Research
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Manitoba
Canola
Growers

CANOLA ON-FARM RESEARCH

PROGRAM RESULTS 2024

www.canolagrowers.com

Program Overview

Canola On-Farm Research

MCGA On-Farm Research Program aims to collaborate with farmers, agronomists and researchers across Manitoba to provide the most relevant and valuable information to our members.

About MCGA Research Program

MCGA Research Program focuses on funding and investing in projects and programs that match farm priorities to improve the sustainability of Manitoba Canola Farms through:

Profits – working towards improved and stable profits from Manitoba canola acres
People – providing safe and manageable farm production options
Planet – increasing the longevity of Manitoba farmland by improving soil quality and cropland biodiversity, while reducing negative environmental impacts of canola production

program funding provided in part by:

Sustainable Canadian Agricultural Partnership

2024 Agronomic Partners:

ANTARA AGRONOMY

NEW ERA AG RESEARCH

360°AG CONSULTING

double diamond FARM SUPPLY

T·A·C TONE AG CONSULTING LTD.

Please contact Amy Delaquis at (204) 384-1196 or amy@canolagrowers.com if you are:

A canola grower that is interested in participating, or have a trial idea for our on-farm program.

An agronomists that is interested in working with MCGA as an Agronomic Partner. MCGA contracts agronomists from across the province to work with farms to establish, manage and harvest research trials.

A researchers that is interested in collaborating with the Canola On-Farm Research Program to complement your research program.

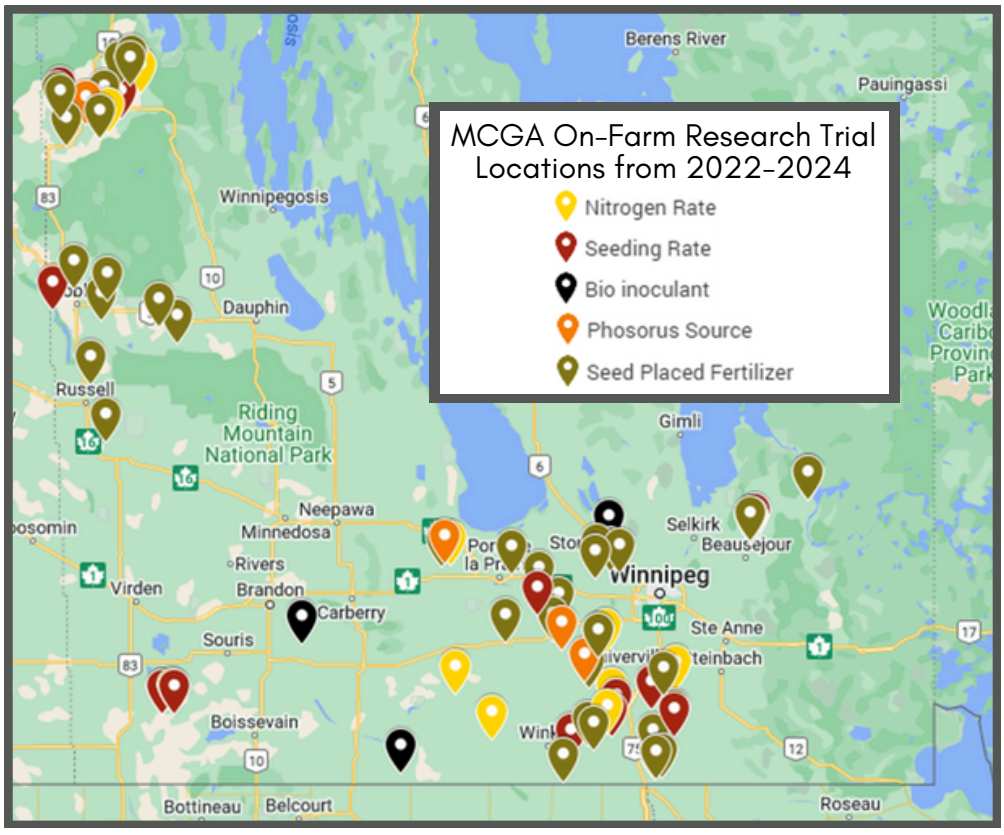
Program Overview

Canola On-Farm Research

Manitoba Canola Growers On-Farm Research Program began in 2022 with 3 trial type across 12 trial locations, it has since grown to include 5 trial types and 37 testing locations across Manitoba.

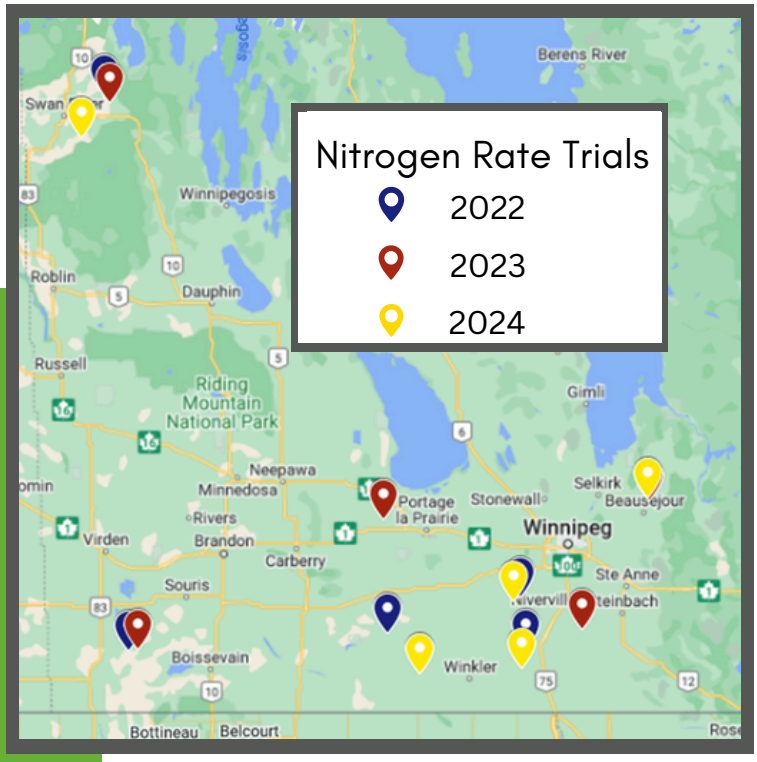
Trial Type	2024 Trial Locations	Testing Years
Nitrogen Rate	5	2022 – 2024
Seeding Rate	6	2022 – 2024
Phosphorus Source	4	2024
Seed Placed Fertilizer Toxicity	19*	2023 – 2024
Cover Cropping for Flea Beetle Management	3	2024

*Replicated by location (1 rep per location)



Trial Summary

Canola Nitrogen Rate Trial



Research Question:

Are nitrogen (N) rates being used for canola production across Manitoba sufficient for optimizing yield and nitrogen efficiency?

Treatments:

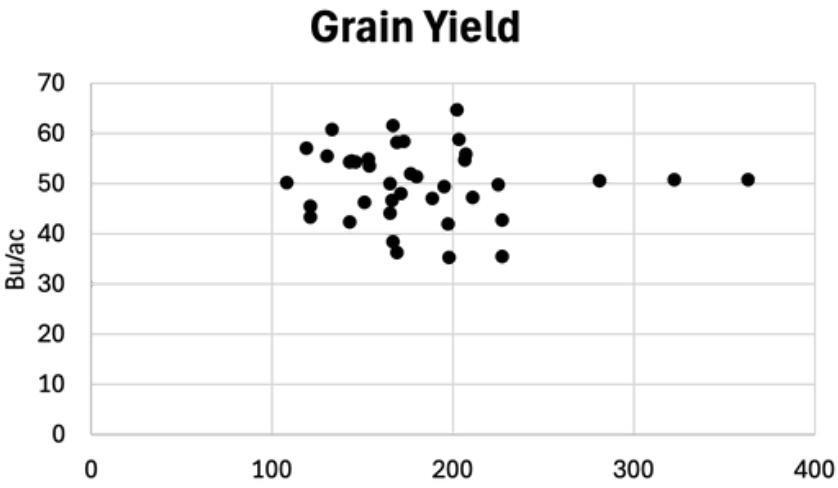
1. Reduced N Rate (75%)
2. Standard N Rate (100%) - Farm Normal for Field
3. High N Rate (125%)

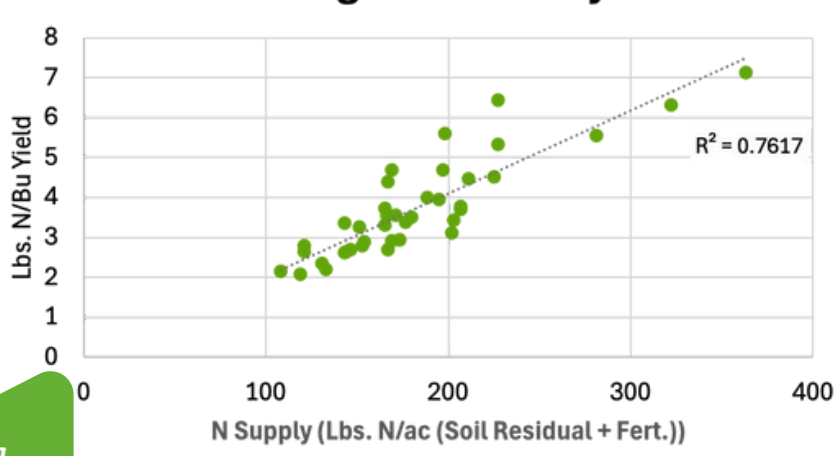
Trial Setup:

Randomized complete block, each treatment was one equipment width x field length, with 4 replicates per locations (12 strips per location)

Data Collection:

Plant Counts, Tissue N (bolting), Yield, Protein, Oil Content





Background: Current research indicates that canola uptakes an average of 2.6 lbs. of N per bushel of grain yield, with a wide range of 1.3 to 3.6 (Walley et al. 2023). The amount of N available to the crop during the growing season from fertilizer applications and soil supplies can vary widely depending on management and growing season conditions. This makes understanding crop N use on a farm level a major priority for farmers to ensure they are supplying canola with sufficient N while maximizing return on investment.

2022 - 2024 Summary: The vast majority (94%) of fields tested in this trial since 2022 were supplying sufficient N with their current practices, seeing no significant increase in grain yield with a 25% increase in N rate (95% confidence).

