

# **IHARF Winter Meeting**

**Oat and Weed Competition**

**Intercropping**

**Chickpea and flax**

**Camelina and Lentil**

**Cover crops – hemp and sunflower**

**Canaryseed – Chloride and Slope**



# **Competitive Ability of Oat Cultivars**

**William May and Chris Willenborg**

**AAFC**

**and University of Saskatchewan**



# Locations

- Indian Head
- Saskatoon
- Melfort



# Funding

**ADF**

**WGFR**

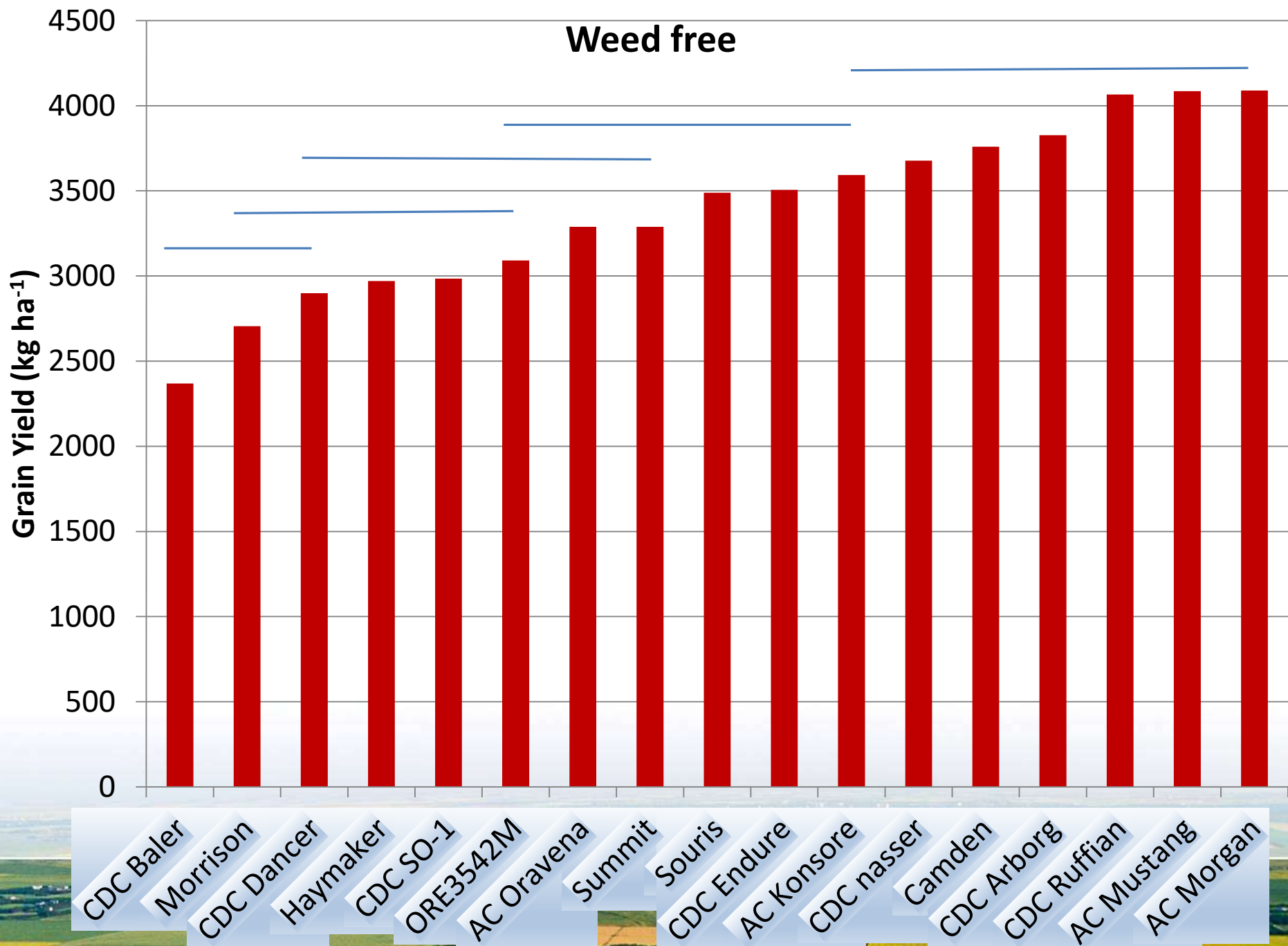


# Experimental Design

- 1) **Cultivar -17 cultivars selected**
- 2) **Weed Presence**  
**yes or no – using canola as a weed**



# Weed free

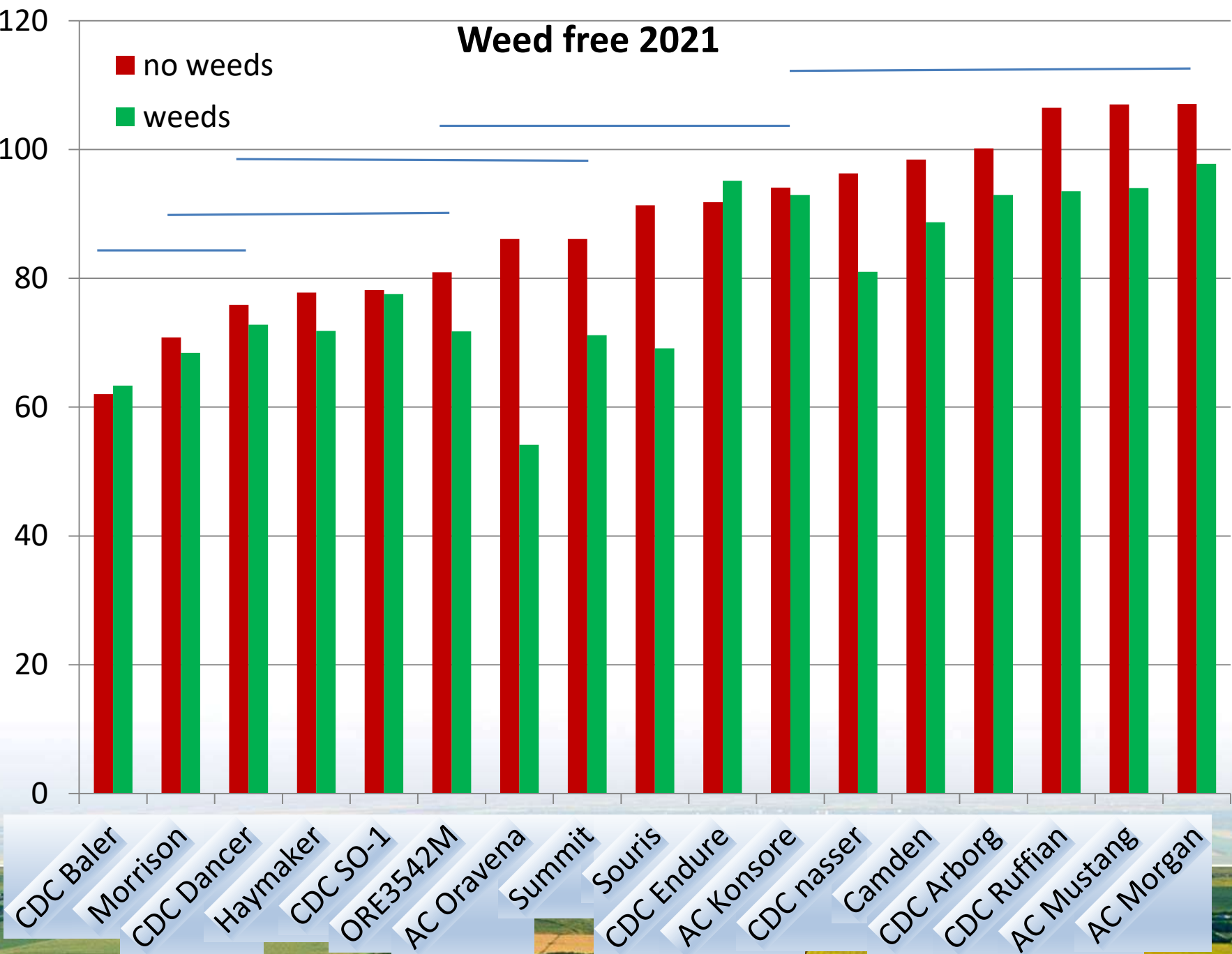




# Weed free 2021

- no weeds
- weeds

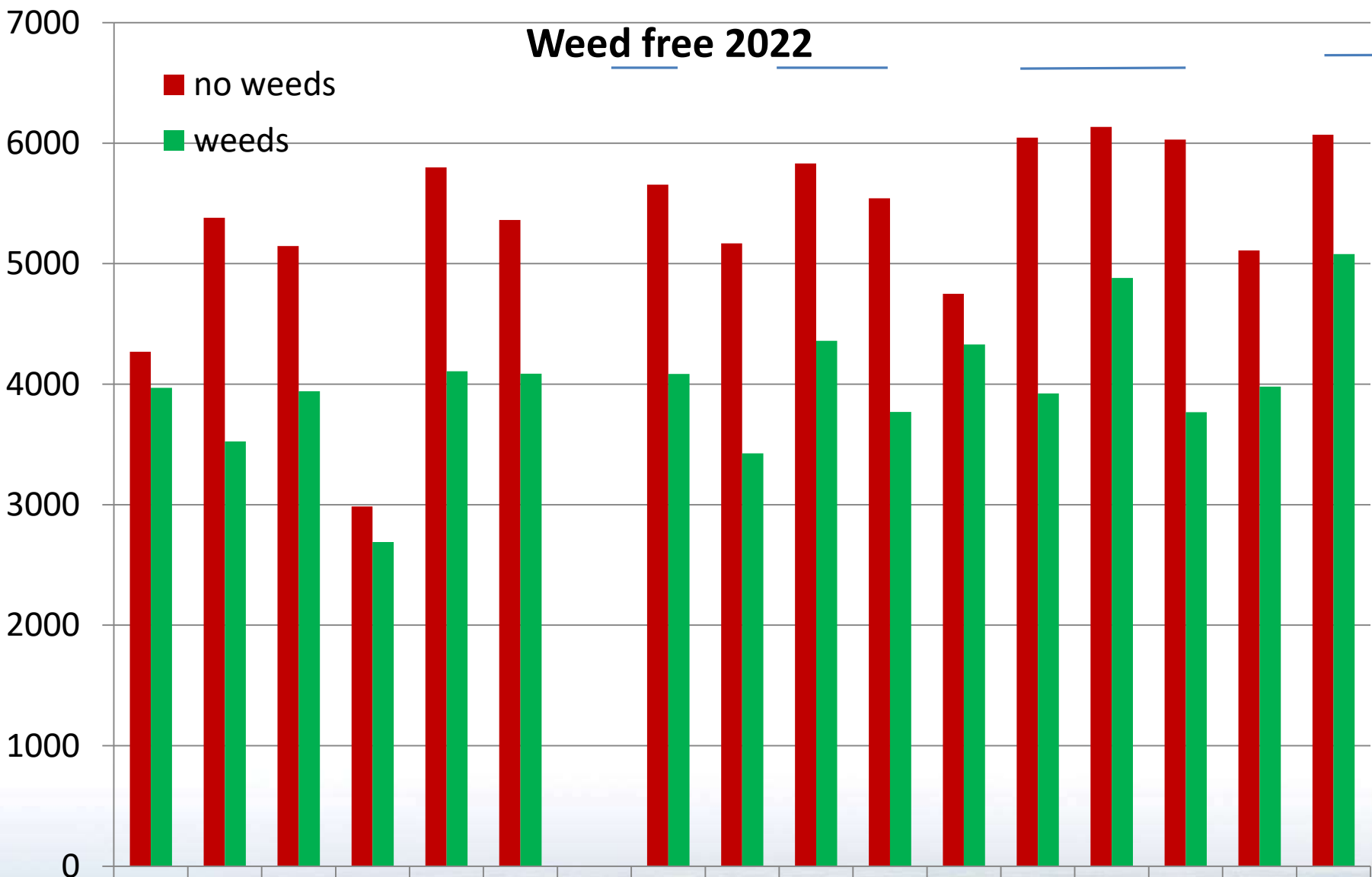
Grain Yield (bu acre<sup>-1</sup>)



# Weed free 2022

■ no weeds  
■ weeds

Grain Yield (kg ha<sup>-1</sup>)

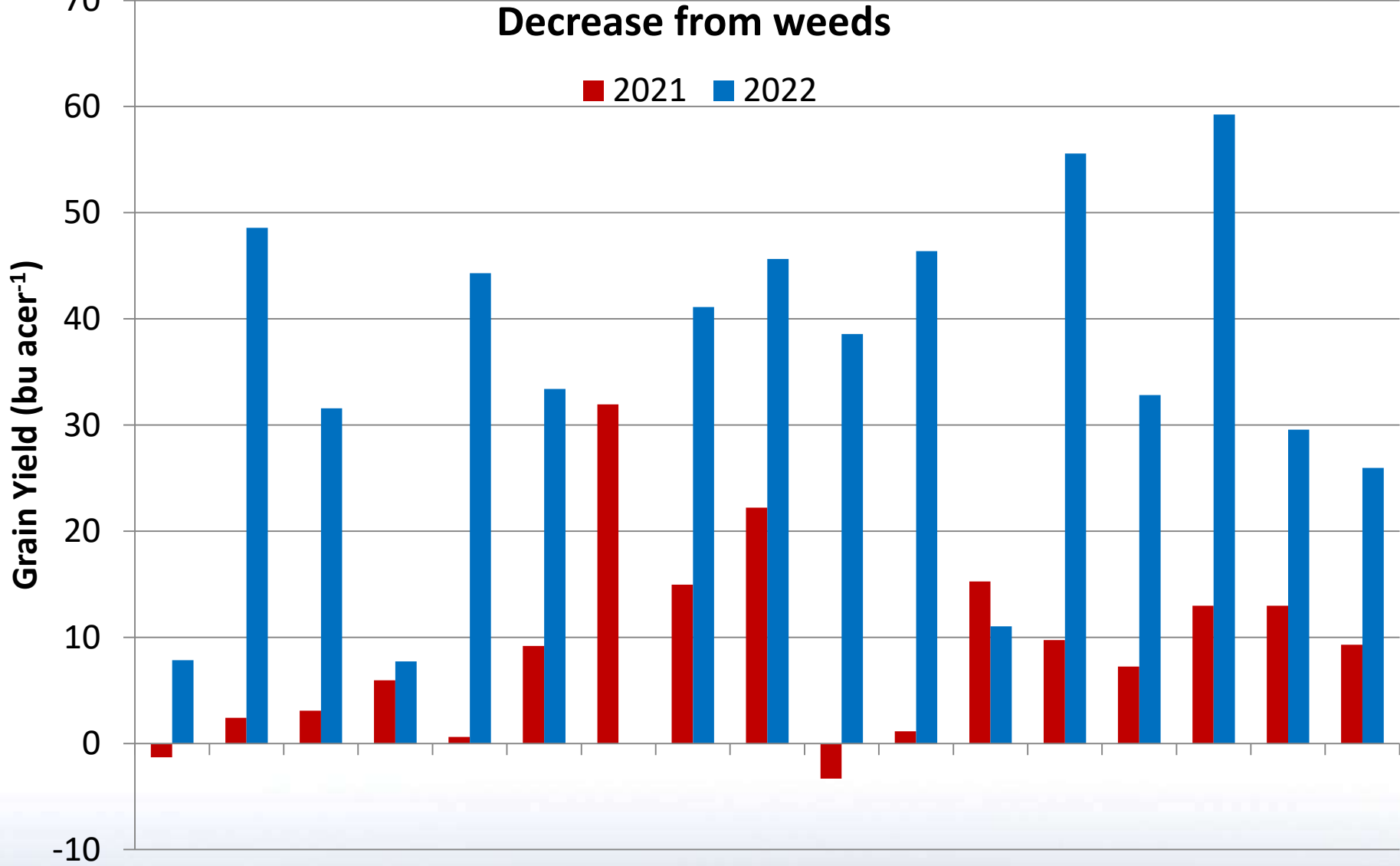


CDC Baler  
Morrison  
CDC Dancer  
Haymaker  
CDC SO-1  
ORE3542M  
AC Oravena  
Summit  
Souris  
CDC Endure  
AC Konsore  
CDC nasser  
Camden  
CDC Arborg  
CDC Ruffian  
AC Mustang  
AC Morgan



