

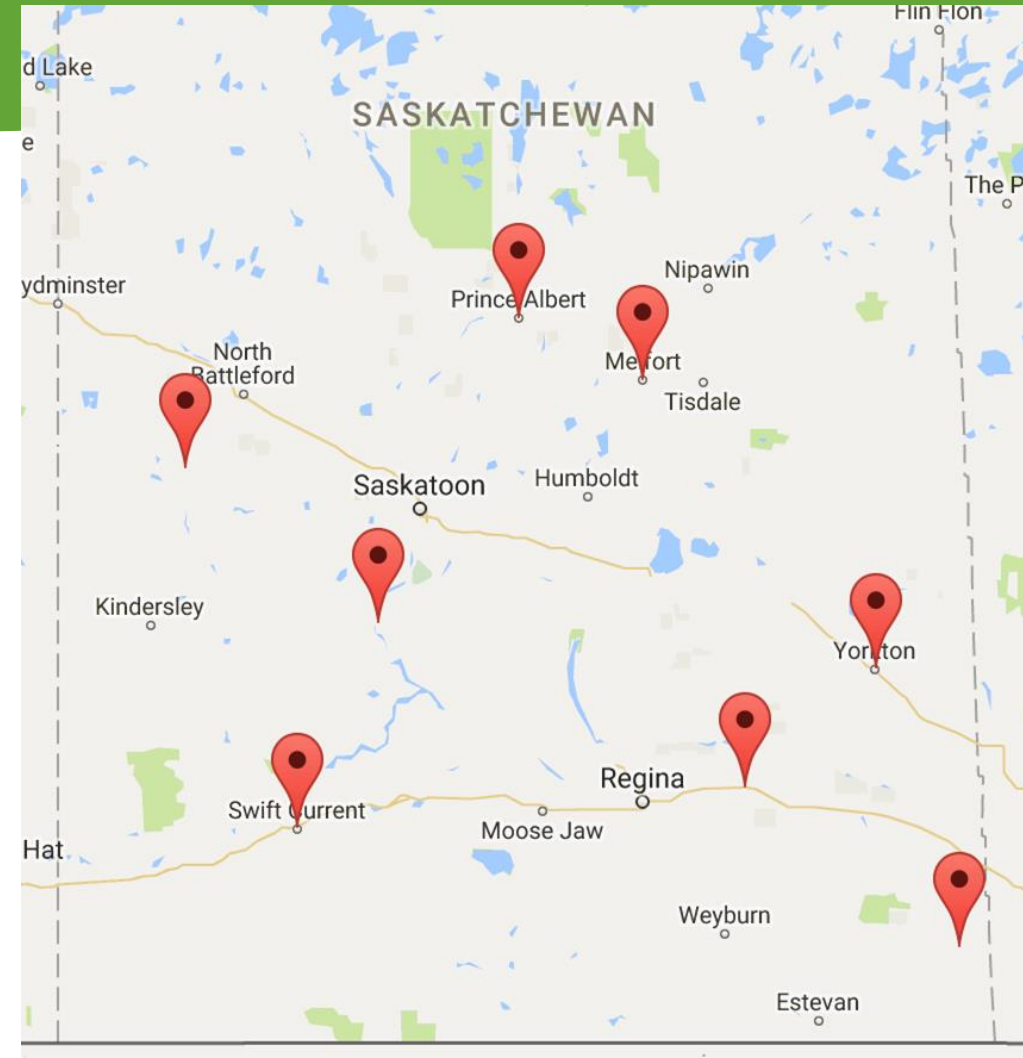


Agronomic Considerations for Growing Oats

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Northeast Agriculture Research Foundation

- Non-for Profit
- Part of the Agri-ARM organization
- small plot research and demonstration
- Anywhere from 40-50 trials in a year
- Work with Sask Ag, Commodity groups, Educational institutions, and Private Industry



What's better Side banding or Midrow banding?

- 4R Management: Right rate and placement for fertilizer in oats
 - Right Source
 - Right Placement
 - Right Time
 - Right Rate
- Funded by the Government of SK Agriculture Demonstration of Practices and Technologies (ADOPT Program) in Collaboration with SaskOats and Fertilizer Canada



What's better Side banding or Midrow banding?

Treatment #	Nitrogen Placement	Nitrogen Rate (kg/ha)	Phosphorus Placement
1	N/A	0	No P
2			Seed Row
3			Side-Band
4	Mid-Row	75	Seed Row
5		100	
6		125	
7	Side-Band	75	Seed Row
8		100	
9		125	
10		75	Side-Band
11		100	
12		125	

What's better Side banding or Midrow banding?



Years: 2022 & 2023



Sites: Melfort & Scott



Design: Unbalanced Split-plot



Data Collection:

Plant Density,
Maturity, Grain Yield,
Test Weight and Seed
Weight



What's better Side banding or Midrow banding?

Site info

Soil Characteristics:

- **Scott:** Dark brown soil zone, Sandy Loam
- relatively low residual N (24lbs in 2022; 10lbs in 2023) in 0-12"
- 6ppm of phos in 2022, 19ppm in 2023
- Moderate OM of 4.4% in 2022 and 4% in 2023
- Relatively neutral pH (more acidic in top 0-6")with low salts.
- **Melfort:** Thick black soil zone; Clay Loam
- moderate to very high residual N (100lbs in 2022; 38lbs in 2023)
- 10ppm of phos in 2022, 9ppm in 2023
- High OM 8.5% in 2022 and 8.8% in 2023
- Relatively neutral pH (more acidic in top 0-6")with low salts.

What's better Side banding or Midrow banding?