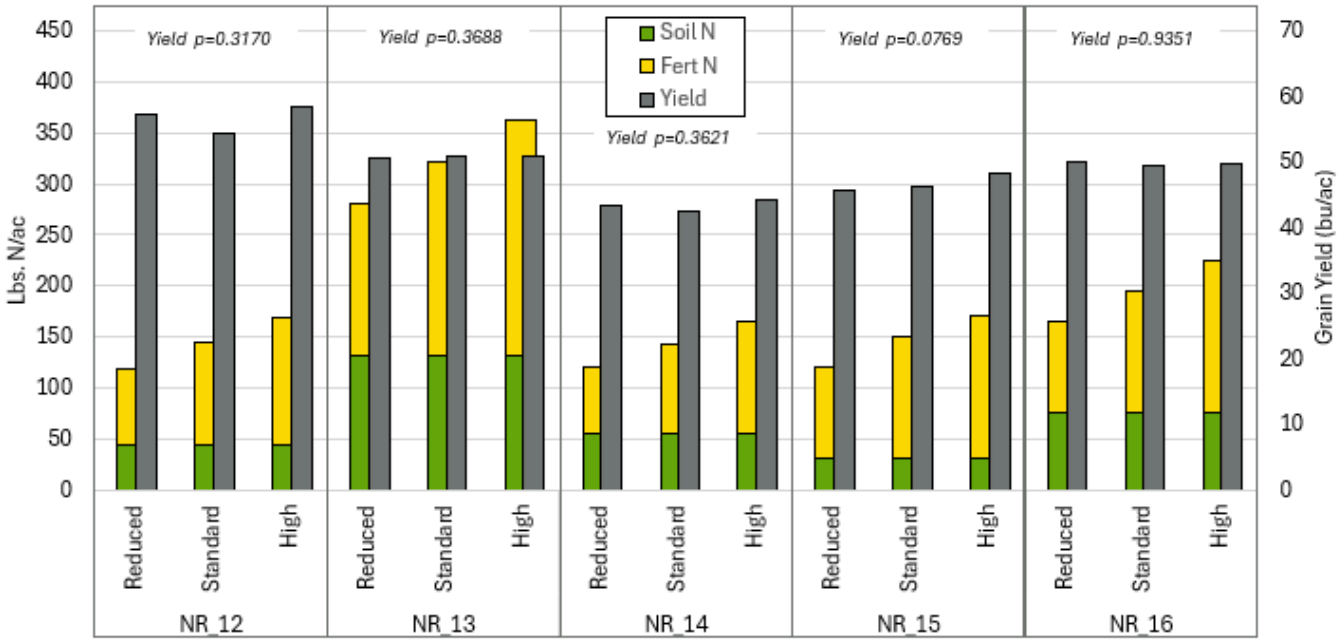
2024 Results Summary

Canola Nitrogen Rate Trials

2024 Nitrogen Rate Trial Sites

Trial ID	RM	Residual N (0-24in)	N Rates (lbs. N/ac)			N Source
			Reduced	Standard	High	
NR_12	Rhineland	44	75	100	125	UAN
NR_13	Brokenhead	132	149	190	231	Urea
NR_14	MacDonald	56	65	87	109	UAN
NR_15	Minitonas-Bowsman	31	90	120	140	Anhydrous
NR_16	Pembina	75	90	120	150	ESN/Urea (50/50)

2024 Grain Yield and Nitrogen Supply



Grain Yield

Yield ranged from 42 to 58 bu/ac across all N rate trials in 2024. There was no significant effect of N rate at any trial location, indicating that N was not a yield limiting factor in these trials.

Nitrogen Efficiency

The average amount of N suppled per bushel of grain yield in the 2024 trials was 3.8 lbs. N/bu, ranging from 2.1 to 7.1lbs N/bu. Because grain yield was not significantly increased when N rates increased, as the amount of N fertilizer supplied to the crop increased the efficiency of N was reduced. This would have reduced economic returns as more N fertilizer was used to produce similar grain yield.

All results presented are preliminary as the trial will continue to run again in 2025 field season. Grain protein and oil content data is pending for 2024 field season.

Nitrogen Rate Trial

NR_12

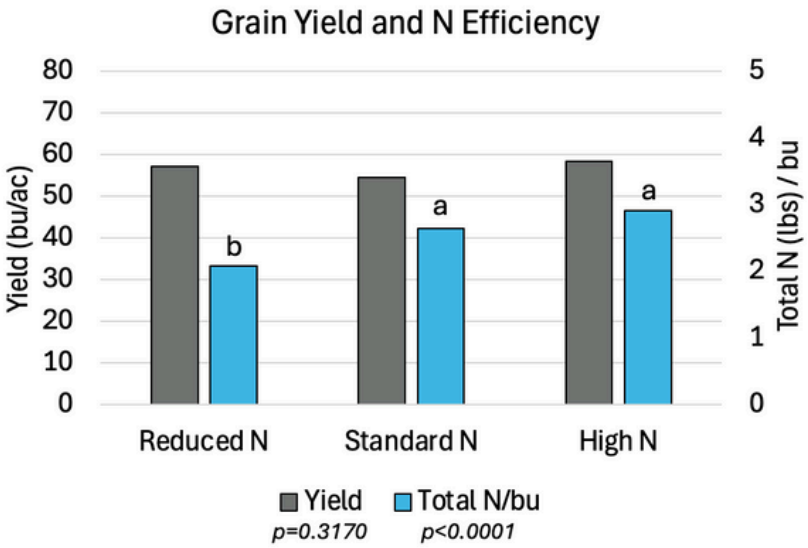
Site Info

Trial ID: NR_12
Rural Municipality: Rhineland
Residual N (0-24"): 44 lbs./ac
Seeding Date: May 11, 2024
Seeding Equipment: John Deere Max Emerge 3 (Disc Drill)
Variety: L340PC
Harvest Date: Sept 6, 2024

Nitrogen Application

Source: UAN (28-0-0)
Placement: Stream
Timing: Pre-seed

Treatment	Fertilizer N Applied	Total N (Soil + Fert)
	Lbs. N/ac	*Lbs. N/ac*
Reduced N	75	119
Standard N	100	144
High N	125	169



Results Summary

Plant Establishment: N Rate had no effect on plant establishment in this trial
Tissue N: N Rate had no effect on N Tissue content at bolting in this trial
Grain Yield: Yield was not significantly influenced by N rate treatments in this trial.
Nitrogen Efficiency: The amount of N used to produce a single bushel of grain yield was reduced with the low N rate treatment in this trial.

	Plant Counts at 4-leaf (ft²)	N Tissue at Bolting (%)	Grain Moisture (%)
Reduced N	6.6	5.6	8.5
Standard N	6.8	5.6	8.6
High N	6.7	5.8	8.6
p-value	*0.6495*	*0.5173*	*0.7900*

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	33	110.2	95.4	99.2	58.6	74.3	470.7
Avg Daily Temp (C)	6.16	12.34	16.57	21.04	17.97	17.97	

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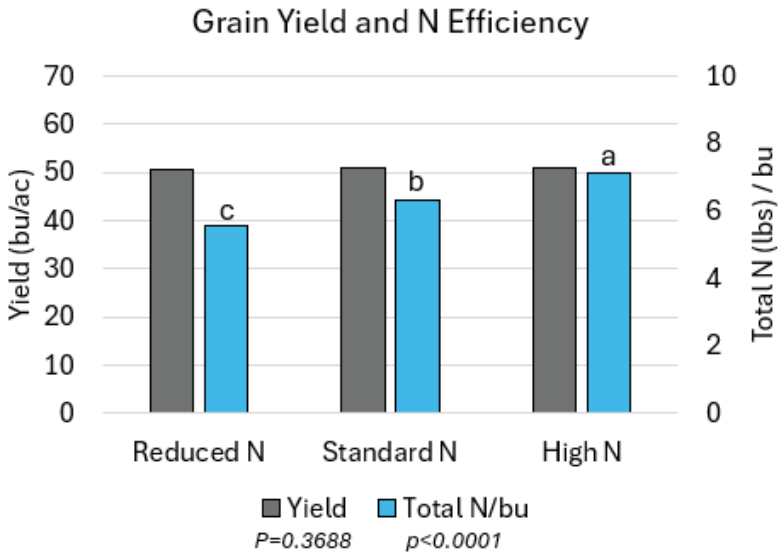
Treatment	Fertilizer N Applied	Total N (Soil + Fert)
	Lbs. N/ac	*Lbs. N/ac*
Reduced N	149	281
Standard N	190	322
High N	231	363



Nitrogen Rate Trial

NR_13

Site Info

Trial ID: NR_13
Rural Municipality: Brokenhead
Residual N (0-24"): 132 lbs. N/ac
Seeding Date: May 23, 2024
Seeding Equipment: Bourgault 3820 (Air Planter)
Variety: L356PC
Harvest Date: Sept 9, 2024

Nitrogen Application

Source: Urea (46-0-0)
Placement: Mid-Row Banded
Timing: Seeding

Results Summary

Plant Establishment: N rate treatments did not influence plant establishment in this trial.
Tissue N: N rate treatments did not influence Tissue N at bolting in this trial.
Grain Yield: N rate treatments did not significantly influence grain yield in this trial.
Nitrogen Efficiency: The amount of N (soil + fert) used to produce a single bushel of grain yield was significantly increased from 5.5 to 7.2 with increasing N rates in this trial due to the lack of yield response as N applications rates increased.

	Plant Counts at 4-leaf (ft^2)	N Tissue at Bolting (%)	Grain Moisture (%)
Reduced N	6.6	5.6	8.5
Standard N	6.8	5.6	8.6
High N	6.7	5.8	8.6
p-value	*0.6495*	*0.5173*	*0.7900*

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	33	110.2	95.4	99.2	58.6	74.3	470.7
Avg Daily Temp (C)	6.16	12.34	16.57	21.04	17.97	17.97	

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Nitrogen Rate Trial

NR_14

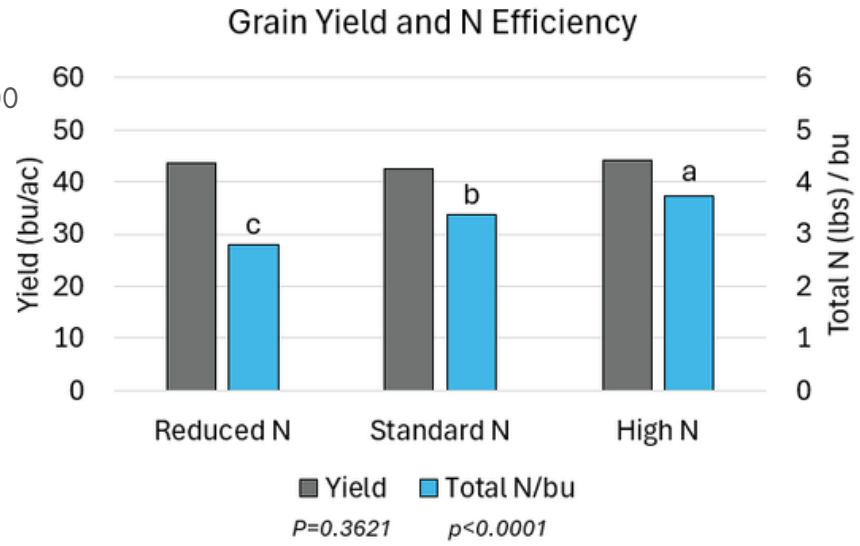
Site Info

Trial ID: NR_14
Rural Municipality: Macdonald
Residual N (0-24"): 56 lbs. N/ac
Seeding Date: June 10, 2024
Seeding Equipment: Case IH Drill PD500
Variety: L340PC
Harvest Date: Sept 24, 2024

Nitrogen Application

Source: UAN (28-0-0)
Placement: Mid-Row Banded
Timing: Spring

Treatment	Fertilizer N Applied	Total N (Soil + Fert)
	Lbs. N/ac	*Lbs. N/ac*
Reduced N	65	121
Standard N	87	143
High N	109	165



Results Summary

Plant Establishment: N rate treatments did not influence plant establishment in this trial.
Tissue N: N rate treatments did not influence Tissue N at bolting in this trial.
Grain Yield: N rate treatments did not significantly influence grain yield in this trial.
Nitrogen Efficiency: The amount of N (soil + fert) used to produce a single bushel of grain yield was significantly increased from 2.8 to 3.7 with increasing N rates in this trial due to the lack of yield response as N application rates increased.

