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Emerging insect pests of pulse crops: lygus and pea leaf weevil

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Outline

- Insect pests of pulse crops in the Prairies
- Lygus – a complex true bug
  - Research update
- Pea leaf weevil
  - Lessons from field peas
  - Expansion to faba bean territory
- Take home messages

Prairie pulse pests

- Prior to 2000 (pea leaf weevil reported)…
  - Mostly free of chronic insect pests
  - Except for pea aphid in Manitoba
  - Intermittent pests: cutworms, wireworms, grasshoppers
  - Lygus
    - …lygus noted in faba beans and increasing (common in alfalfa and canola)
    - 2003 Farming for the future report (Dosdall et al)

Lygus in faba beans

Lygus Bug Control in Fababean Crops in Northwest Alberta

Final Report (Dosdall et al. 2003)

Farming For the Future
On Farm Demonstration Project

Alberta Pulse Growers – Zone 3

Conclusion:

"insecticide applications alone will not be an effective management practice for these pests in fababean … seed perforations were not reduced to acceptable levels.

Future research should focus on alternative management strategies. "

<u>Interaction of lygus and Botrytis (chocolate spot)?</u>
(2015-2016 Study led by Dr. Syama Chatterton)

Common lygus bugs of crops in the Prairies

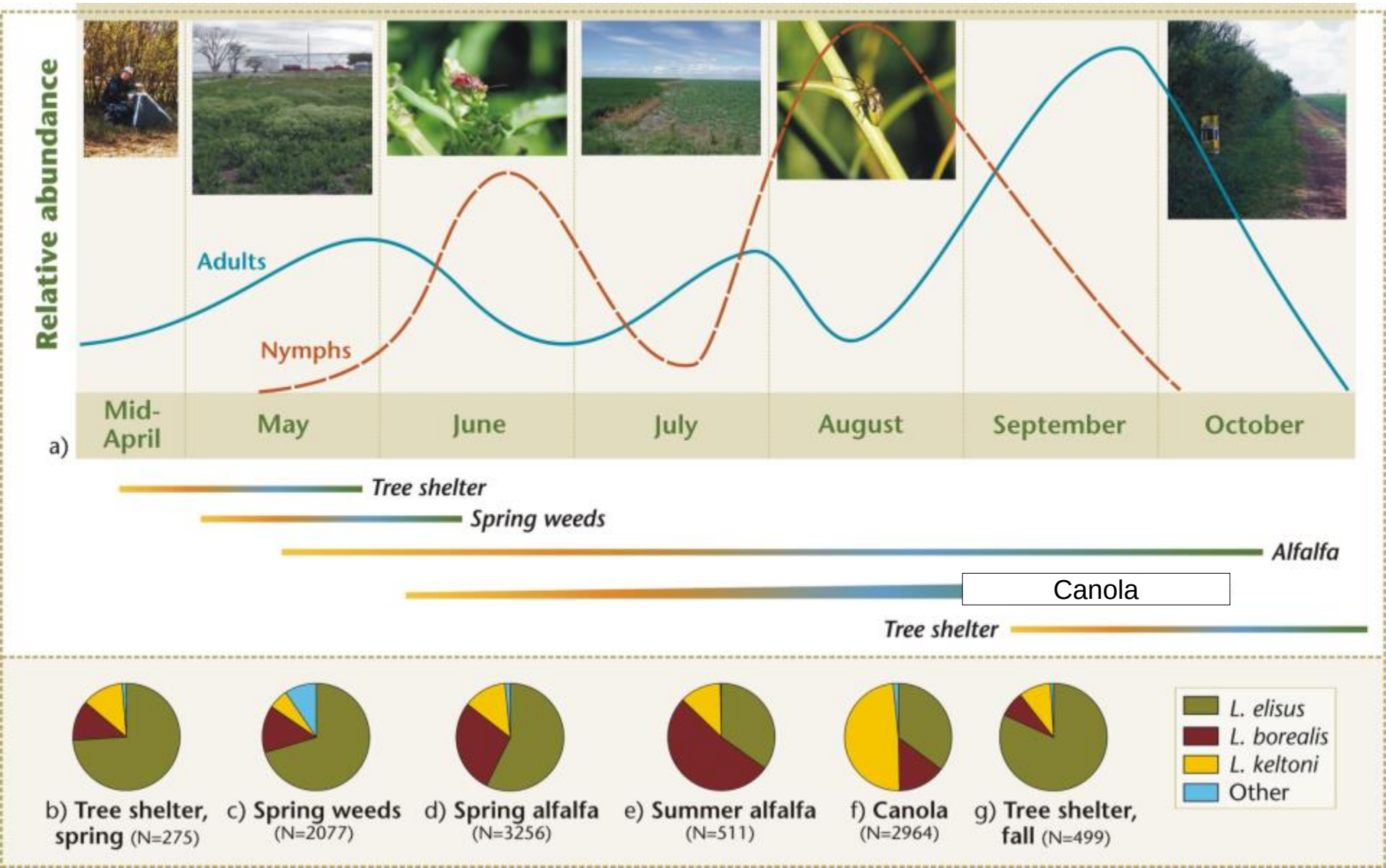
L. keltoni

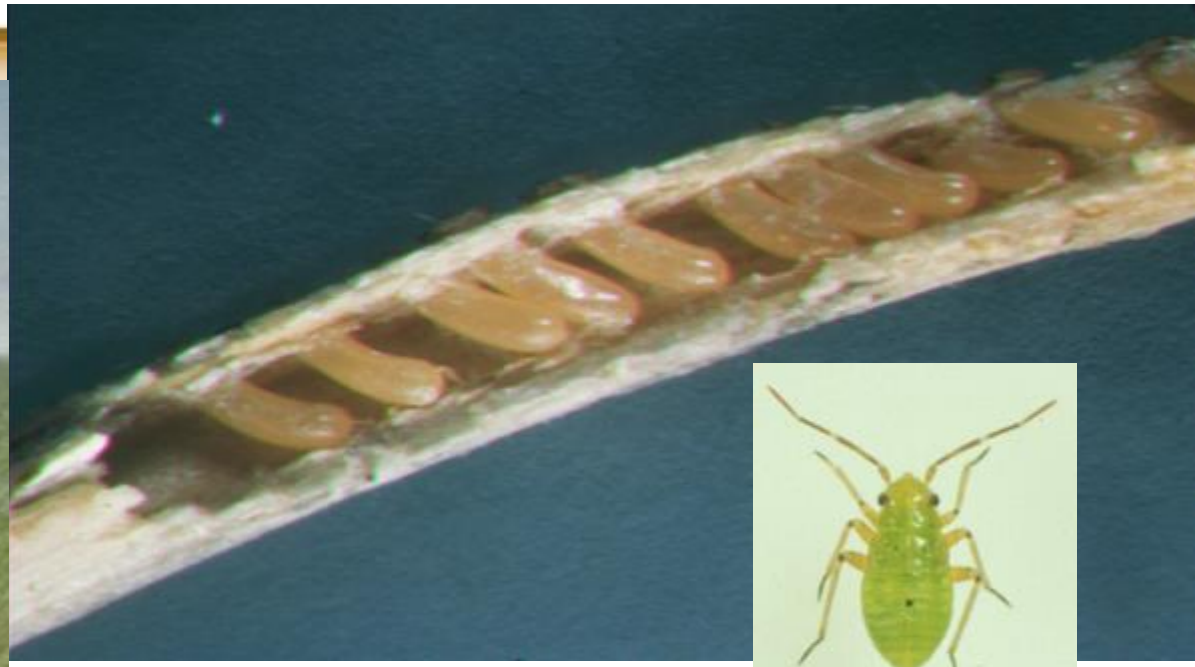
L. lineolaris

L. borealis

L. elisus

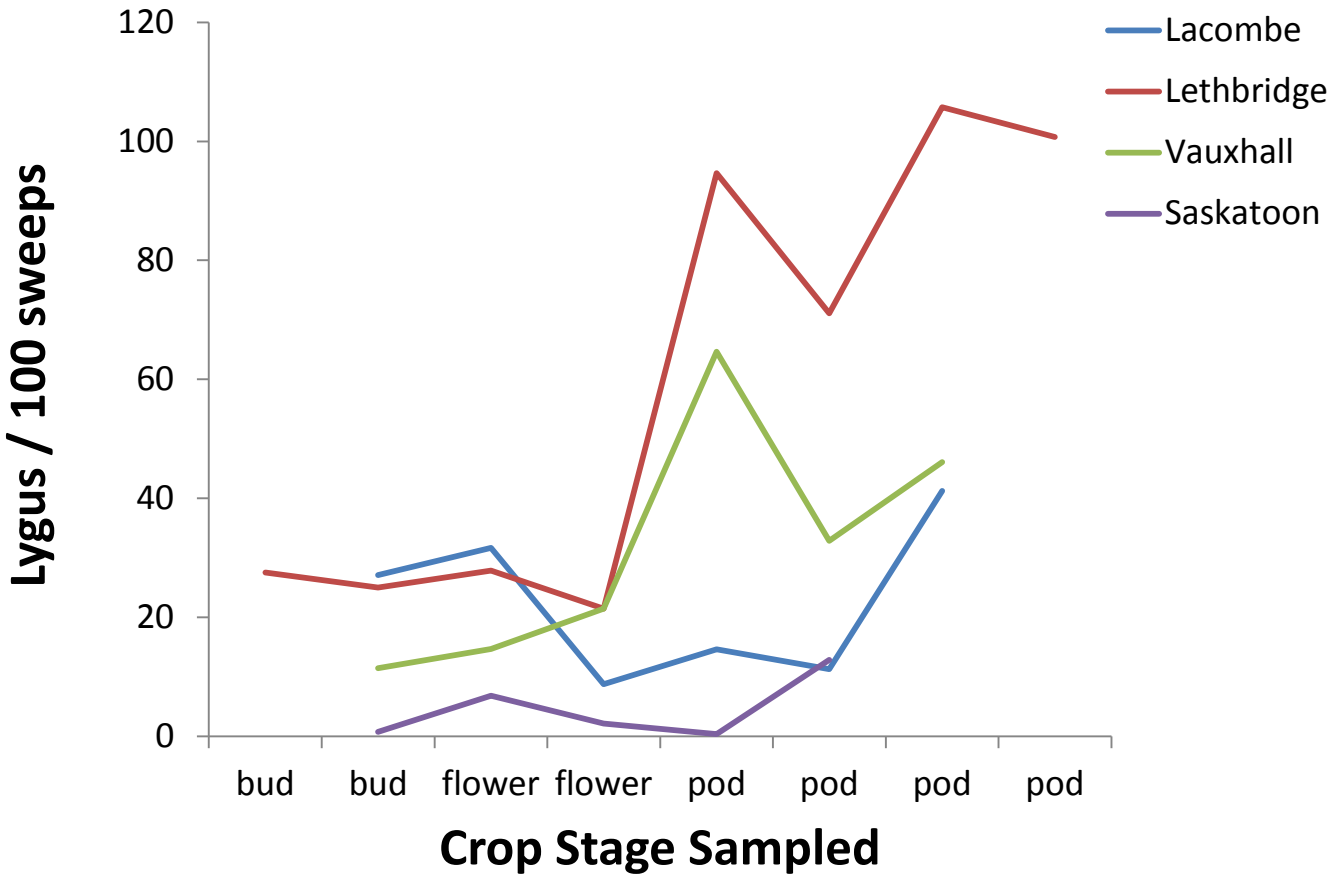
Summary of lygus phenology and species near Lethbridge



