# Examining the role of cover-cash crop rotations on arthropod community dynamics in Lower Rio Grande Valley

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## Introduction

- Ecological principles-based farming such as the adoption of biological control of herbivores can improve the resilience of the agroecosystem
- Cover crops provide a potentially cost-effective method of improving habitats to increase the populations of beneficial arthropods and thus reduce pest incidence
- The impact of cover crops on the arthropod community dynamics in the management of pest populations is poorly understood
- The objective of this study is to investigate the role of cover-cash crop rotations on arthropod community dynamics

## Research question

- Will cover crops be successful in increasing the population of natural enemies thereby reducing the population of herbivores ?

## Results

- A total of 13,831 arthropods were collected and have been classified to their order
- Arthropod community did not vary across the four fields
- There was no significant difference between the population of the pollinators in the cover crop and the control treatments yet.
- There was no significant difference in the population of arthropods in the pitfall and sticky traps
- Aphids, earwigs, and *Megachile* bees were common in the sticky, pitfall, and the pollinator traps respectively across the four fields

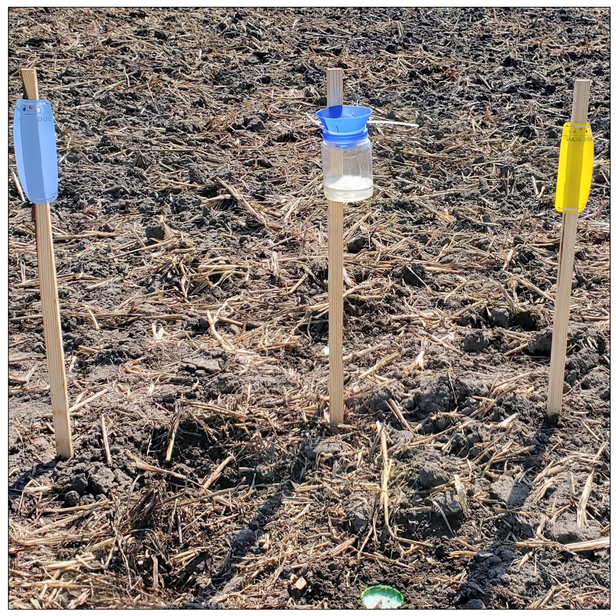

Fig 1. Trap setup

Fig 2. Cover crop treatment

## Hypothesis

- Cover crop treatments would attract beneficial insects such as predators, parasitoids and pollinators
- The parasitoids and predators would repel/reduce herbivory thereby benefitting the subsequent cash crop

## Experiments

**Arthropod diversity**

- Arthropod diversity on the cover and control plots were assessed on 4 farms in the Hidalgo county of the LRGV
- Arthropods populations were assessed using pit fall traps, sticky traps (blue and yellow), and pollinator traps
- The collected traps were brought back to the lab and the insects were classified based on their respective orders
- Statistical analysis was performed using Generalized Linear Models with Poisson distribution

## Conclusion

- Our preliminary result shows that there is a significant difference in the population of the arthropods based on their feeding guild
- Cover treatments did not affect the population of pollinators
- Ground dwelling arthropod community did not vary between the control and cover crop treatments.
- Arthropod abundance did not vary between the cover crop and control treatments
- We speculate that beneficial arthropods such as predators and parasitoids would reduce herbivory in cash crops

