



Perfectly Placed Precision Planters on the Placid Precious Prairies  
Dr. Gurbir Singh Dhillon, Ken Coles, Lewis Baarda (Lethbridge, AB, Can)

# Recognitions



- Developing Canola Agronomy with Precision Planters (Farming Smarter - CARP) 2016-2019
  - Seed rate x planter
  - Liquid Phos
- Perfectly Placed: adapting row-crop planters for enhanced crop production in Alberta (Farming Smarter) 2019-2022

- PP Field Scale
- PP Canola
- PP Durum
- PP Hemp
- PP Pulses (pea, lentil, chickpea, soy, faba)



@RDARAlberta

- Effect of Strip Tillage and precision planting on canola emergence, seed yield and quality (Farming Smarter, Lethbridge College) 2020-23
  - Irrigated
  - dryland



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## Effect of precision planting and seeding rates on canola plant density and seed yield in south Alberta

**Authors:** [Gurbir Singh Dhillon](#) , [Lewis Baarda](#), [Mike Gretzinger](#), and [Ken Coles](#) | [AUTHORS INFO & AFFILIATIONS](#)

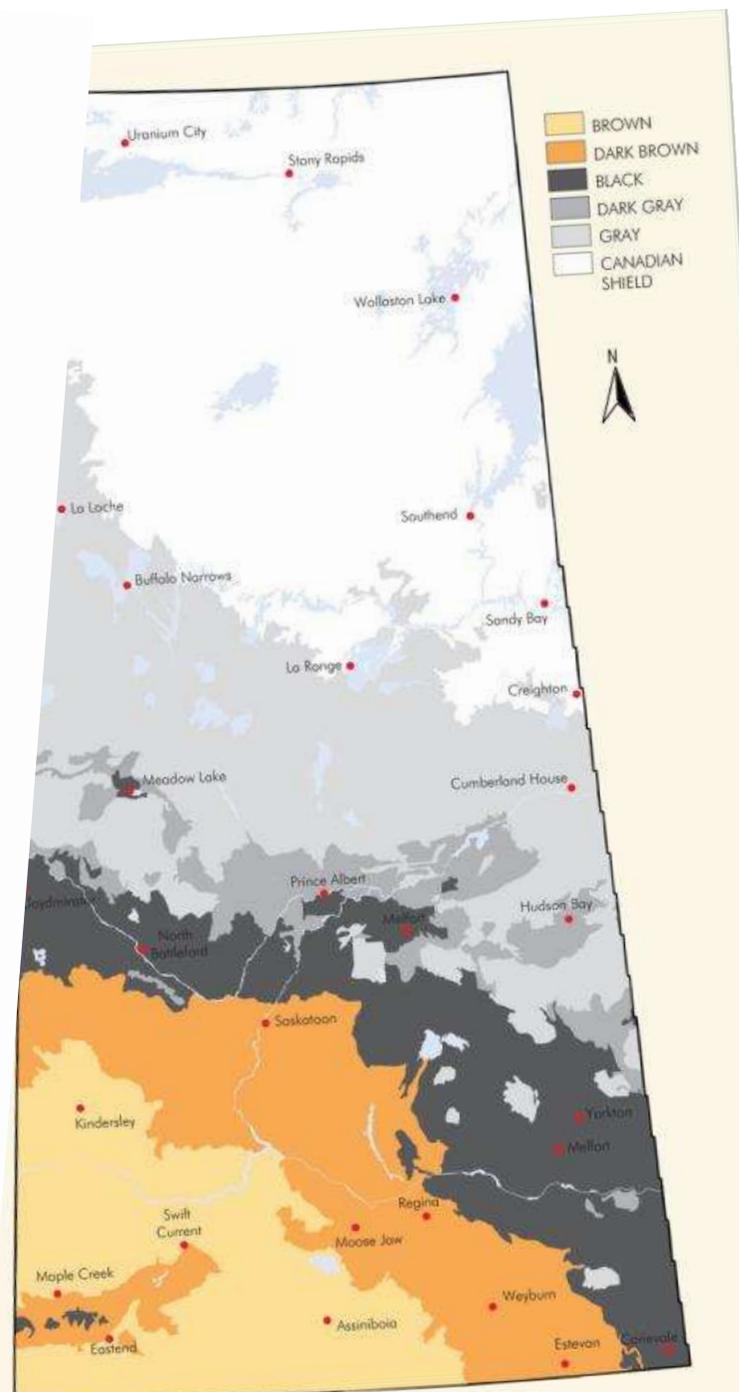
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Brown and dark brown  
Irrigation  
Lots of cropping options



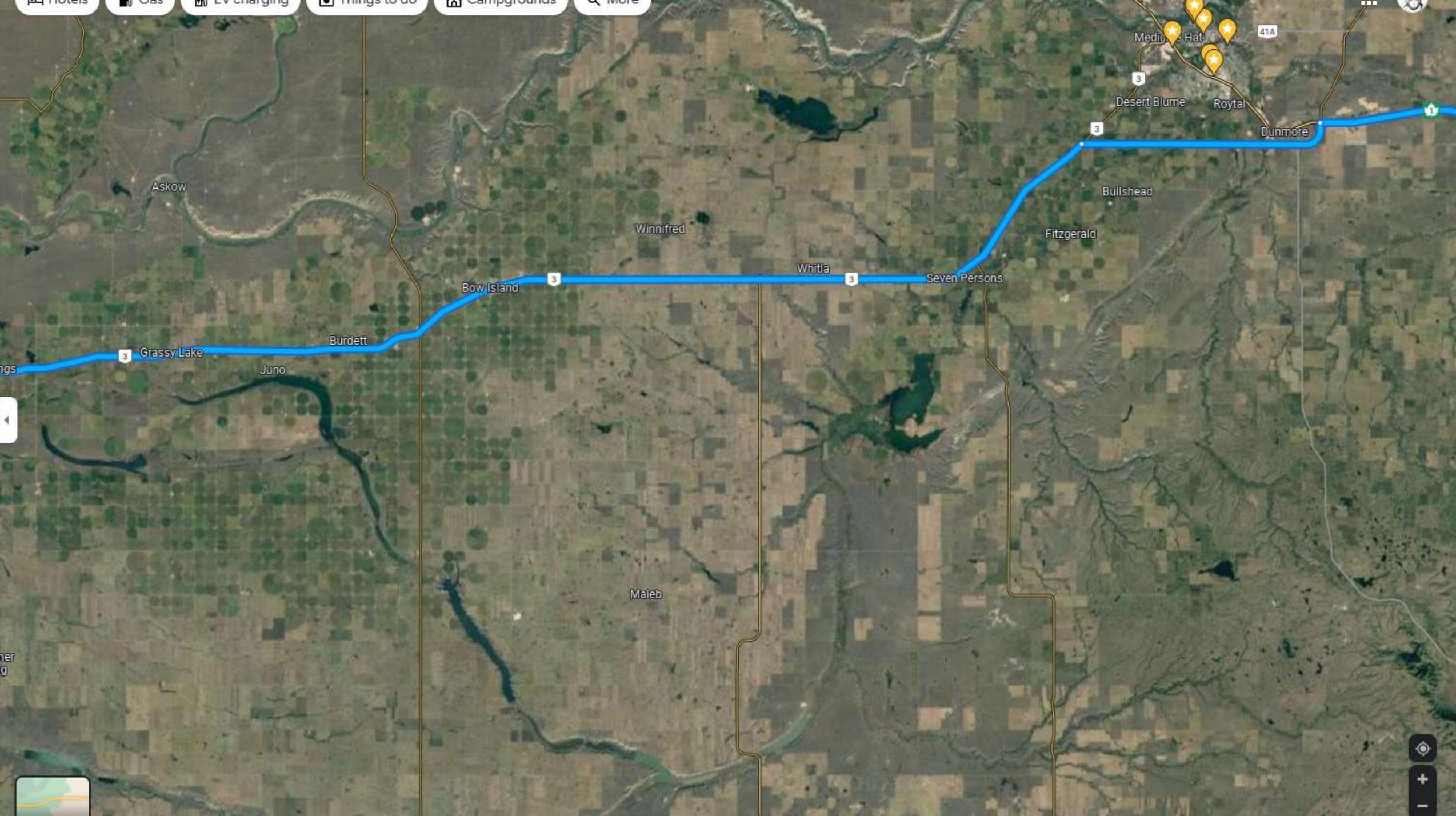
Home » Regina, SK — Lethbridge, AB

### Compare Weather in Regina, SK and Lethbridge, AB

The statistics of the mean, maximum, and minimum temperatures in Regina, SK and Lethbridge, AB are shown in Table 1, Table 2, and Table 3 respectively. 21 years of historical data (2000 — 2020) from two weather stations (see Table 4) was used to calculate the statistics in Table 1, 2, and 3.

Table 1. Average monthly mean temperature °C | °F

Month	Regina, SK	Lethbridge, AB
Jan	-13.2°C	-5.4°C
Feb	-13.4°C	-7.6°C
Mar	-5.7°C	-1.4°C
Apr	3.6°C	5.5°C
May	11.2°C	11.3°C
Jun	16.2°C	15.8°C
Jul	19.2°C	18.2°C
Aug	17.9°C	17.8°C
Sep	12.6°C	12.3°C
Oct	3.9°C	5.2°C
Nov	-4.3°C	0.1°C
Dec	-11.4°C	-4.9°C



Askow

Winnifred

Bullshead

Fitzgerald

Bow Island

Whittia

Seven Persons

Grassy Lake

Burdett

Juno

Maleb

Medicine Hat

Desert Blume

Royal

Dunmore

41A

3

3

3

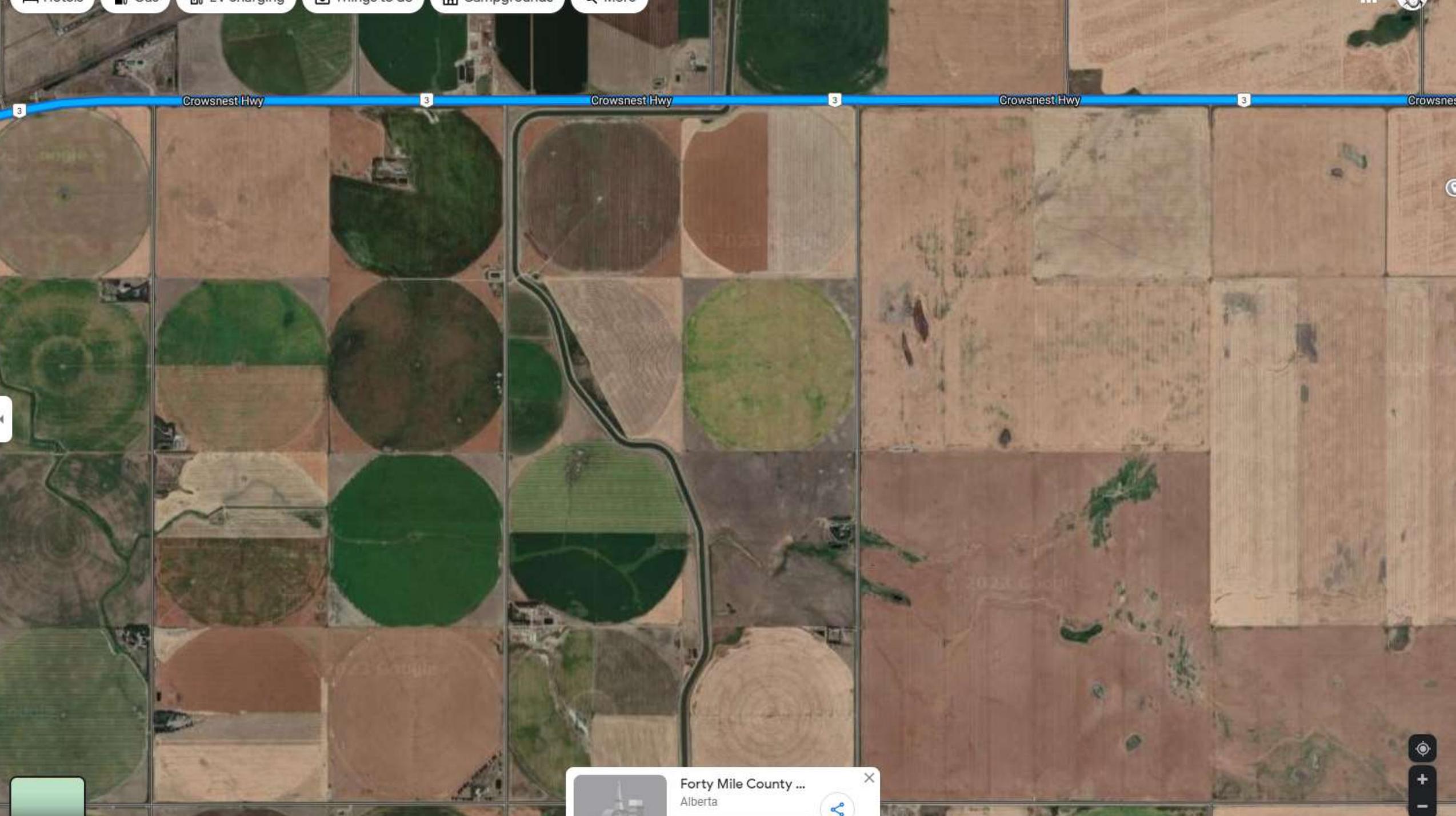
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3

