

# INVESTIGATING THE ROLE OF PLANT DIVERSIFICATION ON ATTRACTION AND PEST SUPPRESSION IN AN INSECTARY BORDER



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# Natural Enemies



# Resource Plant Provisioning

- Insectary plants provision natural enemies (Lundgren, 2009).
- Natural enemies prefer specific resource plants (Hogg et al. 2011).
- Insectary mixtures may support more natural enemies.



# Research Question

- Can plant-based resources promote natural enemy abundance?
  - ▣ Can a mixture provide further support?
- Objectives:
  - ▣ Evaluate potential of two plant species to support natural enemies by assessing:
    - Resource availability
    - Natural enemy abundance
    - Predation levels
- Natural enemy abundance greater in presence of plant-based resources

# Buckwheat

(*Fagopyrum esculenum*)



# Biculture



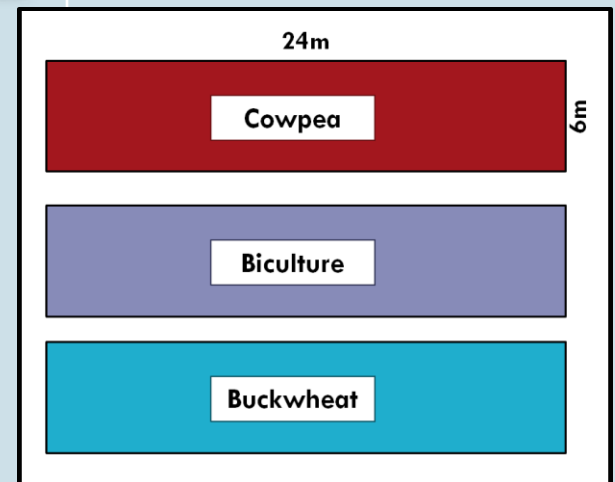
# Cowpea

(*Vigna unguiculata*)



## ■ Sampling:

- Resource abundance
- Sweep net samples
- Sentinel eggs (*Ostrinia nubilalis*)

