

Mixed Grain Intercrops: The Value Proposition

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My Farming Roots



Grandpa Lawrence Wallis in one of his best crops,
near Rosetown, SK

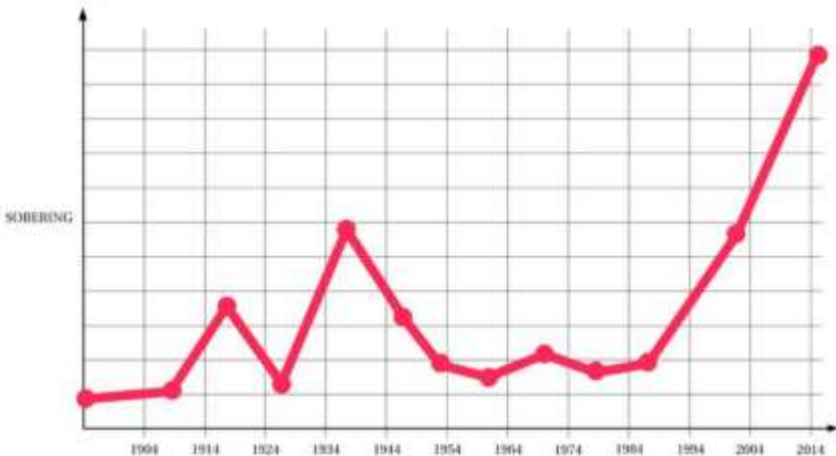
