

Chloride and Canary Seed

William May

AAFC

Indian Head



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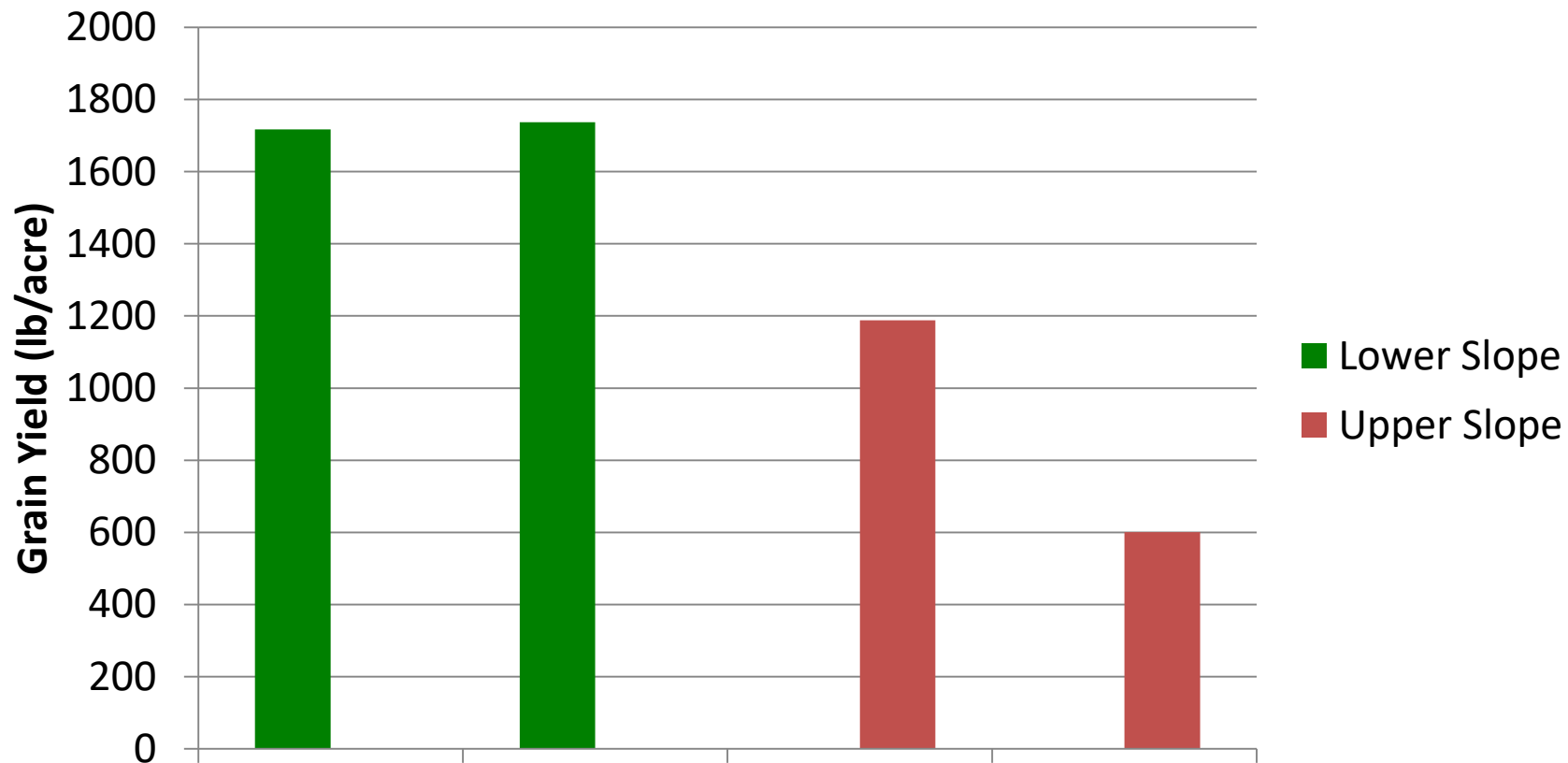
Canada 



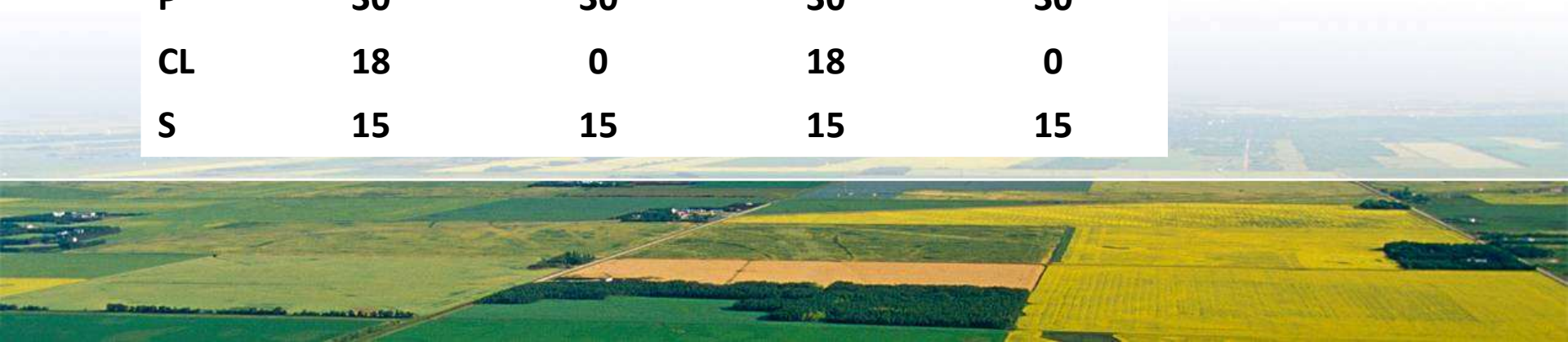


Soil test nutrient levels and physical characteristics

		Indian Head				Melfort	
		2015	2016	2017	2018	2015	2017
Chloride (kg ha ⁻¹)	0-15 cm	2.04	7.95	7.34	11.21		4.95
	0-60 cm	.	25.04	26.4	20.4		16.43
	Chloride in Leaves at Anthesis(%)						
No fertilizer		0.37a	0.34a	0.29a	0.33a		0.03b
Cl, N, P, K and S		0.30a	0.26a	0.37a	0.26a		0.22a
	Chloride in Whole Plant at Anthesis(%)						
No fertilizer		0.55b		0.38b	0.75a	0.09b	0.03b
Cl, N, P, K and S		0.93a		0.62a	0.89a	0.27a	0.44a
	Chloride in Leaves During Seed Filling (%)						
No fertilizer		0.20a	0.35a	0.23a	0.44a	0.04b	0.02a
Cl, N, P, K and S		0.23a	0.26b	0.12b	0.20b	0.15a	0.04a
	Chloride in Whole Plant at Seed Filling (%)						
No fertilizer		0.25	0.45			0.03b	
Cl, N, P, K and S		0.30	0.55			0.15a	



N	60	60	60	60
P	30	30	30	30
CL	18	0	18	0
S	15	15	15	15







30/07/2019

101

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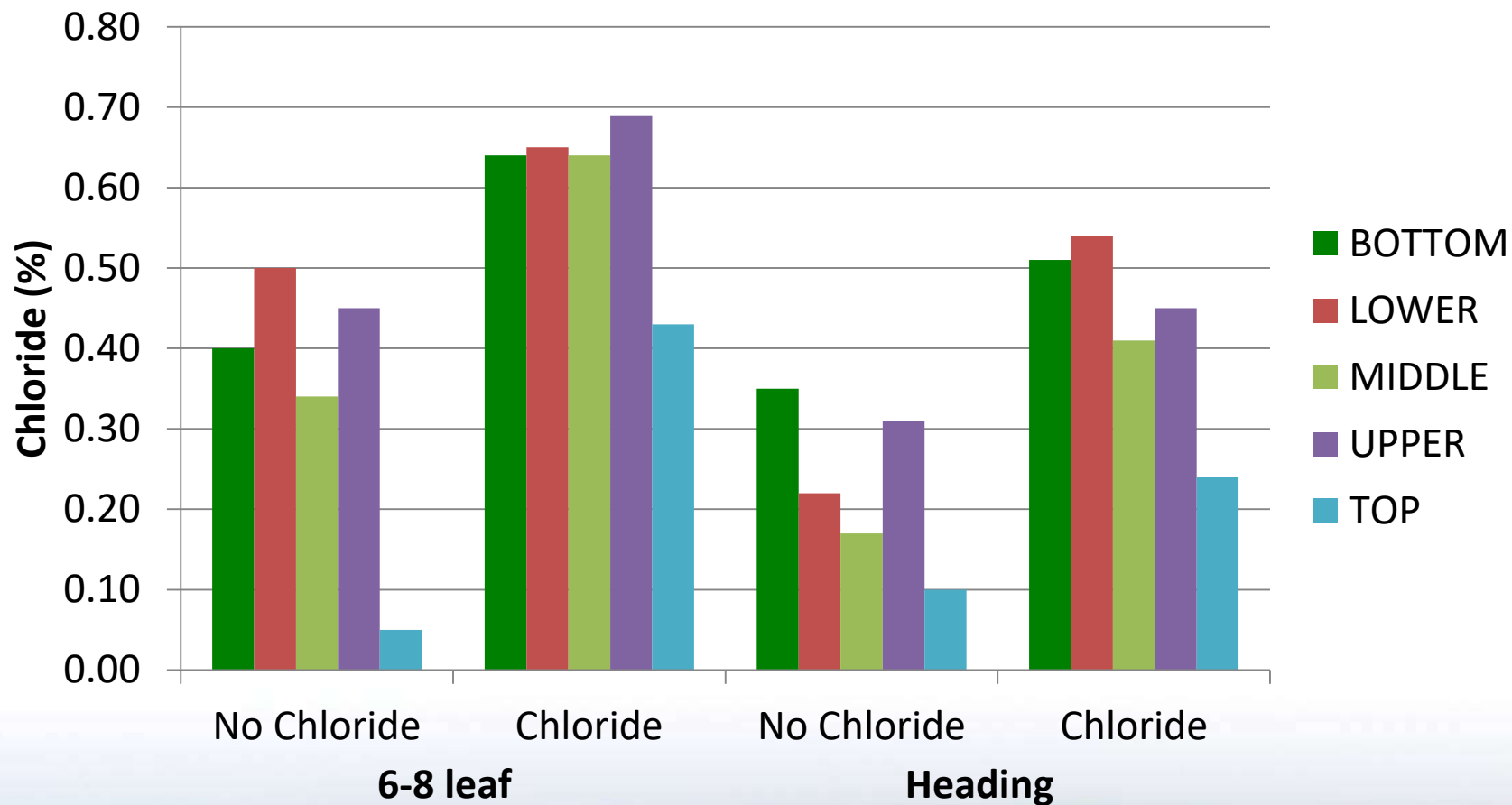


