

**Soils and Crops**  
**2019**



***Phosphorus and Seed Rate Trial  
in Canola***



# Introduction

## Two issues

- Producers want to increase phosphorus application rates
- Producers want to decrease canola seed rates to decrease costs

**\$70-80/acre**

Crop	Actual P <sub>2</sub> O <sub>5</sub> (lb/ac.)
Cereals	50
Canola	25
Canaryseed, Pinto bean	30
Flax, pea, forages (alfalfa, bromegrass)	15
Faba bean	40
Lentil, mustard, chickpea	20

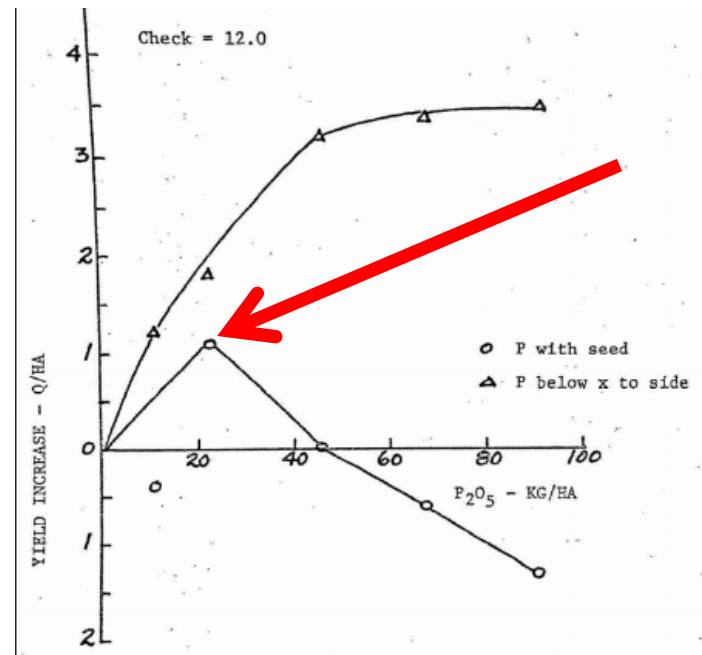


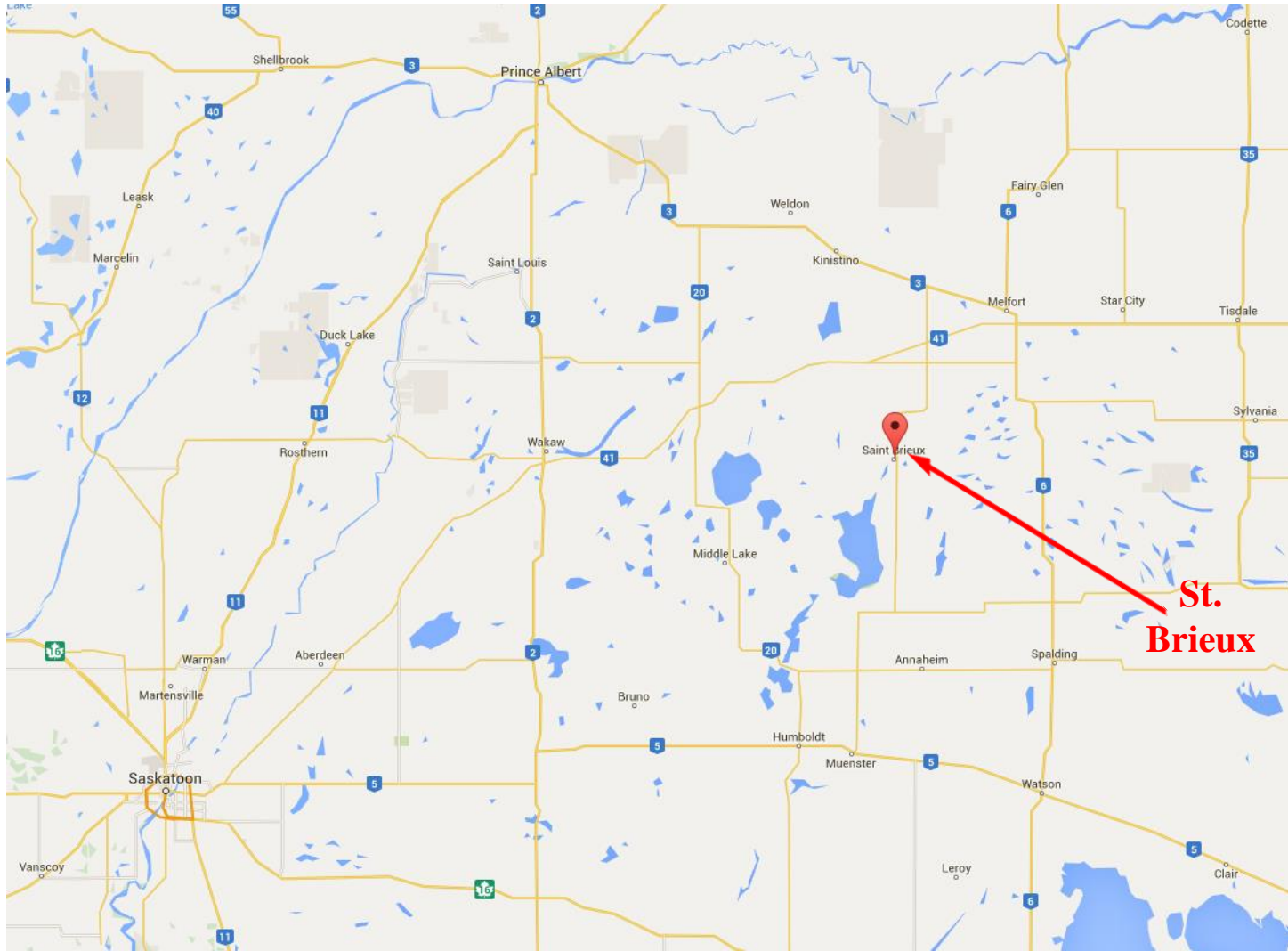
Figure 4. Effect of phosphate fertilizer placement method on yields of Torch rapeseed on fallow. Mean of twenty-one trials on four soil types during 1972-76 (5 yr.)