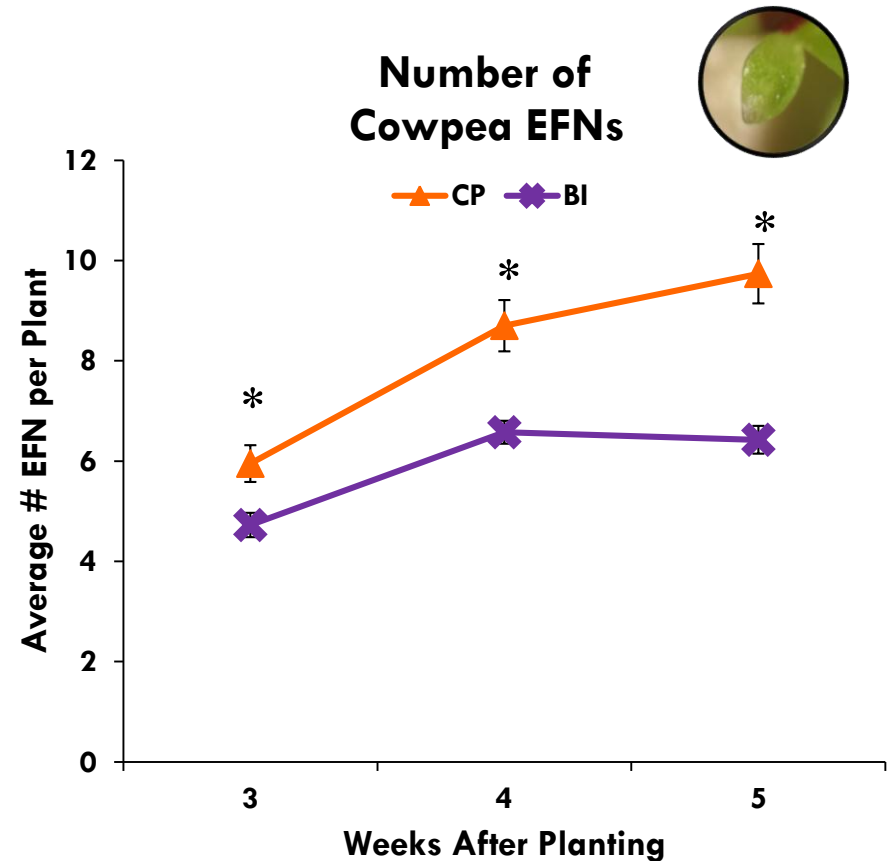
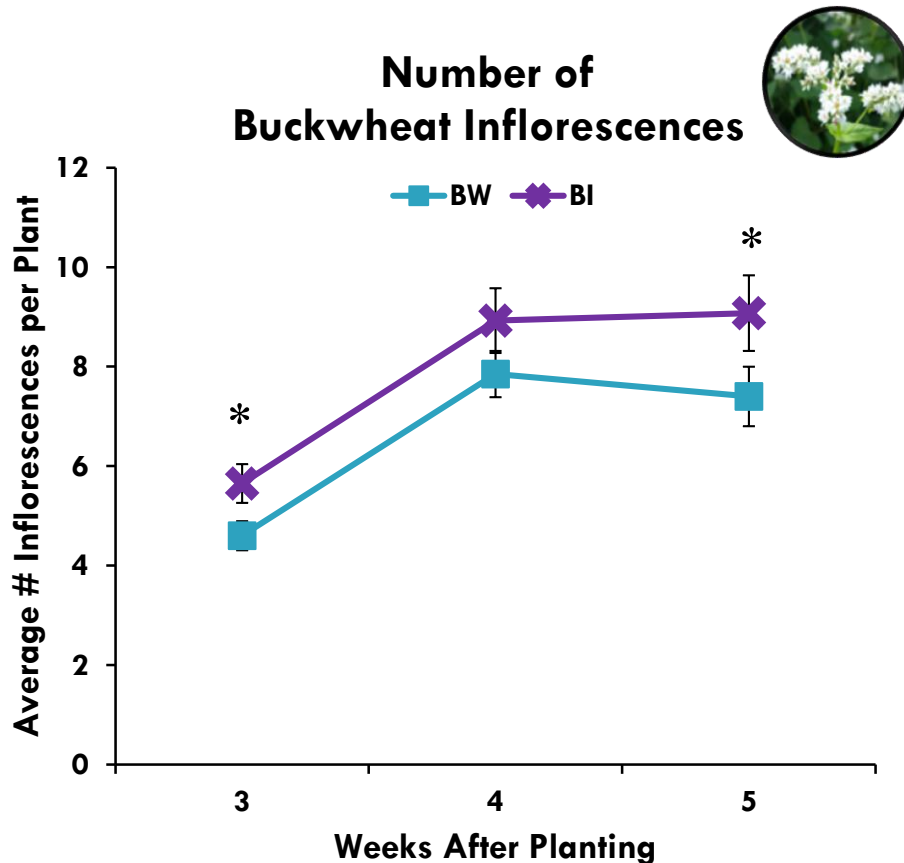


# Stand Establishment

- ❑ Vigorous buckwheat growth; anthesis 3 weeks after planting
- ❑ Poor cowpea establishment
- ❑ Buckwheat dominated biculture