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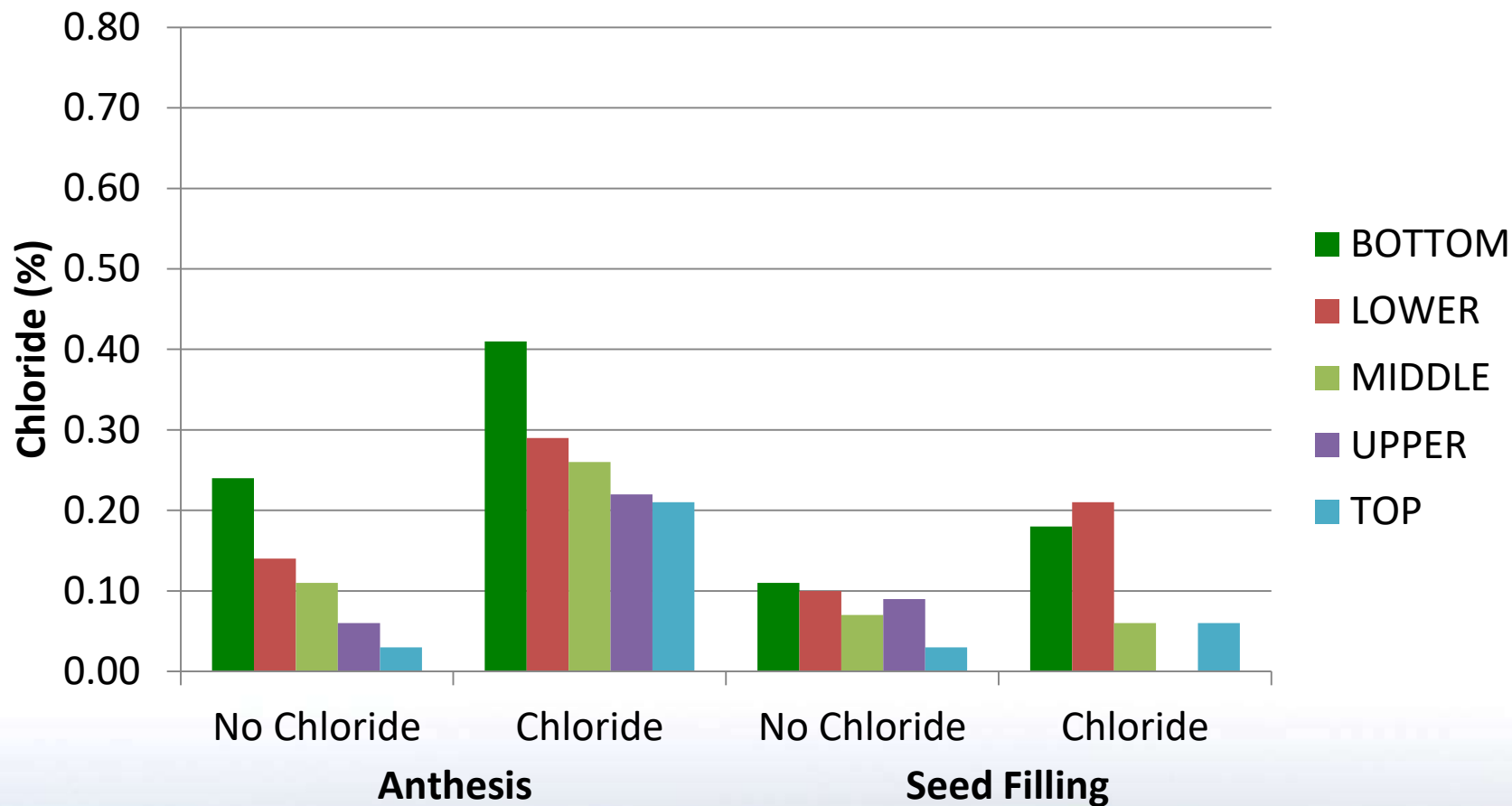


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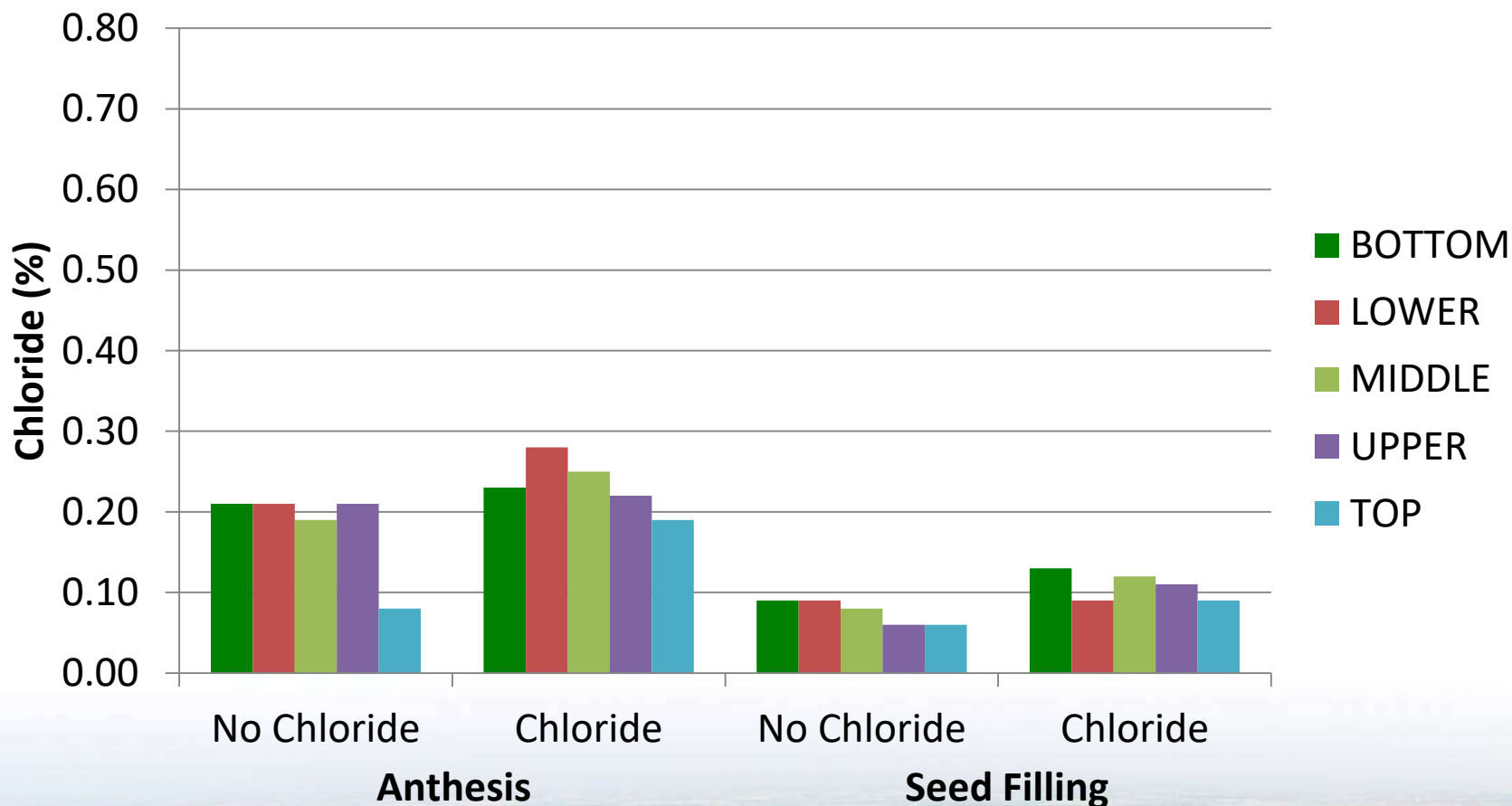
Chloride Concentration in the Leaves of Canaryseed Grown on a Slope from Bottom to Top



