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

Jermaine Hinds & Mary Barbercheck
Penn State Department of Entomology
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.
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)*

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 biculure
Buckwheat inflorescences increase and cowpea EFNs decrease in biculture.
Coleomegilla maculata increases with increasing number of inflorescences but not EFNs.
**Orius spp. abundance greater in presence of flowers**

**Mean # of Orius Found per 5 Sweeps**

- **BW**
- **CP**
- **BI**

Week After Planting:

- Week 3: *
- Week 4: *
- Week 5: *

*P=0.0001

**ns**
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
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?
Acknowledgements

- USDA NIFA-OREI Program
  - Cover Crop Cocktails Group
- NE-SARE Graduate Student Grant
- Bunton-Waller Fellowship
- Alfred P. Sloan Foundation
- Lloyd. E. Adams Memorial Award
- International Association of Black Entomologists
- Russell E. Larson Ag Research Center Staff

PENNSTATE

USDA

Northeast Region SARE

Sustainable Agriculture Research & Education Program

United States Department of Agriculture
National Institute of Food and Agriculture

ALFRED P. SLOAN FOUNDATION