# Decrease from weeds

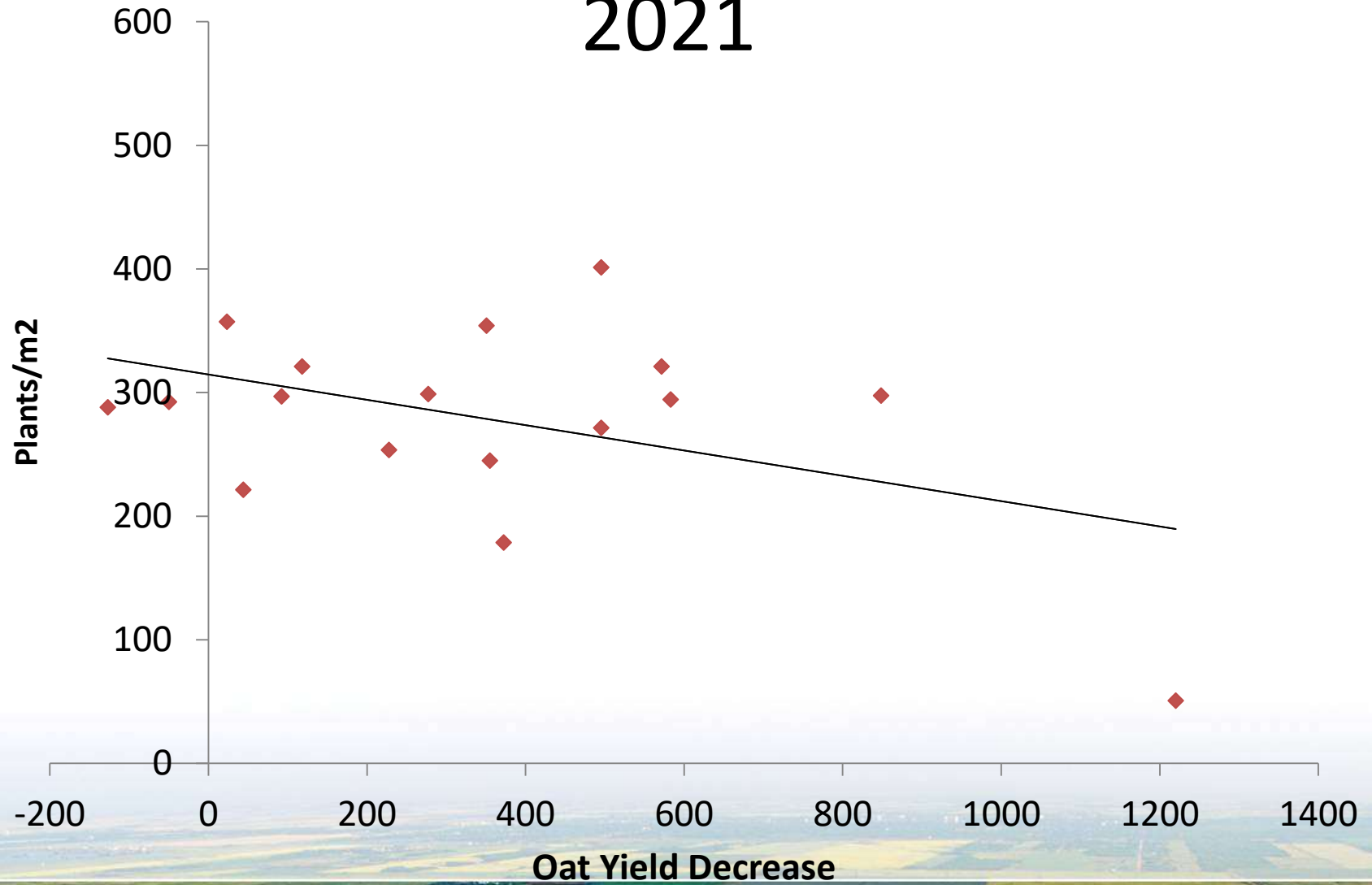
2021 2022



CDC Baler  
Morrison  
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Haymaker  
CDC SO-1  
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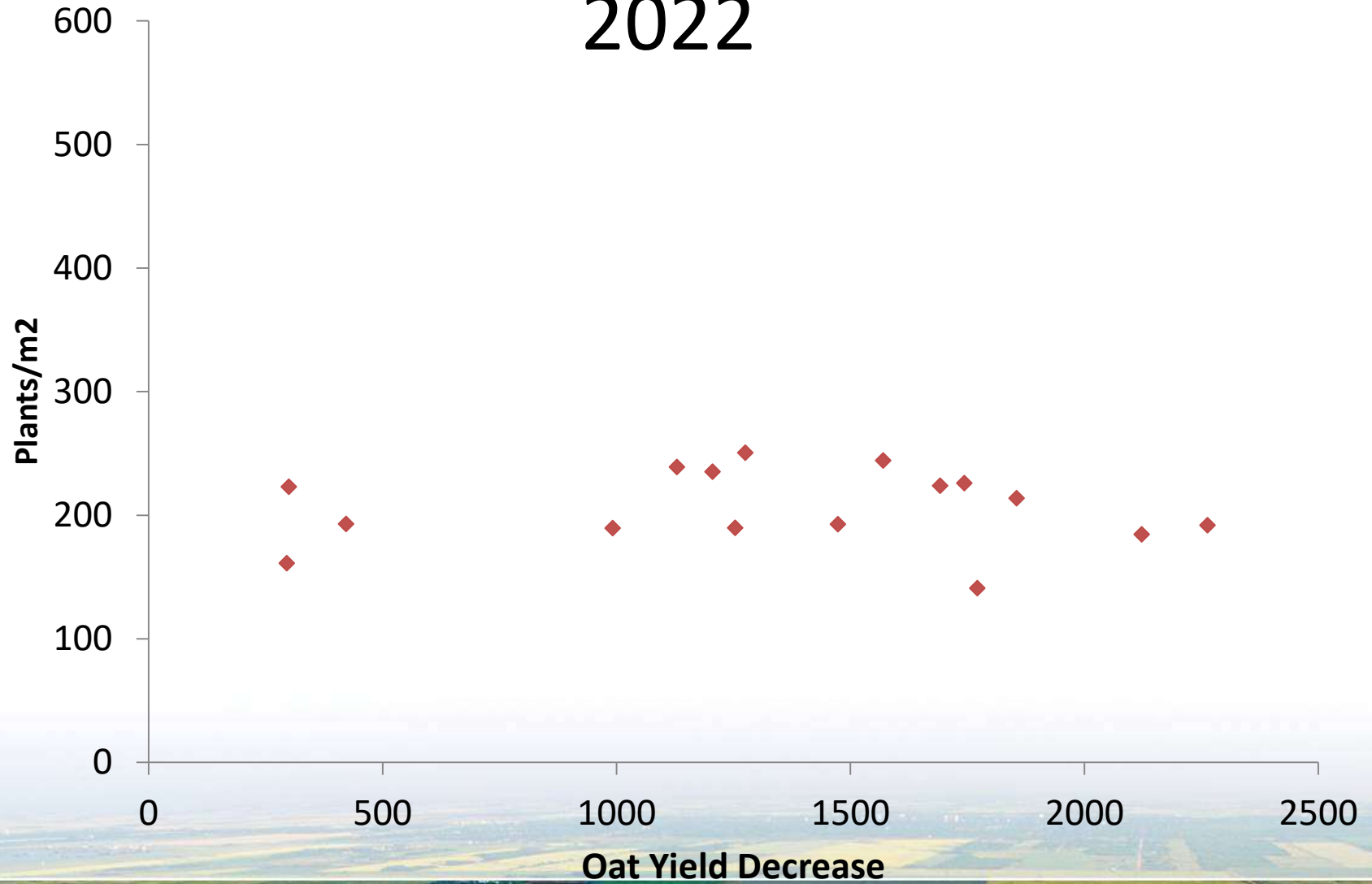
# Oat Plant Density vs Yield decrease

## 2021

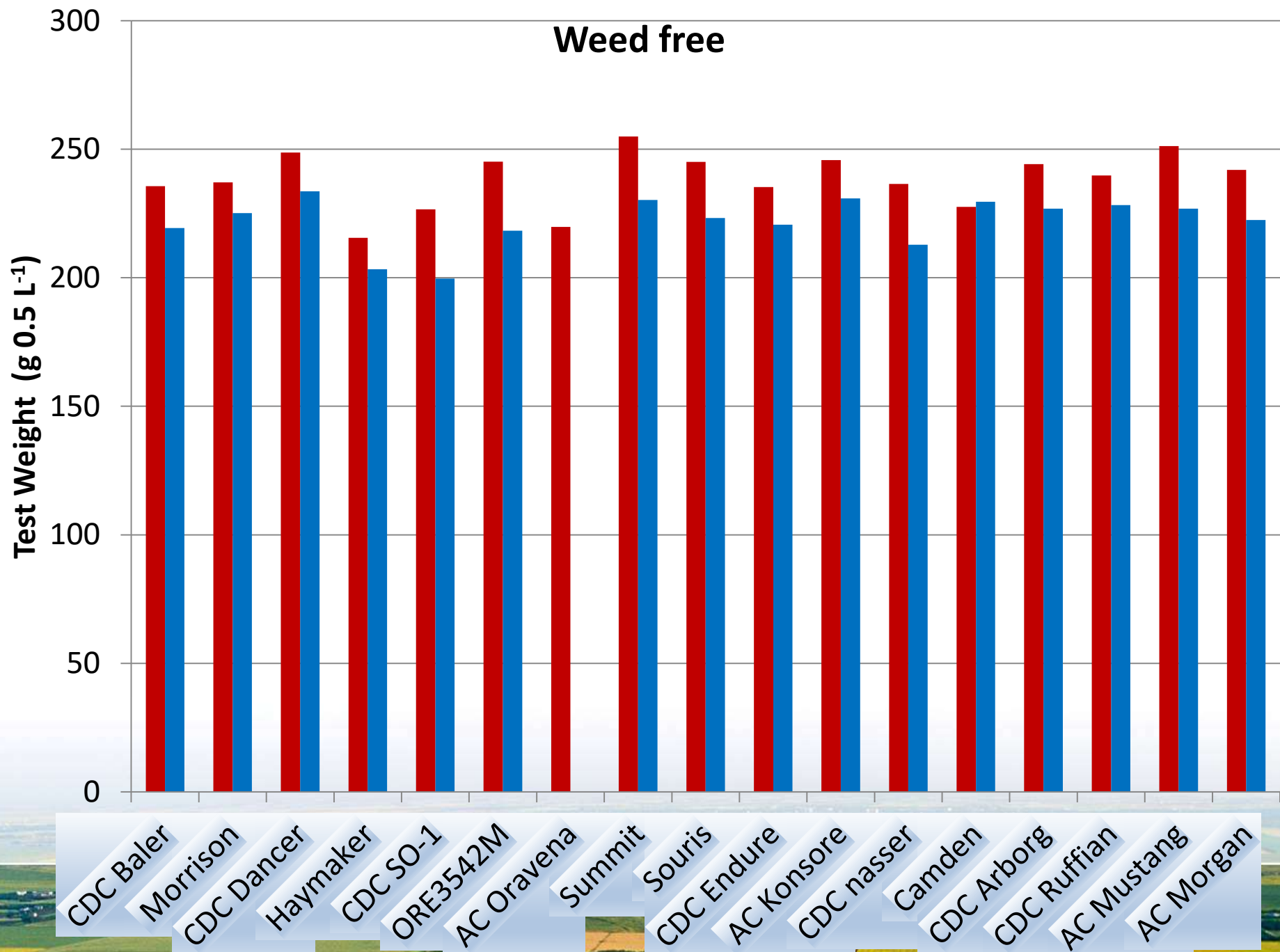


# Oat Plant Density vs Yield decrease

## 2022



# Weed free



# Preliminary Conclusions

- Variation from a weed (canola) on grain yield of a cultivar varied by environmental condition
- Test weight of cultivars not as affected by weeds



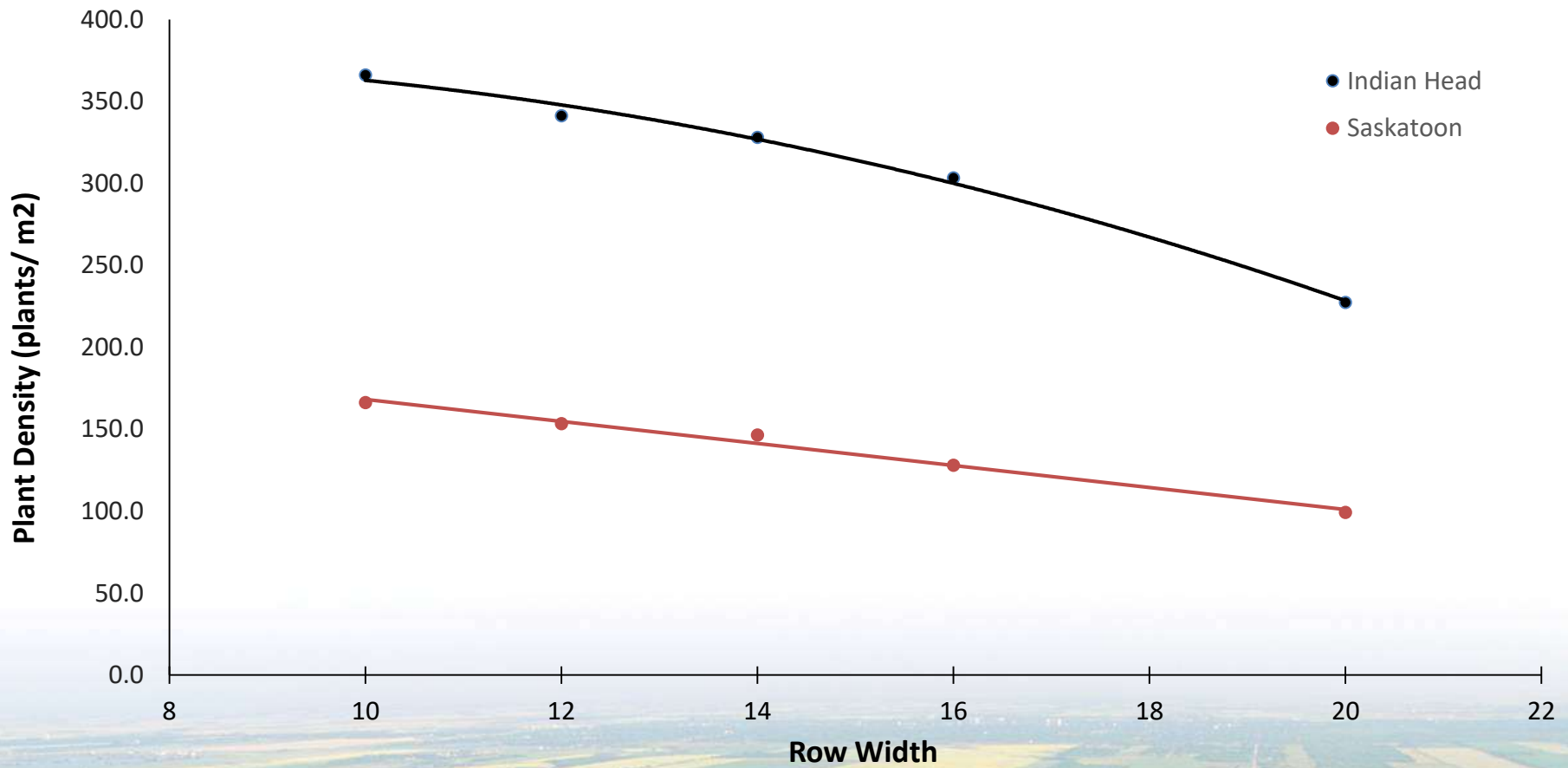
# Experimental Design

- 1) **Weed density**  
**0, 13 and 26 canola/m<sup>2</sup>**
- 2) **Row spacing**  
**10, 12, 14, 16 and 20 inches**
- 3) **Cultivar**  
**AC Morgan and CDC Endure**