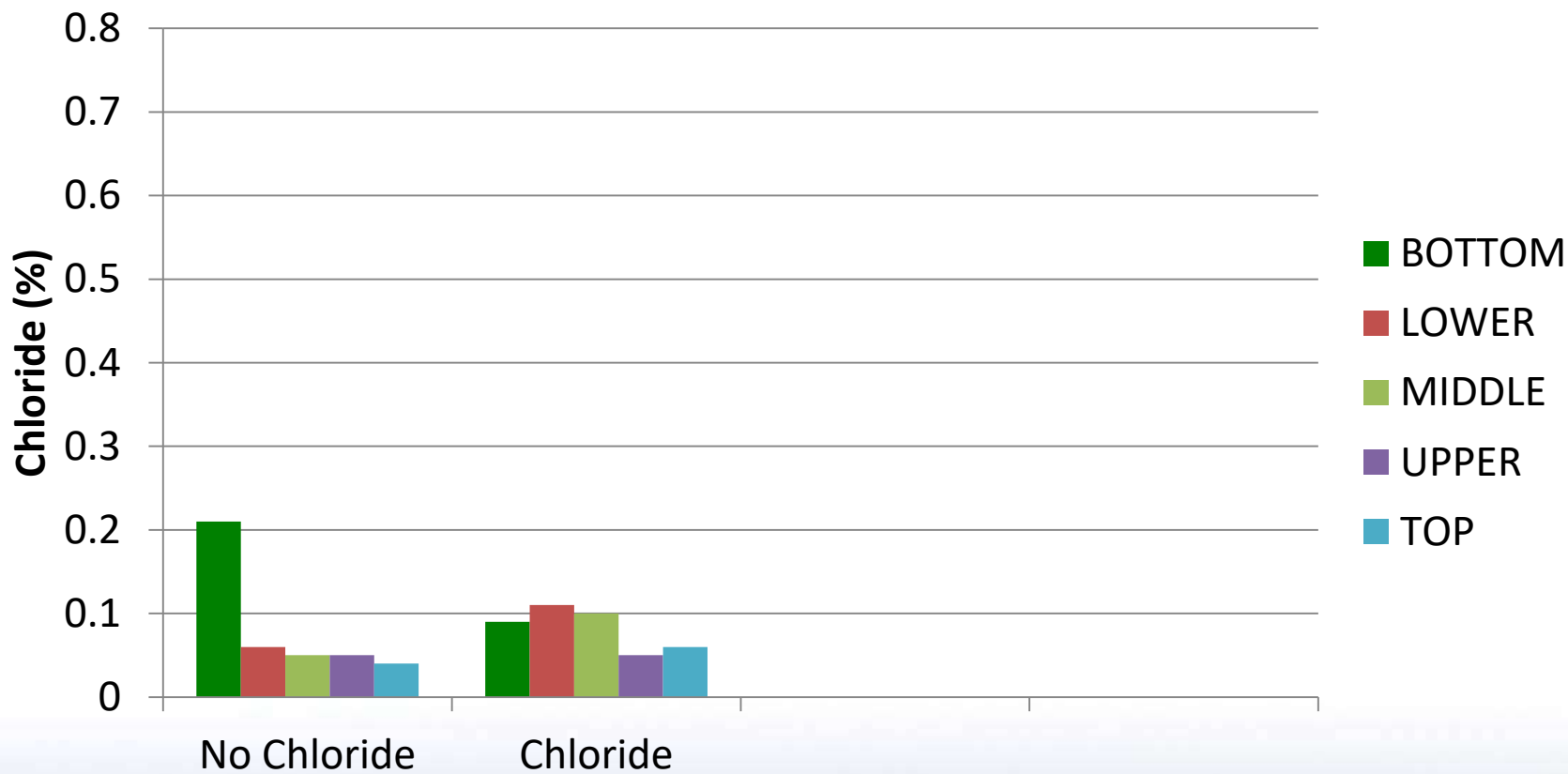
Chloride Concentration in the Leaves of Canaryseed Grown on a Slope from Bottom to Top



Chloride Concentration in the Heads of Canaryseed Grown on a Slope from Bottom to Top



Chloride Concentration in Mature Seed of Canaryseed Grown on a Slope from Bottom to Top



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	Chloride in Whole Plant at Seed Filling (%)						
No fertilizer		0.25	0.45			0.03b	
Cl, N, P, K and S		0.30	0.55			0.15a	

Conclusion

- The slope is having an impact on Chloride concentration in canaryseed
- The addition of Cl fertilizer increased Cl levels in the leaves and heads.



Question

- What is the concentration of Chloride in canaryseed is required?
- When is it required?
- Would providing more Chloride in the upper slope position make a difference in yield?
- Was this due to the 2.5 inches of rain received in August?
- Does it make sense to apply chloride as a variable rate across the field?



INTERCROPPING

William May and Michelle Hubbard

AAFC

Indian Head and Swift Current

Co-authors: L. SHAW



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Intercropping

- Intercropping can be defined as growing two or more crop species together



Intercropping Chickpea and Flax

Objectives

- To develop an agronomic system for intercropping chickpea with flax. Why? (**William May**)
- To determine if intercropping can be used to reduced disease pressure in chickpeas. Why? (**Michelle Hubbard**)
- To determine if the area of adaptation for chickpeas can be expanded
- To increase the production of flax in western 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⁻²)

Approx. lbs/acre

a. 0	0
b. 75	5 (2018)
c. 150	10
d. 300	19
e. 600	38

3) Nitrogen Rate (kg ha⁻¹)

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





Crop Intersected
19/07/2018
19/07/2018

19/07/2018

I, 0 flax, 0 N



Crops Intermixed
This and nearby
treatment plots

19/07/2018

I, 0 flax, 60 N



High Nitrogen Flax
19/07/2018

19/07/2018

A, 0 flax, 0 N



Clara Alberta Flax
100% pure
100% pure
100% pure

19/07/2018

A, 0 flax, 60 N



Crops Intercrowded
Crops Intercrowded
Crops Intercrowded

I, 75 flax, 0 N

19/07/2018



Crops Intensity
Flax Intensity 75
Flax N 60

19/07/2018

I, 75 flax, 60 N



Crop Rotation Rows
Cultivar: ...
Treatment: ...

19/07/2018

A, 75 flax, 0 N



Crops Alternated Rows
Flax 75% 60 N
Flax 75% 60 N

19/07/2018

A, 75 flax, 60 N



Flax Treatment
1, 300 flax, 0 N

19/07/2018

1, 300 flax, 0 N



Crop Experiment
Date: 19/07/2018
Location: [illegible]