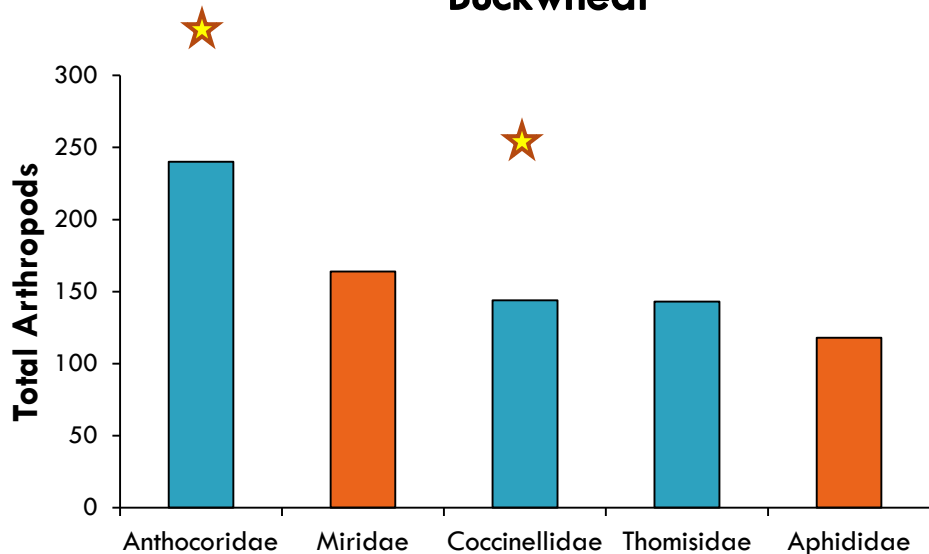


# Buckwheat inflorescences increase and cowpea EFNs decrease in biculture

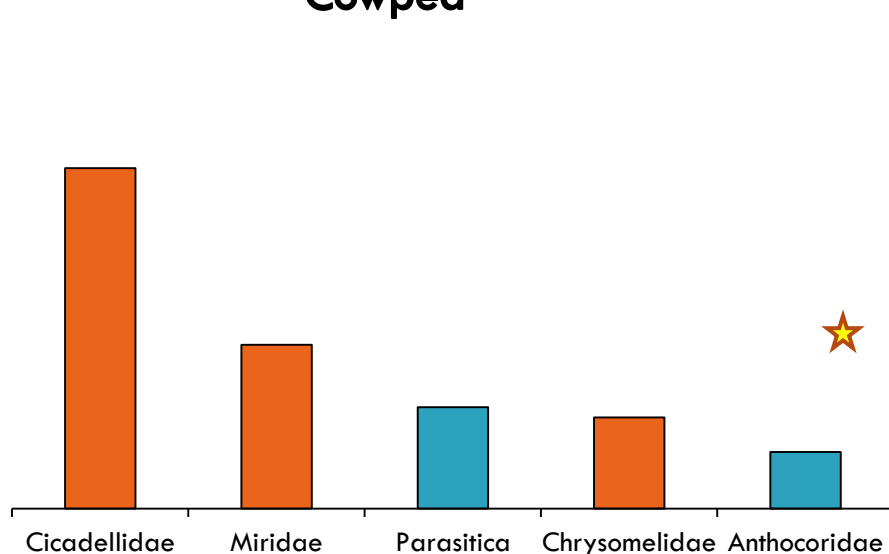