	Plant Counts at 4-leaf (ft^2)	N Tissue at Bolting (%)	Grain Moisture (%)
Reduced N	7.8	6.4	10
Standard N	7.6	6.8	10.1
High N	7.6	6.7	10
p-value	*0.8119*	*0.0965*	*0.6806*

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	29.5	51.5	132.8	69.4	74.4	55.6	413.2
Avg Daily Temp (C)	5.64	12.34	16.66	21.03	17.47	17.47	

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ANTARA AGRONOMY

Treatment	Fertilizer N Applied	Total N (Soil + Fert)
	Lbs. N/ac	*Lbs. N/ac*
Reduced N	90	121
Standard N	120	151
High N	140	171

Nitrogen Rate Trial

NR_15

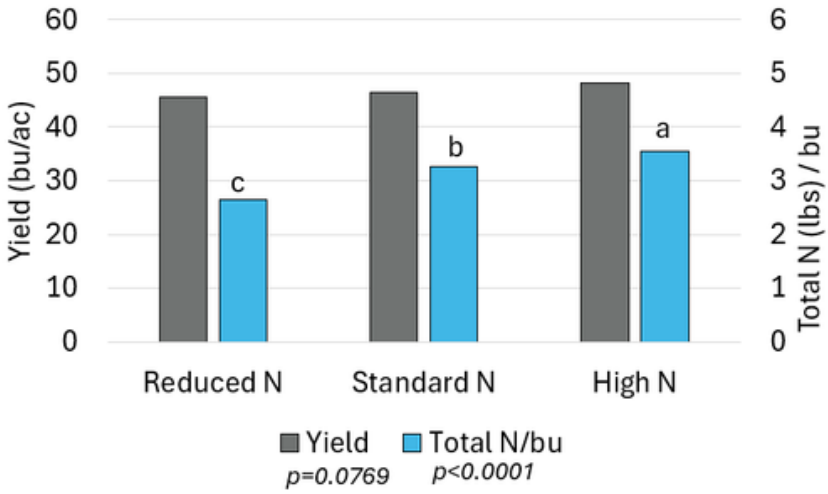
Site Info

Trial ID: NR_15
Rural Municipality: Minitonas-Bowsman
Residual N (0-24"): 31lbs N/ac
Seeding Date: May 28, 2024
Seeding Equipment: Bourgault 5710
Variety: L356PC
Harvest Date: Sept 15, 2024

Nitrogen Application

Source: Anhydrous Ammonia
Placement: Banded
Timing: Fall 2023

Grain Yield and N Efficiency



Results Summary

Plant Establishment: N rate treatments did not influence plant establishment in this trial.
Tissue N: N rate treatments did not influence Tissue N at bolting in this trial.
Grain Yield: N rate treatments did not significantly influence grain yield in this trial.
Nitrogen Efficiency: The amount of N (soil + fert) used to produce a single bushel of grain yield was significantly increased from 2.7 to 3.6 with increasing N rates in this trial due to the lack of yield response as N application rates increased.

	Plant Counts at 4-leaf (ft²)	N Tissue at Bolting (%)	Grain Moisture (%)
Reduced N	7.4	5.7	5.8
Standard N	8.1	6.1	5.8
High N	7.5	6.2	5.8
p-value	*0.3533*	*0.0563*	*0.6141*

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	36.8	65.3	63.0	32.3	33.9	27.8	259.1
Avg Daily Temp (C)	5.72	10.52	13.98	19.85	16.62	16.62	

Agronomic Support for this Trial Provided by:

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Nitrogen Rate Trial

NR_16

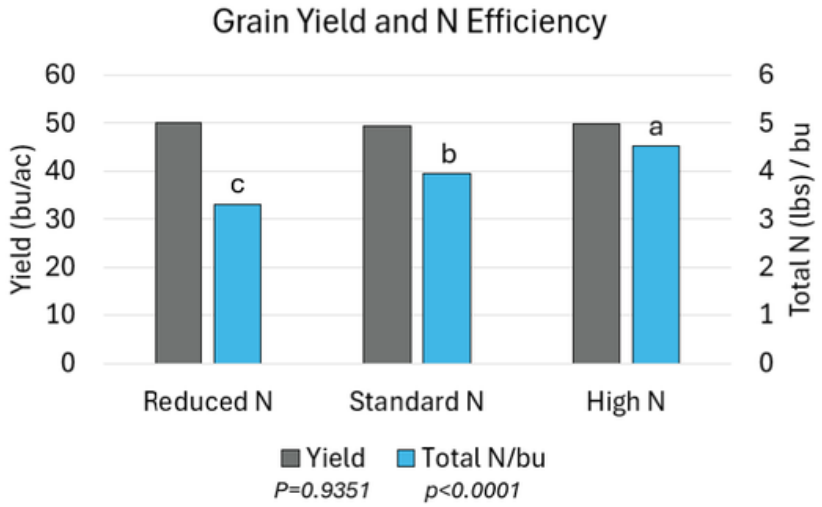
Site Info

Trial ID: NR_16
Rural Municipality: Pembina
Residual N (0-24"): 75 lbs. N/ac
Seeding Date: May 21, 2024
Seeding Equipment: Bourgault 3710
Variety: L340PC
Harvest Date: Sept 6, 2024

Nitrogen Application

Source: 35% ESN & 65% Urea
Placement: Midrow Banded
Timing: Spring

Treatment	Fertilizer N Applied	Total N (Soil + Fert)
	Lbs. N/ac	*Lbs. N/ac*
Reduced N	90	165
Standard N	120	195
High N	150	225



Results Summary

Plant Establishment: There was a small but significant increase in plant stand with the low rate of N compared to the standard N rate treatment.
Tissue N: There was a significant reduction in tissue N at bolting with the reduced N rate treatment compared to the standard but there was no influence from the standard to the high rate of N.
Grain Yield: N rate treatments did not significantly influence grain yield in this trial.
Nitrogen Efficiency: The amount of N (soil + fert) used to produce a single bushel of grain yield was significantly increased from 3.3 to 4.5 with increasing N rates in this trial due to the lack of yield response as N application rates increased.

	Plant Counts at 4-leaf (ft²)	N Tissue at Bolting (%)	Grain Moisture (%)
Reduced N	6.7	4.9 b	8.8
Standard N	6.7	5.6 a	8.7
High N	6.4	5.4 ab	8.8
p-value	*0.9989*	*0.0396*	*0.805*

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	32.4	139.4	93.5	79	73.9	46.5	464.7
Avg Daily Temp (C)	5.13	10.71	15.18	19.71	16.9	16.9	

Agronomic Support for this Trial Provided by:

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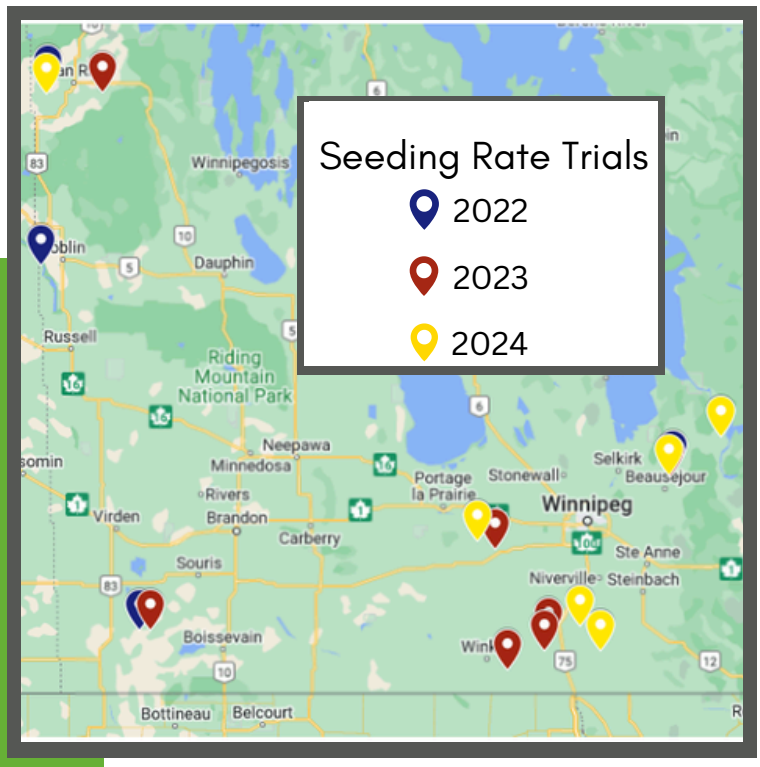
Notes

Why participate in On-Farm Research?

- Join a network of growers conducting and sharing on-farm trial results.
- Understand performance of new and improved production practices in your farm operation.
- A research specialist or agronomist will support you through every step of the research process and collect all data during the season.
- Statistically valid results.

Trial Summary

Canola Seeding Rate Trial



Research Question:

Can Manitoba canola farms reduce their seeding rates without sacrificing yield to increase return on investment?

Treatments:

1. Reduced Seeding Rate (75%)
2. Standard Seeding Rate (100%) - *Farm Normal*
3. High Seeding Rate (125%)

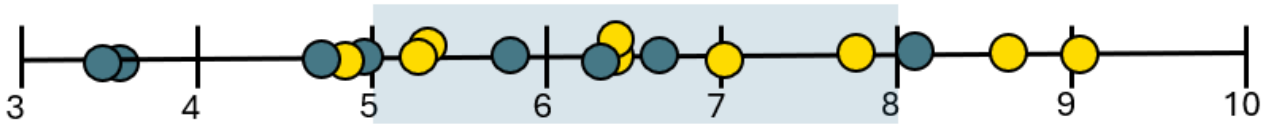
Trial Setup:

Randomized complete block, each treatment was one equipment width x field length, with 4 replicates per location (12 strips per location)

Data Collection:

Plant Counts, Emergence, Survival, Yield

Plant Establishment with Farm Standard Seeding Rate (2022-2024)



	Emergence	Seeding Rate
Air Drill	51 – 89%	3 – 5 lbs./ac
Planter	77 – 98%	2 – 3.3 lbs./ac

Background: The recommended plant stand for canola is 5-8 plants/ft2 to maximize return on seed investment while minimizing risks associated with low plant populations such as reduced competitive ability against pests. The emergence of canola seed in the field is highly variable and dependent on farm management growing season conditions. Therefore, it is important that growers understand emergence in their operations and how that may change with seeding rate decisions.

2022-2024 Summary: Overall, there was no significant influence of seeding rate on grain yield. When seeding rates were reduced by 25% emergence increased by 13% and when seeding rates were increased by 25% emergence was 4% lower than the standard seeding rates. This indicates that, on average, seeding rates can be lowered without a large reduction in plant stand to increase economic return on investment.