# Effect of Row Spacing on Oat Density



10

12

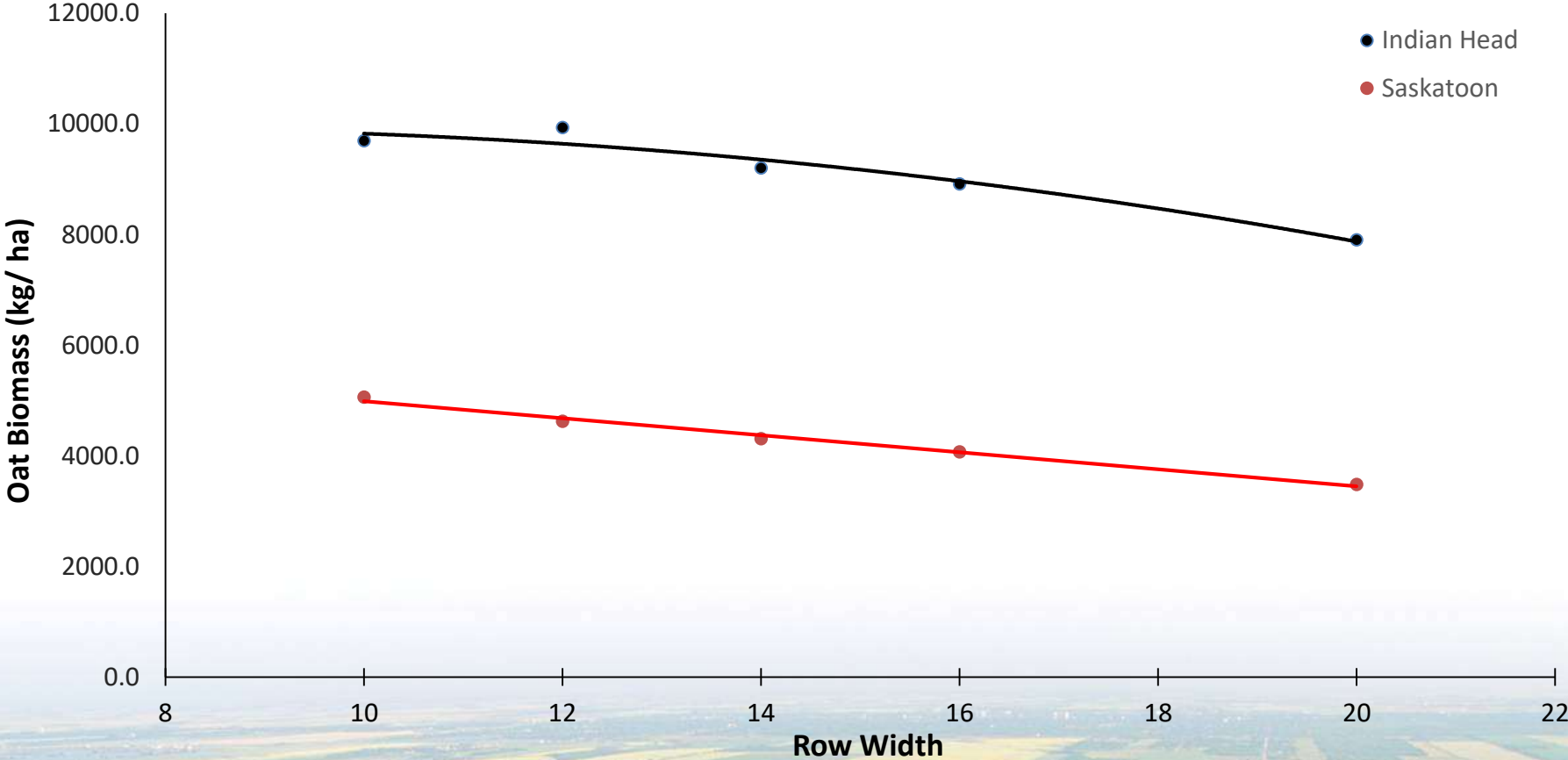
14

16

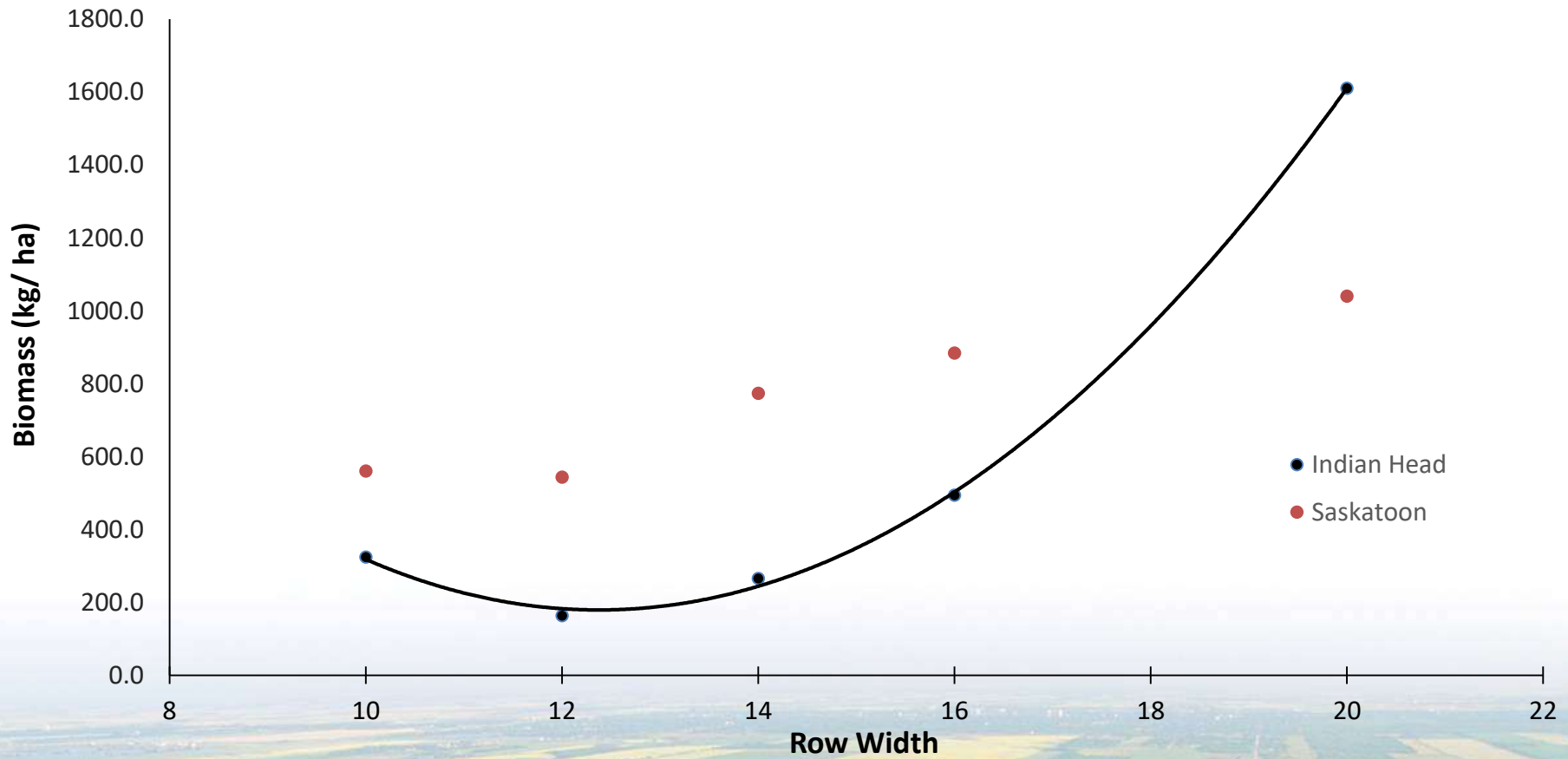
20



# Effect of Row Spacing on Oat Biomass

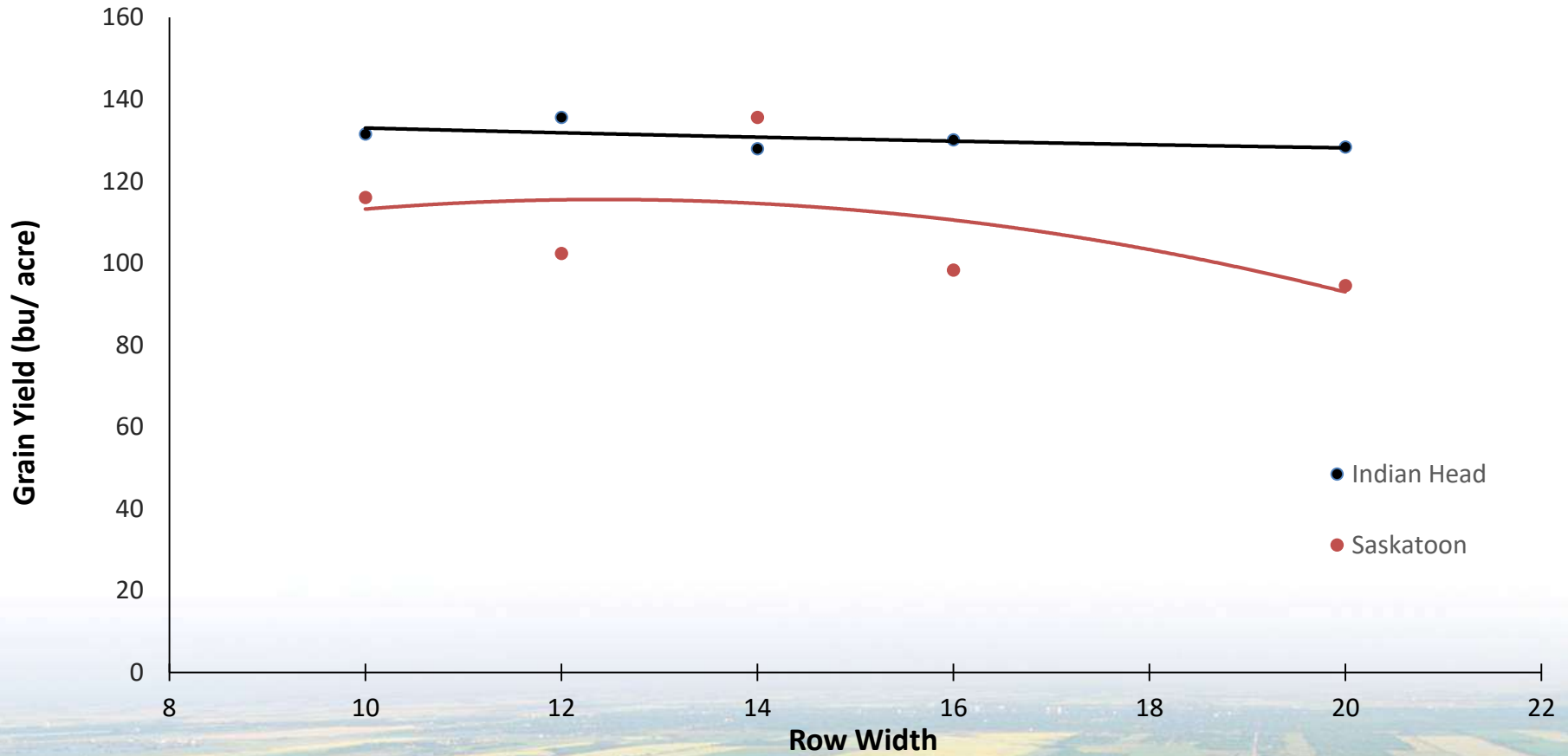


# Effect of Row Spacing on Canola Biomass





# Effect of Row Spacing on Oat Yield



- Just getting started





# INTERCROPPING

## Chickpea and flax



Agriculture and  
Agri-Food Canada

Agriculture et  
Agroalimentaire Canada

Canada 

# Intercropping Chickpea and Flax

## 1) Crop Placement (special arrangement)

Intermixed (both crops in same row)