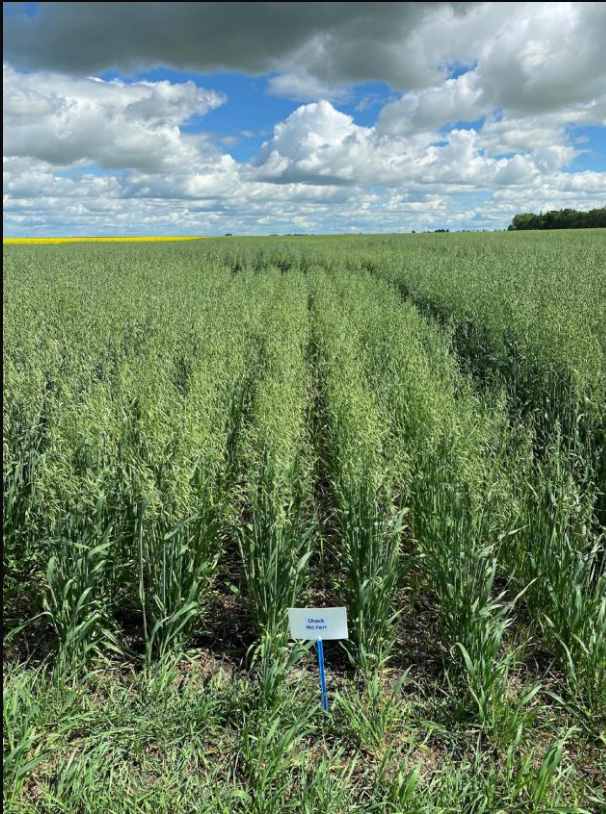
- Site info
 - Weather Conditions

	May	June	July	August	Average/Total
--Temperature(°C)--					
Scott 2022	10.0	15.0	18.3	18.9	15.6 (+0.8°C)
Scott 2023	14.9	17.2	17.1	17.4	16.7 (+1.9°C)
Long-term^x	10.8	14.8	17.3	16.3	14.8
Melfort 2022	9.9	15.2	18.2	18.7	15.5 (+0.5°C)
Melfort 2023	14.1	19.2	22.5	19.1	18.7 (+3.7°C)
Long-term^x	10.1	15.2	17.8	16.7	15.0
--Precipitation(mm)--					
Scott 2022	11.0	57.1	86.5	32.1	186.7 (82%)
Scott 2023	16.6	81.1	29.7	31.7	159.1 (70%)
Long-term^x	38.9	69.7	69.4	48.7	226.7
Melfort 2022	90.8	78.1	34.9	36.5	240.3 (105%)
Melfort 2023	31.5	26.4	16.4	50.0	124.3 (54%)
Long-term^x	33.4	79.5	69.6	45.9	228.4
^x Long-Term Climate Normal from local Environment Canada Weather Station at Melfort (1997-2021); Long-term climate normal for Scott is from 1985-2014					

What's better Side banding or Midrow banding?



125kg/ha N in 2022@ Melfort



Control 2022 Melfort



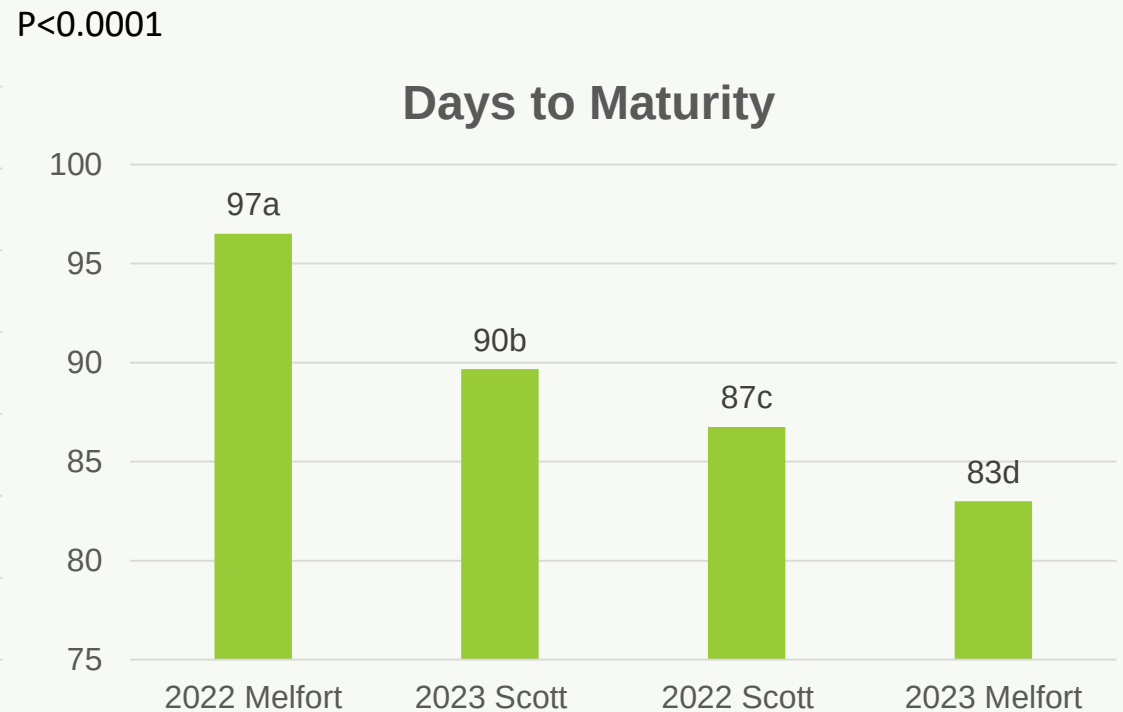
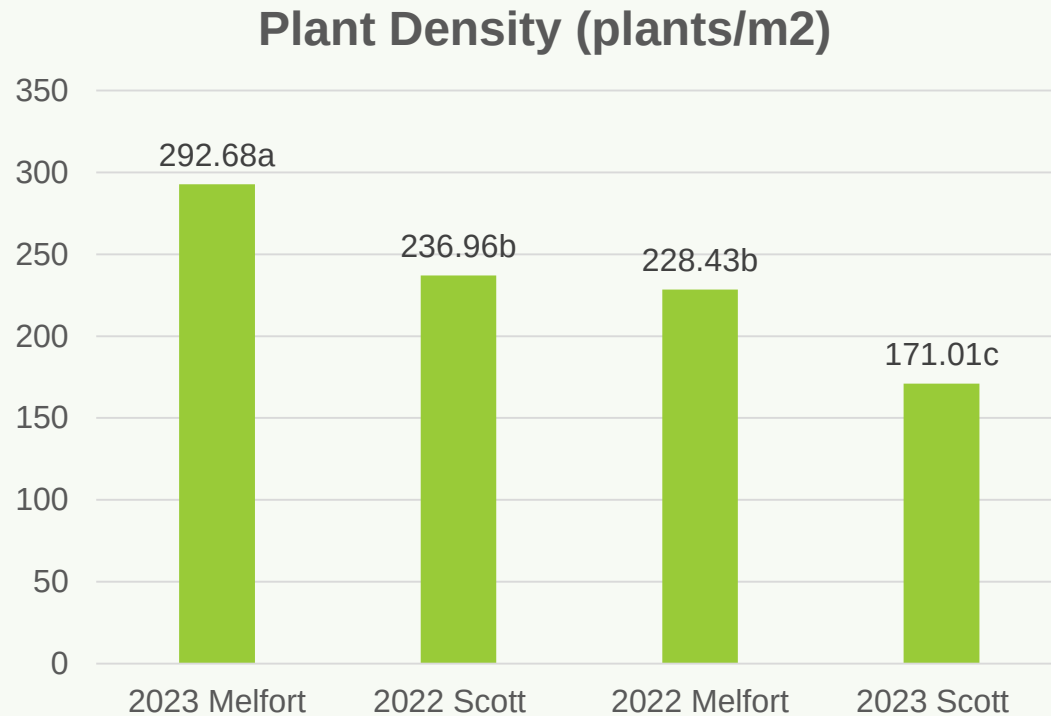
Control 2023 Melfort



