

The role of year-round vegetation in agricultural ditches as refugia for key insect pests and their natural enemies in Ventura County

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Arthropods in Ag Ditches



- ▶ Ditches often maintain vegetation year-round, if not managed with herbicide
- ▶ Arthropod diversity in field margins, drainage ditches, and other non-crop areas has been documented
- ▶ They can maintain both insect pests and beneficial predators and parasitoids
- ▶ Insect pest species can feed on naturalized and wild plant species in uncultivated lands and can vector viruses to agricultural crops
- ▶ It has never been studied in Ventura County
- ▶ Need to understand the relationship between vegetation, insect pests, and beneficial arthropods
- ▶ Adequate and informed management strategies can enhance the ecosystem services provided by arthropods and minimize disservices



Objectives

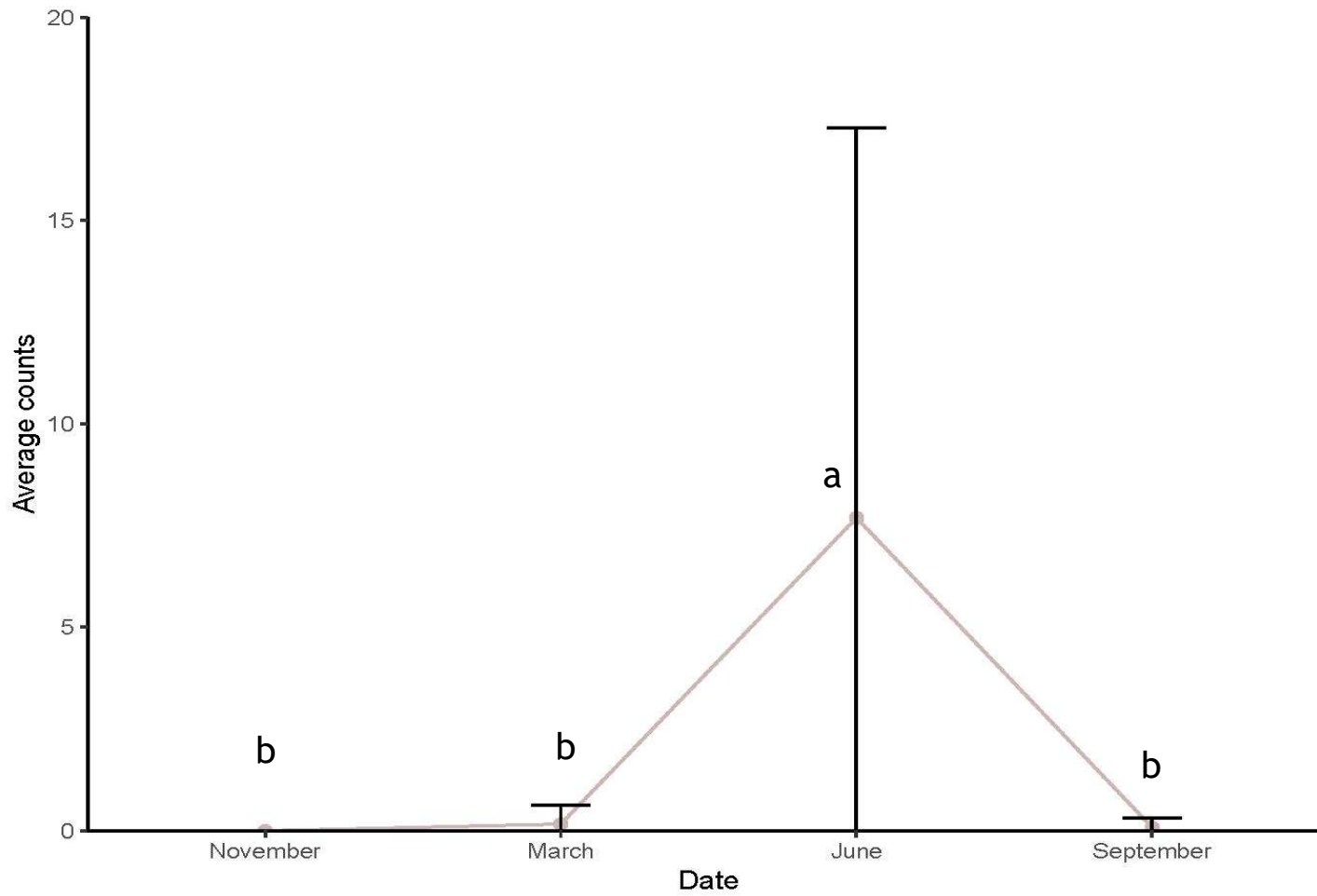
- ▶ Assess the extent to which drainage ditches serve as refugia insect pests and their predator/parasitoid complex in Ventura County.
- ▶ Identify how vegetation composition in ag ditches relates to the presence and abundance of the target pest species:
 - ▶ *Plutella xylostella*- *Diamondback moth*
 - ▶ *Lygus herperus*- *Lygus bug*
 - ▶ *Frankliniella occidentalis*- *Western flower thrips*
- ▶ Identify what vegetation composition and structure might enhance the presence and abundance of predators and parasitoids.
- ▶ Produce a bilingual guidelines for management strategies to enhance beneficial predators and parasitoids and to minimize the presence of pest species in ditches, respectively.