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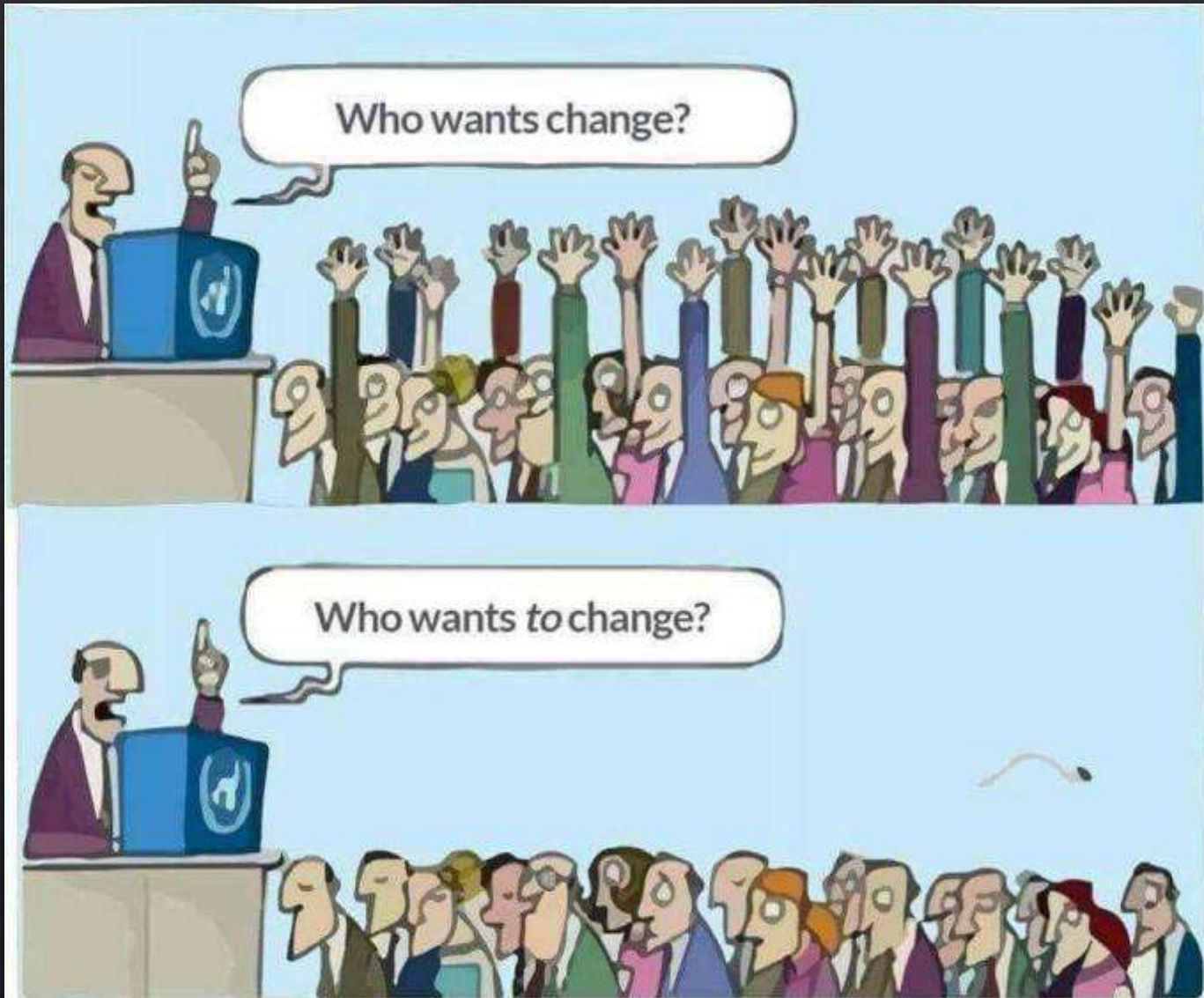
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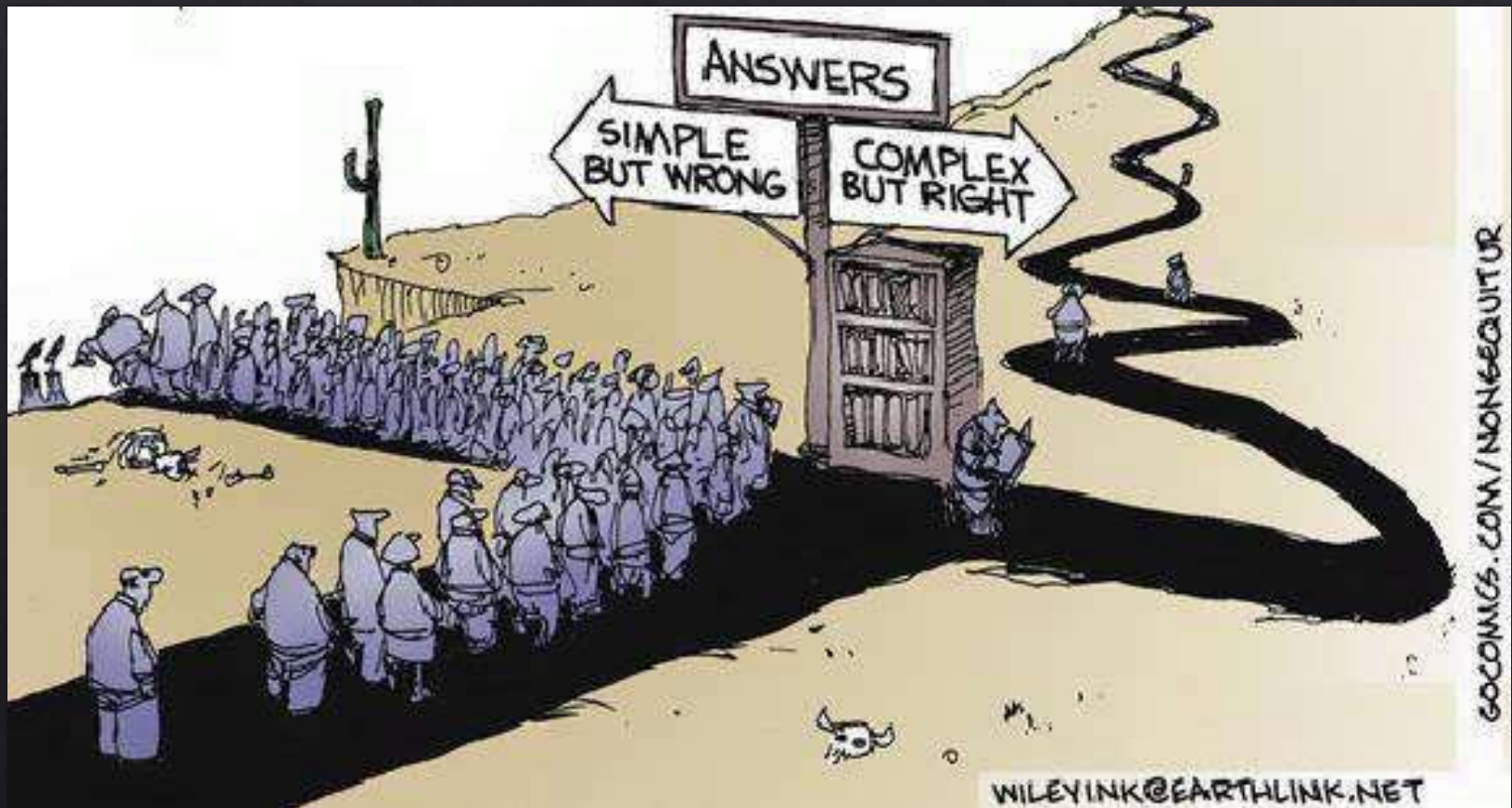
TWO YEAR CROP ROTATIONS