19/07/2018

I, 300 flax, 60 N



Flax, Atlantic Blue
100 plants/m²
100 plants/m²
100 plants/m²

19/07/2018

A, 300 flax, 0 N



Flax
300
60 N

19/07/2018

A, 300 flax, 60 N



Crops Intersected
Flax Intersected
Flax Intersected

19/07/2018

I, 600 flax, 60 N



19/07/2018

19/07/2018

A, 600 flax, 60 N

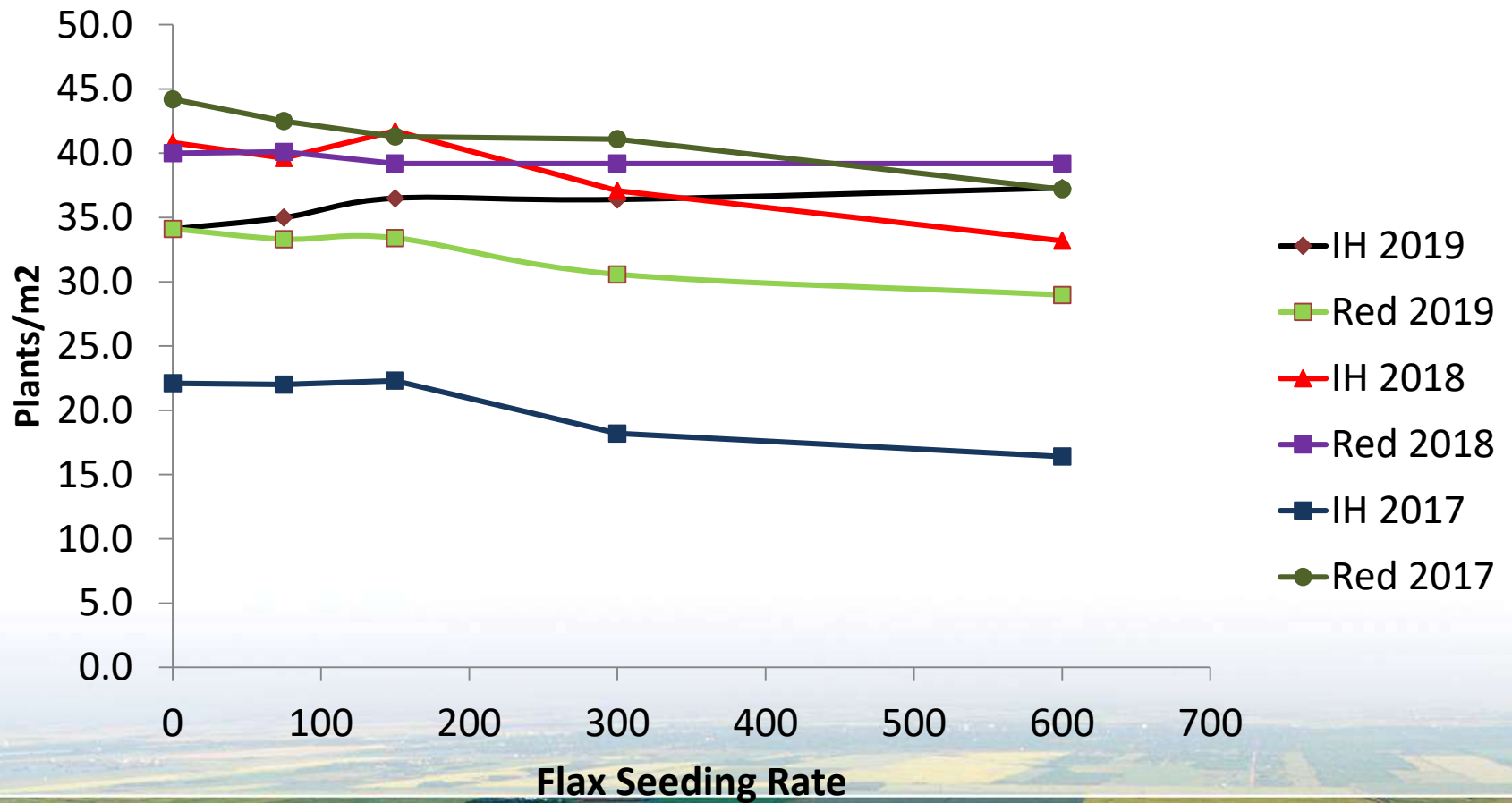


Flax Maturity
19/07/2018

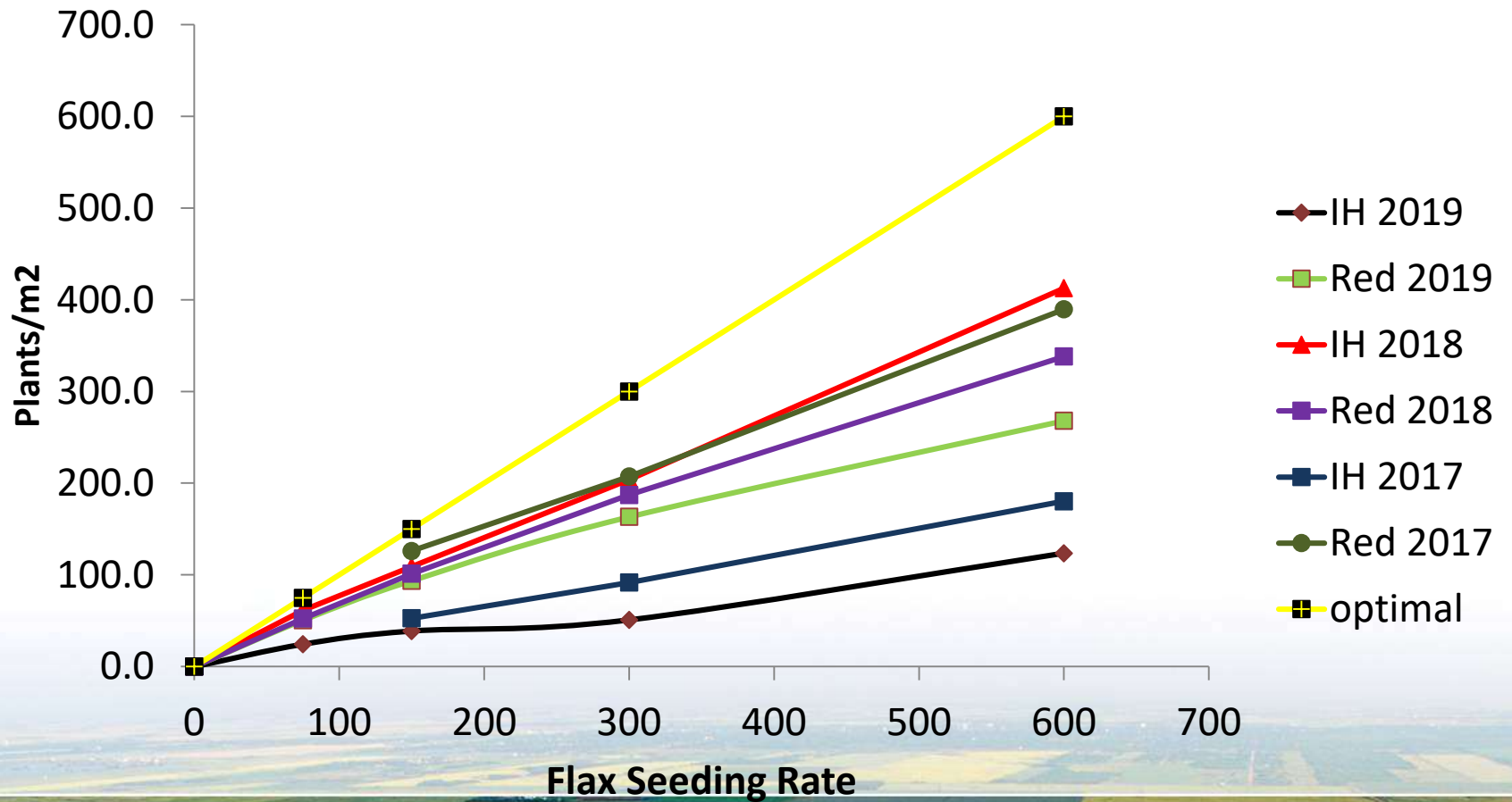
