

Canola Nitrogen Rate Trials

2022 – 2023 Summary

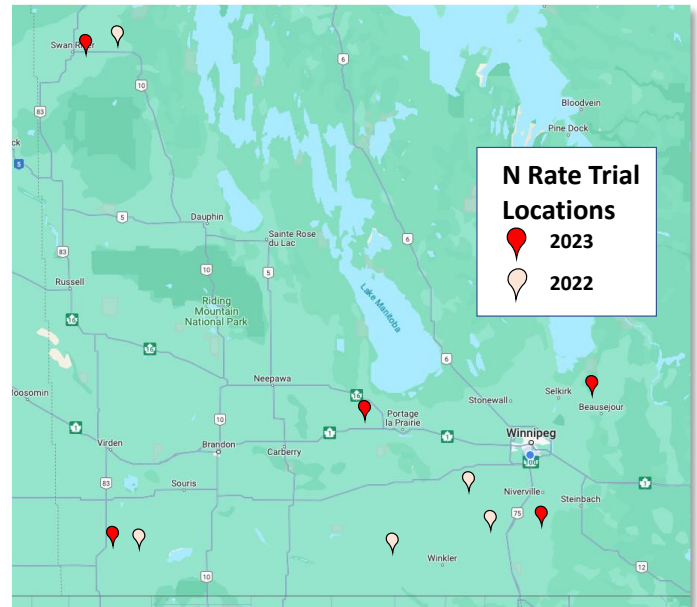
Research Question: Are N rates being used on canola across Manitoba sufficient for optimizing yield and nitrogen efficiency?

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



Trial ID (year)	RM	Standard N Rate (100%)		Reduced N Rate (75%)	High N Rate (125%)	CV
		N Applied (soil residual N)	Yield	Change in Yield from Standard Rate		
		lbs. N/ac	bu/ac	bu/ac	bu/ac	%
NR_01 (2022)	Swan Valley West	113 (76)	47.1	-0.4	+1.6	1.8
NR_02 (2022)	Macdonald	122 (55)	52.0	+2.3	+3.9*	4.1
NR_03 (2022)	Lorne	138 (60)	35.4	+0.9	+0.1	5.5
NR_04 (2022)	Morris	120 (53)	58.6	-4.2*	+0.4	4.5
NR_05 (2022)	Two Borders	118 (79)	42.0	-3.3	+0.9	11.9
NR_06 (2023)	Minitonas-Bowsman	113 (18)	55.5	-5.3*	-0.5	5.2
NR_08 (2023)	North Norfolk	135 (25)	58.0	-2.5	+4.2	9.2
NR_09 (2023)	Brokenhead	137 (30)	61.7	-0.9	+3.0	4.2
NR_10 (2023)	Two Borders	130 (50)	51.4	+2.3	+3.3	7.6
NR_11 (2023)	De Salaberry	158 (127)	22.8	-1.3	-0.1	5.5
COMBINED		129 (57)	48.4	-1.3	+1.6*	24

*Significantly (p-value < 0.05) different from standard N rate

- Average farm standard N rate was 128 lbs. N/ac (fert) and **186 lbs. N/ac** (fert + soil residual), ranging from 113 – 158 lbs. N/ac (fert) and **131 – 285 lbs. N/ac** (fert + soil residual).