125kg/ha N in 2023@ Melfort

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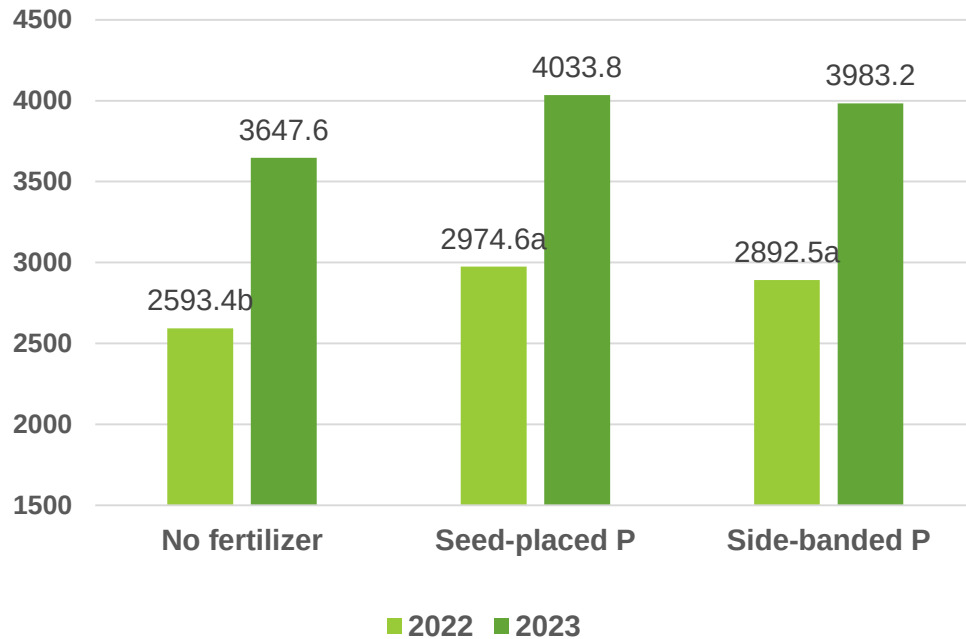
Phosphorus effect by site (trt 1-3)



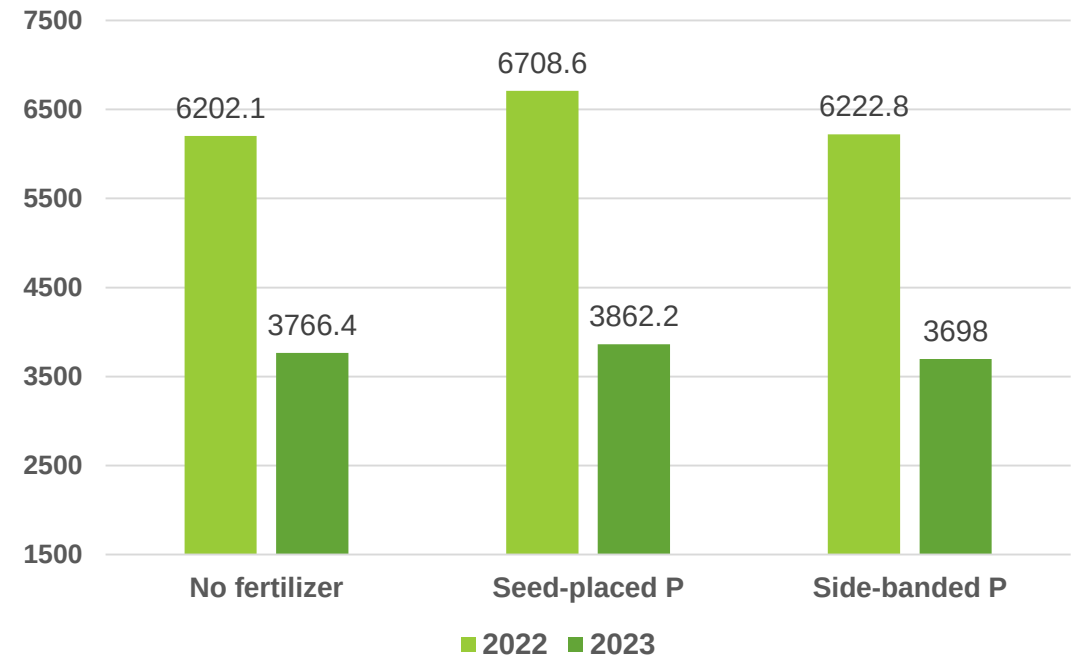
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Phosphorus Effect by site (TRT 1-3)