2024 Results Summary

Canola Seed Rate Trial

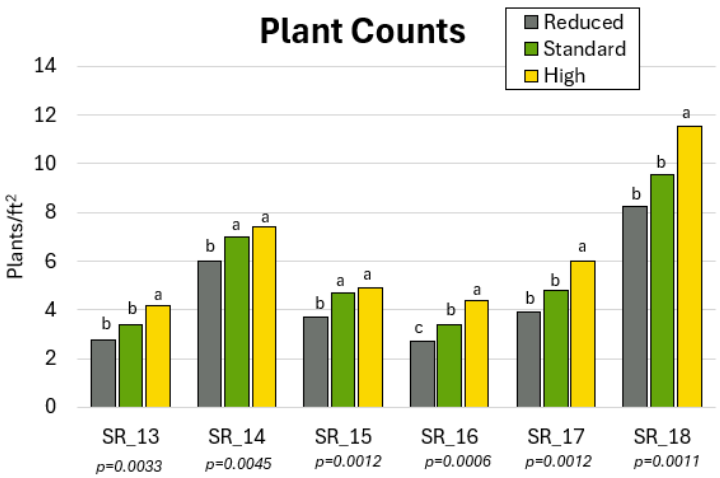
Trial ID	RM	Seeding Equipment (Row Spacing)	Seeding Rate (lbs./ac)			TKW (g)
			Reduced	Standard	High	
SR_13	Emerson – Franklin	John Deere DB88 (22 in)	1.4	2	2.7	4.7
SR_14	Lac du Bonnet	Horsch Disc Drill (10 in)	3.1	3.9	4.7	5
SR_15	Grey	John Deere 1790 (15 in)	2.4	2.8	3.4	5
SR_16	Brokenhead	Bourgault 3820 - Air Planter (10 in)	1.5	2	2.5	4.7
SR_17	Morris	Bourgault Disc Drill (10in)	2.25	3	3.75	4.9
SR_18	Swan Valley West	Bourgault 3320 XTC (10in)	3.4	4.2	5.1	4.1

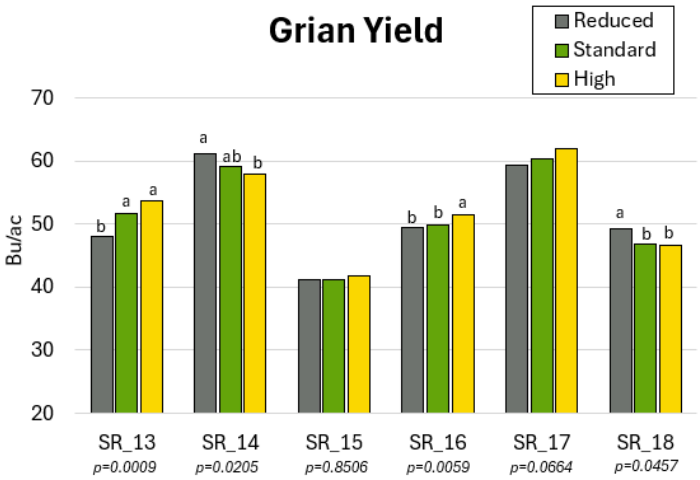
Plant Establishment:

Out of the 6 trials in 2024 there was 4 that were pushing very low seeding rates with their farm standard practices (<3 lbs./ac), leading to plant stand establishment being lower than the recommended 5 plants/ft2. All trials had increased plant stand with increasing seeding rates.

Grain Yield:

There was an increase in grain yield with the high seeding rates at the two trials that had the lowest standard seeding rates (2 lbs./ac) and plant populations (3.1 – 3.4 plants/ft2). Alternatively, the two locations that had higher plant stands with their standard seeding rates (7-9.5 plants/ft2) had an increase in grain yield when seeding rate was reduced.





Within each trial location treatments with similar lowercase letters are not significantly different at 95% confidence level. Locations with no lowercase letters listed indicate an insignificant treatment effect.

2024 Highlights:

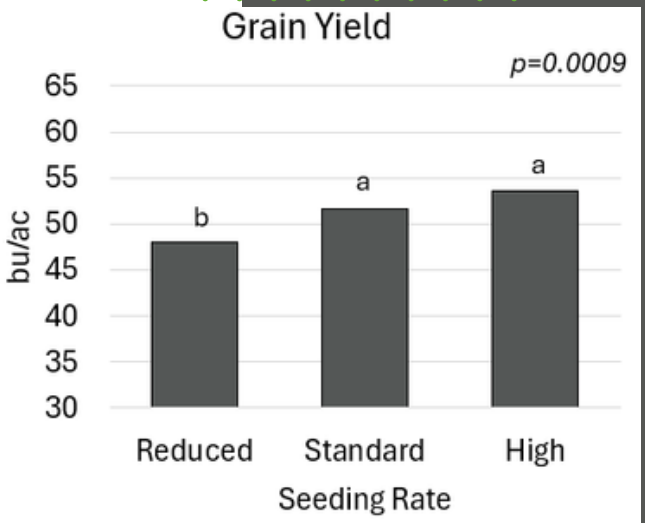
Across the 2024 trials it was critical that that standard seeding rate was targeting a plant stand >4.5 plants/ft2 to avoid yield loss due to insufficient plant populations.
All results presented are preliminary as the trial will continue to run again in 2025 field season

Seeding Rate Trial

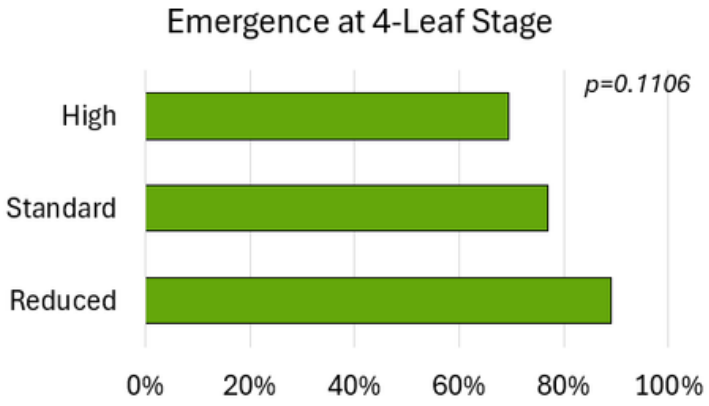
SR_13

Site Info

Trial ID: SR_13
Rural Municipality: Emerson - Franklin
Seeding Date: May 19, 2024
Seeding Equipment: John Deere DB88 (Planter)
Variety: L345PC
Seed Treatment: Lumiderm
TKW: 4.7 g/1000 seeds
Row Spacing: 22 in
Harvest Date: Sept 14,2024



Treatment	Seeding Rate		Plant Counts (ft2)	
	Lbs./ac	Seeds/ac	4 Leaf	Maturity
Reduced Seeding Rate (75%)	1.4	135,113	2.8 b	3.2 b
Standard Seeding Rate (100%)	2	193,018	3.4 b	4.7 a
High Seeding Rate (150%)	2.7	260,575	4.2 a	5.2 a
p-value			*0.0033*	*0.0009*



Results Summary

Plant Establishment: Overall plant population was lower than recommended target populations across this trial as seeding rates used were low. At the 4 leaf stage and maturity growth stages there was an increased plant stand as seeding rates increased. Plant stand was higher at maturity than 4 leaf for all treatments indicating that there was likely delayed germination across this trial. Emergence % was highest with the low seeding rate and lowest with high seeding rate, although this was not significant at the 95% confidence level.

Grain Yield: Due to the low plant populations in the trial there was a significant increase in grain yield as seeding rate increased.

Additional considerations: Risks associated with low plant populations outside the scope of this trial include reduced competitiveness against field pests.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	33.6	122	90.6	60.4	60.6	115.7	482.9
Avg Daily Temp (C)	5.59	12.06	16.48	20.77	17.85	17.85	

Agronomic Support for this Trial Provided by:

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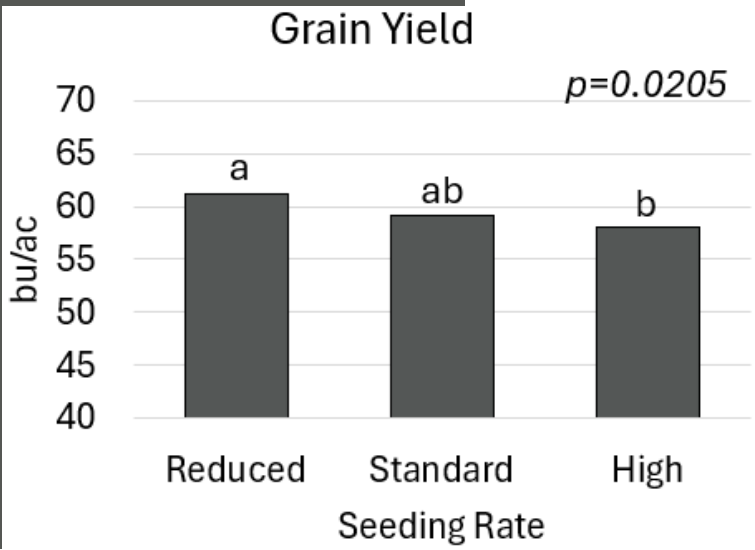


Seeding Rate Trial

SR_14

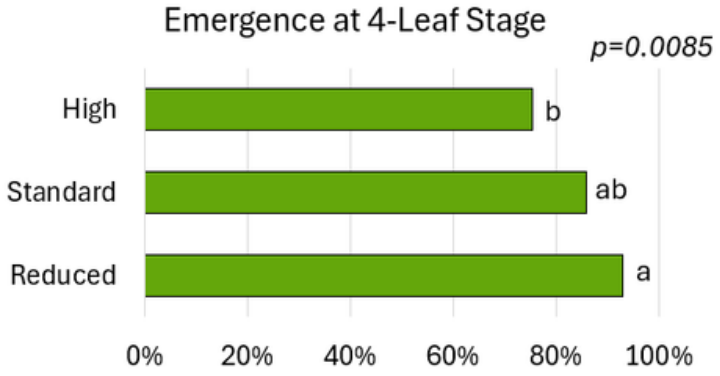
Site Info

Trial ID: SR_14
Rural Municipality: Lac du Bonnet
Seeding Date: May 17, 2024
Seeding Equipment: Horsch Disc Drill
Variety: L350PC
Seed Treatment: BUTEO Start 480 FS / Helix Vibrance
TKW: 5g/1000 seeds
Row Spacing: 10 in
Seed-placed Fertilizer: 100 Lbs/ac (12-40-0-10)
Harvest Date: Sept 4, 2024

Treatment	Seeding Rate		Plant Counts (ft2)	
	Lbs./ac	Seeds/ac	4 Leaf	Maturity
Reduced Seeding Rate (75%)	3.1	281,228	6 b	6.4 a
Standard Seeding Rate (100%)	3.9	353,808	7 a	6.8 a
High Seeding Rate (150%)	4.7	426,377	7.4 a	7.4 a
p-value			*0.0045*	*0.1598*

Results Summary

Plant Establishment: At the 4 leaf stage and maturity growth stages there was an increased plant stand as seeding rates increased. Emergence was higher for the reduced seeding rate treatments compared to the high seeding rate treatment. Plant survival from 4-leaf to maturity was very close to 100% for all treatments.