# Trial Design – Land

- 500' x 25'
- Randomized Complete Block – 3 replications



# Trial Design – Land



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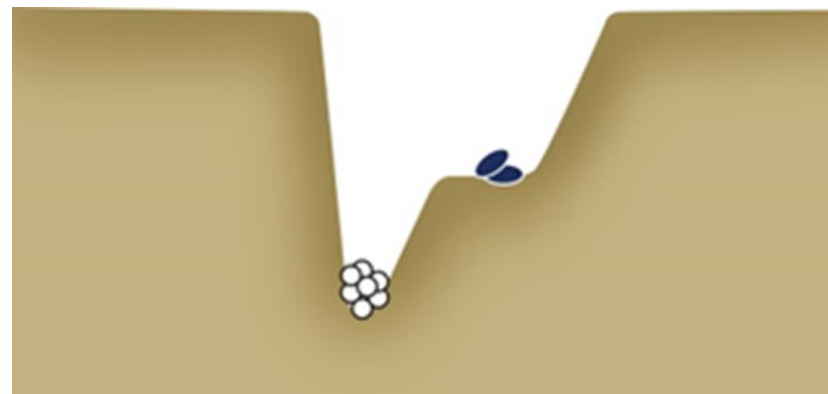
## Soil Type

- Waitville-Whitewood
- Dark Gray wooded soil formed on loamy glacial till; loam surface texture
- Nearly level topography but contains moderate amount of stones

## Nutrient levels (tested spring 2018)

N	27 lbs (0-24")
P <sub>2</sub> O <sub>5</sub>	16 lbs (0-6")
K	160 lbs
S	10 lbs (0-24")
O.M.	3.0%
pH	6.9

# Trial Design – Equipment



# Trial Design – Equipment

## Harvest

- Use of modern equipment
- Every trial weighed and sampled
- Yields equalized to 10% moisture and 0% dockage