ngs

her  
g





Crowsnest Hwy

Crowsnest Hwy

Crowsnest Hwy

Crowsnest Hwy

Forty Mile County ...  
Alberta







VS





46-0-0

Seed

46-0-0

residue

Liquid Phos

10040035

**ATTENTION**  
A chaque mise en route, vérifier la position de la plaque de niveau à l'intérieur du couvercle

**IMPORTANT**  
When starting up check the position of the level plate on the inside of the cover

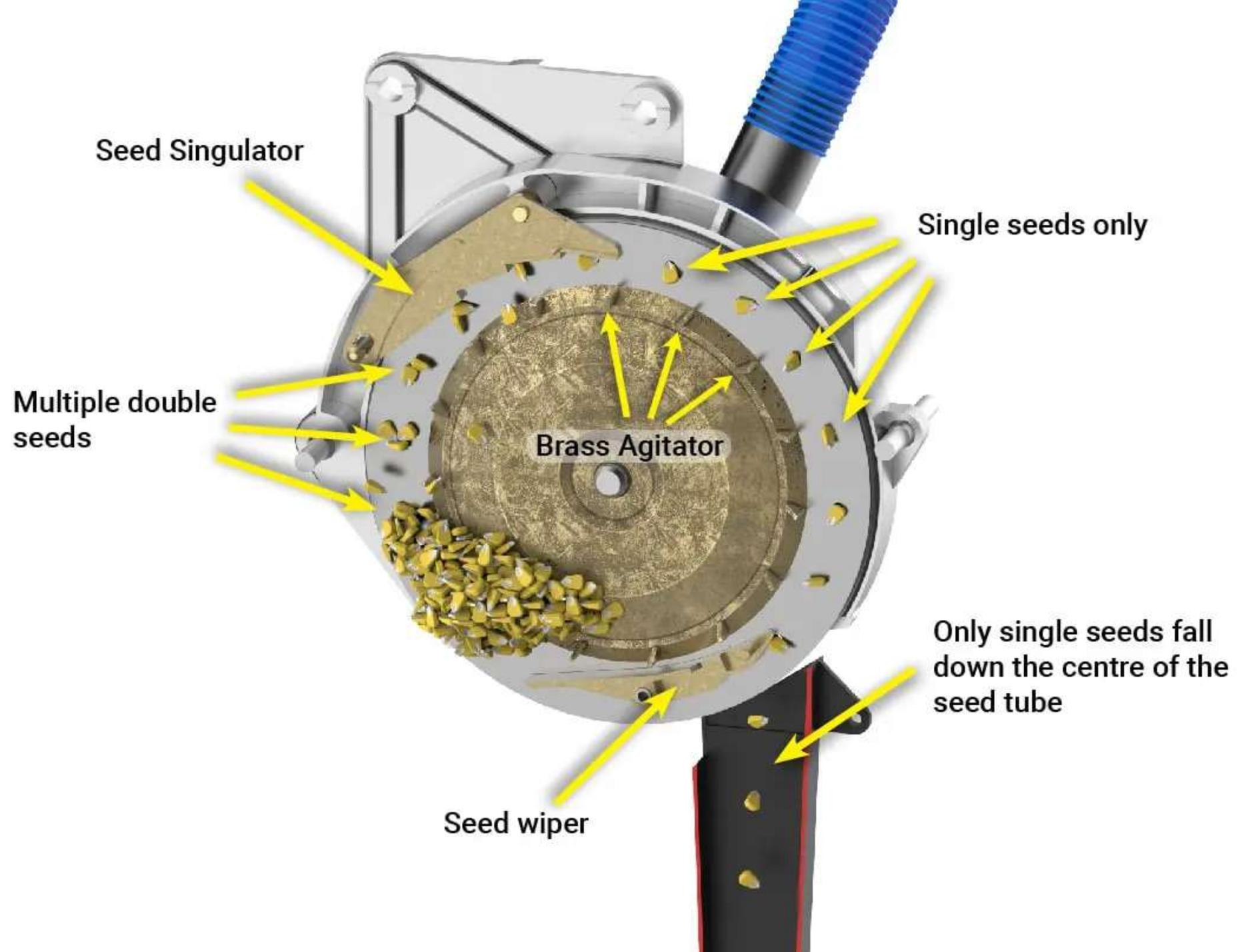
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MONOSEM  
SEED  
DISCS



# 6045 pea/lenil, 4850 faba, chickpea, etc, 12018 durum

The seed disc charts are given as a guide. The top chart displays the plant spacing within the rows for discs of varying numbers of holes along with the available hole diameters for the disc. The bottom chart provides hole diameter recommendations for various crops. More options are available, and hole diameter may vary for specified crops due to seed size.

Number of Holes		Distance in the Row (seed spacing gearbox and standard sprockets)	Diameter of Holes (mm)
Single Row Disc	Double Row Disc		
18	18 x 2	5 1/8" - 14 7/8"	6 - 7 - 8 - 9 - 10 - 12 - 15 - 18 - 20 - 22 - 25
30	30 x 2	3" - 9"	
36	36 x 2	2 1/2" - 7 1/2"	
60	60 x 2	1 1/2" - 4 1/2"	
72	72 x 2	1 1/4" - 3 3/4"	
120	120 x 2	3/4" - 2 1/4"	6 - 7 - 8 - 9 - 10 - 12 - 15 - 18
180	180 x 2	1/2" - 1 1/2"	



Single Row Disc

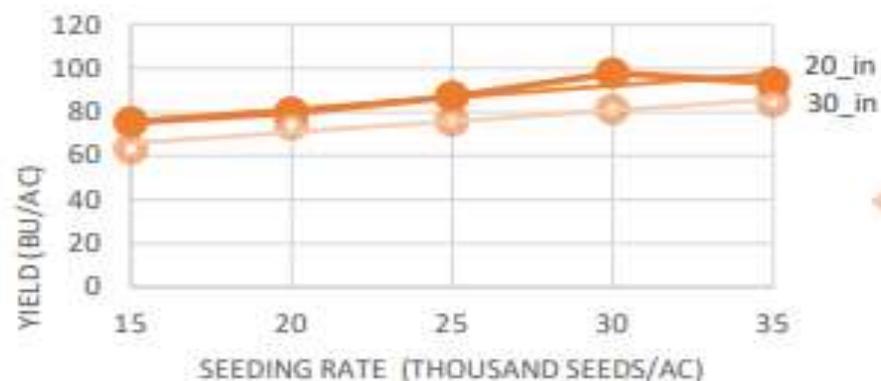


Double Row Disc

Diameter of Holes (mm)	Types of Seeds (given as a guide)
22	Chard, Pelleted Lettuce, Pelleted Onion
20	Asparagus, Sugar Beets
18	Cucumber, Spinach, Melon, Radish
15	Paprika
12	Pelleted Carrot, Cabbage, Coriander, Raw Onion, Radish, Tomato
10	Broccoli, Fennel, Mustard
9	Turnip
8	Lettuce, Poppy
7	Raw Carrot, Chives, Parsley
6	Endive, Raw Lettuce



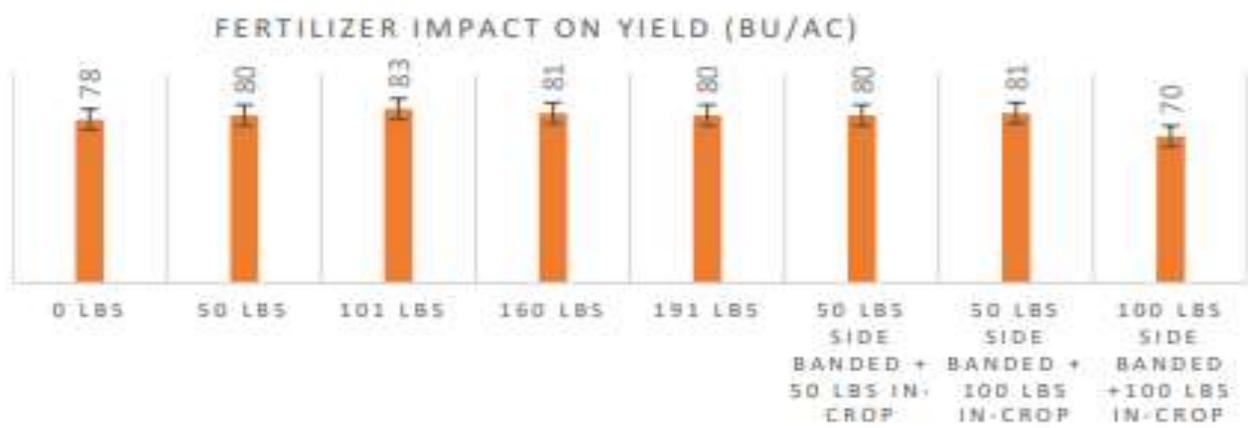
# Dryland Grain Corn



**Narrower Rows (20") and higher seeding rates (30,000+ seeds/ac) produced maximum yields in dryland fields of southern Alberta**