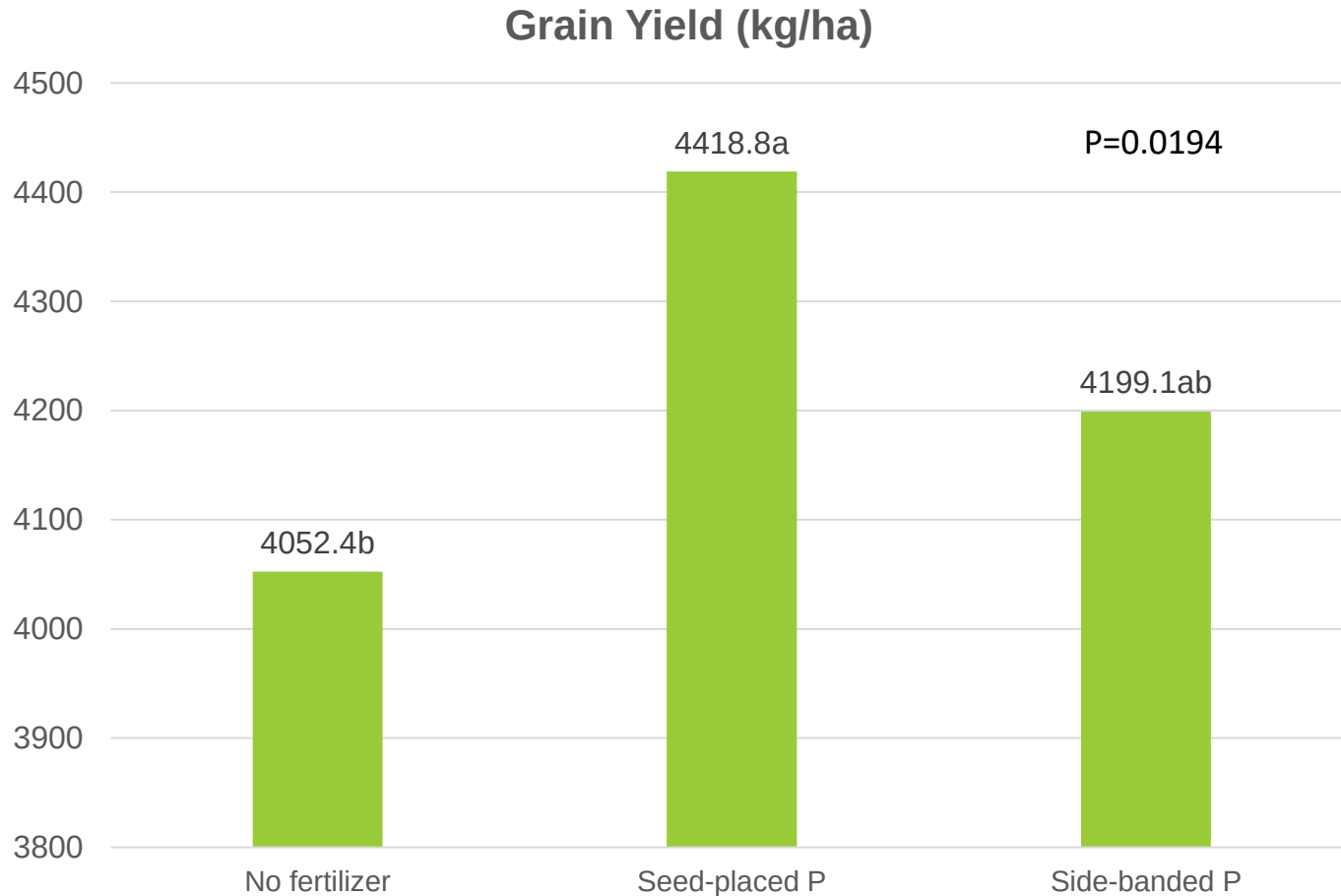
Scott Grain Yield (kg/ha)



Melfort Grain Yield (kg/ha)



What's better Side banding or Midrow banding?



- Phosphorus Effect combined across all sites and years

What's better Side banding or Midrow banding?

- Nitrogen Placement effect by site and year alone (TRT 4-9)
 - Side band vs Midrow band

Scott 2022	Plant density (plants/m2)
P-value	0.0036
Side band	201.2b
Midrow Band	230.4a

