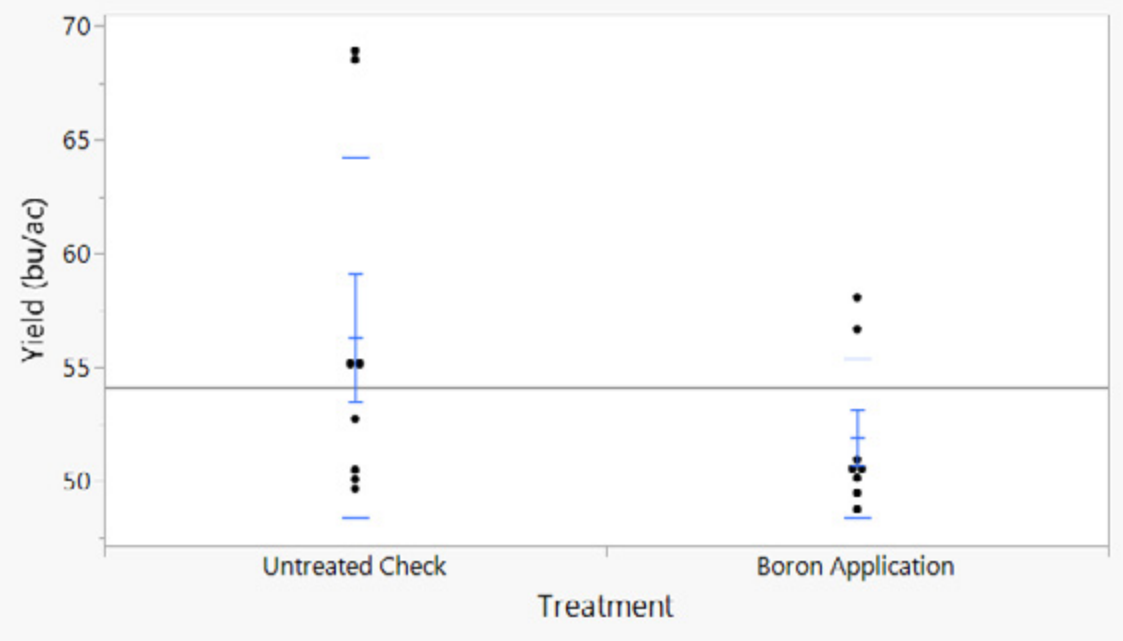
[2]A linear regression was used to assess the effects of varieties on the response variables. The data was also analyzed using the Mixed Model procedure in JMP with replicate considered random and boron application considered a fixed effect. Treatment means were separated using Least Significant Difference (LSD) test. All treatment effects and differences between means were considered significant at $p \leq 0.05$. However, p-values of 0.05-0.1 may also be acknowledged.

$P < 0.05$: There is a 95% probability (19 out of 20 times) that the observed difference is due to the treatment rather than random variation.
$P < 0.1$: There is a 90% probability (9 out of 10 times) that the difference is due to the treatment effect.
$P > 0.1$: There is a higher likelihood that the observed difference is due to random variability rather than the treatment.

2025 Combined Results (2 sites)

Only yield could be analyzed across sites, as it was the sole parameter measured consistently at both locations. In the combined analysis, the untreated check produced a significantly higher yield than the boron application; however, this difference was driven primarily by site effects rather than a consistent treatment response. Specifically, the untreated check yielded higher at the Birsay site, which disproportionately influenced the overall analysis. As a result, the observed yield difference reflects location-specific performance rather than a clear yield advantage associated with the absence of boron application.

Treatment	Yield (bu/ac)
Untreated Check	56.3 a
Boron Application	51.9 b
SED[1]	1.00
p-value[2]	0.0046



TOP NOTCH FARMING RESEARCH TRIALS

Boron Applications in Canola
(Birsay)

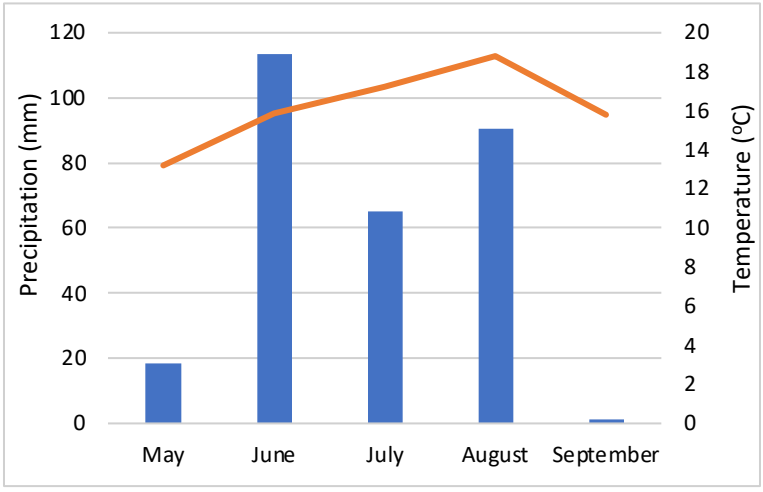
Objective: To assess the effectiveness and cost-efficiency of various boron placements, timings, and rates for canola under different environmental conditions and risk factors.

Treatment #	Description
1	Untreated Check
2	Boron Application

Boron Application	
Product	10% ATP Granular Boron
Rate	10 lb/ac
Date	June 5
Crop Stage	2 leaf

General Trial Information		
Variety	InVigor L356PC	
Thousand Seed Weight (TSW)	4.8 g	
Seed Treatment	Buteo® Start (flupyradifurone)	
Previous Crop	Wheat	
Fall 2025 Soil Organic Matter	1.1%	
Fall 2025 Residual Nitrate-N		
- **0-6”**	11 lb/ac	
- **6-24”**	15 lb/ac	
Boron (ppm)	Treated	Untreated
- **Fall 2025 Soil Test**	0.7	0.4
- **June 24 Tissue Test**	27	27
- **July 8 Tissue Test**	90	65
Seeding Date	May 20, 2025	
Seeding Equipment	Bourgault 6700	
Seeding Rate	4.5 lb/ac	
Seeding Depth	½”	
Seeding Speed	4 mph	
Total Applied Fertilizer (lb/ac N-P-K-S)	80 – 25 – 0 – 14	
Crop Protection	May 10: Certitude® (topramezone + bromoxynil) June 17: Liberty® (glufosinate) + Centurion® (clethodim)	

Precipitation and temperature from local weather station



Treatment	Yield (bu/ac)
Untreated Check	61.9 a
Boron Application	53.9 b
SED[1]	1.96
p-value[2]	0.0265

Grain Analysis	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	3.8	64.5	20.4	6.3	0.0	45.9
Boron Application	3.0	64.8	25.7	8.8	0.0	42.3

Economics

	Boron Cost ($/ac)[y]	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Untreated Check	0.00	61.9	13.00	804.70	804.70	0.00
Boron Application	7.82	53.9	13.00	700.70	692.88	-111.82

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (Sulfur (S) and Other $7.82/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Yield was the only parameter evaluated at this location and had a significant effect. The untreated check resulted in an 8 bu/ac increase over the boron application. Boron levels were sufficient throughout the trial.

To review footnote references please refer to overall trial summary on page 54.

This trial was conducted with the agronomic support of Nutrien

TOP NOTCH FARMING RESEARCH TRIALS

Boron Applications in Canola

(Wilkie)

Objective: To assess the effectiveness and cost-efficiency of various boron placements, timings, and rates for canola under different environmental conditions and risk factors.

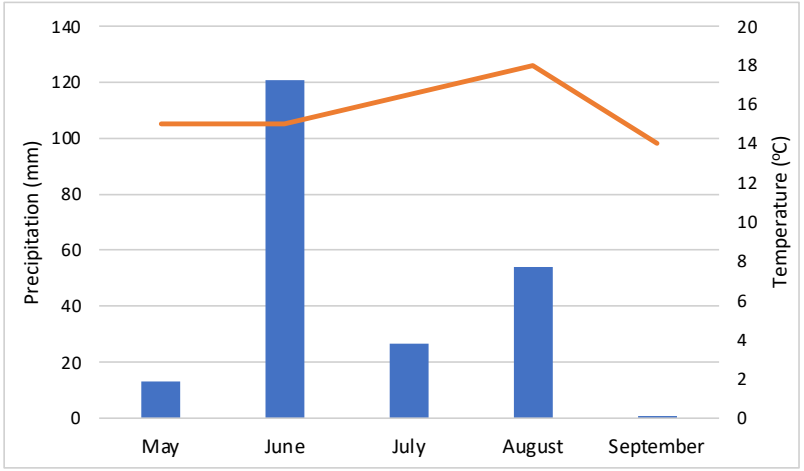
Treatment #	Description
1	Untreated Check
2	Boron Application

General Trial Information

Variety	P519L
Thousand Seed Weight (TSW)	5.59 g
Seed Treatment	LumiGEN® (inpyrfluxam, metalaxyl, ipconazole, picoxystrobin + thiamethoxam)
Previous Crop	Wheat
Soil Organic Matter	4.4%
Residual Nitrate-N	
- **0-6”**	15 lb/ac
- **6-24”**	30 lb/ac
Boron (ppm)	0.9
Seeding Date	May 17, 2025
Seeding Equipment	Seed Hawk 6510
Seeding Rate	4.3 lb/ac
Seeding Depth	¾”
Seeding Speed	4.2 mph
Total Applied Fertilizer (lb/ac N-P-K-S)	112 – 48 – 2 – 15
Crop Protection	May 16: Glyphosate + Revenge® (carfentrazone) June 9: Liberty® (glufosinate) + Independence® (clethodim) June 26: Liberty® (glufosinate)

Boron Application	
Product	Kinetic Boron
Rate	0.5 L/ac
Date	June 26
Crop Stage	Cabbaging
Water Volume	10 gal/ac
Speed	11 mph
Sprayer	Case 4440
Nozzle	Flat fan

Precipitation and temperature from local weather station



Results

	Boron Tissue Test (ppm)	Sclerotinia (0-5)	Blackleg		Verticillium Stripe (Y/N)*	Aster Yellows (Y/N)*
			Basal Canker (0-5)	Stem Lesions (Y/N)*		
Untreated Check	21 b	0.08 a	0.23 a	0.10 a	0.0 a	0.0 a
Boron Application	27 a	0.25 a	0.05 a	0.05 a	0.0 a	0.0 a
SED[1]	0.00	0.075	0.111	0.096	0.0	0.0
p-value[2]	0.024	0.102	0.213	0.638	1.0	1.0

*yes=1, no=0

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	50.7 a	2.8 a	63.0 a	21.3 a	5.6 a	0.09 a	48.3 a
Boron Application	49.9 a	2.8 a	62.9 a	21.5 a	5.6 a	0.20 a	49.2 a
SED[1]	0.436	0.052	0.110	0.166	0.035	0.055	0.492
p-value[2]	0.157	0.769	0.507	0.507	1.0	0.135	0.165

Economics

Treatment	Boron ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Untreated Check	0.00	0.00	50.7	13.00	659.10	659.10	0.00
Boron Application	7.82	7.82	49.9	13.00	648.70	640.88	-18.22

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (sulphur and other cost $7.82/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Boron application significantly increased tissue boron concentration compared with the untreated check (27 vs. 21 ppm; p = 0.024), confirming effective nutrient uptake; however, this increase did not translate into measurable agronomic or disease benefits. Disease levels, including sclerotinia, blackleg basal canker and stem lesions, verticillium stripe, and aster yellows, were low and statistically similar between treatments (p > 0.05). Yield and all assessed seed quality parameters—thousand kernel weight, test weight, protein, moisture, green seed, and oil content—also did not differ between the untreated check and the boron application, with yield averaging approximately 50 bu/ac. Overall, while boron application improved plant boron status, it did not affect disease incidence, yield, or grain quality under the conditions of this study.

To review footnote references please refer to overall trial summary on page 54.

This trial was conducted with the agronomic support of

WARC Western Applied Research Corporation — Research from our farms to yours

TOP NOTCH
FARMING
RESEARCH TRIALS
Brought to you by SaskOilseeds

Canola Enhanced Efficiency Nitrogen Fertilizer Trial

Nitrogen (N) is one of the most important nutrients for canola production in Saskatchewan. Producers have been challenged with maximizing nitrogen use efficiency while increasing yield and quality due to high fertilizer prices and government/societal pressure to minimize greenhouse gas emissions. As part of a nitrogen management plan, producers have included the use of enhanced efficiency nitrogen fertilizer (EENF) products including urease inhibitors, nitrification inhibitors and controlled release nitrogen or combination products. These products have the potential to reduce nutrient loss and increase N fertilizer efficiency. Producers are interested in using an EENF to sustain or increase yield and quality on their farm but are unsure of the best practices for their growing conditions and operation and whether it is economical.

Objective

To examine different ratios or proportions of treated and untreated N fertilizer using an EENF product of choice, compared to 100% untreated N fertilizer, on canola establishment, yield, and quality under various management, soil, and weather conditions in Saskatchewan.

Treatments

1)	100% untreated N fertilizer
2)	75% untreated N fertilizer + 25% treated with EENF
3)	50% untreated + 50% treated

Trials were set up in randomized strips with four replications, for a total of 12 plots. All plots were managed the same agronomically, besides N fertility, including seeding date, variety, seeding depth, seed treatment, and pesticide application.

Data Collection

- Soil samples
- Plant density
- The following management and agronomic data were recorded precisely:
  - Fertilizer products, rates, placement, timing
  - Equipment type, opener, and row spacing
  - Canola variety, TSW and seeding rate
  - Crop protection: seed treatment, pesticide applications
  - Previous crop and residue accumulation
  - General notes on weed, insect, disease infestations, and notable weather events
- Yield was determined for each plot separately by weighing with a weigh wagon or grain cart with scale
- Grain samples were collected from each plot separately for grain quality analysis.

The following footnotes will be referred to for individual site report for this protocol:

[1]SED is a measure of how much variability (same units as mean) you would expect in the difference between sample means if you repeated the experiment several times. The Least Significant Difference (LSD) is approximately 2 times the SED.

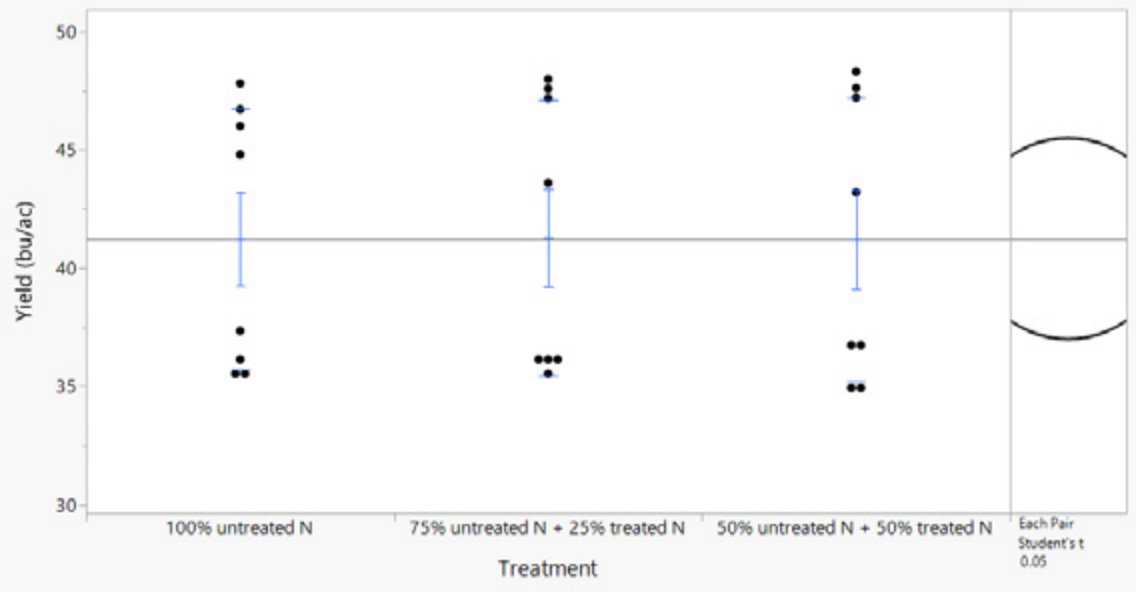
[2]A linear regression was used to assess the effects of varieties on the response variables. The data was also analyzed using the Mixed Model procedure in JMP with replicate considered random and nitrogen considered a fixed effect. Treatment means were separated using Least Significant Difference (LSD) test. All treatment effects and differences between means were considered significant at $p \leq 0.05$. However, p-values of 0.05-0.1 may also be acknowledged.

P < 0.05: There is a 95% probability (19 out of 20 times) that the observed difference is due to the treatment rather than random variation.
P < 0.1: There is a 90% probability (9 out of 10 times) that the difference is due to the treatment effect.
P > 0.1: There is a higher likelihood that the observed difference is due to random variability rather than the treatment.

2024 Combined Results (2 sites)

Only two out of the three sites were combined due to the third site conducting different treatments. Across all treatments, there were no significant differences in plant density, yield, or seed quality. Plant density averaged 7–8 plants/ft^2, and yield remained stable at approximately 41.2 bu/ac across treatments. Thousand kernel weight, test weight, protein, oil, moisture, and green seed levels were also similar among treatments. These results indicate that increasing the proportion of treated seed up to 50% did not affect crop establishment, yield, or grain quality under the conditions of this study.

	Plant Density (plants/ft^2)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000s)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% untreated N	8 a	41.2 a	66.0 a	4.3 a	22.2 a	5.7 a	0.0 a	48.5 a
75% untreated + 25% treated	8 a	41.3 a	66.0 a	4.3 a	21.8 a	5.6 a	0.0 a	48.8 a
50% untreated + 50% treated	7 a	41.2 a	66.0 a	4.6 a	22.3 a	6.0 a	0.0 a	47.8 a
SED[1]	0.275	0.714	0.067	0.129	0.293	0.329	0.0	0.534
p-value[2]	0.313	0.994	0.374	0.143	0.206	0.390	1.0	0.216



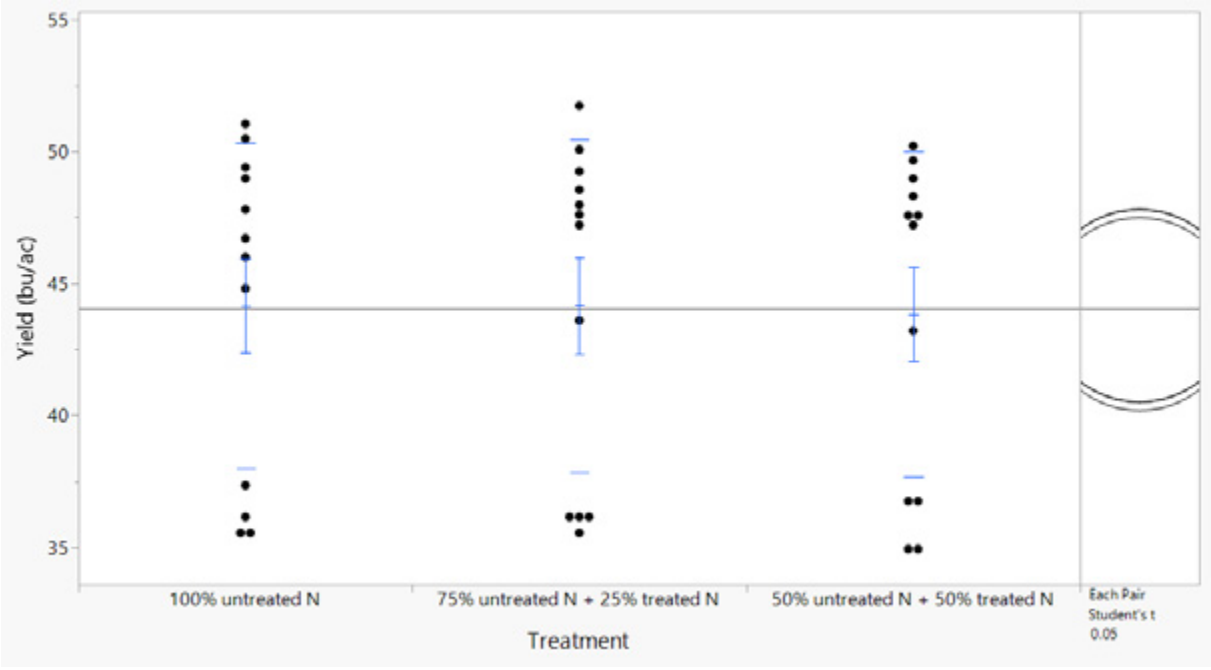
2025 Combined Results

Because only two sites were completed in 2025 and each site evaluated different treatments, a combined analysis was not possible, as treatment responses were confounded by site effects and results were driven more by location than by treatment differences.

2024 and 2025 Combined Results (3 sites)

2 sites from 2024 and 1 site from 2025 were analyzed in the combined results. Across all treatments, there were no significant differences in plant density, yield, or seed quality. Plant density was consistent at 7 plants/ft², and yield averaged approximately 44 bu/ac across treatments. Thousand kernel weight, test weight, protein, oil, moisture, and green seed levels were also similar among treatments. Overall, increasing the proportion of treated seed up to 50% did not impact crop establishment, yield, or grain quality under the conditions of this study.

	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% untreated N	7 a	44.2 a	45.4 a	25.1 a	22.0 a	5.6 a	0.01 a	49.4 a
75% untreated + 25% treated	7 a	44.2 a	45.3 a	25.1 a	21.6 a	5.5 a	0.02 a	49.6 a
50% untreated + 50% treated	7 a	43.8 a	45.3 a	25.3 a	22.0 a	5.8 a	0.02 a	49.1 a
SED[1]	0.226	0.527	0.097	0.110	0.206	0.221	0.008	0.363
p-value[2]	0.992	0.784	0.350	0.189	0.188	0.328	0.194	0.324



TOP NOTCH FARMING RESEARCH TRIALS

Canola Enhanced Efficiency Nitrogen Fertilizer (EENF)

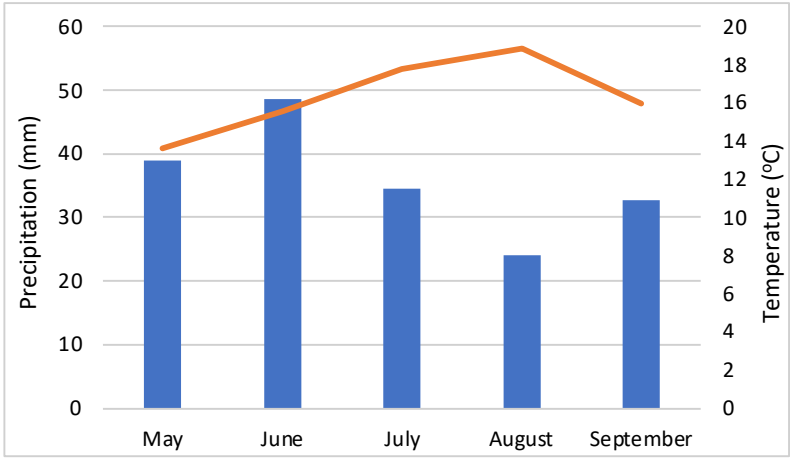
(Dysart)

Objective: To examine different ratios or proportions of treated and untreated N fertilizer using an EENF product of choice, compared to 100% untreated N fertilizer, on canola establishment, yield, and quality under various management, soil, and weather conditions in Saskatchewan.

Treatment #	Description
1	100% untreated N fertilizer
2	75% untreated N fertilizer: 25% treated with EENF product
3	50% untreated N fertilizer: 50% treated with EENF product

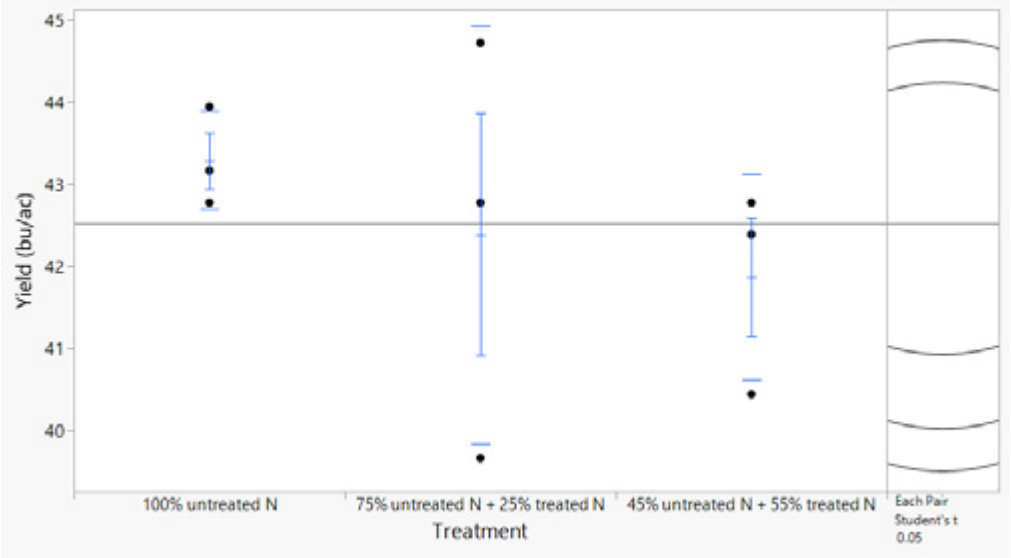
General Trial Information	
Variety	InVigor
Thousand Seed Weight (TSW)	5.3 g
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane) + Buteo® Start (flupyradifurone)
Previous Crop	Wheat
Soil Organic Matter	4.6%
Residual Nitrate-N	
- **0-6”**	53 lb/ac
- **6-24”**	150 lb/ac
Seeding Date	May 26, 2025
Seeding Rate	4.81 lb/ac
Seeding Equipment	Seed Hawk
Seeding Depth	¾”
Seeding Speed	4.5 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	102 – 49 – 0 – 22
Crop Protection	May 24: Glyphosate 540 + Prospect® (halauxifen + carfentrazone-ethyl) June 10 + June 28: Glufosinate® 150 + Select® Plus (clethodim + quizalofop) July 13: Miravis® Star (pydiflumetofen + fludioxonil) September 8: Glyphosate

Precipitation and temperature from a local weather station



Results

	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% untreated N	9 a	43.3 a	2.8 a	64.0 a	23.1 a	6.7 a	0.03 a	47.0 a
75% untreated + 25% treated	9 a	42.4 a	2.8 a	64.0 a	22.8 a	6.8 a	0.03 a	45.8 a
45% untreated + 55% treated	8 a	41. 9 a	2.7 a	63.8 a	22.4 a	6.8 a	0.08 a	45.8 a
SED[1]	0.693	0.961	0.517	0.147	0.464	0.115	0.065	0.936
p-value[2]	0.332	0.409	0.970	0.323	0.421	0.909	0.694	0.451



Economics

	Untreated N ($/ac)[x]	Treated N ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net Profit ($/ac)	Profit/Loss ($/ac)
100% untreated N	32.43	0.00	32.43	43.3	13.00	562.90	530.47	0.00
75% untreated + 25% treated	24.45	9.62	34.07	42.4	13.00	551.20	517.13	-13.34
45% untreated + 55% treated	14.69	21.38	36.07	41.9	13.00	544.70	508.63	-21.84

[x]untreated N price, Local Retailer, November 25, 2025 ($780/MT)
[y]treated N price, Local Retailer, November 25, 2025 ($940/MT)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Across all treatments, there were no significant differences in plant density, yield, or seed quality. Plant density averaged 8–9 plants/ft², while yield ranged from 41.9 to 43.3 bu/ac, with all treatments statistically similar. Thousand kernel weight, test weight, protein, oil, moisture, and green seed levels also did not differ among treatments. Overall, increasing the proportion of treated fertilizer up to 55% did not affect crop establishment, yield, or grain quality under the conditions of this study.

To review footnote references please refer to overall trial summary on page 61.

This trial was conducted with the agronomic support of

Ag Grow Consulting Ltd.