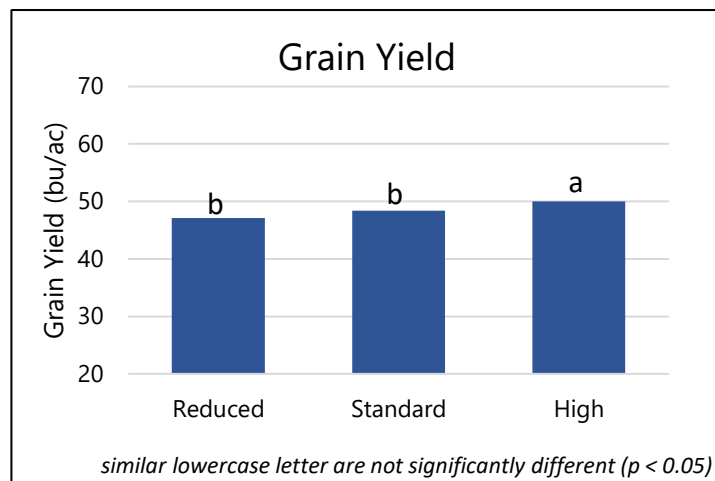


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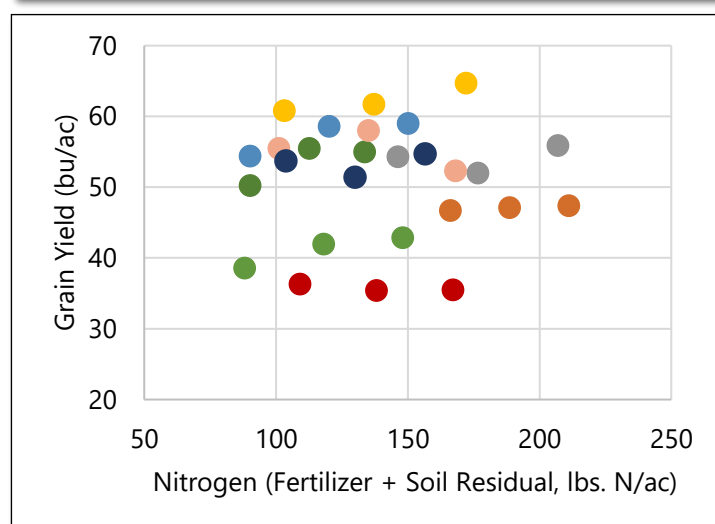
Grain Yield

- Average grain yield across all trial locations when the farm normal rate of N fertilizer was applied was **48 bu/ac**, ranging from **23 – 62 bu/ac**.
- Overall, there was a significant 1.6 bu/ac increase in yield when an additional 25% N fertilizer was applied to the farm standard N rate.
- 2 of 10 locations had a significant yield reduction of -4.2 and -5.3 bu/ac when N was reduced by 25%.
- 1 of 10 locations had a significant yield increase of 3.9 bu/ac when N fertilizer was increased by 25%,



Nitrogen Fertilizer Efficiency

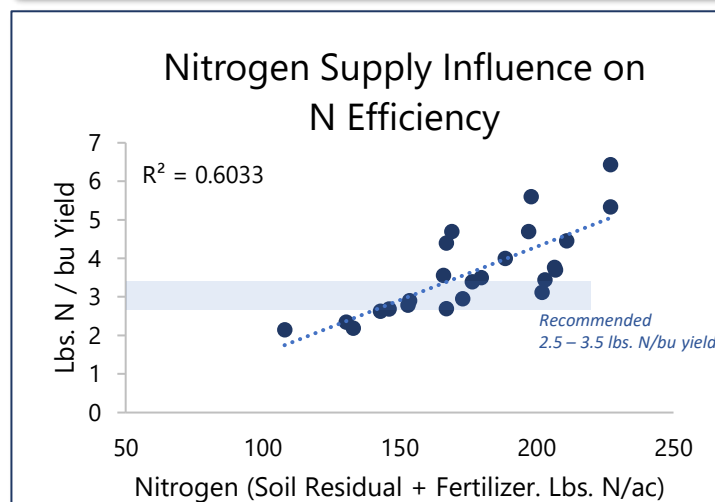
- The current N fertilization recommendation for canola in Manitoba is to provide canola with 2.5 to 3.5 lbs. N (soil + fertilizer) per bushel of yield targeted (Canola Council of Canada and Manitoba Agriculture). Example: for a target yield of 50 bu/ac recommended N would be from 125 to 175 lbs. N/ac (soil + fertilizer).
- N provided to the crop per bushel at farm standard N rate ranged from 2.4 to 5.6 in this trial.
- As the amount of fertilizer supplied to the crop increases the efficiency of N was reduced → more N used per bushel of yield.



Economic considerations will vary farm-to-farm depending on buying price of N fertilizer, canola price and standard N rates.

In Summary

- All results presented are preliminary as this trial will continue in 2024 and 2025 field seasons.
- Farms that saw a decrease in yield with reduced N rates achieved high grain yield (>55bu/ac) with modest N fertilization (2.4 and 2.9 lbs. N/bu yield)
- The significant combined increase in grain yield of 1.6 bu/ac for could be sufficient to cover the added cost of 32 lbs. N/ac (\$0.76 lbs. N and \$16 canola)
- Grain protein and oil content pending



For full individual trial reports with all data collected please visit Canolagrowers.com

