University of Saskatchewan
College of Agriculture and Bioresources

The potential for inter-row cultivation in organic pulse production

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Field Pea & Lentil

- Important to the global agriculture industry
- Canada is a leading exporter
- Important dietary components
  - High in protein, minerals and vitamins

Agronomic benefits of pulse crops

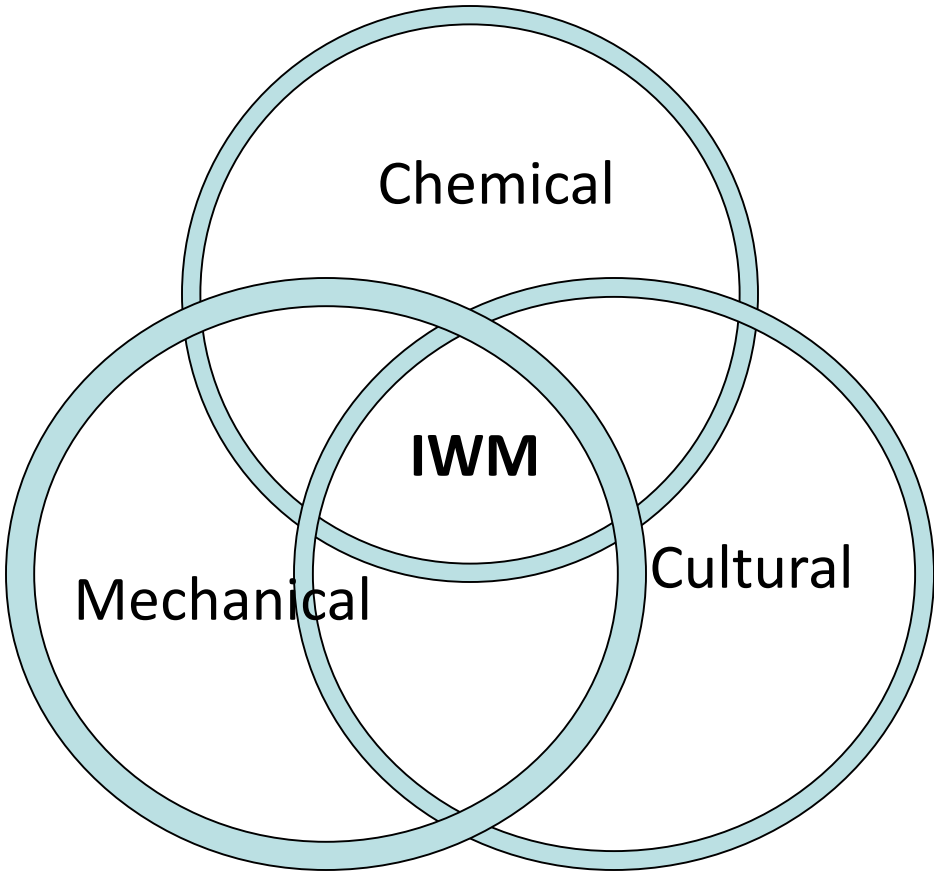
- Nitrogen fixation
- Increase diversity in rotation
- Increased profit margins

Issues with management

- Poorly competitive with weeds results in significant yield loss
  - Short in stature
  - Slow rates of canopy closure
- Limited herbicide options
  - Increase in herbicide resistant weeds

Integrated Weed Management

- Can be employed in both organic and conventional systems
- Increases selectivity and effectiveness
- Heavier reliance on cultural and mechanical practices in organic production



Inter-row cultivator

- Post-emergence
- Between row control
- Allows for removal of weeds during the critical period of weed control
- Steerable and vision guided

Objective

- To examine the suitability of inter-row cultivation for weed control in organic pulse production.