Grain Yield: Grain yield increased by 3.2 bu/ac from the low seeding rate to the high seeding rate in this trial.
Additional considerations: Risks associated with low plant populations outside the scope of this trial include reduced competitiveness against field pests.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	42.4	83.3	82.2	87.7	29.1	0.7	325.4
Avg Daily Temp (C)	4.82	11.17	15.57	20.03	17.35	17.35	

Agronomic Support for this Trial Provided by:

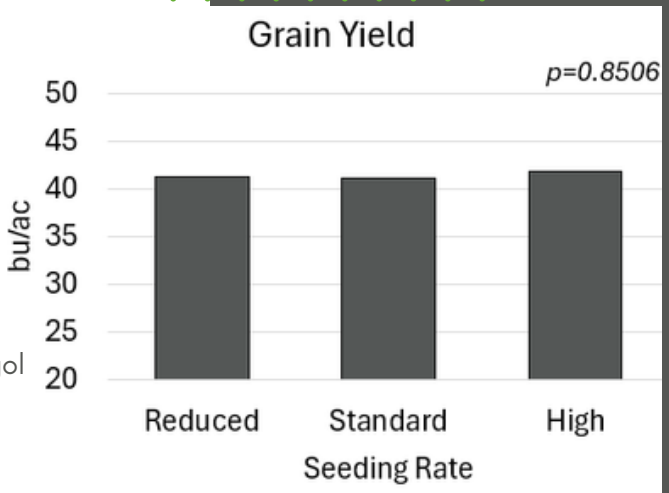
T·A·C TONE AG CONSULTING LTD.

Seeding Rate Trial

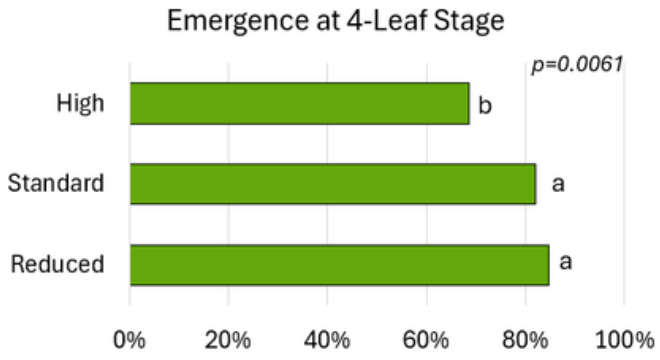
SR_15

Site Info

Trial ID: SR_15
Rural Municipality: Grey
Seeding Date: May 23, 2024
Seeding Equipment: John Deere 1790 (Planter)
Variety: L356PC
Seed Treatment: BUTEO Start 480 FS/Prosper Evergol
TKW: 5 g/1000 seeds
Row Spacing: 15 in
Harvest Date: Sept 11, 2024



Treatment	Seeding Rate		Plant Counts (ft2)	
	Lbs./ac	Seeds/ac	4 Leaf	Maturity
Reduced Seeding Rate (75%)	2.4	190,000	3.7 b	4.3 b
Standard Seeding Rate (100%)	2.8	250,000	4.7 a	5.2 a
High Seeding Rate (150%)	3.4	310,000	4.9 a	5.2 a
		p-value	*0.0012*	*0.0136*



Results Summary

Plant Establishment: At the 4 leaf stage and maturity growth stages there was a reduced plant stand as seeding rates reduced to the low seeding rate treatment. Plant stand was higher at maturity than 4 leaf for all treatments indicating that there was likely delayed germination across this trial. Emergence was 14% lower with the high seeding rate treatment compared to the standard rate.

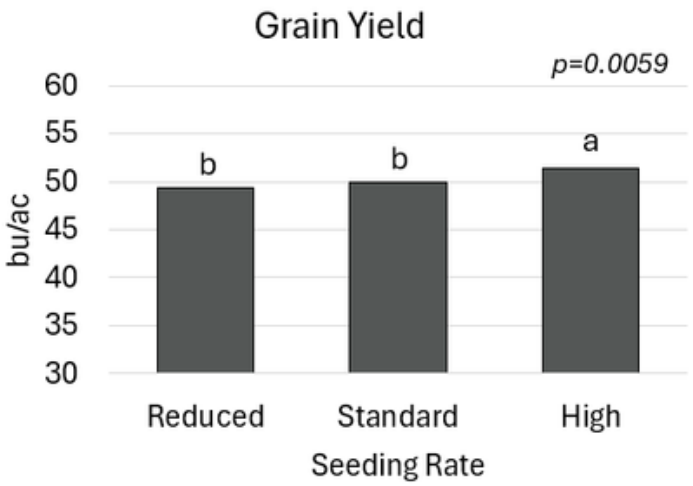
Grain Yield: N rate had no significant influence on grain yield in this trial.
Additional considerations: risks associated with low plant populations outside the scope of this trial include reduced competitiveness against field pests

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	30.5	108.4	118.7	40.2	54.5	52.2	404.5
Avg Daily Temp (C)	6.11	12.12	16.30	20.73	17.63	17.63	

Agronomic Support for this Trial Provided by:

T·A·C TONE AG CONSULTING LTD.

SR_16



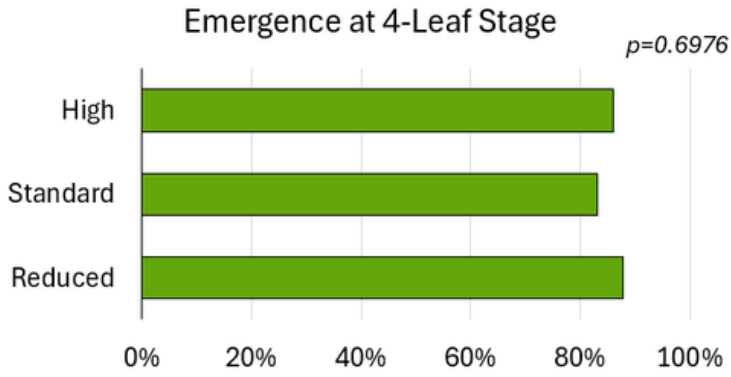
Site Info

Trial ID: SR_16
Rural Municipality: Brokenhead
Seeding Date: May 23, 2024
Seeding Equipment: Bourgault 3820 (Air Planter)
Variety: L356PC
Seed Treatment: Lumiderm / Helix Vibrance / BUTEO Start
TKW: 4.7g/1000 seeds
Row Spacing: 10 in
Seed-placed Fertilizer: 38 Lbs/ac (11-52-0)
Harvest Date: Sept 9, 2024

Treatment	Seeding Rate		Plant Counts (ft2)	
	Lbs./ac	Seeds/ac	4 Leaf	Maturity
Reduced Seeding Rate (75%)	1.5	135,000	2.7 c	4.3 b
Standard Seeding Rate (100%)	2	180,000	3.4 b	4.3 b
High Seeding Rate (150%)	2.5	225,000	4.4 a	4.7 a
p-value			*0.0006*	*0.0005*

Results Summary

Plant Establishment: Overall plant population was lower than recommended target populations across this trial as seeding rates used were low. At the 4 leaf stage and maturity growth stages there was an increased plant stand as seeding rates increased. Plant stand was higher at maturity than 4 leaf for all treatments indicating that there was likely delayed germination across this trial.



Emergence % was not significantly influenced by the seeding rate treatments in this trial.

Grain Yield: Due to the low plant populations in the trial, there was a significant increase in grain yield as seeding rate increased.

Additional considerations: Risks associated with low plant populations outside the scope of this trial include reduced competitiveness against field pests.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	33.5	72.3	102	87.6	40.4	50.2	386
Avg Daily Temp (C)	5.39	11.93	16.57	20.64	17.87	17.87	

Agronomic Support for this Trial Provided by:

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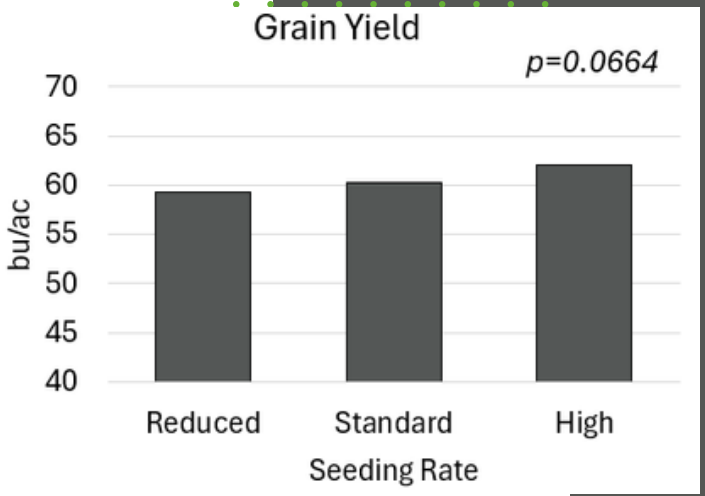
TONE AG CONSULTING LTD.

Seeding Rate Trial

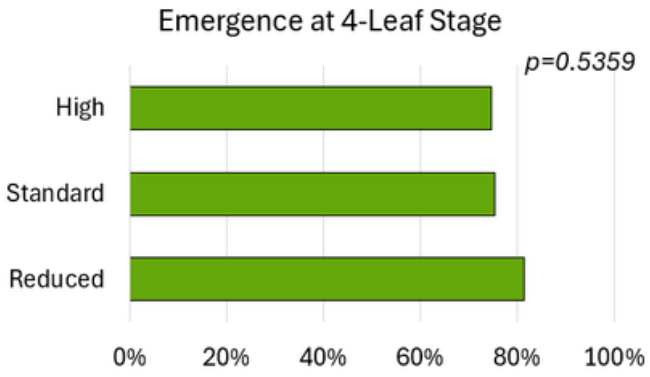
SR_17



Site Info

Trial ID: SR_17
Rural Municipality: Morris
Seeding Date: May 20, 2024
Seeding Equipment: Bourgault Disc Drill
Variety: L340PC
Seed Treatment: Helix, Buteo Start
TKW: 4.9 g/1000 seeds
Row Spacing: 10 in
Seed-placed Fertilizer: 12 lbs/ac Urea + 15 lbs/ac ESN/Rock 40 blend (50-45-0-7-1.1 Z)
Harvest Date: Sept 11, 2024

Treatment	Seeding Rate		Plant Counts (ft2)	
	Lbs./ac	Seeds/ac	4 Leaf	Maturity
Reduced Seeding Rate (75%)	2.25	208,469	3.9 b	4.1
Standard Seeding Rate (100%)	3.0	277,959	4.8 b	4.2
High Seeding Rate (150%)	3.75	347,449	6.0 a	4.3
p-value			*0.0012*	*0.9576*



Results Summary

Plant Establishment: Plant population increased at the 4 leaf stage as the seeding rate treatments increased from low to high. Survival from 4 leaf to maturity was increased with the low seeding rate treatment and as a result the plant populations across the three treatments were very similar at maturity. Emergence was not significantly influence by seeding rate treatments in this trial.

Grain Yield: There was no significant differences in grain yield across the three seeding rate treatments in this trial.