TOP NOTCH FARMING RESEARCH TRIALS

Canola Enhanced Efficiency Nitrogen Fertilizer (EENF)

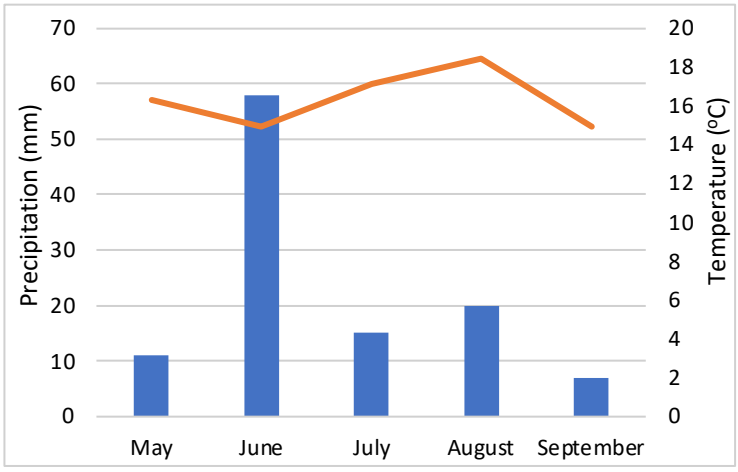
(Maidstone)

Objective: To examine different ratios or proportions of treated and untreated N fertilizer using an EENF product of choice, compared to 100% untreated N fertilizer, on canola establishment, yield, and quality under various management, soil, and weather conditions in Saskatchewan.

Treatment #	Description
1	100% untreated N fertilizer
2	75% untreated N fertilizer: 25% treated with EENF product
3	50% untreated N fertilizer: 50% treated with EENF product

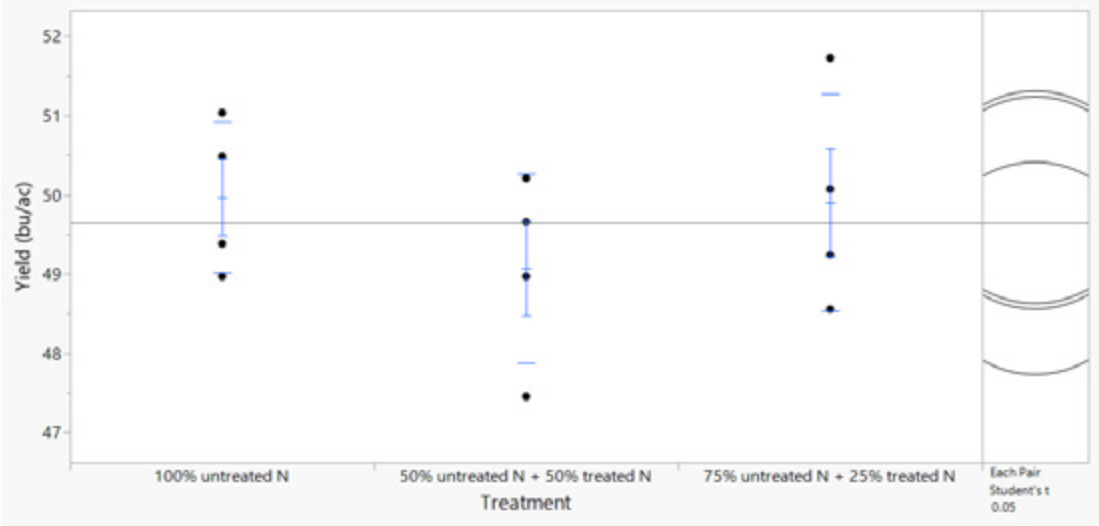
General Trial Information	
Variety	BY7204LL
Thousand Seed Weight (TSW)	5.67 g
Seed Treatment	Helix® Saltro (thiamethoxam, difenoconazole, metalaxyl, fludioxonil, sedaxane + pydiflumetofen)
Previous Crop	Wheat
Soil Organic Matter	3.7%
Residual Nitrate-N	
- **0-6”**	18 lb/ac
- **6-20”**	26 lb/ac
Soil Texture	Medium
Seeding Date	May 23, 2025
Seeding Rate	5 lb/ac
Seeding Equipment	Bourgault 3320
Seeding Depth	½”
Seeding Speed	4 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	113 – 45 – 17 – 26
Crop Protection	May 16: RoundUp® Transorb (glyphosate) + Prospect® (halauxifen + carfentrazone) June 16: Glufosinate® 150 SL + Patron® Complete (clethodim) July 7: Viatude® (picoxystrobin and prothioconazole)

Precipitation and temperature from a local weather station



Results

	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% untreated N	5 a	50.0 a	4.3 a	66.6 a	21.4 a	5.4 a	0.03 a	51.3 a
75% untreated + 25% treated	6 a	49.1 a	3.8 a	66.7 a	21.3 a	5.5 a	0.06 a	51.6 a
50% untreated + 50% treated	5 a	49.9 a	3.8 a	66.6 a	21.3 a	5.4 a	0.06 a	51.3 a
SED[1]	0.398	0.680	0.258	0.205	0.196	0.072	0.023	0.214
p-value[2]	0.230	0.398	0.253	0.912	0.751	0.518	0.244	0.363



Economics

	Untreated N ($/ac)[x]	Treated N ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net Profit ($/ac)	Profit/Loss ($/ac)
100% untreated N	28.66	0.00	28.66	50.0	13.00	650.00	621.34	0.00
75% untreated + 25% treated	21.58	8.53	30.11	49.1	13.00	638.30	608.19	-13.15
50% untreated + 50% treated	14.33	17.27	31.60	49.9	13.00	648.70	617.10	-4.24

[x]untreated N price, Local Retailer, November 25, 2025 ($780/MT)
[y]treated N price, Local Retailer, November 25, 2025 ($940/MT)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Across all treatments, there were no significant differences in plant density, yield, or seed quality. Plant density averaged 5–6 plants/ft² and yield remained consistent at approximately 49–50 bu/ac regardless of the proportion of treated seed. Thousand kernel weight, test weight, protein, oil, moisture, and green seed levels were also similar among treatments. These results indicate that partially replacing untreated fertilizer with treated fertilizer, up to a 50% inclusion rate, did not affect crop performance or grain quality under the conditions of this study.

To review footnote references please refer to overall trial summary on page 61.

This trial was conducted with the agronomic support of

SWATMAPS

TOP NOTCH FARMING RESEARCH TRIALS
Brought to you by SaskOilseeds

Canola Seeding Rate and Survivability

Canola farmers are challenged with the rising cost of inputs, with seed cost comprising one of the most significant expenses. Recommendations have been updated over the years to use the seed size (thousand seed weight, TSW) of canola seed lots to adjust seeding rates with the aim of achieving the optimal plant density for maximized productivity. Seeding rate tools have been developed to help with this calculation. The calculation includes an adjustment for estimated survivability, which is the proportion of seeds that emerge and develop to maturity. It is recommended to factor 60% survivability of canola seed; however, producer experience and previous research have shown this value can range widely. Survivability can depend on many factors including soil and weather conditions, equipment, and management practices which vary by field and farm. Thus, uncertainty remains in the estimation of survivability in consideration of these factors, and so we may be missing the mark when calculating optimal seeding rates to achieve agronomic and economic goals.

Objective

To determine the range of canola survivability rates on commercial farms and the optimal seeding rate to achieve adequate plant densities and maximize yield under various management, soil and weather conditions in Saskatchewan.

Treatments

1) Low Rate: 6-7 seeds per sq. ft
2) Standard Rate: 8-9 seeds per sq. ft
3) High Rate: 10-11 seeds per sq. ft

Seeding rates were calculated using the TSW of the canola seed lot for each trial individually, accounting for a 100% survivability. Trials were set up in randomized strips with four replications, for a total of 12 plots. All plots were managed the same agronomically, besides seeding rate, including seeding date, variety, seeding depth, seed treatment, fertility and pesticide application.

Data Collection

- Spring soil samples
- Plant density was conducted at 2 weeks after seeding, 2-4 leaf stage and post-harvest.
- The following management and agronomic data were recorded precisely:
  - Fertilizer products, rates, placement, timing
  - Equipment type, opener, and row spacing
  - Canola variety, TSW and seeding rate
  - Crop protection: seed treatment, pesticide applications
  - Previous crop and residue accumulation
  - General notes on weed, insect, disease infestations, and notable weather events
- Yield was determined for each plot separately by weighing with a weigh wagon or grain cart with scale
- Grain samples were collected from each plot separately for grain quality analysis.

The following footnotes will be referred to for individual site report for this protocol:

[1]SED is a measure of how much variability (same units as mean) you would expect in the difference between sample means if you repeated the experiment several times. The Least Significant Difference (LSD) is approximately 2 times the SED.

[2]A linear regression was used to assess the effects of varieties on the response variables. The data was also analyzed using the Mixed Model procedure in JMP with replicate considered random and seeding rate considered a fixed effect. Treatment means were separated using Least Significant Difference (LSD) test. All treatment effects and differences between means were considered significant at $p \leq 0.05$. However, p-values of 0.05-0.1 may also be acknowledged.

$P < 0.05$: There is a 95% probability (19 out of 20 times) that the observed difference is due to the treatment rather than random variation.
$P < 0.1$: There is a 90% probability (9 out of 10 times) that the difference is due to the treatment effect.
$P > 0.1$: There is a higher likelihood that the observed difference is due to random variability rather than the treatment.

Breakdown:

To equally compare all sites in 2024 and 2025, each sites highest parameter (max yield) was the base 100% then the remaining plots were calculated as a percent of the max.

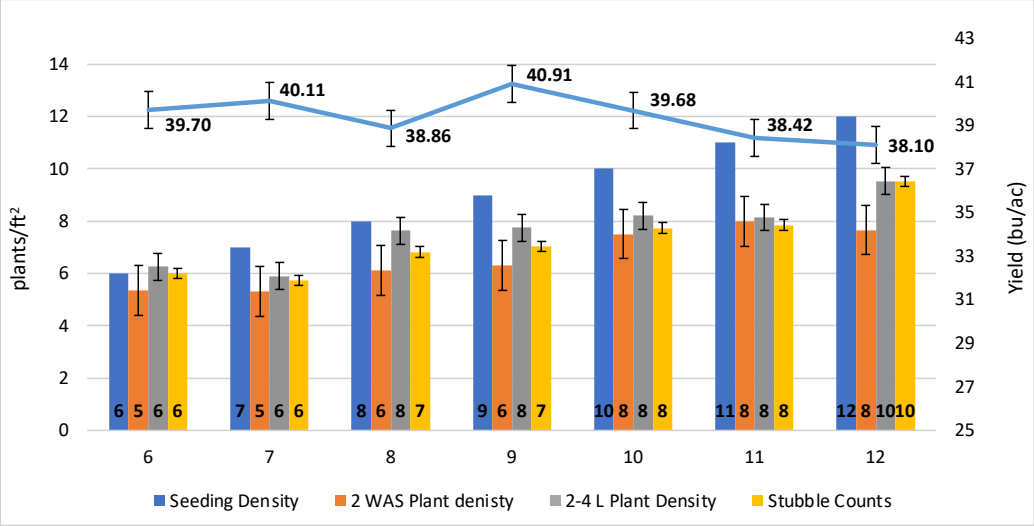
Example:

Plants	Yield	Calculation	Max % of Yield
12	99.30	(99.3/102.93)*100	96.5
12	102.93	(102.93/102.93)*101	100.0
13	98.20	(98.2/102.93)*100	95.4

2024 Combined Data (7 sites)

In 2024, eight sites were evaluated; however, Carrot River was excluded from the combined analysis due to the use of higher seeding densities. Across all plant density assessments—from two weeks after seeding through post-harvest stubble counts—higher seeding densities resulted in significantly greater in-season plant counts. There was some small yield differences with different seeding densities; however, no consistent trend. Additionally, no seeding density effects were observed for any grain quality parameters.

Treatment - Seeding Density (plants/ft^2)	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest		Yield (bu/ac)
	Plant Density (plants/ft^2)	Survival (%)	Plant Density (plants/ft^2)	Survival (%)	Stubble Density (plants/ft^2)	Survival (%)	
6	5 c	86.8 a	6 c	93.1 a	6 d	90.7 ab	39.7 a
7	5 cd	81.5 a	6 c	94.8 a	6 d	92.9 a	40.1 a
8	6 bc	75.5 a	8 b	90.0 a	7 c	79.7 c	38.9 a
9	6 abcd	72.0 a	8 b	91.2 a	7 c	82.8 bc	40.9 a
10	8 ad	74.6 a	8 ab	78.1 a	8 b	74.4 c	39.7 a
11	8 ab	73.1 a	8 ab	79.9 a	8 b	75.4 c	38.4 a
12	8 abcd	63.4 a	10 a	77.5 a	10 a	82.2 abc	38.1 a
SED[1]	0.946	8.39	0.512	7.23	0.202	5.12	0.839
p-value[2]	0.041	0.175	0.0009	0.057	<.0001	0.007	0.064

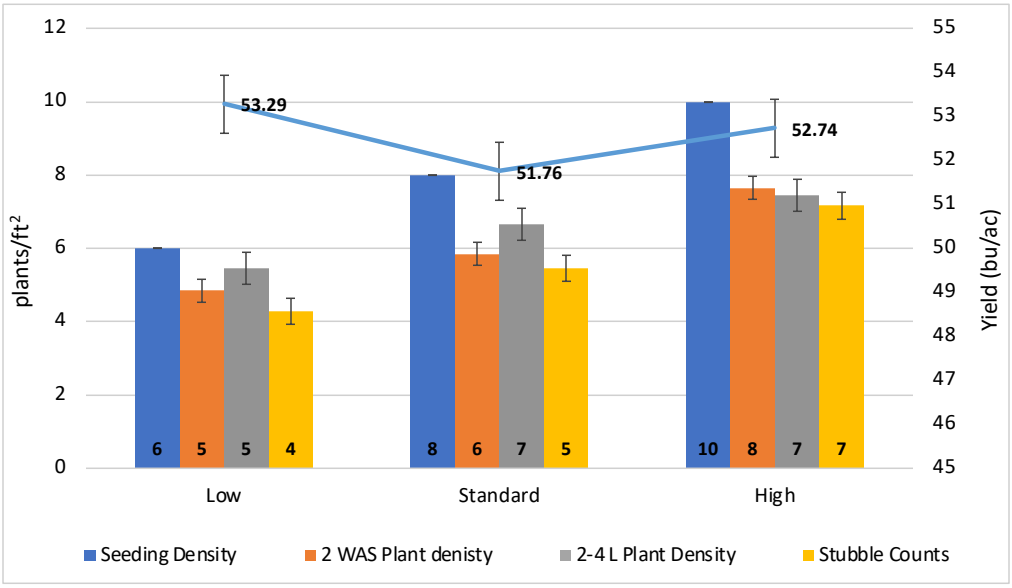


2025 Combined (6 sites)

Seven sites conducted the seeding rate trial in 2025; however, Elrose was excluded from the combined analysis due to the use of different seeding rates. Because all remaining sites used the same seeding densities, data were combined using a simple ANOVA rather than the percent-of-maximum yield approach used in 2024. Increasing seeding density from 6 to 10 plants/ft² resulted in significantly higher plant densities from 2 WAS through post-harvest stubble counts, although stubble survival at harvest was unaffected. Despite differences in in-season plant density and early survival, seeding density had no significant effect on yield or grain quality parameters, with similar yields observed across all treatments, indicating no yield advantage from higher seeding densities.

Treatment - Seeding Density (plants/ft²)	Target Seeding Density (seeds/ft²)	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest	
		Plant Density (plants/ft²)	Survival (%)	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
6	6 c	5 c	80.8 a	5 b	91.0 a	4 c	71.5 a
8	8 b	6 b	73.1 b	7 a	83.3 ab	5 b	68.2 a
10	10 a	8 a	76.5 ab	7 a	74.6 b	7 a	71.7 a
SED[1]	0.0	0.309	2.04	0.436	4.93	0.357	3.38
p-value[2]	0.0227	<.0001	0.017	0.003	0.024	<.0001	0.537

Treatment - Seeding Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
6	53.3 a	3.5 a	63.8 a	22.1 a	6.9 a	0.06 a	45.49 a
8	51.8 a	3.6 a	63.6 a	22.1 a	6.9 a	0.04 a	45.62 a
10	52.7 a	3.6 a	63.6 a	21.7 b	6.9 a	0.02 a	45.63 a
SED[1]	0.656	0.104	0.102	0.176	0.046	0.017	0.286
p-value[2]	0.120	0.939	0.248	0.082	0.473	0.081	0.865



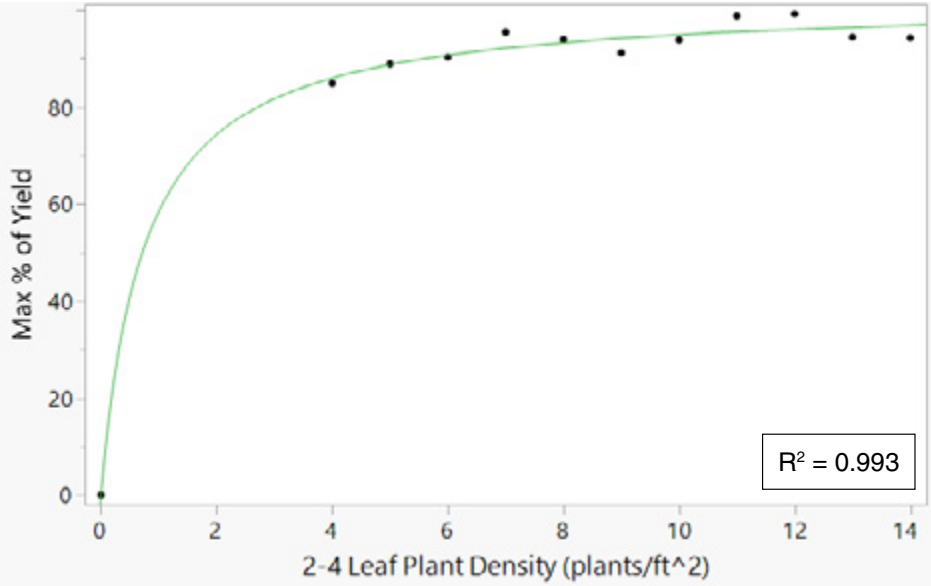
2024 and 2025 Combined (13 sites)

All sites were included in the analysis except Elrose and Carrot River in 2024, as their seeding densities fell outside the defined treatment range. Seeding density significantly affected plant density and survival across the season, with higher seeding rates producing greater plant densities but generally lower percent survival, particularly at the 2–4 leaf stage and in post-harvest stubble counts. Despite these differences in stand establishment, seeding density had no significant effect on yield or grain quality parameters, with yield, TKW, test weight, protein, moisture, green seed, and oil content remaining consistent across all treatments.

Treatment - Seeding Density (plants/ft²)	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest	
	Plant Density (plants/ft²)	Survival (%)	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
Low Rate (6-7)	5 c	80.4 a	6 c	90.5 a	5 c	81.6 a
Standard Rate (8-9)	6 b	70.6 b	7 b	84.5 b	6 b	75.0 b
High Rate (10-11)	7 a	72.3 b	8 a	75.5 c	7 a	73.2 b
SED[1]	0.270	1.77	0.234	2.73	0.210	2.49
p-value[2]	<.0001	<.0001	<.0001	<.0001	<.0001	0.006

Treatment - Seeding Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Low Rate (6-7)	46.9 a	3.9 a	64.1 a	22.9 a	7.4 a	0.03 a	46.4 a
Standard Rate (8-9)	46.2 a	3.9 a	64.1 a	23.0 a	7.4 a	0.02 a	46.2 a
High Rate (10-11)	46.5 a	3.9 a	64.1 a	22.8 a	7.4 a	0.01 a	46.3 a
SED[1]	0.470	0.056	0.093	0.142	0.055	0.009	0.167
p-value[2]	0.317	0.754	0.624	0.586	0.861	0.086	0.481

For the combined 2024–2025 data, a non-linear regression model was used to evaluate percent of maximum yield in relation to plant density at the 2–4 leaf stage. Focusing on the fitted response curve rather than individual data points, approximately 85–90% of maximum yield was achieved when plant densities ranged from 4 to 7 plants/ft².



TOP NOTCH FARMING RESEARCH TRIALS

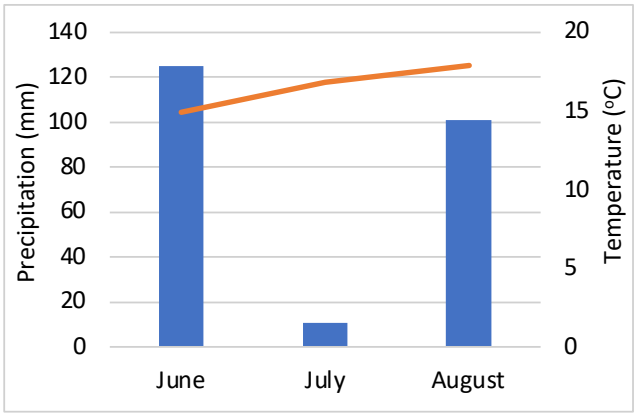
Canola Seeding Rate and Survivability
(Birch Hills)

Objective: To determine the range of canola survivability rates on commercial farms and the optimal seeding rate to achieve adequate plant densities and maximize yield under various management, soil and weather conditions in Saskatchewan.

Treatment #	Description	Target Seeding Density (seeds/ft²)	Actual Seeding Rate (lb/ac)
1	Low Rate	6	2.8
2	Standard Rate	8	3.7
3	High Rate	10	4.6

General Trial Information	
Variety	InVigor Health L358HPC
Thousand Seed Weight (TSW)	4.8 g
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane) + Buteo® Start (flupyradifurone)
Previous Crop	Barley
Soil Organic Matter	7.1%
Residual Nitrate-N	
- **0-6”**	33 lb/ac
- **6-24”**	48 lb/ac
Soil Texture	Medium
Seeding Date	May 16
Soil Temperature	14 **0**C
Seeding Equipment	John Deere/Seed Master P670
Seeding Depth	¾”
Seeding Speed	4.8 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	84 – 27 – 0 – 12
Crop Protection	May 10: Glyphosate June 28: Liberty® (glufosinate)

Precipitation from rain gauge and temperature from Environment Canada (Prince Albert Glass Field)



Economics

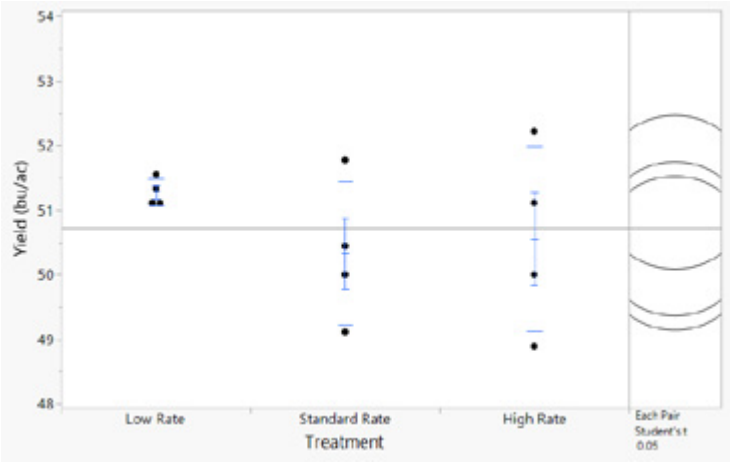
Treatment	Seeding Rate (lb/ac)	Seed ($/lb)[x]	Seed Treatment & Inoculant ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Low Rate	2.8	48.64	5.04	53.68	51.3	13.00	666.90	613.22	30.25
Standard Rate	3.7	64.27	6.66	70.93	50.3	13.00	653.90	582.97	0.00
High Rate	4.6	79.90	8.28	88.18	50.6	13.00	657.80	569.62	-13.35

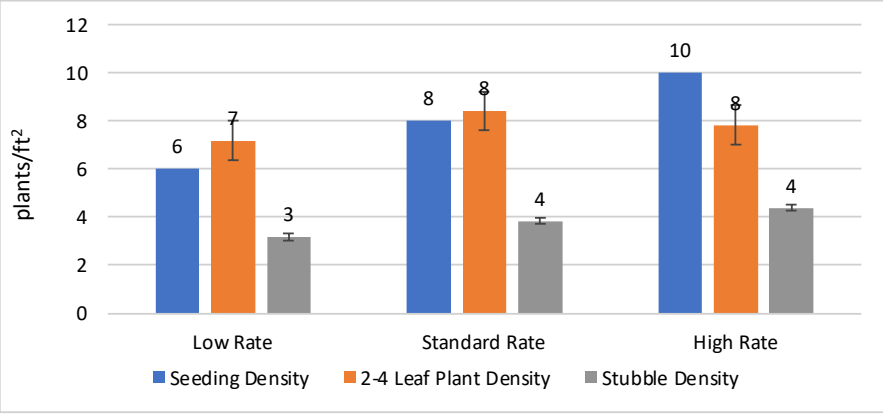
[x]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed price $86.85/ac)
[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed treatments/inoculants $9/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13/bu)

Results

	2 – 4 Leaf Stage		Post Harvest	
	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
Low Rate	7 a	119.8 a	3 c	43.8 c
Standard Rate	8 a	105.1 a	4 b	48.0 b
High Rate	8 a	78.3 b	4 a	52.7 a
SED[1]	0.809	10.0	0.134	1.50
p-value[2]	0.381	0.016	0.0003	0.003

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Low Rate	51.3 a	3.6 a	66.1 a	20.6 a	8.2 a	0.15 a	51.4 a
Standard Rate	50.3 a	3.1 a	66.1 a	20.2 a	8.3 a	0.06 a	51.9 a
High Rate	50.6 a	3.3 a	66.1 a	20.0 a	8.0 a	0.00 a	52.5 a
SED[1]	0.714	0.380	0.279	0.276	0.129	0.051	0.437
p-value[2]	0.436	0.407	0.986	0.142	0.154	0.068	0.111





Summary

Plant counts at two weeks after seeding were not conducted; however, at the 2–4 leaf stage, plant density did not differ among seeding rates, while percent survival was highest at the low and standard rates and significantly reduced at the high rate. Post-harvest stubble density and survival increased with seeding rate, with the high rate producing the greatest stubble density, and yield and seed quality parameters were largely unaffected by seeding rate, aside from minor differences in thousand kernel weight and a lower green seed percentage at the high rate.

To review footnote references please refer to overall trial summary on page 69.

This trial was conducted with the agronomic support of

TOMTENE SEED FARM J.V

TOP NOTCH FARMING RESEARCH TRIALS

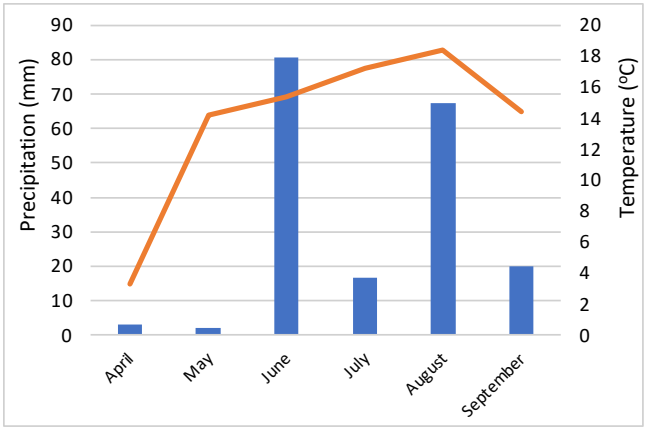
Canola Seeding Rate and Survivability
(Carrot River)

Objective: To determine the range of canola survivability rates on commercial farms and the optimal seeding rate to achieve adequate plant densities and maximize yield under various management, soil and weather conditions in Saskatchewan.