19/07/2018

600 flax, 60 N

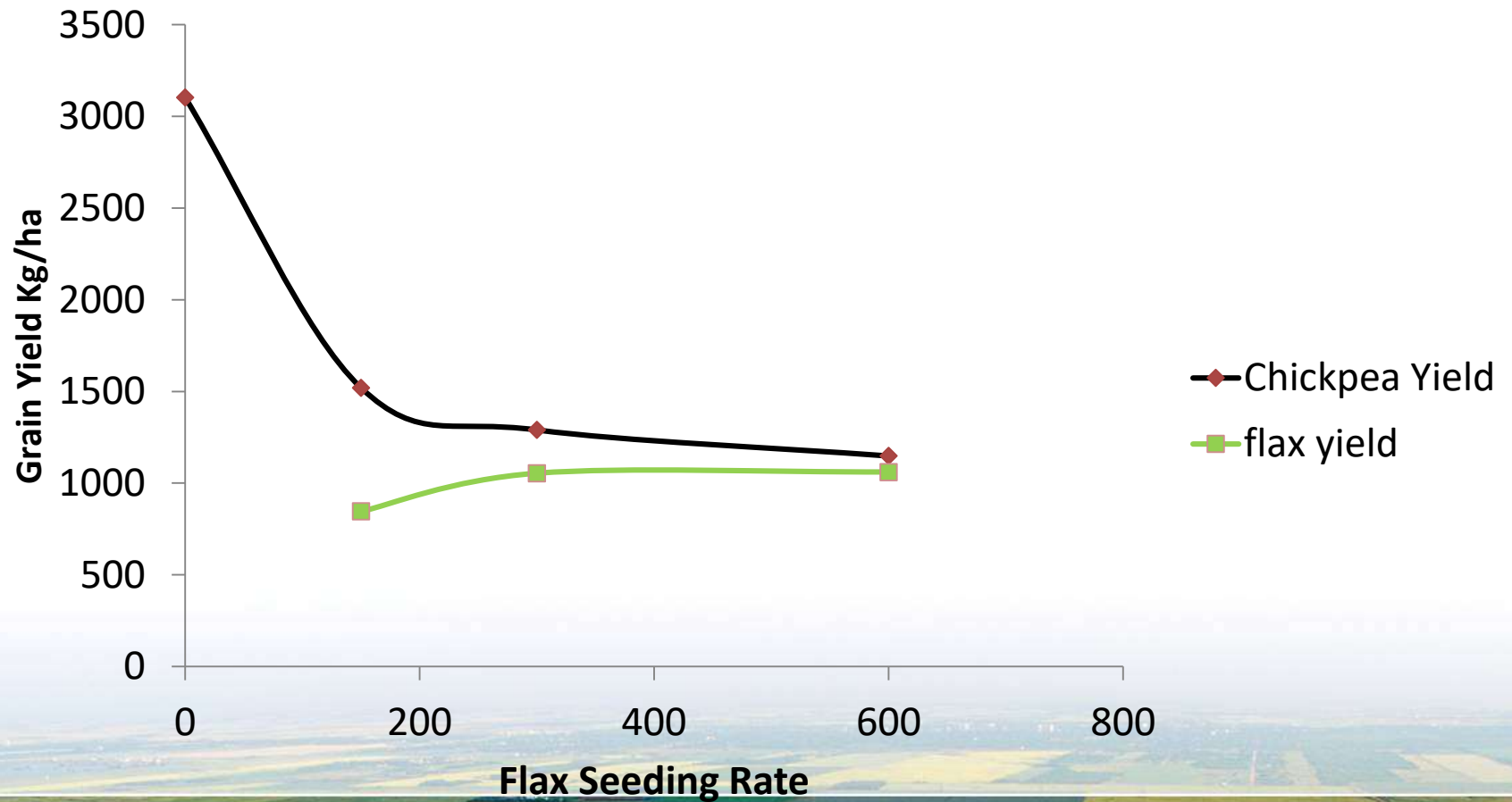
Chickpea Plant Density



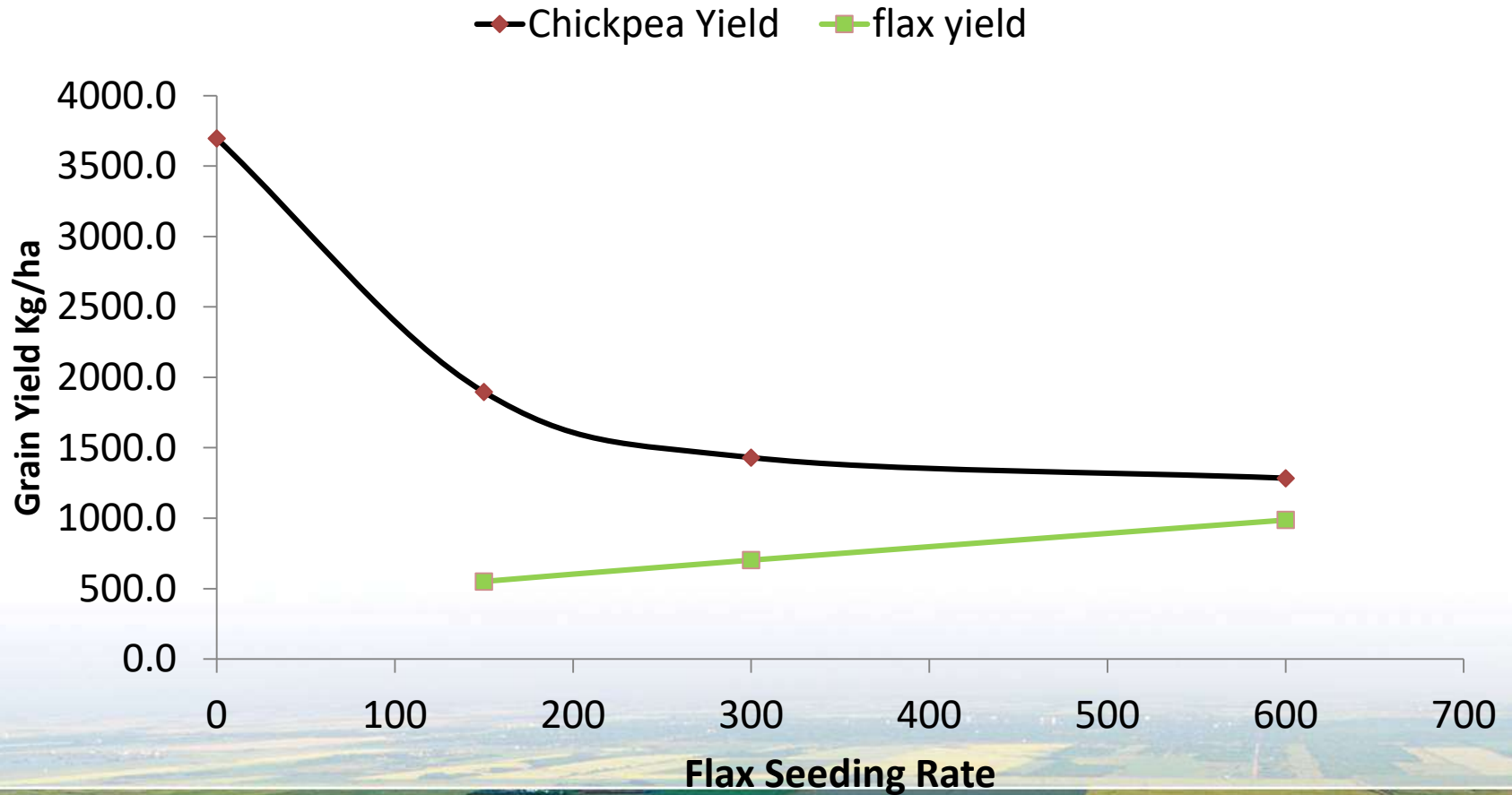
Flax Plant Density



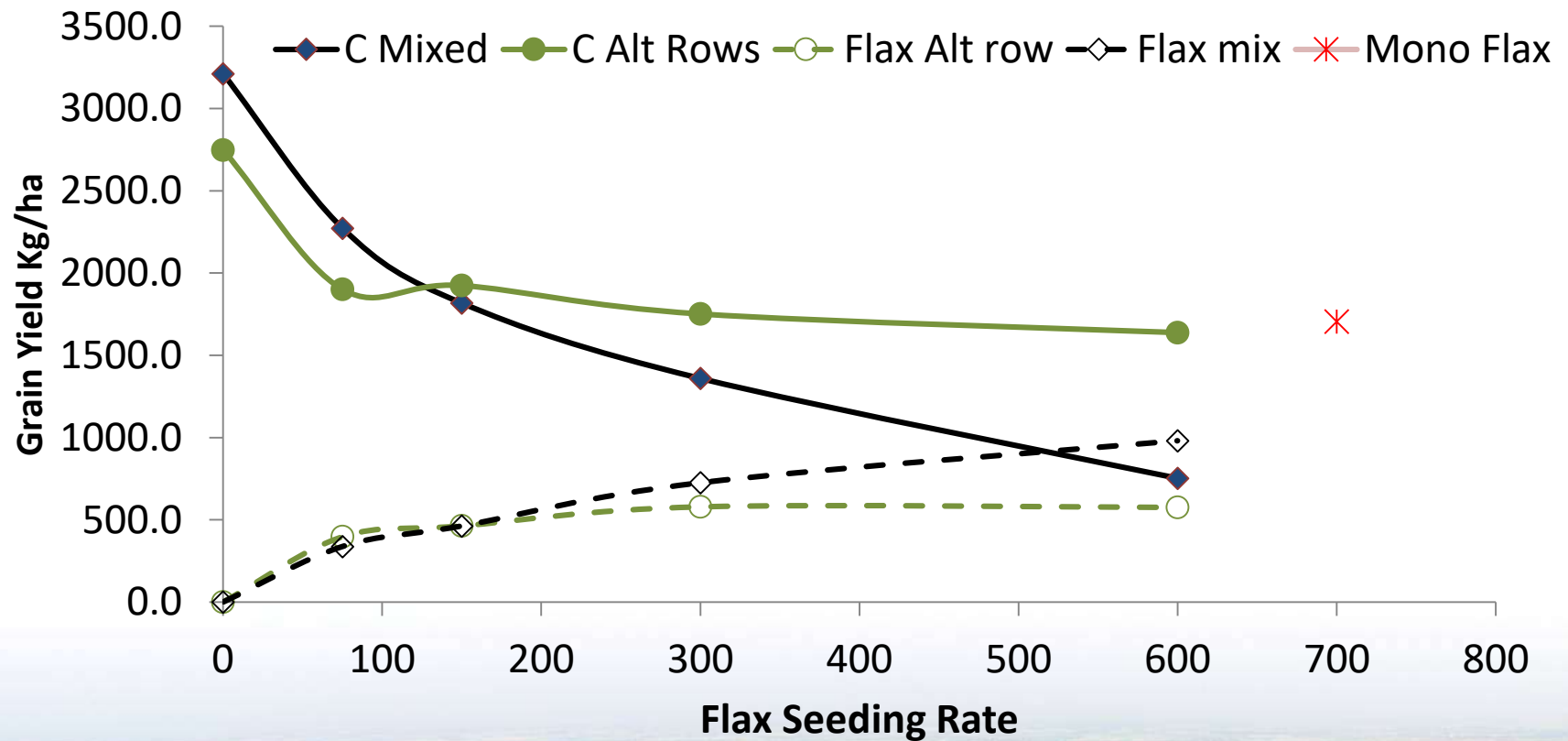
Grain Yield Indian Head 2017



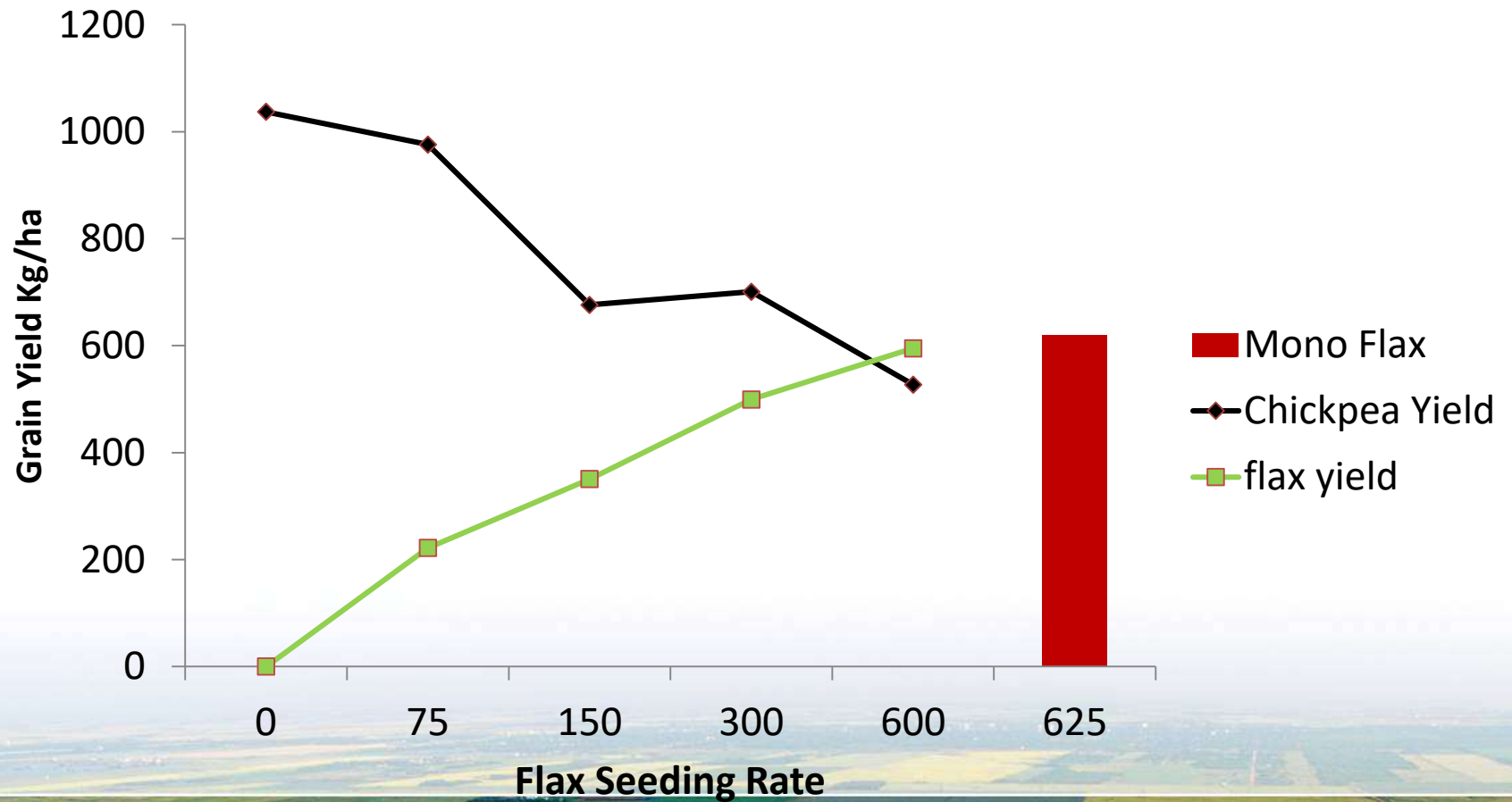
Grain Yield Redvers 2017



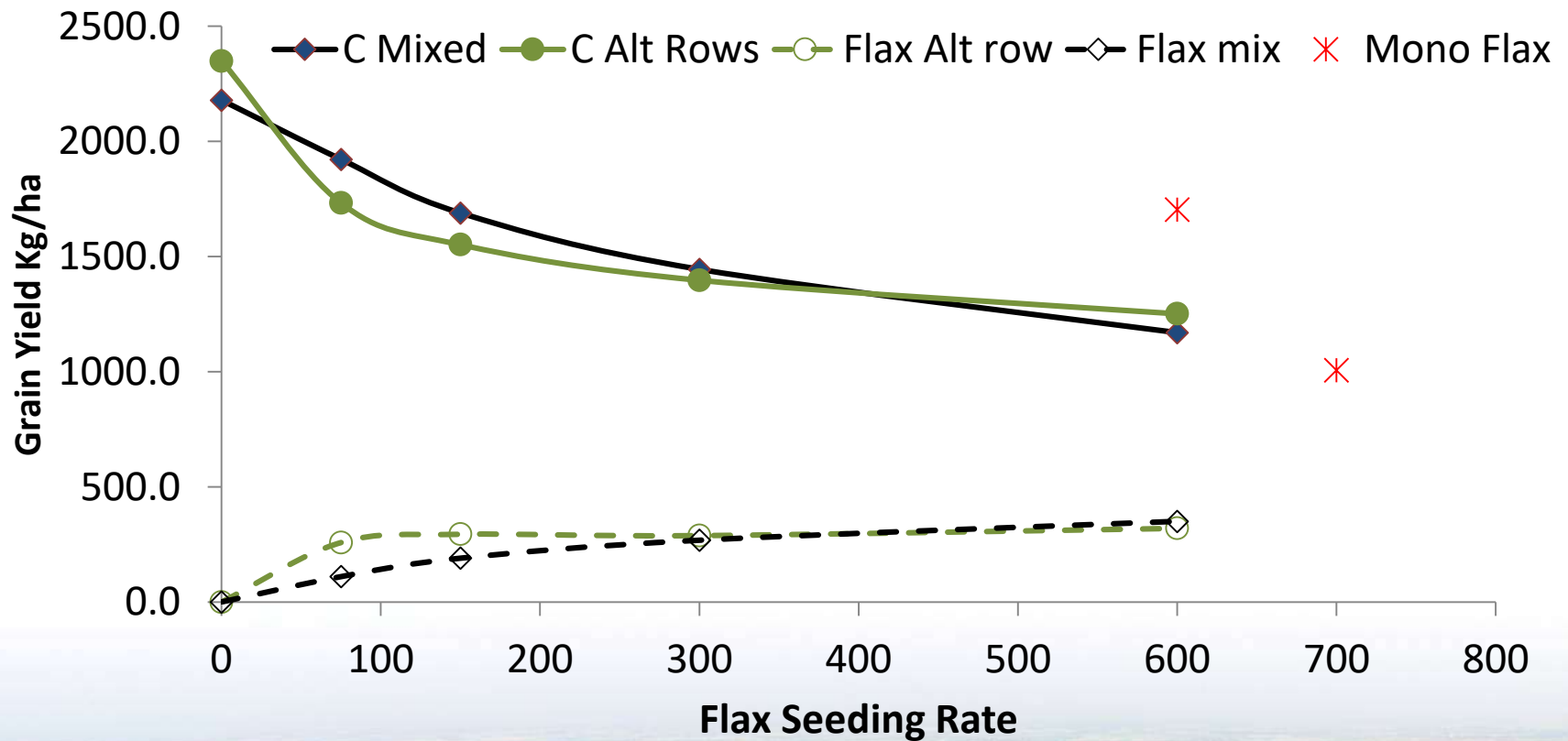
Grain Yield Indian Head 2018