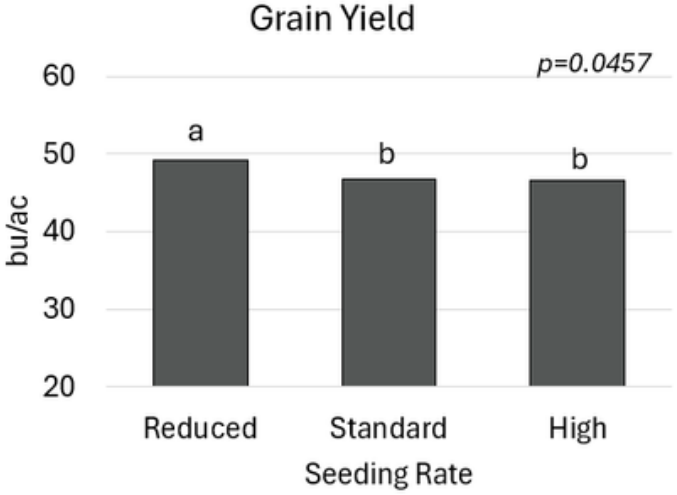
Additional considerations: Risks associated with low plant populations outside the scope of this trial include reduced competitiveness against field pests.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	35.4	66.6	127.4	38.4	69.4	5.4	342.6
Avg Daily Temp (C)	5.87	13.14	17.22	21.64	17.83	17.83	

Agronomic Support for this Trial Provided by:

ANTARA AGRONOMY

SR_18



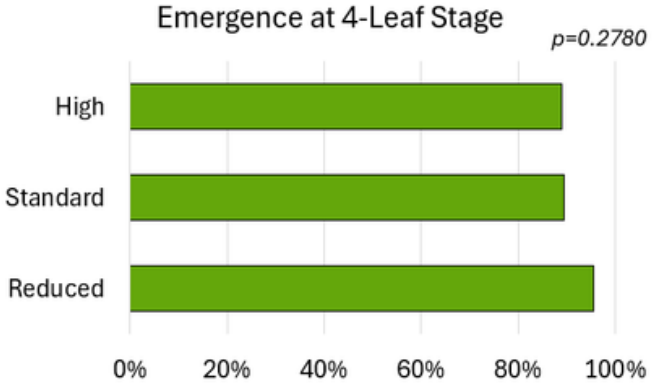
Site Info

Trial ID: SR_18
Rural Municipality: Swan Valley West
Seeding Date: May 16, 2024
Seeding Equipment: Bourgault 3320 XTC
Variety: L358HPC
Seed Treatment: Helix Vibrance & Buteo
TKW: 4.1g/1000 seeds
Row Spacing: 10 in
Seed-placed Fertilizer: 89 lbs/ac MES15 (12-29-0-14)
Harvest Date: Sept 24, 2024

Treatment	Seeding Rate		Plant Counts (ft2)	
	Lbs./ac	Seeds/ac	4 Leaf	Maturity
Reduced Seeding Rate (75%)	3.4	376,488	8.3 b	7.2
Standard Seeding Rate (100%)	4.2	465,073	9.6 b	7.8
High Seeding Rate (150%)	5.1	564,732	11.5 a	8.1
p-value			*0.0011*	*0.0643*

Results Summary

Plant Establishment: Overall, plant populations were high across this trial, with populations from 8 - 12 plants/ft2. Plant populations did increase as seeding rates increased at 4 leaf and maturity; however survival was reduced due to plant competition in the high seeding rate treatments. Emergence was similar for all treatments.



Grain Yield: The reduced seeding rate treatment did result in a significant 2.4 bu/ac yield advantage over the standard seeding rate in this trial. This was likely due to competitive stress imposed on the crop in the standard and high seeding rates.
Additional considerations: Risks associated with low plant populations outside the scope of this trial include reduced competitiveness against field pests.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	36.8	65.3	63	32.3	33.9	27.8	259.1
Avg Daily Temp (C)	5.72	10.52	13.98	19.85	16.62	16.62	

Agronomic Support for this Trial Provided by:

NEW ERA AG RESEARCH

Notes

Research Priorities

1. Increase canola yield potential and stability in Manitoba conditions through genetic and agronomic solutions
2. Protect canola yields from current and emerging pests
3. Improve canola nutrient use efficiency through 4R management practices
4. Reduce or improve the environmental impact of canola production
5. Reduce harvest and storage loss through genetic and management solutions, as well as equipment optimization
6. Ensure supply of high-quality canola to meet current and future end-use demands

NEW TRIAL TYPE

Trial Summary

Canola Phosphorus Source

Research Question:

What is the influence of Phosphorus (P) fertilizer sources on crop P availability, seed safety and yield for canola production across Manitoba soils.

Treatments:

Each farm chose whichever P sources were of interest to them to include in the trial.

1. P Source 1 – Standard Rate
2. P Source 1 – High Rate
3. P Source 2 – Standard Rate
4. P Source 2 – High Rate

Includes one unreplicated untreated control (no P) plot to characterize P responsiveness of field.

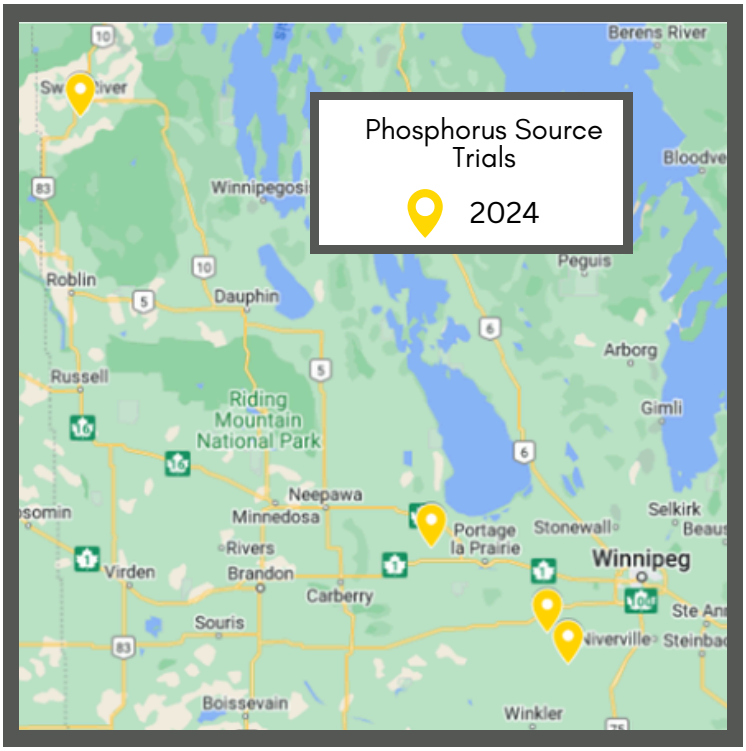
Trial Setup:

Randomized complete block, each treatment was one equipment width x field length, with 4 replicates per locations (12 strips per location)

Data Collection:

Plant Counts, Emergence, P Tissue, Biomass (Rosette), Yield

Note: Due to challenges in handling and supply of P sources not all trial locations were able to test the exact same total P205 rates for the two fertilizer sources.



Background: Canola requires P in large amounts during the growing season (approximately 1.5 lbs. of phosphate per bushel), especially during the early growth stages. The early season demand of P and immobility in the soil P fertilizers are typically applied in close proximity to the canola seed row, which may result in toxicity issues when large amounts of P fertilizer are applied. There are many different P fertilizers being marketed to farmers with claims of increased seed safety and P availability compared to conventional P sources with little independent research done across Manitoba growing regions.

2024 P Source Trial Sites

Trial ID	RM	Soil Residual P (0-6 in)	P Placement	Seeding Equipment	Row spacing
PS_01	North Norfolk	7 ppm	Side-Banded	John Deere 1790	15 in
PS_02	Grey	13 ppm	Seed-Placed	New Holland P250	10 in
PS_03	Swan Valley West	4 ppm	Seed-Placed	Bourgault 3320 Paralink	10 in
PS_04	Morris	8 ppm	Seed-Placed	John Deere N560F	10 in

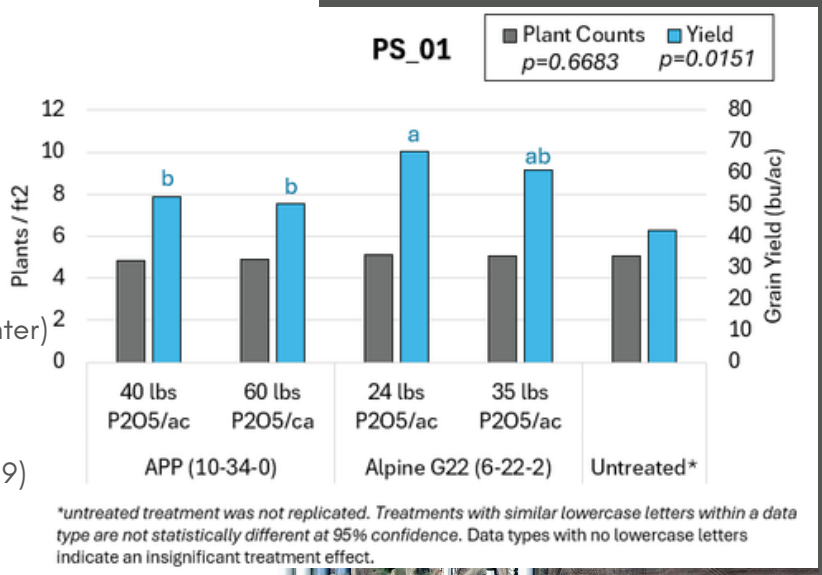
All results presented are preliminary as the trial will continue to run again in 2025 field season. P availability for canola uptake is highly dependent on environmental conditions, these results are all from a single location in a single year. Caution should be used when interpreting results and making management decisions from data with limited replication.

Phosphorus Source Trial

PS_01

Site Info

Trial ID: PS_01
Rural Municipality: North Norfolk
Seeding Date: May 11, 2024
Soil Residual P(0-6in): 7ppm
Seeding Equipment: John Deere 1790 (Planter)
Opener Type: Disc
Row Spacing: 15 in
Seedbed Utilization: 5%
Seeding Rate: 275,000 seeds/ac (TKW 5.9)
Variety: L345PC
Harvest Date: Aug 21, 2024



*untreated treatment was not replicated. Treatments with similar lowercase letters within a data type are not statistically different at 95% confidence. Data types with no lowercase letters indicate an insignificant treatment effect.