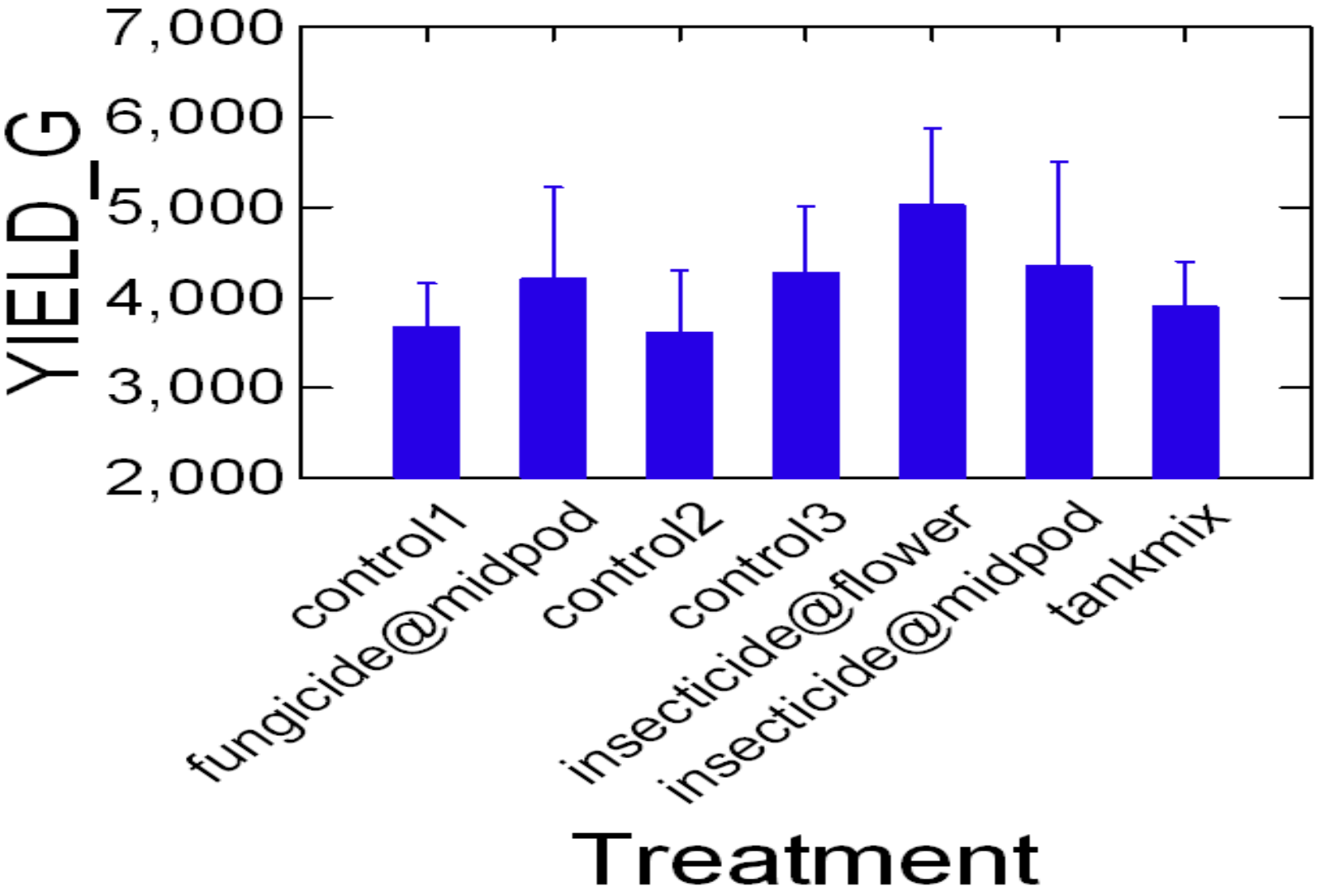


Lygus abundance in faba beans, 2015 survey

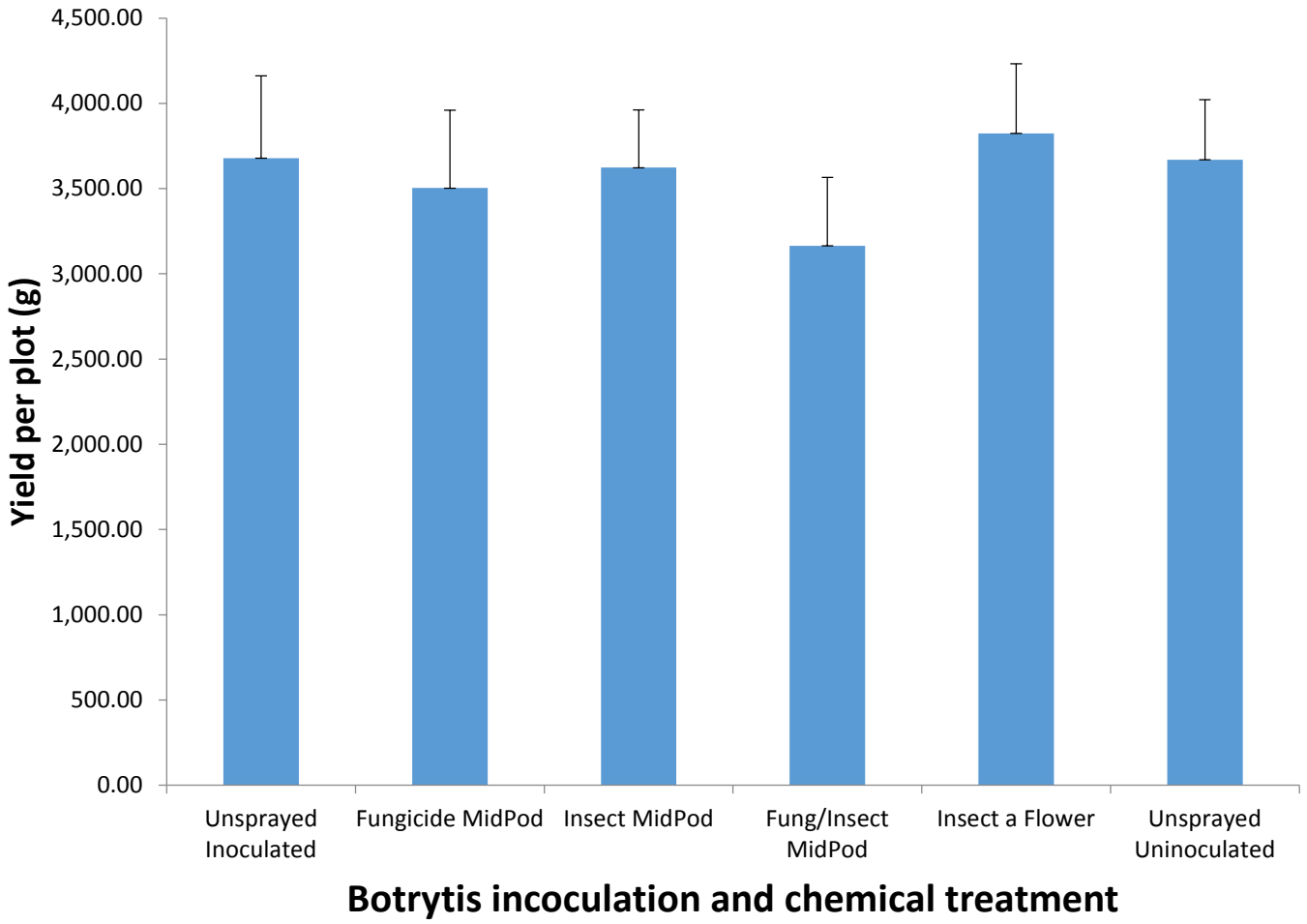
Lygus in 2015



Seed yields at Lethbridge, 2015



Faba bean yields, Saskatoon 2015



Management?

- Seed as early as possible to attempt to escape the “lygus flush”
- Chemical control? Need to keep working on threshold development and crop stage
  - Looks like late flower/early pod best stage but may not be enough to reduce dark spotting
  - Ideally…need a soft, specific long residual chemical (soft on beneficials)

Pea Leaf Weevil

- Sitona (broad nosed weevils)
  - ~23 spp in Canada, native and introduced
- *Sitona lineatus* (native to Europe, N. Africa)
- Adult 5 mm long
- Light brown stripes extend to wing covers

- Larva milky white body and dark head
- grub-like, curved shape
- legless

Life Cycle in Alberta

Alfalfa & tree shelters

Sept-May

Pea fields

May-June-July

Pea roots

June-July-August

Pea field harvest

August-Sept

Host plants

- Feeding hosts
  - Adults feed on many leguminaceae (e.g. alfalfa, beans, clover, lentils, lupins, vetch) but generally don’t cause economic damage
- Reproductive hosts
  - Peas
  - Faba beans