Experiments

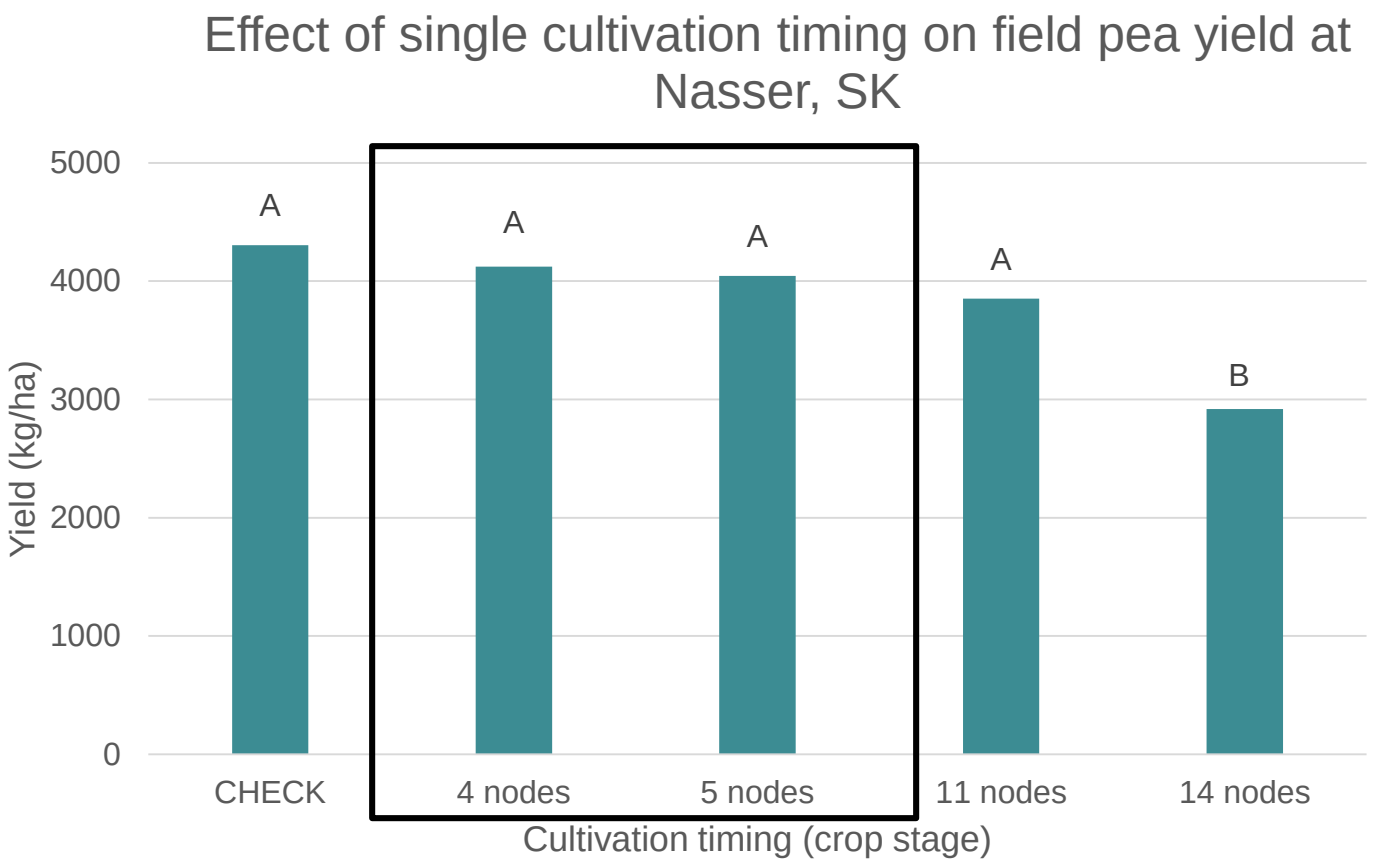
1) Crop tolerance to inter-row cultivation