Intercropping is a big change!



No Easy Answers on Intercropping



Intercropping Catch 22

- ◆ Catch 22: A situation in which a desired outcome or solution is impossible to attain because of a set of inherently contradictory rules or conditions.



Farmers are leading the way!

- ◆ Hybrid of organic and “conventional” techniques
- ◆ “New Conventional”?
- ◆ Sustainable Intensification
- ◆ More profit

Derek and Tannis Axten Win Saskatchewan Outstanding Young Farmers Award

Published: 22 June 2017

Written by Neil Billinger



Farmers are leading the way!



FAQ: Why Mixed Grain Intercropping?



Photo: Kurt Myllymaki, Montana, 2018

- ◇ Why not?
- ◇ Obstacles are surmountable
- ◇ Multiple observed benefits
 - ◇ Productivity (yield)
 - ◇ Pest Reduction
 - ◇ Harvestability
 - ◇ Nutrient Efficiency
 - ◇ Risk Mitigation
 - ◇ Ecosystem services?

October 2012 – SERF Intercrop

New Strategy for Mixed Grain Intercrops:

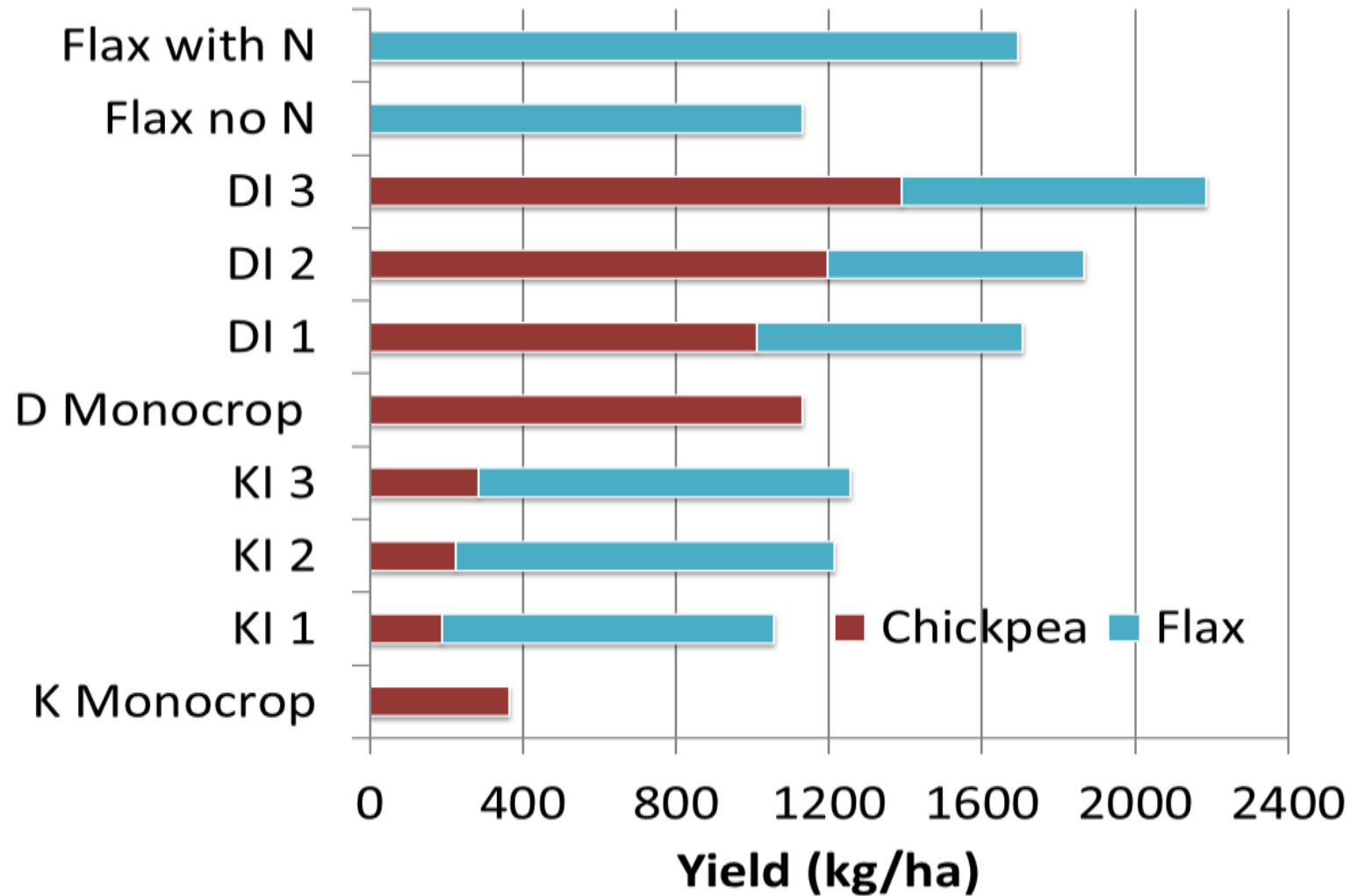
- Use less competitive, higher value, hard to grow crops in combinations.
- Use seed rate and fertility to pick a main crop and a companion (pick a winner).
- Area of crop economic, agronomic adaptations can change.