Treatment #	Description	Target Seeding Density (seeds/ft²)	Actual Seeding Rate (lb/ac)
1	Low Rate	6	2.7
2	Standard Rate	8	3.6
3	High Rate	10	4.5

General Trial Information	
Variety	InVigor L340PC
Thousand Seed Weight (TSW)	4.7 g
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane) + Buteo® (flupyradifurone)
Previous Crop	Barley
Soil Organic Matter	4.8%
Residual Nitrate-N	
- **0-6”**	17 lb/ac
- **6-24”**	15 lb/ac
Seeding Date	May 17
Soil Temperature	12 °C
Seeding Equipment	Seed Hawk ½” factory knives
Seeding Depth	½”
Seeding Speed	4.5 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	169 – 50 – 30 – 29
Crop Protection	June 6: Glufosinate® + Clethodim® June 20: Glufosinate® August 15: Coragen® Max (chlorantraniliprole)

Precipitation from rain gauge and temperature from Environment Canada (Nipawin)



Economics

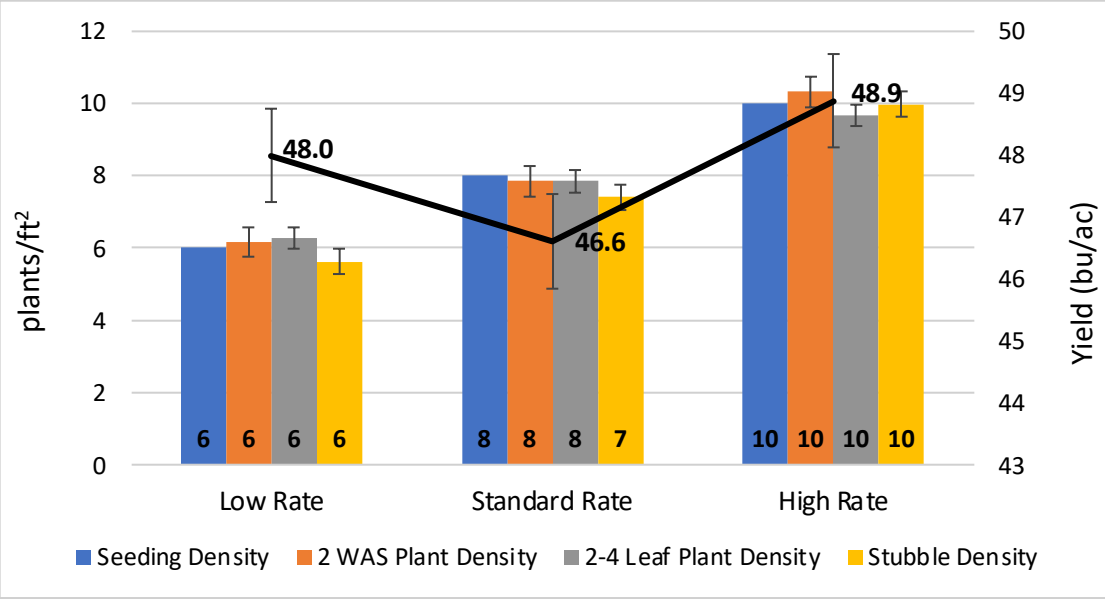
Treatment	Seeding Rate (lb/ac)	Seed ($/lb)[x]	Seed Treatment & Inoculant ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Low Rate	2.7	46.90	4.86	51.76	48.0	13.00	624.00	572.24	35.45
Standard Rate	3.6	62.53	6.48	69.01	46.6	13.00	605.80	536.79	0.00
High Rate	4.5	78.17	8.10	86.27	48.9	13.00	635.70	549.44	12.65

[x]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed price $86.85/ac)
[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed treatments/inoculants $9/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13/bu)

Results

	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest	
	Plant Density (plants/ft²)	Survival (%)	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
Low Rate	6 c	102.6 a	6 c	104.7 a	6 c	93.8 a
Standard Rate	8 b	98.1 a	8 b	98.1 a	7 b	92.6 a
High Rate	10 a	103.1 a	10 a	96.6 a	10 a	99.7 a
SED[1]	0.413	5.13	0.305	3.93	0.355	4.98
p-value[2]	0.0002	0.582	0.0001	0.170	<.0001	0.373

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Low Rate	48.0 a	3.13 a	63.7 a	22.6 a	7.1 a	0.13 a	41.8 a
Standard Rate	46.6 a	3.19 a	63.5 a	22.9 a	7.1 a	0.13 a	41.4 a
High Rate	48.9 a	3.22 a	63.3 a	21.7 a	7.1 a	0.08 a	42.1 a
SED[1]	0.757	0.104	0.196	0.729	0.076	0.070	1.16
p-value[2]	0.063	0.725	0.256	0.327	0.799	0.723	0.842



Summary

Plant density and post-harvest stubble density increased significantly with increasing seeding rate at all assessment timings, while percent survival did not differ among treatments. Yield showed a slight trend toward being higher at the high seeding rate compared with the standard rate, but thousand kernel weight, test weight, protein, moisture, green seed, and oil content were not affected, indicating overall seed quality was consistent across seeding rates.

To review footnote references please refer to overall trial summary on page 69.

This trial was conducted with the agronomic support of

Ag Grow Consulting Ltd.

TOP NOTCH FARMING RESEARCH TRIALS

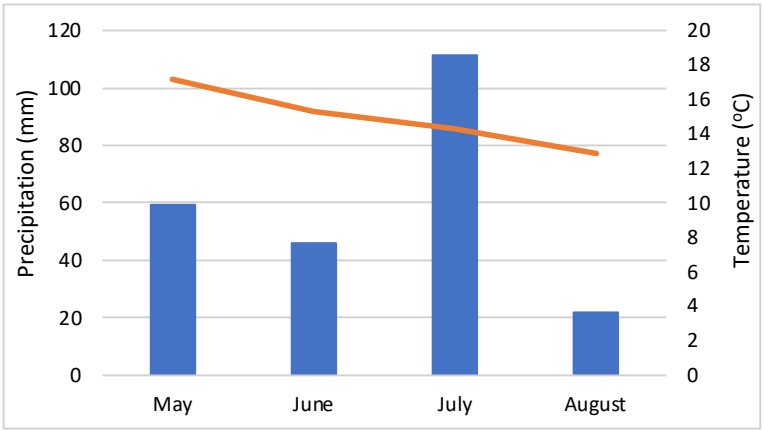
Canola Seeding Rate and Survivability
(Cut Knife)

Objective: To determine the range of canola survivability rates on commercial farms and the optimal seeding rate to achieve adequate plant densities and maximize yield under various management, soil and weather conditions in Saskatchewan.

Treatment #	Description	Target Seeding Density (seeds/ft²)	Actual Seeding Rate (lb/ac)
1	Low Rate	6	2.3
2	Standard Rate	8	3.1
3	High Rate	10	3.8

General Trial Information	
Variety	InVigor L340PC
Thousand Seed Weight (TSW)	4.0 g
Seed Treatment	Lumiderm® (fluopyram)
Previous Crop	Wheat
Soil Organic Matter	4.8 %
Residual Nitrate-N	
- **0-6”**	17 lb/ac
- **6-24”**	19 lb/ac
Seeding Date	May 17
Soil Temperature	10 °C
Seeding Equipment	Bourgault 3320 XTC
Seeding Depth	¾”
Seeding Speed	5 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	120 – 35 – 0 – 30
Crop Protection	May 16: Glyphosate + Prospect® (halauxifen + carfentrazone) June 17: Liberty® (glufonsinate) + Centurion® (clethodim) July 9: Sparex® September 7: Glyphosate + Heat® (saflufenacil)

Precipitation and temperature from local weather station



Economics

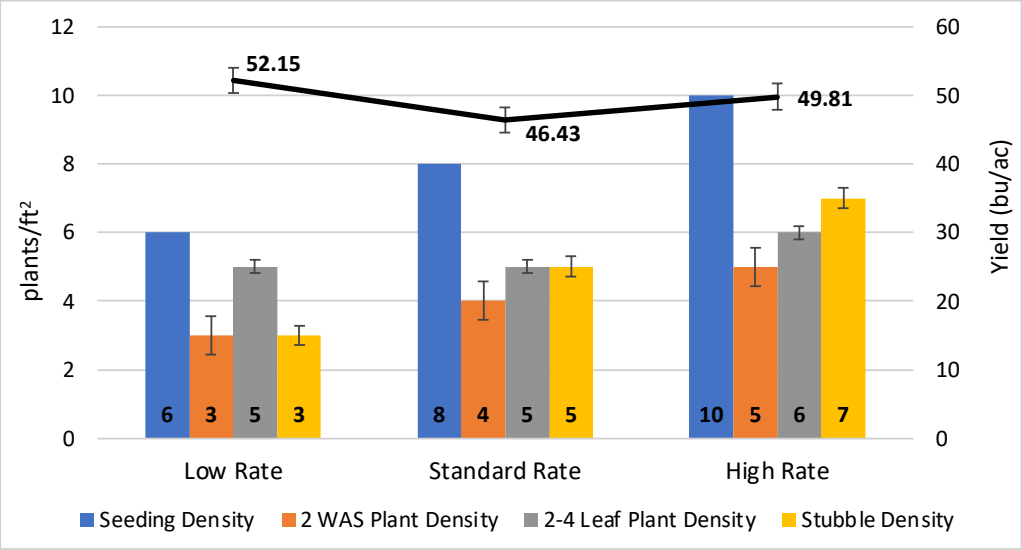
Treatment	Seeding Rate (lb/ac)	Seed ($/lb)[x]	Seed Treatment & Inoculant ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Low Rate	2.3	39.95	4.14	44.09	52.2	13.00	678.60	634.51	90.74
Standard Rate	3.1	53.85	5.58	59.43	46.4	13.00	603.20	543.77	0.00
High Rate	3.8	66.01	6.84	72.85	49.8	13.00	647.40	574.55	30.78

[x]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed price $86.85/ac)
[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed treatments/inoculants $9/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13/bu)

Results

	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest	
	Plant Density (plants/ft²)	Survival (%)	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
Low Rate	3 b	52.1 a	5 b	80.2 a	3 c	58.0
Standard Rate	4 b	50.0 a	5 b	59.3 b	5 b	63.4
High Rate	5 a	54.8 a	6 a	59.9 b	7 a	66.2
SED[1]	0.560	7.76	0.190	2.39	0.291	3.45
p-value[2]	0.016	0.832	0.001	0.0002	0.0001	0.128

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Low Rate	52.2 a	3.7 a	61.7 a	23.1 a	7.0 a	0.01 a	47.3 a
Standard Rate	46.4 a	4.2 a	61.4 a	23.2 a	7.0 a	0.00 a	46.7 a
High Rate	49.8 a	4.0 a	61.1 a	22.8 a	6.8 a	0.00 a	46.5 a
SED[1]	1.84	0.314	0.461	0.311	0.095	0.010	0.381
p-value[2]	0.055	0.337	0.539	0.471	0.185	0.422	0.176



Summary

Plant density increased consistently with increasing seeding rate at all assessment timings, while percent survival did not differ among treatments at two weeks after seeding or post-harvest. At the 2–4 leaf stage, percent survival was significantly higher at the low seeding rate compared with the standard and high rates. Yield was greatest at the low seeding rate, lower at the standard rate, and intermediate at the high rate. Seed quality parameters, including thousand kernel weight, test weight, protein, moisture, green seed, and oil content, were not affected by seeding rate and remained consistent across treatments.

To review footnote references please refer to overall trial summary on page 69.

This trial was conducted with the agronomic support of

TOP NOTCH FARMING RESEARCH TRIALS

Canola Seeding Rate and Survivability (Elrose)

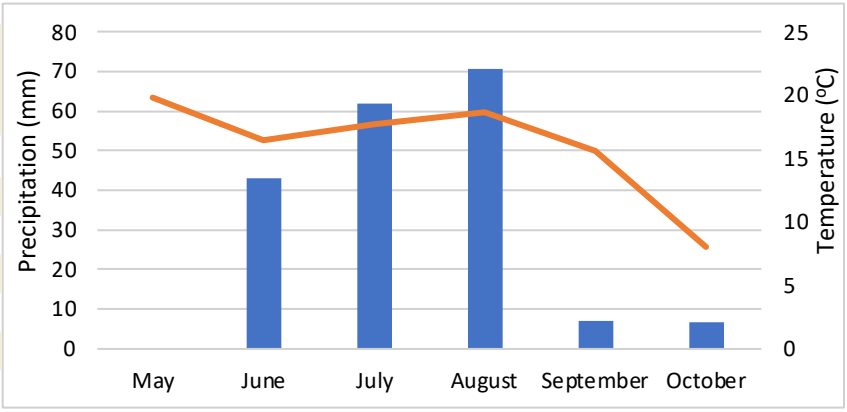
Objective: To determine the range of canola survivability rates on commercial farms and the optimal seeding rate to achieve adequate plant densities and maximize yield under various management, soil and weather conditions in Saskatchewan.

Treatment #	Description	Target Seeding Density (seeds/ft²)	Actual Seeding Rate (lb/ac)
1	Low Rate	7	3.2
2	Standard Rate	9	3.9
3	High Rate	10	4.5

General Trial Information

Variety	InVigor L340PC
Thousand Seed Weight (TSW)	4.7 g
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane) + Buteo® Start (flupyradifurone)
Previous Crop	Durum
Soil Organic Matter	2.5%
Residual Nitrate-N	
- **0-6”**	6 lb/ac
- **6-18”**	6 lb/ac
Seeding Date	May 26
Soil Temperature	11 **0**C
Seeding Equipment	K-Hart Spyder
Seeding Depth	¾”
Seeding Speed	6.2 mph
Row Spacing	10”
Total Applied Fertilizer (lb/ac N-P-K-S)	124 – 26 – 0 – 71
Crop Protection	May 24: Glyphosate + AIM® (carfentrazone) + Bromoxynil® June 26: Liberty® (glufosinate) + Clethodim® July 18: Soratel® (penthiopyrad)

Precipitation and temperature from local weather station



Economics

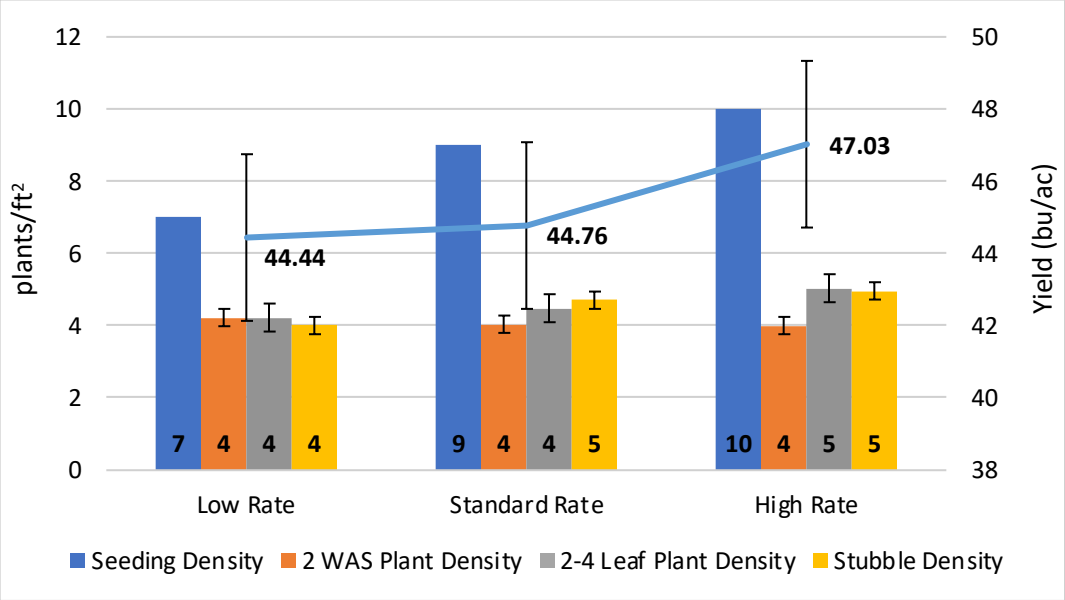
Treatment	Seeding Rate (lb/ac)	Seed ($/lb)[x]	Seed Treatment & Inoculant ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Low Rate	3.2	55.58	5.76	61.34	44.4	13.00	577.20	515.86	8.22
Standard Rate	3.9	67.74	7.02	74.76	44.8	13.00	582.40	507.64	0.00
High Rate	4.5	78.17	8.10	86.27	47.0	13.00	611.00	524.74	17.10

[x]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed price $86.85/ac)
[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed treatments/inoculants $9/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13/bu)

Results

	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest	
	Plant Density (plants/ft²)	Survival (%)	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
Low Rate	4 a	59.6 a	4 a	59.6 a	4 b	56.7 a
Standard Rate	4 a	46.7 b	4 a	51.8 a	5 a	54.5 a
High Rate	4 a	40.0 b	5 a	50.6 a	5 a	49.7 a
SED[1]	0.241	2.87	0.384	4.51	0.237	2.96
p-value[2]	0.619	0.0014	0.174	0.177	0.018	0.131

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Low Rate	44.4 a	3.8 a	65.3 a	23.2 a	10.0 a	0.03 a	46.3 a
Standard Rate	44.8 a	3.5 a	66.0 a	23.4 a	9.7 a	0.04 a	45.2 a
High Rate	47.0 a	3.7 a	66.1 a	24.7 a	10.4 a	0.03 a	45.2 a
SED[1]	2.32	0.377	0.414	0.566	0.333	0.028	1.19
p-value[2]	0.517	0.692	0.204	0.076	0.198	0.880	0.631



Summary

Plant density did not differ among seeding rates at any assessment timing, while percent survival at four weeks after seeding was significantly higher at the low seeding rate compared with the standard and high rates. Post-harvest stubble density was greater at the standard and high seeding rates than at the low rate, with no differences in post-harvest survival. Yield and most seed quality parameters, including thousand kernel weight, test weight, moisture, green seed, and oil content, were not affected by seeding rate. Protein content showed a trend toward being higher at the high seeding rate, but overall seed quality was similar across treatments.

To review footnote references please refer to overall trial summary on page 69.

This trial was conducted with the agronomic support of

MNP AgINTELLECT

TOP NOTCH FARMING RESEARCH TRIALS

Canola Seeding Rate and Survivability (Lampman)

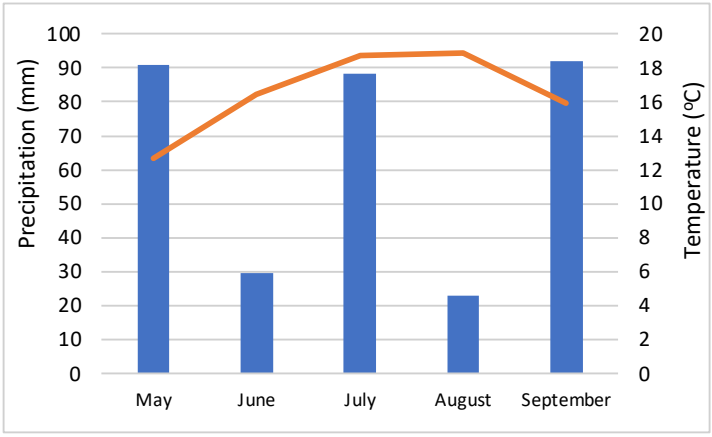
Objective: To determine the range of canola survivability rates on commercial farms and the optimal seeding rate to achieve adequate plant densities and maximize yield under various management, soil and weather conditions in Saskatchewan.

Treatment #	Description	Target Seeding Density (seeds/ft²)	Actual Seeding Rate (lb/ac)
1	Low Rate	6	2.7
2	Standard Rate	8	3.6
3	High Rate	10	4.5

General Trial Information

Variety	InVigor L340PC
Thousand Seed Weight (TSW)	4.7 g
Seed Treatment	Lumiderm® (fluopyram) + Helix® (difenoconazole, fludioxonil + mefenoxam)
Previous Crop	Barley
Soil Organic Matter	2.4
Residual Nitrate-N - **0-6”**	24 lb/ac
Seeding Date	May 28, 2025
Soil Temperature	12°C
Seeding Equipment	Bourgault Trimax 3335 QDA Dual Shank + MRB
Seeding Depth	¾”
Seeding Speed	4.6 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	Fall ’24: 0 – 0 – 0 – 90 Spring ’25: 112 – 52 – 0 – 10
Crop Protection	May 12: Glyphosate + Certitude® (bromoxynil + topramezone) June 17: Liberty® (glufosinate) + Centurion® (clethodim)

Precipitation from local weather station and temperature from Environment Canada (Estevan)



Economics

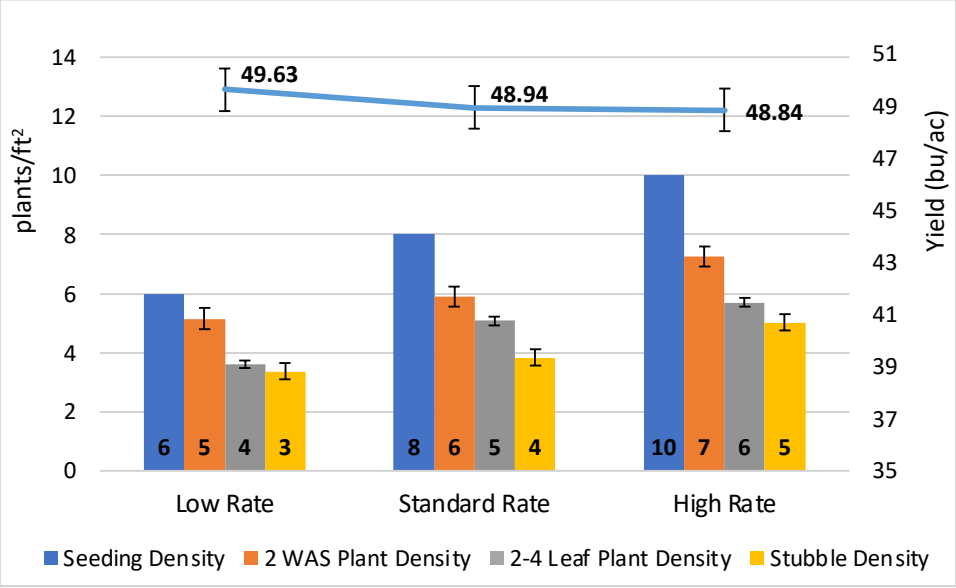
Treatment	Seeding Rate (lb/ac)	Seed ($/lb)[x]	Seed Treatment & Inoculant ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Low Rate	2.7	46.90	4.86	51.76	49.6	13.00	644.80	593.04	26.35
Standard Rate	3.6	62.53	6.48	69.01	48.9	13.00	635.70	566.69	0.00
High Rate	4.5	78.17	8.10	86.27	48.8	13.00	634.40	548.14	-18.55

[x]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed price $86.85/ac)
[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed treatments/inoculants $9/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13/bu)

Results

	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest	
	Plant Density (plants/ft²)	Survival (%)	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
Low Rate	5 c	84.2 a	4 c	60.2 a	3 b	56.1 a
Standard Rate	6 b	73.8 a	5 b	63.4 a	4 b	47.8 a
High Rate	7 a	72.5 a	6 a	57.1 a	5 a	50.3 a
SED[1]	0.347	4.86	0.142	2.22	0.280	3.85
p-value[2]	0.002	0.0998	<.0001	0.074	0.003	0.171

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Low Rate	49.6 a	3.6 a	61.7 a	19.4 a	5.3 a	0.0 a	37.2 a
Standard Rate	48.9 a	3.7 a	61.6 a	12.0 a	5.3 a	0.0 a	38.8 a
High Rate	48.8 a	3.4 a	61.3 a	19.1 a	5.4 a	0.0 a	38.0 a
SED[1]	0.809	0.115	0.330	0.719	0.095	0.0	2.04
p-value[2]	0.601	0.209	0.437	0.494	0.535	1.0	0.715



Summary

Plant density increased with seeding rate at all assessment timings, while percent survival did not differ among treatments at two weeks after seeding or post-harvest. At the 2–4 leaf stage, survival was slightly higher at the standard seeding rate and lowest at the high rate, though differences were modest. Yield and all measured seed quality parameters were unaffected by seeding rate, indicating overall crop performance and seed quality were consistent across treatments.

To review footnote references please refer to overall trial summary on page 69.

This trial was conducted with the agronomic support of

KAV

TOP NOTCH FARMING RESEARCH TRIALS

Canola Seeding Rate and Survivability (Unity)

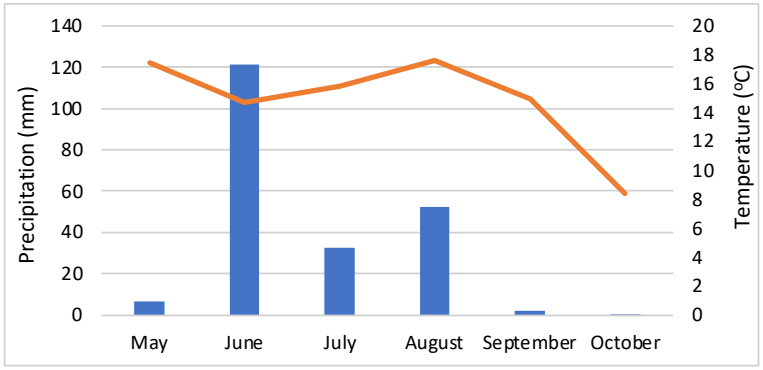
Objective: To determine the range of canola survivability rates on commercial farms and the optimal seeding rate to achieve adequate plant densities and maximize yield under various management, soil and weather conditions in Saskatchewan.

Treatment #	Description	Target Seeding Density (seeds/ft²)	Actual Seeding Rate (lb/ac)
1	Low Rate	6	2.9
2	Standard Rate	8	3.9
3	High Rate	10	4.9

General Trial Information

Variety	InVigor L340PC
Thousand Seed Weight (TSW)	5.1 g
Seed Treatment	Helix® Vibrance (sedaxane, difenoconazole, fludioxonil + mefenoxam), Lumiposa® (cyantraniliprole) + Buteo® (flupyradifurone)
Previous Crop	Wheat
Soil Organic Matter	3.1%
Residual Nitrate-N	
- **0-6”**	20 lb/ac
- **6-18”**	20 lb/ac
Seeding Date	May 13
Soil Temperature	10°C
Seeding Equipment	Bourgault 3320, ¾” sidewing
Seeding Depth	¾”
Seeding Speed	4.2 mph
Row Spacing	10”
Total Applied Fertilizer (lb/ac N-P-K-S)	140 – 35 – 0 – 30
Crop Protection	May 12: Glyphosate + Emphasis® Max (bromoxynil + carfentrazone) June 18: Advantage (imidacloprid) + Arrow (clethodim) July 4: Proline® Gold (prothioconazole) September 2: Glyphosate

Precipitation and temperature from local weather station (May 13 – October 8)



Economics

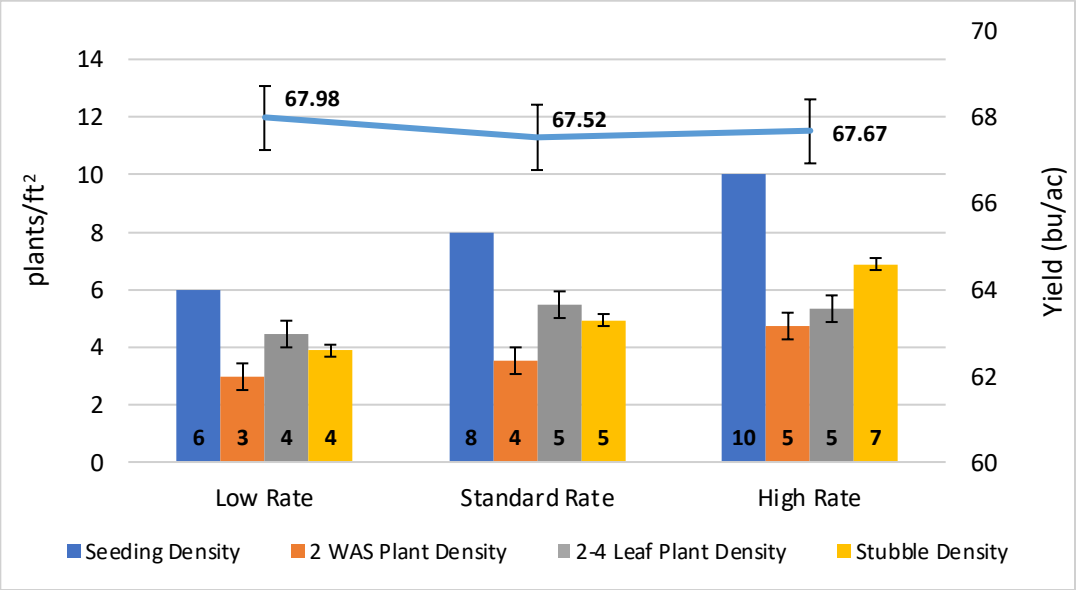
Treatment	Seeding Rate (lb/ac)	Seed ($/lb)[x]	Seed Treatment & Inoculant ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Low Rate	2.9	50.37	5.22	55.59	68.0	13.00	884.00	828.41	25.67
Standard Rate	3.9	67.74	7.02	74.76	67.5	13.00	877.50	802.74	0.00
High Rate	4.9	85.11	8.82	93.93	67.7	13.00	880.10	786.17	-16.57

[x]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed price $86.85/ac)
[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed treatments/inoculants $9/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13/bu)

Results

	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest	
	Plant Density (plants/ft²)	Survival (%)	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
Low Rate	3 b	49.5 a	4 a	74.5 a	4 c	65.0 a
Standard Rate	4 b	44.5 a	5 a	68.3 a	5 b	61.7 a
High Rate	5 a	47.5 a	5 a	53.6 a	7 a	68.8 a
SED[1]	0.466	5.68	0.463	7.46	0.205	2.72
p-value[2]	0.023	0.683	0.139	0.074	<.0001	0.103

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Low Rate	68.0 a	3.8 a	63.5 a	21.7 a	6.7 a	0.04 a	47.3 a
Standard Rate	67.5 a	3.7 a	63.2 a	21.5 a	6.7 a	0.01 a	47.3 a
High Rate	67.7 a	3.8 a	63.3 a	21.9 a	6.8 a	0.01 a	46.8 a
SED[1]	0.748	0.081	0.533	0.379	0.064	0.024	0.521
p-value[2]	0.829	0.562	0.900	0.600	0.614	0.512	0.529



Summary

Plant density increased with seeding rate at two weeks after seeding and post-harvest, while percent survival did not differ among treatments at any assessment timing. At the 2–4 leaf stage, survival tended to be slightly lower at the high seeding rate compared with the low and standard rates. Yield and all measured seed quality parameters were unaffected by seeding rate, indicating overall crop performance and seed quality were consistent across treatments.