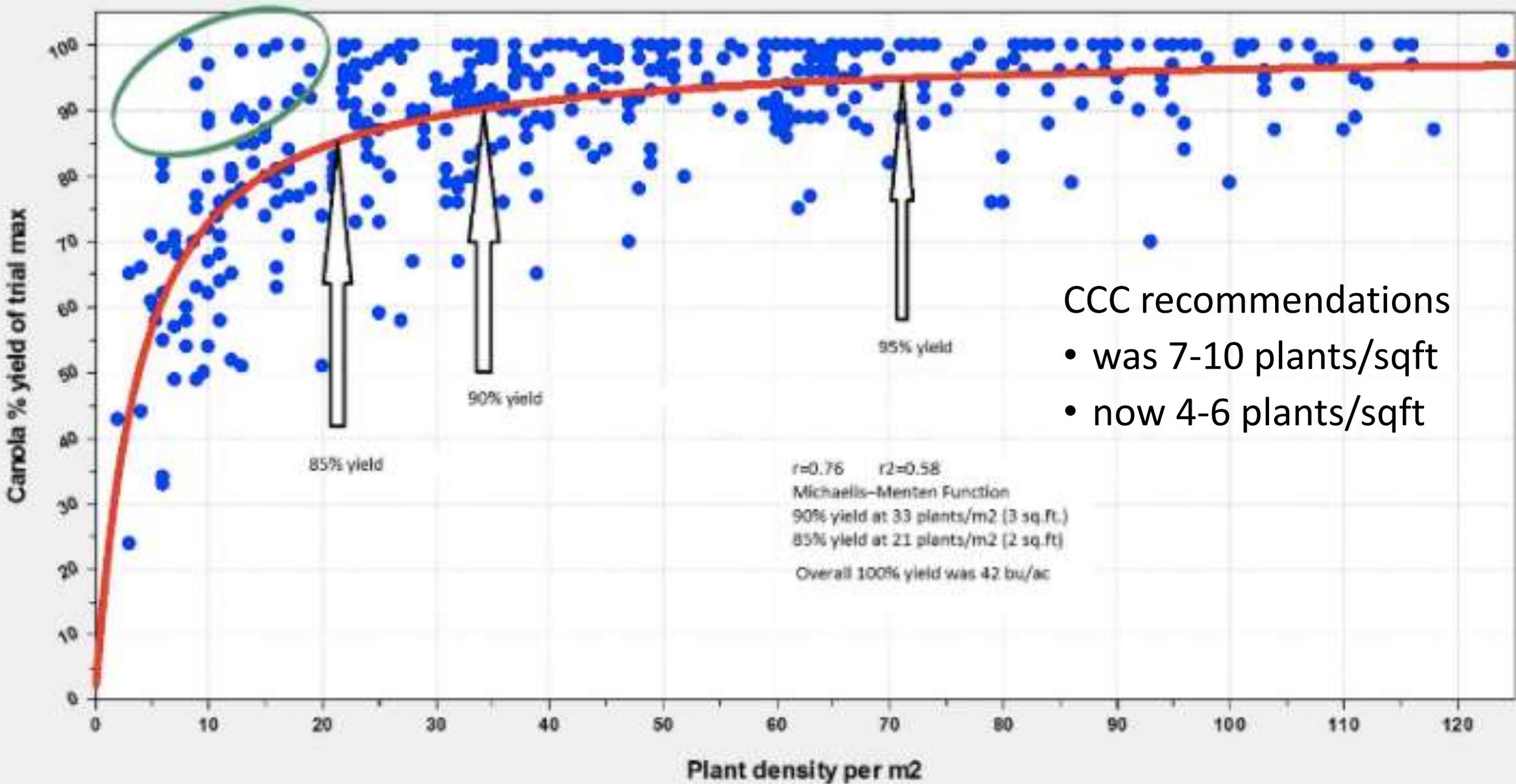


**There was NO significant yield response to Nitrogen Fertilizer. Anywhere between 50 lbs/ac to 200 lbs/ac of total available nitrogen (soil content + Fertilizer) was sufficient for maximum yield**



**Corn emergence was 99% in cultivated plots and 84% in zero-till plots, but there was no significant difference in yield between Conventional and Zero Till systems**

# Canola HT Hybrid Yield vs Plant Density



CCC recommendations

- was 7-10 plants/sqft
- now 4-6 plants/sqft

# Canola Study 1



- Developing Canola Agronomy with Precision Planters (Farming Smarter - CARP) 2016-2019
  - Seed rate x planter
    - 20, 40, 60, 80, 160 seeds/m<sup>2</sup>
    - AD 9.5", PP 12", PP 20"
  - Liquid Phos
    - 0,5,10,20,40,60 kg/ha



160  
seeds/m2      **6.7**  
                         **lbs/ac**

80  
seeds/m2      **3.3**  
                         **lbs/ac**

60  
seeds/m2      **2.5**  
                         **lbs/ac**

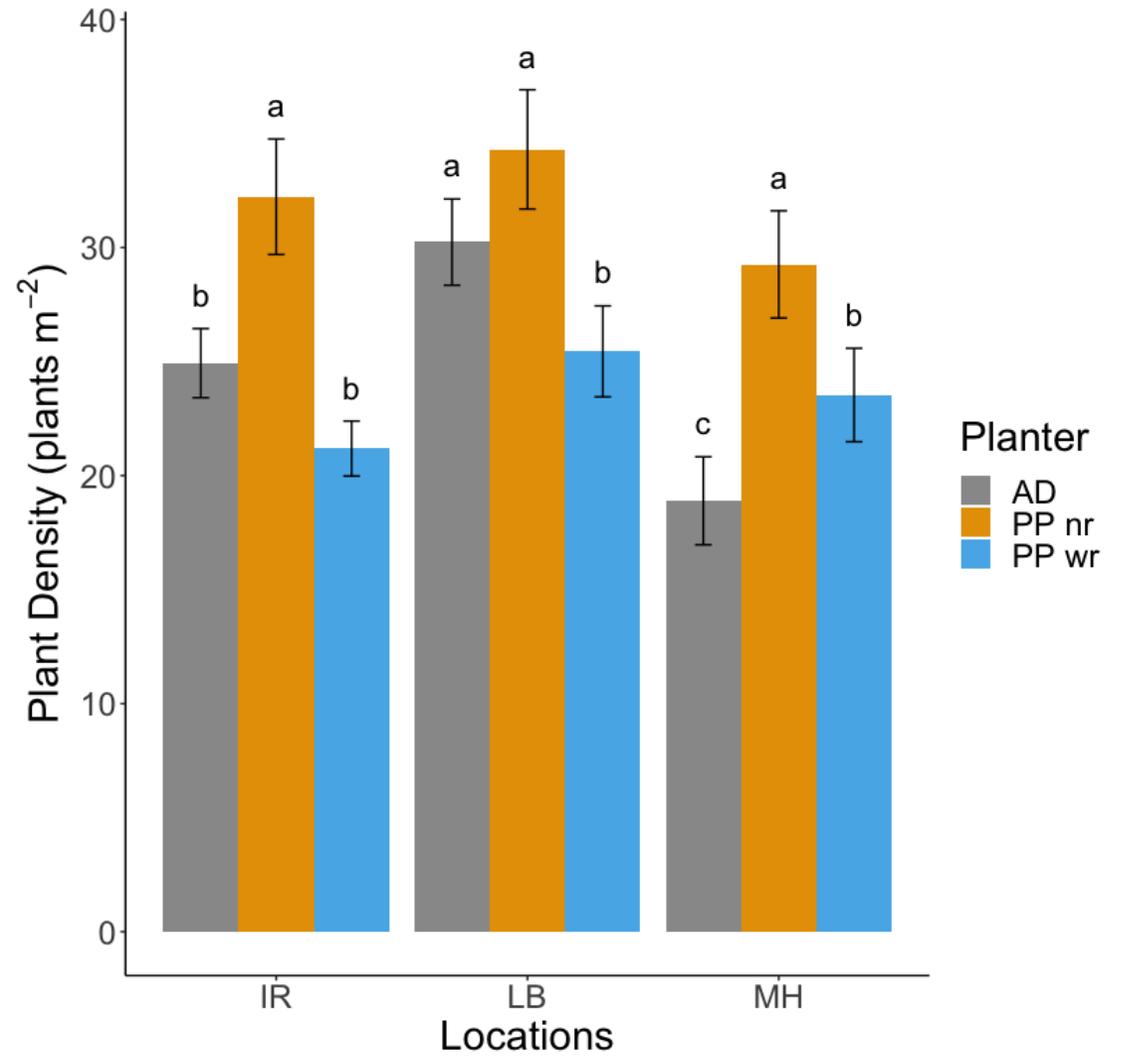
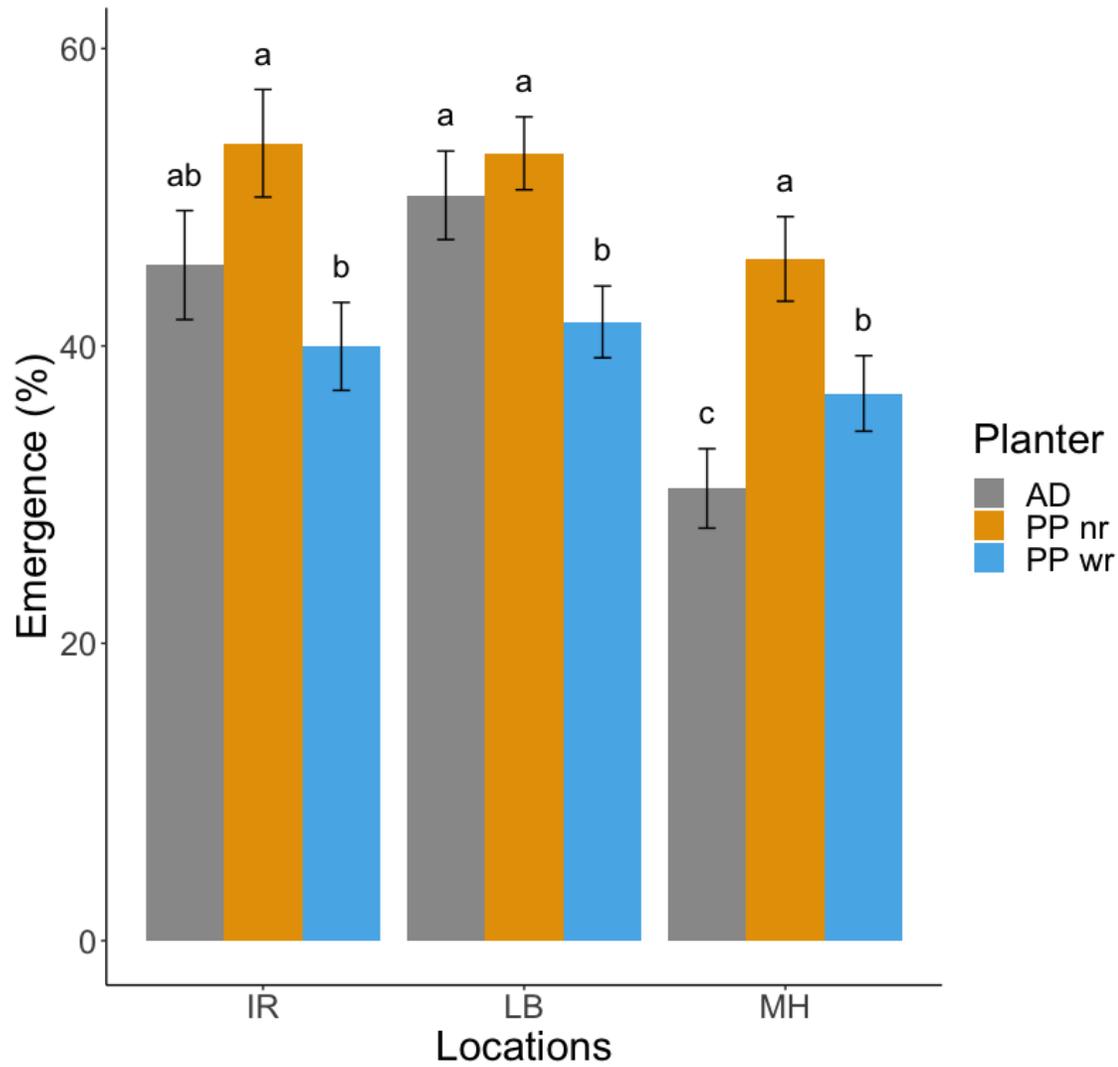
40  
seeds/m2      **1.7**  
                         **lbs/ac**