Chickpea Flax Intercropping Trials

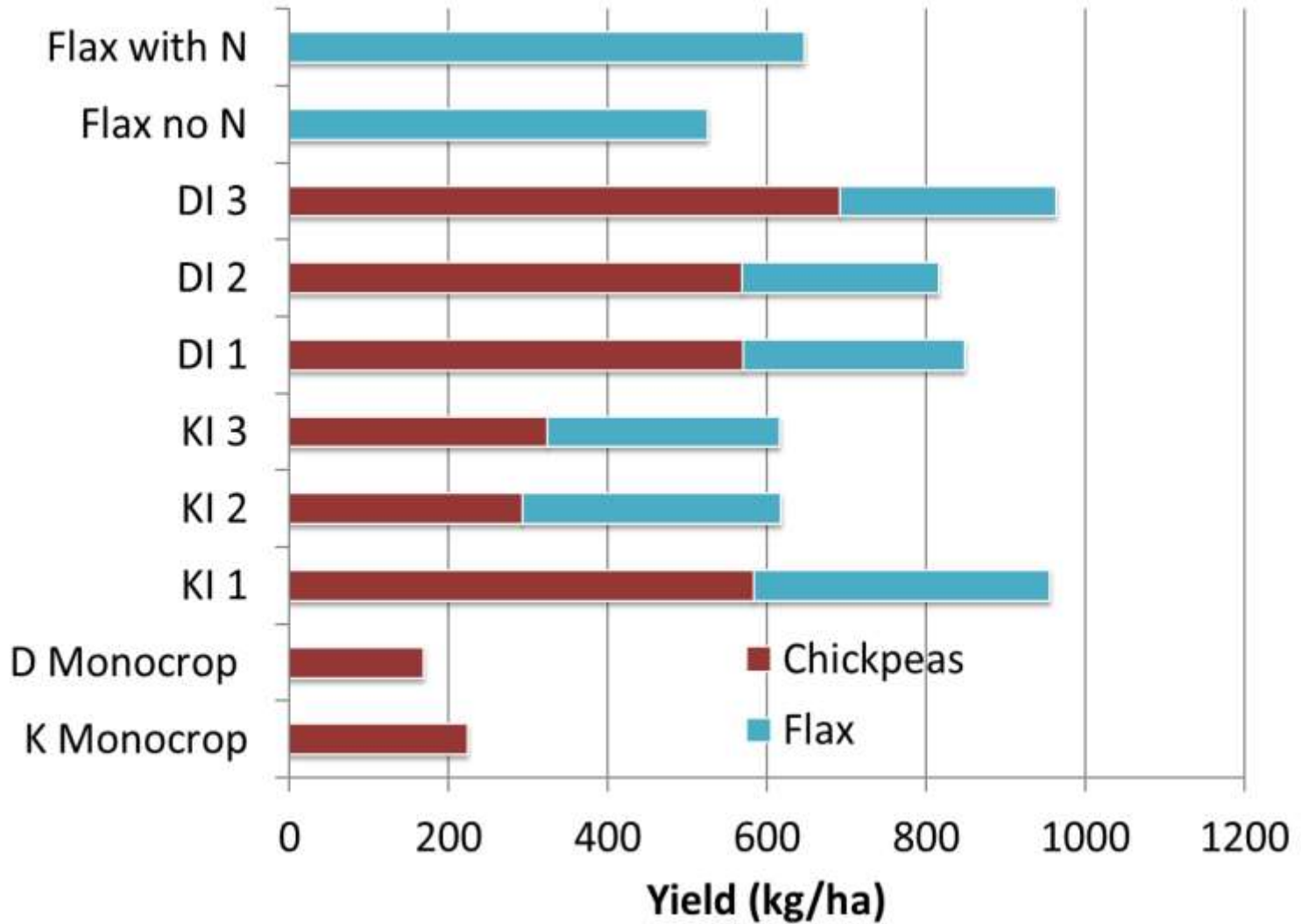


- ◆ Alt vs Mixed Rows (2016, 2017, 2018)
- ◆ Flax Seed Rate, N (2017, 2018)

2013 Redvers Chickpea Flax (ADOPT)



2014 Redvers Chickpea Flax (ADOPT)



Redvers 2014

Disease incidence was reduced in intercrop plots