To review footnote references please refer to overall trial summary on page 69.

This trial was conducted with the agronomic support of

WARC

TOP NOTCH FARMING RESEARCH TRIALS

Canola Seeding Rate and Survivability (Wakaw)

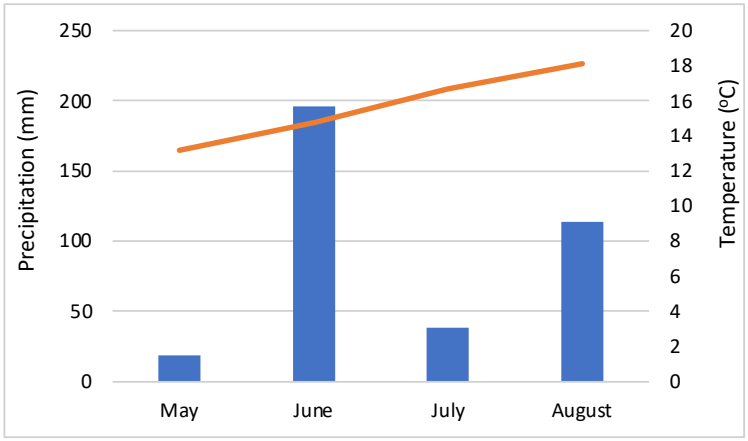
Objective: To determine the range of canola survivability rates on commercial farms and the optimal seeding rate to achieve adequate plant densities and maximize yield under various management, soil and weather conditions in Saskatchewan.

Treatment #	Description	Target Seeding Density (seeds/ft²)	Actual Seeding Rate (lb/ac)
1	Low Rate	6	3.0
2	Standard Rate	8	4.1
3	High Rate	10	5.1

General Trial Information

Variety	PV 681 LC
Thousand Seed Weight (TSW)	5.28 g
Seed Treatment	Buteo® (flupyradifurone)
Previous Crop	Wheat
Soil Organic Matter	6.5%
Residual Nitrate-N	
- **0-6”**	51 lb/ac
- **6-24”**	39 lb/ac
Seeding Date	May 18, 2025
Soil Temperature	11°C
Seeding Equipment	SeedMaster 5012 ½”
Seeding Depth	¾”
Seeding Speed	3.5 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	Fall ’24: 80 – 0 – 0 – 0 Spring ‘25: 20 – 42 – 15 – 10
Crop Protection	May 15: Glyphosate June 26: Interline® (glufosinate) + Shadow® XL (clethodim) July 9: Miravis Bold Li 700 (pydiflumetofen) August 18: Volaim® Xpress (lambda + chlorantraniliprole)

Precipitation and temperature from local weather station



Economics

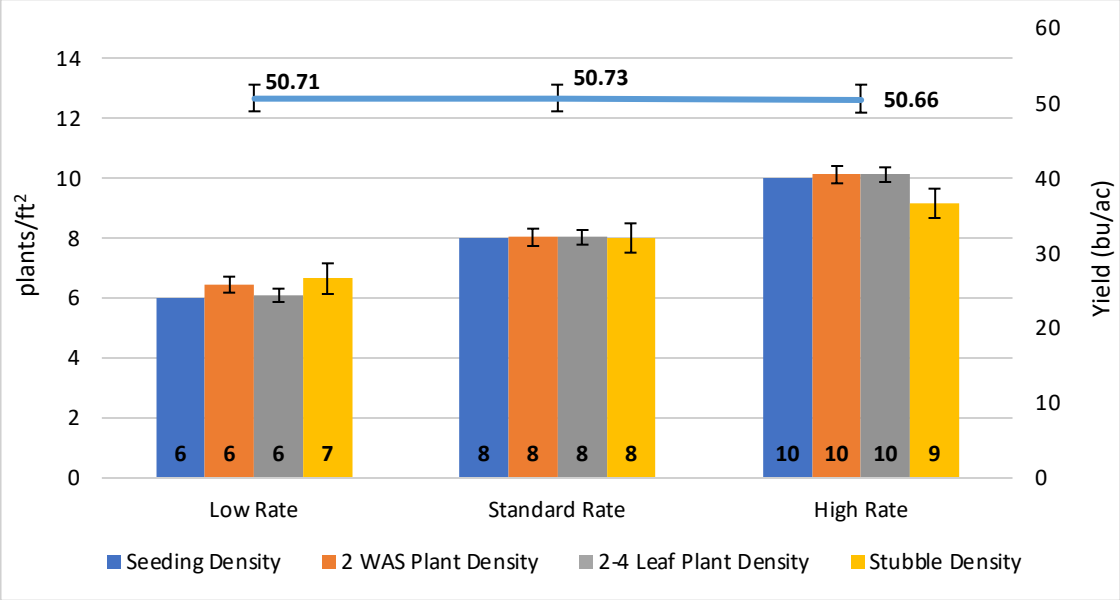
Treatment	Seeding Rate (lb/ac)	Seed ($/lb)[x]	Seed Treatment & Inoculant ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Low Rate	3.0	52.11	5.40	57.51	50.7	13.00	659.10	601.59	21.09
Standard Rate	4.1	71.22	7.38	78.60	50.7	13.00	659.10	580.50	0.00
High Rate	5.1	88.59	9.18	97.77	50.7	13.00	659.10	561.33	-19.17

[x]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed price $86.85/ac)
[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (seed rate 5 lb/ac; seed treatments/inoculants $9/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13/bu)

Results

	2 Weeks after Seeding (WAS)		2 – 4 Leaf Stage		Post Harvest	
	Plant Density (plants/ft²)	Survival (%)	Plant Density (plants/ft²)	Survival (%)	Stubble Density (plants/ft²)	Survival (%)
Low Rate	6 c	107.3 a	6 c	101.6 a	7 b	110.9 a
Standard Rate	8 b	100.4 a	8 b	100.4 a	8 a	100.0 ab
High Rate	10 a	101.3 a	10 a	101.3 a	9 a	91.6 b
SED[1]	0.270	3.65	0.232	3.38	0.502	4.95
p-value[2]	<.0001	0.201	<.0001	0.938	0.007	0.022

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Low Rate	50.7 a	3.45 a	66.1 a	24.9 a	7.1 a	0.03 a	47.7 a
Standard Rate	50.7 a	3.57 a	66.0 a	25.0 a	7.1 a	0.01 a	47.6 a
High Rate	50.7 a	3.58 a	66.3 a	24.6 a	7.1 a	0.01 a	47.9 a
SED[1]	1.80	0.075	0.078	0.181	0.064	0.028	0.176
p-value[2]	0.999	0.233	0.016	0.178	0.975	0.880	0.259



Summary

Plant density differed significantly among seeding rates at all growth stages, with low, standard, and high rates maintaining their target densities from two weeks after seeding through post-harvest ($p < 0.0001$). Percent survival was similar among seeding rates at two weeks after seeding and at the 2–4 leaf stage, but post-harvest survival was reduced at the high seeding rate compared with the low and standard rates ($p = 0.022$). Seeding rate had no effect on yield, thousand kernel weight, protein, moisture, green seed, or oil content, as all treatments performed similarly ($p > 0.05$). Test weight differed slightly among seeding rates ($p = 0.016$), although differences were small and values were comparable across treatments.

To review footnote references please refer to overall trial summary on page 69.

This trial was conducted with the agronomic support of

SARA OLEXSYN

TOP NOTCH
FARMING
RESEARCH TRIALS
Brought to you by SaskOilseeds

Split Nitrogen or Top-Up Nitrogen Trial

Nitrogen (N) plays a critical role in canola production in Saskatchewan. Producers are tasked with increasing yield, quality and economic return while using applied nutrients efficiently, considering factors such as cost and environmental impact. Two related management practices have emerged to potentially increase efficiency and reduce the economic risk of N fertilizer application, split N application and top-dressing N. Split application is primarily a risk management approach, where only part of the total N required based on the yield goal, is applied at or before seeding, and the remainder applied in-crop if conditions are conducive to achieving the yield goal. Top-dressing entails applying 100% of the recommended N at seeding and supplementing with additional N in-season if growing conditions are conducive to further improving the yield or quality of the crop. These methods could potentially help crops utilize N more effectively, boost productivity, reduce costs, and minimize environmental impact from N losses.

Objective

To determine if there is an agronomic and economic advantage to using a split N application or top-dressing N compared to applying all nitrogen at seeding on canola yield, quality and economic return under various soil and weather conditions in Saskatchewan.

Treatments

Option A: Split N	Option B: Split N + Top dress
1) 100% N at seeding	1) 100% N at seeding
2) 70% N at seeding + 30% in-crop	2) 70% N at seeding + 30% in-crop
	3) 100% N at seeding + additional in-crop

Trials were set up in randomized strips with four replications, for a total of 8 (option A) or 12 plots (option B). All plots were managed the same agronomically, besides N fertility, including seeding date, variety, seeding depth, seed treatment, and pesticide application.

Data Collection

- Soil samples
- Plant density
- The following management and agronomic data were recorded precisely:
  - Fertilizer products, rates, placement, timing
  - Equipment type, opener, and row spacing
  - Canola variety, TSW and seeding rate
  - Crop protection: seed treatment, pesticide applications
  - Previous crop and residue accumulation
  - General notes on weed, insect, disease infestations, and notable weather events
- Yield was determined for each plot separately by weighing with a weigh wagon or grain cart with scale
- Grain samples were collected from each plot separately for grain quality analysis.

The following footnotes will be referred to for individual site report for this protocol:

[1]SED is a measure of how much variability (same units as mean) you would expect in the difference between sample means if you repeated the experiment several times. The Least Significant Difference (LSD) is approximately 2 times the SED.

[2]A linear regression was used to assess the effects of varieties on the response variables. The data was also analyzed using the Mixed Model procedure in JMP with replicate considered random and nitrogen considered a fixed effect. Treatment means were separated using Least Significant Difference (LSD) test. All treatment effects and differences between means were considered significant at $p \leq 0.05$. However, p-values of 0.05-0.1 may also be acknowledged.

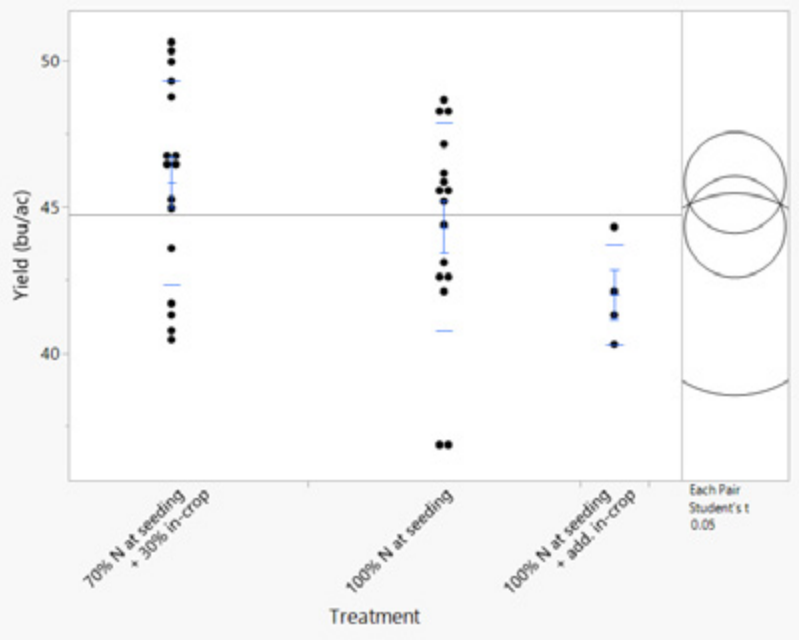
$P < 0.05$: There is a 95% probability (19 out of 20 times) that the observed difference is due to the treatment rather than random variation.
$P < 0.1$: There is a 90% probability (9 out of 10 times) that the difference is due to the treatment effect.
$P > 0.1$: There is a higher likelihood that the observed difference is due to random variability rather than the treatment

2024 Combined Results (4 sites)

Across locations, nitrogen application strategy had no significant effect on crop establishment, yield, or seed quality. Plant density ranged from 6 to 7 plants/ft², and yields were statistically similar at 42.77 to 45.82 bu/ac, with all treatments sharing the same significance grouping. Thousand kernel weight and test weight showed only minor numerical variation and were not significantly affected. Seed quality parameters were likewise unaffected, with protein ranging from 23.82–23.98%, moisture from 7.85–8.08%, green seed remaining negligible (0.00–0.01%), and oil content ranging from 47.33–47.64%. The consistently non-significant p-values indicate that applying nitrogen entirely at seeding, splitting nitrogen between seeding and in-crop, or adding additional in-crop nitrogen resulted in equivalent agronomic and seed quality performance under the conditions of this trial.

Treatment	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)
100% N at seeding	6 a	44.3 a	65.4 a	5.8 a
70% N at seeding + 30% in-crop	7 a	45.8 a	65.5 a	5.7 a
100% N at seeding + additional in-crop	7 a	42.8 a	65.7 a	6.0 a
SED[1]	0.264	3.21	0.115	0.087
p-value[2]	0.406	0.643	0.162	0.194

Treatment	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% N at seeding	24.0 a	8.0 a	0.01 a	47.3 a
70% N at seeding + 30% in-crop	23.8 a	7.9 a	0.01 a	47.3 a
100% N at seeding + additional in-crop	24.0 a	8.1 a	0.00 a	47.6 a
SED[1]	0.343	0.301	0.008	0.292
p-value[2]	0.777	0.652	0.976	0.682

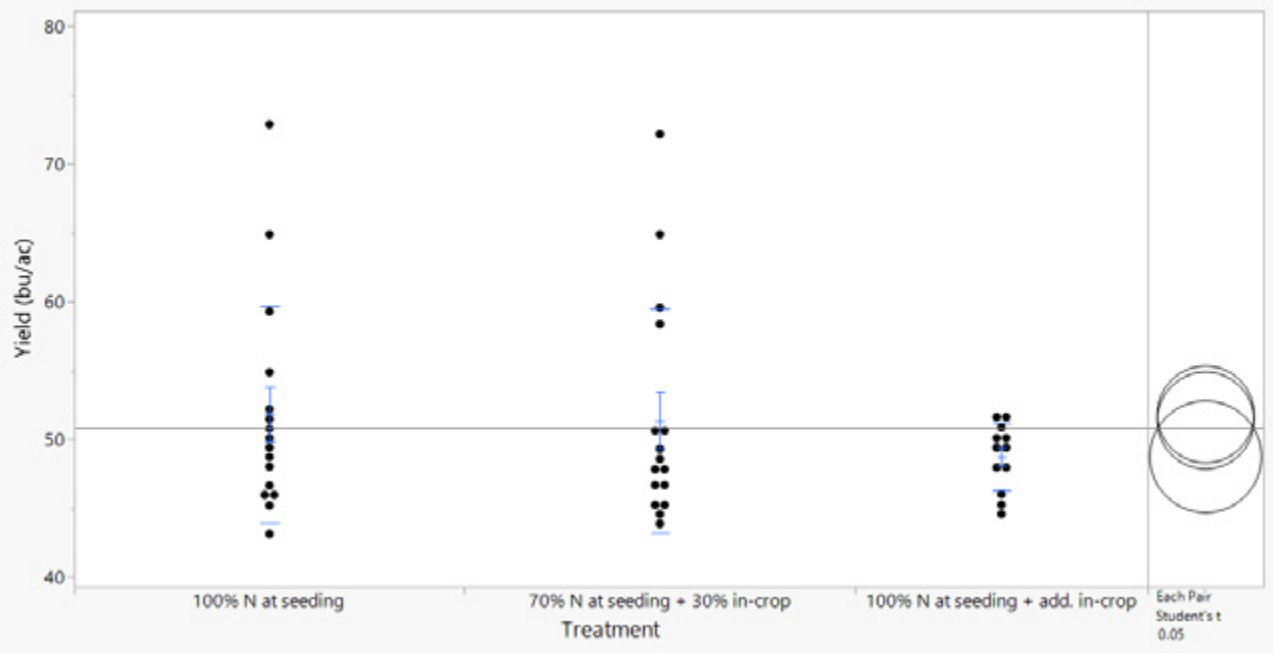


2025 Combined (4 sites)

Across all treatments, nitrogen application strategy did not significantly influence crop performance or seed quality. Stand establishment was uniform at 7 plants/ft², and grain yield was comparable among treatments, ranging from 51.40 to 52.67 bu/ac. Thousand kernel weight and test weight varied only slightly and showed no statistical separation. Similarly, seed quality parameters were unaffected by nitrogen strategy: protein levels ranged from 23.92 to 24.04%, moisture from 8.37 to 8.66%, green seed levels remained minimal (0.00–0.02%), and oil content ranged from 46.18 to 46.50%. Overall, the lack of significant differences indicates that applying all nitrogen at seeding, splitting applications between seeding and in-crop, or including additional in-crop nitrogen provided comparable agronomic and quality outcomes under the conditions of this trial.

Treatment	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)
100% N at seeding	7 a	51.8 a	3.3 a	64.5 a
70% N at seeding + 30% in-crop	7 a	51.4 a	3.3 a	64.5 a
100% N at seeding + additional in-crop	7 a	52.7 a	3.3 a	64.3 a
SED[1]	0.096	0.454	0.031	0.073
p-value[2]	0.152	0.103	0.838	0.257

Treatment	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% N at seeding	24.0 a	8.7 a	0.01 a	46.2 a
70% N at seeding + 30% in-crop	23.9 a	8.4 a	0.00 a	46.3 a
100% N at seeding + additional in-crop	24.0 a	8.5 a	0.02 a	46.5 a
SED[1]	0.295	0.122	0.007	0.342
p-value[2]	0.895	0.126	0.294	0.679

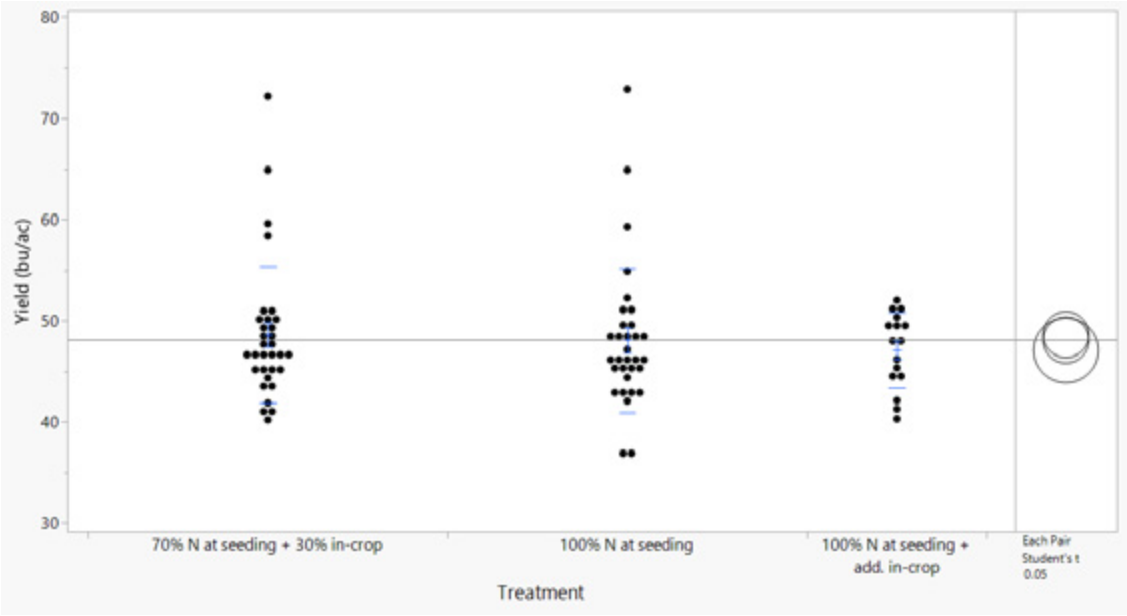


2024 and 2025 Combined Results (8 sites)

Across all 8 locations, over 2 years, nitrogen application strategy had no significant effect on plant density, yield, grain quality, or seed quality. Plant density was uniform at 7 plants/ft², and yields were statistically similar, ranging from 48.07 to 49.02 bu/ac. Thousand kernel weight and test weight showed only minor numerical variation, with all treatments sharing the same statistical grouping. Seed quality parameters were also unaffected, with protein ranging from 23.87–24.01%, moisture from 8.11–8.34%, green seed remaining negligible (0.00–0.01%), and oil content ranging from 46.76–47.05%. The consistently non-significant p-values indicate that applying nitrogen entirely at seeding, splitting nitrogen between seeding and in-crop, or adding additional in-crop nitrogen resulted in equivalent agronomic and seed quality performance under the conditions of this trial.

Treatment	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)
100% N at seeding	7 a	48.1 a	34.4 a	35.1 a
70% N at seeding + 30% in-crop	7 a	48.6 a	34.4 a	35.1 a
100% N at seeding + additional in-crop	7 a	49.0 a	34.4 a	35.1 a
SED[1]	0.127	1.02	0.060	0.066
p-value[2]	0.939	0.665	0.300	0.520

Treatment	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% N at seeding	24.0 a	8.3 a	0.01 a	46.8 a
70% N at seeding + 30% in-crop	23.9 a	8.1 a	0.00 a	46.8 a
100% N at seeding + additional in-crop	23.9 a	8.3 a	0.01 a	47.1 a
SED[1]	0.197	0.118	0.005	0.215
p-value[2]	0.672	0.101	0.353	0.478



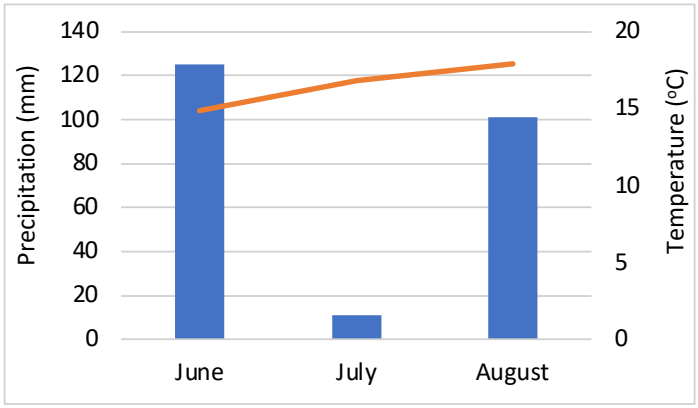
TOP NOTCH FARMING RESEARCH TRIALS

Split N or Top-Up N Trial
(Birch Hills)

Treatment #	Description
1	100% N at seeding
2	70% N at seeding + 30% in-crop
3	100% N at seeding + additional in-crop

Objective: To determine if there is an agronomic and economic advantage to using a split N application or top-dressing N compared to applying all nitrogen at seeding on canola yield, quality and economic return under various soil and weather conditions in Saskatchewan.

Precipitation from rain gauge and temperature from Environment Canada (Prince Albert Glass Field)



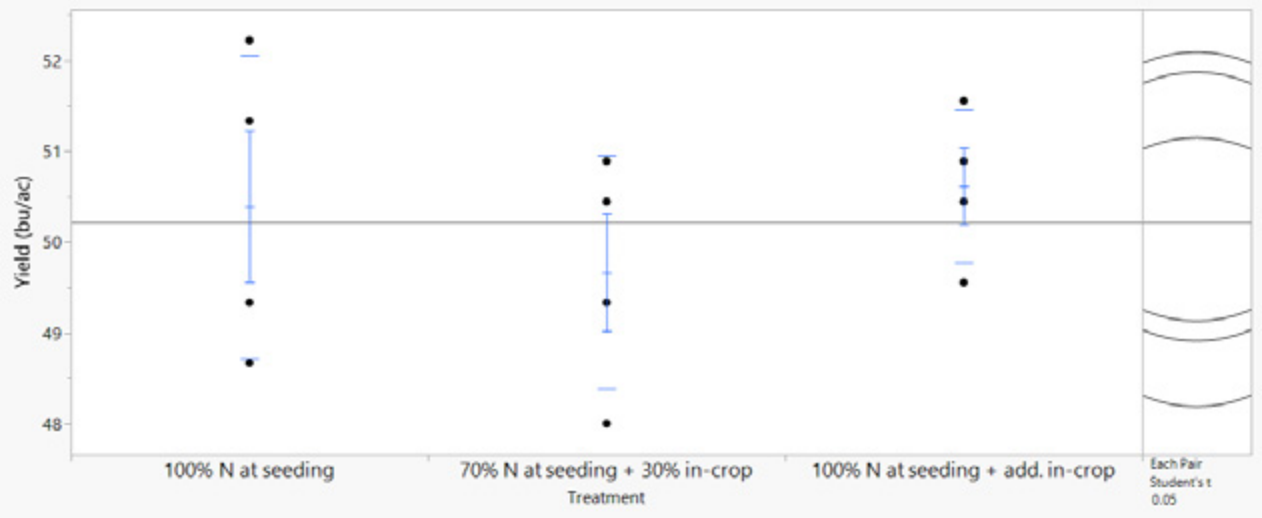
General Trial Information	
Variety	InVigor Health L358HPC
Thousand Seed Weight (TSW)	4.8 g
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane) + Buteo® Start (flupyradifurone)
Previous Crop	Barley
Soil Organic Matter	7.1%
Residual Nitrate-N	
- **0-6”**	33 lb/ac
- **6-12”**	48 lb/ac
Soil Texture	Medium
Seeding Date	May 16, 2025
Seeding Rate	4 lb/ac
Seeding Equipment	John Deere/SeedMaster P670
Seeding Depth	¾”
Seeding Speed	4.8 mph
Row Spacing	12”
Crop Protection	May 10: Glyphosate June 28: Liberty® (glufosinate)

Nitrogen Application			
Seeding		In-Crop	
Product	Urea	Product	UAN (28-0-0)
Date	May 16	Date	July 5
Placement	Sideband	Crop Stage	6 leaf
Form	Granular	Water Volume	0 gal/ac
		Application Rate	7.5 gal/ac
		Speed	12 mph
		Sprayer	JD 616R
		Nozzles	3 stream

Nitrogen Application:	Seeding						In Crop	Total Actual (lb/ac)				
Treatments:	46-0-0 (lb/ac)	Actual N (46-0)	13-33-0-15S (lb/ac)	Actual N	Actual P	Actual S	UAN (gal/ac)	Actual N	N	P	K	S
100% seeding	160	73.6	80 lbs	10.4	26.4	10.4	0	0	84	26.4	0	10.4
70% seeding + 30% in-crop	112	51.5	80 lbs	10.4	26.4	10.4	7.5	22.6	85	26.4	0	10.4
100% seeding + 30% in-crop	160	73.6	80 lbs	10.4	26.4	10.4	7.5	22.6	107	26.4	0	10.4

Results

Treatment	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% N at seeding	9 a	50.4 a	3.2 a	65.8 a	21.2 a	7.6 a	0.01 a	50.9 a
70% N at seeding + 30% in-crop	9 a	49.7 a	3.3 a	65.8 a	20.6 a	7.5 a	0.00 a	51.9 a
100% N at seeding + 30% in crop	8 a	50.6 a	3.2 a	65.8 a	20.8 a	7.6 a	0.01 a	51.3 a
SED[1]	0.408	0.491	0.12	0.12	0.91	0.19	0.02	0.83
p-value[2]	0.552	0.213	0.855	0.941	0.771	0.648	0.670	0.567



Economics

	N at seeding (lb/ac)	N at seeding ($/ac)[x]	In-Crop N gal/ac)	In-Crop N ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net Profit ($/ac)	Profit/Loss ($/ac)
100% N at seeding	160	56.6	0.00	0.00	56.61	50.4	13.00	655.20	598.59	0.00
70% N at seeding + 30% in crop	112	39.6	7.5	18.75	58.38	49.7	13.00	646.10	587.72	-10.87
100% N at seeding + 30% in crop	160	56.6	7.5	18.75	75.36	50.6	13.00	657.80	582.44	-16.15

[x]46-0-0-0 price, Local Retailer, November 27, 2025 ($780/MT)
[y]28-0-0 price, Local Retailer, November 27, 2025 ($520 MT)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Across treatments, nitrogen application had no significant effect on plant density, yield, or seed quality parameters. Plant density remained similar (8–9 plants/ft²), and yields were comparable across treatments, ranging from 49.67 to 50.61 bu/ac, with all means sharing the same statistical grouping. Thousand kernel weight, test weight, protein, moisture, green seed, and oil content also showed minimal variation among treatments, and all p-values indicate no statistically significant differences. Overall, applying nitrogen entirely at seeding, splitting it between seeding and in-crop, or applying additional in-crop nitrogen produced equivalent agronomic and quality outcomes.