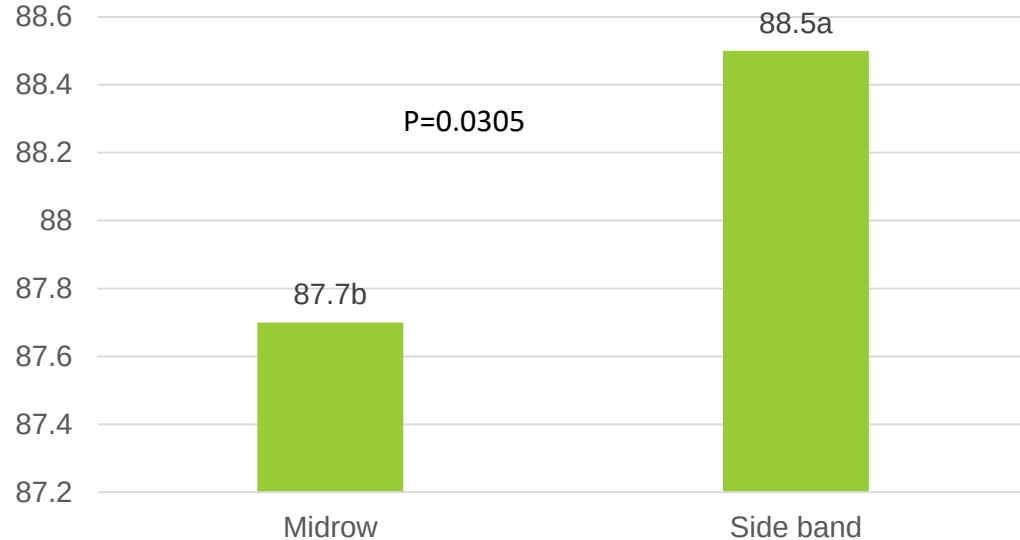


Scott 2022	Plant density (plants/m2)
P-value	0.0401
Midrow 75kg/ha	225.2ab
Midrow 100kg/ha	240.9a
Midrow 125 kg/ha	225.2ab
Side 75 kg/ha	229.3ab
Side 100 kg/ha	193.7bc
Side 125 kg/ha	180.6c

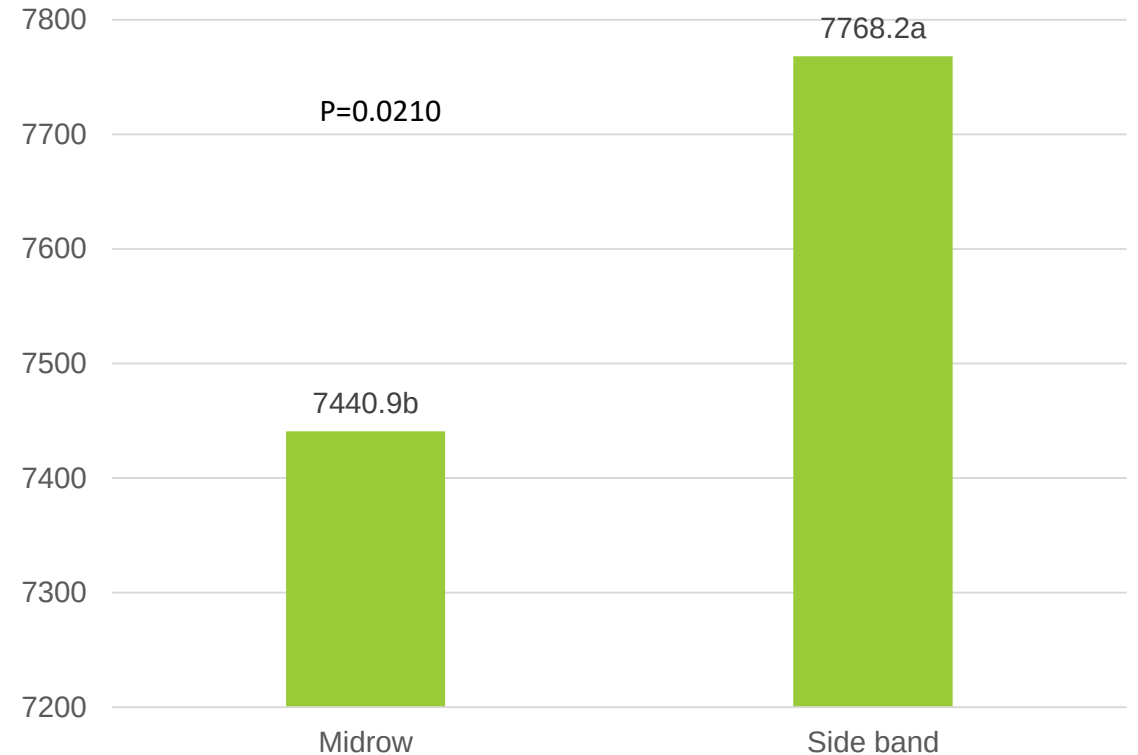
What's better Side banding or Midrow banding?

- Nitrogen Placement effect by site and year (TRT 4-9)
 - Side band vs Midrow band

Scott 2022 DTM

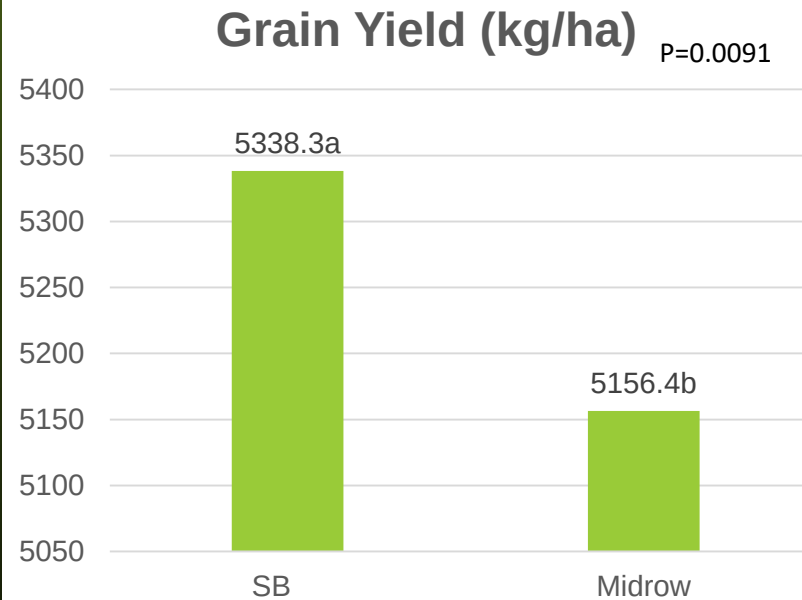


Melfort 2022 Grain Yield (kg/ha)