Sites and Methods

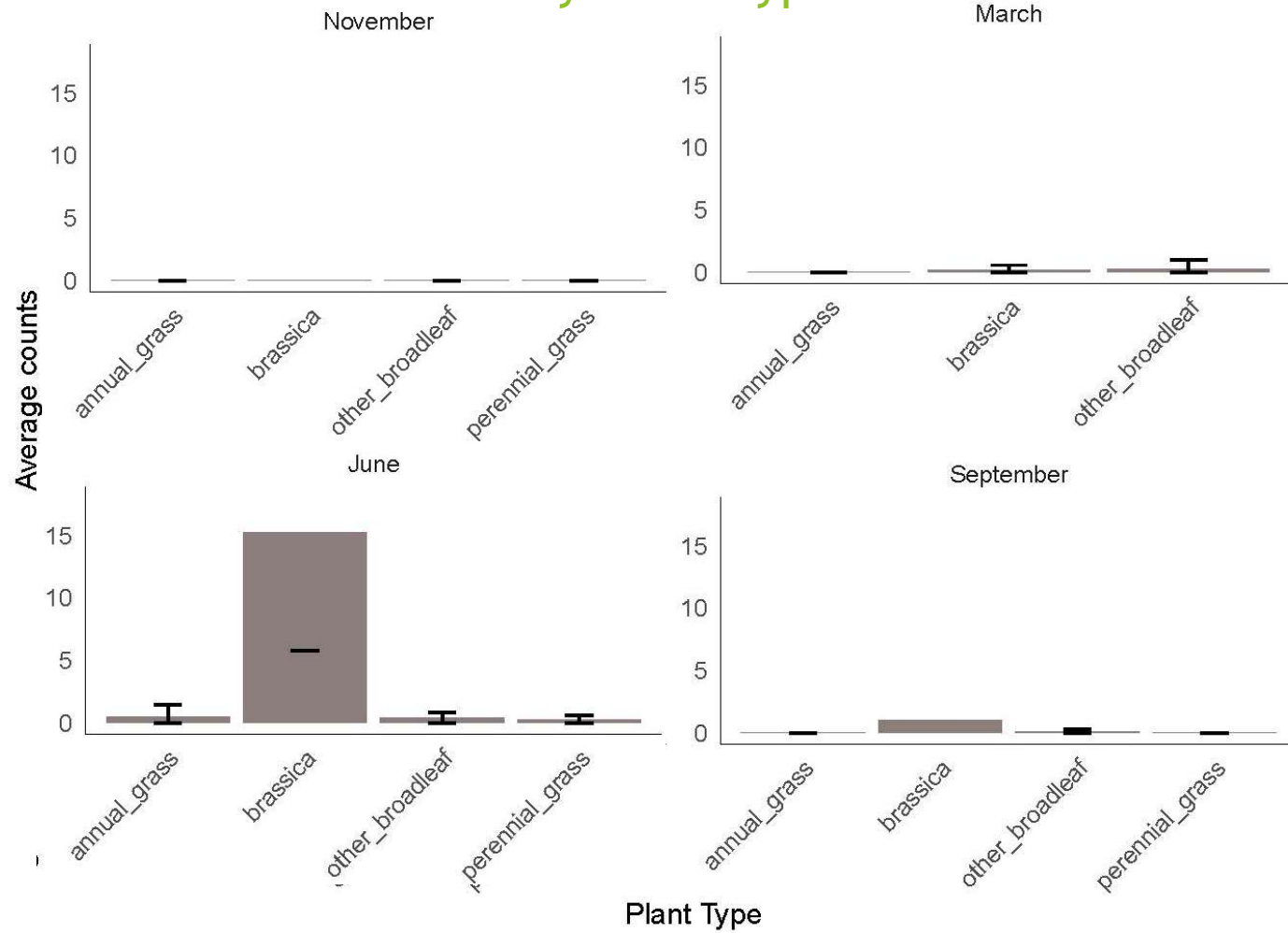
- ▶ 8 ag ditches in the Camarillo-Oxnard plain
- ▶ Vegetation surveys and arthropod sampling in November 2023, and March, June and September 2024
- ▶ Vegetation data: Plant species, % cover, phenology, and more
- ▶ Arthropod samples collected using a vacuum from the top 2-3 plant species (>5%)
 - ▶ 5 samples of 15 seconds per plant species
- ▶ Identification in the lab to lowest taxonomic level possible or of interest