20  
seeds/m2      **0.8**  
                         **lbs/ac**

Air Drill 9.5"

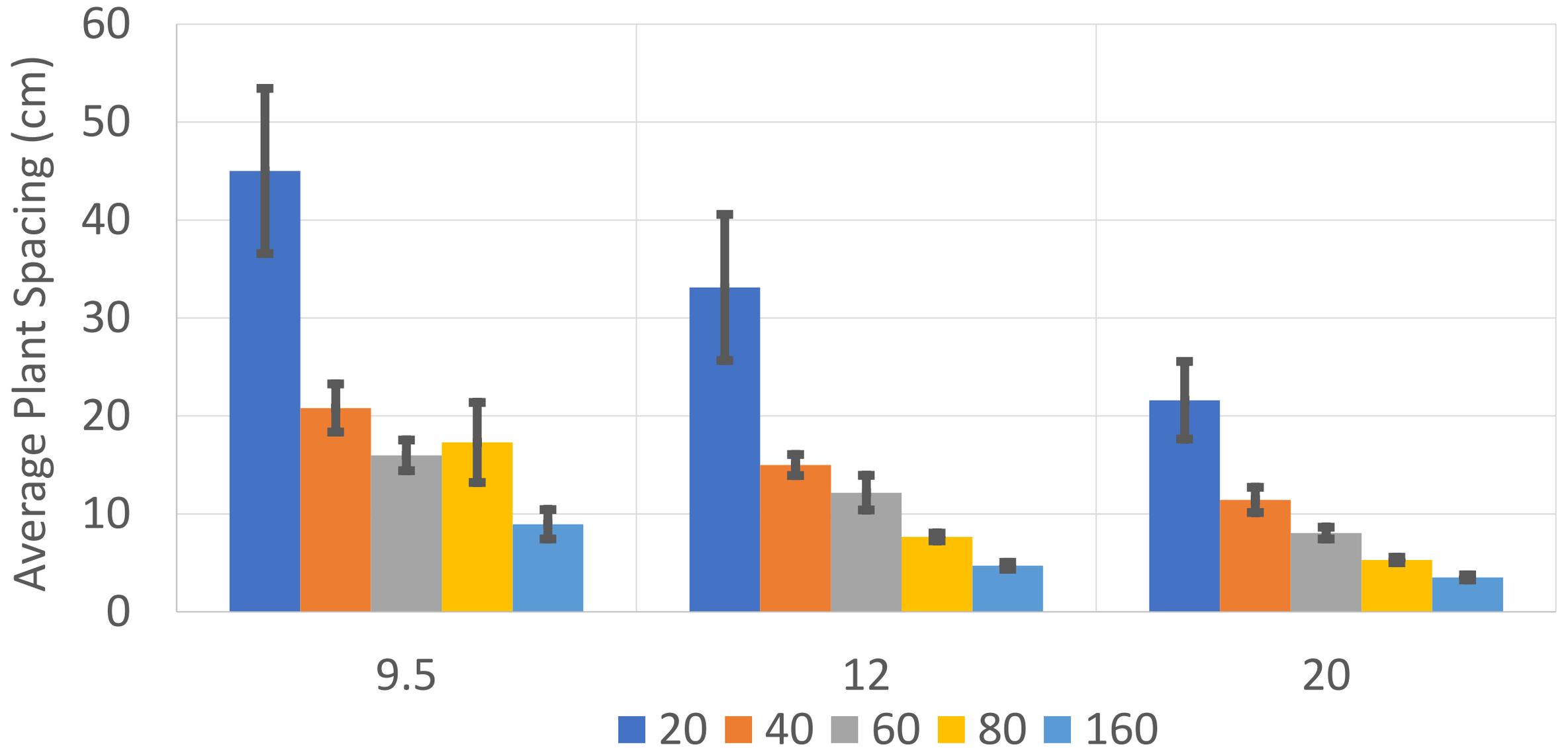
Monosem 12"

Monosem 20"



Seedling emergence for the narrow row precision planter was 1.2-1.5 times higher than the air drill and wide row planter

# Average Space Between Plants within Row 2016-2017 n=6



**Air Drill 9.5"**



**Monosem 12"**



**Monosem 20"**



**Low Seed Rate  
0.8 lbs/acre**



**High Seed Rate  
6.7 lbs/acre**



**Monosem 12"**



**Monosem 20"**

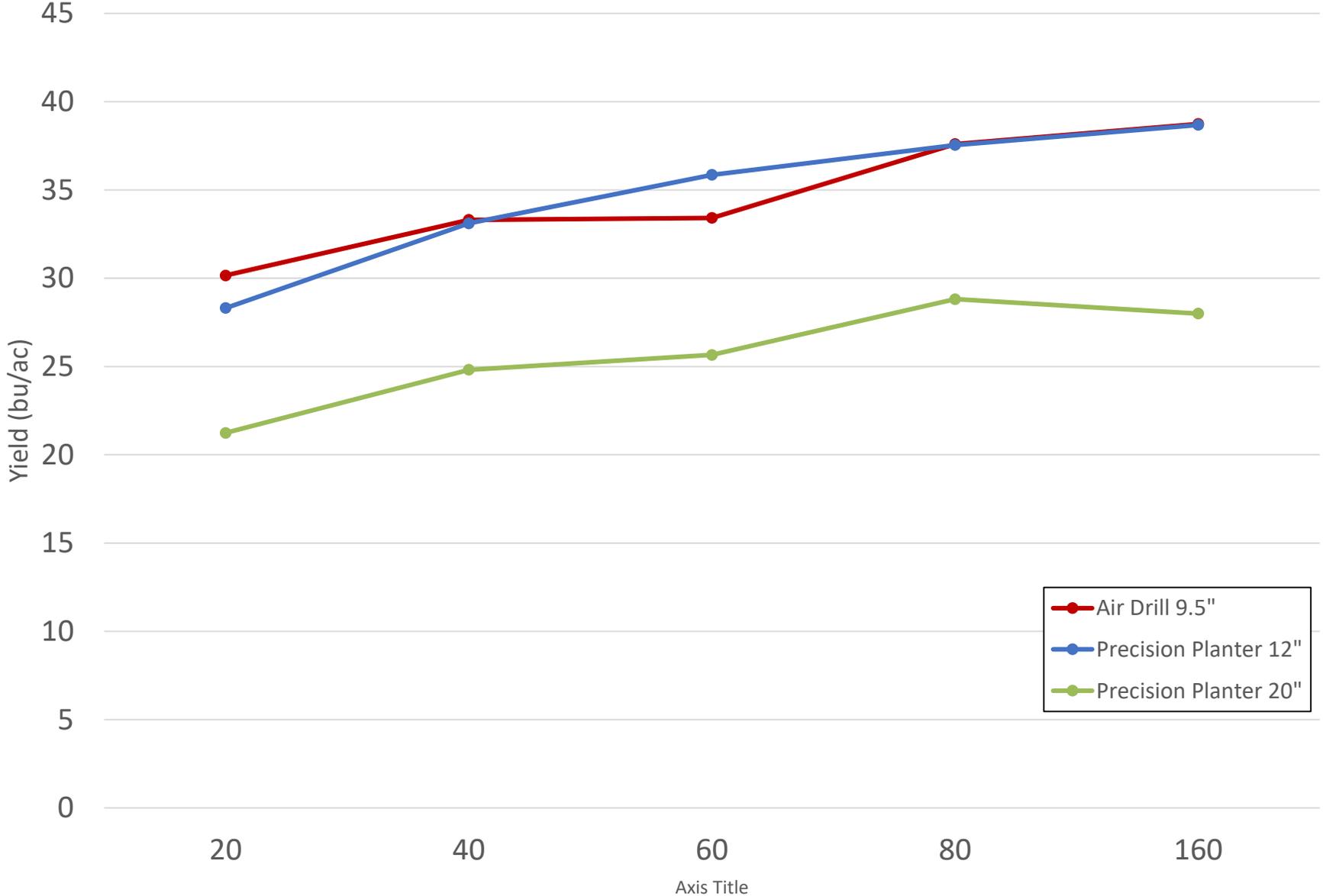


**Air Seeder 10"**



# Canola Yield – Dryland

(n=12)