2) Weed control using inter-row cultivation

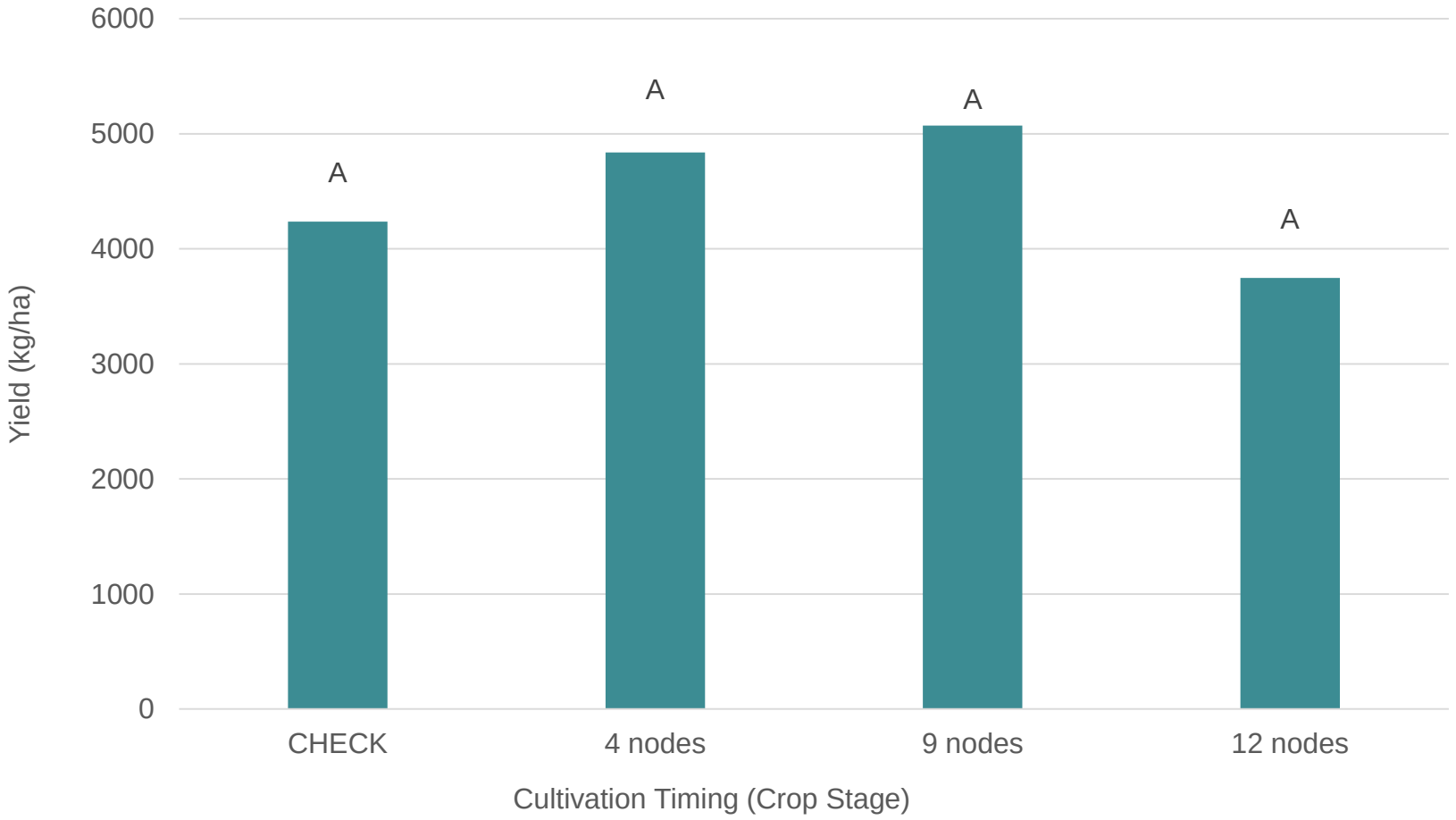
Methods

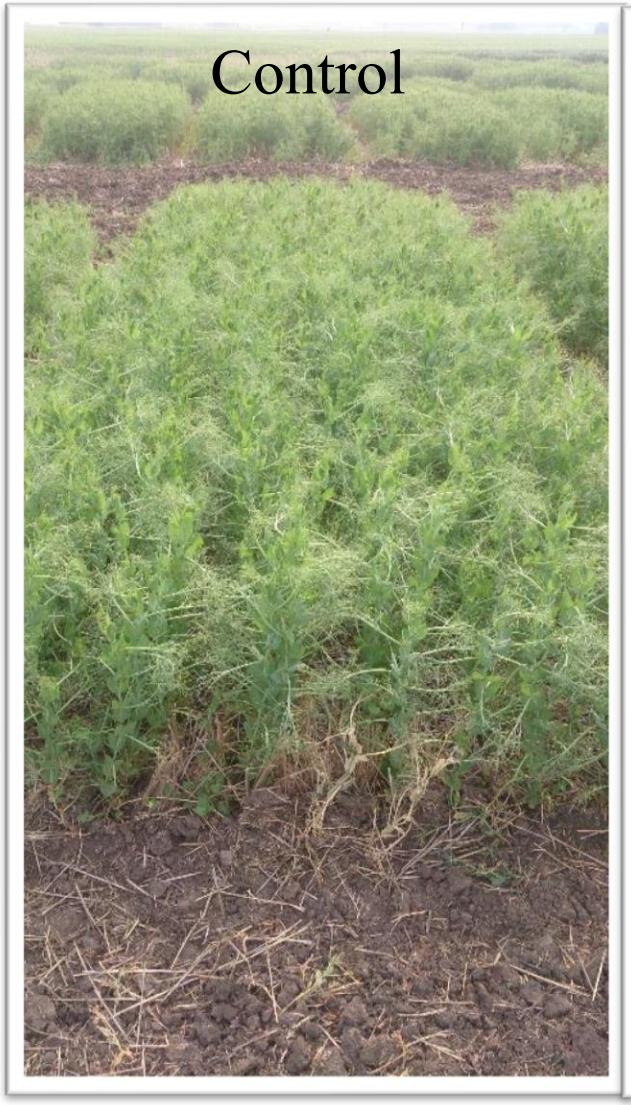
- Randomized Complete Block Design
- 30 cm row spacing
- 120 plants m^{-2} field pea, 240 plants m^{-2} lentil
- 6 single cultivation timings (week 1 – 6)
- 4 multiple cultivation timings (combinations of 2 & 3)