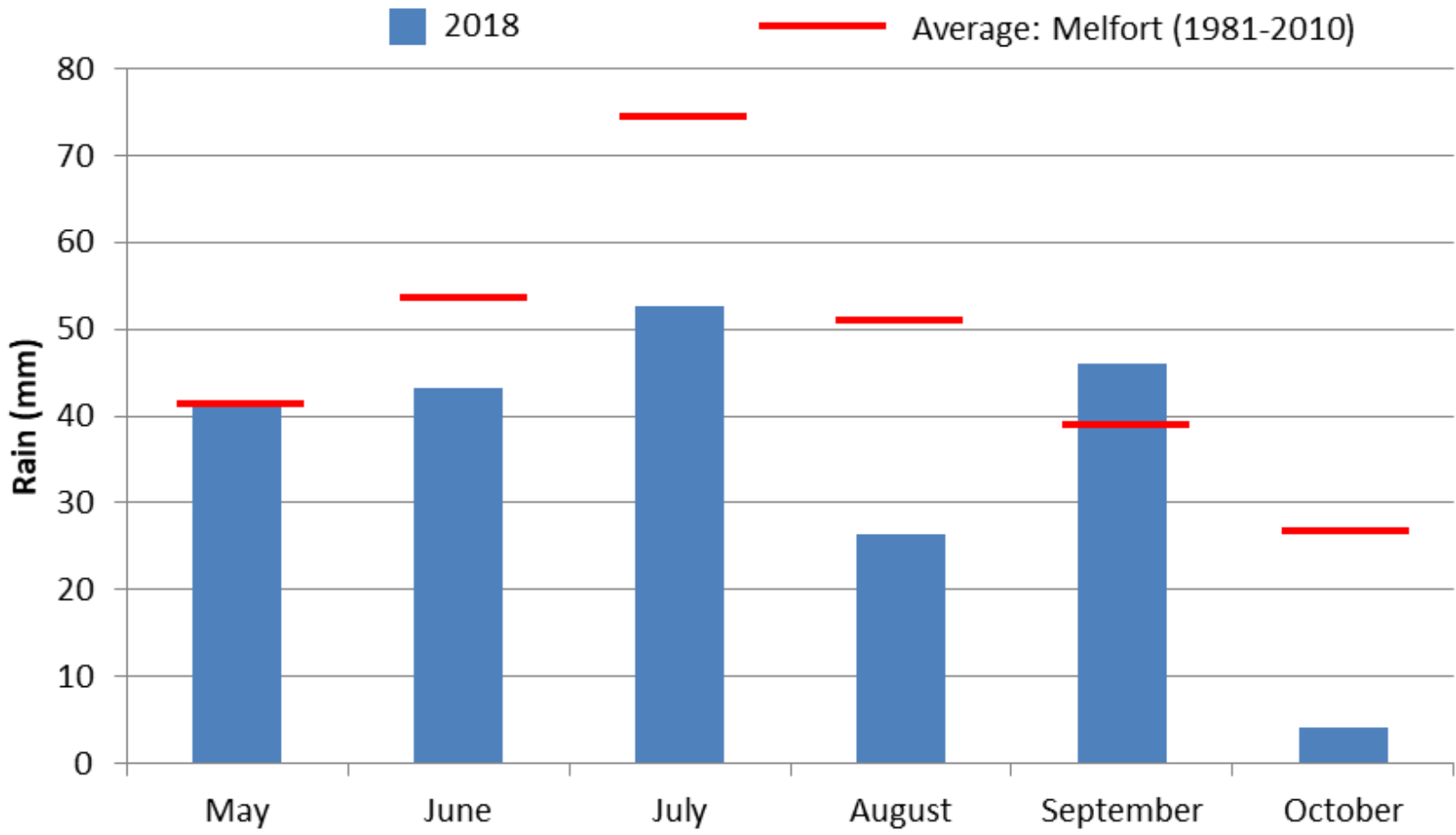
## Plant Count

- Independent consultant
- 6 locations/trial averaged



# 2018 Precipitation

Location: St. Brieux



Total Rain: 213mm





# Trial Design – Treatments

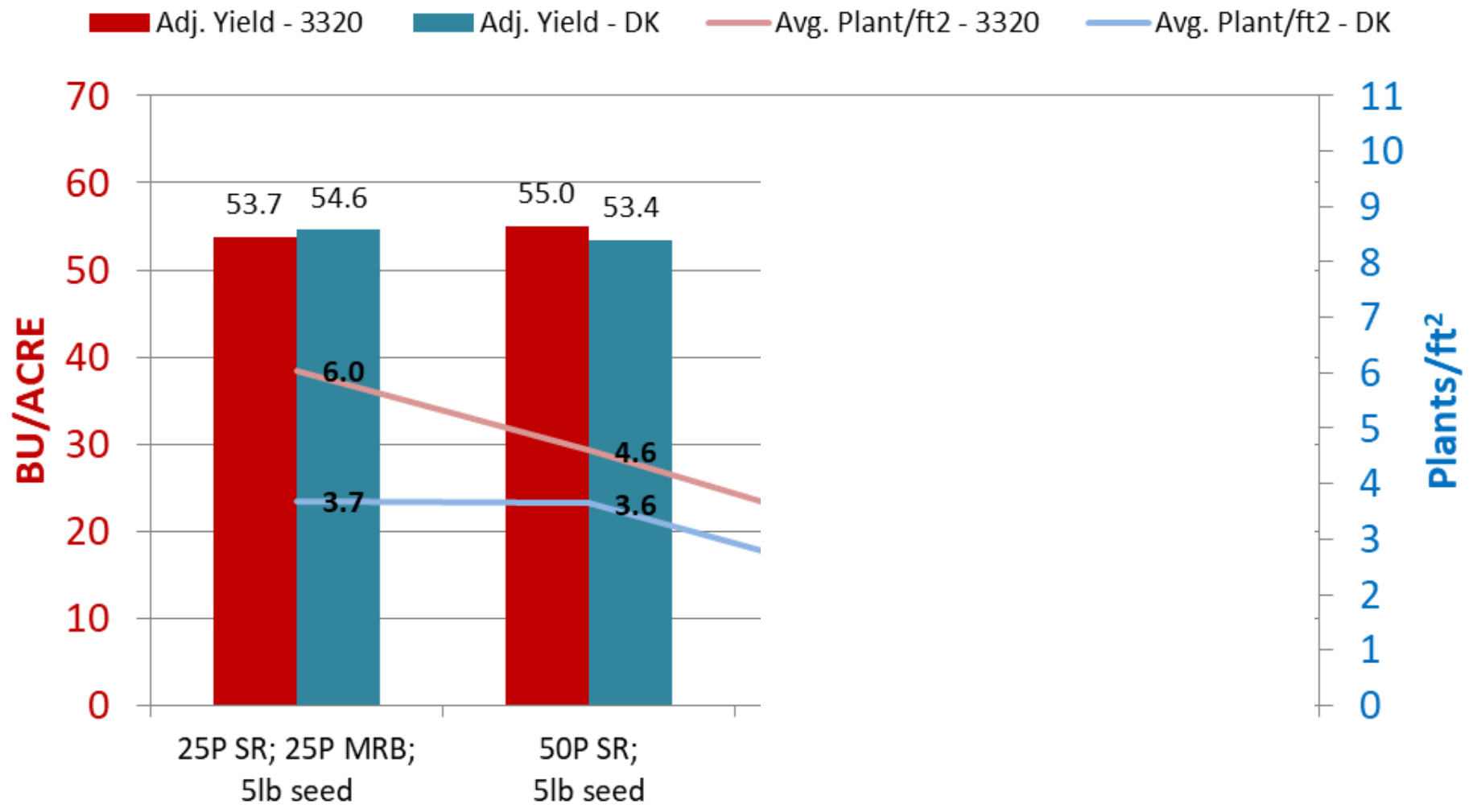
**Total Fertility**  
130-50-0-25

<b>Treatments</b>	<b>Seed Rate</b>	<b>Drill</b>
25P SR; 25P Band; 50P SR;	5lb seed	3320; DK
25P SR; 25P Band; 50P SR;	5lb seed	3320; DK
25P SR; 25P Band; 50P SR;	2.5lb seed	3320; DK
25P SR; 25P Band; 50P SR;	2.5lb seed	3320; DK



Confidence 90%  
Yield LSD 2.6  
Plants LSD 0.9

# 2018 - Canola - P/Seeding Rate - Yield



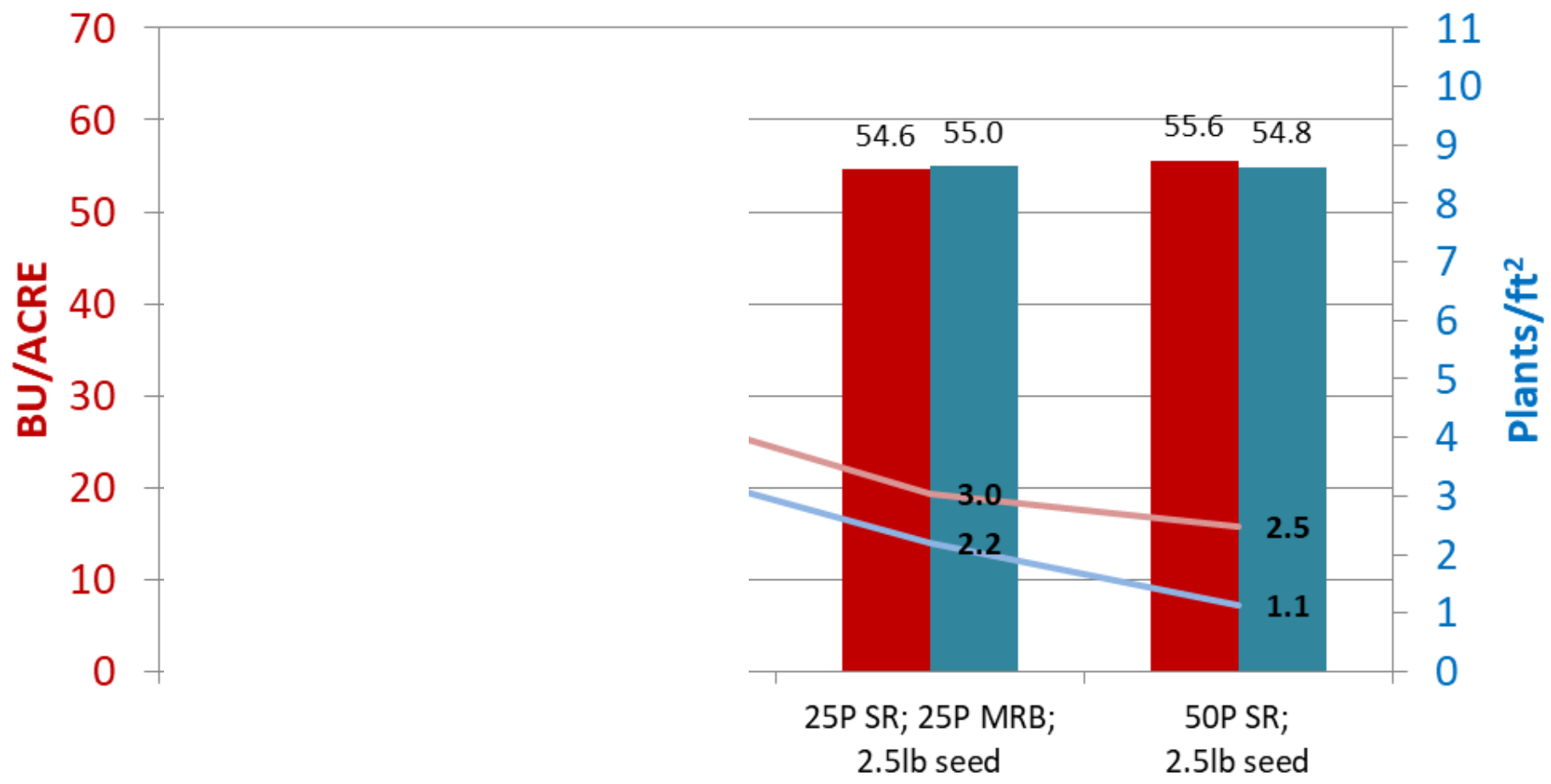
P: lbs P<sub>2</sub>O<sub>5</sub>



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# 2018 - Canola - P/Seeding Rate - Yield

■ Adj. Yield - 3320   ■ Adj. Yield - DK   — Avg. Plant/ft2 - 3320   — Avg. Plant/ft2 - DK