Single alternate rows

## 2) Flax seed density

(seeds m<sup>-2</sup>)                      Approx. lbs/acre

a. 0	0
b. 75	5
c. 150	10
d. 300	19
e. 600	38

## 3) Nitrogen Rate (kg ha<sup>-1</sup>)

0

60

## 4) Flax Mono Crop (2018)



# Locations

- Indian Head
- Redvers
- Swift Current
- Saskatoon
- Melfort



# Funding

**ADOPT**

**Saskatchewan Pulse Growers**

**Adopt a plot**

**Current funding**

**ADF**

**WGRF**

**Saskatchewan Flax Development Commission**







Flax (Linum catharticum)  
19/07/2018

19/07/2018

I, 300 flax, 0 N



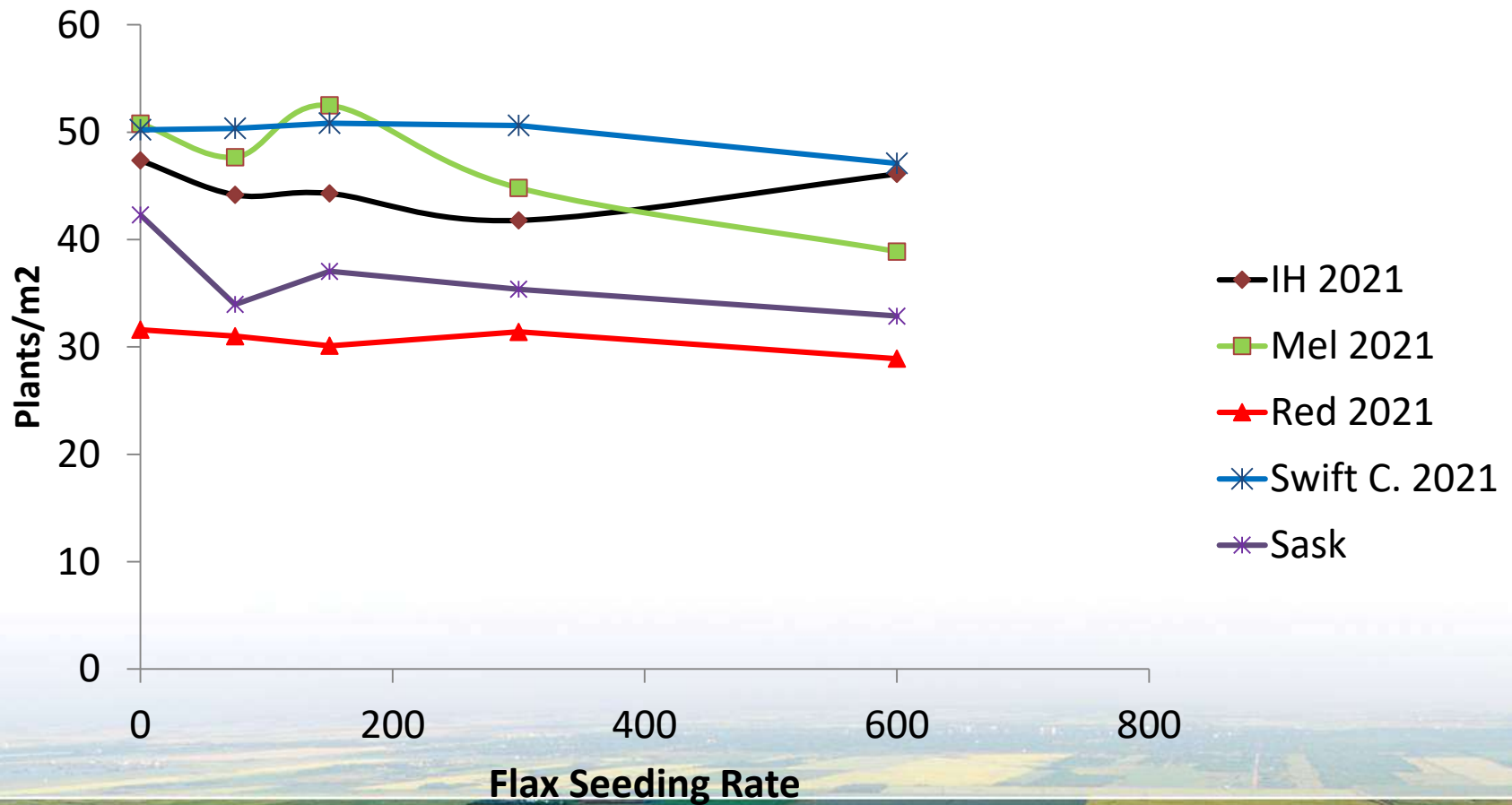


19/07/2018

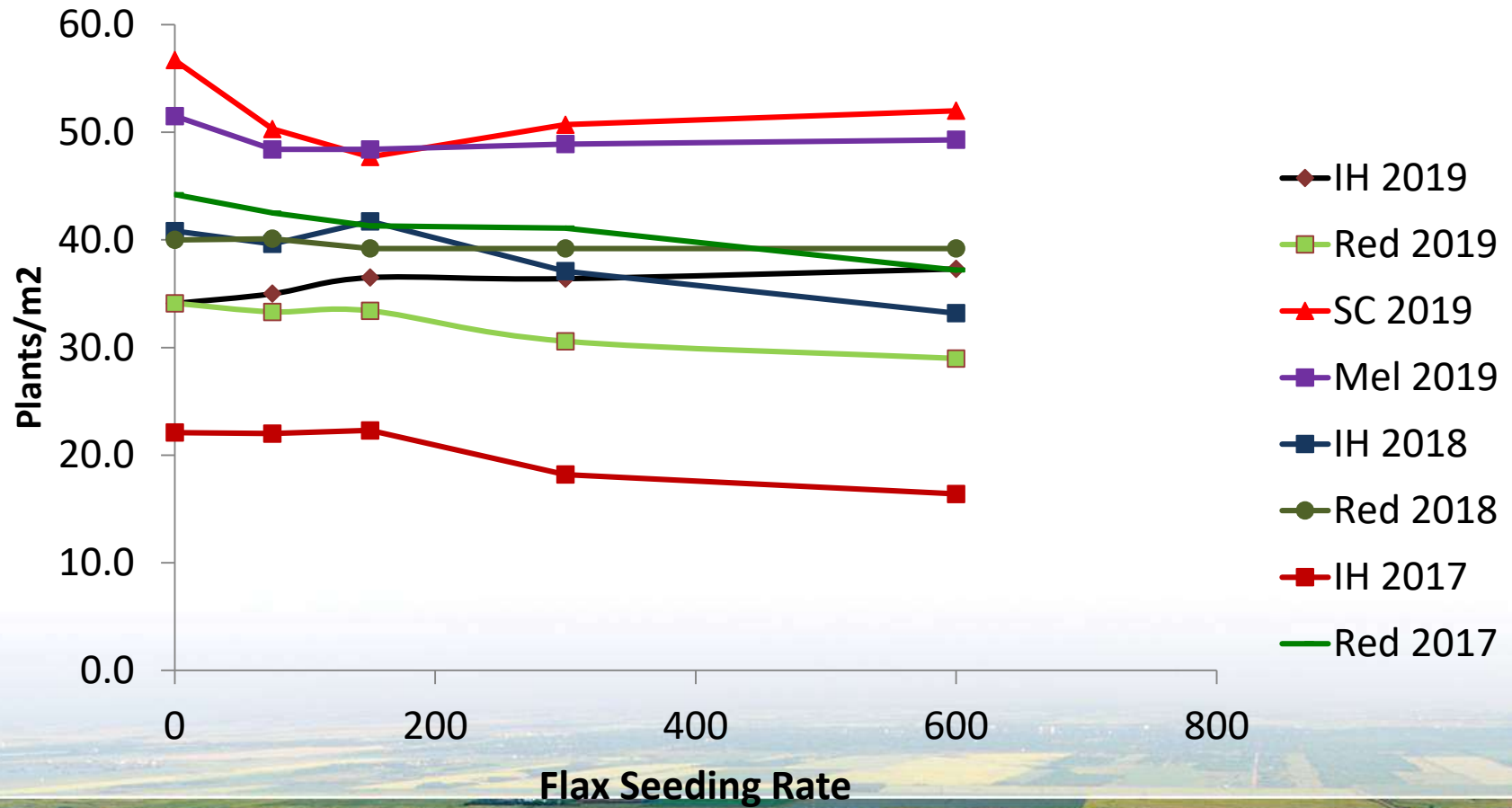
A, 300 flax, 60 N



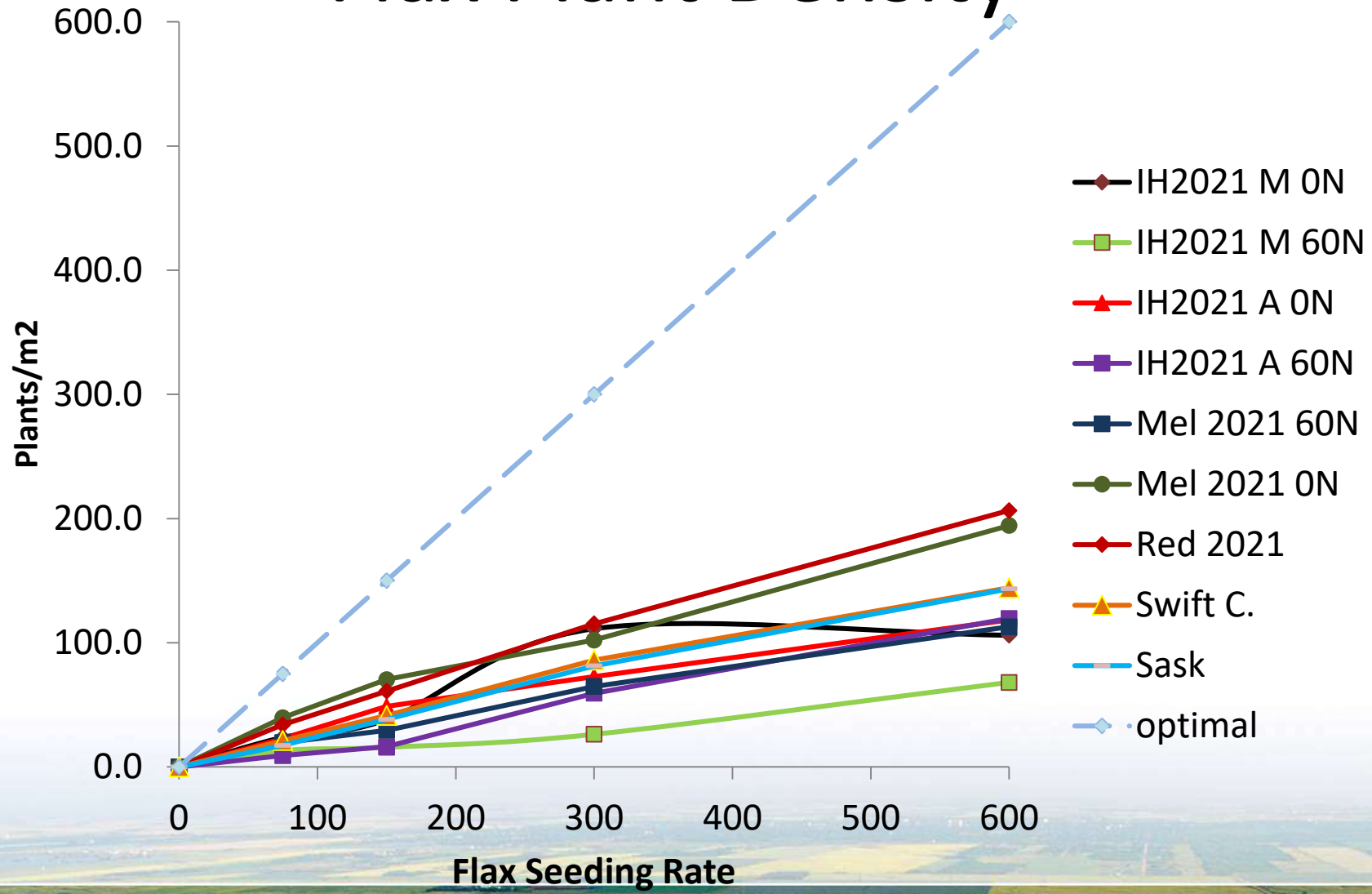