Results – Single cultivation, field pea



Effect of single cultivation timing on field pea yield in Vonda, SK

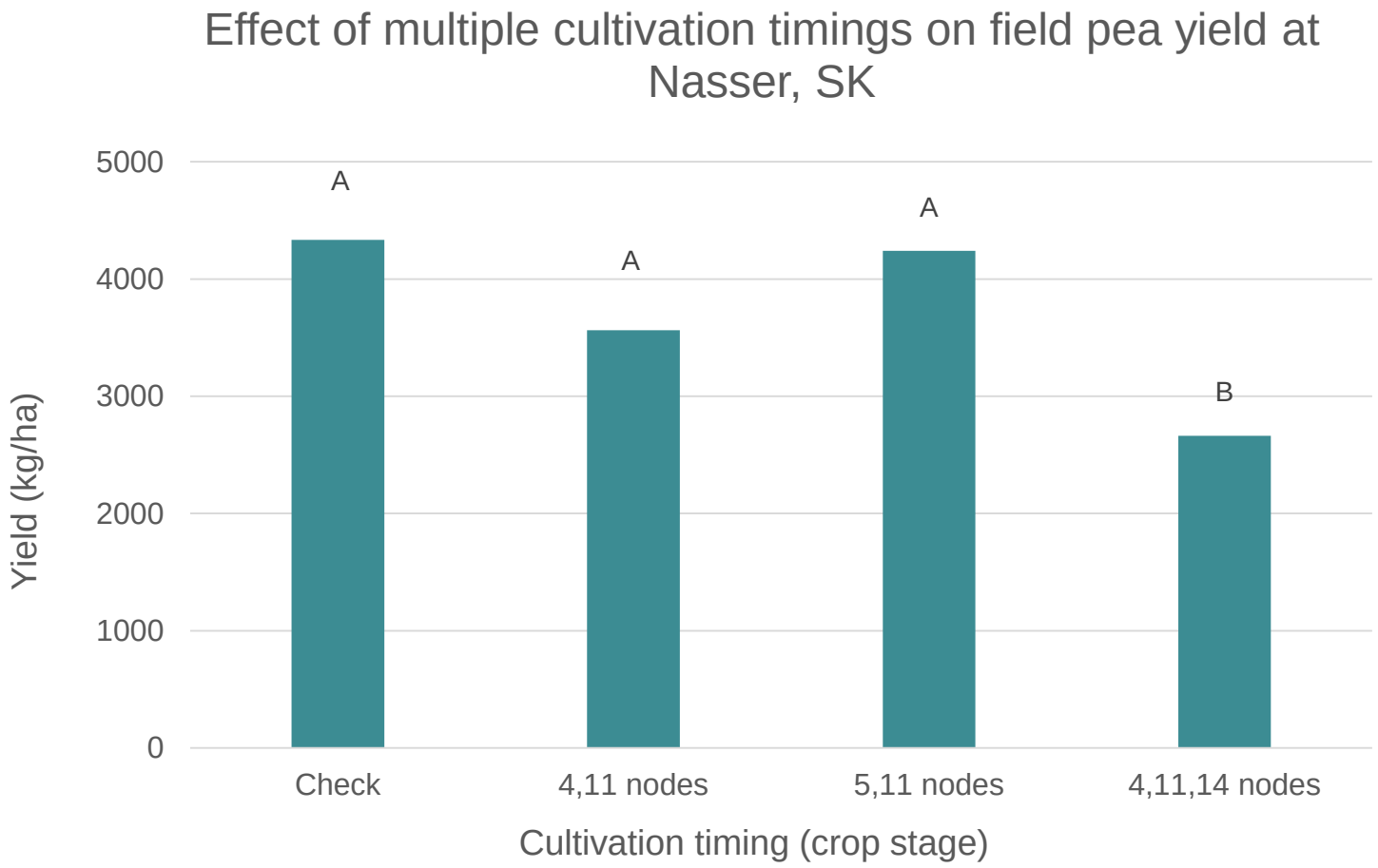



Control

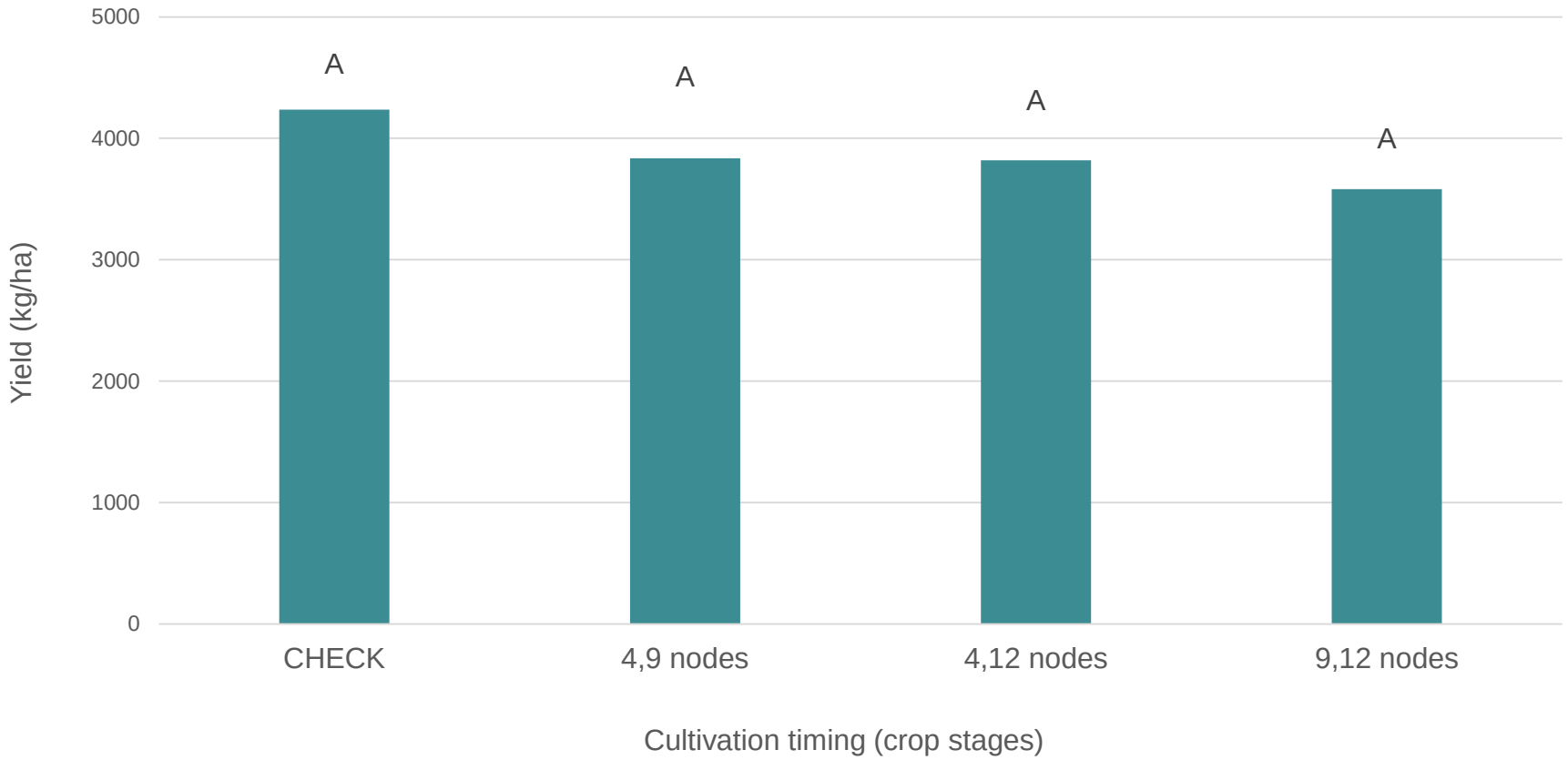

11 nodes


14 nodes

Results – Multiple cultivation, field pea



Effect of multiple cultivation timings on field pea yield in Vonda,SK