# Total Arthropods

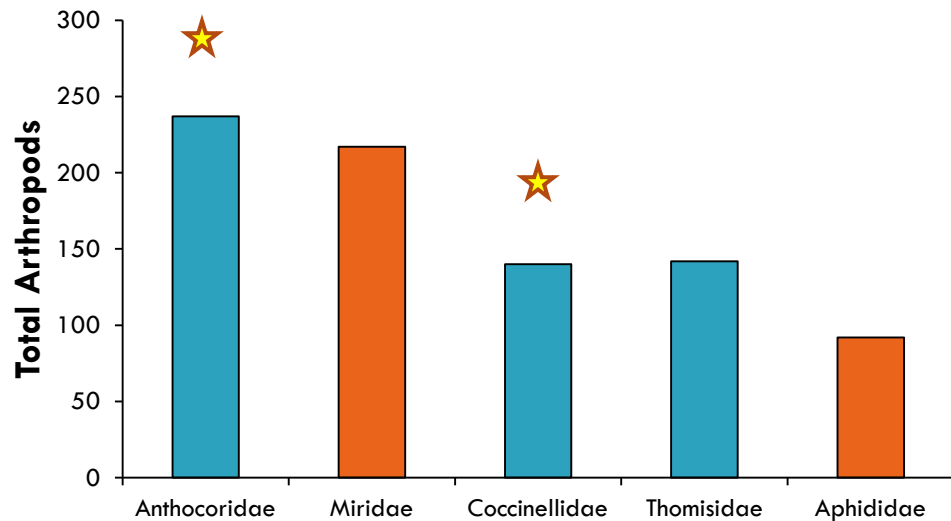
## Buckwheat



## Cowpea



## Biculture



## *Coleomegilla