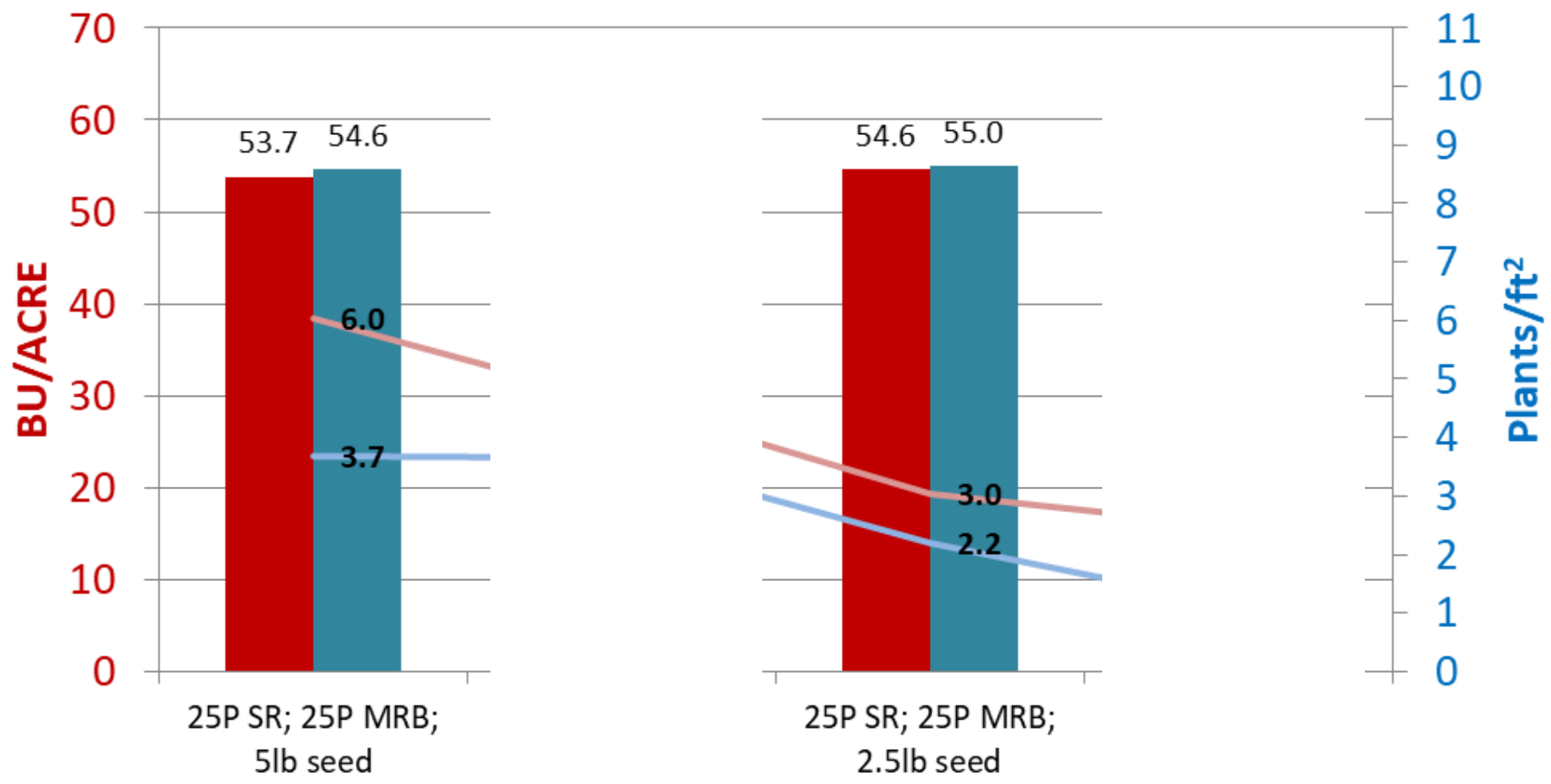
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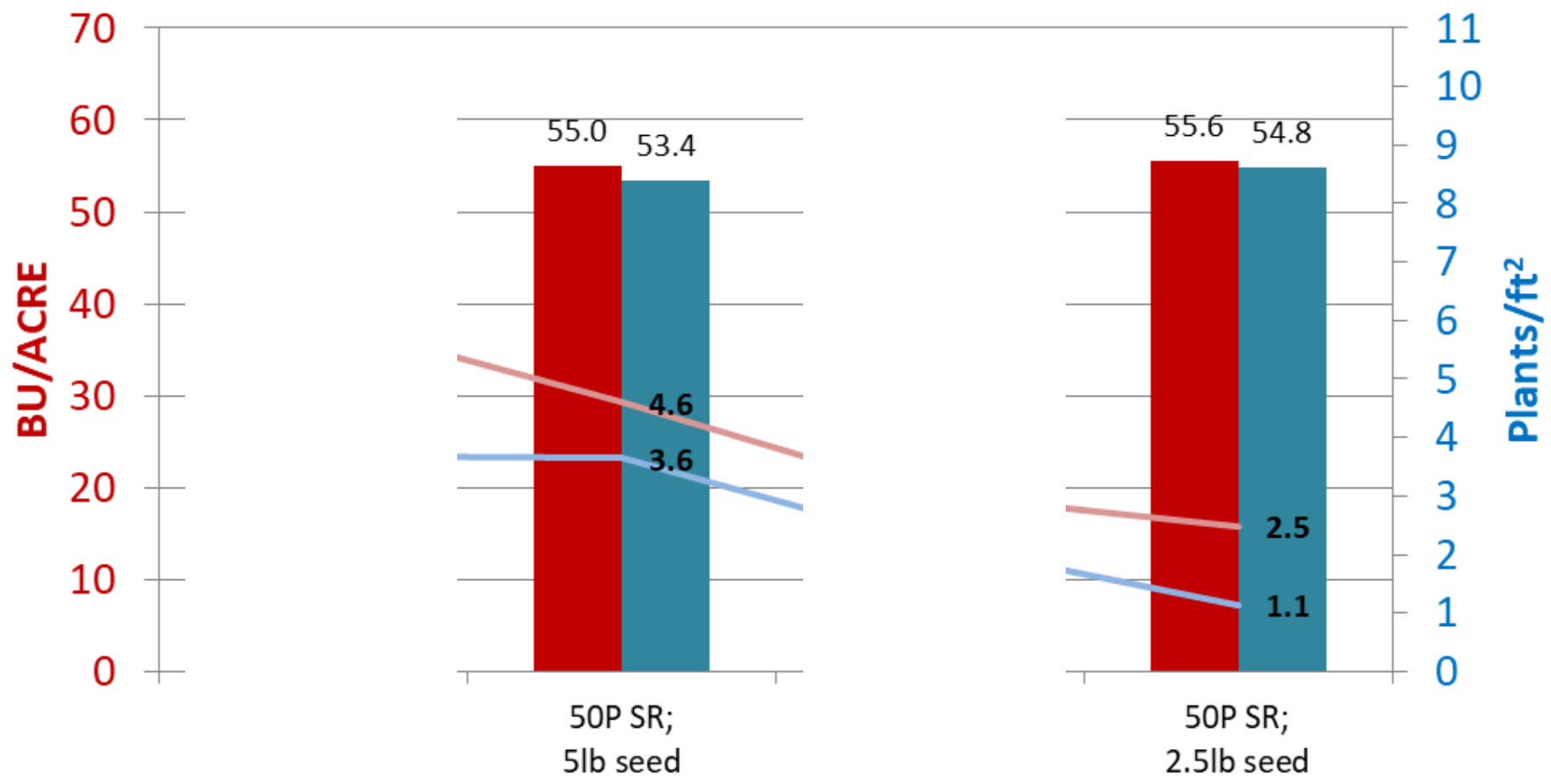
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# 2018 - Canola - P/Seeding Rate - Yield