Damage- Adults

- Notching of leaf margins in June-July
- Plants can compensate

Field peas

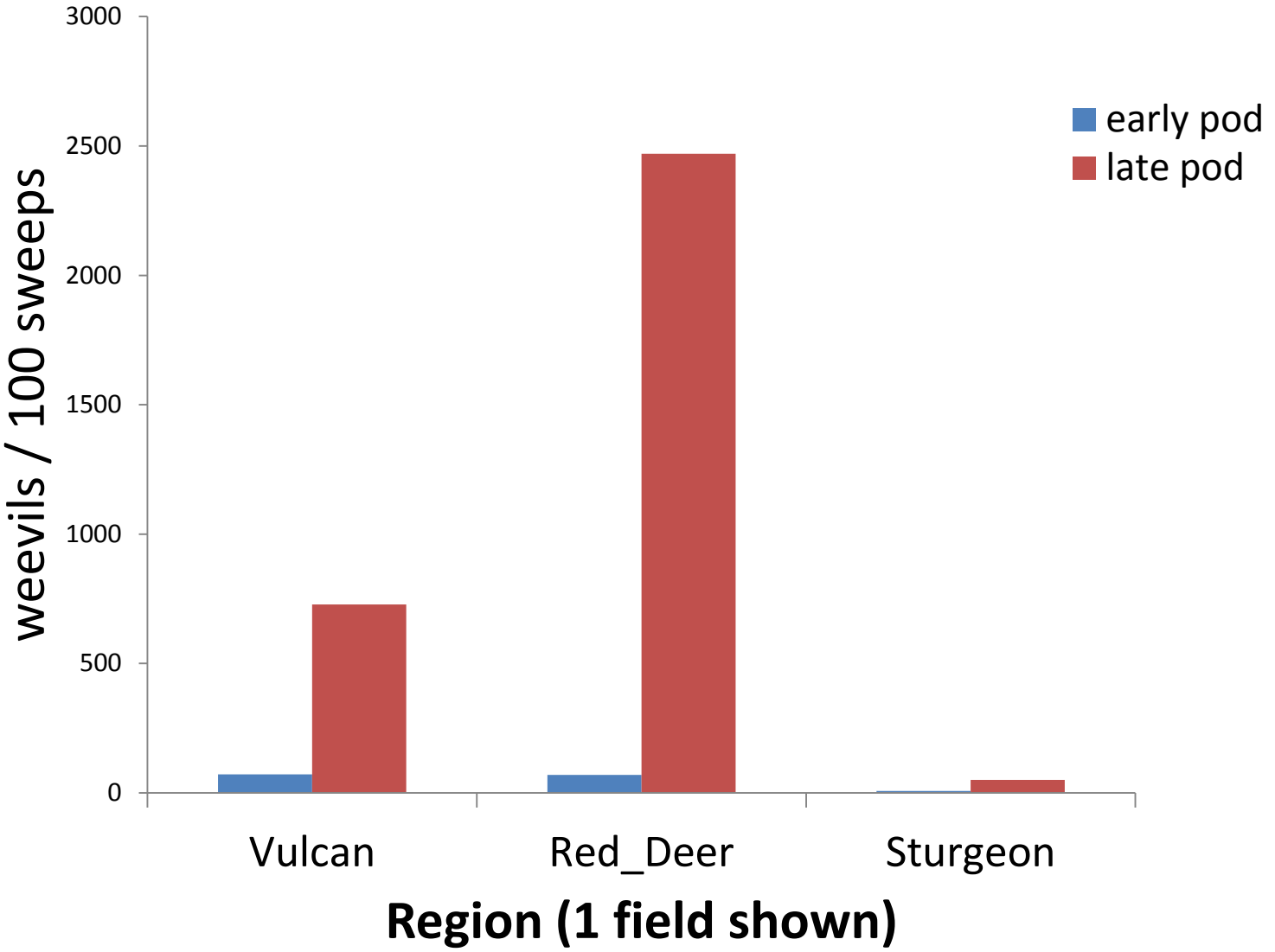
Faba beans

Lupins

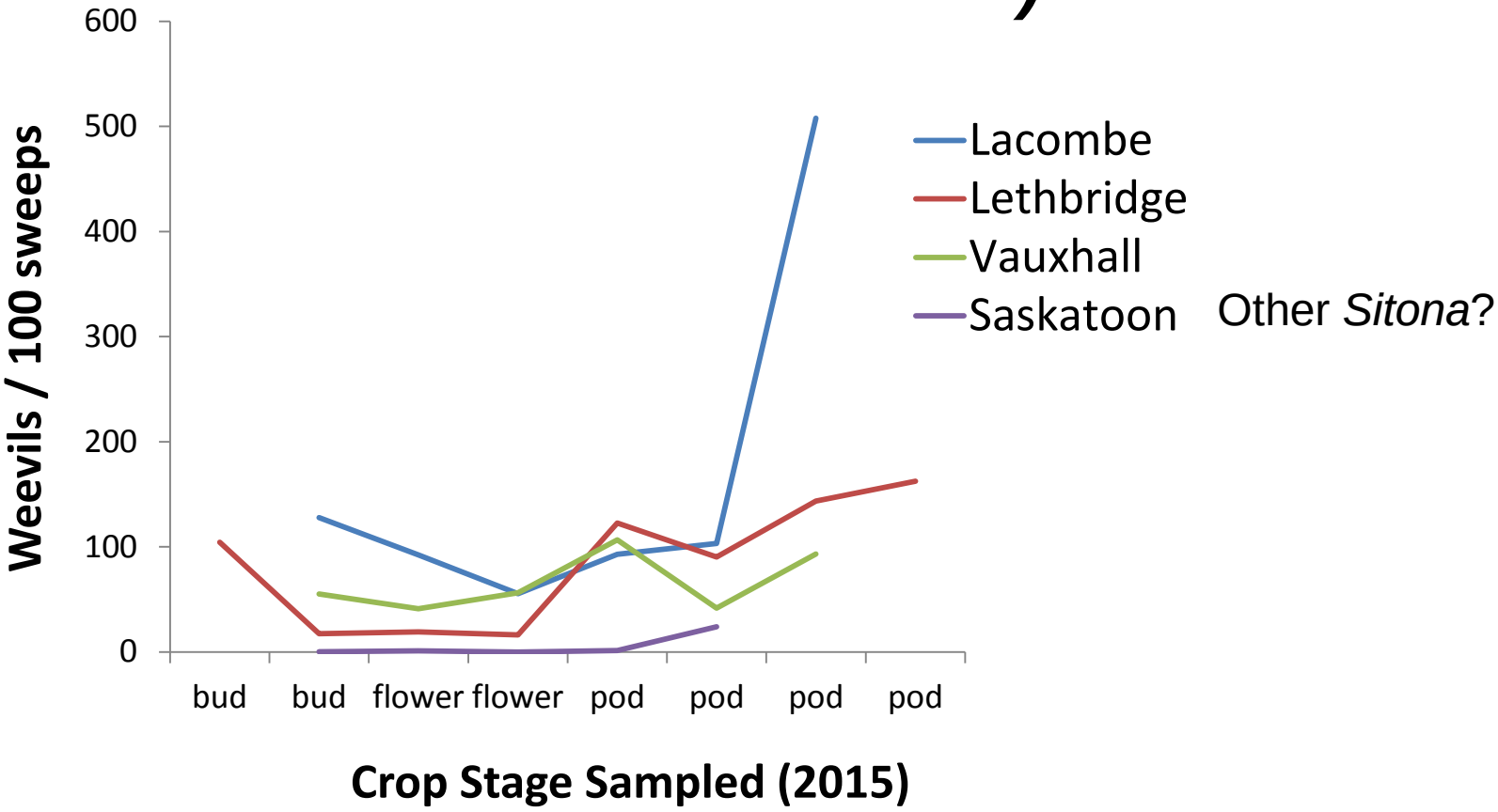
Damage- larva

- Larvae feed on root nodules
- destroy *Rhizobium*

Pea leaf weevil abundance in Alberta, 2015



Sitona (pea leaf and sweet clover weevils)