To review footnote references please refer to overall trial summary on page 89.

This trial was conducted with the agronomic support of

TOMTENE SEED FARM J.V

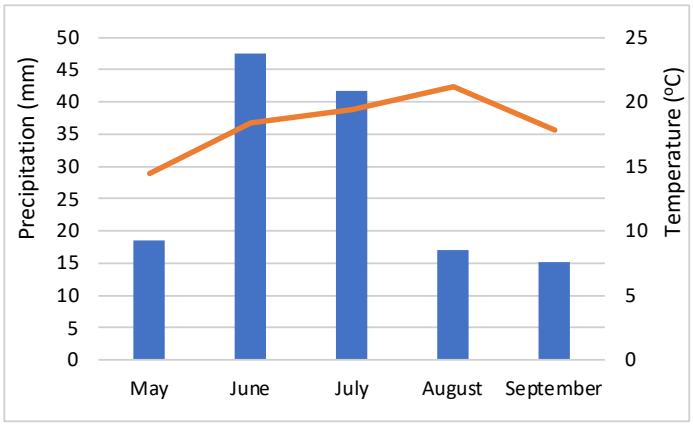
TOP NOTCH FARMING RESEARCH TRIALS

Split N or Top-Up N Trial (Craik)

Treatment #	Description
1	100% N at seeding
2	70% N at seeding + 30% in-crop
3	100% N at seeding + 30% in-crop

Objective: To determine if there is an agronomic and economic advantage to using a split N application or top-dressing N compared to applying all nitrogen at seeding on canola yield, quality and economic return under various soil and weather conditions in Saskatchewan.

Precipitation and temperature from local weather station



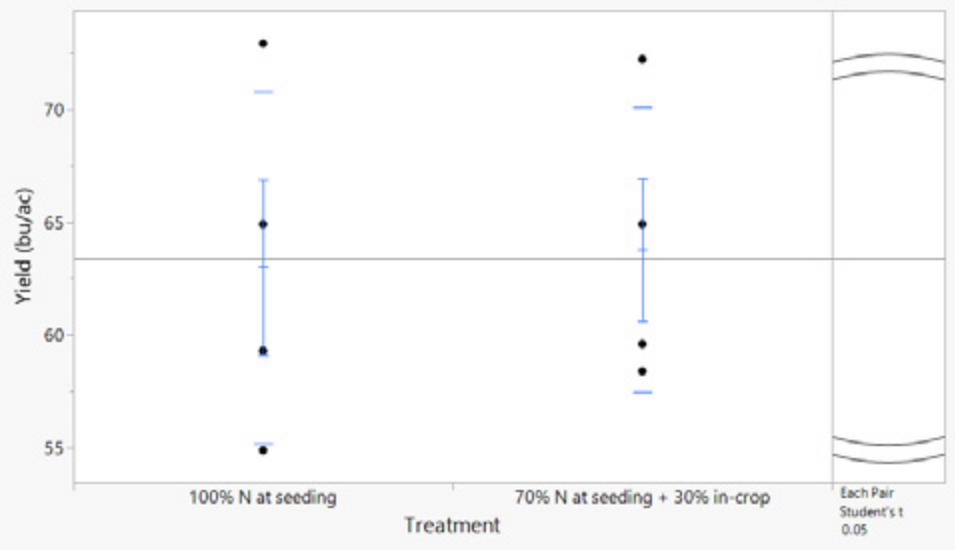
General Trial Information	
Variety	InVigor L340PC
Thousand Seed Weight (TSW)	4.4
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane)
Previous Crop	Barley
Soil Organic Matter	2.1%
Residual Nitrate-N	
- **0-8”**	15 lb/ac
Seeding Date	May 8, 2025
Seeding Rate	4.2 lb/ac
Seeding Equipment	Bourgault 3320
Seeding Depth	1”
Seeding Speed	4.2 mph
Row Spacing	12”
Crop Protection	May 4: Roundup® (glyphosate) June 12: Liberty® (glufosinate) + Centurion® (clethodim)

Nitrogen Application			
Seeding		In-Crop	
Product	46-0-0	Product	UAN (28-0-0)
Date	May 8	Date	June 18
Placement	Midrow	Crop Stage	6 leaf
Form	granular	Water Volume	0 gal/ac
		Application Rate	10 gal/ac
		Speed	15 mph
		Sprayer	Case 4430
		Nozzles	TeeJet SJ7-08

Nitrogen Application	Seeding				In Crop		Total Actual (lb/ac)			
Treatments:	46-0-0 (lb/ac)	Actual N	ESN (lb/ac)	Actual N	UAN (gal/ac)	Actual N	N	P	K	S
100% seeding	100	23	225	104	0	0	138	52	0	0
70% seeding + 30% in-crop	100	23	150	69	10	34	137	52	0	0

Results

Treatment	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% N at seeding	6 a	63.0 a	3.5 a	64.2 a	26.5 a	10.7 a	0.0 a	44.6 a
70% N at seeding + 30% in-crop	6 a	63.8 a	3.5 a	64.2 a	26.9 a	10.6 b	0.0 a	44.2 b
SED[1]	0.194	0.932	0.298	0.110	0.789	0.013	0.0	0.114
p-value[2]	0.769	0.467	0.980	0.740	0.687	0.015	1.0	0.043



Economics

	N at seeding (lb/ac)	N at seeding ($/ac)[x]	In-Crop N gal/ac)	In-Crop N ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net Profit ($/ac)	Profit/Loss ($/ac)
100% N at seeding	104	36.8	0.00	0.00	36.80	63.0	13.00	819.00	782.20	0.00
70% N at seeding + 30% in crop	69	24.4	10.0	25.00	49.41	63.8	13.00	829.40	779.99	-2.22

[x]46-0-0-0 price, Local Retailer, November 27, 2025 ($780/MT)
[y]28-0-0 price, Local Retailer, November 27, 2025 ($520 MT)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Across treatments, plant density, yield, and most seed quality parameters were not significantly affected by nitrogen. Plant density remained at 6 plants/ft², and yields were statistically similar at 63–63.78 bu/ac. Thousand kernel weight, test weight, protein, and green seed percentage also showed no significant differences. However, moisture content was slightly lower with the split nitrogen treatment (10.61%) compared with 100% N at seeding (10.68%), and oil content differed modestly, with slightly higher oil under 100% N at seeding (44.63%) than with split N (44.24%). Overall, nitrogen timing had minimal impact on yield, with only small but statistically significant differences in moisture and oil content.

To review footnote references please refer to overall trial summary on page 89.

This trial was conducted with the agronomic support of

BRODERSON FARMS

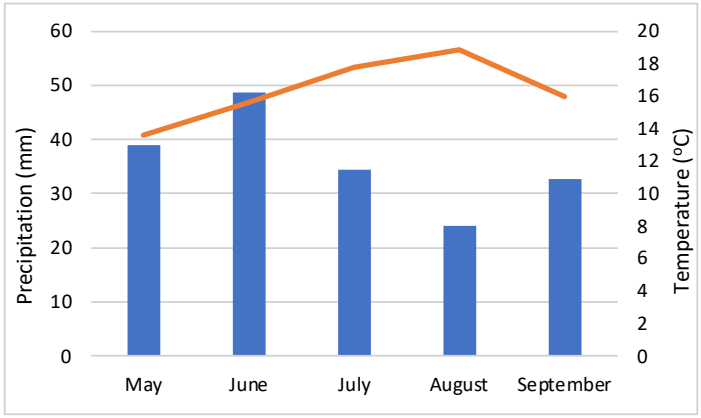
TOP NOTCH FARMING RESEARCH TRIALS

Split N or Top-Up N Trial (Dysart)

Treatment #	Description
1	100% N at seeding
2	70% N at seeding + 30% in-crop
3	100% N at seeding + 30% in-crop

Objective: To determine if there is an agronomic and economic advantage to using a split N application or top-dressing N compared to applying all nitrogen at seeding on canola yield, quality and economic return under various soil and weather conditions in Saskatchewan.

Precipitation and temperature from local weather station



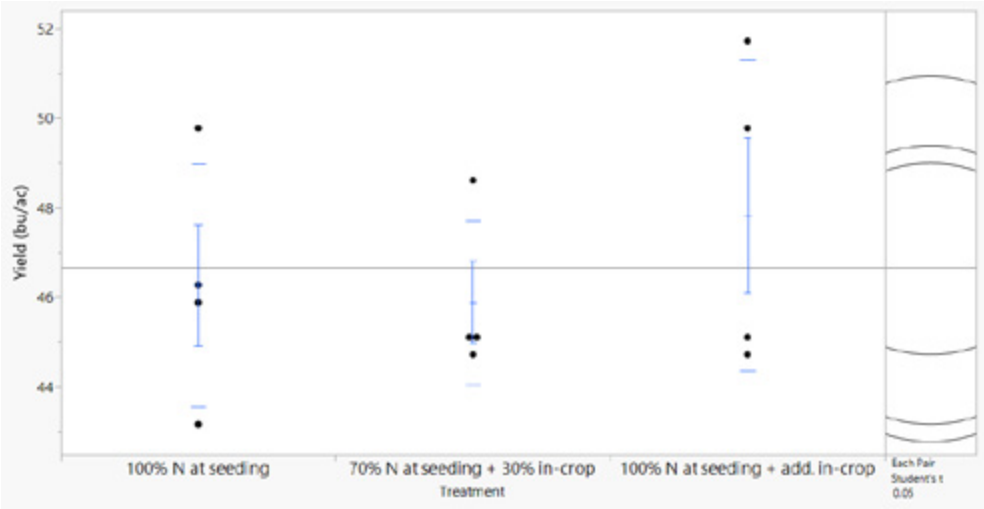
General Trial Information	
Variety	InVigor
Thousand Seed Weight (TSW)	5.3 g
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane) + Buteo® (flupyradifurone)
Previous Crop	Wheat
Soil Organic Matter	4.6%
Residual Nitrate-N	
- **0-6”**	53 lb/ac
- **6-12”**	150 lb/ac
Seeding Date	May 26, 2025
Seeding Rate	4.81 lb/ac
Seeding Equipment	Seed Hawk
Seeding Depth	¾”
Seeding Speed	4.5 mph
Row Spacing	12”
Crop Protection	May 24: Glyphosate 540 + Prospect® (halauxifen + carfentrazone-ethyl) June 13: Glufosinate® 150 + Select® Plus (clethodim + quizalofop)

Nitrogen Application			
Seeding		In-Crop	
Product	46-0-0	Product	UAN (28-0-0)
Date	May 26	Date	June 30
Placement	Sideband	Crop Stage	Cabbaging/early bud
Form	Granular	Water Volume	0 gal/ac
		Application Rate	9.8 gal/ac
		Speed	7.5 mph
		Sprayer	JD 4830
		Nozzles	TeeJet SJ3-04

Nitrogen Application:	Seeding								In Crop		Total Actual (lb/ac)			
Treatments:	30-0-0-16 (lb/ac)	Actual N	Actual S	46-0-0 (lb/ac)	Actual N	11-52 (lb/ac)	Actual N	Actual P	UAN (gal/ac)	Actual N	N	P	K	S
100% seeding	140.5	41.5	22.2	174.4	80.2	94.1	10.4	48.9	0	0	132	49	0	22
70% seeding + 30% in-crop	140.5	41.5	22.2	109.3	50.3	94.1	10.4	48.9	10	30	132	49	0	22
100% seeding + 30% in-crop	140.5	41.5	22.2	174.4	80.2	94.1	10.4	48.9	10	30	162	49	0	22

Results

Treatment	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% N at seeding	8 a	46.3 a	3.2 a	63.9 a	23.0 a	6.8 a	0.01 a	43.8 a
70% N at seeding + 30% in-crop	7 a	45.9 a	3.1 a	63.8 a	23.4 a	6.6 a	0.01 a	43.5 a
100% N at seeding + 30% in crop	7 a	47.8 a	3.2 a	63.7 a	23.7 a	6.8 a	0.04 a	43.6 a
SED[1]	0.328	1.95	0.414	0.093	0.275	0.127	0.024	0.607
p-value[2]	0.647	0.600	0.974	0.274	0.140	0.265	0.512	0.842



Economics

	N at seeding (lb/ac)	N at seeding ($/ac)[x]	In-Crop N gal/ac)	In-Crop N ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net Profit ($/ac)	Profit/Loss ($/ac)
100% N at seeding	80	28.3	0	0.00	28.30	46.3	13.00	601.90	573.60	0.00
70% N at seeding + 30% in crop	50	17.7	7.5	25.00	42.69	45.9	13.00	596.70	554.01	-19.59
100% N at seeding + 30% in crop	80	28.3	7.5	25.00	53.31	47.8	13.00	621.40	568.09	-5.50

[x]46-0-0-0 price, Local Retailer, November 27, 2025 ($780/MT)
[y]28-0-0 price, Local Retailer, November 27, 2025 ($520 MT)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Across treatments, nitrogen had no significant effect on plant density, yield, or seed quality. Plant density ranged from 7–8 plants/ft², and yields were statistically similar, varying from 45.89 to 47.83 bu/ac, with all treatments sharing the same significance grouping. Thousand kernel weight, test weight, protein, moisture, green seed percentage, and oil content also showed minimal variation, and all p-values indicate no statistically significant differences among treatments. Overall, applying nitrogen entirely at seeding, splitting it between seeding and in-crop, or applying additional in-crop nitrogen resulted in equivalent agronomic and quality performance under the conditions of this trial.

To review footnote references please refer to overall trial summary on page 89.

This trial was conducted with the agronomic support of

Ag Grow Consulting Ltd.

TOP NOTCH FARMING RESEARCH TRIALS

Split N or Top-Up N Trial (Langenburg)

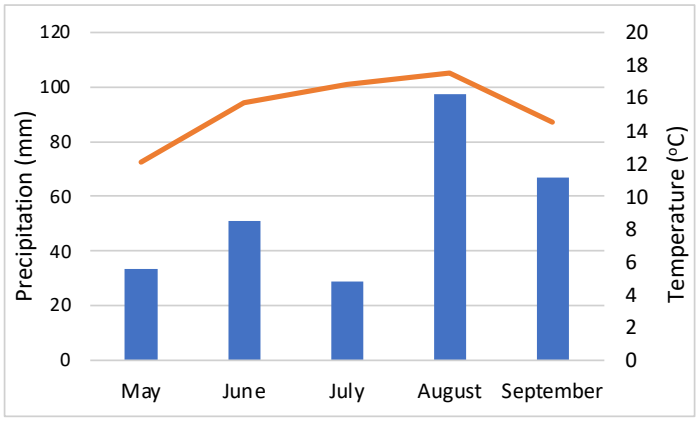
Treatment #	Description
1	100% N at seeding
2	70% N at seeding + 30% in-crop
3	100% N at seeding + 30% in-crop

Objective: To determine if there is an agronomic and economic advantage to using a split N application or top-dressing N compared to applying all nitrogen at seeding on canola yield, quality and economic return under various soil and weather conditions in Saskatchewan.

General Trial Information

Variety	DKL 801LL
Thousand Seed Weight (TSW)	4.1 g
Seed Treatment	Buteo® Start (flupyradifurone)
Previous Crop	Oats
Soil Organic Matter	4.1%
Residual Nitrate-N	
- **0-6”**	13 lb/ac
- **6-12”**	21 lb/ac
Seeding Date	May 28, 2025
Seeding Rate	3 lb/ac
Seeding Equipment	Seed Hawk
Seeding Depth	¾”
Seeding Speed	4.8 mph
Row Spacing	12”
Crop Protection	May 27: Command® Charge (clomazone, carfentrazone + glyphosate) June 26: Glufosinate®+ Antler® Strikelock (aminopyralid) July 16: Cotegra® (clopyralid) September 21: Glyphosate

Weather from Environment Canada (Roblin, MB)



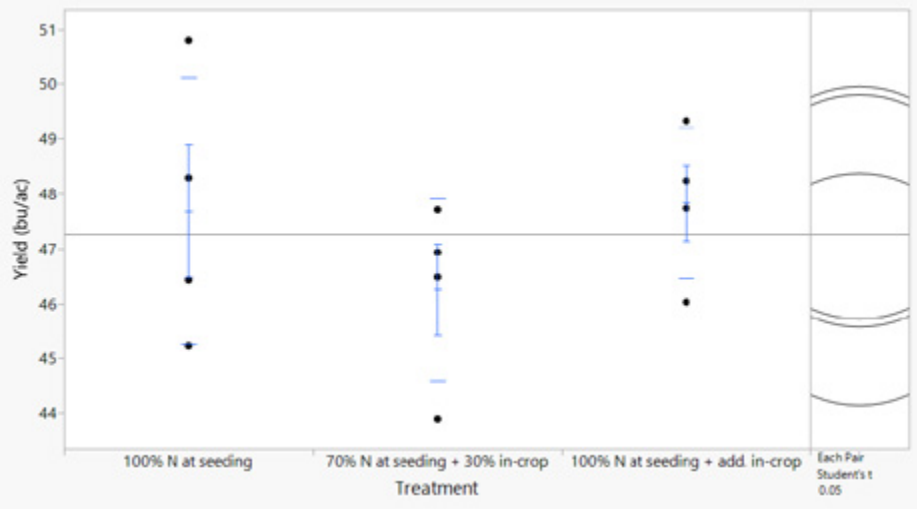
Nitrogen Application

Seeding		In-Crop	
Product	39-9-0-0	Product	UAN (28-0-0)
Date	May 28	Date	July 6
Placement	Sideband	Crop Stage	Flowering
Form	granular	Water Volume	10 gal/ac
		Application Rate	15 gal/ac
		Speed	12 mph
		Sprayer	JD 4940
		Nozzles	Dribble band

Nitrogen Application:	Seeding						In Crop		Total Actual (lb/ac)			
Treatments:	39-9-0 (lb/ac)	Actual N	Actual P	11-52-0 (lb/ac)	Actual N	Actual P	UAN (gal/ac)	Actual N	N	P	K	S
100% seeding	255	99	10	36	4	8	0	0	103	18	81	69
70% seeding + 30% in-crop	165	64	7	36	4	8	15	46	114	15	81	69
100% seeding + 30% in-crop	255	99	10	36	4	8	15	46	149	18	81	69

Results

Treatment	Plant Density (plants/ft²)	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
100% N at seeding	7 a	47.7 a	3.5 a	64.1 a	25.5 a	9.6 a	0.01 a	45.3 a
70% N at seeding + 30% in-crop	7 a	46.3 a	3.5 a	63.9 a	24.8 a	8.9 a	0.00 a	45.8 a
100% N at seeding + 30% in crop	7 a	47.8 a	3.4 a	63.7 a	24.8 a	9.1 a	0.00 a	46.4 a
SED[1]	0.141	1.26	0.116	0.177	0.509	0.411	0.010	0.593
p-value[2]	0.692	0.436	0.883	0.218	0.394	0.302	0.422	0.261



Economics

	N at seeding (lb/ac)	N at seeding ($/ac)[x]	In-Crop N gal/ac)	In-Crop N ($/ac)[y]	Total Cost ($/ac)	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net Profit ($/ac)	Profit/Loss ($/ac)
100% N at seeding	255	99.13	0	0.00	99.13	46.3	13.00	601.9	502.77	0.00
70% N at seeding + 30% in crop	165	64.1	15.0	37.50	101.64	47.7	13.00	620.1	518.46	15.68
100% N at seeding + 30% in crop	255	99.13	15.0	37.50	136.63	47.8	13.00	621.4	484.77	-18.00

[x]39-9-0-0 price, Local Retailer, November 27, 2025 ($857/MT)
[y]28-0-0 price, Local Retailer, November 27, 2025 ($520 MT)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Across treatments, nitrogen had no significant effect on crop establishment, yield, or seed quality. Plant density was consistent at 7 plants/ft², and yields were statistically similar, ranging from 46.3 to 47.8 bu/ac, with all treatments sharing the same significance grouping. Thousand kernel weight, test weight, protein, moisture, green seed percentage, and oil content showed only minor numerical differences, and all p-values indicate no statistically significant treatment effects. Overall, applying nitrogen entirely at seeding, splitting nitrogen between seeding and in-crop, or adding additional in-crop nitrogen resulted in equivalent agronomic and quality performance under the conditions of this trial.

To review footnote references please refer to overall trial summary on page 89.

This trial was conducted with the agronomic support of

MNP AgINTELLECT

TOP NOTCH FARMING RESEARCH TRIALS

Sclerotinia Fungicide Trial

A common disease in Saskatchewan canola is sclerotinia caused by Sclerotinia sclerotiorum[1]. The fungus can overwinter in the soil, along with can be found in common weed species, such as shepherds' purse, it can remain in the soil for five years or more. First symptoms appear at the end of flowering, when conditions are hot and moist. Symptoms include light brown lesions, evolving into greyish white and eventually bleaching the stems. Therefore, application of a fungicide is a great tool in reducing diseases in canola but comes at a cost. Evaluating sclerotia and fungicides effect on yield, grade and economics through the use of check strips is a great way to determine the possible effectiveness of fungicides.

[1]*Sclerotinia stem rot. Diseases. Canola Encyclopedia. Canola Council. https://www.canolacouncil.org/canola-encyclopedia/diseases/sclerotinia-stem-rot/#disease-cycle-for-sclerotinia-stem-rot*

Objective

The objective of this field scale trial is to evaluate fungicide performance and economics on canola.

Treatments

1)	Untreated check
2)	Fungicide Application

Fungicides were applied according to label recommendations, and replicated four times, for a total of eight plots. Apart from fungicide application, all strips were managed the same agronomically including seeding, fertility, and pesticide (excluding fungicide) application.

Data Collection

- Spring or fall soil sample
- Disease assessments
- Yield
- Harvest samples for each plot
- The following management and agronomic data were recorded precisely:
  - Fungicide products, rates, placement, timing
  - Crop protection: seeding, fertility, pesticide applications
  - General notes on weed, insect, disease infestations, and notable weather events

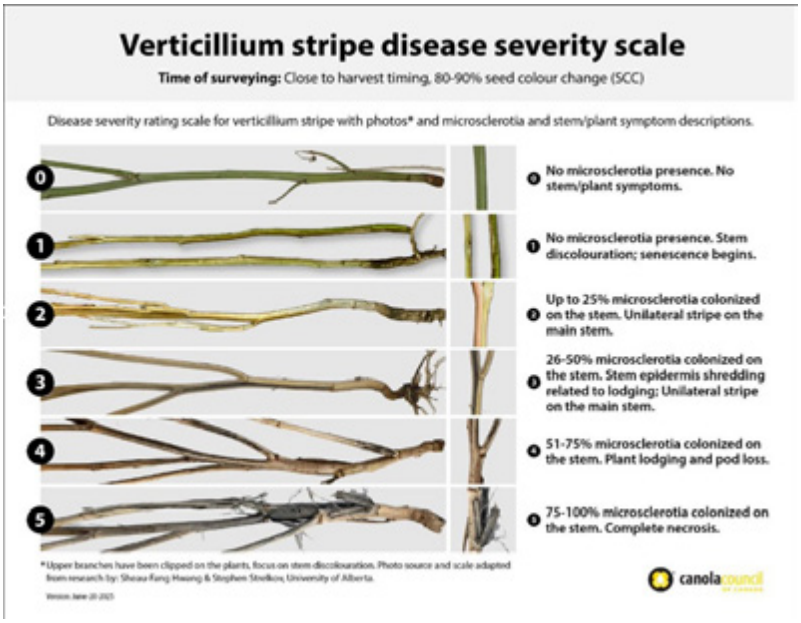
The following footnotes will be referred to for individual site report for this protocol:

[1]SED is a measure of how much variability (same units as mean) you would expect in the difference between sample means if you repeated the experiment several times. The Least Significant Difference (LSD) is approximately 2 times the SED.

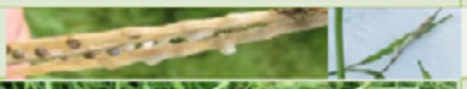
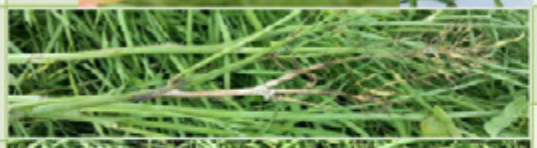
[2]A linear regression was used to assess the effects of varieties on the response variables. The data was also analyzed using the Mixed Model procedure in JMP with replicate considered random and fungicide application considered a fixed effect. Treatment means were separated using Least Significant Difference (LSD) test. All treatment effects and differences between means were considered significant at $p \leq 0.05$. However, p-values of 0.05-0.1 may also be acknowledged.

$P < 0.05$: There is a 95% probability (19 out of 20 times) that the observed difference is due to the treatment rather than random variation.
$P < 0.1$: There is a 90% probability (9 out of 10 times) that the difference is due to the treatment effect.
$P > 0.1$: There is a higher likelihood that the observed difference is due to random variability rather than the treatment.