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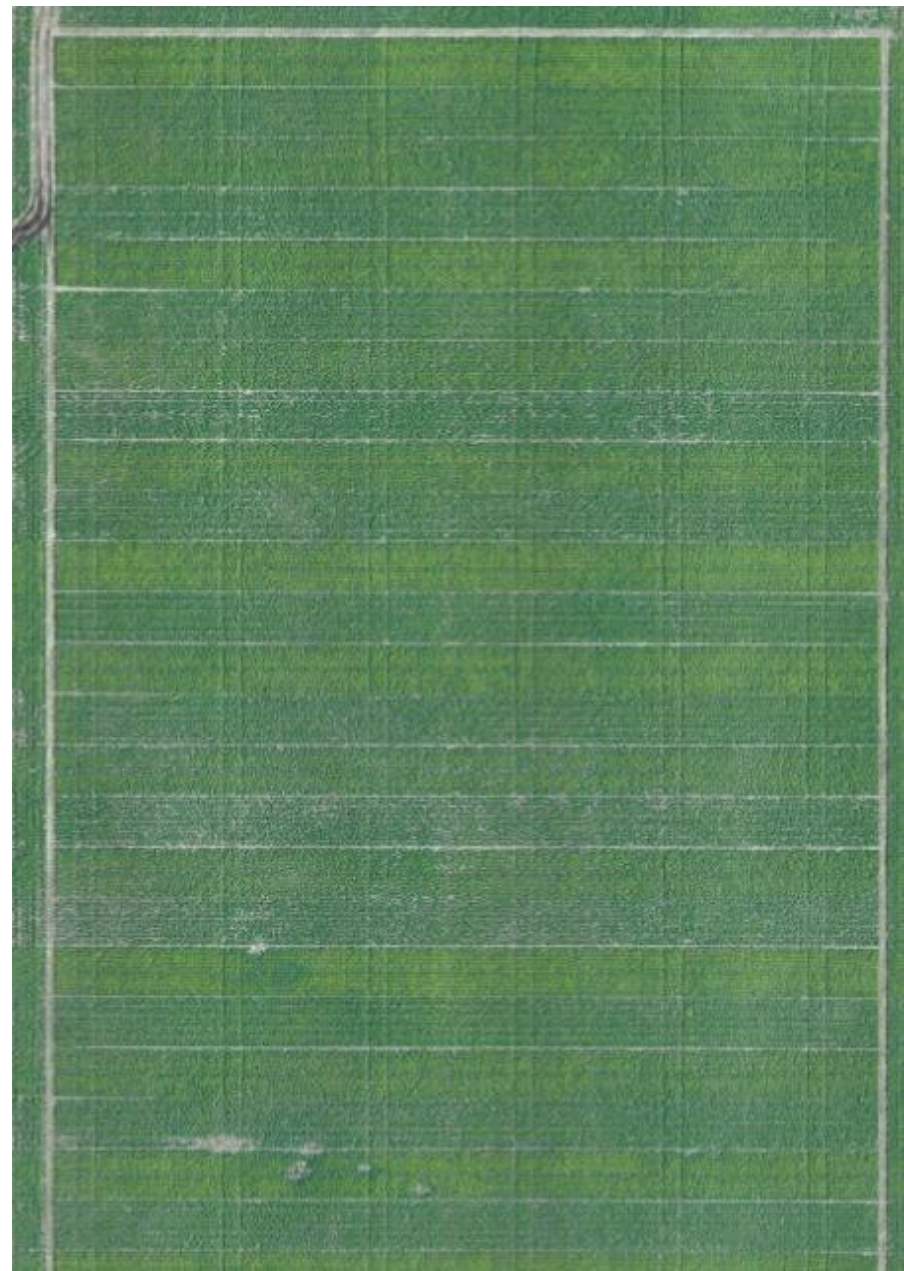
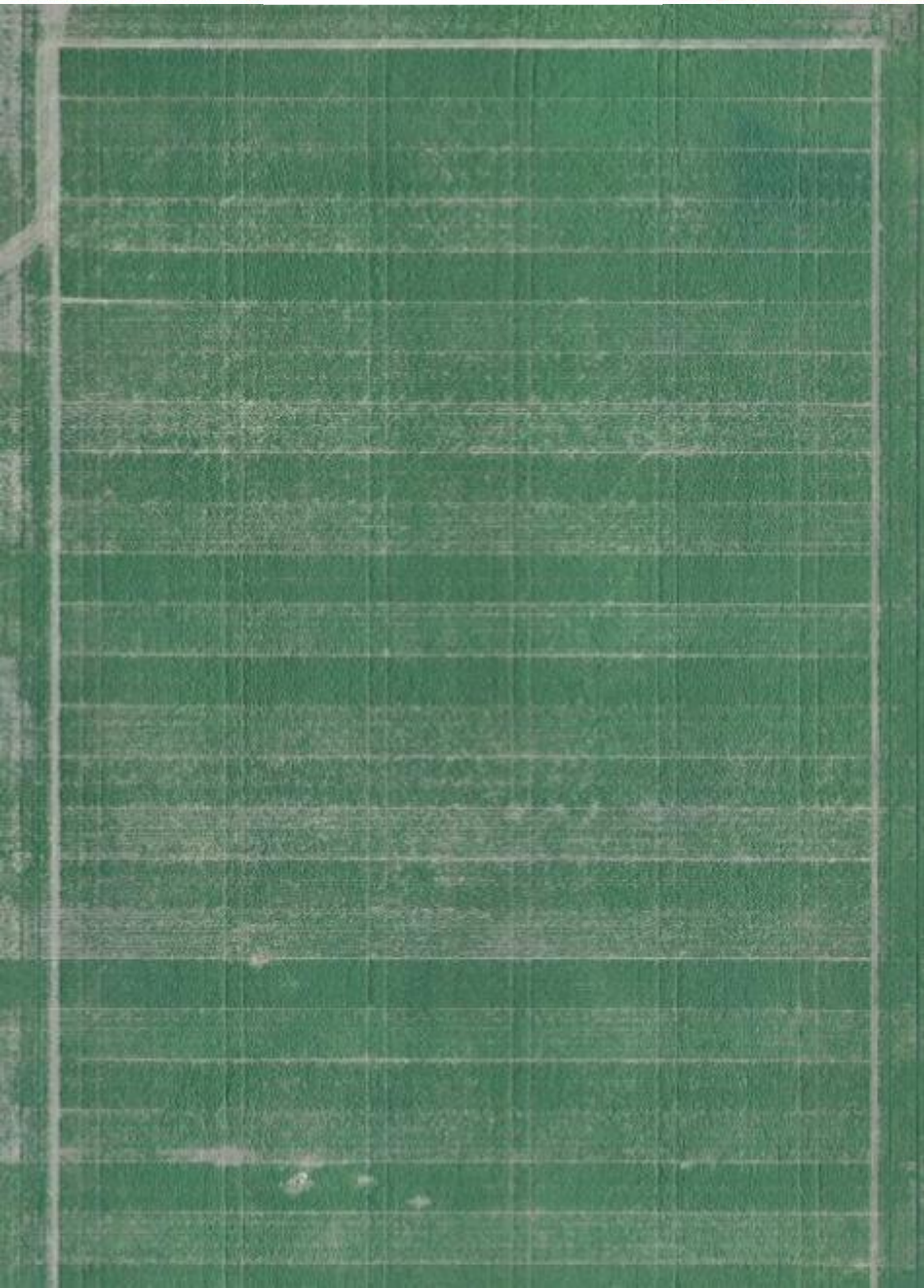