Summary: Management

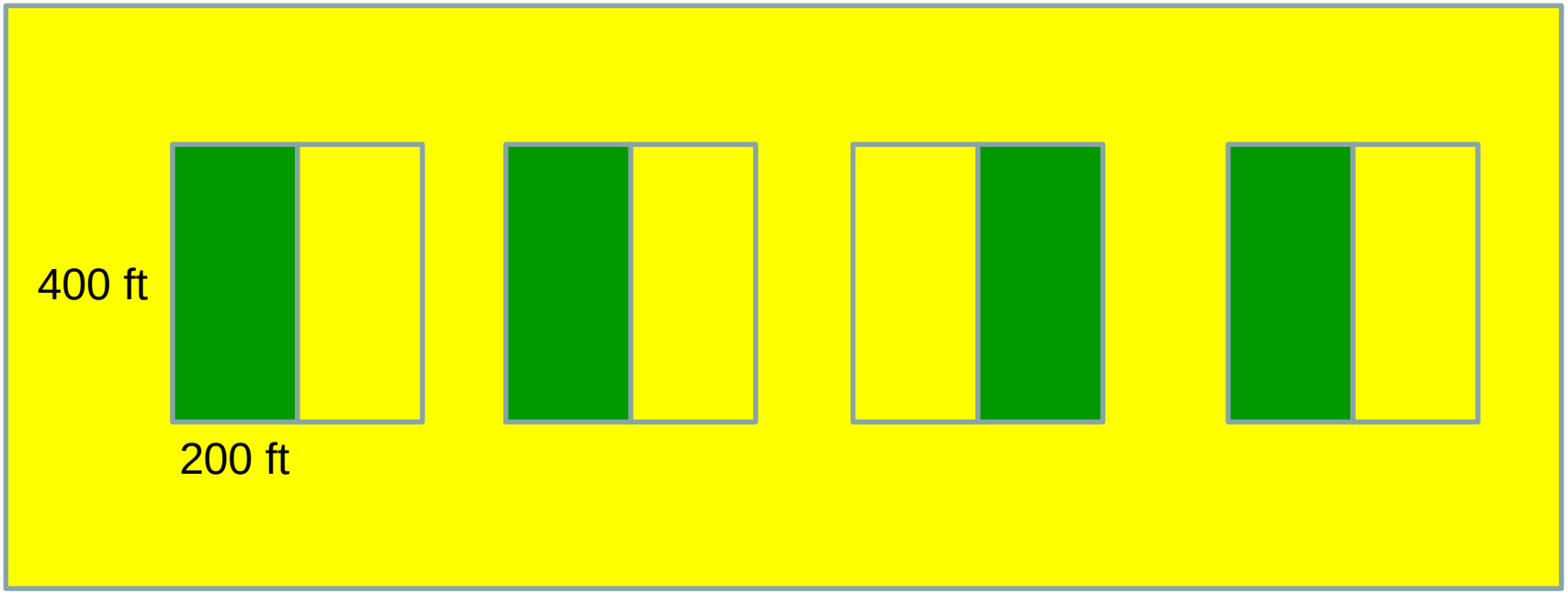
- Plant early to maximize yields (earliest gets the most weevils though!)
- Consider trap crops of winter peas (?) or earlier planted spring peas (weevils love fabas!)
- if high populations in the area in previous year consider insecticide seed treatment (worked better than foliar in our trials)

Summary: Management

- Monitor as soon as plants emerge up to 6 node stage; edges vs middle of field will differ
- Thresholds: 30 % seedlings with clam leaf feeding
- Foliar and seed treatments registered
  - Our plots produced variable yield results, seed treatment more consistent
- Under cool spring conditions or if high soil N (manured fields), weevils less of a problem
- Predators can eat pea leaf weevil eggs, there is room for exotic biocontrol agents

Growers can work with researchers to do on-farm strip trials

- At least 8 large sampling strips, randomly choose check and sprayed treatments; 2 years



Need yield measurements (gps combine yield data) or weigh wagon or truck

Acknowledgements

- Funding
  - Alberta Crop Industry Development Fund
  - Alberta and Saskatchewan Pulse Grower Commission
- Technical support
  - Shelley Barkley, Carolyn Herle, Cheryl Chelle, Sheree Daniels, dozens of undergraduate students

- Resources
  - http://www.prairiesoilsandcrops.ca/volume4.php
    - All major insect and disease pests