Disease Assessment Scales



Sclerotinia Disease Severity Rating Scale

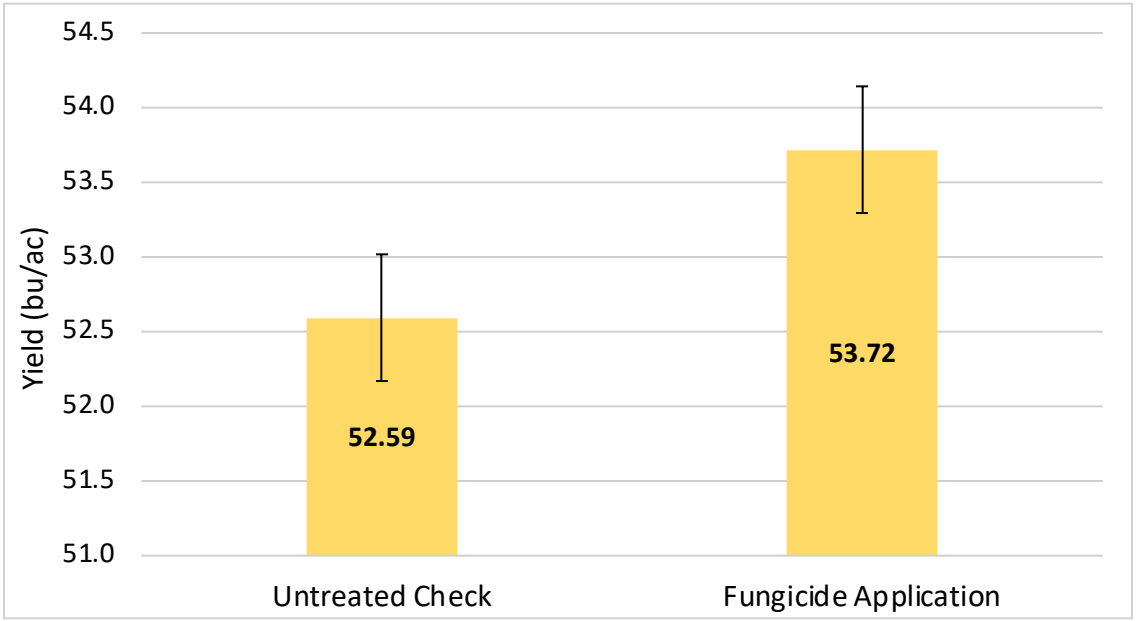
Disease Rating	Lesion Location	Symptoms
0	None	No symptoms
1	Pod 	Infection of pods only
2		Lesion situated on main stem or branch(es) with potential to affect up to ¼ of seed formation and filling on plant
3		Lesion situated on main stem or on a number of branches with potential to affect up to ½ of seed formation and filling on plant
4		Lesion situated on main stem or on a number of branches with potential to affect up to 3/4 of seed formation and filling on plant
5	Lower  	Main stem lesion with potential effects on seed formation and filling of entire plant

2025 Combined Results

Across the six sites, three locations (Birch Hills, Davidson, and Wilkie) included an untreated check and a single fungicide application. Disease assessments at the Wilkie and Davidson sites showed overall low disease pressure, with no significant differences between treatments for sclerotinia, blackleg, aster yellows, or stem lesions. Verticillium stripe incidence was significantly higher in the fungicide treatment compared to the untreated check ($p = 0.036$), although absolute levels were low. The fungicide application resulted in a statistically significant increase in yield ($p = 0.023$), with no effects on thousand kernel weight, test weight, protein, moisture, green seed, or oil content, indicating a modest yield benefit without changes to seed quality.

		Blackleg			
	Sclerotinia (0-5)	Basal Canker (0-5)	Stem Lesions (Yes = 1, No = 0)	Verticillium Stripe (Yes = 1, No = 0)	Aster Yellows (Yes = 1, No = 0)
Untreated Check	0.13 a	0.10 a	0.08 b	0.0 a	0.01 a
Fungicide Application	0.27 a	0.15 a	0.15 a	0.0 a	0.0 a
SED[1]	0.089	0.046	0.025	0.0	0.01
p-value[2]	0.174	0.312	0.036	1.0	0.242

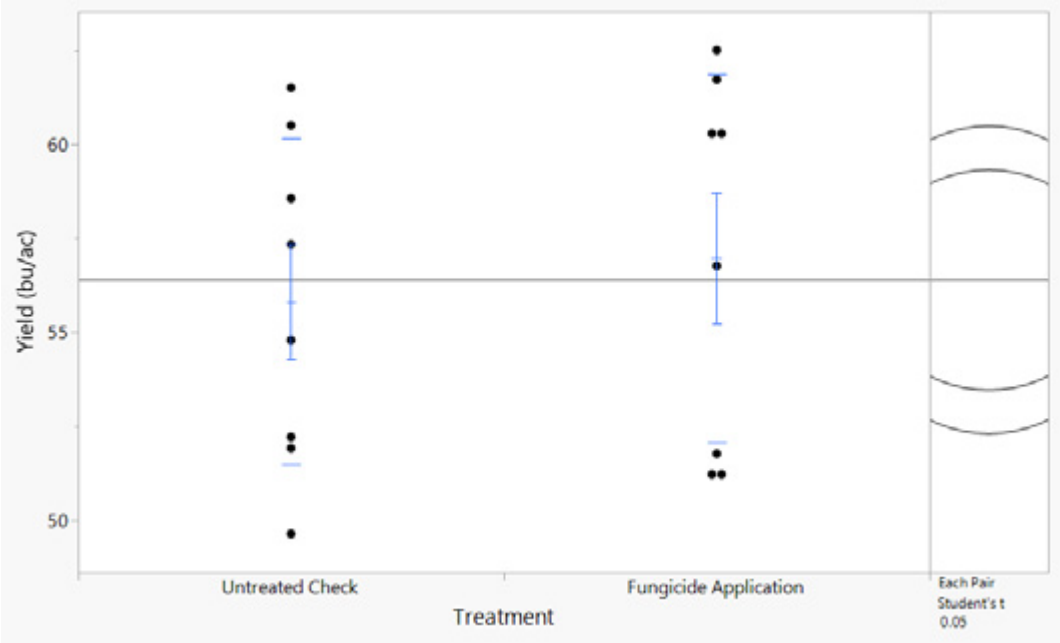
	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	52.6 b	3.6 a	64.7 a	20.1 a	7.0 a	0.01 a	51.5 a
Fungicide Application	53.7 a	3.5 a	64.7 a	20.1 a	6.9 a	0.04 a	51.7 a
SED[1]	0.425	0.136	0.140	0.331	0.110	0.015	0.267
p-value[2]	0.023	0.842	0.844	0.928	0.452	0.147	0.532



At two sites, an untreated check was compared with a dual fungicide application, with no single-application treatment included. Disease pressure was low overall, with no significant differences observed for sclerotinia, verticillium stripe, aster yellows, or stem lesions. Blackleg severity was significantly lower with the fungicide treatment (p = 0.019), indicating effective suppression under these conditions. Yield and thousand kernel weight were not affected by fungicide application, while test weight was significantly higher (p = 0.009); other seed quality parameters remained unchanged.

		Blackleg			
	Sclerotinia (0-5)	Basal Canker (0-5)	Stem Lesions (Yes = 1, No = 0)	Verticillium Stripe (Yes = 1, No = 0)	Aster Yellows (Yes = 1, No = 0)
Untreated Check	0.18 a	0.46 a	0.05 a	0.00 a	0.05 a
Fungicide Application	0.04 a	0.06 b	0.00 a	0.00 a	0.03 a
SED[1]	0.070	0.125	0.00	0.00	0.027
p-value[2]	0.098	0.019	0.981	1.00	0.390

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	55.80 a	3.25 a	65.80 b	24.23 a	6.79 a	0.03 a	46.44 a
Fungicide Application	56.97 a	3.54 a	66.15 a	24.31 a	6.81 a	0.03 a	46.44 a
SED[1]	0.986	0.219	0.091	0.263	0.047	0.018	0.206
p-value[2]	0.282	0.232	0.009	0.768	0.801	1.00	1.00



Indian Head was the only site that included an untreated check, a single fungicide application, and a dual application, and therefore could not be combined with data from other sites.

TOP NOTCH FARMING RESEARCH TRIALS

Sclerotinia Fungicide Trial

(Birch Hills)

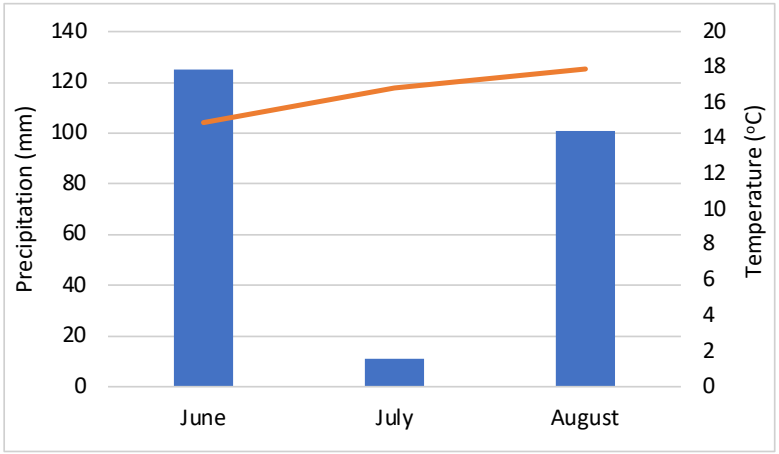
Objective: To evaluate fungicide effectiveness and economics on canola under different environmental conditions and risk factors.

Treatment #	Description
1	Untreated Check
2	Fungicide Application

General Trial Information	
Variety	InVigor L358HPC
Thousand Seed Weight (TSW)	4.8 g
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane + Buteo® Start (flupyradifurone)
Previous Crop	Barley
Soil Organic Matter	7.1%
Residual Nitrate-N	
- **0-6”**	33 lb/ac
- **6-24”**	48 lb/ac
Soil Texture	Medium
Seeding Date	May 16, 2025
Seeding Equipment	John Deere/SeedMaster P670
Seeding Rate	4.1 lb/ac
Seeding Depth	¾”
Seeding Speed	4.8 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	84 – 27 – 0 – 12
Crop Protection	May 10: Glyphosate June 28: Liberty® (glufosinate)

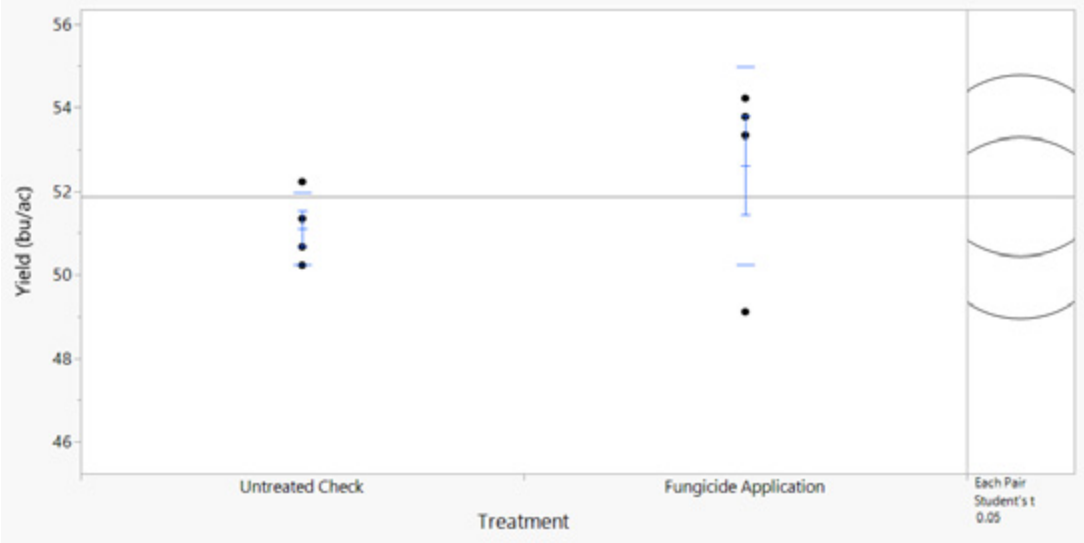
Fungicide Application	
Product	Pavise® 480 (prothioconazole)
Rate	0.3 L/ac
Date	July 11
Crop Stage	40% Flower
Tank Mix	N/A
Water Volume	13 gal/ac
Speed	11 mph
Nozzle	Twin Flat Fan

Precipitation from rain gauge and temperature from Environment Canada (Prince Albert Glass Field)



Results

	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	51.1 a	3.4 a	66.3 a	20.1 a	8.7 a	0.0 a	53.0 a
Fungicide Application	52.6 a	3.1 a	66.3 a	20.2 a	8.6 a	0.01 a	53.4 a
SED[1]	1.18	0.236	0.438	0.927	0.372	0.013	0.539
p-value[2]	0.292	0.252	0.966	0.970	0.714	0.391	0.562



Economics

Treatment	Fungicide ($/ac)[y]	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Untreated Check	0.00	51.1	13.00	664.30	664.30	0.00
Fungicide Application	23.65	52.6	13.00	683.80	660.15	-4.15

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Yield and all measured seed quality parameters were similar between the fungicide-treated and untreated check treatments, with no statistically significant differences observed. While yield and oil content were numerically higher in the fungicide application, these differences were not statistically significant. Disease ratings were not collected at this site, which limited the ability to assess disease pressure or determine whether disease levels influenced treatment response. As a result, conclusions are based solely on yield and quality outcomes under the conditions of this trial.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

TOMTENE SEED FARM J.V

TOP NOTCH FARMING RESEARCH TRIALS

Sclerotinia Fungicide Trial

(Davidson)

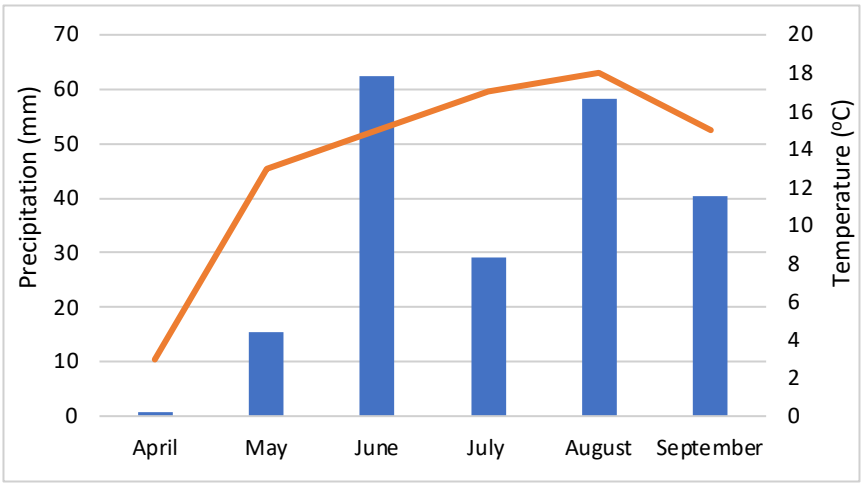
Objective: To evaluate fungicide effectiveness and economics on canola under different environmental conditions and risk factors.

Treatment #	Description
1	Untreated Check
2	Fungicide Application

General Trial Information	
Variety	InVigor L340PC
Thousand Seed Weight (TSW)	4.3 g
Seed Treatment	Buteo® (flupyradifurone) + Prosper® (clothianidin, penflufen, trifloxystrobin + metalaxyl)
Previous Crop	Wheat
Seeding Date	May 14, 2025
Seeding Rate	4.1 lb/ac
Seeding Depth	¾”
Seeding Speed	4.3 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	120 – 44 – 0 – 0
Crop Protection	May 11: Glyphosate + Certitude® (topramezone + bromoxynil) June 16: Liberty® (glufosinate) September 1: Glyphosate

Fungicide Application	
Product	Cotegra® (boscalid + prothioconazole)
Rate	240 mL/ac
Date	June 7
Crop Stage	40% flowered
Tank Mix	N/A
Water Volume	13.5 gal/ac
Speed	13.8 mph
Nozzles	Flat Fan

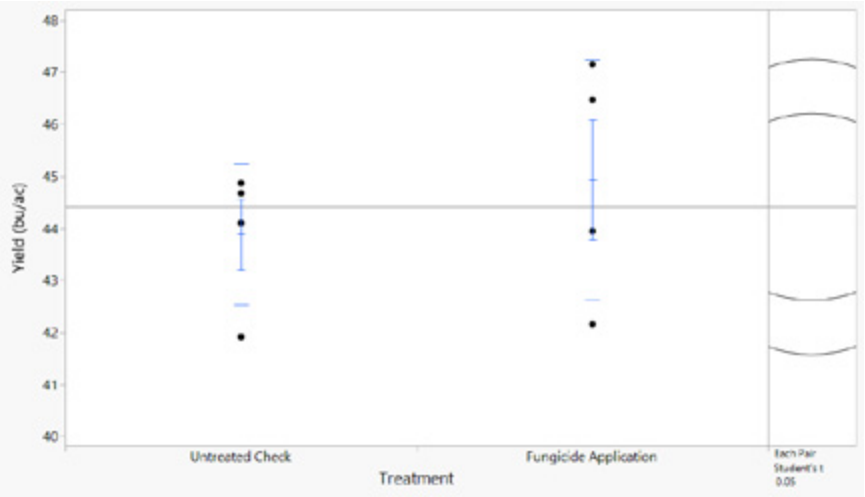
Precipitation and temperature from local weather station



Results

	Sclerotinia (0-5)	Blackleg		Verticillium Stripe (Yes = 1, No = 0)	Aster Yellows (Yes = 1, No = 0)
		Basal Canker (0-5)	Stem Lesions (Yes = 1, No = 0)		
Untreated Check	0.2 a	0.08 a	0.15 a	0.0 a	0.03 a
Single Fungicide Application	0.5 a	0.23 a	0.28 a	0.0 a	0.0 a
Dual Fungicide Application	0.212	0.096	0.048	0.0	0.025
SED[1]	0.252	0.215	0.080	1.0	0.391
p-value[2]	1.0	1.0	1.0	1.0	1.0

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	43.9 a	4.2 a	62.1 a	21.2 a	6.6 a	0.03 a	47.1 a
Fungicide Application	44.9 a	4.1 a	62.3 a	21.3 a	6.5 a	0.08 a	46.9 a
SED[1]	0.823	0.370	0.186	0.630	0.079	0.041	0.622
p-value[2]	0.294	0.836	0.416	0.870	0.572	0.308	0.742



Economics

Treatment	Fungicide ($/ac)[y]	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Untreated Check	0.00	43.9	13.00	570.70	570.70	0.00
Fungicide Application	23.65	44.9	13.00	583.70	560.05	-10.65

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Across all assessed diseases and agronomic parameters, there were no statistically significant differences between the untreated check and the fungicide application. Disease severity for sclerotinia, blackleg, and verticillium stripe was numerically higher in fungicide-treated plots, while aster yellows incidence was zero in both treatments, indicating no disease suppression benefit under trial conditions. Similarly, yield and seed quality metrics—including thousand kernel weight, test weight, protein, moisture, green seed, and oil content—were statistically equivalent between treatments, demonstrating that the fungicide application did not provide measurable yield or quality advantages in this study.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

WARWICK AG SERVICES

TOP NOTCH FARMING RESEARCH TRIALS

Sclerotinia Fungicide Trial

(Indian Head)

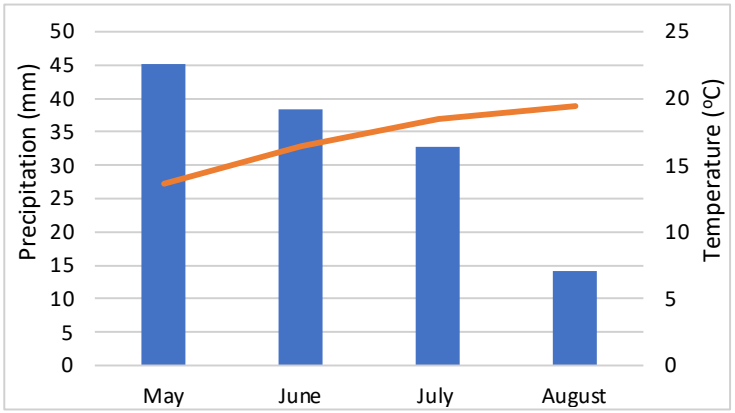
Objective: To evaluate fungicide effectiveness and economics on canola under different environmental conditions and risk factors.

Treatment #	Description
1	Untreated Check
2	Single Fungicide Application
3	Dual Fungicide Application

General Trial Information	
Variety	InVigor L330PC
Thousand Seed Weight (TSW)	4.8 g
Seed Treatment	Lumiposa® (cyantraniliprole), Buteo® Start (flupyradifurone) + Helix® Vibrance (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane)
Previous Crop	Canary Seed
Soil Organic Matter	4.4%
Residual Nitrate-N	
- **0-6”**	9 lb/ac
- **6-24”**	6 lb/ac
Seeding Date	May 28, 2025
Seeding Equipment	SeedMaster
Seeding Rate	4.7 lb/ac
Seeding Depth	1”
Seeding Speed	4.5 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	130 – 45 – 0 – 15
Crop Protection	May 28: RoundUp® Transorb HC (glyphosate) June 27: Liberty® 150SN (glufosinate) + Centurion® ADV (clethodim) September 7: RoundUp Transorb HC (glyphosate)

Fungicide Application		
	Single Application	**Dual Application**
Product	Proline® Gold (prothioconazole + fluopyram)	Cotegra® (boscalid + prothioconazole)
Rate	0.253 L/ac	0.280 L/ac
Date	July 13	July 23
Crop Stage	35% bloom	100% bloom
Tank Mix	N/A	N/A
Water Volume	12.5 gal/ac	20 gal/ac
Speed	10 mph	12 mph
Nozzles	Lechler Air Induction IDK 110-04	Turbo Twinjet 11006

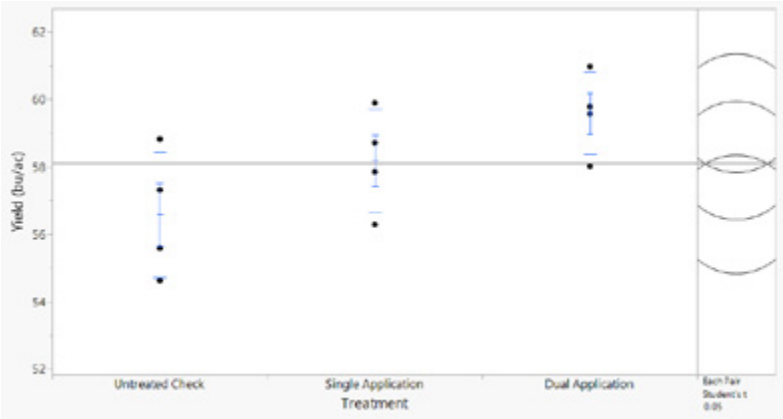
Precipitation and temperature from local weather station



Results

	Sclerotinia (0-5)	Blackleg		Verticillium Stripe (Yes = 1, No = 0)	Aster Yellows (Yes = 1, No = 0)
		Basal Canker (0-5)	Stem Lesions (Yes = 1, No = 0)		
Untreated Check	0 a	0 a	0 a	0 a	0 a
Single Fungicide Application	0 a	0 a	0 a	0 a	0 a
Dual Fungicide Application	0 a	0 a	0 a	0 a	0 a
SED[1]	0.0	0.0	0.0	0.0	0.0
p-value[2]	1.0	1.0	1.0	1.0	1.0

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	56.6 b	3.3 a	64.7 a	21.9 a	6.6 a	0.01 a	40.8 b
Single Fungicide Application	58.2 ab	3.3 a	64.7 a	22. 1 a	6.7 a	0.03 a	42.4 a
Dual Fungicide Application	59.6 a	3.3 a	64.7 a	22.2 a	6.6 a	0.01 a	42.4 a
SED[1]	0.660	0.272	0.123	0.320	0.059	0.028	0.567
p-value[2]	0.011	1.0	0.739	0.604	0.818	0.880	0.046



Economics

Treatment	Fungicide ($/ac)[y]	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Untreated Check	0.00	56.6	13.00	735.80	735.80	0.00
Single Fungicide Application	23.65	58.2	13.00	756.60	732.95	-2.85
Dual Fungicide Application	47.30	59.6	13.00	774.80	727.50	-8.30

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

No disease symptoms were observed across any treatment, with the untreated check and both fungicide programs recording zero incidence or severity for all assessed diseases, resulting in no statistical differences among treatments (p = 1.0). Consequently, disease pressure was absent and fungicide efficacy could not be evaluated under the conditions of this trial. Despite the lack of disease, yield differed among treatments, with the dual fungicide application achieving a significantly higher yield than the untreated check and the single application being intermediate; oil content was also significantly higher in both fungicide treatments, while all other seed quality parameters were unaffected.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

IHARF
INDIAN HEAD AGRICULTURAL RESEARCH FOUNDATION

TOP NOTCH FARMING RESEARCH TRIALS

Sclerotinia Fungicide Trial

(Wakaw 1)

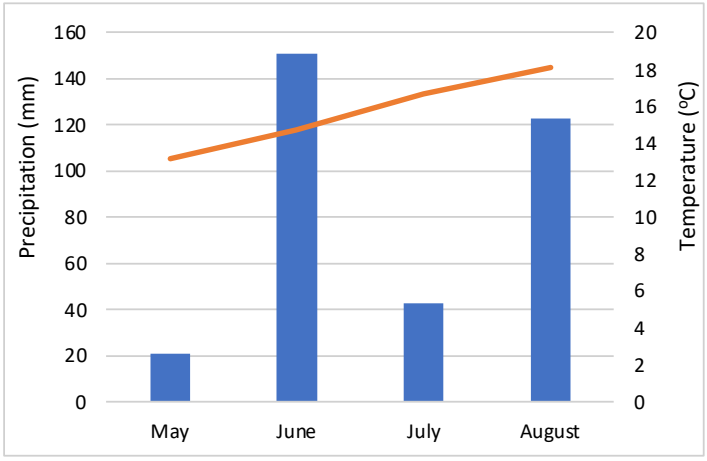
Objective: To evaluate fungicide effectiveness and economics on canola under different environmental conditions and risk factors.

Treatment #	Description
1	Untreated Check
2	Fungicide Application

General Trial Information

Variety	PV 681 LC
Thousand Seed Weight (TSW)	6.42 g
Seed Treatment	Prosper® EverGol (clothianidin, penflufen, trifloxystrobin + metalaxyl) + Buteo® (flupyradifurone)
Previous Crop	Wheat
Soil Organic Matter	6.5%
Residual Nitrate-N - **0-6”** - **6-24”**	 51 lb/ac 39 lb/ac
Soil Texture	Medium
Seeding Date	May 22
Seeding Equipment	SeedMaster 5012
Seeding Rate	6.5 lb/ac
Seeding Depth	¾”
Seeding Speed	4 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	100 – 42 – 10 – 15
Crop Protection	May 15: Glyphosate June 28: Interline® (glufosinate) + Shadow® XL (clethodim) August 18: Voliam® Xpress (lambda + chlorantraniliprole)

Precipitation and temperature from local weather station

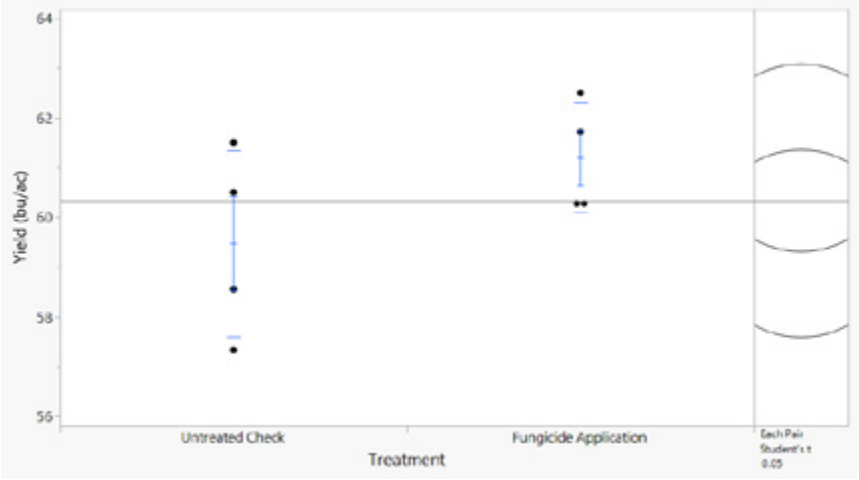


Fungicide Application	
Product	Miravis® Bold Li 700 (pydiflumetofen)
Rate	20 ac/jug
Date	July 10 + July 18
Crop Stage	30% flower + end of flowering
Tank Mix	N/A
Water Volume	15 gal/ac
Speed	8 mph
Nozzle	Split Application

Results

	Sclerotinia (0-5)	Blackleg		Verticillium Stripe (Yes = 1, No = 0)	Aster Yellows (Yes = 1, No = 0)
		Basal Canker (0-5)	Stem Lesions (Yes = 1, No = 0)		
Untreated Check	0.18 a	0.53 a	0.10 a	0.0 a	0.05 a
Fungicide Application	0.03 a	0.10 b	0.0 a	0.0 a	0.03 a
SED[1]	0.087	0.125	0.0	0.0	0.025
p-value[2]	0.182	0.043	0.962	1.0	0.391

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	59.5 a	3.0 a	65.3 b	23.2 a	6.7 a	0.04 a	45.3 a
Fungicide Application	61.2 a	3.3 a	66.0 a	23.3 a	6.7 a	0.01 a	45.2 a
SED[1]	1.02	0.370	0.115	0.407	0.075	0.014	0.331
p-value[2]	0.190	0.547	0.011	0.737	0.391	0.182	0.731



Economics

Treatment	Fungicide ($/ac)[y]	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Untreated Check	0.00	59.5	13.00	773.50	773.50	0.00
Fungicide Application	23.65	61.2	13.00	795.60	771.95	-1.55

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Disease pressure was low across the trial, with the fungicide application significantly reducing blackleg severity but showing no effect on sclerotinia, verticillium stripe, aster yellows, or stem lesions. Yield did not differ significantly between treatments, and most seed quality parameters were unaffected. Test weight was significantly higher in the fungicide-treated plots compared with the untreated check. Overall, the fungicide provided limited agronomic benefit under the conditions of this study.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

SARA OLEXSYN

TOP NOTCH FARMING RESEARCH TRIALS

Sclerotinia Fungicide Trial

(Wakaw 2)

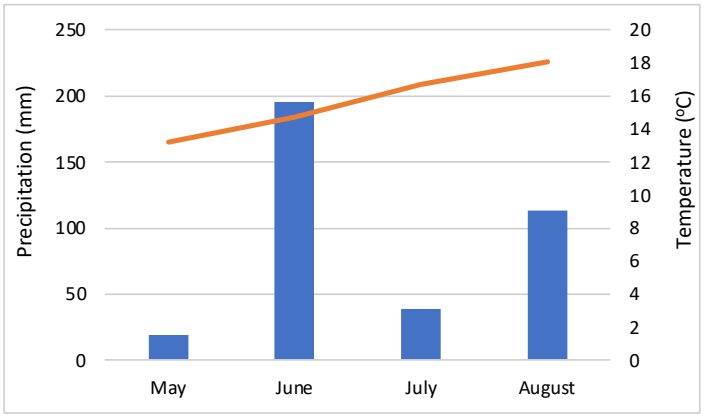
Objective: To evaluate fungicide effectiveness and economics on canola under different environmental conditions and risk factors.