Treatment	Phosphorus Source	Rate	Total P @ Rosette	Grain Moisture
		(lbs. P_2O_5/ac)	(%)	(%)
1	10-34-0	40	0.56	9.8 a
2	10-34-0	60	0.57	9.5 ab
3	ALPINE G22	24	0.52	9.2 ab
4	ALPINE G22	35	0.59	8.9 b
p-value			0.6246	0.0299

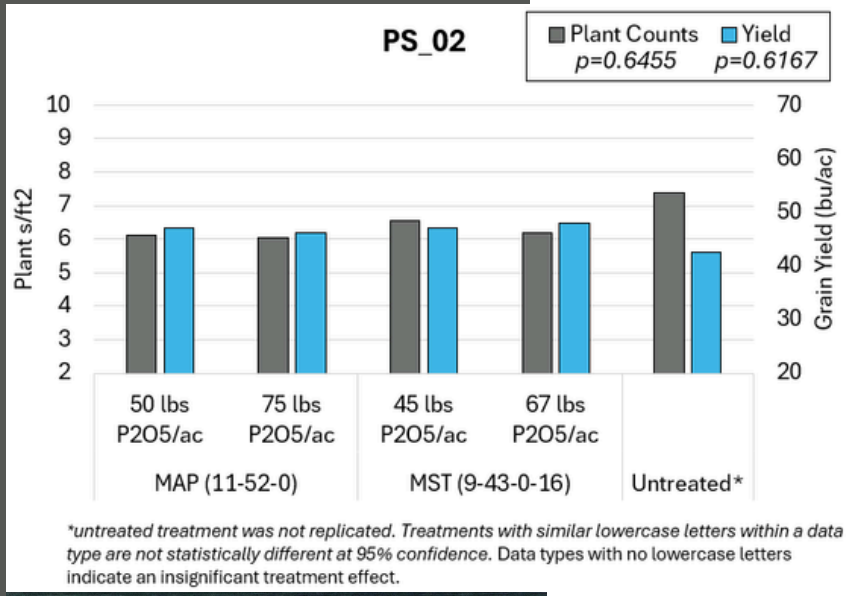
Results Summary

Plant Establishment: There was no significant effect of P source treatments or rates on plant establishment in this trial.
P Tissue: There was no significant effect of P source on P tissue concentration at rosette stage in this trial.
Grain Yield: The standard rate of Alpine G22 has a significant increase in grain yield compared to both rates of 10-34-0 (APP). Grain moisture was reduced with high rates of Alpine G22 compared to similar rates of APP.
P availability for canola uptake is highly dependent on environmental conditions, these results are all from a single location in a single year. Caution should be used when interpreting results and making management decisions from data with limited replication.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	44.1	120.1	122.4	24.4	53	56.4	420.4
Avg Daily Temp (C)	5.65	11.11	15.78	20.75	17.09	17.09	

Agronomic Support for this Trial Provided by:

TONE AG CONSULTING LTD.



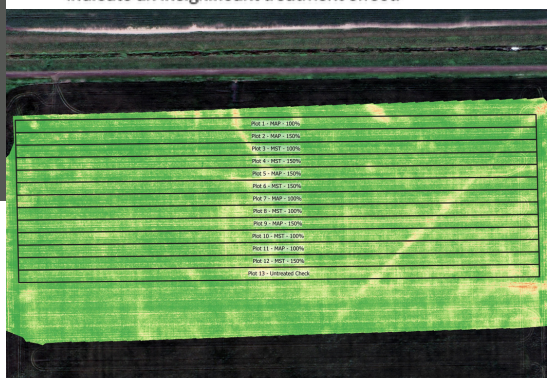
untreated treatment was not replicated. Treatments with similar lowercase letters within a data type are not statistically different at 95% confidence. Data types with no lowercase letters indicate an insignificant treatment effect.

Phosphorus Source Trial

PS_02

Site Info

Trial ID: PS_02
Rural Municipality: Grey
Seeding Date: May 11, 2024
Soil Residual P (0-6in): 13ppm
Seeding Equipment: New Holland P250 Air Drill
Opener Type: Spikes
Row Spacing: 10 in
Seedbed Utilization: 7.5%
Seeding Rate: 5 lbs/ac (5 TKW)
Variety: B3017N
Harvest Date: Sept 7, 2024



Treatment	Phosphorus Source	Rate	Total P @ Rosette	Grain Moisture
		(lbs. P_2O_5/ac)	(%)	(%)
1	MAP 11-52-0	50	0.69	7.3
2	MAP 11-52-0	75	0.78	7.1
3	MST 9-43-0-16	45	0.71	7.1
4	MST 9-43-0-16	67	0.74	7.2
p-value			*0.4886*	*0.2579*

Results Summary

Plant Establishment: There was no significant effect of P source treatments or rates on plant establishment in this trial.
P Tissue: There was no significant effect of P source on P tissue concentration at rosette stage in this trial.
Grain Yield: There was no significant of P source treatments on grain yield in this trial.
P availability for canola uptake is highly dependent on environmental conditions, these results are all from a single location in a single year. Caution should be used when interpreting results and making management decisions from data with limited replication.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	30.5	108.4	118.7	40.2	54.5	52.2	404.5
Avg Daily Temp (C)	6.1	12.12	16.3	20.73	17.63	17.63	

Agronomic Support for this Trial Provided by:

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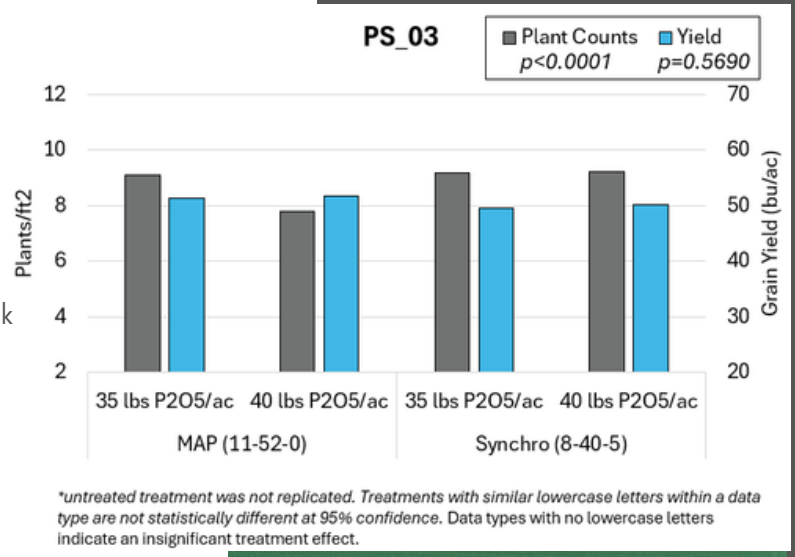
Phosphorus Source Trial

PS_03

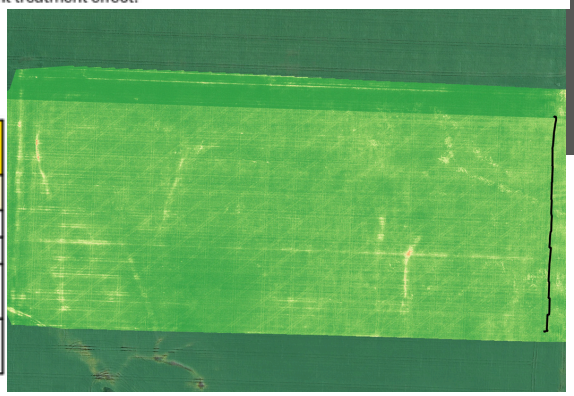
Site Info

Trial ID: PS_03
Rural Municipality: Swan Valley West
Seeding Date: May 14, 2024
Soil Residual P (0-6in): 4 ppm
Seeding Equipment: Bourgault 3320 Paralink
Opener Type: Knife
Row Spacing: 10 in
Seedbed Utilization: 20%
Seeding Rate: 4.2 lbs/ac (TKW 4.5)
Variety: L340PC
Harvest Date: Sept 9, 2024



*untreated treatment was not replicated. Treatments with similar lowercase letters within a data type are not statistically different at 95% confidence. Data types with no lowercase letters indicate an insignificant treatment effect.

Treatment	Phosphorus Source	Rate	Total P @ Rosette	Biomass
		(lbs. P_2O_5/ac)	(%)	(g/m^2)
1	MAP 11-52-0	35.2	0.62	1643
2	MAP 11-52-0	40	0.62	1456
3	Synchro Crystal Green	35.2	0.52	1223
4	Synchro Crystal Green	40	0.49	1233
p-value			0.0837	0.4442



Results Summary

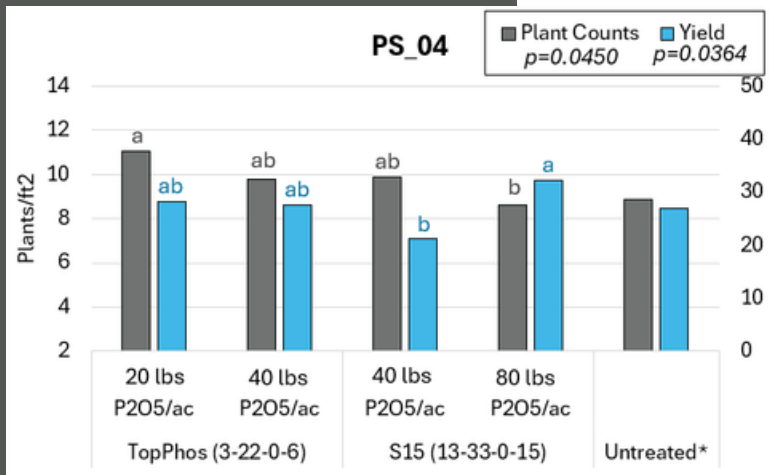
Plant Establishment: When Crystal Green Synchro was compared to 11-52-0 (MAP) there was a significant increase in emergence and plant stand with Synchro when high rates of product were applied.
P Tissue and Biomass: There was no significant effect of P source on P tissue concentration or crop biomass at rosette stage in this trial.

Grain Yield: There was no significant of P source treatments on grain yield in this trial.
P availability for canola uptake is highly dependent on environmental conditions, these results are all from a single location in a single year. Caution should be used when interpreting results and making management decisions from data with limited replication.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	36.8	65.3	63	32.3	33.9	27.8	259.1
Avg Daily Temp (C)	5.72	10.52	13.98	19.85	16.62	16.62	

Agronomic Support for this Trial Provided by: NEW ERA AG RESEARCH

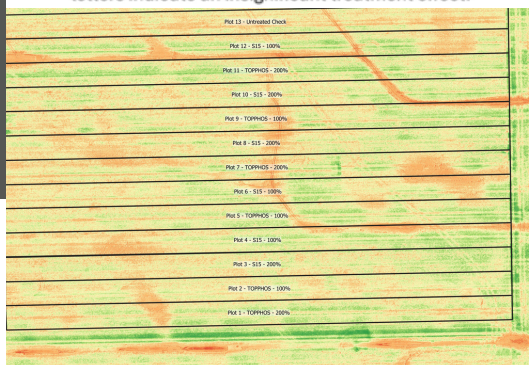
PS_04



untreated treatment was not replicated. Treatments with similar lowercase letters within a data type are not statistically different at 95% confidence. Data types with no lowercase letters indicate an insignificant treatment effect.

Site Info

Trial ID: PS_04
Rural Municipality: Morris
Seeding Date: May 22, 2024
Soil Residual P (0-6in): 8 ppm
Seeding Equipment: John Deere N560F
Opener Type: Disc
Row Spacing: 10 in
Seedbed Utilization: 7.5%
Seeding Rate: 2.8 lbs/ac (4.2 TKW)
Variety: DKLL 83 SC
Harvest Date: Sept 15, 2024



Treatment	Phosphorus Source	Rate	Total P @ Rosette	Grain Moisture
		(lbs. P_2O_5/ac)	(%)	(%)
1	TOPPHOS 3-22-0-6	20	0.39	10.43
2	TOPPHOS 3-22-0-6	40	0.48	11.4
3	S15 13-33-0-15	40	0.55	9.1
4	S15 13-33-0-15	80	0.52	8.1
p-value			0.1369	0.1078

Results Summary

Plant Establishment: There was no significant effect of P source treatments that had similar rates of P2O5 applied on plant establishment in this trial.
P Tissue: There was no significant effect of P source on P tissue concentration at rosette stage in this trial.
Grain Yield: There was no significant of P source treatments on grain yield in this trial. Within the S15 treatments in this trial there was a significant increase in grain yield by 11 bu/ac from the low to high rates.
P availability for canola uptake is highly dependent on environmental conditions, these results are all from a single location in a single year. Caution should be used when interpreting results and making management decisions from data with limited replication.