# Chickpea Plant Density



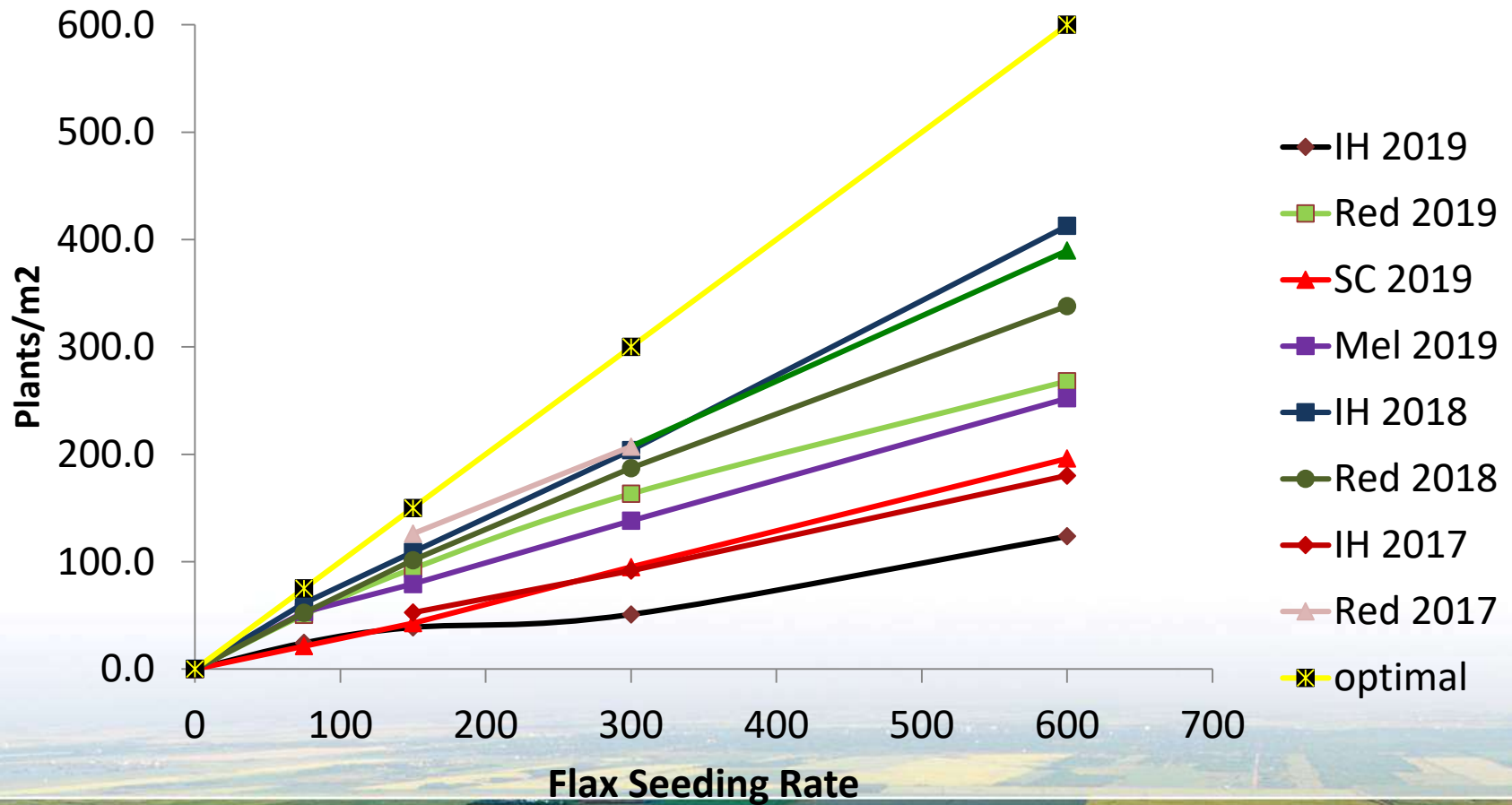
# Chickpea Plant Density



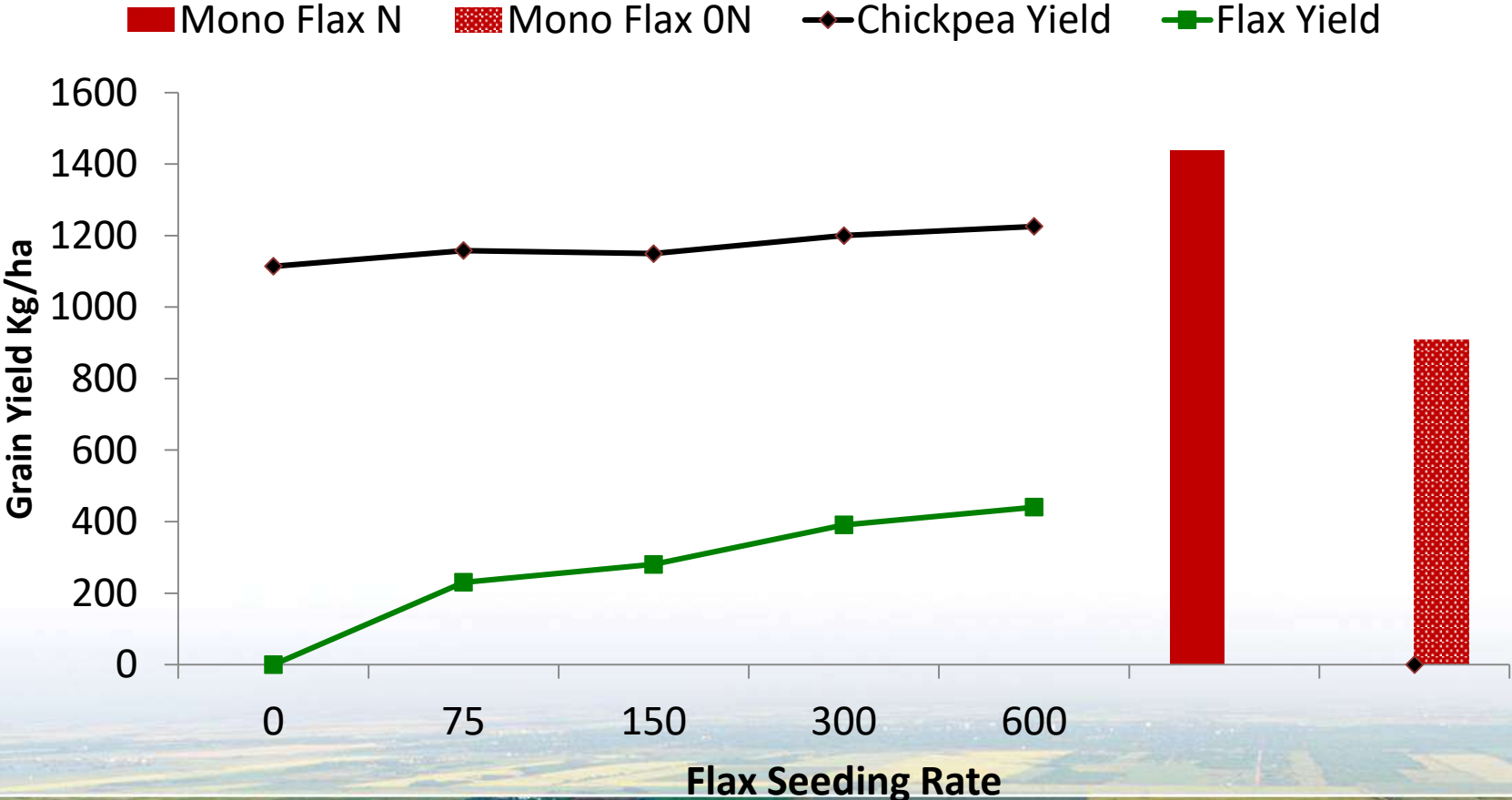
# Flax Plant Density



# Flax Plant Density

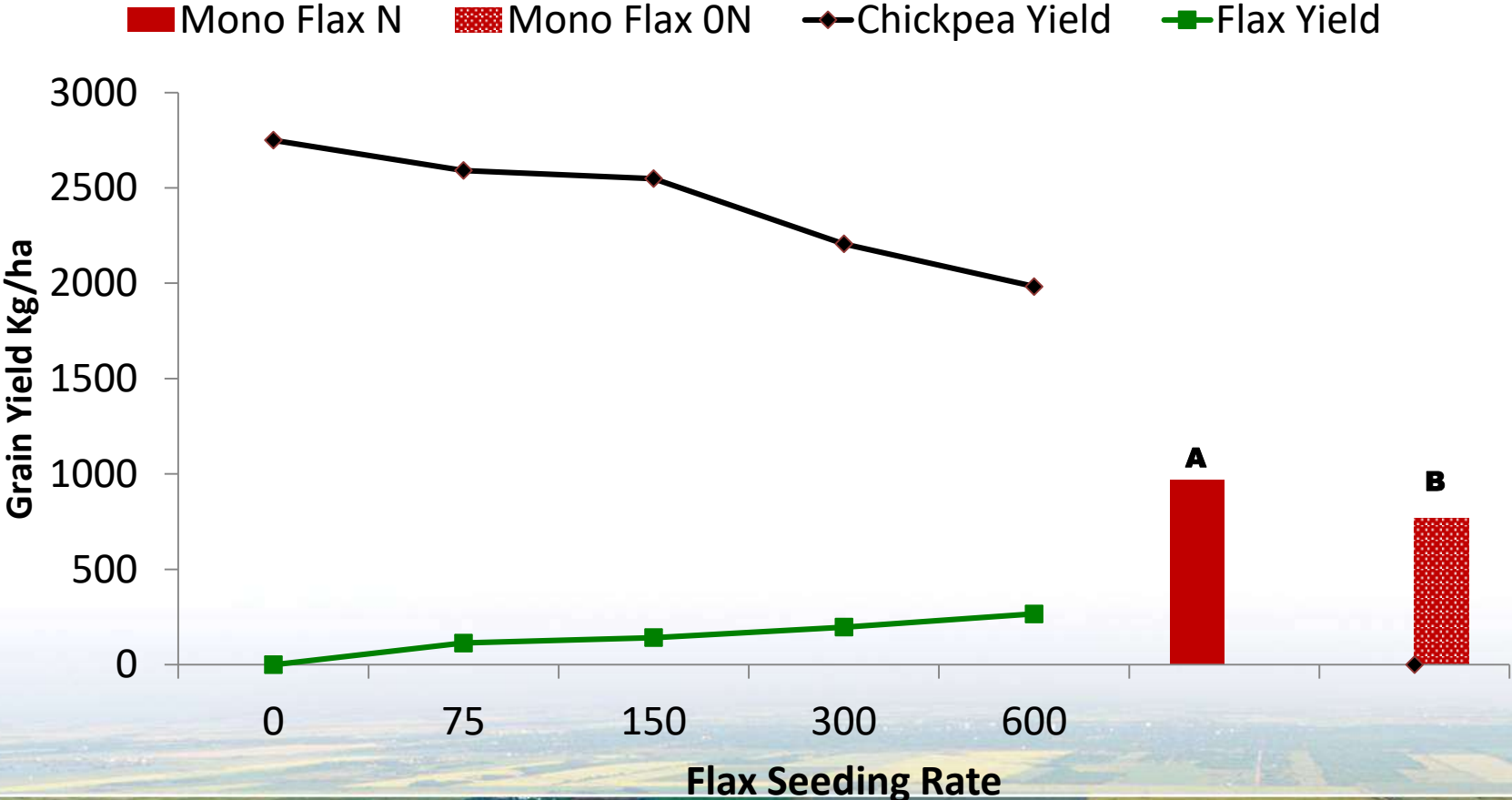


# Grain Yield Indian Head 2022



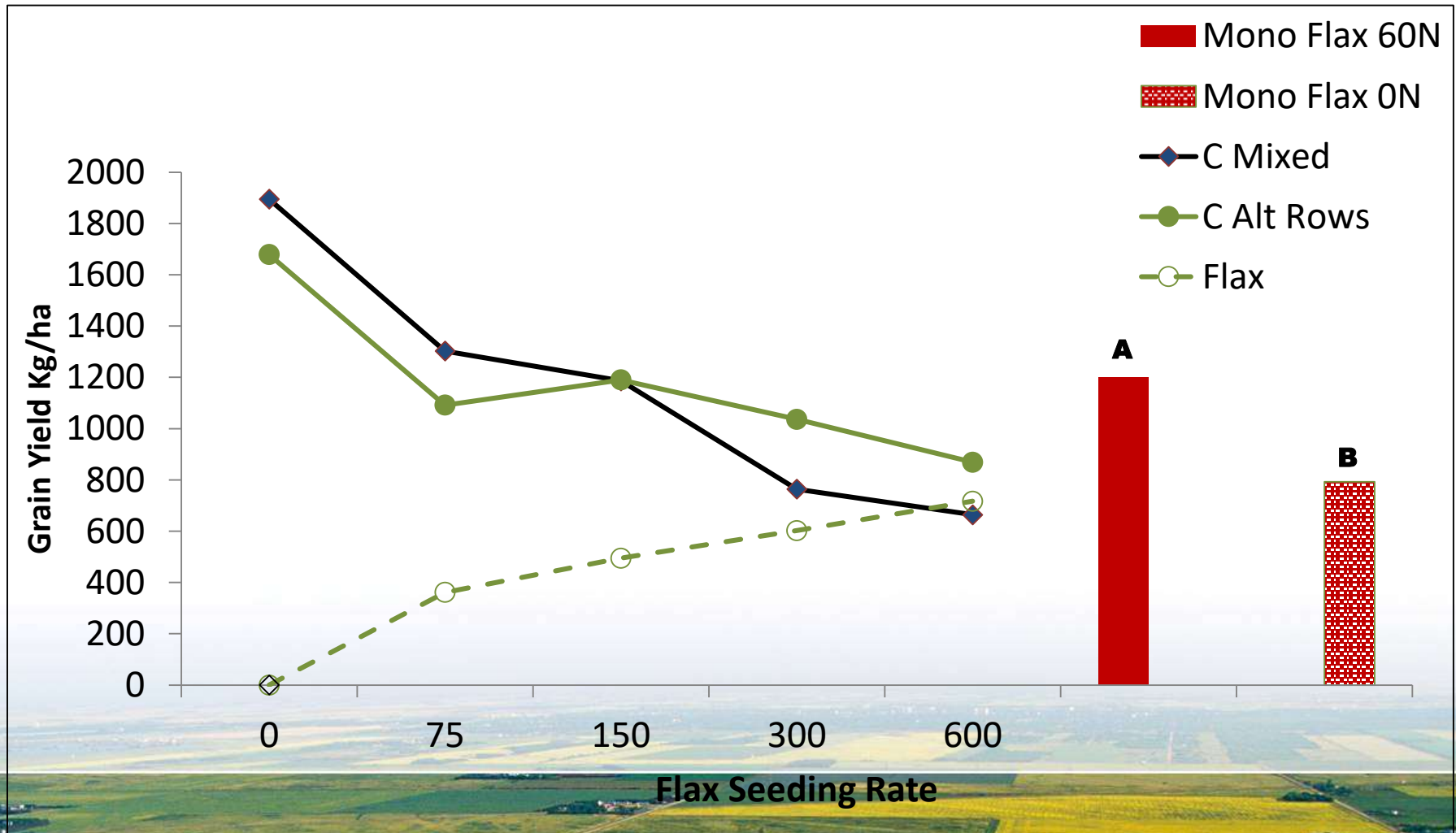


# Grain Yield Indian Head 2021

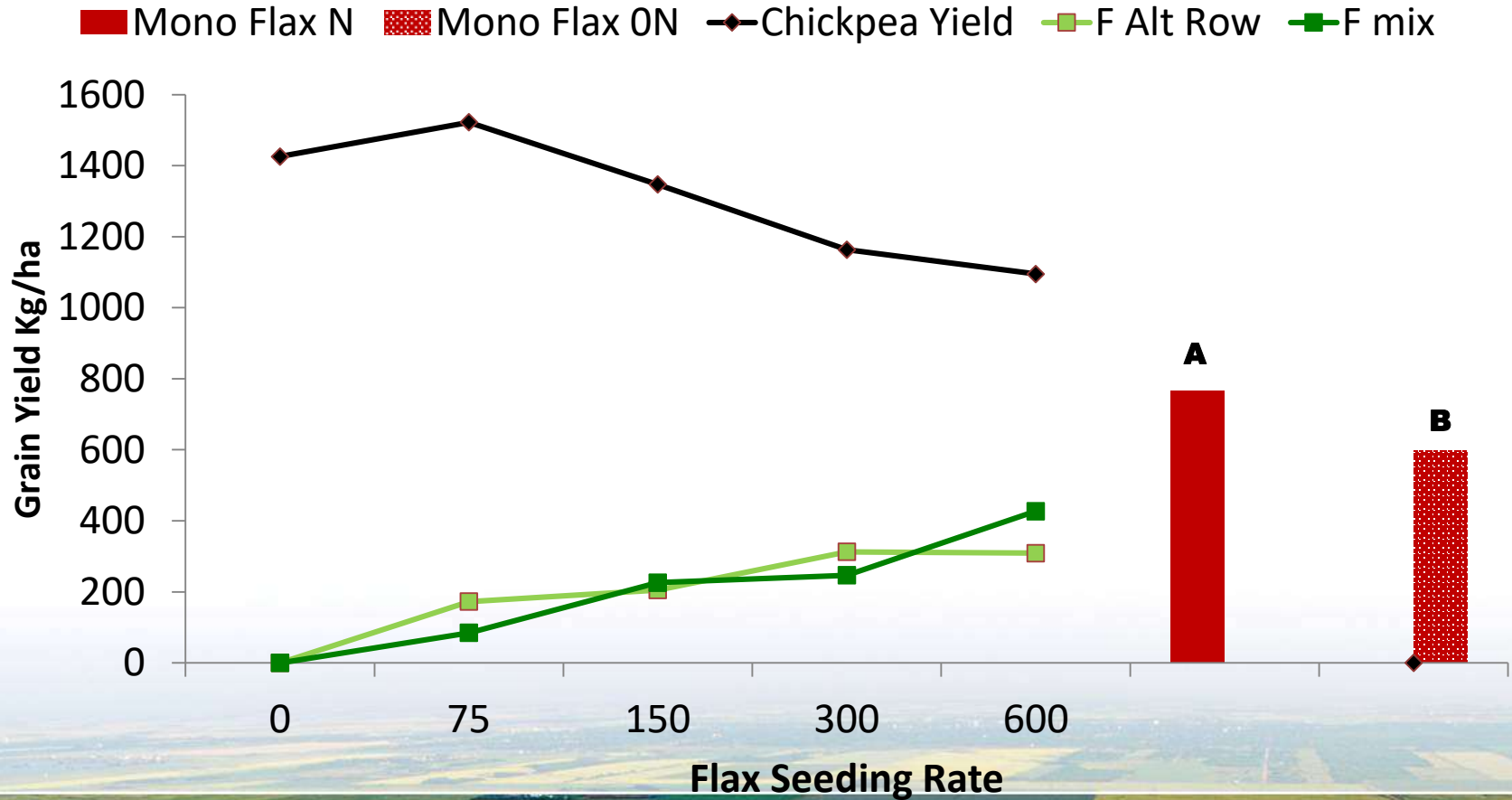




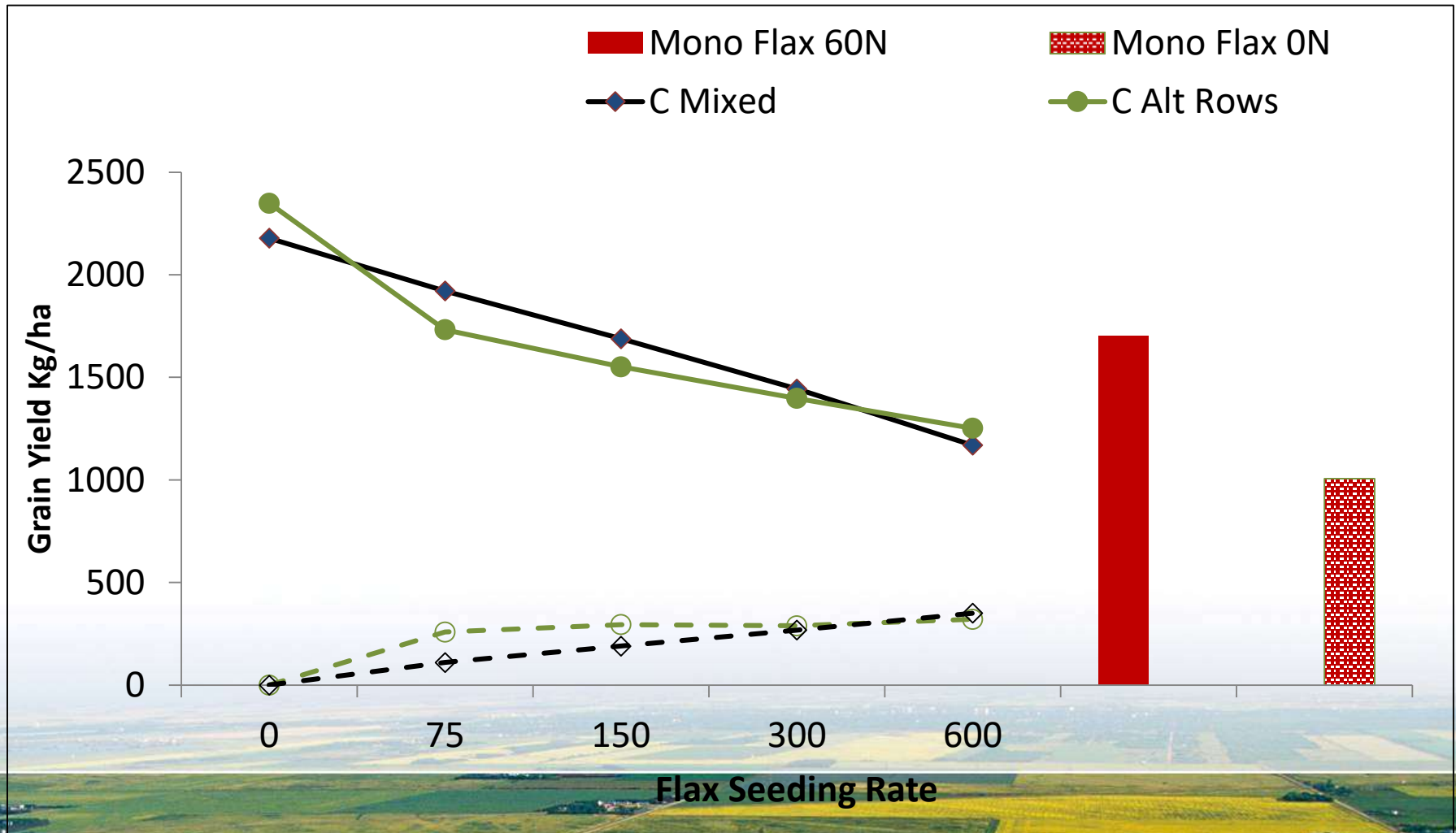
# Grain Yield Melfort 2021



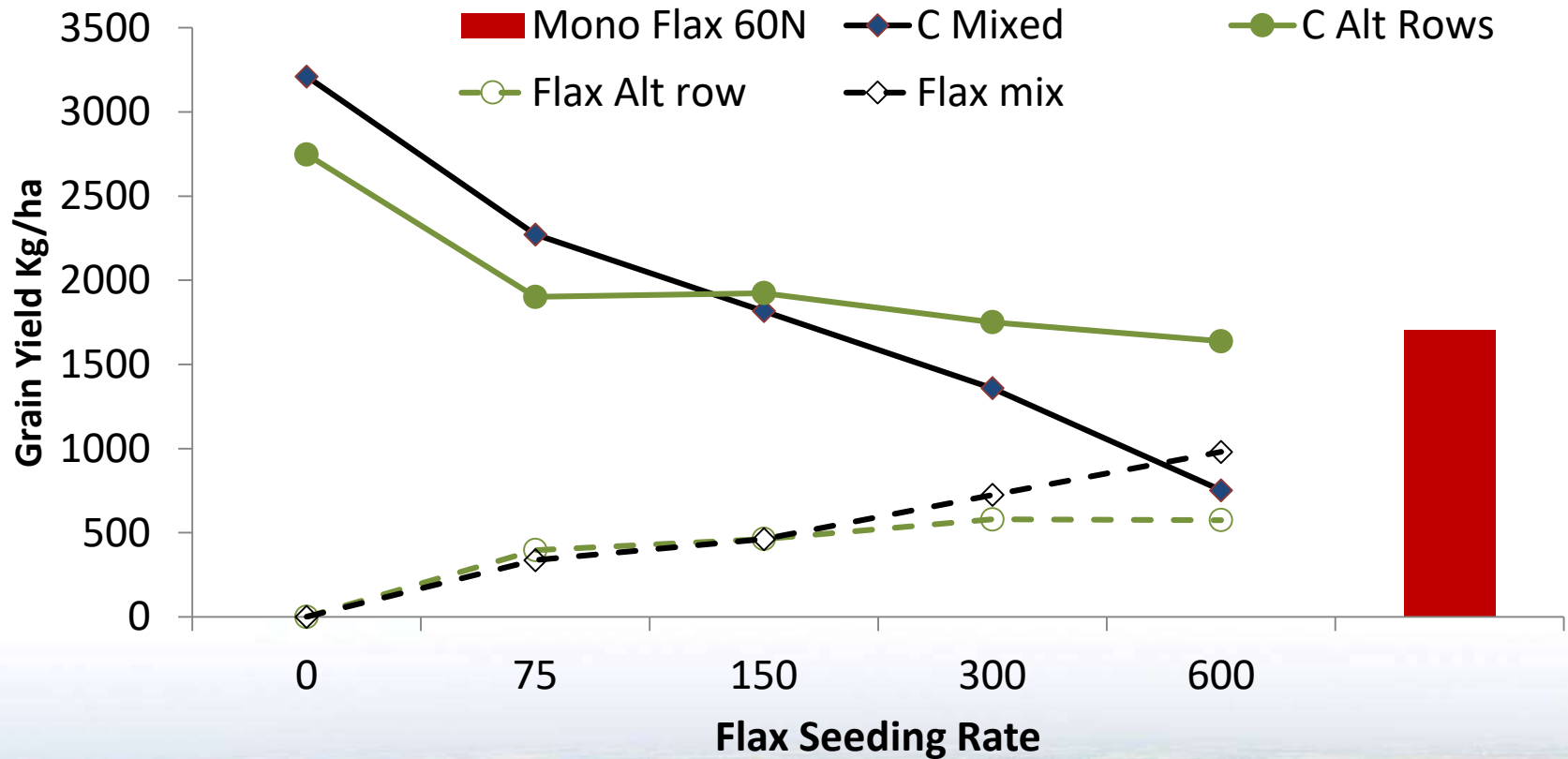
# Grain Yield Redvers 2021



# Grain Yield Indian Head 2019

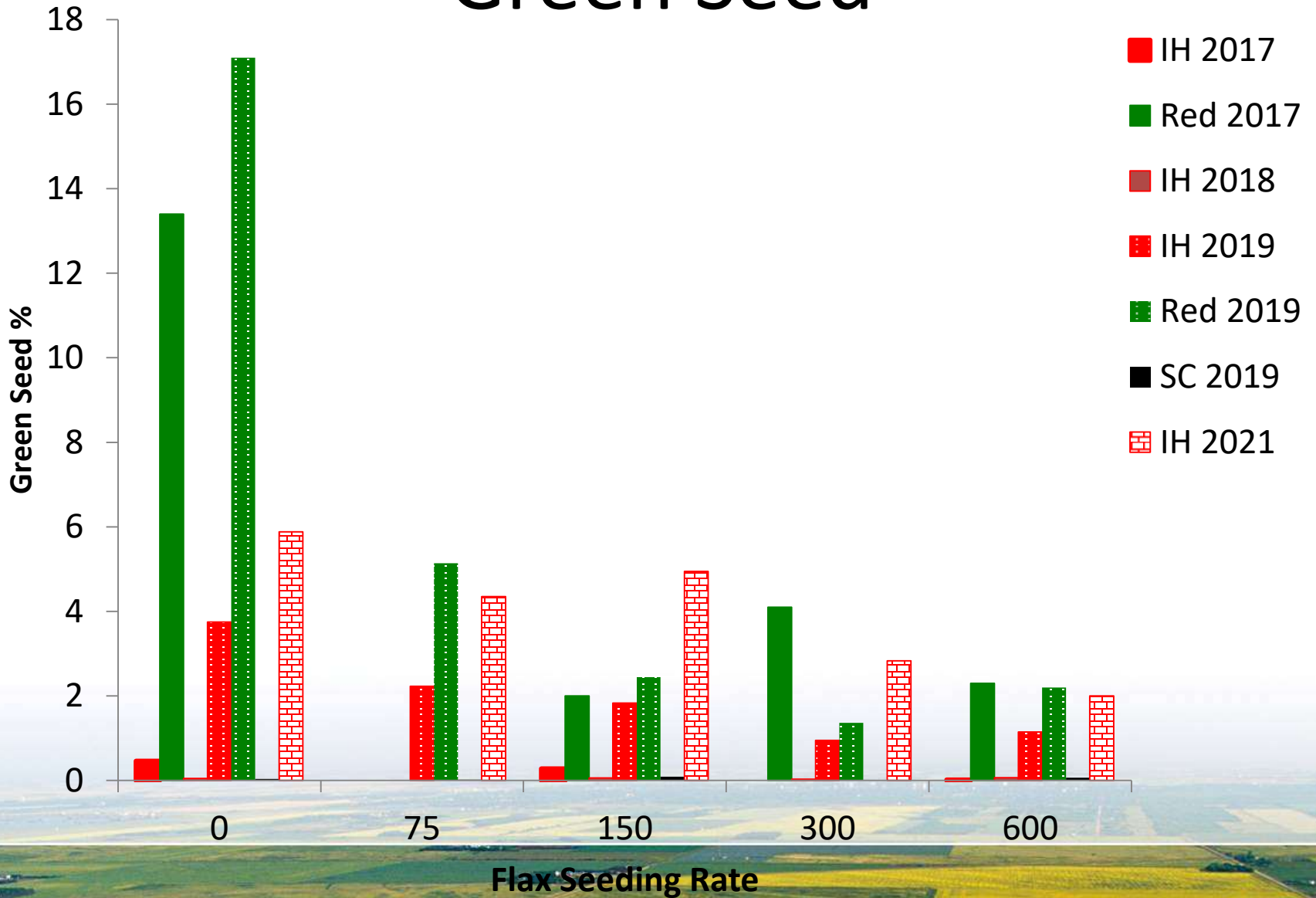


# Grain Yield Indian Head 2018

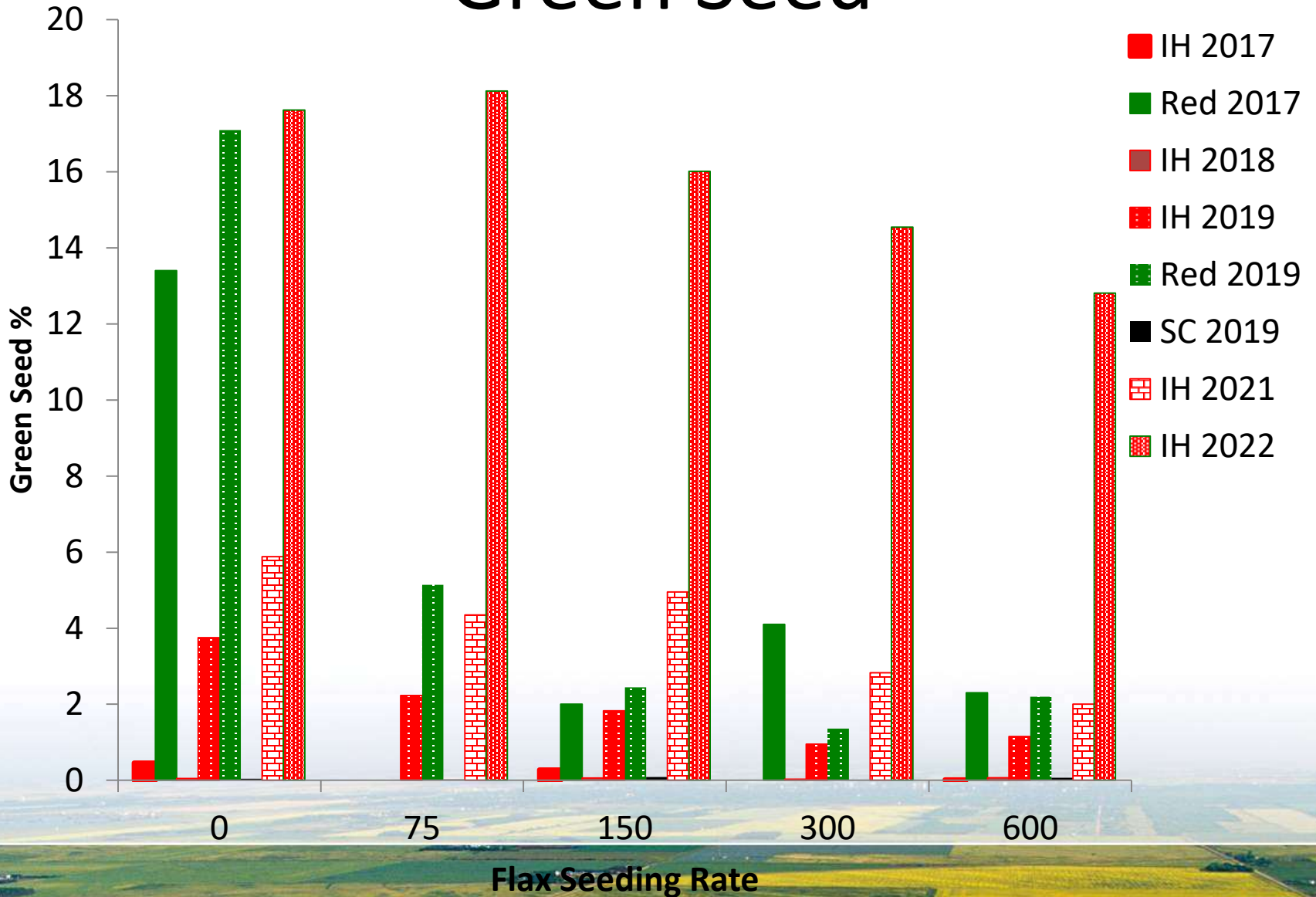




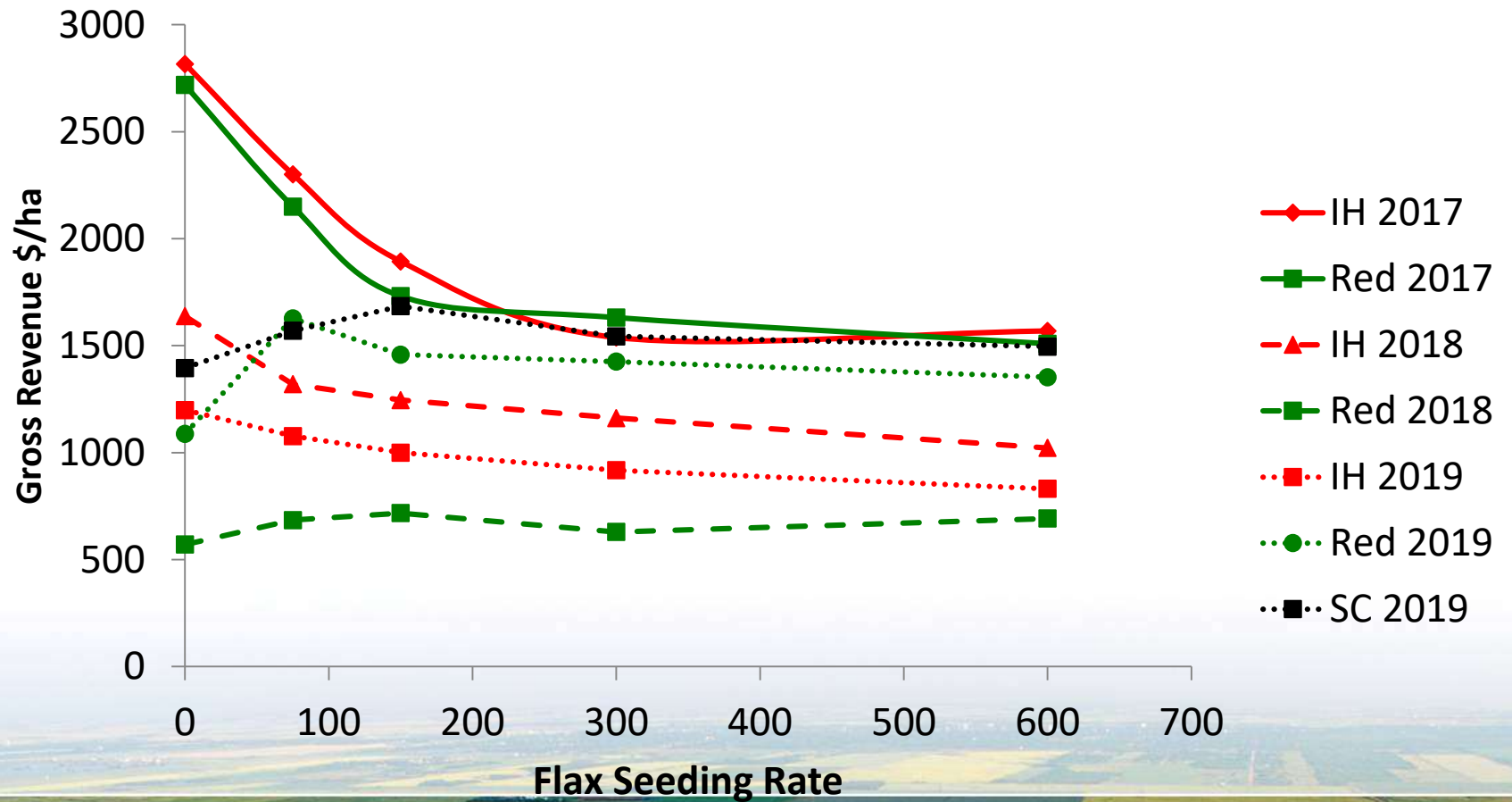