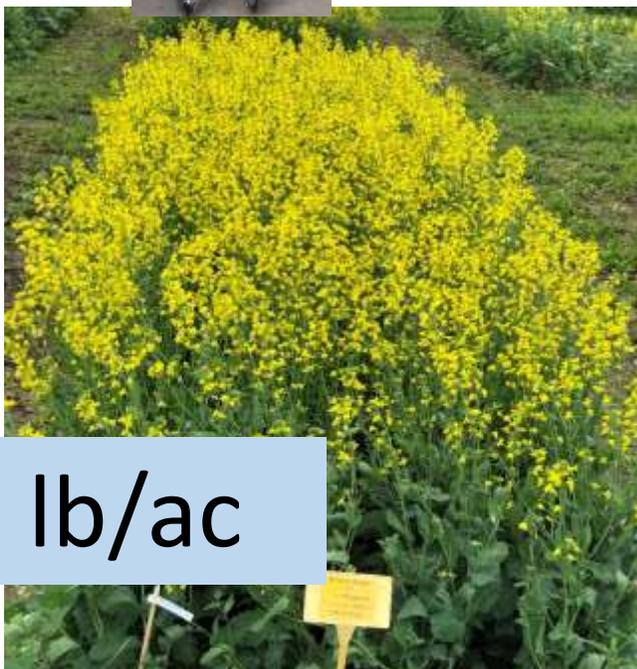


2.25 lb/ac



**Monosem 12''**

4.5 lb/ac



**Monosem 20''**

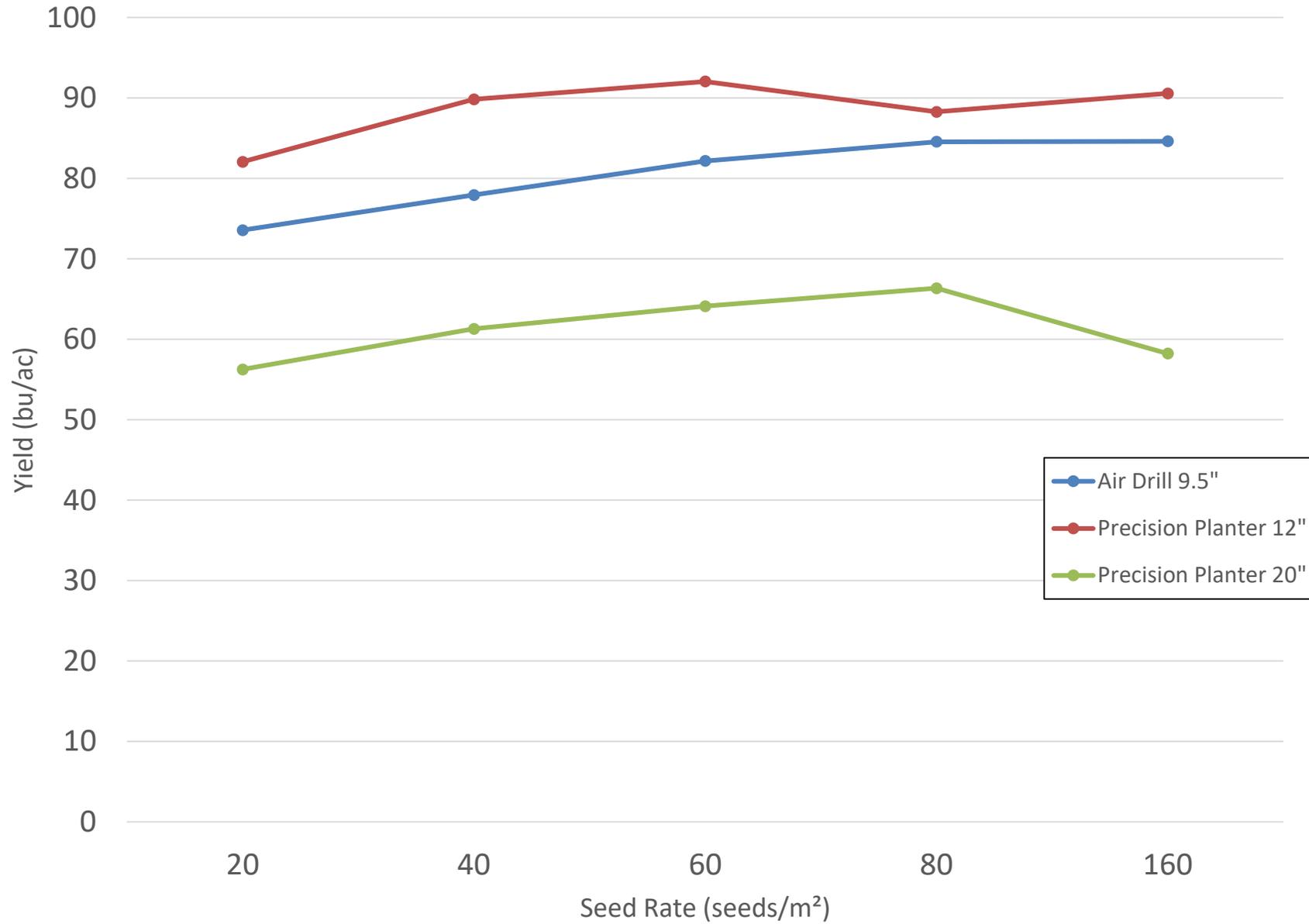


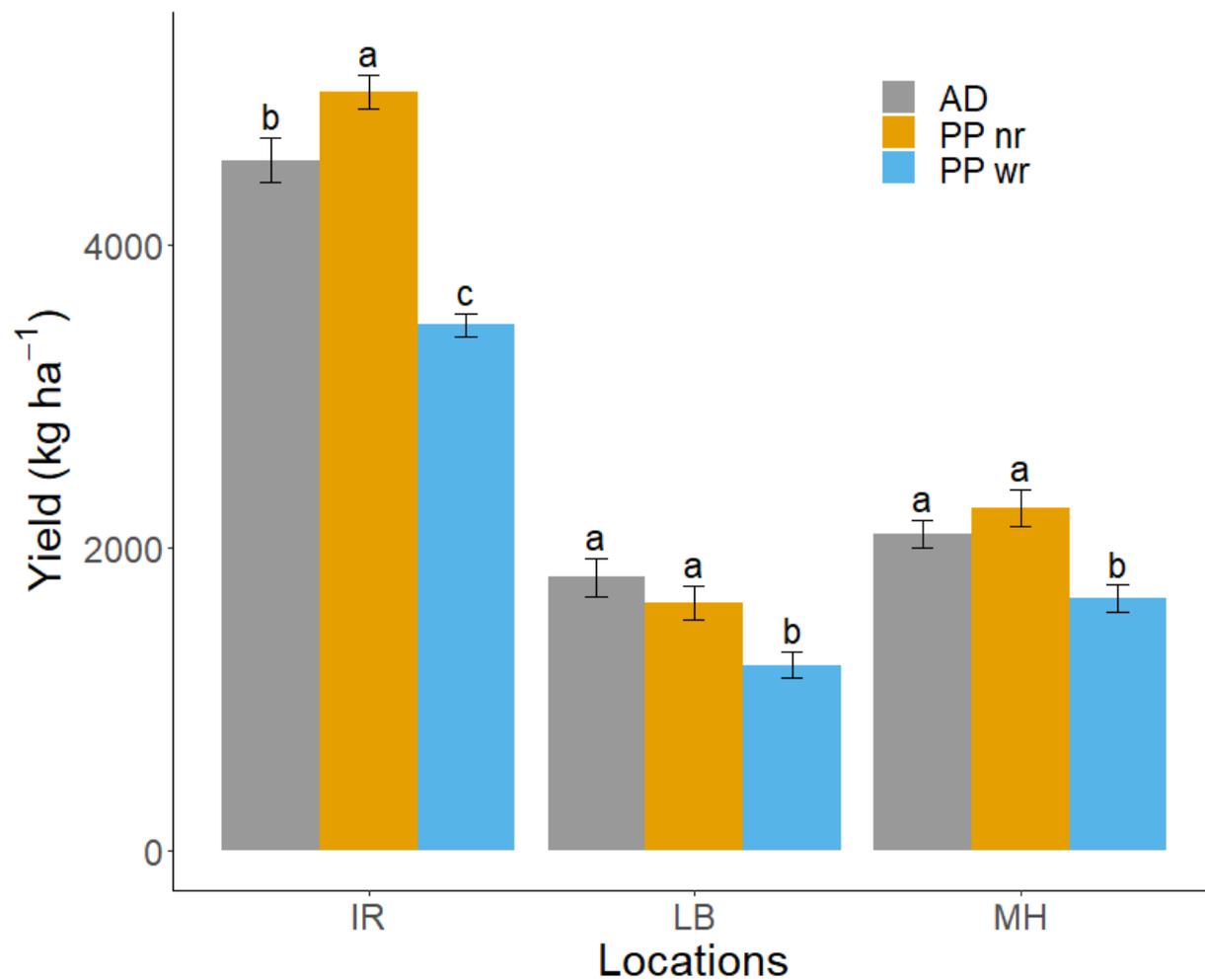
**Air Seeder 10''**



# Canola Yield – Irrigated

(n=12)

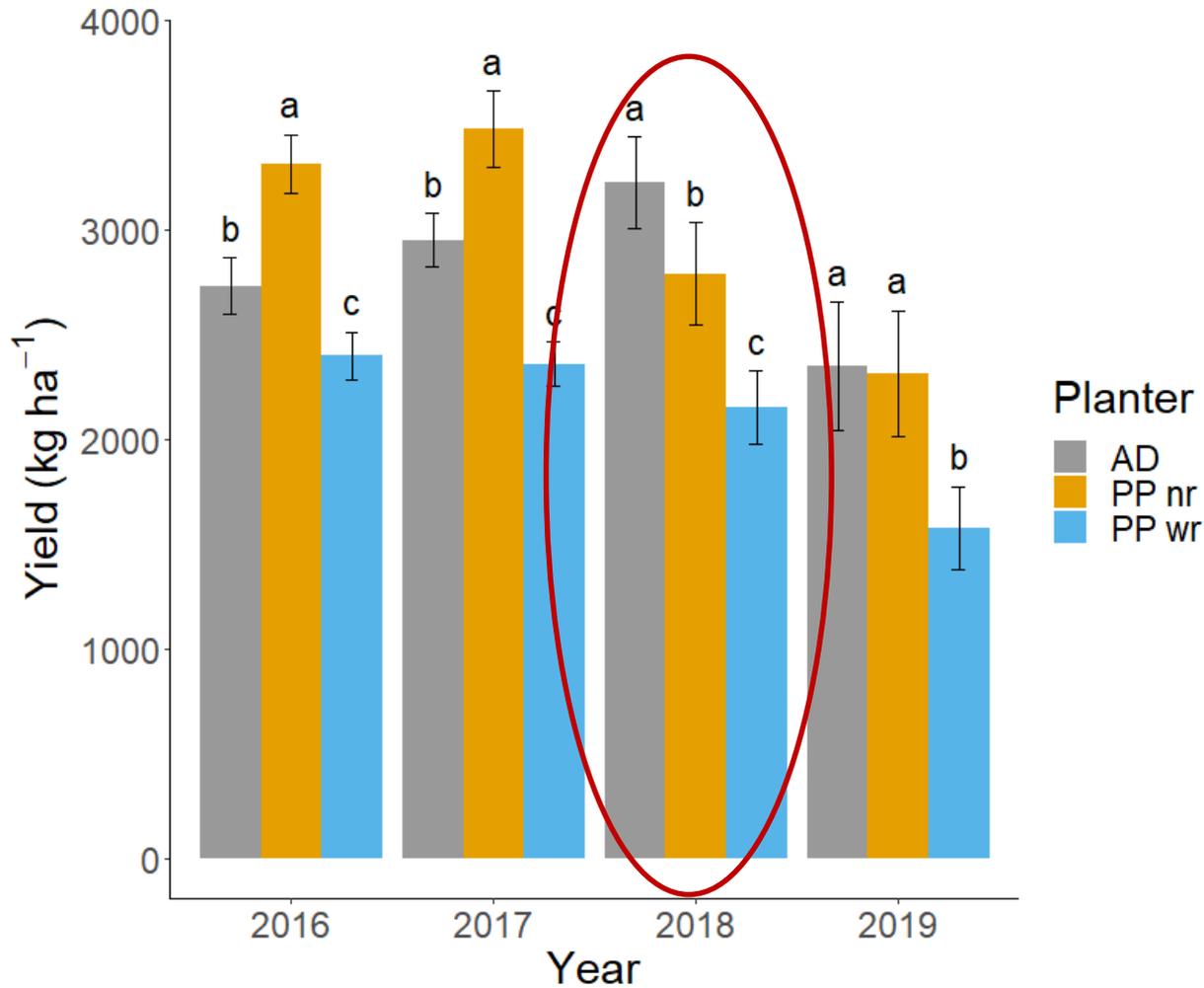




**At irrigated location** - Narrow row planter had ~10% increase in yield compared to air drill

**At rainfed locations** - No significant difference in canola yield for the air drill and narrow row planter

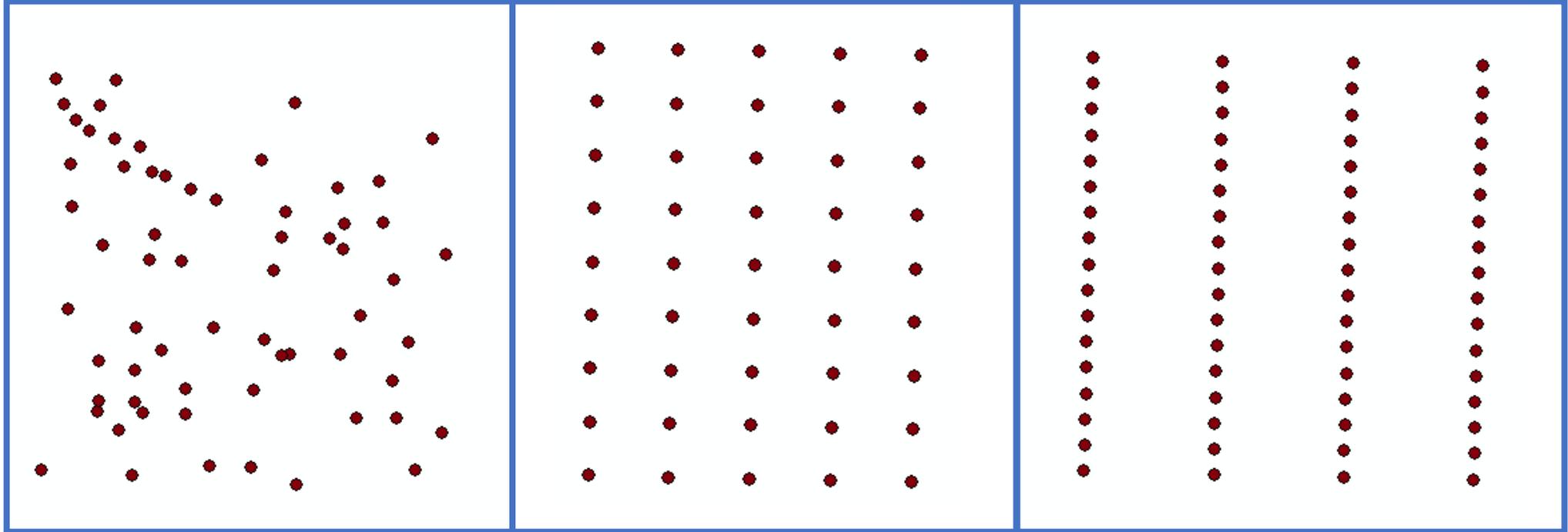
Canola yield for the wide row planter was 25-31% less than the narrow row planter for different locations.