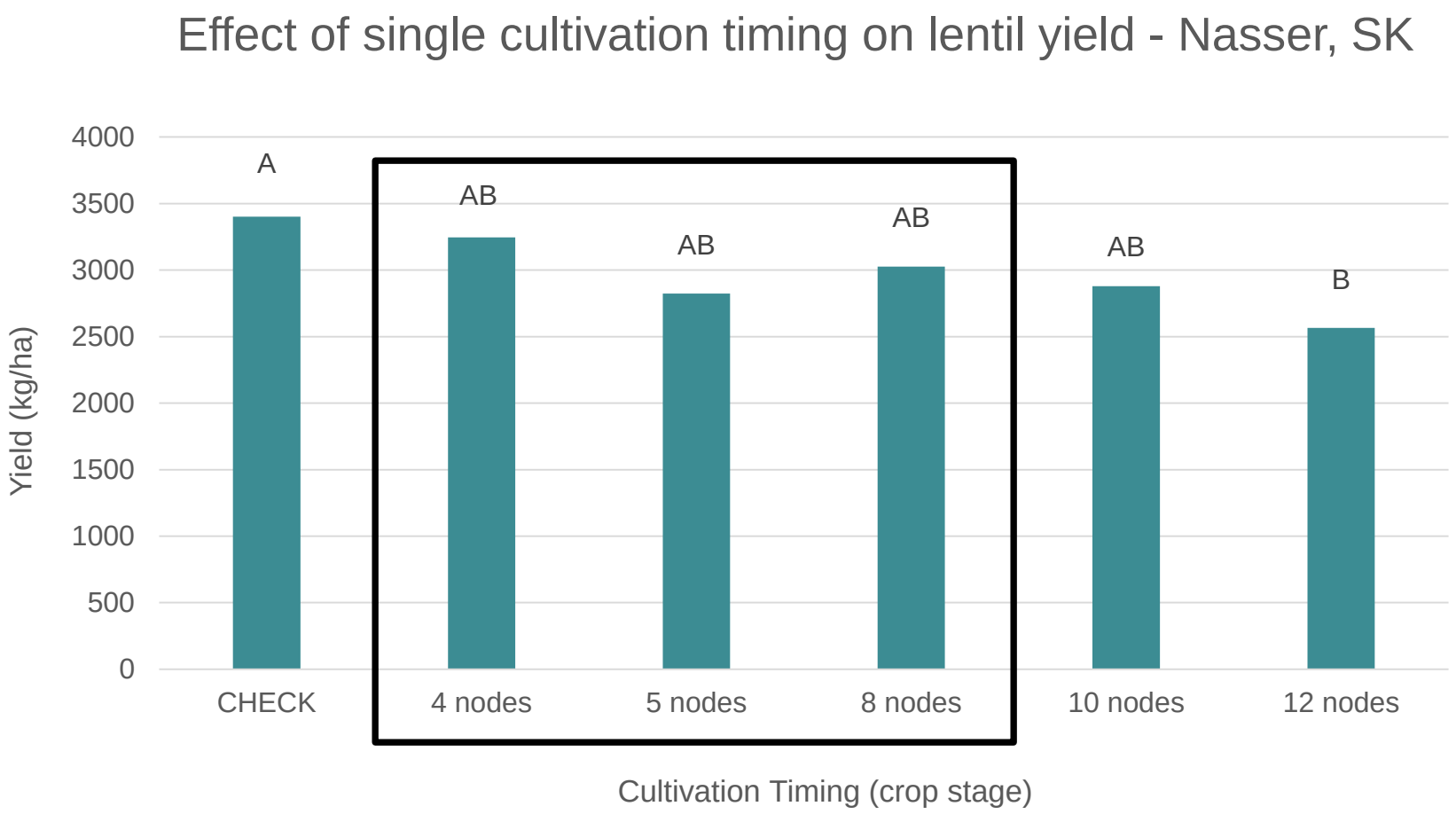



Control

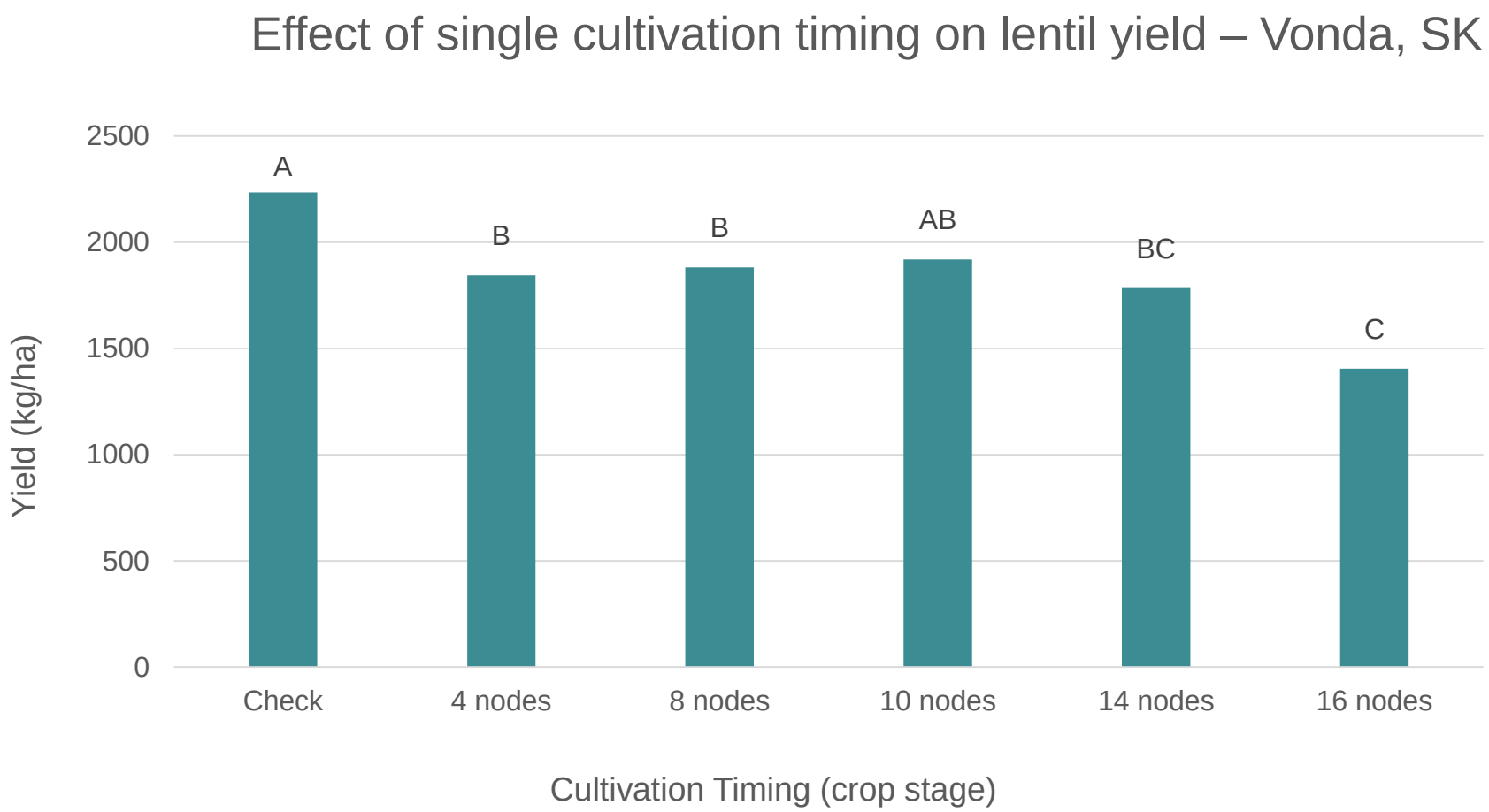

4,11 nodes


4,11,14 nodes

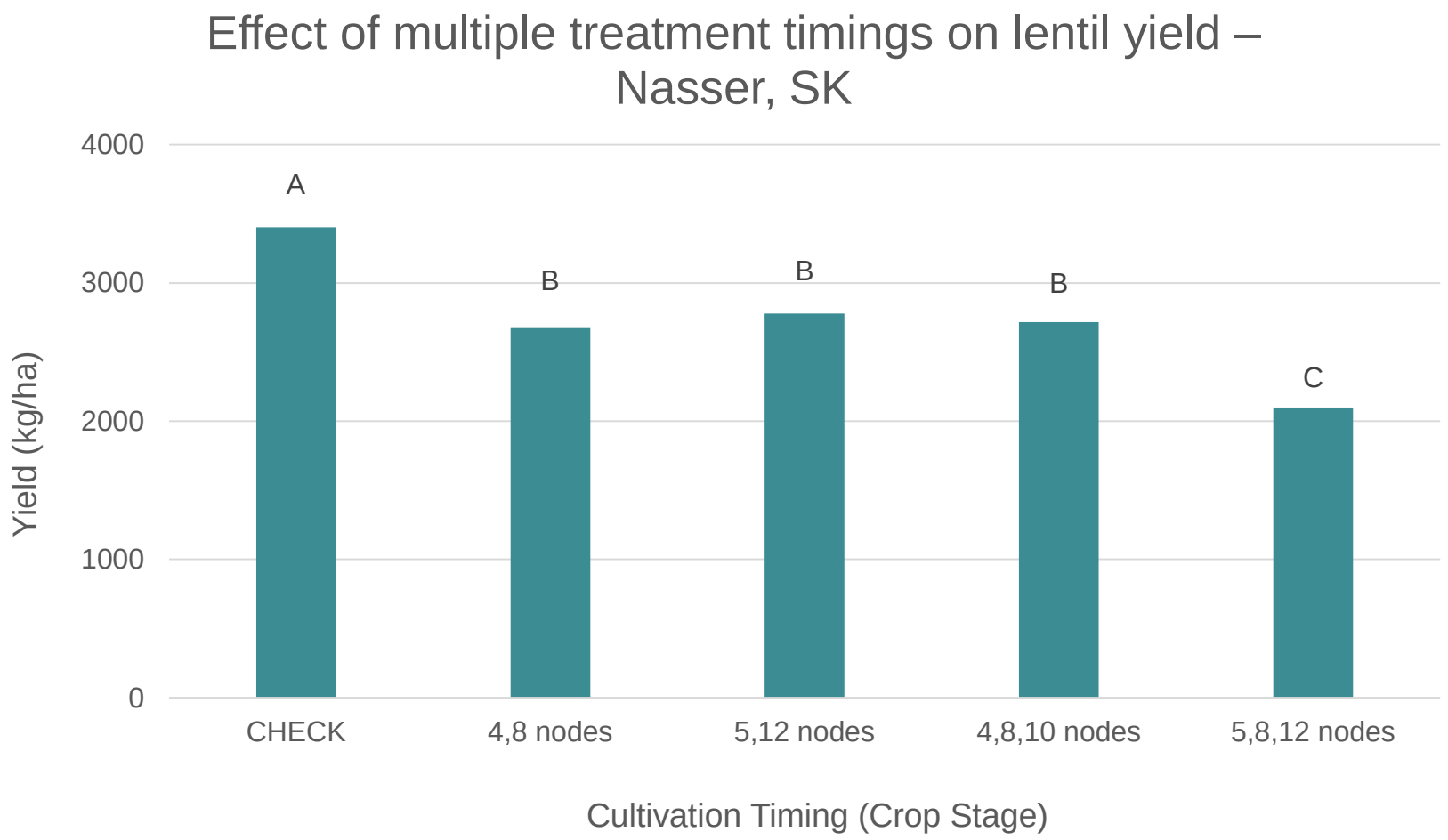
Results – Single cultivation, lentil



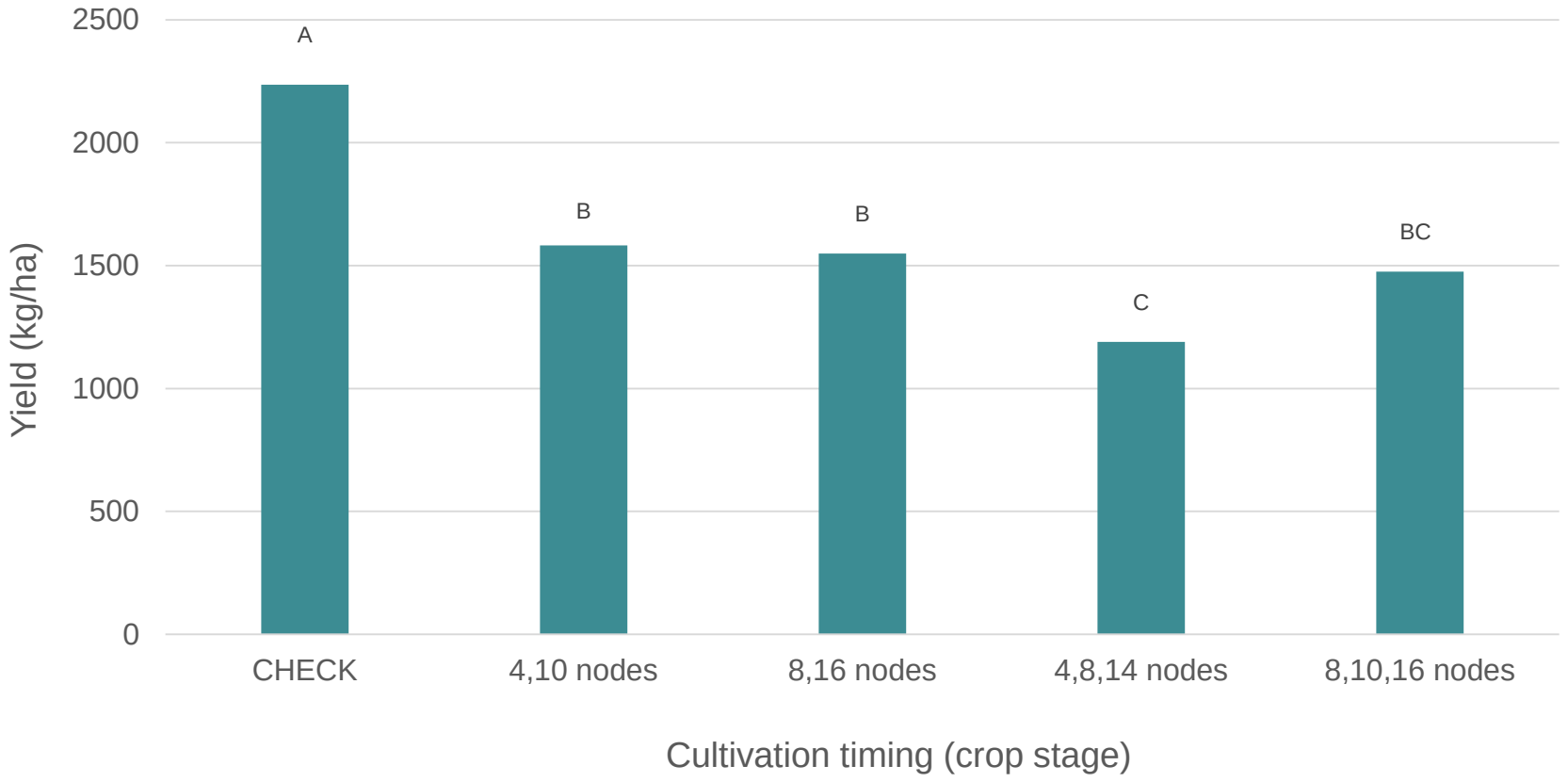
Results – Lentil Yield, Vonda SK

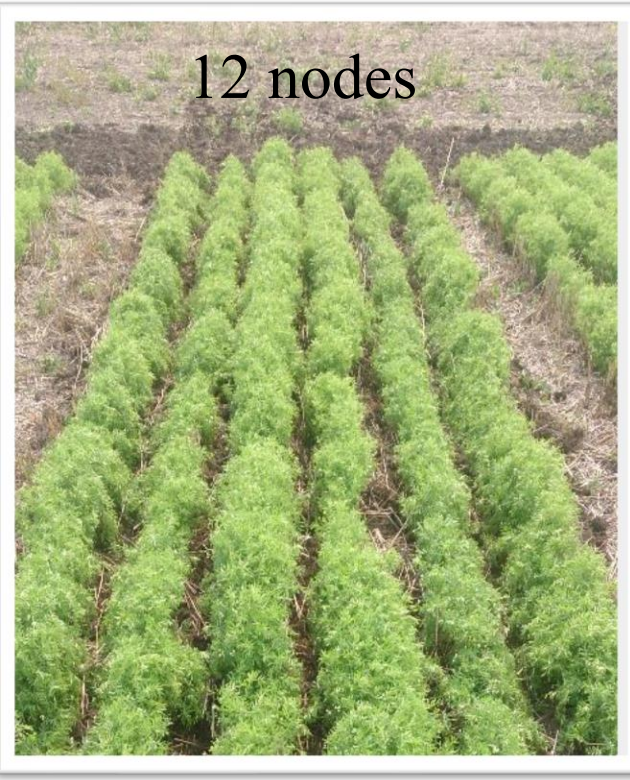