Chickpea *Aschocyta* Incidence on Aug 30 (% severity):

- 51% for monocrop plots
- 17% for intercrop plots
- Significant difference



Chickpea Flax (2017 Redvers)



Sept 2, 2017

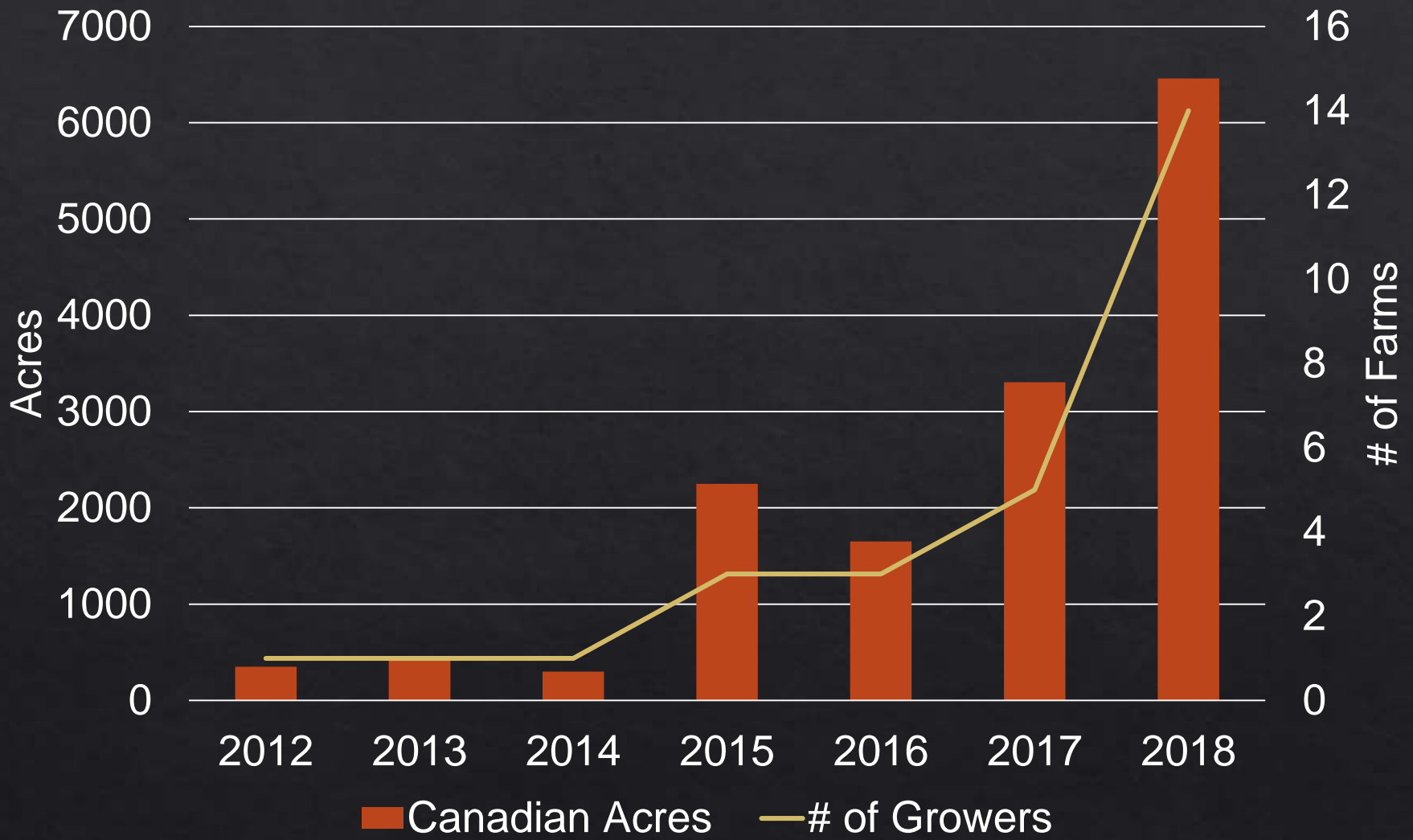
Monocrop chickpeas still flowering in low area.