**At irrigated location** - Narrow row planter had ~10% increase in yield compared to air drill

**At rainfed locations** - No significant difference in canola yield for the air drill and narrow row planter

Canola yield for the wide row planter was 25-31% less than the narrow row planter for different locations.



**Air Drill**



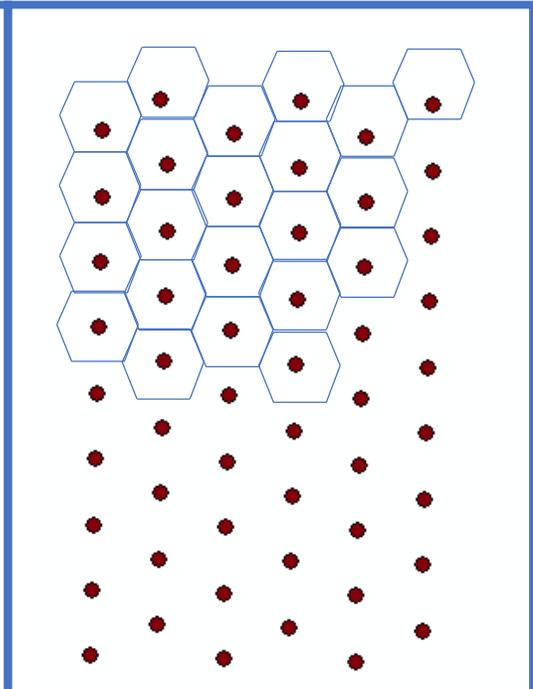
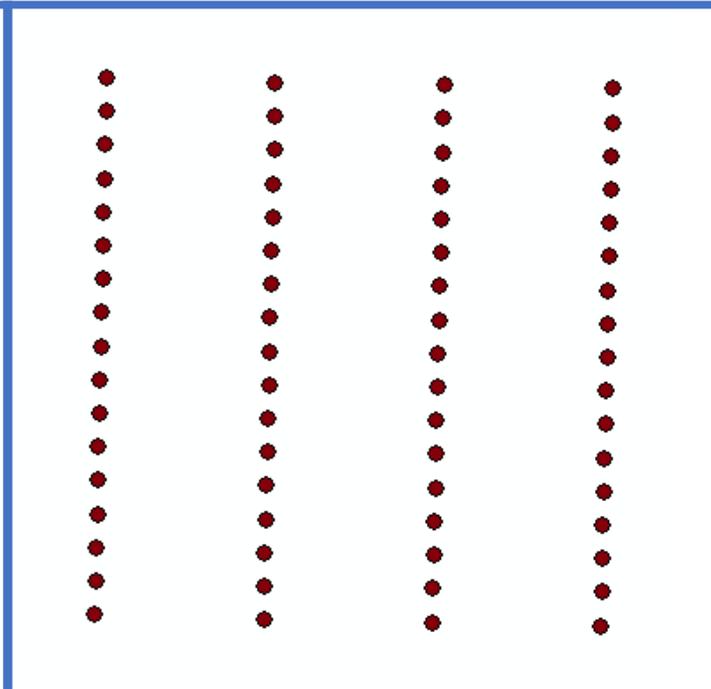
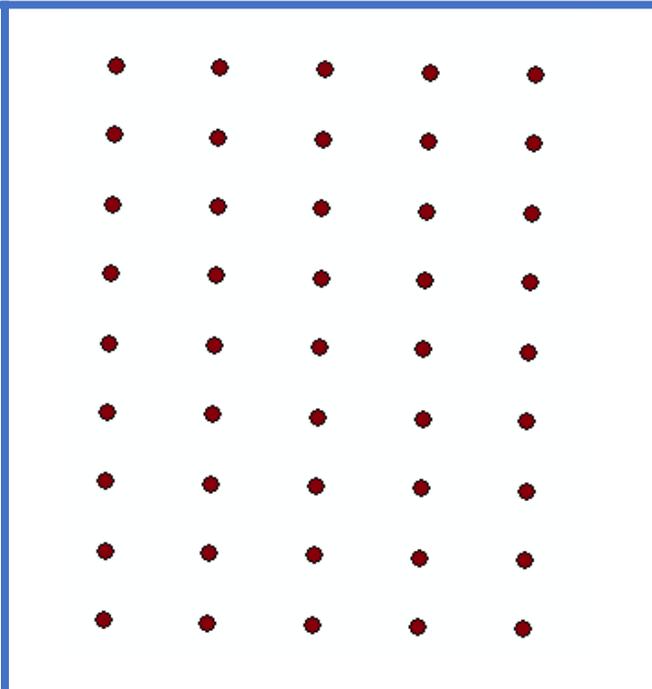
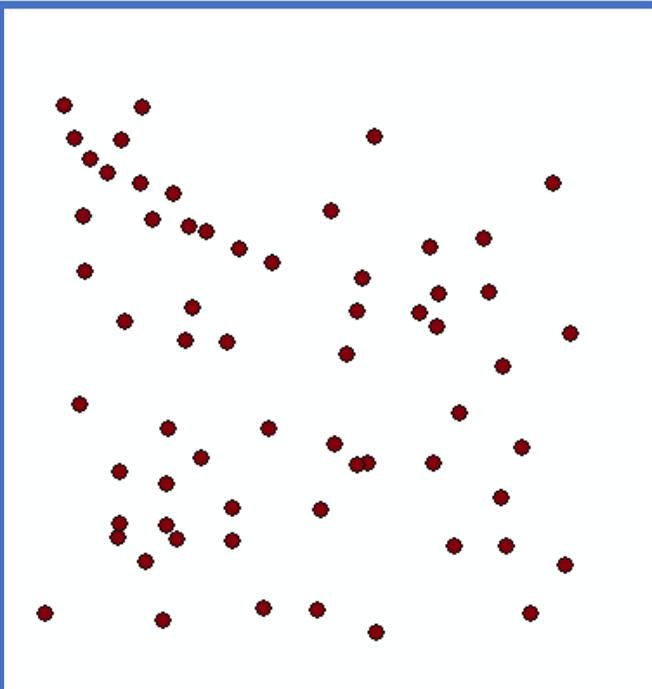
**Monosem 12**



**Monosem 20**



# Seed Placement



**Air Drill**



**Monosem 12**

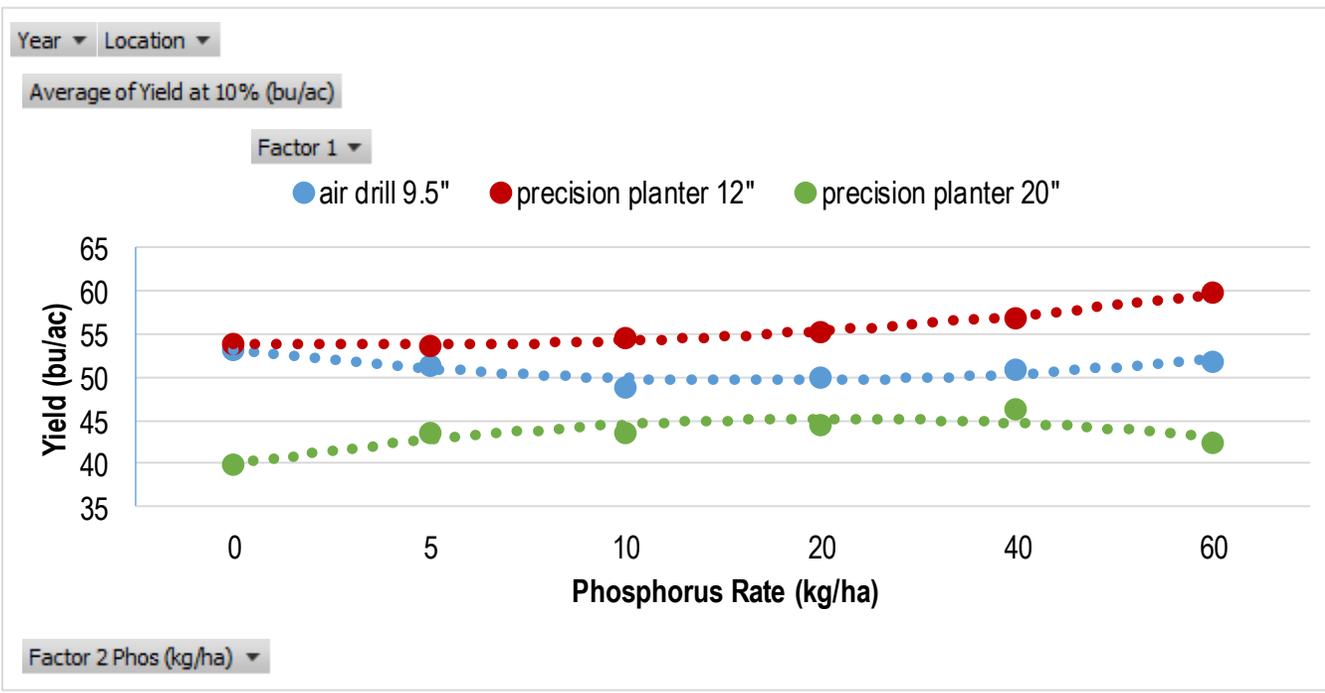
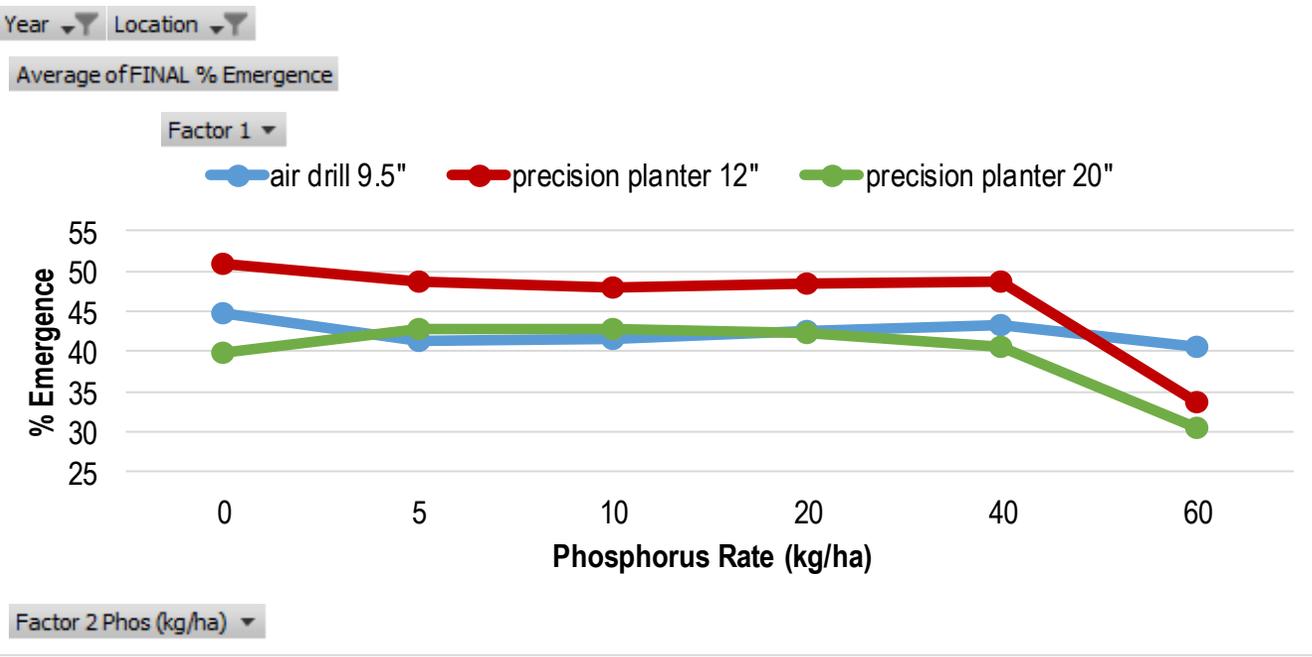