P: lbs P<sub>2</sub>O<sub>5</sub>

June 28

July 5

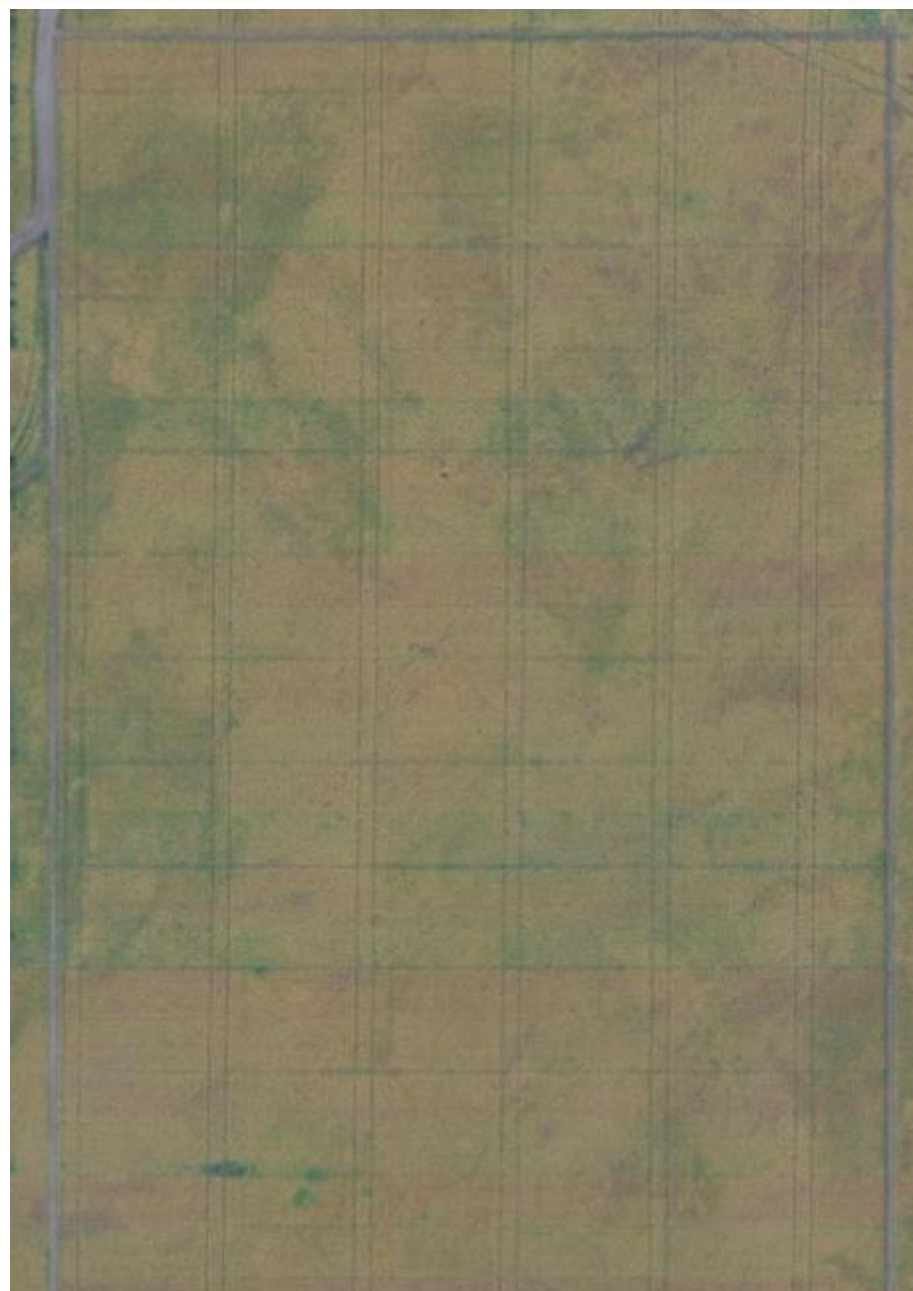
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June 28

Aug. 26

BOURGAULT



# Supporting Research

## Western Applied Research Corporation (WARC) - 2015

- Applied 0, 18, 35, and 70lbs P<sub>2</sub>O<sub>5</sub>/acre
- Placed in the seed row





## Plant Count

Phosphorus Rate (PR)	<.0001
0 kg P <sub>2</sub> O <sub>5</sub>	58 <sup>A</sup>
20 kg P <sub>2</sub> O <sub>5</sub>	53 <sup>A</sup>
40 kg P <sub>2</sub> O <sub>5</sub>	45 <sup>B</sup>
80 kg P <sub>2</sub> O <sub>5</sub>	37 <sup>C</sup>
	----- <i>p value</i> -----
SR* PR	0.0986