Intercrop ripening well beside - 7-10 days difference average for whole trial

Sask Pulse Trials: Indian Head and Redvers 2017

- ◆ Less green seed, shortened maturity
- ◆ 1000 kg/ha (18 bu/ac) flax in intercrops added to value
- ◆ Profitable combined yield of chickpea and flax
 - ◆ > 2000 kg/ha combined on average
- ◆ Stable yields, profitable production

Commercial Chickpea Flax



Never underestimate the ingenuity of farmers

- ◆ 32K SK Acres reported to SCIC
- ◆ Crop Insurance is available but very limited so far



Chickpea Flax Intercrop

Best Advice So Far

- ◆ Start with small acreage
- ◆ Target monocrop chickpea density
- ◆ Flax rate 10-20 lb/ac (preliminary), do strip trials for local verification
- ◆ Chickpeas thresh the flax bolls
- ◆ Intercrop compensates, lowers risk (esp. in wet areas)

Aftermath of Intercrops

Chickpea-Flax (Kurt Myllymaki, Montana)



Pea Canola (Chris Jorgenson, AB)



Snow-trapping? Erosion Reduction? Stubble for Winter Cereals? Probably added benefit

How do you separate it?



- ◆ Large seed size difference is important
- ◆ Dockage cleaners have capacity
- ◆ Custom basic cleaning \$.50 - \$1/bu

What about rotations?

- ◆ Apply basic principles with more complexity
- ◆ Rotate herbicides
- ◆ Don't have to intercrop everything in rotation
- ◆ Alternate broadleaf intercrop with cereal monocrop
- ◆ Don't turn 3 year rotation into 2 year
- ◆ Aphanomyces, clubroot, flea beetles



Mixed Grain Intercrops

- ◆ 18 combinations tested so far
- ◆ If not here, where?
 - ◆ Flax, mustards, camelina
 - ◆ Diverse pulses: chickpea, lentil, faba, pea
 - ◆ Local markets and handling facilities
- ◆ If not now, when?

What is the Value Proposition?

- ◆ Depends on the crop combination
- ◆ Look at all benefits to risk, workload, production cost
- ◆ Higher yield is only part of the story
- ◆ Effects on harvestability, maturity, disease pressure

Challenge to Farmers and Industry

- ◇ Steep learning curve for farmers
- ◇ VR seeding and fertilizer application mapping
- ◇ Plant count and pod counts in strip trials
- ◇ Yield mapping for strip trials (seed rates, fertilizers, inoculants)
- ◇ More boots on the ground!





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Twitter: SE_ResearchFarm
#IntercropInnovators