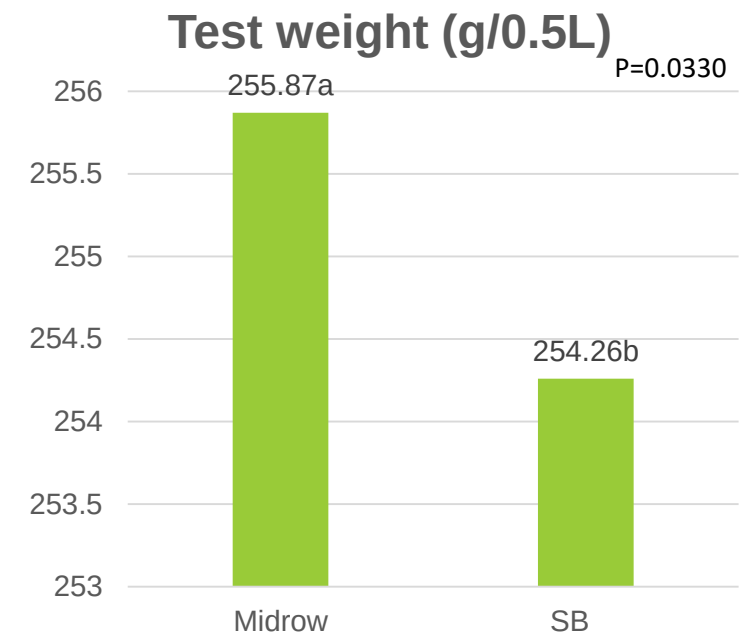


What's better Side banding or Midrow banding?

Nitrogen Placement combined effect (TRT 4-9):

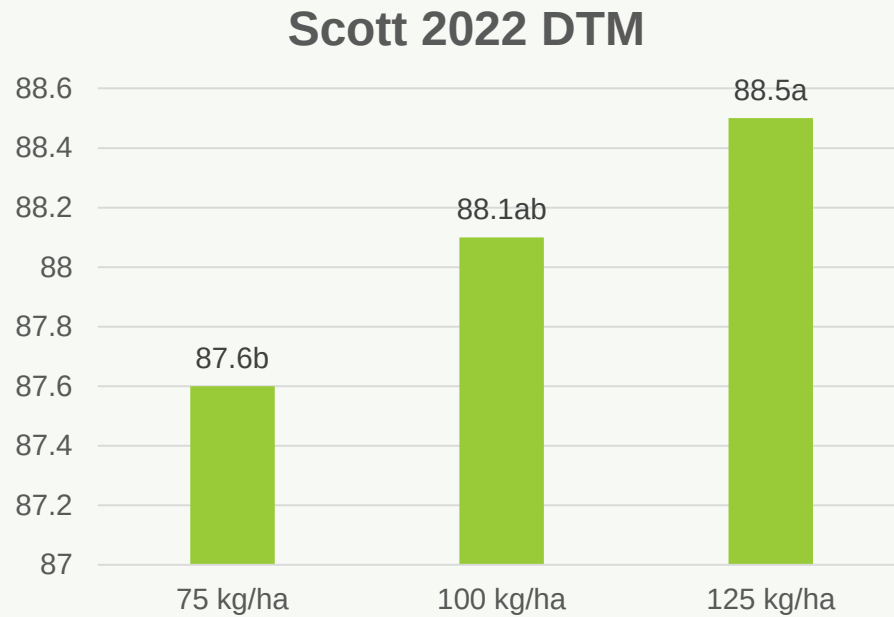


	Plant Density (plants/m2)
Side band	198.4
Midrow band	222.1



What's better Side banding or Midrow banding?