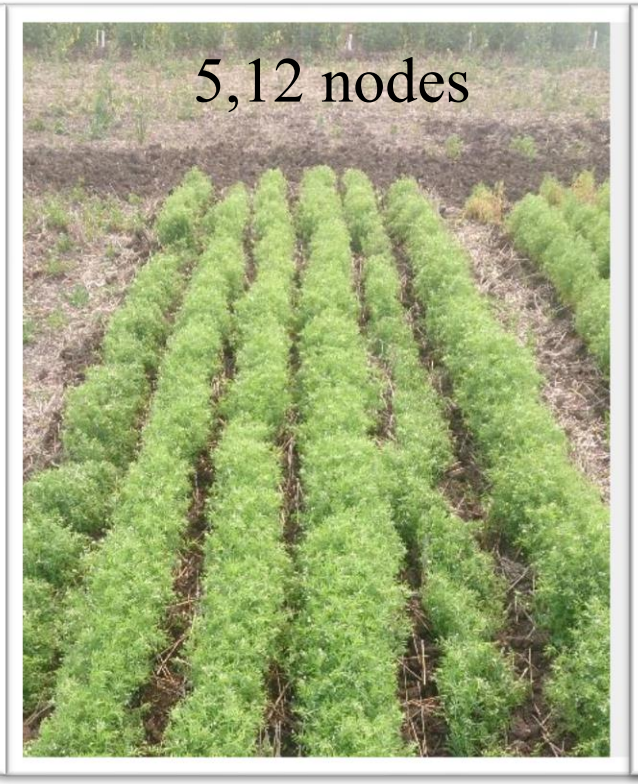
Results- Multiple cultivations, lentil

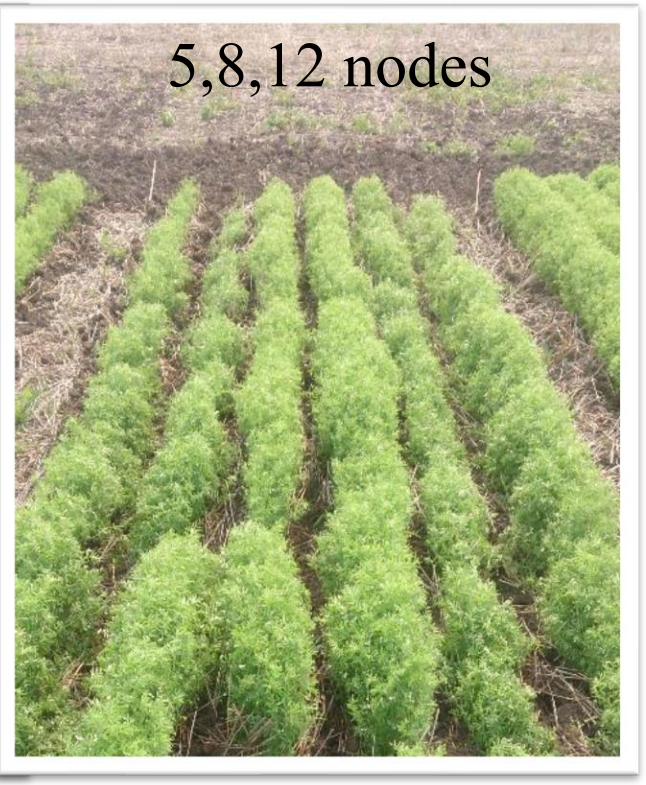


Effect of multiple cultivation timings on lentil yield - Vonda, SK




12 nodes


5,12 nodes


5,8,12 nodes

Conclusions

- Inter-row cultivation at early growth stages in field pea and lentil has low risk to yield potential
- Variability in lentil response
- Field pea tolerates two cultivation timings
- Risk in yield loss with late and multiple cultivation timings
- Preliminary visual observations show weed control potential of inter-row cultivation

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- Fellow graduate students

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Growing Forward 2 — A federal-provincial-territorial initiative

Government of Saskatchewan — Ministry of Agriculture

Canada

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Saskatchewan Pulse Growers

Certified Organic OCIA

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Questions?