maculata*

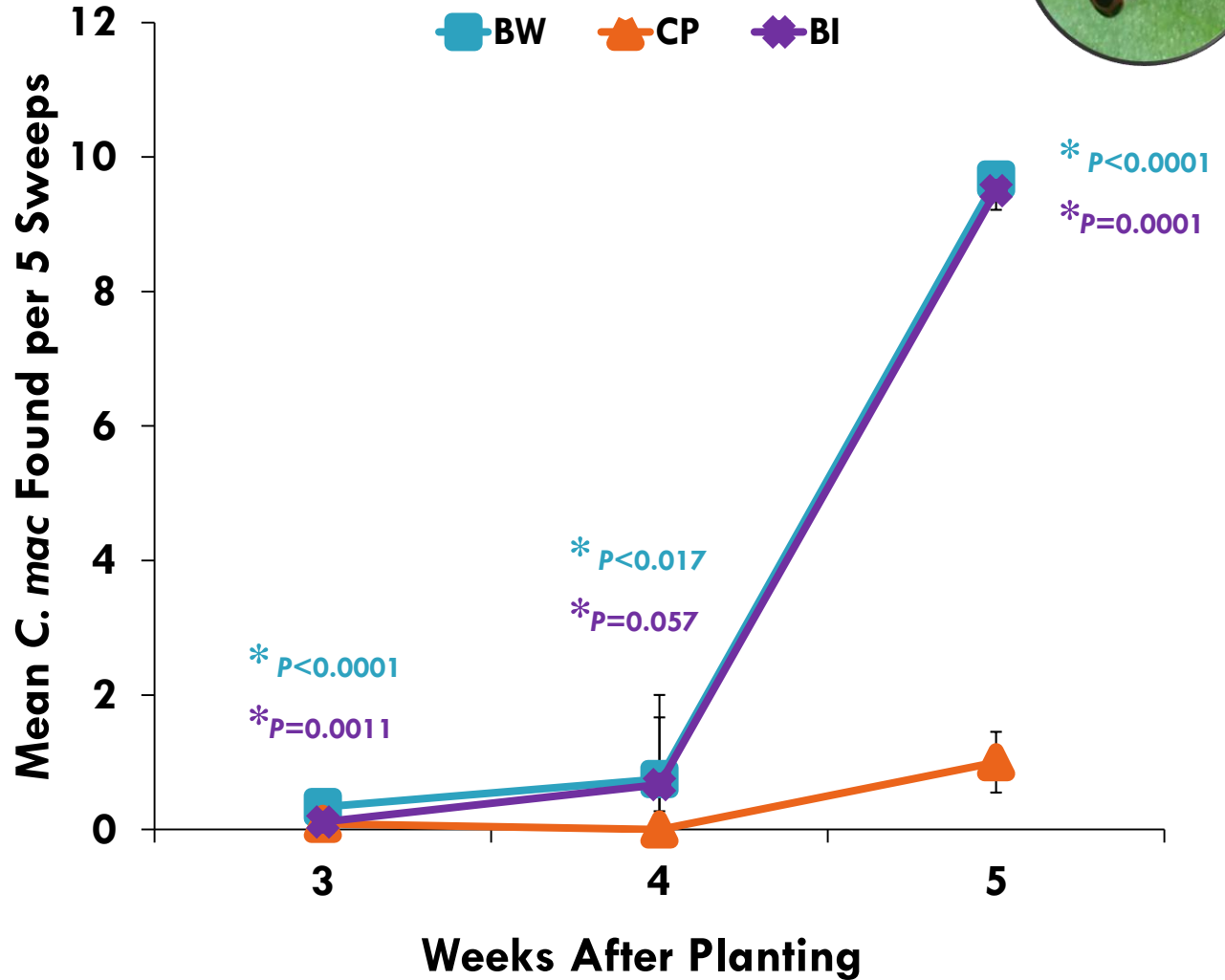
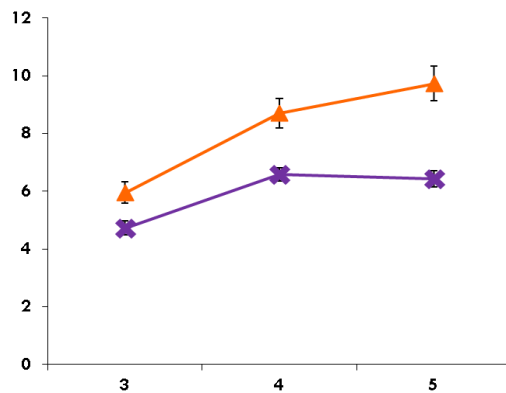
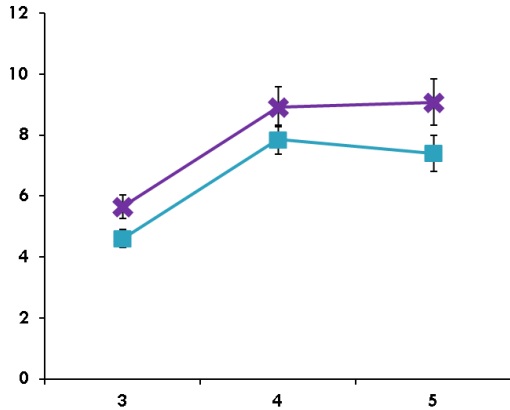