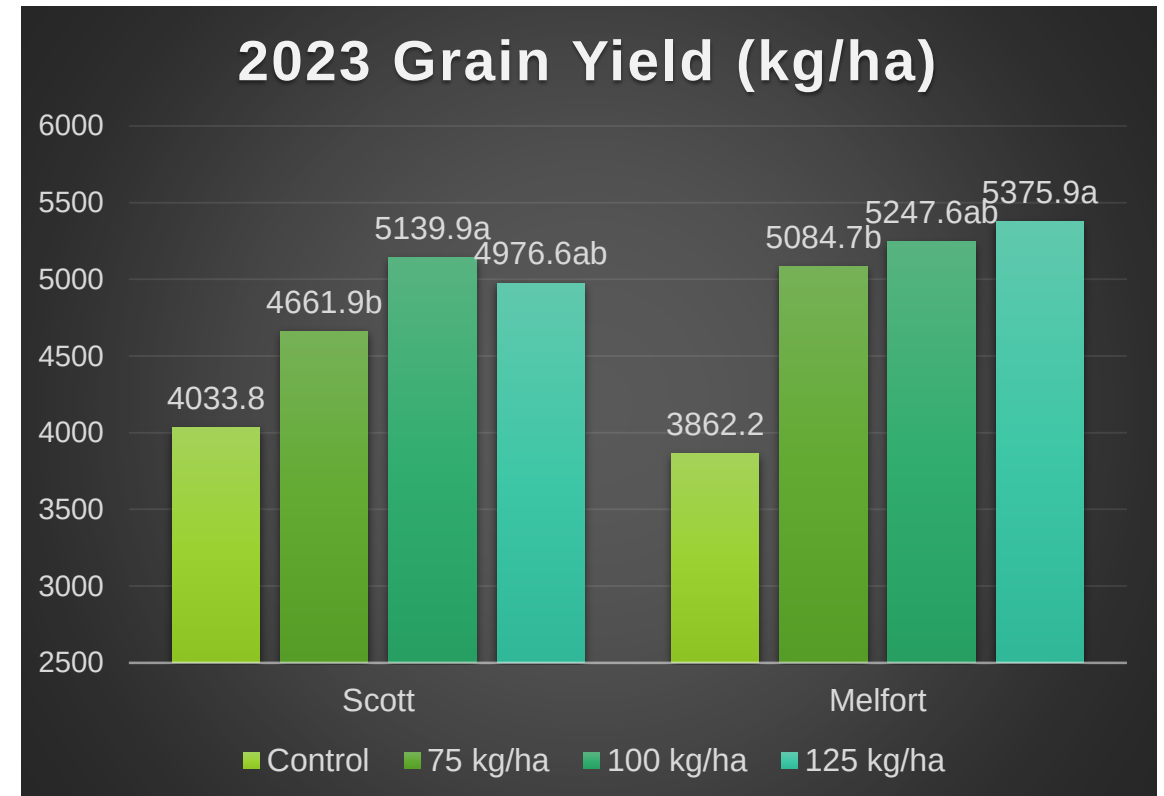
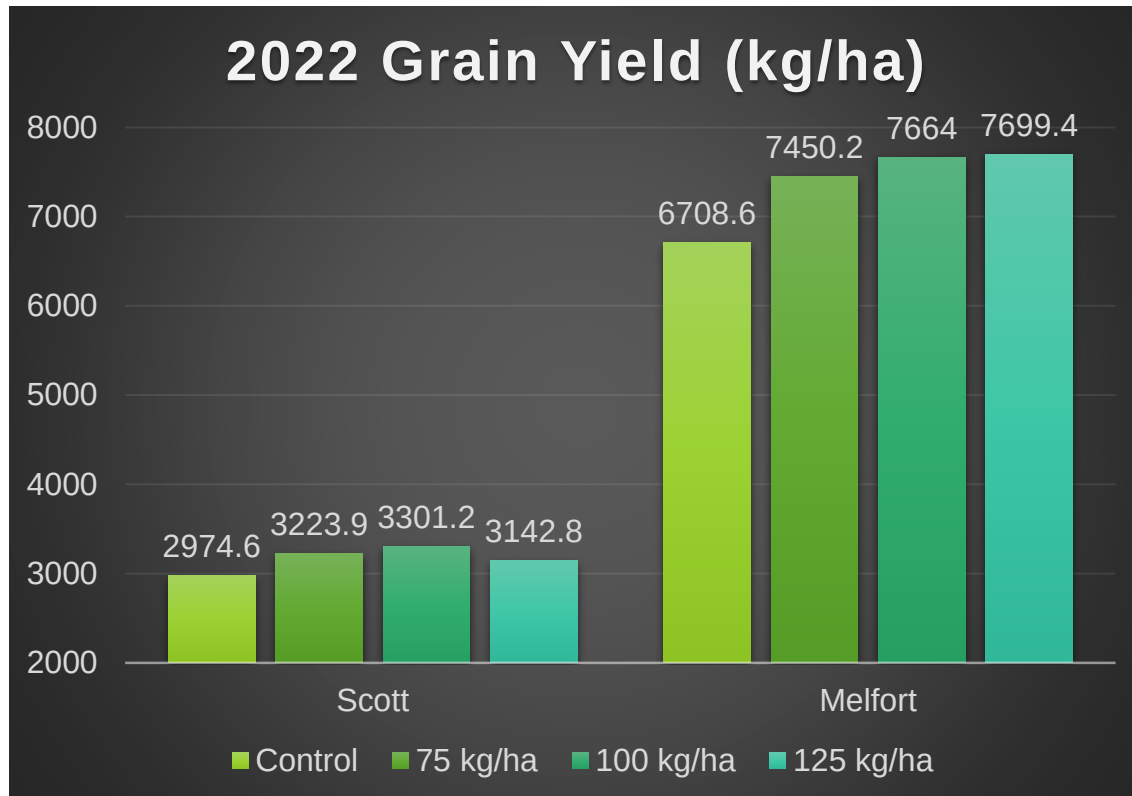
Nitrogen rate effect by site and year (TRT 4-9)



What's better Side banding or Midrow banding?

- Nitrogen rate effect by site and year (TRT 4-9)