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# Yield

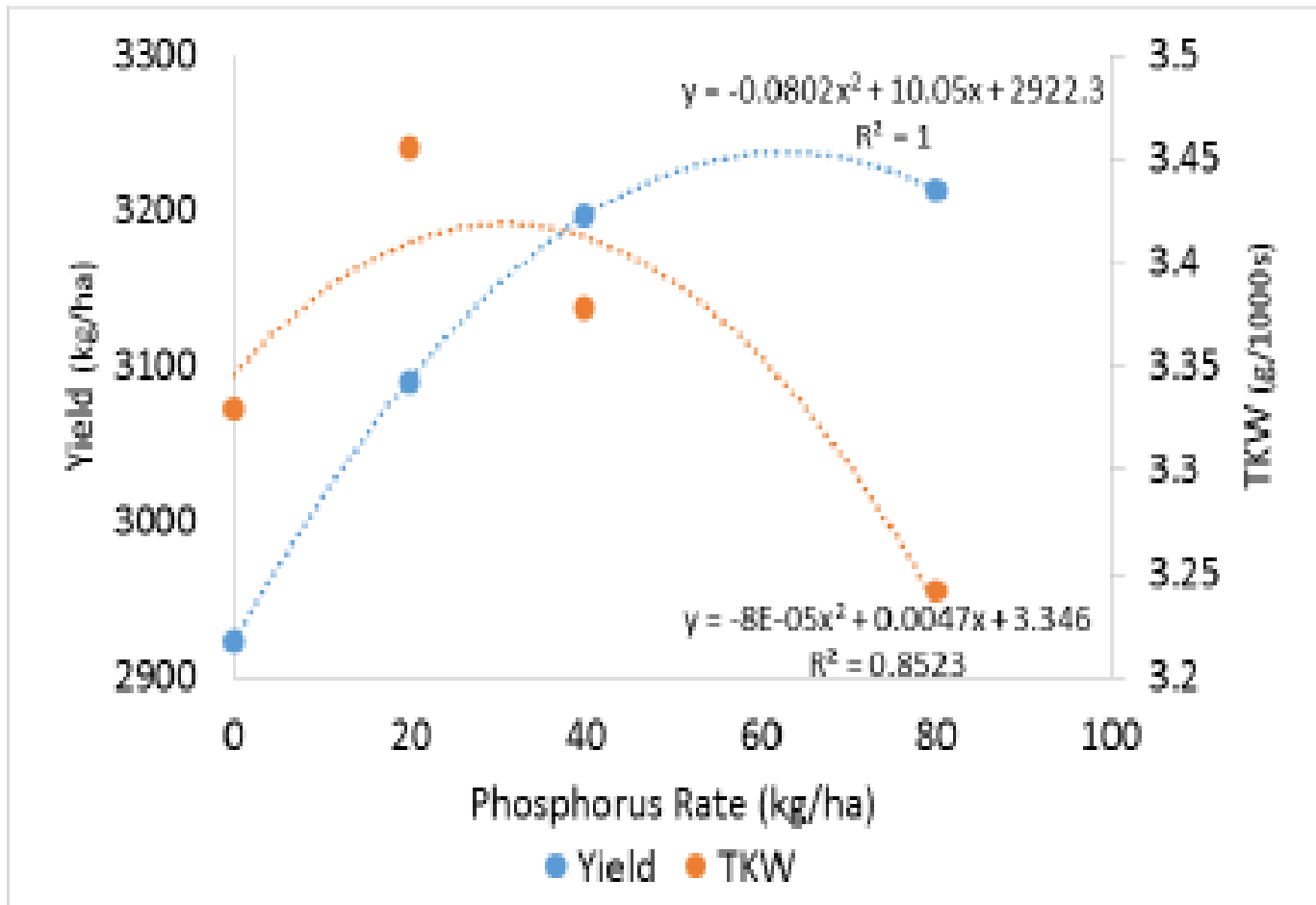


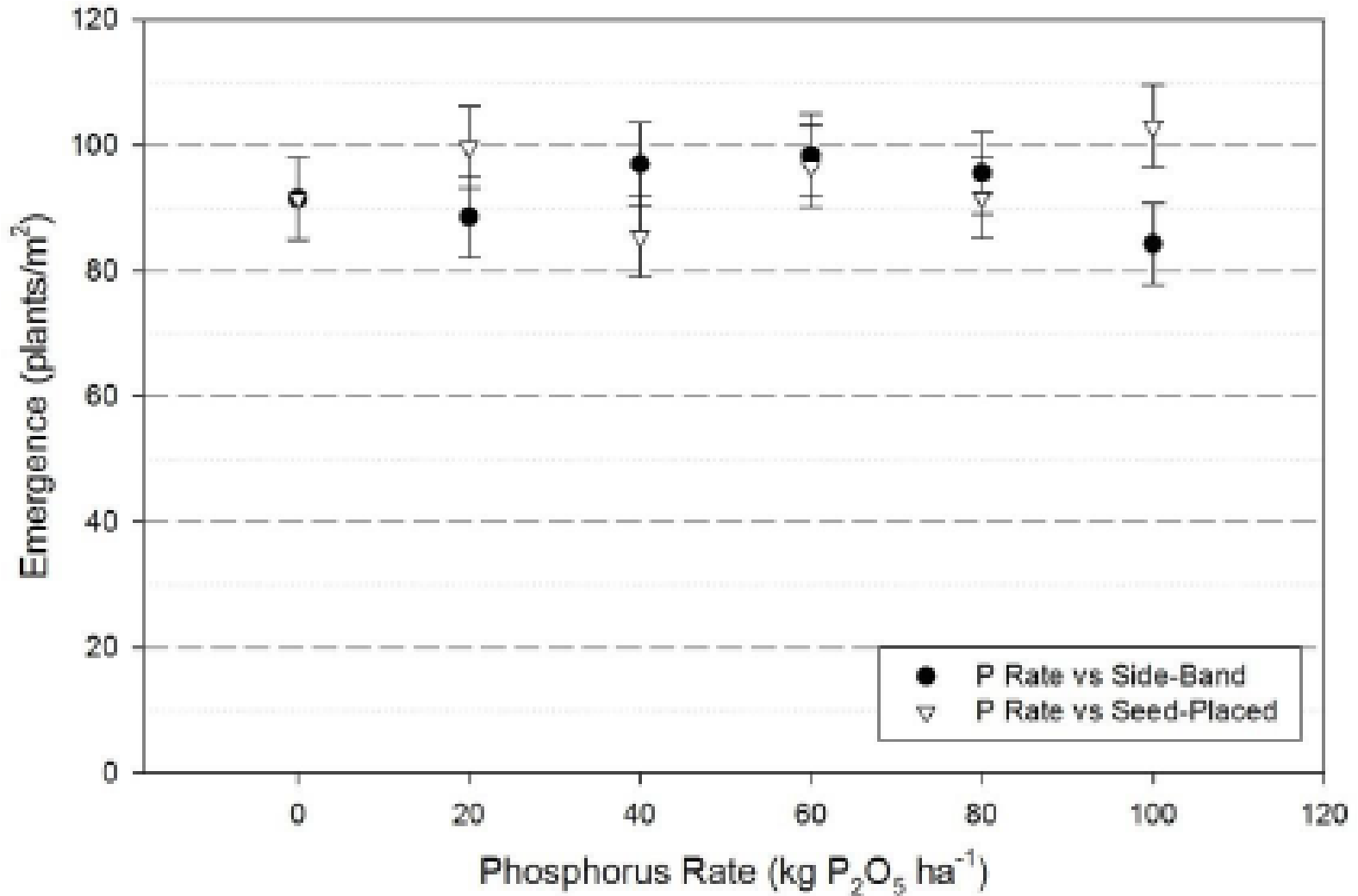
Figure 3. The effect of P rate (kg/ha) on canola yield and thousand kernel weight at Scott SK, 2015.