**Monosem 20**

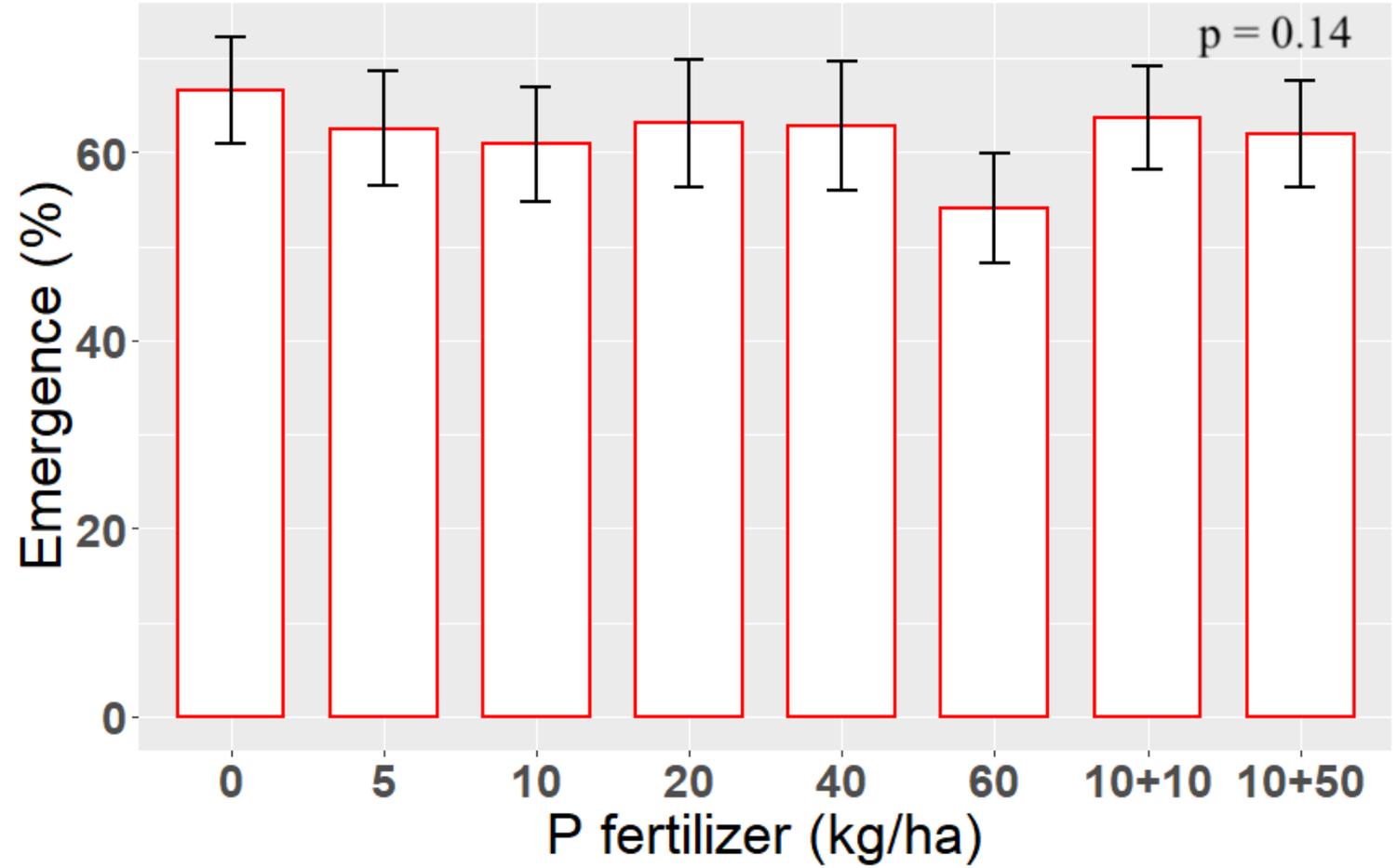


**Future: Prime Placement**

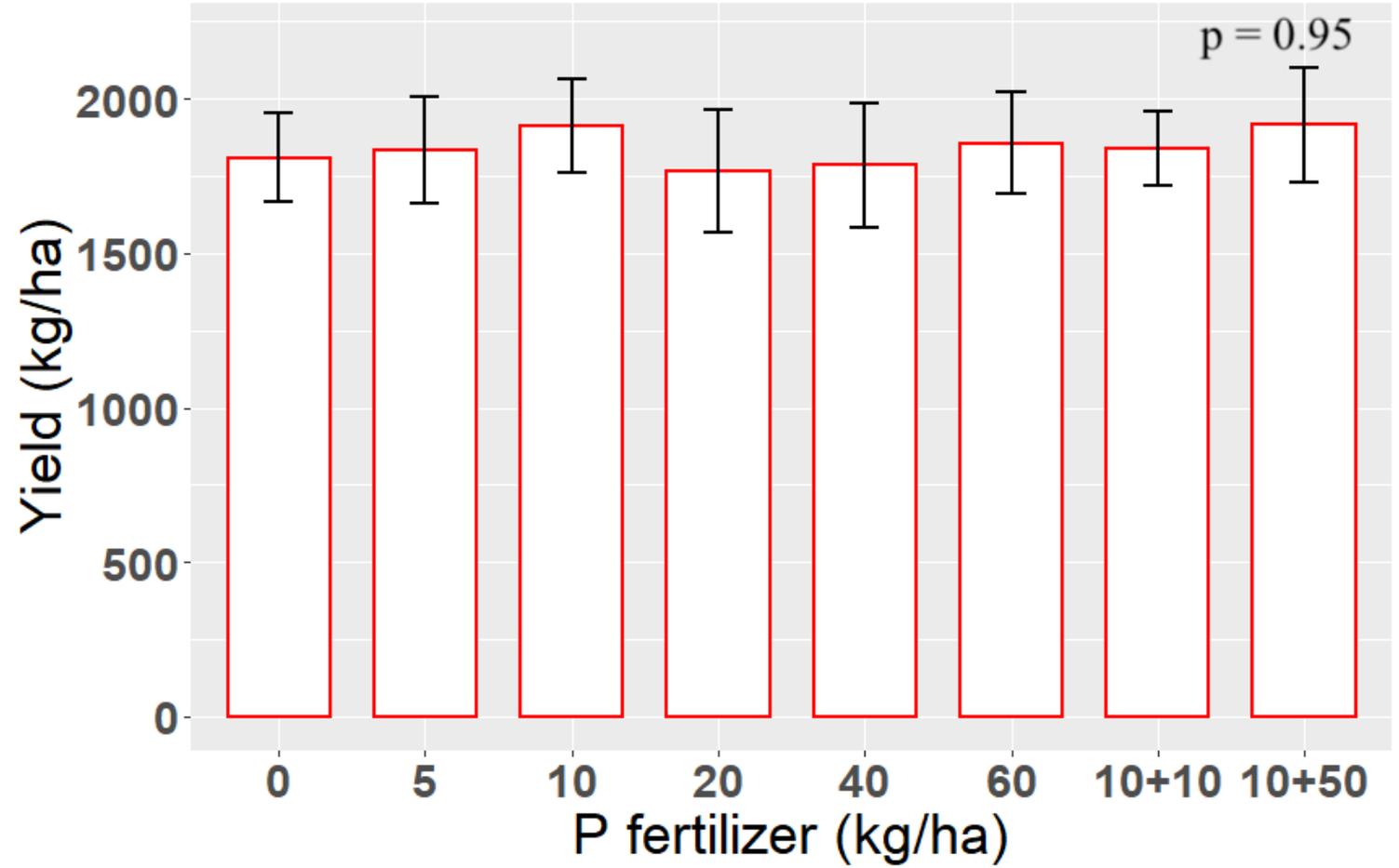




PP hemp  
emergence  
FS 19-20



PP hemp  
yield FS 19-  
20



# Summary

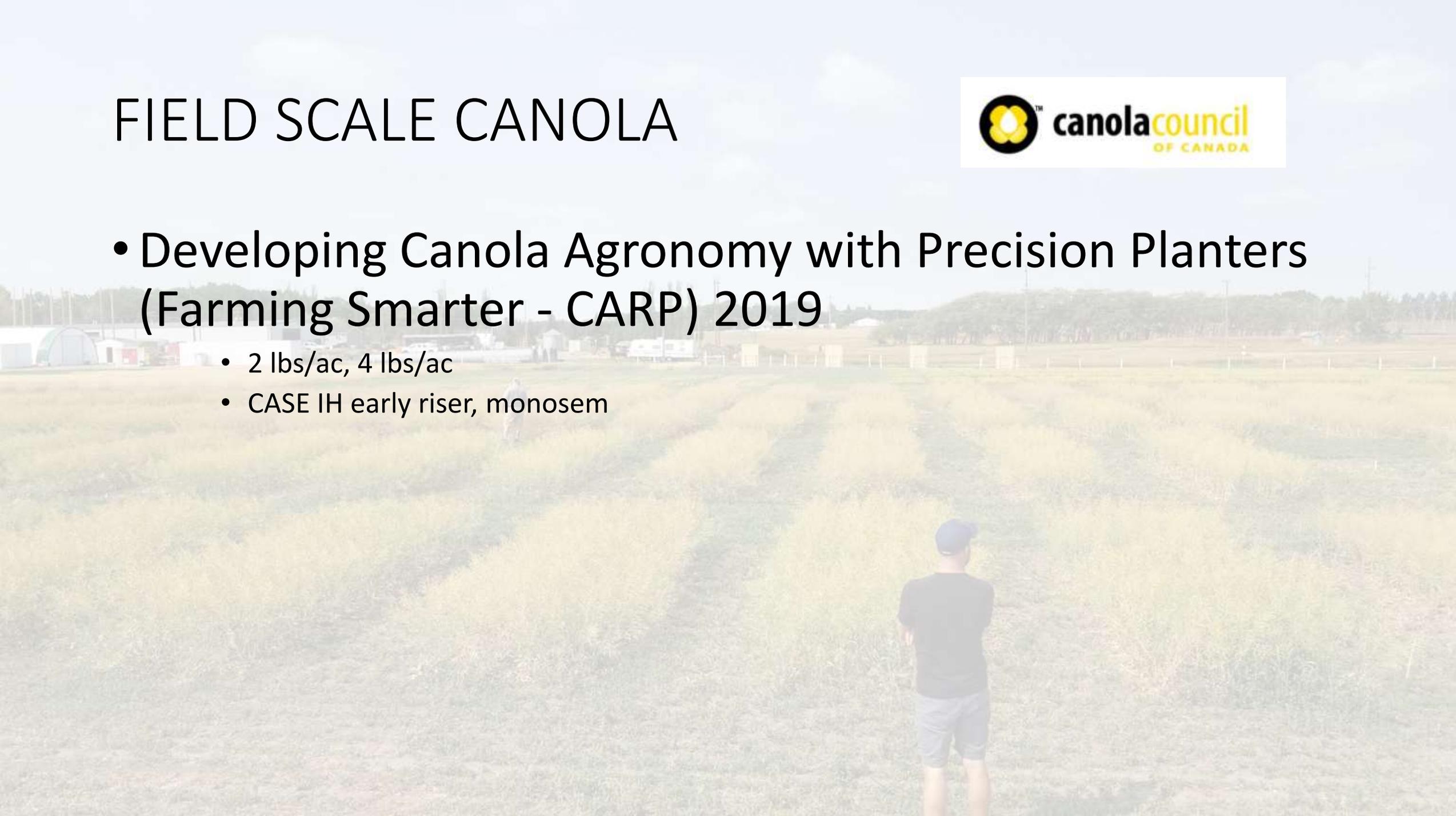
1. Crop emergence and stand density were higher for the narrow row precision planter compared to the air drill.
2. Narrow row planter performs better in irrigated or high-precipitation conditions that favor increased crop production
3. Adoption of wide row planters (20") to seed canola may lead to a significant reduction in crop yield