*Orius* spp.

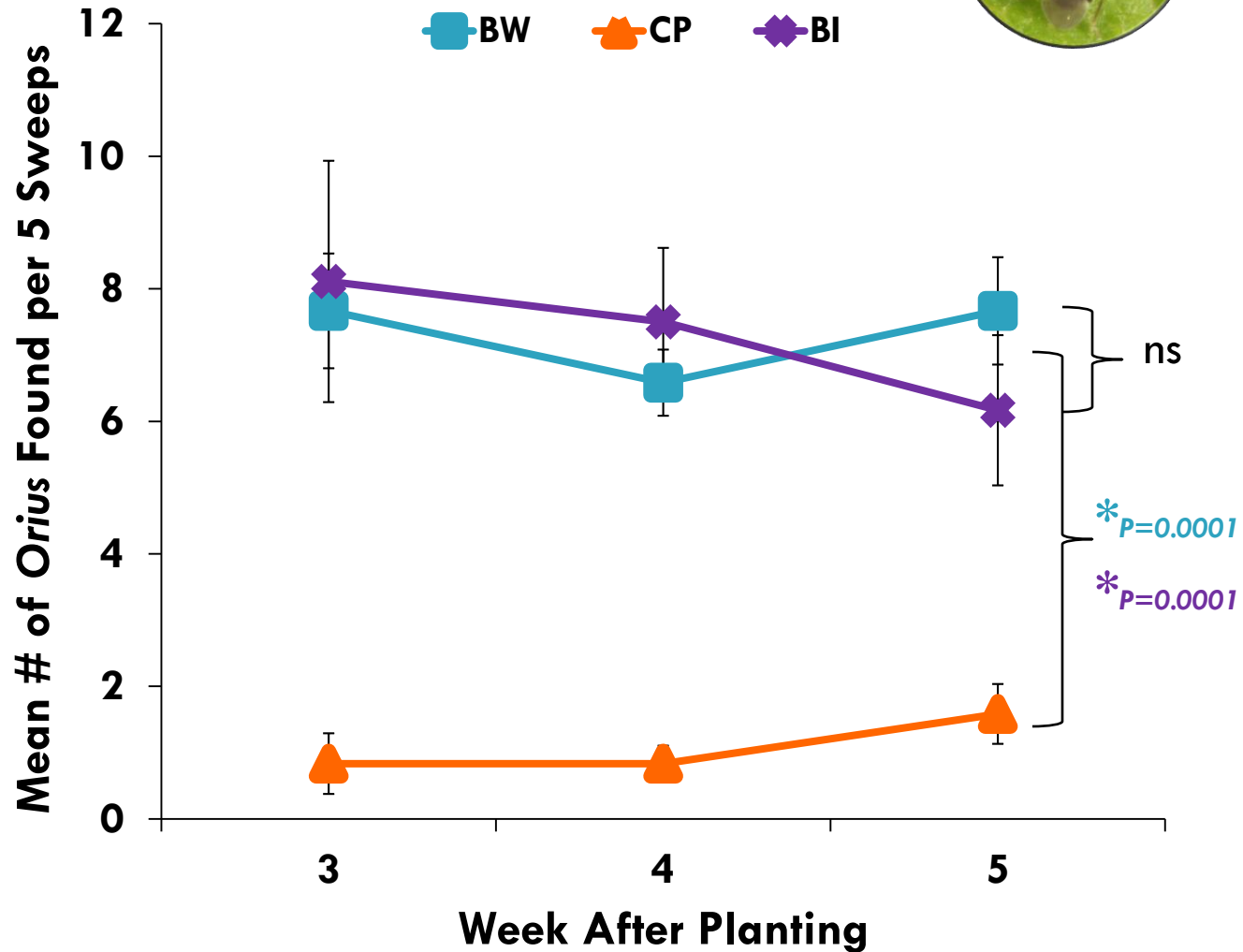
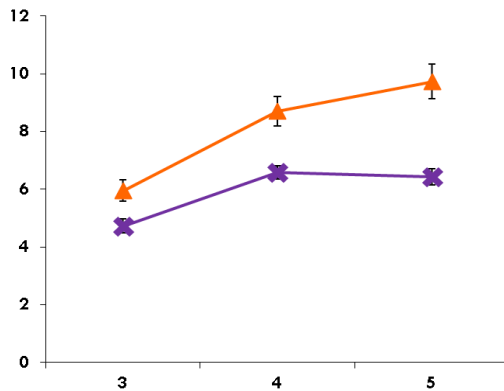
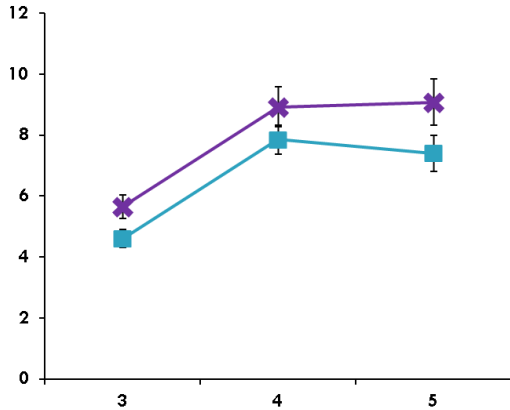