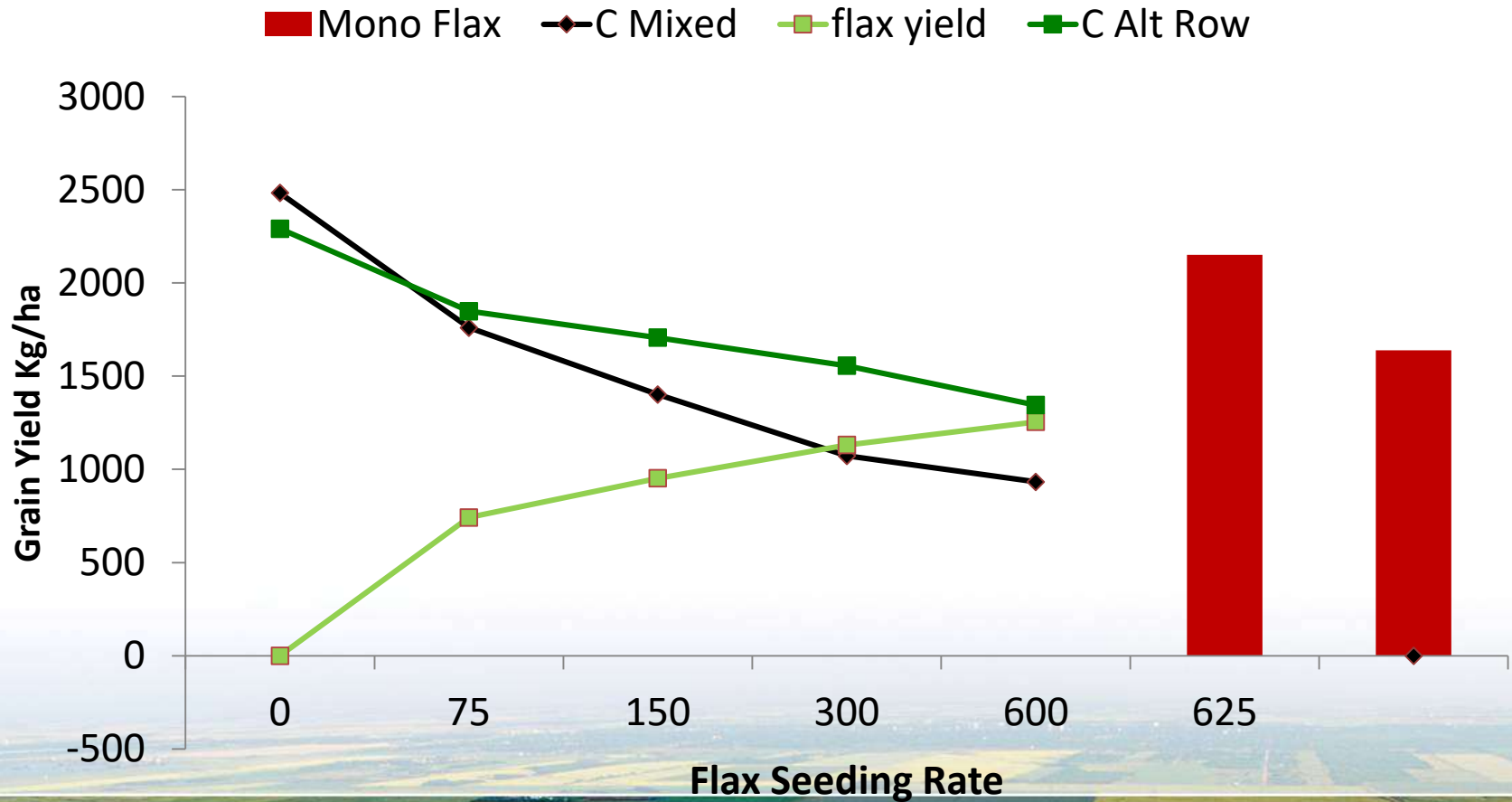
Grain Yield Redvers 2018



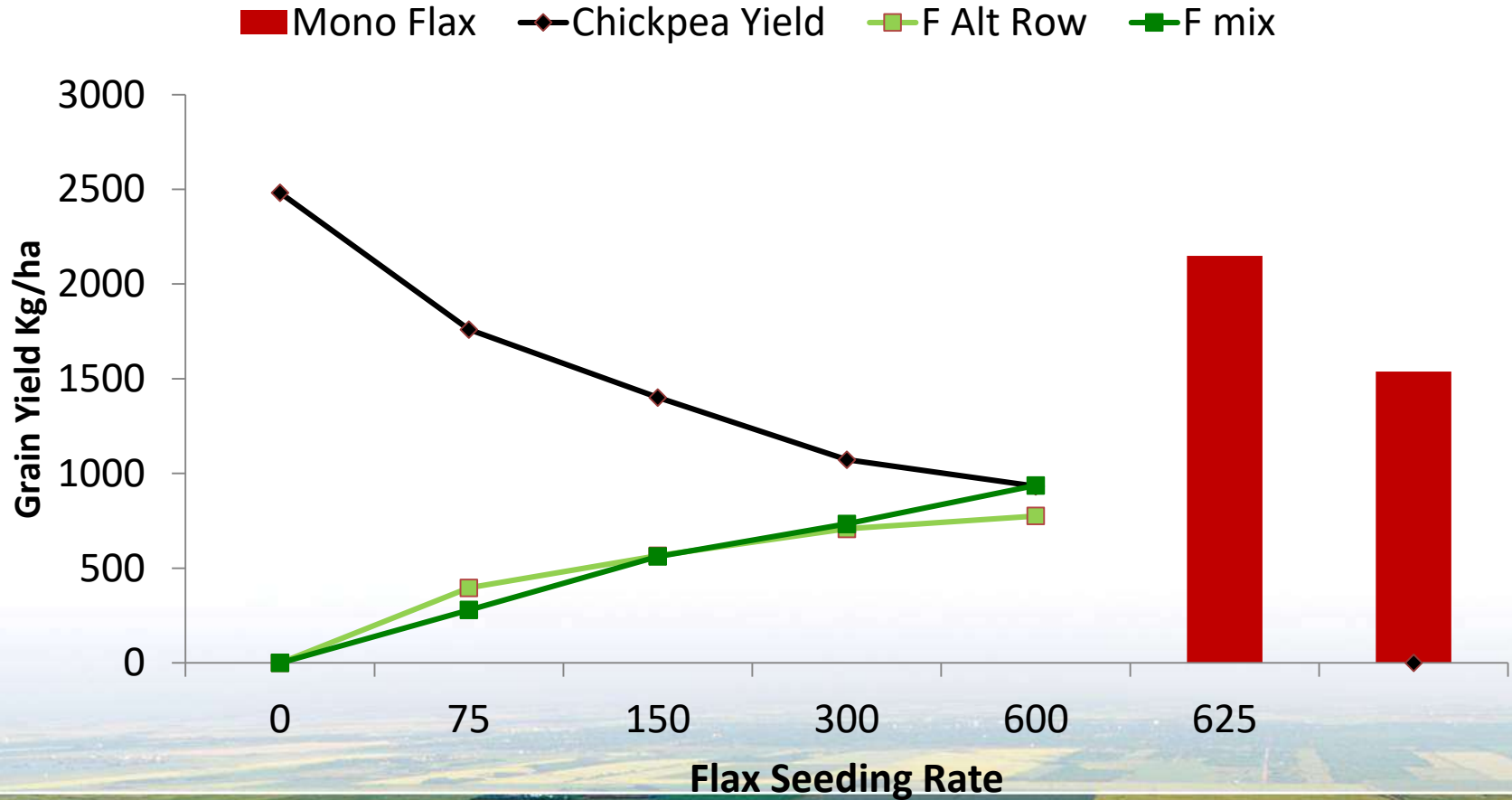
Grain Yield Indian Head 2019



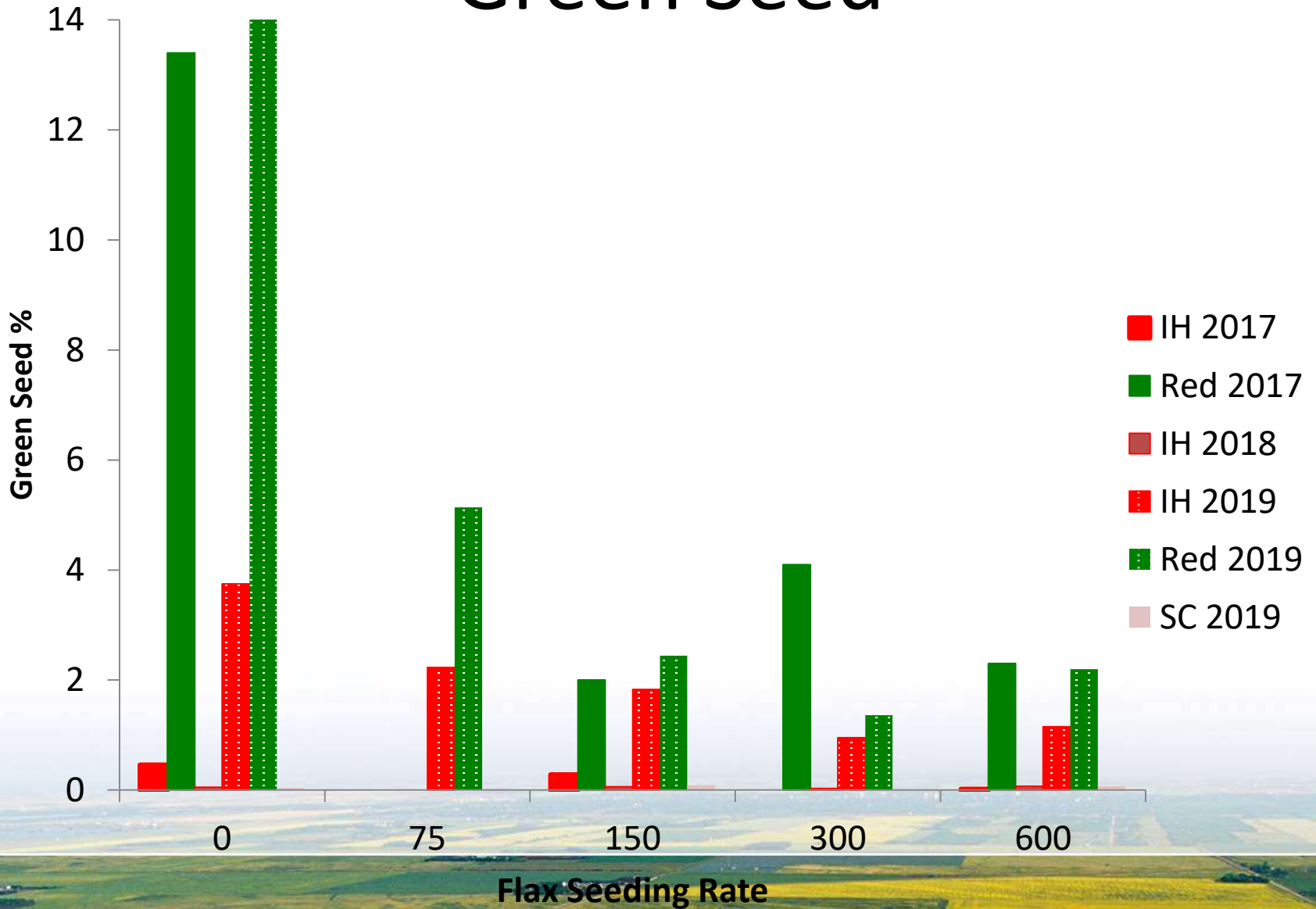
Grain Yield Redvers 2019



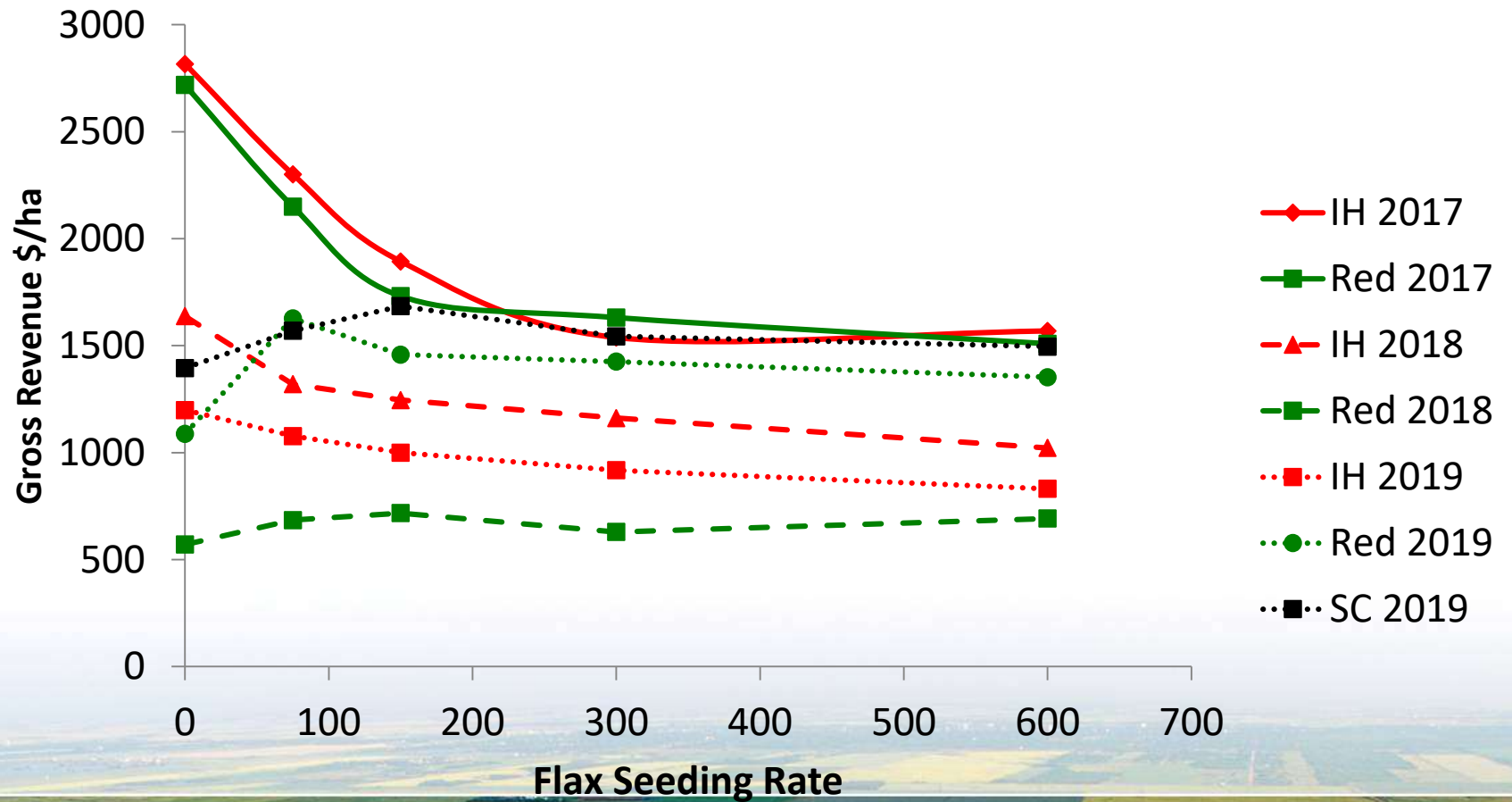
Grain Yield Swift Current 2019



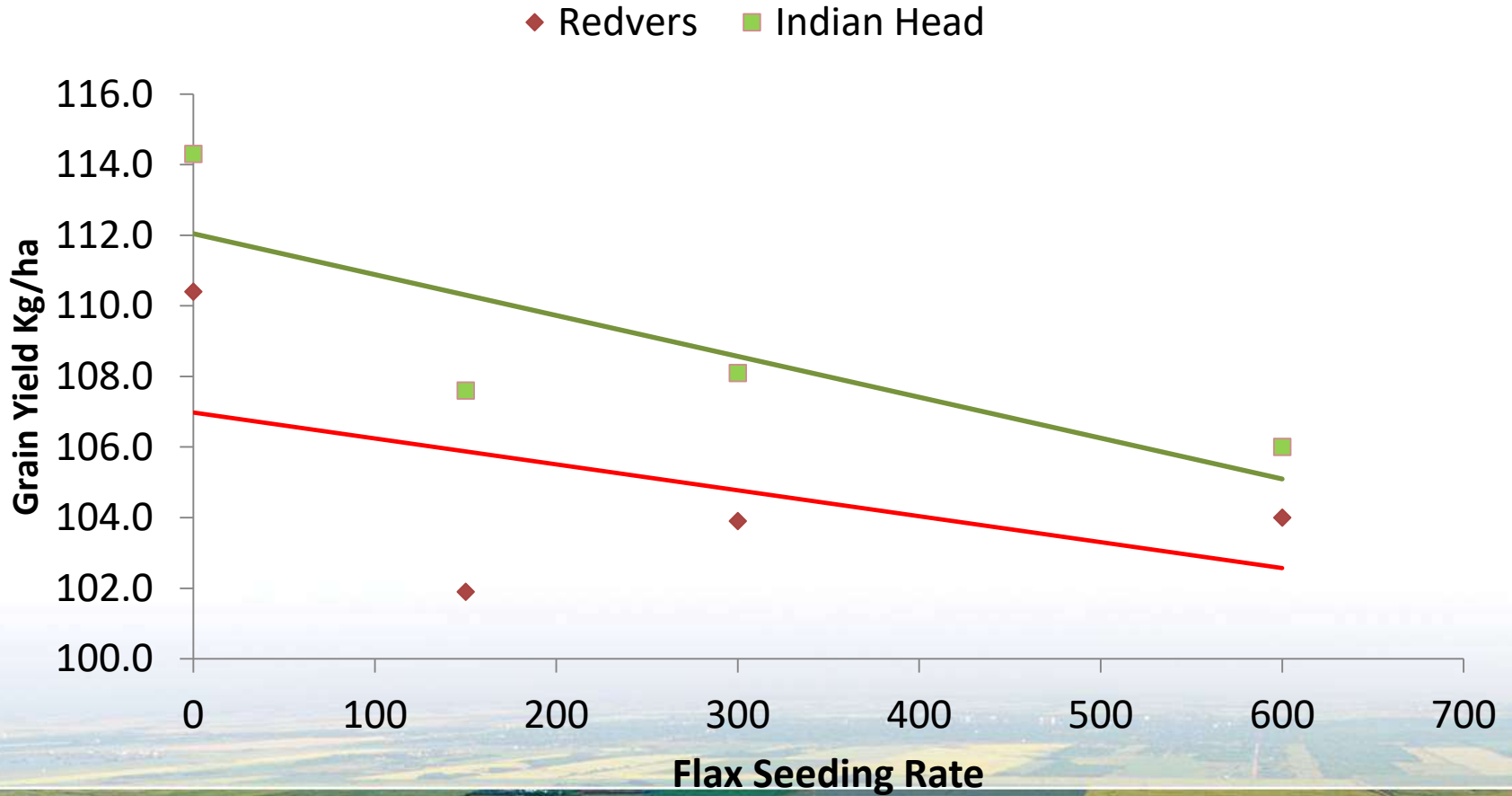
Green Seed



Gross Income



Maturity 2017



Conclusions - Bill

- **Just getting started**
- **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 and Questions

- Other factors (row placement and N fert.) do not impact disease
 - At low to moderate pressure
 - May have impact at high disease pressure
 - Impact some aspects of plant growth and agronomy
 - Branching, LER
 - But branching etc. may or may not be important in disease
 - If not these traits, what is?
 - **How** might intercropping help manage Ascochyta?



Acknowledgments

Swift Current:

Technicians: Lee Poppy

General labor: Eric Walker

Students: Ben Kellough, Alex Menun

Redvers:

Technician: Elijah Leatherdale

Other staff: Gordon Leatherdale, Pat Leatherdale

Intern: Louis Gegu

Indian Head:

Technicians: Rebecca Davies, Orla Willoughby, Randy Shiplack

Other staff: Kevin Willoughby, Kathy Ringdal, Joanne MacKay