# FIELD SCALE CANOLA



## • Developing Canola Agronomy with Precision Planters (Farming Smarter - CARP) 2019

- 2 lbs/ac, 4 lbs/ac
- CASE IH early riser, monosem





1240 CASE IH  
EARLY RISER





1240 CASE IH  
EARLY RISE II







Seeder 2 lb/ac



Planter 2 lb/ac



Seeder 4lb/ac



Planter 4lb/ac

Seeder 2 lb/ac



Planter 2 lb/ac



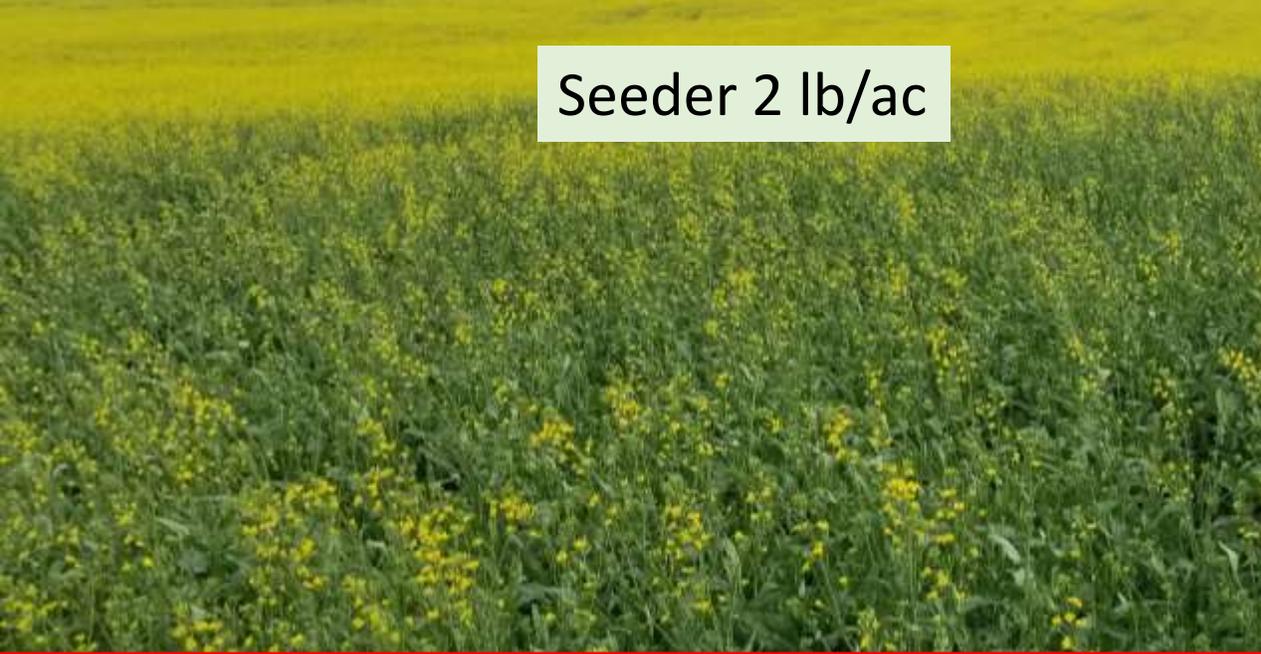
Seeder 4lb/ac



Planter 4lb/ac



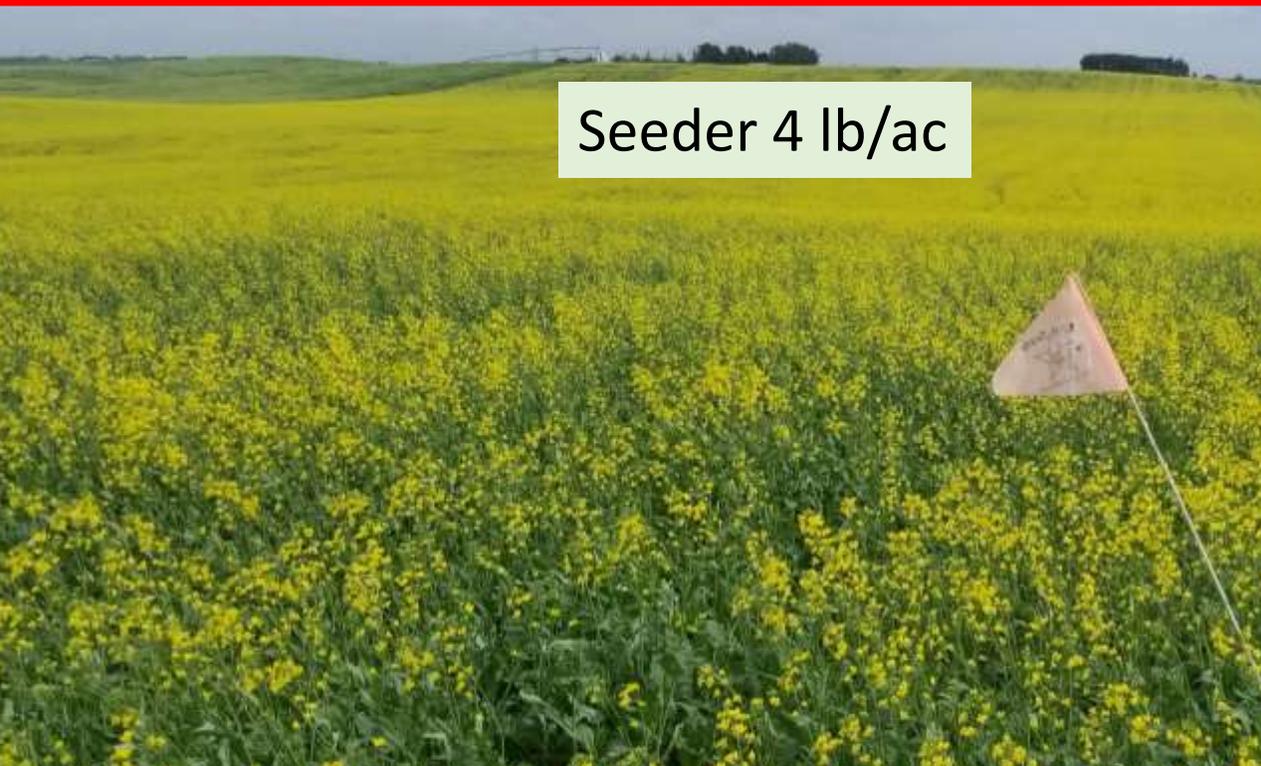
Seeder 2 lb/ac



Planter 2 lb/ac



Seeder 4 lb/ac



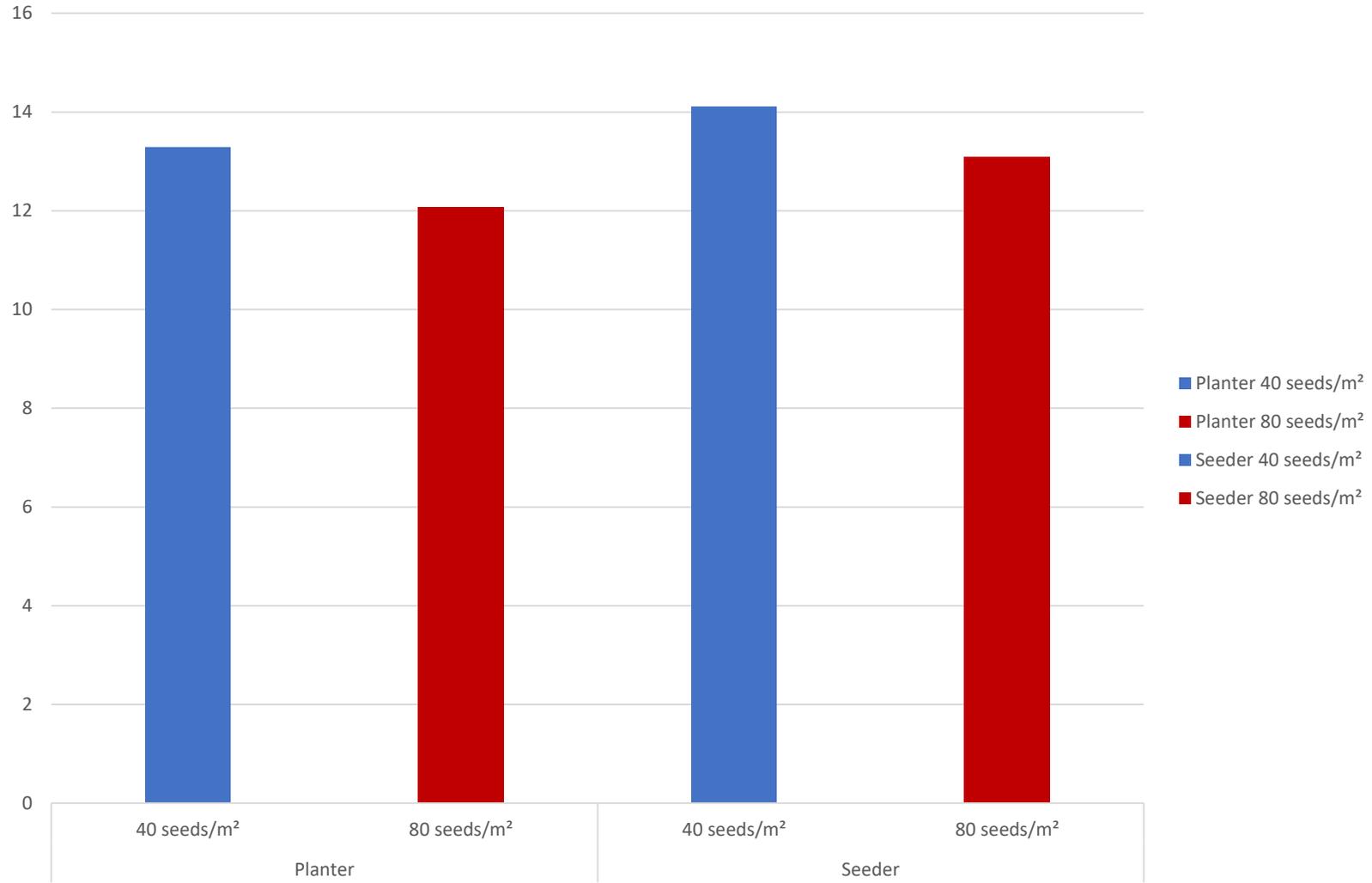
Planter 4 lb/ac







# Dryland Yield



# Irrigated Yield