	Apr	May	June	July	Aug	Sept	Total
Rainfall (mm)	38.3	130.3	144.2	38.3	73.7	50.9	475.7
Avg Daily Temp (C)	6.17	11.82	16.46	20.7	17.5	17.5	

Agronomic Support for this Trial Provided by:

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TONE AG CONSULTING LTD.

Trial Summary

Seed-Placed Fertilizer Toxicity Trial

Research Question:

Are Seed-Placed fertilizer (SPF) applications being used across Manitoba safe for canola plant stand establishment and what are the major factors influencing seed safety?

Treatments:

1. No Seed-Placed Fertilizer
2. Standard Seed-Placed Fertilizer (100%)
3. High Seed-Placed Fertilizer (150%)

Trial Setup:

In this trial each location has one replicate of each treatment (replicated by locations). This is to allow for a wider range in testing environments (soil/rainfall), equipment (row spacing, openers, SBU), and agronomic practices (fertilizer sources and rates). This allows for the examination of the relationships between these testing factors and seed safety.

Data Collection:

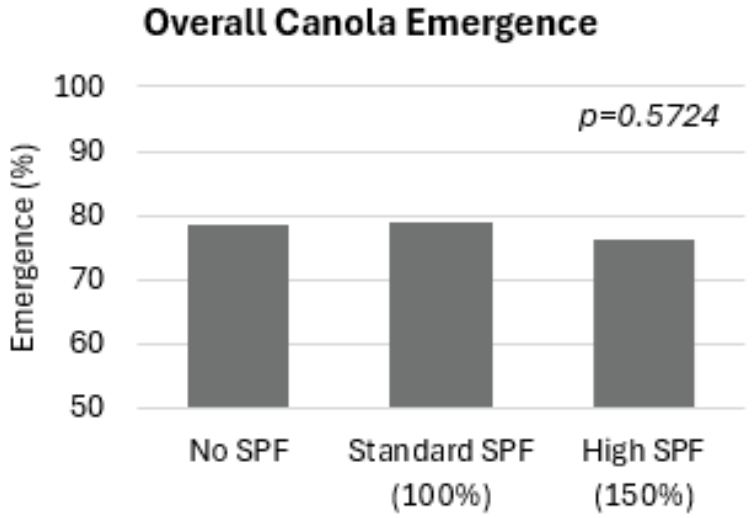
Plant Counts (4 leaf), Emergence %

Background: Current recommendations for seed-safe levels of P and S fertilizers are much lower than crop uptake requirements. This paired with an increase in single pass seeding systems and low disturbance openers had resulted in farms pushing to increase seed applied fertilizer levels. Fertilizer toxicity is highly dependent on a number of environmental and management factors and their interactions that can vary with the growing season.

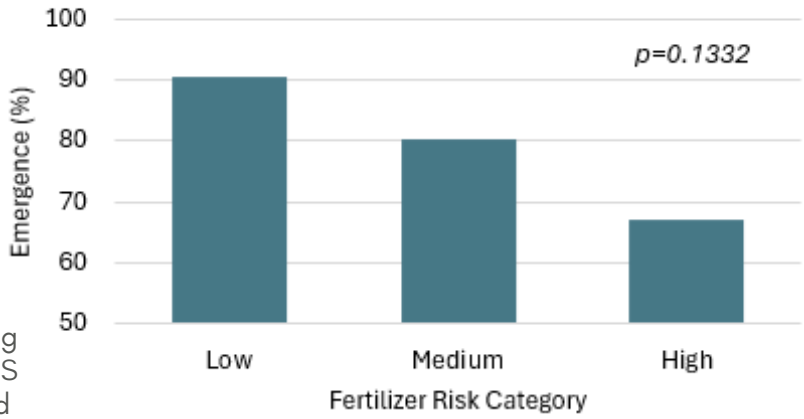
Seed-Placed Fertilizer Toxicity Trial

Preliminary Results (2023-2024)

After two years we have tested 39 locations across MB, which is not yet enough data points to conduct multivariate analysis to examine interactions between factors. Please note that the following is preliminary and does not account for multiple factors influencing toxicity and results should be interpreted with caution.
Emergence (%) = (Plants per acre at 4-leaf / seeds planted per acre) * 100
Many farms are pushing "safe" seed-placed fertilizer rates as they move towards low disturbance and one pass seeding systems and target higher yields.

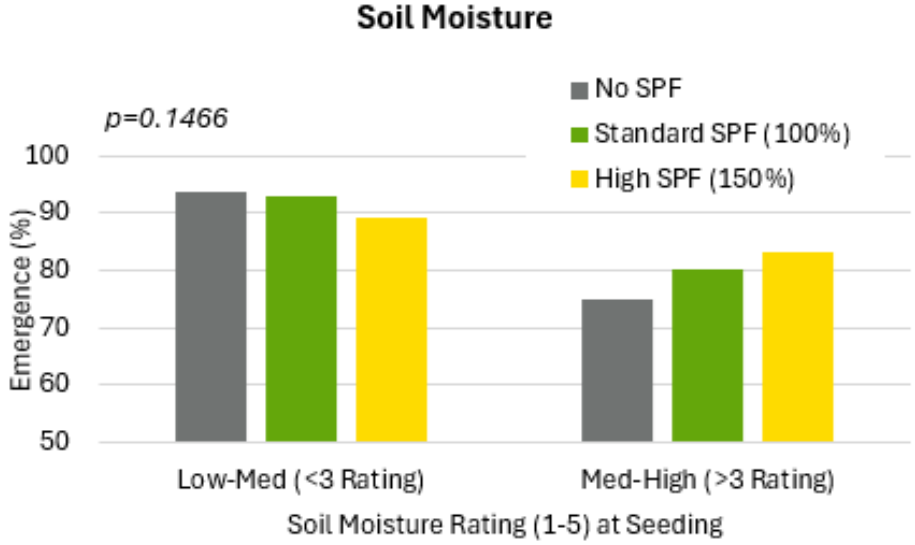


- Wet spring conditions in 2024 led to canola tolerating high rates of seed-placed fertilizer with little influence on emergence.
- There was a slight, non-significant decrease in emergence with high rates of SPF overall at all farms.



Each farm was categorized based on the farm's standard SPF Rates into the following fertilizer risk category: High Risk = N, P and S rates above recommended safe levels, Med Risk = N, P, or S rates above recommended safe levels and Low Risk = all SPF fall into recommended safe levels.

- Fertilizer risk category of a farm had a larger influence on emergence than the rate of SPF at the particular farm.



- There was a general trend for emergence to be reduced with high rate of SPF when soil moisture levels were rated low-medium. When soil moisture at seeding was rated med-high there was a trend for increased emergence as SPF rates increase.

2024 Seed-Placed Fertilizer Toxicity Testing Locations

							Emergence		
Trial ID	**Location**	**Seeding Equipment**	**SBU**	**SPF Analysis**	**SPF Sources**	**Standard SPF Rate**	**No SPF**	**Standard SPF**	**150% SPF**
			(%)	**(N-P-K-S)**		**(lbs. product/ac)**		**(%)**	
SPF_28	Lac Du Bonnet	Disc Drill – HORSCH	10	12-40-0-10	12-40-0-10	100	124.2	106.2	89.2
SPF_29	Beausejour	Air Planter – Bourgault 3820	10	4-20-0-0	MAP	39	91.2	77.2	107.0
SPF_36	Altona	JD 9330	10	10-45-25-10	MAP/AMS	170	57.8	54.1	52.7
SPF_37	Brunkild	Case IH Drill PD500	6.67	12-40-0-10-1ZN	MESZ	30	81.6	85.3	80.7
SPF_38	St. Pierre Jolys	Bourgault Disc Drill	5	50-45-0-7-1.1 Z	Urea/ESN/Rock 40	15	74.5	80.2	71.1
SPF_39	Emerson	JD N542	6.67	13-33-0-15	MES15	100	54.7	52.4	58.4
SPF_40	Emerson	JD N542	6.67	13-33-0-15	MES15	100	81.5	81.5	90.0
SPF_41	Minitonas	Seedhawk 80-10	5	29-50-0-20	MAP	180	56.6	64.1	72.6
SPF_42	Swan River	Seedhawk	6.25	11-52-0	MAP	96	72.0	87.8	86.6
SPF_43	Swan River	Bourgault 5710	30	25-33-0-15	MES15	137	65.9	92.9	98.8
SPF_44	Durban	Bourgault 3320 XTC	15.31	12-29-0-14	MES15	89	89.5	101.4	94.4
SPF_45	Swan River	Independent shank	4.17	11-50-20-30	MAP	205	69.0	79.5	100.0
SPF_48	Grandview	Bourgault 3320 XTC	7.65	11-52-0	MAP	58	66.6	76.8	75.4
SPF_49	Roblin	Seedmaster Ultra Pro II 360	7.5	11-52-0	MAP	67	125.3	130.9	105.5
SPF_50	Inglis	Bourgault 3310	7.5	11-52-0	MAP	67	64.1	76.1	69.8
SPF_51	Roblin	Seedhawk 6010	7.5	11-52-0	MAP	67	98.4	88.0	96.9
SPF_52	Russell	Bourgault 3335 PLX	7.5	11-52-0	MAP	67	70.9	77.9	84.9
SPF_53	Togo	Bourgault 3310	30	11-52-0	MAP	80	78.2	79.6	88.2
SPF_54	Grandview	Bourgault 5710	20.41	11-52-0	MAP	58	117.9	111.6	92.8

Project Overview

Cover Cropping for Flea Beetle Management

This trial is conducted in collaboration with University of Manitoba (Lawley Lab) and is complimenting a small plot experiment looking at fall rye and oat nurse cover crops on their ability to aid in flea beetle management of canola.

Research Question:

Does using a spring planted cereal nurse cover crop with canola reduces early season flea beetle damage compared to a farm's standard practice for growing canola?

Treatments:

1. Cereal nurse cover crop seeded in the seed row with canola at planting and terminated using a herbicide when canola reaches the 2 leaf stage.
2. Control treatment following the farmer's standard practice for growing canola.

Trial Setup:

Four replicates of alternating treatments in full length field strips.

Data Collection:

Weekly flea beetle presence and damage until 3 leaf stage, weekly natural enemy sampling, canola plant counts, nurse crop plant stand counts, grain yield
Data is Being Processed, Stay Tuned for Results!

To learn more about this project and first year results from the small plot trials visit the project page on Canola Research Hub!

Agronomic Support for this Trial Provided by:

ANTARA AGRONOMY

Notes

Notes

Contact Us :

Phone Number
204-982-2122

Email Address
info@canolagrowers.com

Social Media
@CanolaGrowers

Office Address
400-167 Lombard Ave
Winnipeg, MB R3B 0T6

Website
www.canolagrowers.com