# Green Seed



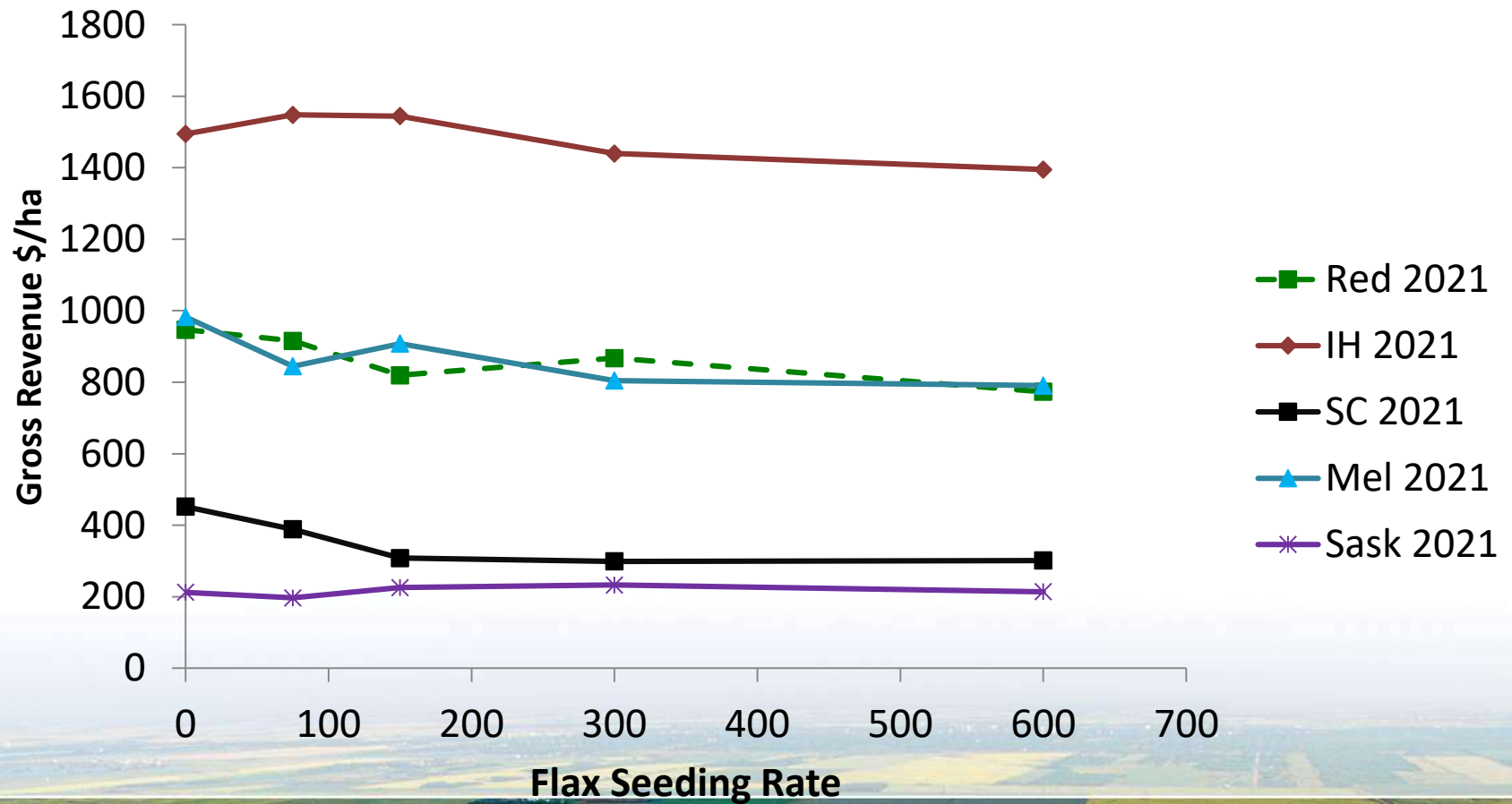
# Green Seed



# Gross Income



# Gross Income





# Conclusions

- **Need normal wet years**
- **Focus**
  - Chickpea Yield, Maturity, Green Seed
  - Flax Yield
- **Flax Seeding Rate is the Driver**



# Conclusions

- Intercropping with flax has potential as a tool to manage *Ascochyta* blight in chickpeas
- Specifically
  - ↓ incidence, even when disease pressure is low
  - ↓ severity under moderate disease



# Conclusions

- Stability of economic returns is the greatest advantage



# Intercropping Camelina and lentil

1) Lentil seeding Rate (seeds  $m^{-2}$ ):

a. 60

b. 90

c. 120

2) Nitrogen Rate ( $kg\ ha^{-1}$ )