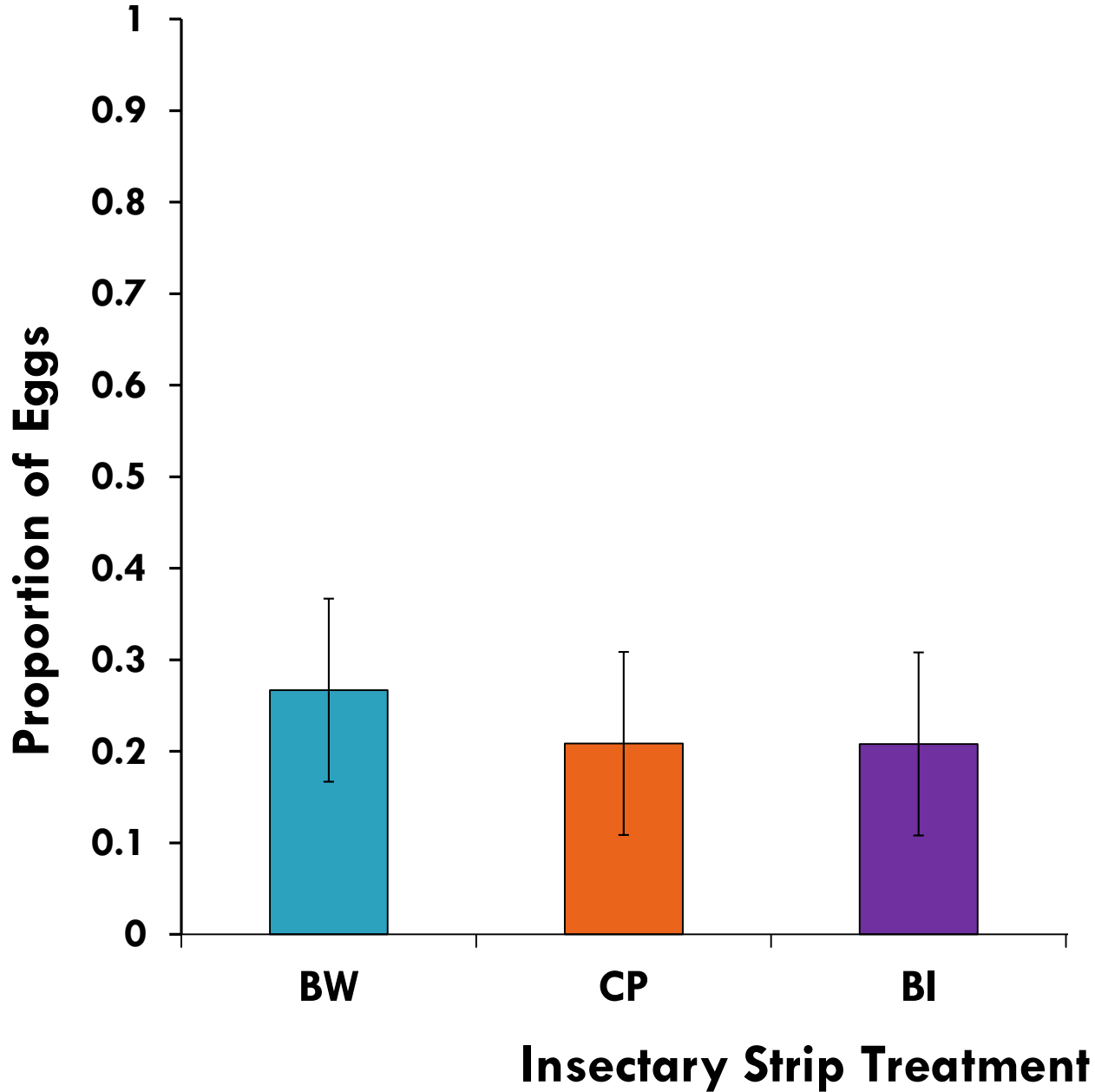
# *Coleomegilla maculata* increases with increasing number of inflorescences but not EFNs



# *Orius* spp. abundance greater in presence of flowers



# Egg predation is not affected by treatment



# Preliminary Findings

- Can plant-based resources promote natural enemy abundance in insectary strips?
  - ▣ *C. maculata* and *Orius spp.* greater in floral plots
  - ▣ Natural enemies not abundant in cowpea
- Can a mixture further support natural enemies?

Biculture dominated by buckwheat
- Does insectary strip enhance predation?
  - ▣ Not affected by treatment

# Lingering Questions and Future Directions

## □ Future Directions

- ▣ Are insectary strips reducing predation on arthropod prey by distracting *C. maculata* and *Orius spp.*?
- ▣ How does insectary plants influence predation within nearby crops?
- ▣ Can management of insectary plants be used to “push” beneficial insects into nearby cash crops?

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