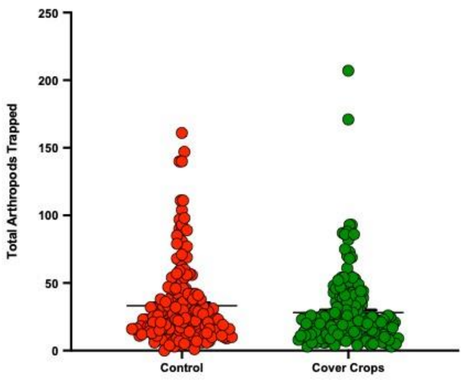


Fig 3. Total population of arthropods pooled from all traps

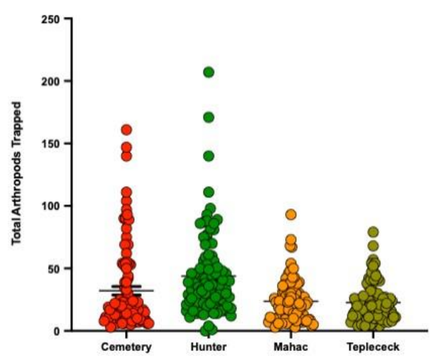


Fig 4. Total population of arthropods from all fields

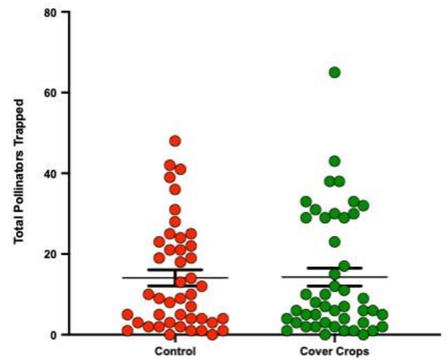


Fig 5. Population of pollinators trapped in cover and control plots

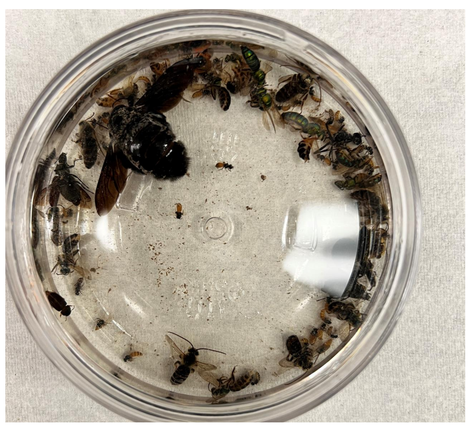

Fig 6. Arthropods from pollinator traps

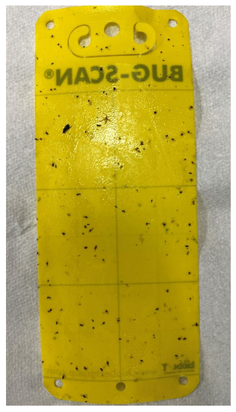


Fig 7. Arthropods on Yellow sticky traps

Fig 8. Arthropods on Blue sticky traps

Fig 9. Arthropods from pitfall traps

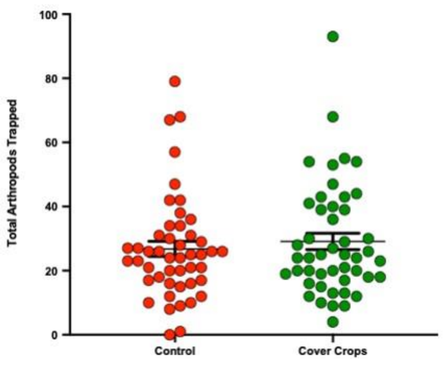


Fig 10. Population of arthropods from pitfall traps

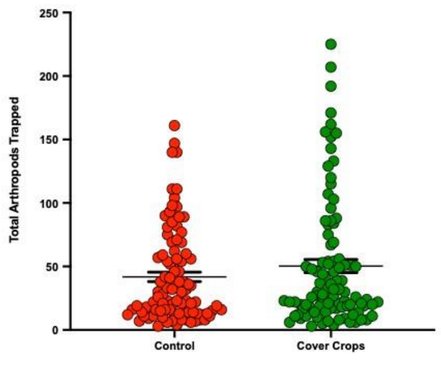


Fig 11. Population of arthropods from the sticky trap

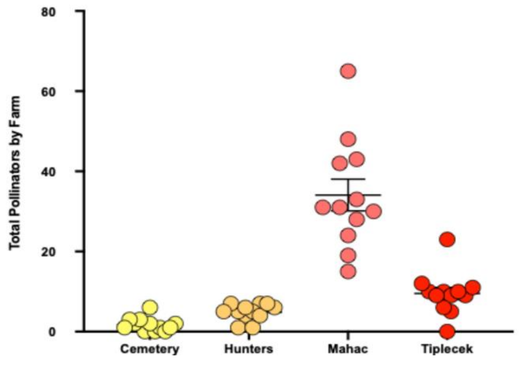


Fig 12. Population of pollinations across the fields

## Acknowledgement & Funding

- The authors thank Daphne Zapsas, Manish Gautam, Juan Raygoza , Cruz Salinas and Alejandro Vasquez for field work and USDA for funding through the Subtropical Soil Health Demonstration grant

## References

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