Treatment #	Description
1	Untreated Check
2	Fungicide Application

General Trial Information

Variety	PV 681 LC
Thousand Seed Weight (TSW)	6.4 g
Seed Treatment	Prosper® EverGol (clothianidin, penflufen, trifloxystrobin + metalaxyl) + Buteo® (flupyradifurone)
Previous Crop	Wheat
Soil Organic Matter	6.5%
Residual Nitrate-N	
- **0-6”**	51 lb/ac
- **6-24”**	39 lb/ac
Seeding Date	May 18, 2025
Seeding Equipment	SeedMaster 5012
Seeding Rate	6.5 lb/ac
Seeding Depth	¾”
Seeding Speed	3.5 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	100 – 42 – 10 – 15
Crop Protection	May 15: Glyphosate June 26: Interline® (glufosinate) + Shadow® XL (clethodim) August 18: Volaim® Xpress (lambda + chlorantraniliprole)

Precipitation and temperature from local weather station

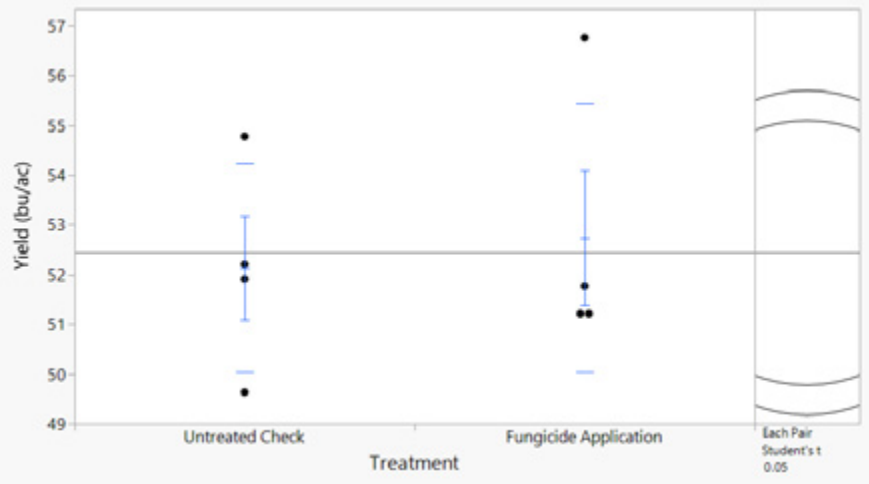


	Fungicide Application
Product	Miravis® Star + Miravis® Bold
Rate	20 ac/jug + 20 ac/jug
Date	July 9 + July 18
Crop Stage	35% flowering + end of flowering
Tank Mix	N/A
Water Volume	15 gal/ac
Speed	8 mph
Sprayer	Case Patriot 3185
Nozzles	Split Application

Results

	Sclerotinia (0-5)	Blackleg		Verticillium Stripe (Yes = 1, No = 0)	Aster Yellows (Yes = 1, No = 0)
		Basal Canker (0-5)	Stem Lesions (Yes = 1, No = 0)		
Untreated Check	0.18 a	0.40 a	0.0 a	0.0 a	0.05 a
Fungicide Application	0.05 a	0.03 a	0.0 a	0.0 a	0.03 a
SED[1]	0.111	0.217	0.0	0.0	0.048
p-value[2]	0.342	0.183	1.0	1.0	0.638

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	52.1 a	3.5 a	66.3 a	25.3 a	6.9 a	0.03 a	47.5 a
Fungicide Application	52.7 a	3.8 a	66.3 a	25.3 a	6.9 a	0.05 a	47.7 a
SED[1]	1.69	0.236	0.141	0.334	0.058	0.032	0.247
p-value[2]	0.743	0.252	0.734	0.973	0.450	0.495	0.648



Economics

Treatment	Fungicide ($/ac)[y]	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Untreated Check	0.00	59.5	13.00	773.50	773.50	0.00
Fungicide Application	23.65	61.2	13.00	795.60	771.95	-1.55

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Overall disease pressure was low, and no statistically significant differences were observed between the untreated check and the fungicide application for any assessed disease. Although sclerotinia and blackleg levels were numerically lower in fungicide-treated plots, these differences were not significant, indicating limited disease control under trial conditions. Yield and all measured seed quality parameters were also statistically similar between treatments. Overall, the fungicide application did not provide measurable disease, yield, or quality benefits in this study.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

SARA OLEXSYN

TOP NOTCH FARMING RESEARCH TRIALS

Sclerotinia Fungicide Trial

(Wilkie)

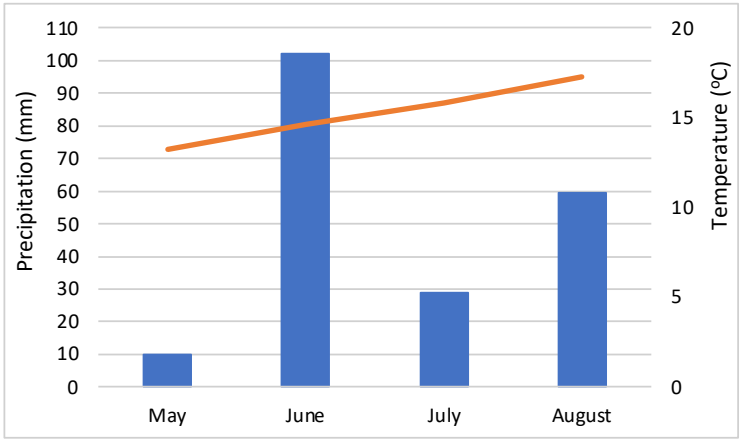
Objective: To evaluate fungicide effectiveness and economics on canola under different environmental conditions and risk factors.

Treatment #	Description
1	Untreated Check
2	Fungicide Application

General Trial Information

Variety	InVigor L350PC
Thousand Seed Weight (TSW)	4.7 g
Seed Treatment	Buteo®
Previous Crop	Wheat
Residual Nitrate-N	
- **0-6”**	22.3 lb/ac
Soil Texture	
Seeding Date	May 16, 2025
Seeding Equipment	Seed Hawk 60-12-660
Seeding Rate	3.5 lb/ac
Seeding Depth	¾”
Seeding Speed	4.1 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	135 – 40 – 6 – 30
Crop Protection	May 14: Conquer® II (pyraflufen + bromoxynil) June 18: Liberty® (glufosinate) + Centurion® (clethodim) September 2: Glyphosate

Precipitation and temperature from local weather station

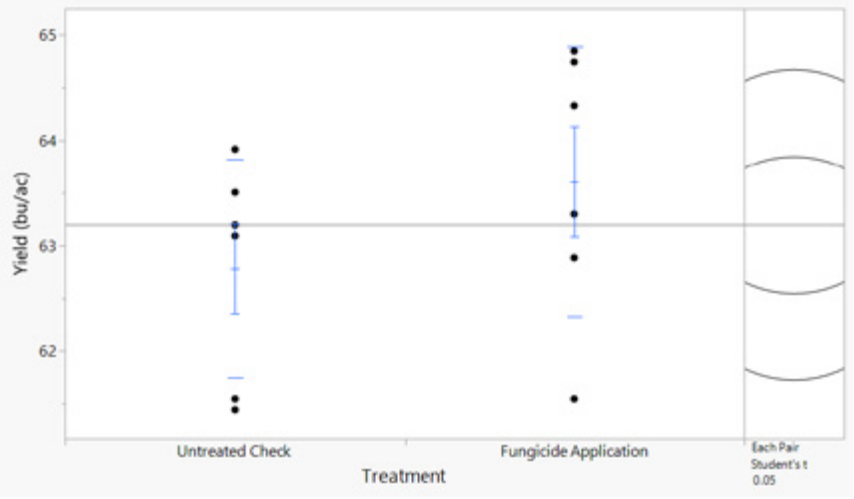


Fungicide Application	
Product	Maxentis® (azoxystrobin + prothioconazole)
Rate	16 ac/jug
Date	July 14
Crop Stage	50% flower
Tank Mix	N/A
Water Volume	16 gal/ac
Sprayer	Case 4440
Speed	10 mph
Nozzles	Twin Fan

Results

	Sclerotinia (0-5)	Blackleg		Verticillium Stripe (Yes = 1, No = 0)	Aster Yellows (Yes = 1, No = 0)
		Basal Canker (0-5)	Stem Lesions (Yes = 1, No = 0)		
Untreated Check	0.07 a	0.13 a	0.02 a	0.0 a	0.0 a
Fungicide Application	0.03 a	0.08 a	0.02 a	0.0 a	0.0 a
SED[1]	0.049	0.043	0.03	0.0	0.0
p-value[2]	0.530	0.296	1.0	1.0	1.0

	Yield (bu/ac)	Thousand Kernel Weight (TKW) (g/1000)	Test Weight (TW) (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	62.8 b	3.1 b	65.7 a	19.0 a	5.6 a	0.02 a	54.3 a
Fungicide Application	63.6 a	3.4 a	65.7 a	18.7 a	5.5 a	0.03 a	54.7 a
SED[1]	0.259	0.122	0.084	0.200	0.049	0.020	0.286
p-value[2]	0.025	0.041	0.441	0.281	0.288	0.695	0.230



Economics

Treatment	Fungicide ($/ac)[y]	Yield (bu/ac)	Target Price ($/bu)[z]	Revenue ($/ac)	Net/Loss ($/ac)	Profit/Loss ($/ac)
Untreated Check	0.00	62.8	13.00	816.40	816.40	0.00
Fungicide Application	23.65	63.6	13.00	826.80	803.15	-13.25

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Disease pressure was low across all treatments, with only minor numerical differences between the untreated check and the fungicide application. Although the fungicide treatment showed slightly lower ratings for sclerotinia and blackleg, these differences were not statistically significant, and no treatment effects were observed for verticillium stripe, aster yellows, or stem lesions. Despite the low disease levels, the fungicide application resulted in a statistically significant increase in yield and thousand kernel weight compared to the untreated check ($p < 0.05$). Other grain quality parameters, including test weight, protein, moisture, green seed, and oil content, were not affected by the fungicide treatment.

To review footnote references please refer to overall trial summary on page 103.

This trial was conducted with the agronomic support of

WARC

TOP NOTCH FARMING RESEARCH TRIALS

Blackleg Fungicide Trial

Blackleg is a widespread and damaging disease in Saskatchewan canola, present in about 92% of surveyed fields in 2024. Infection begins early, often at the seedling stage, and worsens as plants mature. The disease damages stems, restricting water and nutrient uptake and reducing yield. Symptoms can appear on cotyledons, leaves, stems, and pods, with black pycnidia and stem-base cankers as key signs. Infected pods may ripen early and shatter at harvest. Management starts with crop rotation, resistant varieties, and seed treatments. Fungicides can help when disease risk is high, but their cost means applications should be based on field-specific risk, with check strips used to evaluate yield, grade, and economic return.

Objective

The objective of this field-scale trial is to assess the effectiveness and economic viability of early fungicide applications for managing blackleg in canola across varying environmental conditions and risk factors.

Treatments

1)	Untreated check
2)	Blackleg Fungicide Application

Fungicides were applied according to label recommendations, and replicated four times, for a total of eight plots. Apart from fungicide application, all strips were managed the same agronomically including seeding, fertility, and pesticide (excluding fungicide) application.

Data Collection

- Spring or fall soil sample
- Spring and fall blackleg race ID testing
- Disease assessments
- Yield
- Harvest samples for each plot
- The following management and agronomic data were recorded precisely:
  - Fungicide products, rates, placement, timing
  - Crop protection: seeding, fertility, pesticide applications
  - General notes on weed, insect, disease infestations, and notable weather events

The following footnotes will be referred to for individual site report for this protocol:

[1]SED is a measure of how much variability (same units as mean) you would expect in the difference between sample means if you repeated the experiment several times. The Least Significant Difference (LSD) is approximately 2 times the SED.

[2]A linear regression was used to assess the effects of varieties on the response variables. The data was also analyzed using the Mixed Model procedure in JMP with replicate considered random and fungicide application considered a fixed effect. Treatment means were separated using Least Significant Difference (LSD) test. All treatment effects and differences between means were considered significant at $p \leq 0.05$. However, p-values of 0.05-0.1 may also be acknowledged.

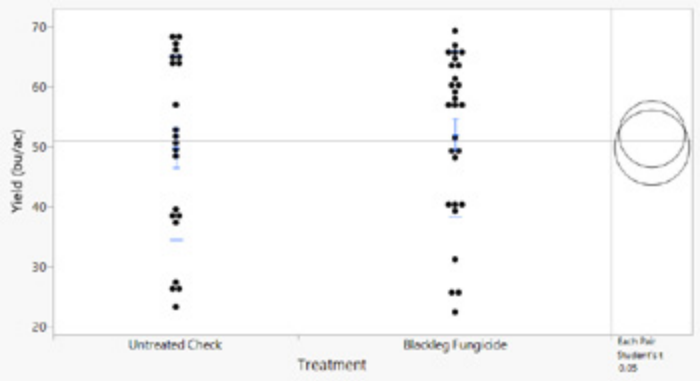
$P < 0.05$: There is a 95% probability (19 out of 20 times) that the observed difference is due to the treatment rather than random variation.
$P < 0.1$: There is a 90% probability (9 out of 10 times) that the difference is due to the treatment effect.
$P > 0.1$: There is a higher likelihood that the observed difference is due to random variability rather than the treatment

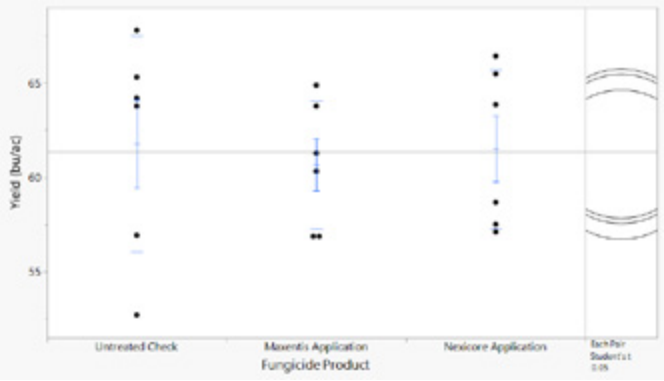
2025 Combined Results (6 sites)

At all locations, blackleg severity was numerically lower with the fungicide treatment compared with the untreated check, but this difference was not statistically significant (p = 0.076). Yield and all assessed seed quality parameters, including seed size, test weight, protein, moisture, green seed, and oil content, were similar between treatments, indicating no measurable agronomic or quality benefit from fungicide application under the conditions of this trial. Across the two-sites where two products were used, blackleg severity was low and did not differ significantly among the untreated check, Maxentis, or Nexicore treatments. Likewise, yield and all measured seed quality parameters were statistically similar across treatments, suggesting fungicide applications did not provide a yield or quality advantage under low disease pressure conditions.

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	0.37 a	50.7 a	3.6 a	64.0 a	22.3 a	7.9 a	0.07 a	47.1 a
Blackleg Fungicide	0.29 a	50.5 a	3.6 a	64.0 a	22.2 a	7.9 a	0.07 a	47.3 a
SED[1]	0.036	0.459	0.086	0.103	0.259	0.043	0.012	0.150
p-value[2]	0.076	0.598	0.405	0.897	0.717	0.915	0.598	0.227

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	0.26 a	61.8 a	3.4 a	65.1 a	25.2 a	10.1 a	21.9 a	23.3 a
Maxentis Application	0.26 a	60.7 a	3.6 a	64.8 a	24.6 a	10.2 a	21.7 a	23.5 a
Nexicore Application	0.20 a	61.5 a	3.7 a	65.0 a	24.0 a	9.9 a	22.1 a	23.4 a
SED[1]	0.071	1.68	0.179	0.201	0.560	0.148	0.237	0.426
p-value[2]	0.604	0.793	0.467	0.263	0.203	0.338	0.269	0.843






TOP NOTCH
FARMS

TOP NOTCH FARMING RESEARCH TRIALS

Blackleg Fungicide
(Davidson 1)

Treatment #	Description
1	Untreated
2	Blackleg Fungicide Application

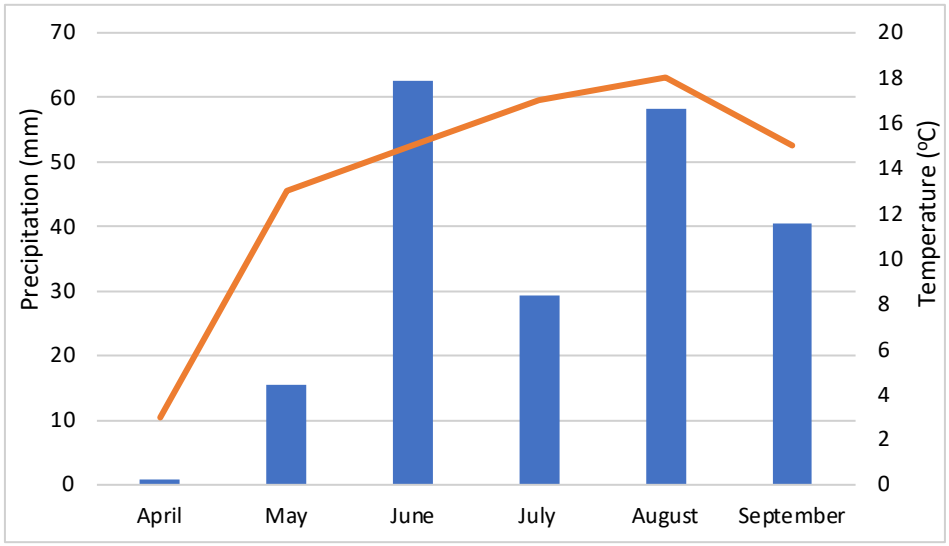
Objective: is to assess the effectiveness and economic viability of early fungicide applications for managing blackleg in canola across varying environmental conditions and risk factors.

General Trial Information	
Variety	InVigor Health L358HPC
Thousand Kernel Weight	4.5 g
Seed Treatment	Buteo®(flupyradifurone) + Lumiderm® (cyantraniliprole)
Previous Crop	Wheat
Seeding Date	May 15
Seeding Rate	4.4 lb/ac
Seeding Depth	1”
Seeding Speed	4.6 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	117 – 21 – 0 – 0
Crop Protection	June 10: Liberty® (glufosinate) + Centurion® (clethodim) September 18: Glyphosate

Blackleg Fungicide Application	
Product	Nexicor® (fluxapyroxad, pyraclostrobin + propiconazole)
Rate	200 mL/ac
Date	June 11
Crop Stage	2-3 leaf
Tank Mix	N/A
Water Volume	15 gal/ac
Speed	10 mpg

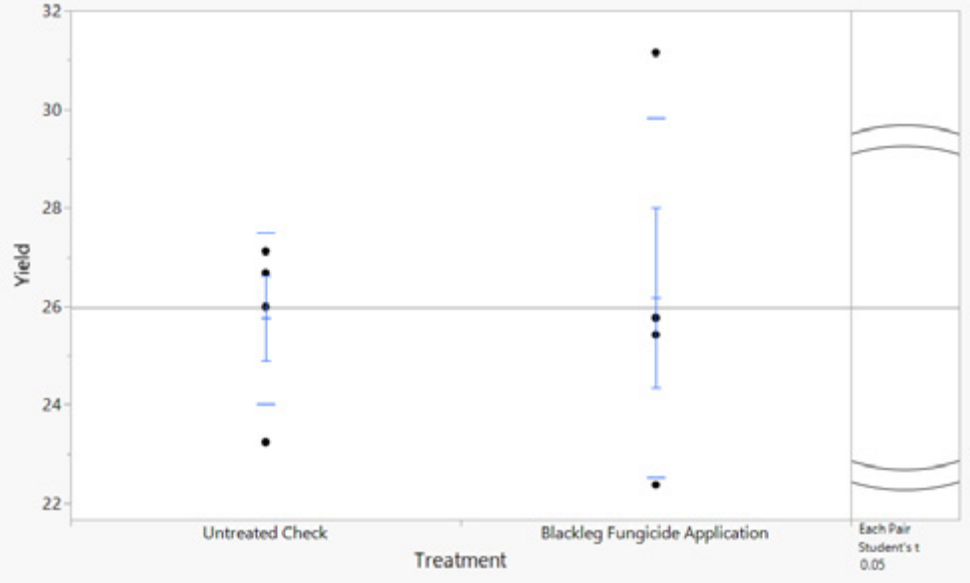
Blackleg Tissue Testing (Fall 2025)	
Untreated	L. maculans: Not detected
	V. longisporum: Detected 1 stem
Blackleg Fungicide	L. maculans: Not detected
	V. longisporum: Not detected

Precipitation and temperature from a local weather station



Results

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated	0.03 a	25.8 a	3.8 a	64.8 a	19.6 a	5.8 a	0.16 a	52.6 a
Blackleg Fungicide	0.01 a	26.2 a	3.6 a	65.1 a	20.2 a	5.7 a	0.18 a	52.6 a
SED[1]	0.012	1.80	0.250	0.225	0.677	0.113	0.031	0.540
p-value[2]	0.182	0.830	0.391	0.247	0.504	0.553	0.718	0.949



Economics

Treatments	Fungicide Cost ($/ac)[y]	Yield (bu/ac)	Target Price $/bu)[z]	Revenue ($/ac)	Net ($/ac)	Profit/Loss ($/ac)
Untreated	0.00	25.8	13.00	335.40	335.40	0.00
Blackleg Fungicide	23.65	26.2	13.00	340.60	316.95	-18.45

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Blackleg incidence was low across treatments, with no statistically significant differences observed between the untreated control and the blackleg fungicide treatment (p = 0.182). Yield, thousand kernel weight, test weight, protein, moisture, green seed, and oil content were also not significantly affected by fungicide application, as all measured parameters showed p-values greater than 0.05. Although the fungicide treatment showed a numerically higher yield and test weight compared with the untreated control, these differences were not statistically meaningful. Overall, under the conditions of this study, blackleg fungicide application did not result in measurable agronomic or quality benefits.

To review footnote references please refer to overall trial summary on page 121.

This trial was conducted with the agronomic support of

WARMENTIN AG SERVICES

TOP NOTCH FARMING RESEARCH TRIALS

Treatment #	Description
1	Untreated
2	Blackleg Fungicide Application

Blackleg Fungicide
(Davidson 2)

Objective: To evaluate fungicide performance and farm economics on wheat.

General Trial Information

Variety	InVigor L340PC
Thousand Kernel Weight	4.3 g
Seed Treatment	Buteo® (flupyradifurone) + Prosper® (clothianidin, metalaxyl + trifloxystrobin)
Previous Crop	Wheat
Seeding Date	May 14, 2025
Seeding Rate	4.1 lb/ac
Seeding Depth	1”
Seeding Speed	4.3 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	123 – 17 – 0 – 0
Crop Protection	May 11: Glyphosate® + Certitude (fluxapyroxad + pyraclostrobin) June 17: Liberty® (glufosinate) September 1: Glyphosate

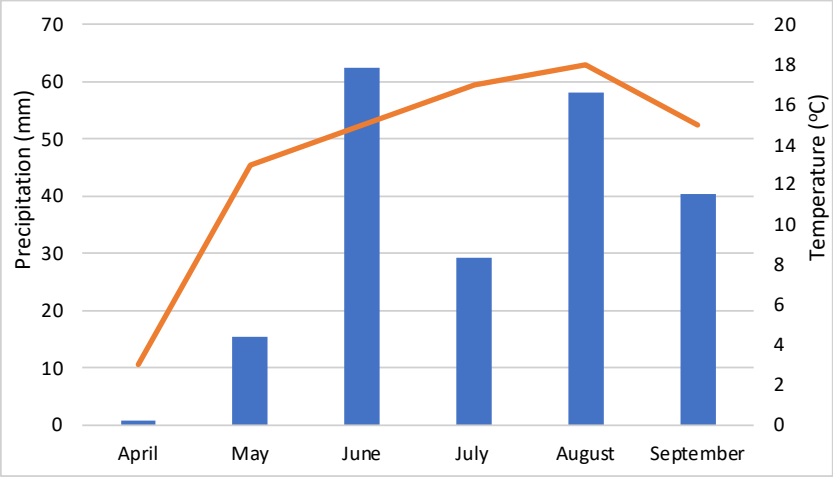
Blackleg Tissue Testing (Fall 2025)

Untreated	V. longisporum: Not detected.		
	L. maculans:	Genotype	Phenotype
	2	AvrLm2-3-4-5-6-7-9-11	A2-4-5-6-7-11
	1	AvrLm3-4-5-6-7-9	A4-5-6-7
	1	AvrLm2-3-5-6-7-9-11	A2-5-6-7-11
Blackleg Fungicide	V. longisporum: Not detected.		
	L. maculans:	Genotype	Phenotype
	3	AvrLm2-3-4-5-6-7-9-11	A2-4-5-6-7-11

Blackleg Fungicide Application

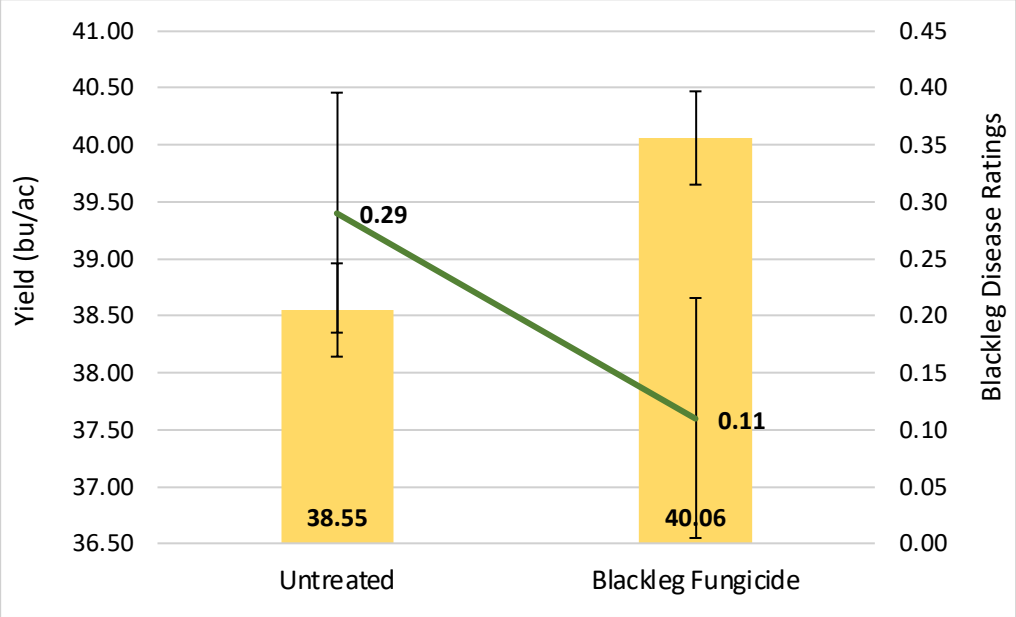
Product	Cotegra® (boscalid + prothioconazole)
Rate	240 mL/ac
Date	June 11
Crop Stage	3-4 leaf
Tank Mix	N/A
Water Volume	10 gal/ac
Speed	12.7 mph
Nozzles	Flat Fan

Precipitation and temperature from a local weather station



Results

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated	0.29 a	38.6 a	3.4 a	61.1 a	21.6 a	6.2 a	0.08 a	46.6 a
Blackleg Fungicide	0.11 a	40.1 a	3.8 a	61.2 a	21.4 a	6.1 a	0.01 a	47.5 a
SED[1]	0.105	0.409	0.491	0.060	0.195	0.024	0.038	0.532
p-value[2]	0.186	0.034	0.546	0.761	0.466	0.080	0.194	0.203



Economics

Treatments	Fungicide Cost ($/ac)[y]	Yield (bu/ac)	Target Price $/bu)[z]	Revenue ($/ac)	Net ($/ac)	Profit/Loss ($/ac)
Untreated	0.00	38.6	13.00	501.80	501.80	0.00
Blackleg Fungicide	23.65	40.1	13.00	521.30	497.65	-4.15

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Blackleg disease severity was numerically lower in fungicide-treated plots compared with the untreated check, although this difference was not statistically significant (p = 0.186). Yield was significantly higher with the blackleg fungicide application, averaging 40.06 bu/ac versus 38.55 bu/ac in the untreated control (p = 0.034). No significant differences were observed between treatments for thousand kernel weight, test weight, protein, moisture, green seed, or oil content (p > 0.05). Despite the observed yield increase, the gain was insufficient to economically offset the cost of the fungicide application.