Scott P=0.0478
Melfort P=0.0071



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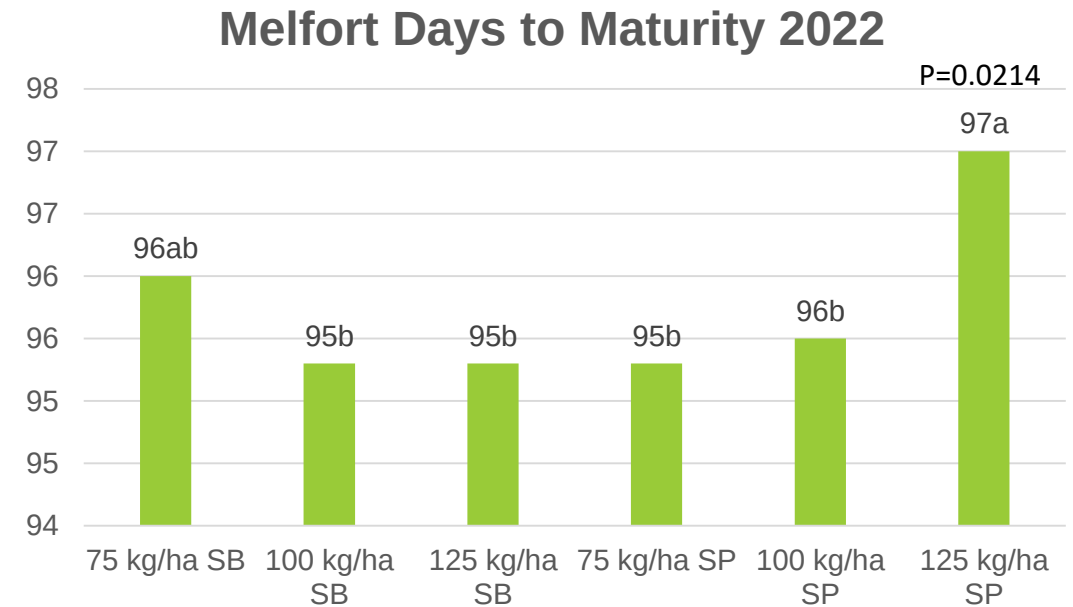
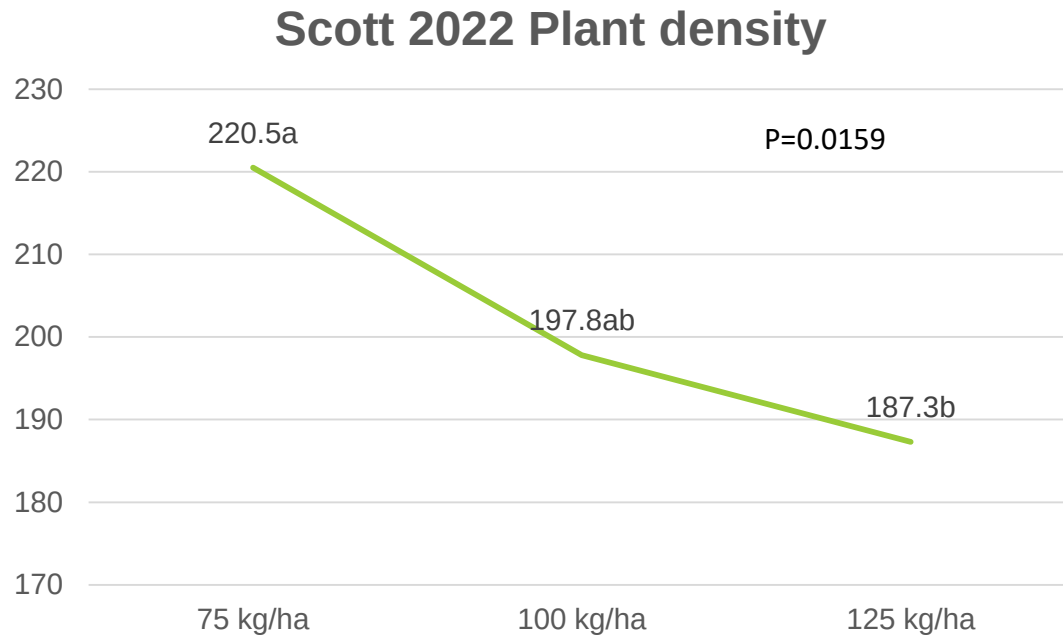
- Nitrogen rate effect by site and year (TRT 4-9)



	Test weight 2022		Test weight 2023	
	Scott	Melfort	Scott	Melfort
Control	235.0	262.5	240.7	252.0
75 kg/ha	227.1	260.3	236.5	239.1
100 kg/ha	224.8	262.3	235.8	237.9
125 kg/ha	224.1	262.5	235.0	238.7

What's better Side banding or Midrow banding?

- Nitrogen rate by phos placement effect (TRT 7-12): 2022



Scott Test Weight 2023

P-value	0.0316
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75 kg/ha	237.81a
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100 kg/ha	234.55ab
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125 kg/ha	233.25b
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- Nitrogen rate by phos placement effect (TRT 7-12): 2023

What's better Side banding or Midrow banding?



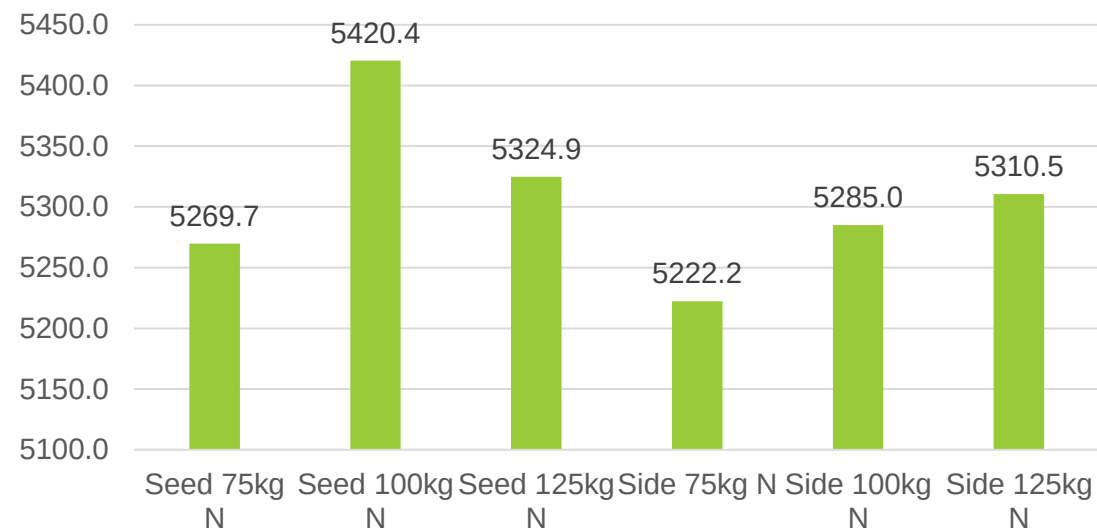
What's better Side banding or Midrow banding?

Nitrogen rate by phos placement effect (TRT 7-12): Combined

Plant Density combined (plants/m²)



Grain yield combined (kg/ha)



General Conclusions

Nitrogen Placement

Nitrogen Rate

Phosphorus Placement

Side band for best
yield

Midrow for better
stand and Test
weight

100-125kg/ha to
maximize yield

Added N = lower
test weight

Seed placed = best yield

Residual N and yield
potential effect response
to high rates

Rates used low and
unlikely to affect stand

Thank you!

- Funders
- Staff at NARF & WARC
- Other Oat Research at NARF and through the Agri-ARM network
 - www.neag.ca
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