21

75

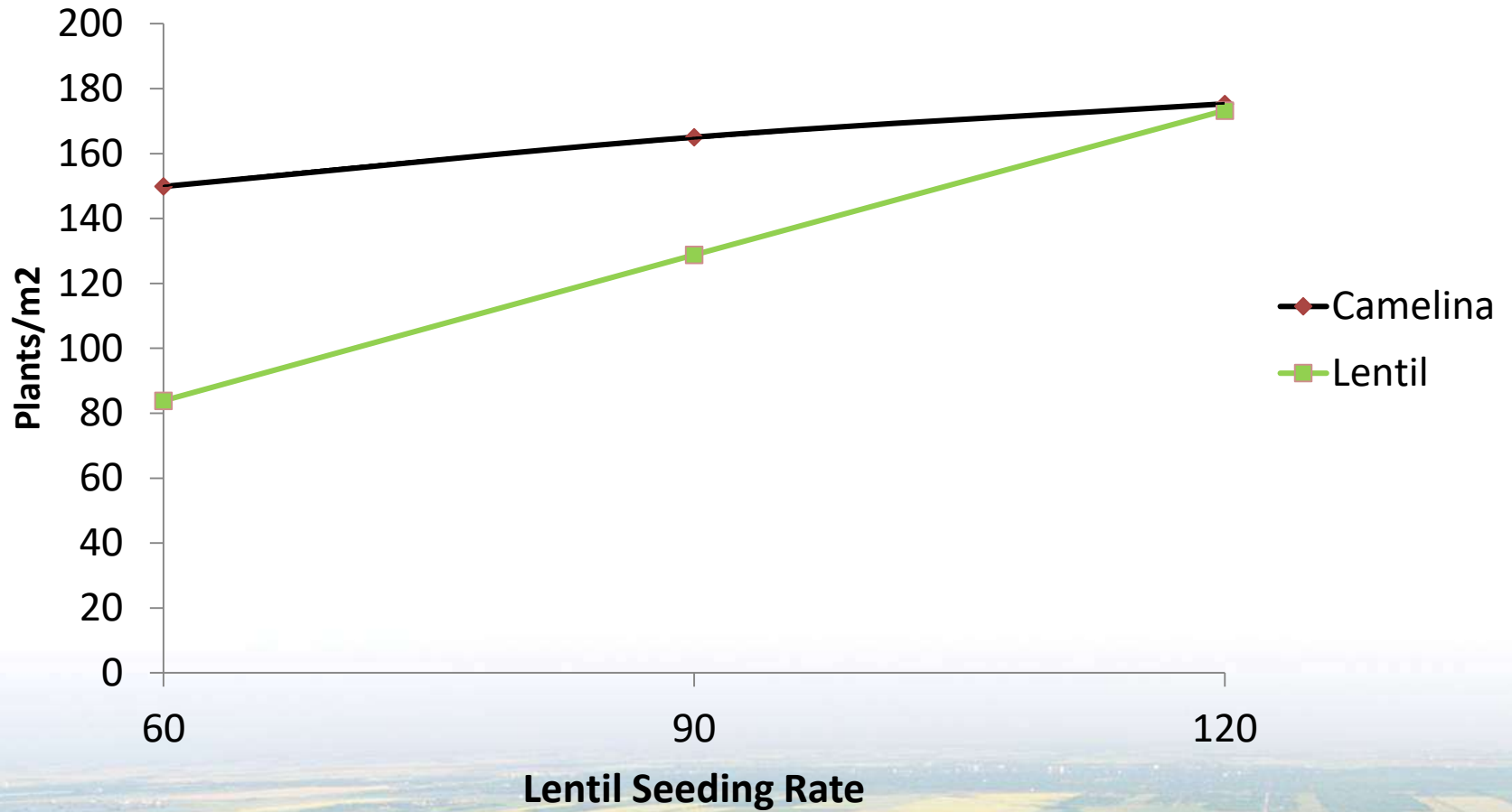
Camelina Mono Crop

Lentil Mono Crop

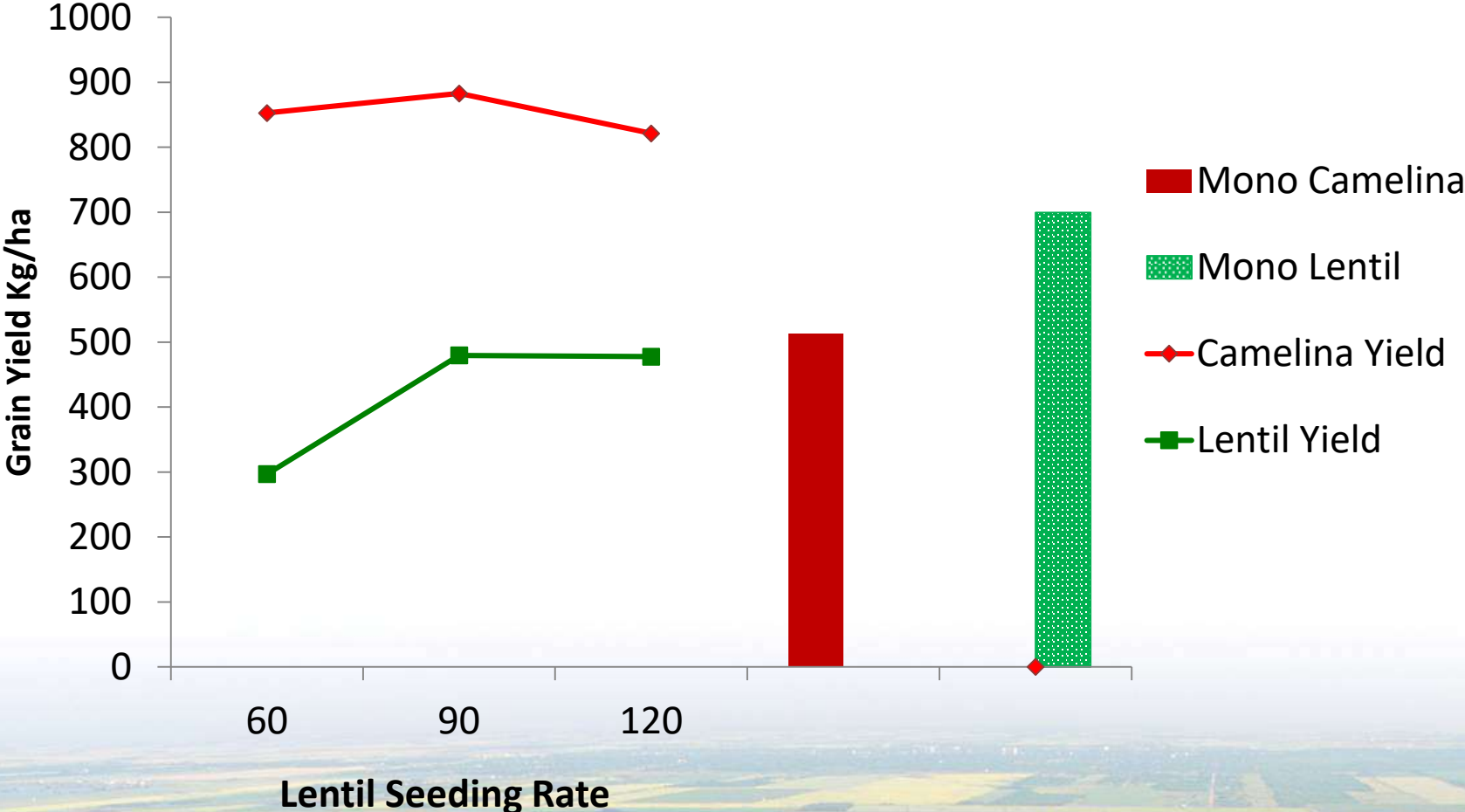




# Camelina & Lentil Plant Density



# Grain Yield Indian Head 2022

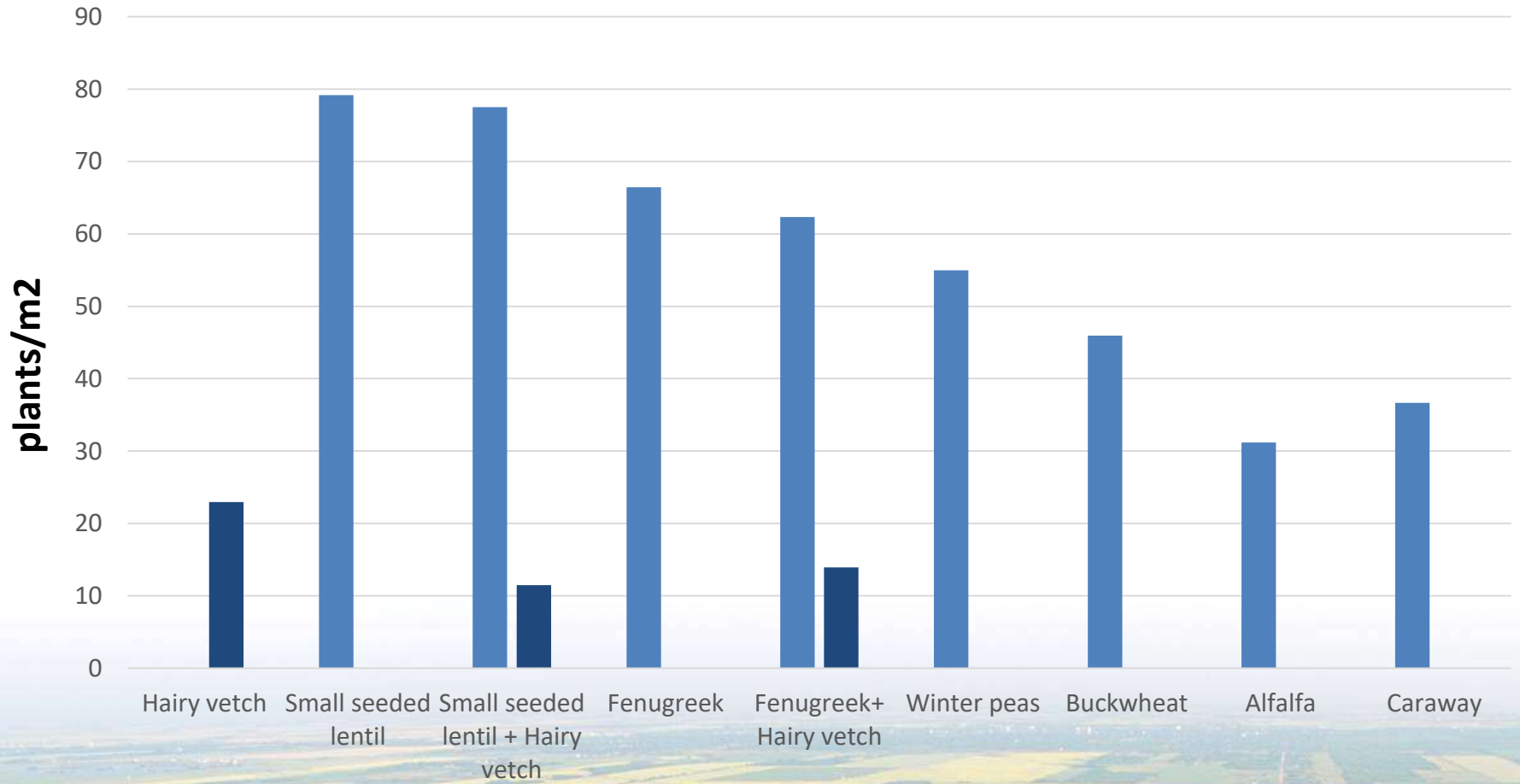


# Cover crops

1) None	0
2) Hairy vetch	5.6 kg/ha
3) Small seeded lentil	75 seeds/m <sup>2</sup>
4) Small seeded lentil+ Hairy Vetch	75 seeds/m <sup>2</sup> + 5.6 kg/ha
5) Fenugreek	35 kg/ha kg/ha
6) Fenugreek+ Hairy Vetch	35 kg/ha kg/ha +5.6 kg/ha
7) Winter peas	40 seeds/m <sup>2</sup>
8) Buckwheat	15 kg/ha
9) Alfalfa	10 kg/ha
10) Caraway	13 kg/ha