# Independent Research

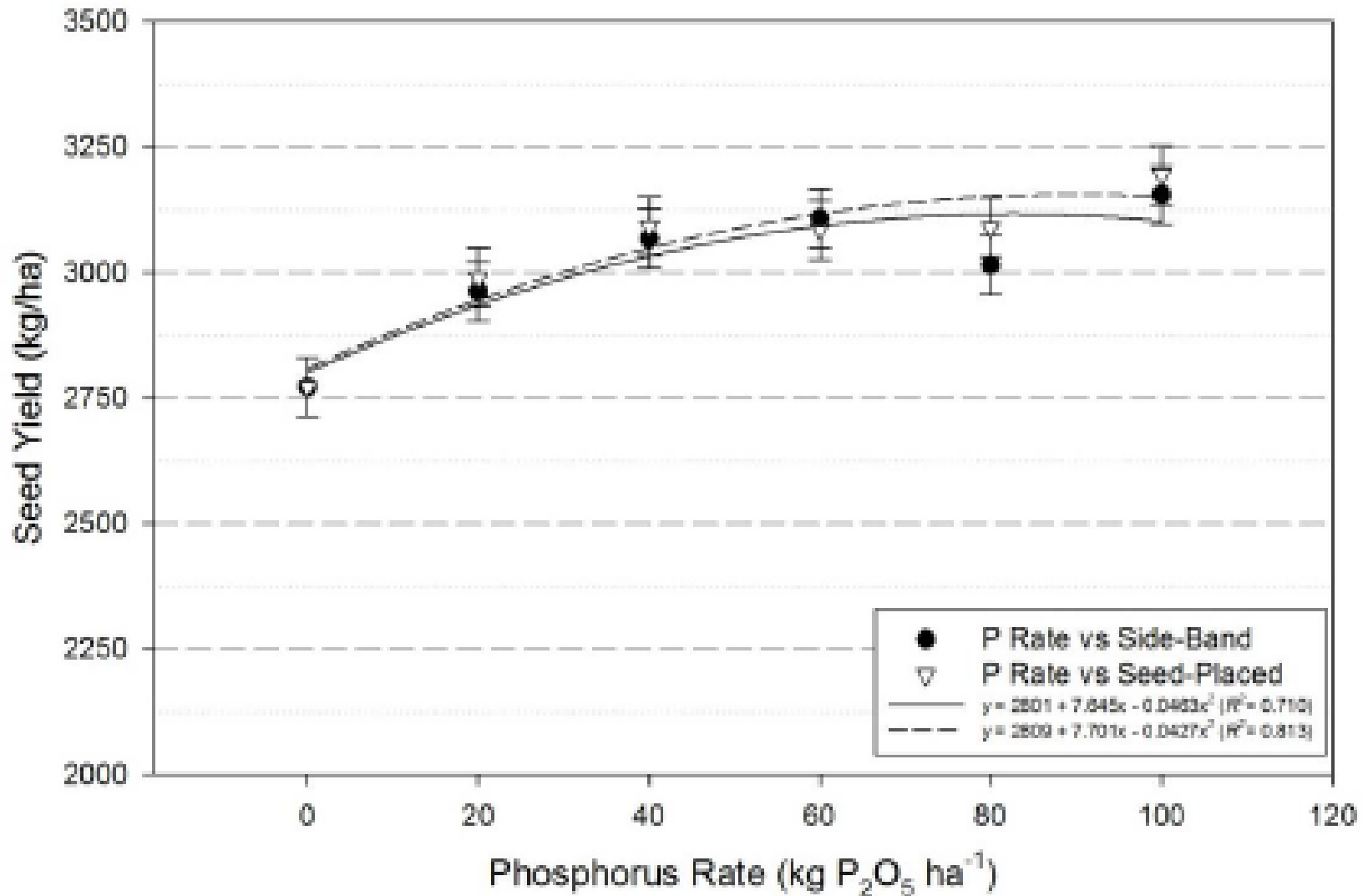
## Indian Head Agriculture Research Foundation (IHARF) - 2015

- Applied 18, 35, 53, 70, and 88 lbs  $P_2O_5$ /acre
- Placed in the seed row or in the side-band

# Plant Count



# Yield



# Conclusion

- Did not find a correlation of plant stand to yield
- Decreasing seed rate influenced plant stand the most
- Increasing seed placed phosphorus also decreased plant count, but not as much as seeding rate
- The combination of low seeding rate and high seed placed phosphorus decreased plant stand the greatest
- Row spacing and proximity of nitrogen to the seed row reduced plant stand, but can not determine between the two

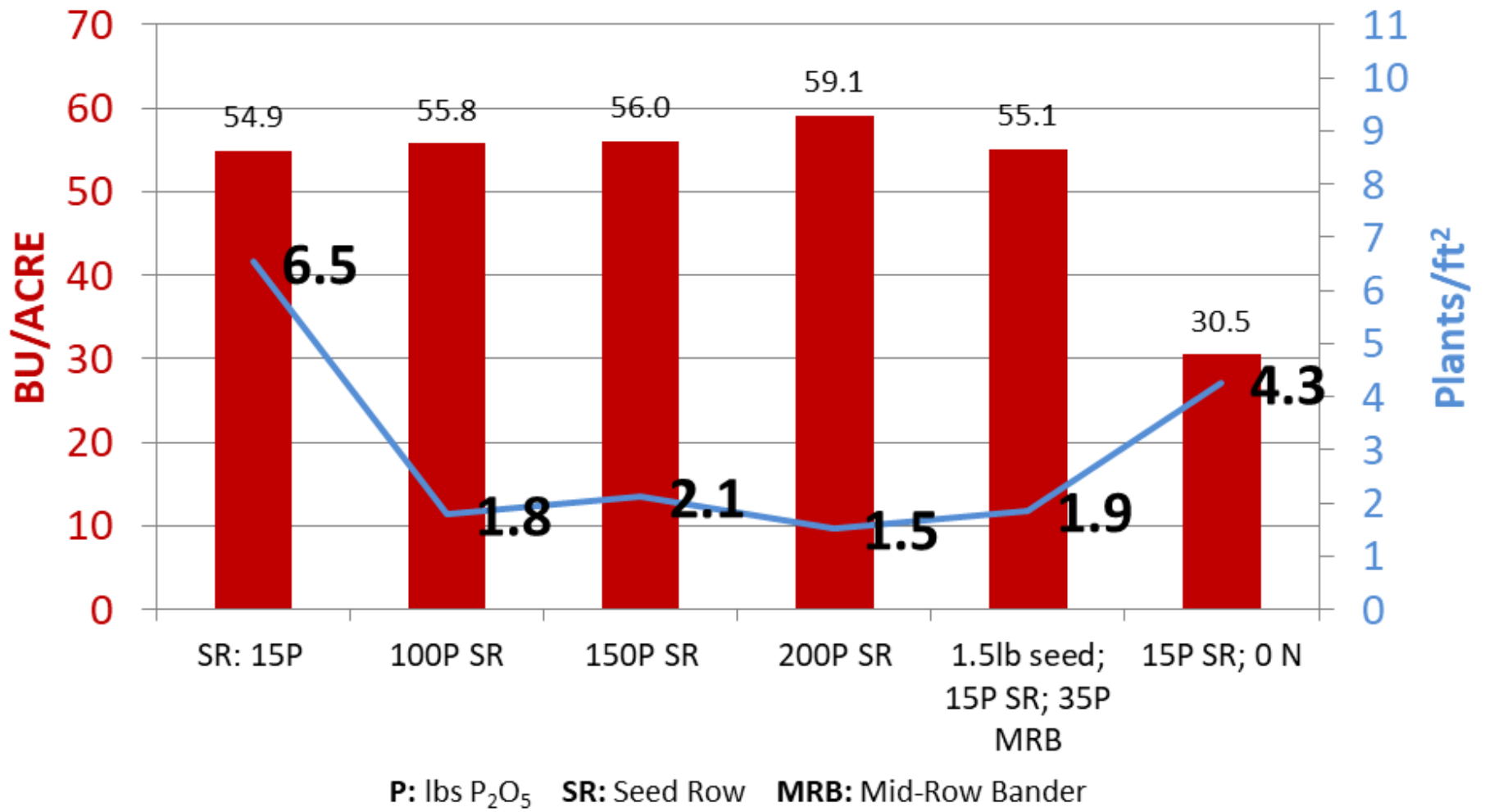
# Recommendations

- If a producer is looking to decrease seeding rate, they must take into consideration other controllable factors at the time of seeding including:
  - seed placed phosphorus
  - row spacing
  - nitrogen placement
- Lower plant counts lead to longer maturity which increases end of season frost risk



# 2018 - Canola - Demonstration

ADJ Yield - 3320      Plant/ft2 - 3320







# Thank you!



## References

- Ukraintez H. 1977. *Effect of Phosphate Placement on Yields of Different Crops in West-Central Saskatchewan.* Presented at Soils and Crops 1977.