To review footnote references please refer to overall trial summary on page 121.

This trial was conducted with the agronomic support of

WARWICK AG SERVICES

TOP NOTCH FARMING RESEARCH TRIALS

Blackleg Fungicide
(Elrose)

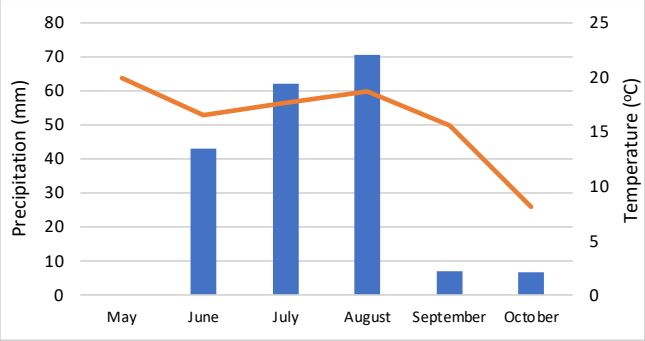
Treatment #	Description
1	Untreated Check
2	Blackleg Fungicide Application (Nexicor®)
3	Blackleg Fungicide Application (Maxentis®)

Objective: is to assess the effectiveness and economic viability of early fungicide applications for managing blackleg in canola across varying environmental conditions and risk factors.

General Trial Information

Variety	DK400 TL
Thousand Kernel Weight	4.7 g
Seed Treatment	Buteo® Start (flupyradifurone)
Previous Crop	Lentils
Seeding Date	May 25, 2025
Seeding Rate	3.6 lb/ac
Seeding Depth	¾ - 1”
Seeding Speed	6.2 mph
Row Spacing	10”
Total Applied Fertilizer (lb/ac N-P-K-S)	90 – 28 – 0 – 50
Crop Protection	May 12: Glyphosate, AIM® (carfentrazone) + Bromoxynil® June 27: Liberty® (glufosinate) + Clethodim® July 18: Soratel® (mefentrifluconazole)

Precipitation and temperature from local weather station (May 23 – October 14)



Blackleg Fungicide Application		
Product	Nexicor® (fluxapyroxad + pyraclostrobin)	Maxentis® (fluxapyroxad + pyraclostrobin)
Rate	202 mL/ac	253 mL/ac
Date	June 20	June 20
Crop Stage	4-5 leaf	4-5 leaf
Tank Mix	N/A	N/A
Water Volume	10 gal/ac	10 gal/ac
Speed	15 mph	15 mph

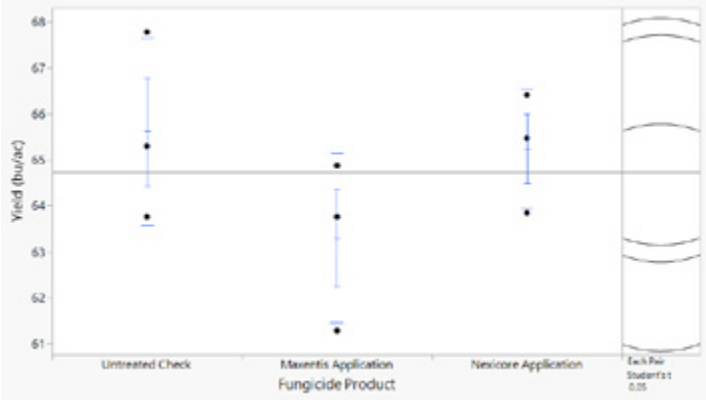
Blackleg Tissue Testing (Fall 2025)

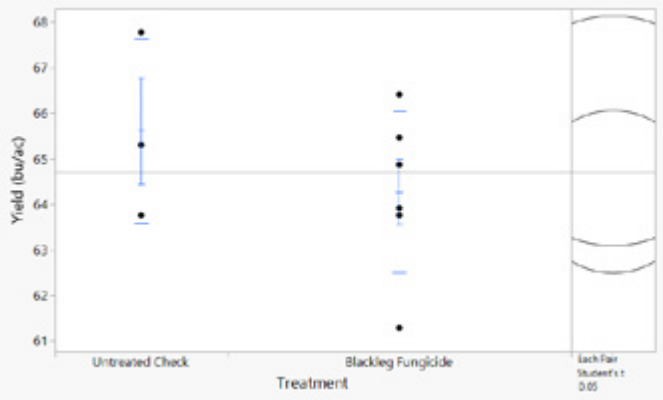
Untreated	V.longisporum: Not detected		
	L.maculans: 3	Genotype AvrLm2-3-4-5-6-7-9-11	Phenotype A2-4-5-6-7-11
Blackleg Fungicide (Nexicor®)	V.longisporum: Not detected		
	L.maculans: 2	Genotype AvrLm2-3-4-5-6-7-9-11	Phenotype A2-4-5-6-7-11
Blackleg Fungicide (Maxentis®)	V.longisporum: Not detected		
	L.maculans: Not detected		

Results

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated	0.23 a	65.6 a	3.3 a	64.8 a	26.2 a	10.9 a	0.02 a	43.8 a
Blackleg Fungicide	0.20 a	64.3 a	3.6 a	64.5 a	25.1 a	10.8 a	0.01 a	43.9 a
SED[1]	0.092	1.5	0.209	0.199	0.737	0.189	0.014	0.493
p-value[2]	0.732	0.415	0.242	0.162	0.193	0.738	0.465	0.962

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	0.23 a	65.6 a	3.3 a	64.8 a	26.2 a	10.9 a	0.02 a	43.8 a
Maxentis® Fungicide	0.23 a	63.3 a	3.7 a	64.4 a	25.8 a	11.0 a	0.0 a	43.4 a
Nexicor® Fungicide	0.17 a	65.2 a	3.6 a	64.5 a	24.5 a	10.7 a	0.02 a	44.3 a
SED[1]	0.114	1.69	0.264	0.247	0.703	0.192	0.014	0.473
p-value[2]	0.805	0.422	0.502	0.362	0.141	0.367	0.309	0.306





Economics

Treatments	Fungicide Cost ($/ac)[y]	Yield (bu/ac)	Target Price $/bu)[z]	Revenue ($/ac)	Net ($/ac)	Profit/Loss ($/ac)
Untreated	0.00	65.6	13.00	852.80	852.80	0.00
Blackleg Fungicide	23.65	64.3	13.00	835.90	812.25	-40.55

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Blackleg disease incidence was low and did not differ significantly between the untreated check and fungicide-treated plots across both trials. In the first comparison, no statistically significant differences were observed between the untreated check and the blackleg fungicide treatment for yield, thousand kernel weight, test weight, protein, moisture, green seed, or oil content. Similarly, in the second comparison, blackleg incidence, yield, and all measured quality parameters did not differ among the untreated check, Maxentis®, and Nexicor® treatments ($p > 0.05$). Overall, under the low disease pressure present in these trials, fungicide applications did not result in measurable agronomic or seed quality benefits.

To review footnote references please refer to overall trial summary on page 121.

This trial was conducted with the agronomic support of

MNP AgINTELLECT

TOP NOTCH FARMING RESEARCH TRIALS

Blackleg Fungicide
(Plenty)

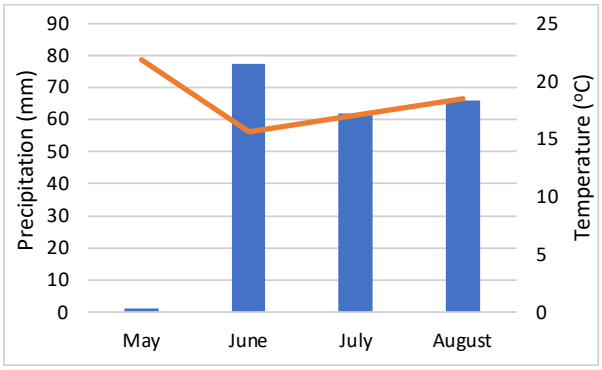
Treatment #	Description
1	Untreated Check
2	Blackleg Fungicide Application (Nexicor®)
3	Blackleg Fungicide Application (Maxentis®)

Objective: is to assess the effectiveness and economic viability of early fungicide applications for managing blackleg in canola across varying environmental conditions and risk factors.

General Trial Information

Variety	InVigor L340PC
Thousand Kernel Weight	4.7 g
Seed Treatment	Helix® Vibrance (sedaxane), Lumiposa® (chlorantraniliprole) + Buteo® Start (flupyradifurone)
Previous Crop	Wheat
Seeding Date	May 7, 2025
Seeding Rate	3.6 lb/ac
Seeding Depth	¾ - 1”
Seeding Speed	4.5 mph
Row Spacing	12”
Total Applied Fertilizer (lb/ac N-P-K-S)	108 – 40 – 0 – 0
Crop Protection	May 6: Glyphosate June 11: Octainn® (flumioxazin) + Simplicity® (pyroxasulfone) August 25: Roundup® Transorb 540 (glyphosate)

Precipitation and temperature from local weather station (May 29)



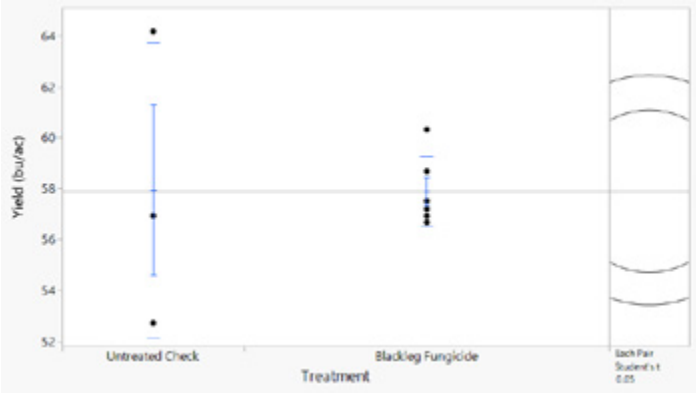
Blackleg Fungicide Application		
Product	Nexicor® (fluxapyroxad + pyraclostrobin)	Maxentis® (fluxapyroxad + pyraclostrobin)
Rate	202 mL/ac	253 mL/ac
Date	June 18	June 18
Crop Stage	6 leaf	6 leaf
Tank Mix	N/A	N/A
Water Volume	10 gal/ac	10 gal/ac
Speed	15.4 mph	15.4 mph
Nozzles	TeeJet	TeeJet

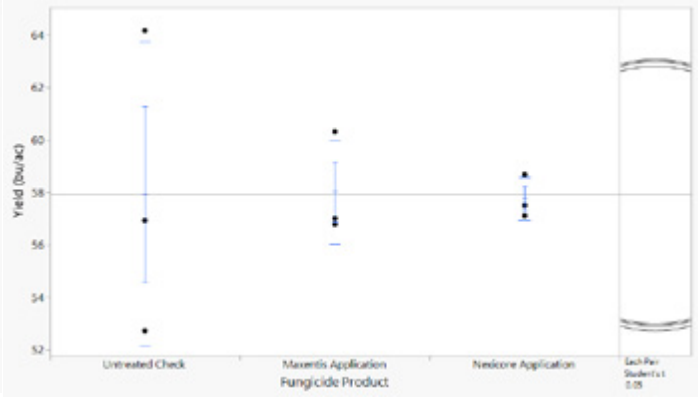
Blackleg Tissue Testing (Fall 2025)			
Untreated	V. longisporum: Not detected		
	L. maculans: Not detected		
	L. biglobosa: Detected 7 stems		
Blackleg Fungicide (Nexicor®)	V.longisporum: Not detected		
	L.maculans: 1 1	Genotype AvrLm2-3-4-5-6-7-9-11 AvrLm3-4-5-6-7-11	Phenotype A2-4-5-6-7-11 A4-5-6-7-11
Blackleg Fungicide (Maxentis®)	V.longisporum: Not detected		
	L.maculans: 1	Genotype AvrLm3-5-6-7-9-11	Phenotype A5-6-7-11

Results

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated	0.29 a	57.94 a	3.56 a	65.48 a	24.08 a	9.32 a	0.00 a	46.52 a
Blackleg Fungicide	0.25 a	57.89 a	3.67 a	56.28 a	23.54 a	9.28 a	0.01 a	46.94 a
SED[1]	0.069	2.25	0.205	0.262	0.679	0.184	0.012	0.664
p-value[2]	0.585	0.984	0.611	0.469	0.461	0.830	0.530	0.550

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated Check	0.29 a	57.94 a	3.56 a	65.48 a	24.08 a	9.32 a	0.0 a	46.52 a
Maxentis® Fungicide	0.28 a	58.02 a	3.56 a	65.16 a	23.47 a	9.35 a	0.02 a	47.03 a
Nexicor® Fungicide	0.23 a	57.76 a	3.78 a	65.39 a	23.62 a	9.20 a	0.0 a	46.85 a
SED[1]	0.084	2.90	0.240	0.318	0.873	0.225	0.014	0.852
p-value[2]	0.724	0.996	0.605	0.620	0.775	0.794	0.444	0.835





Economics

Treatments	Fungicide Cost ($/ac)[y]	Yield (bu/ac)	Target Price $/bu)[z]	Revenue ($/ac)	Net ($/ac)	Profit/Loss ($/ac)
Untreated	0.00	57.9	13.00	752.70	752.70	0.00
Blackleg Fungicide	23.65	57.9	13.00	752.70	729.05	-23.65

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Blackleg disease incidence was low and did not differ significantly between the untreated check and the blackleg fungicide treatment. No statistically significant differences were observed for yield, thousand kernel weight, test weight, protein, moisture, green seed, or oil content ($p > 0.05$), indicating no measurable agronomic or seed quality benefits from fungicide application under the low disease pressure observed in this trial. Similarly, blackleg incidence remained low and did not differ significantly among the untreated check, Maxentis®, and Nexicor® fungicide treatments. Yield and all assessed seed quality parameters were comparable across treatments ($p > 0.05$), suggesting that fungicide applications did not provide added agronomic or quality benefits under the conditions of this study.

To review footnote references please refer to overall trial summary on page 121.

This trial was conducted with the agronomic support of

MNP AgINTELLECT

TOP NOTCH FARMING RESEARCH TRIALS

Blackleg Fungicide
(Sedley)

Treatment #	Description
1	Untreated
2	Blackleg Fungicide Application

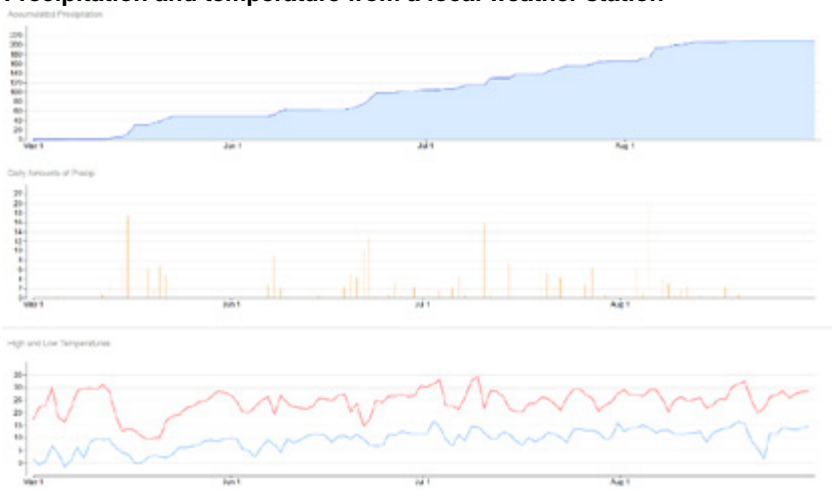
Objective: is to assess the effectiveness and economic viability of early fungicide applications for managing blackleg in canola across varying environmental conditions and risk factors.

General Trial Information

Variety	InVigor L340PC
Thousand Kernel Weight	4.8 g
Seed Treatment	Helix® (thiamethoxam, difenoconazole, mefenoxam, fludioxonil + sedaxane) + Buteo® (flupyradifurone)
Previous Crop	Lentils
Seeding Date	May 24, 2025
Seeding Rate	4.8 lb/ac
Seeding Depth	1 – 1 ½”
Seeding Speed	4 mph
Row Spacing	10”
Total Applied Fertilizer (lb/ac N-P-K-S)	124 – 56 – 0 – 0
Crop Protection	May 12: Conquer® II (fluroxypyr) + Glyphosate June 11: Glufosinate®, AMS® + Arrow® (clethodim) July 10: Proline® Gold (prothioconazole + tebuconazole) September 4: Reglone® Ion (diquat)

Blackleg Fungicide Application	
Product	Nexicor® (fluxapyroxad + pyraclostrobin)
Rate	202 mL/ac
Date	June 16
Crop Stage	3-4 leaf
Tank Mix	N/A
Water Volume	10 gal/ac
Speed	13 mph
Nozzles	Flat Fan (TeeJet)

Precipitation and temperature from a local weather station



Blackleg Tissue Testing (Fall 2025)

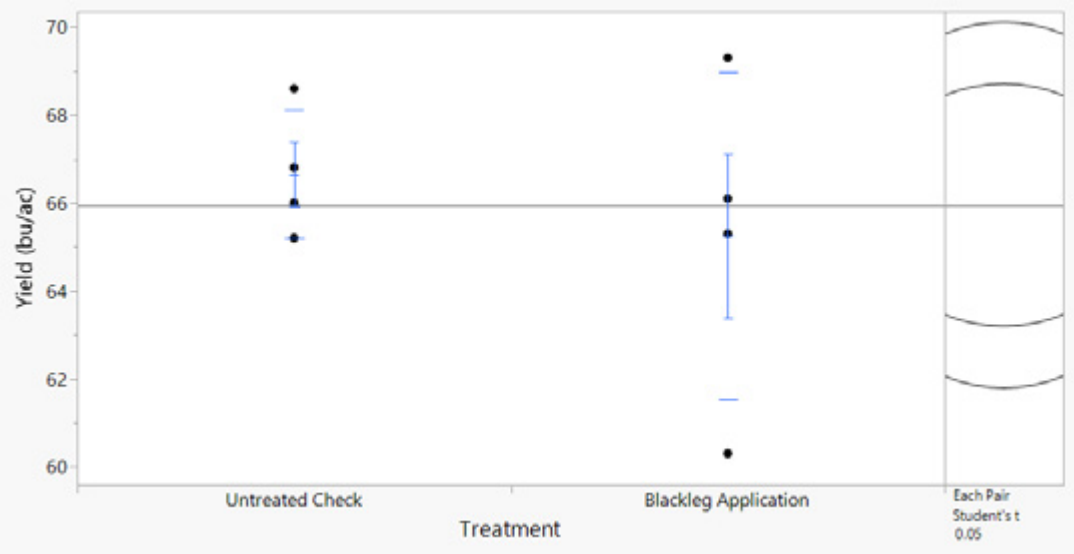
V.longisporum: Detected (8 stems)

1 L. biglobosa

# isolates:	Genotype:	Phenotype:
2	AvrLm2-3-4-5-6-7-9-11	A2-4-5-6-7-11
1	AvrLm2-3-5-6-7-9-11	A2-5-6-7-11

Results

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated	1.3 a	66.7 a	4.2 a	63.8 a	23.7 a	7.5 a	0.13 a	43.6 a
Blackleg Fungicide	1.1 a	65.3 a	4.2 a	63.8 a	23.8 a	7.5 a	0.13 a	43.7 a
SED[1]	0.356	1.46	0.408	0.182	0.309	0.047	0.054	0.404
p-value[2]	0.613	0.409	1.0	0.980	0.796	0.809	1.000	0.865



Economics

Treatments	Fungicide Cost ($/ac)[y]	Yield (bu/ac)	Target Price $/bu)[z]	Revenue ($/ac)	Net ($/ac)	Profit/Loss ($/ac)
Untreated	0.00	66.7	13.00	867.10	867.10	0.00
Blackleg Fungicide	23.65	65.3	13.00	848.90	825.25	-41.85

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Blackleg disease incidence was moderate but did not differ significantly between the untreated and blackleg fungicide treatments. Yield and thousand kernel weight were comparable between treatments, with no statistically significant differences observed. Similarly, no treatment effects were detected for test weight, protein, moisture, green seed, or oil content ($p > 0.05$). Overall, the fungicide application did not result in measurable agronomic or seed quality benefits under the disease pressure present in this trial.

To review footnote references please refer to overall trial summary on page 121.

Thank you to syngenta for the use of their weigh wagon

The trial was conducted with the agronomic support of MNP AgINTELLECT

TOP NOTCH FARMING RESEARCH TRIALS

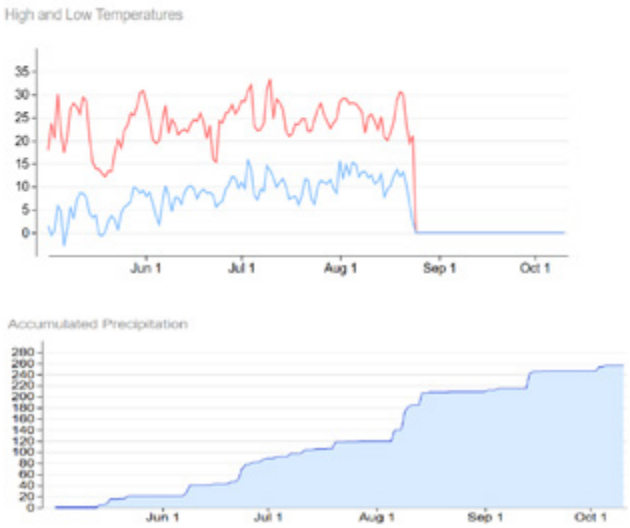
Blackleg Fungicide
(Wynyard)

Treatment #	Description
1	Untreated
2	Blackleg Fungicide Application

Objective: is to assess the effectiveness and economic viability of early fungicide applications for managing blackleg in canola across varying environmental conditions and risk factors.

General Trial Information	
Variety	InVigor Health L358HPC
Thousand Kernel Weight	4.5 g
Seed Treatment	Helix® Vibrance (thiamethoxam, difenoconazole mefenoxam, fludioxonil + sedaxane) + Buteo® (flupyradifurone)
Previous Crop	Wheat
Seeding Date	May 23, 2025
Seeding Rate	3.5 lb/ac
Seeding Depth	½”
Seeding Speed	3.7 mph
Row Spacing	13.5”
Total Applied Fertilizer (lb/ac N-P-K-S)	107 – 47 – 0 – 0
Crop Protection	May 22: Certitude® (topramezone + bromoxynil) June 12 + 30: Liberty® (glufosinate) July 13: Proline® Gold (prothioconazole + fluopyram)

Precipitation and temperature from a local weather station

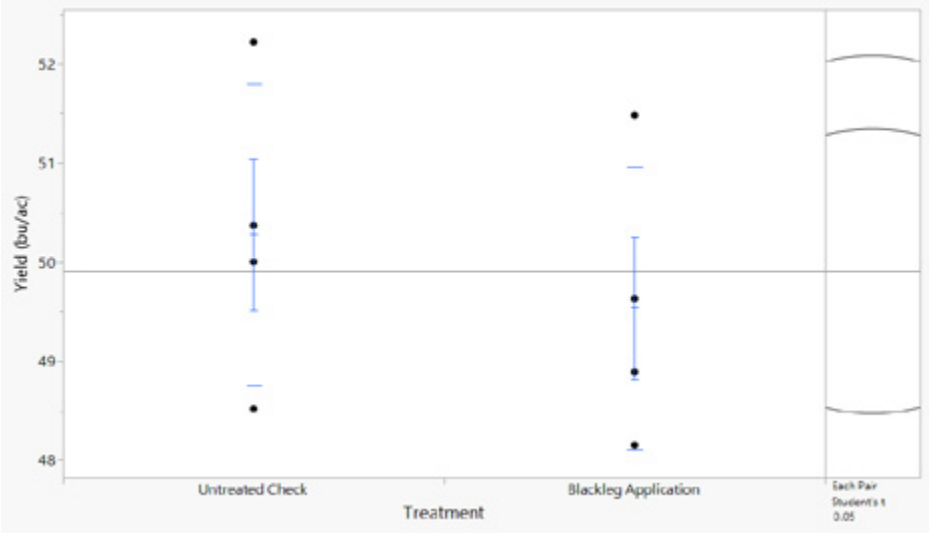


Blackleg Fungicide Application	
Product	Evito® (fluoxastrobin)
Rate	80 ac/jug
Date	June 30
Crop Stage	4-5 leaf
Tank Mix	N/A
Water Volume	10 gal/ac
Speed	13 mph

Blackleg Tissue Testing (Fall 2025)	
Untreated	V.longisporum: Not detected
	L. maculans: Not detected
Blackleg Fungicide	V.longisporum: Not detected
	L. maculans: Not detected

Results

	Blackleg Disease (%)	Yield (bu/ac)	Thousand Kernel Weight (g/1000)	Test Weight (kg/hL)	Protein (%)	Moisture (%)	Green Seed (%)	Oil (%)
Untreated	0.0 a	50.3 a	2.9 a	64.2 a	19.0 a	7.8 a	0.05 a	49.5 a
Blackleg Fungicide	0.0 a	49.5 a	2.9 a	64.4 a	19.6 a	8.0 a	0.07 a	49.5 a
SED[1]	0.0	1.27	0.136	0.236	0.409	0.167	0.022	0.817
p-value[2]	1.0	0.602	1.0	0.348	0.254	0.317	0.495	0.921



Economics

Treatments	Fungicide Cost ($/ac)[y]	Yield (bu/ac)	Target Price $/bu)[z]	Revenue ($/ac)	Net ($/ac)	Profit/Loss ($/ac)
Untreated	0.00	50.3	13.00	653.90	653.90	0.00
Blackleg Fungicide	23.65	49.5	13.00	643.50	619.85	-34.05

[y]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (fungicide cost $23.65/ac)
[z]2025 Canola, 2025 Crop Planning Guide, Government of Saskatchewan (target price $13.00/bu)

Summary

Blackleg disease pressure was negligible in this trial, with no measurable disease observed in either the untreated or fungicide-treated plots. As a result, there were no statistically significant differences between treatments for yield or any measured grain quality parameters, including thousand kernel weight, test weight, protein, moisture, green seed, or oil content ($p > 0.05$). Yield and quality values were comparable across treatments, indicating that the blackleg fungicide did not provide a measurable agronomic benefit under the low disease conditions present. These results suggest fungicide efficacy could not be fully evaluated due to the absence of disease pressure.

To review footnote references please refer to overall trial summary on page 121.

This trial was conducted with the agronomic support of

Cargill