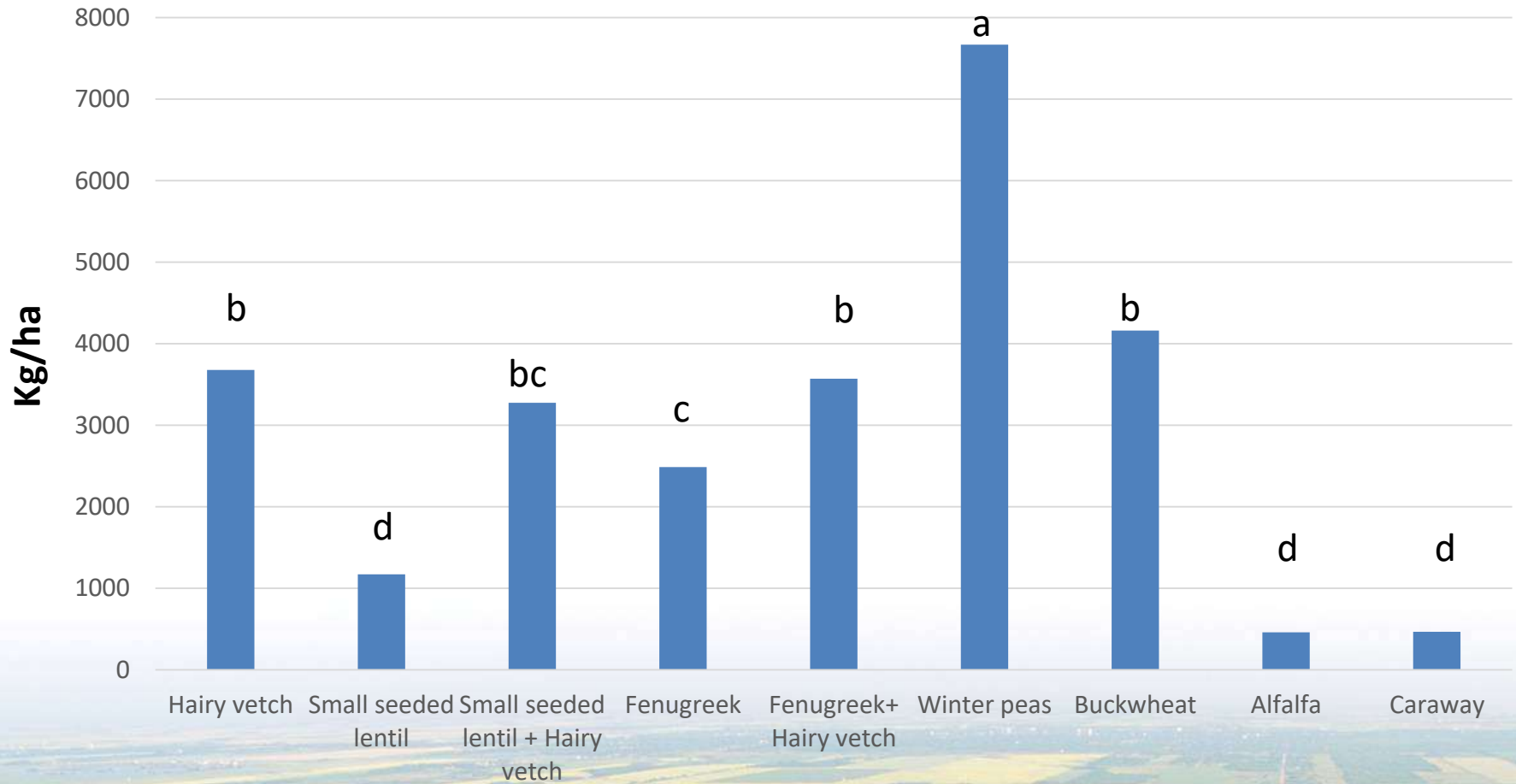


# Cover Crop Plant Density in Hemp





# Cover Crop Biomass in Hemp

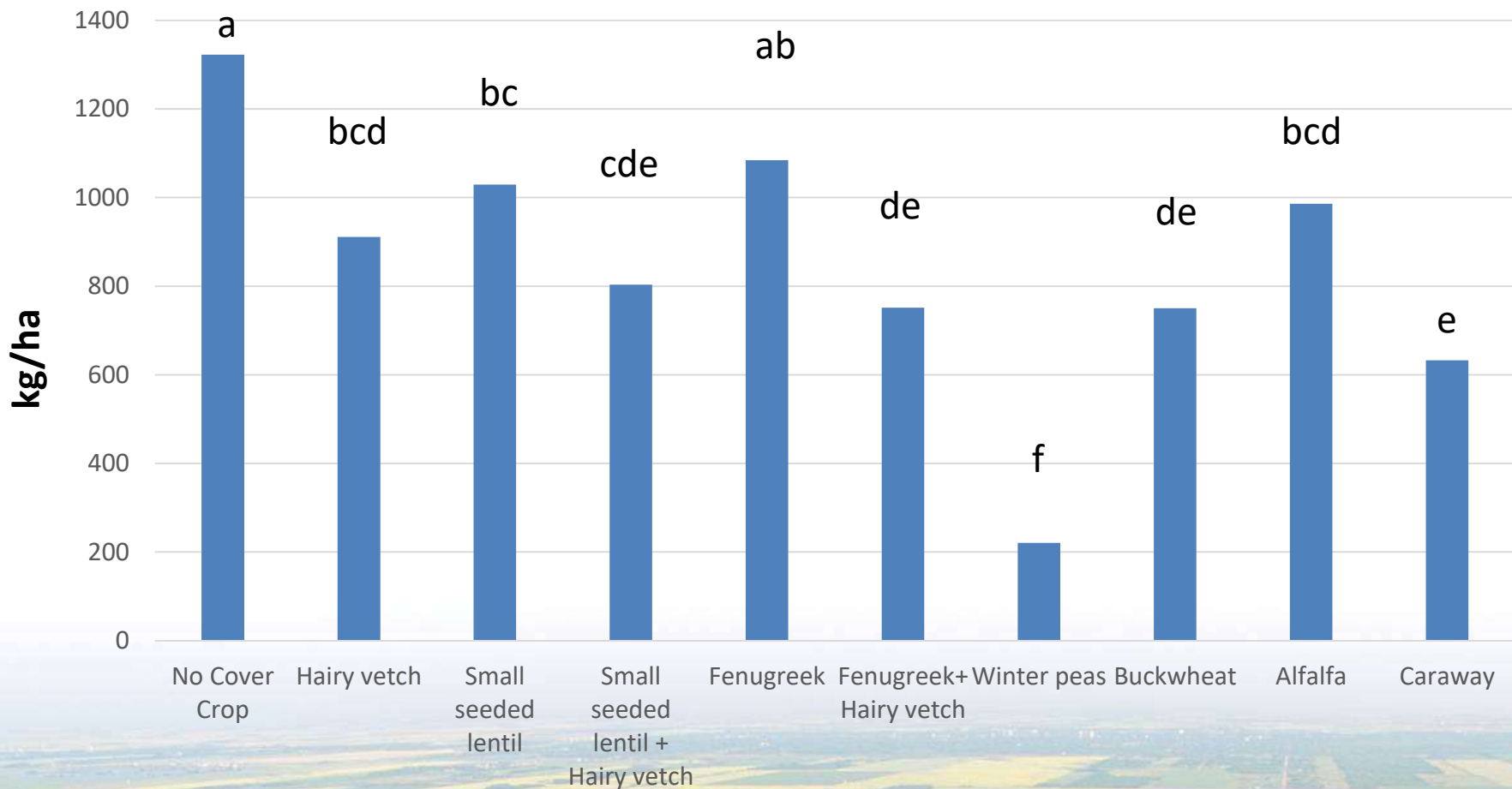




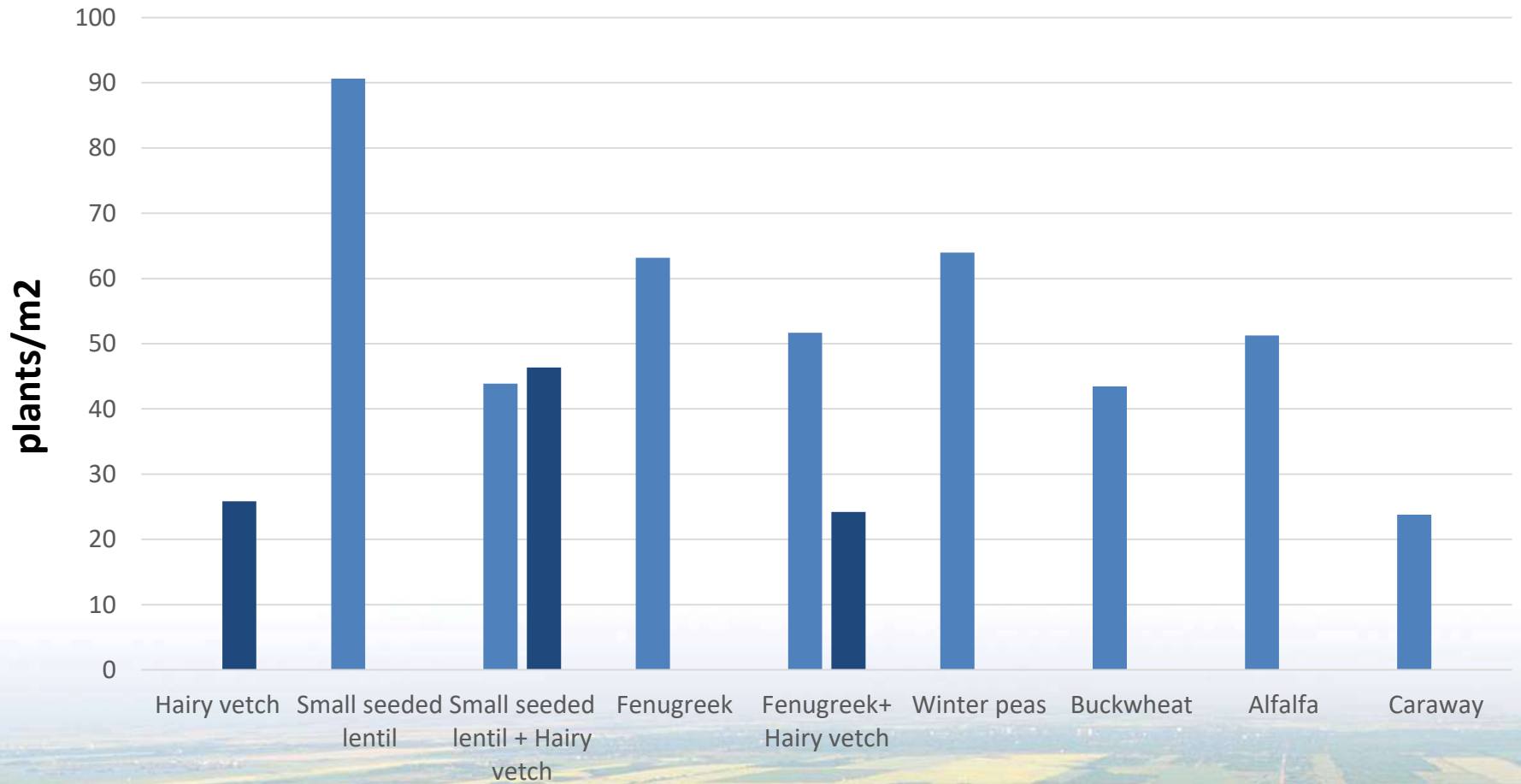




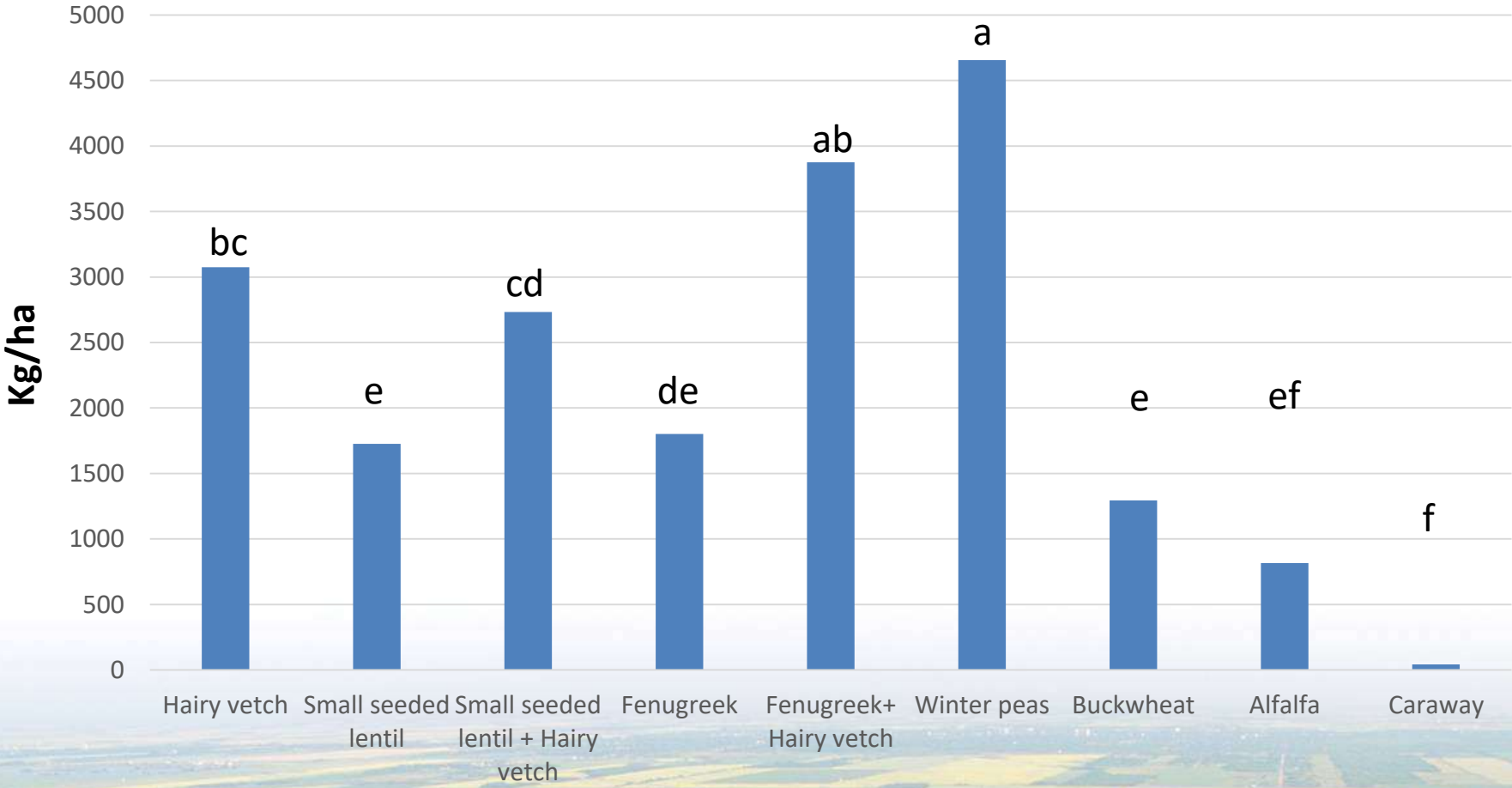
# Hemp Grain Yield



# Cover Crop Plant Density in Sunflowers



# Cover Crop Biomass in Sunflowers



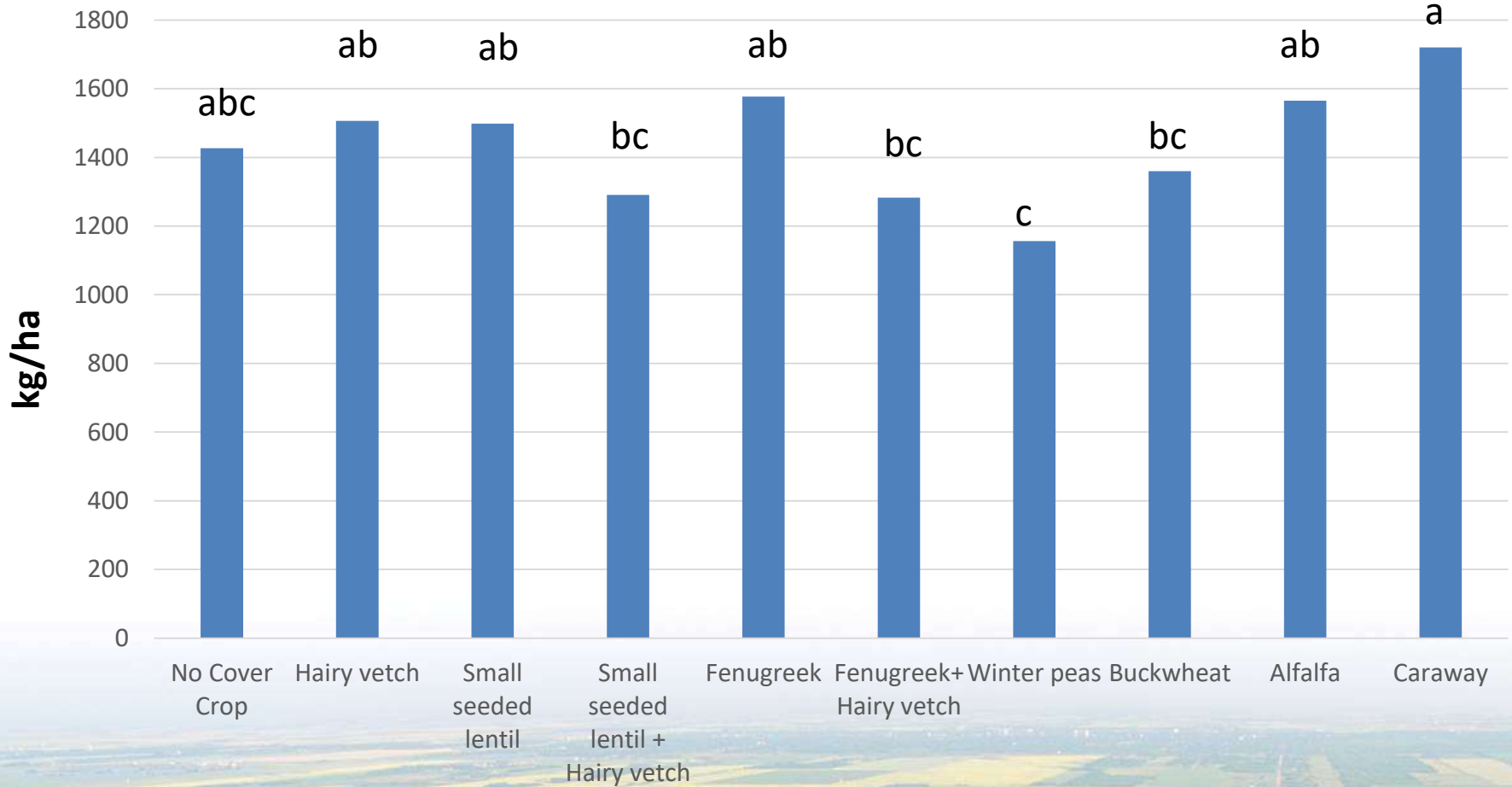








# Sunflower Grain Yield





# Effect of slope and CI on canaryseed

**Slope –top, upper slope, middle, lower slope and bottom**

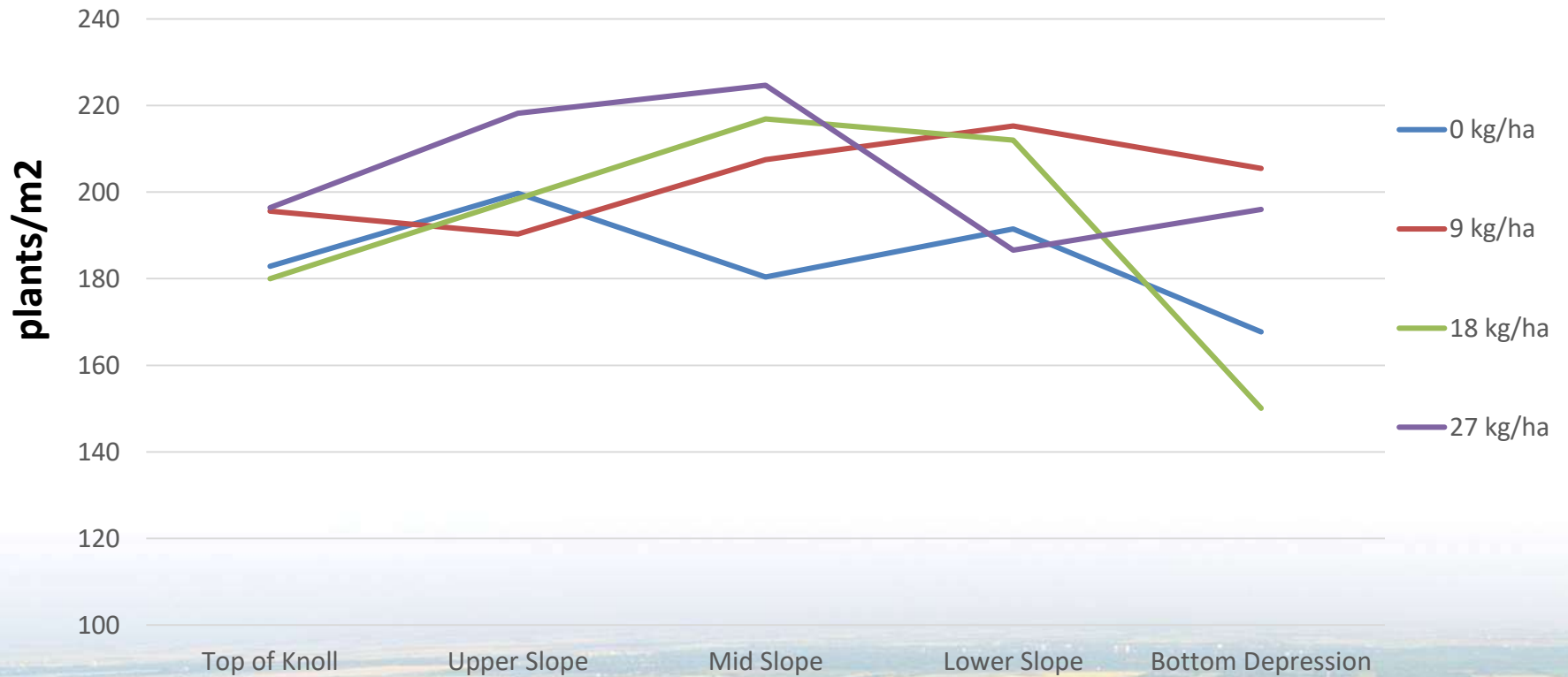
**CI rate - 0, 9, 18 and 27 kg CI/ha**

**Funding**

- **Canary Seed Development Commission of Saskatchewan**



# Plant Density in Canaryseed





# Canaryseed Grain Yield