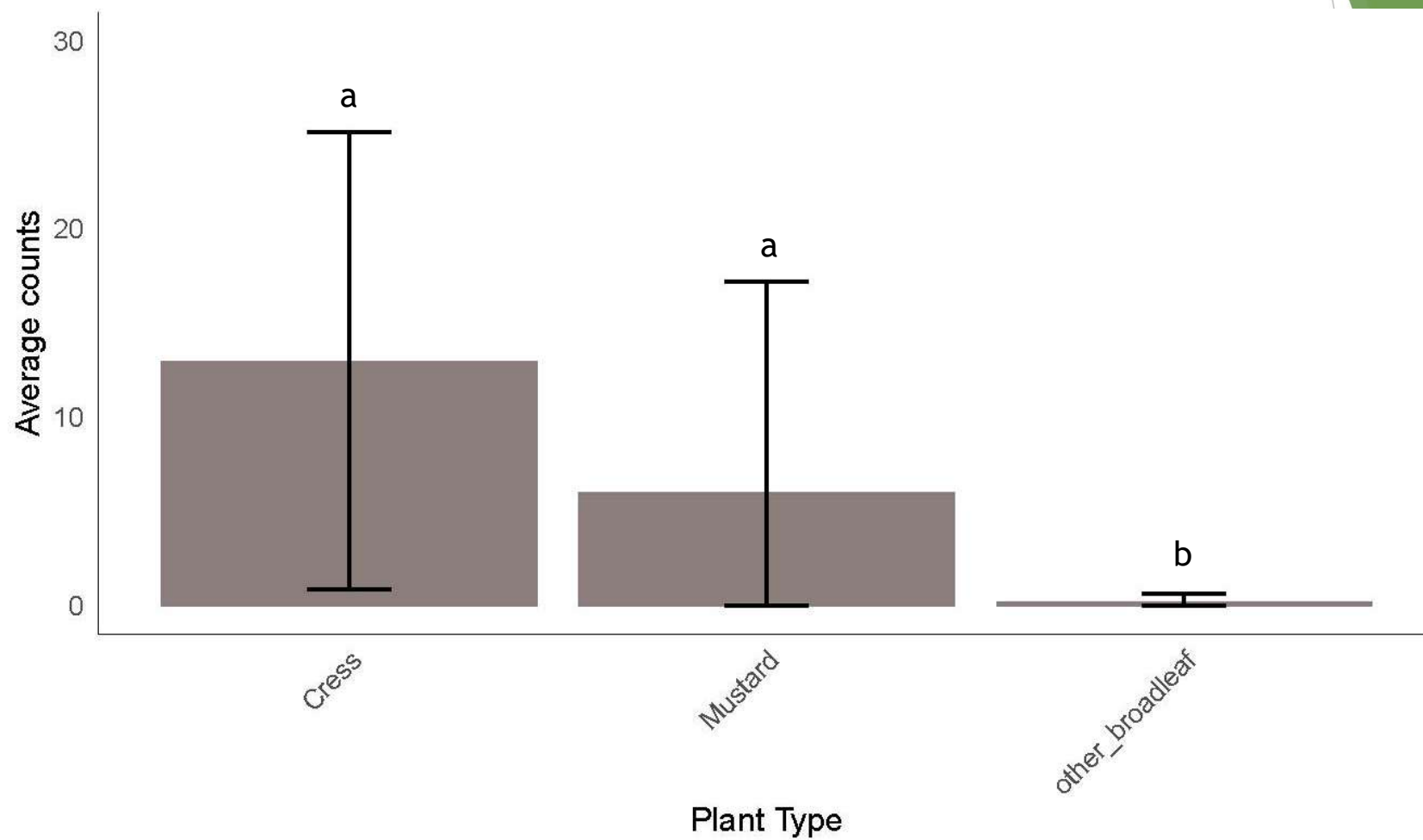
Diamondback Moth Abundance over Time



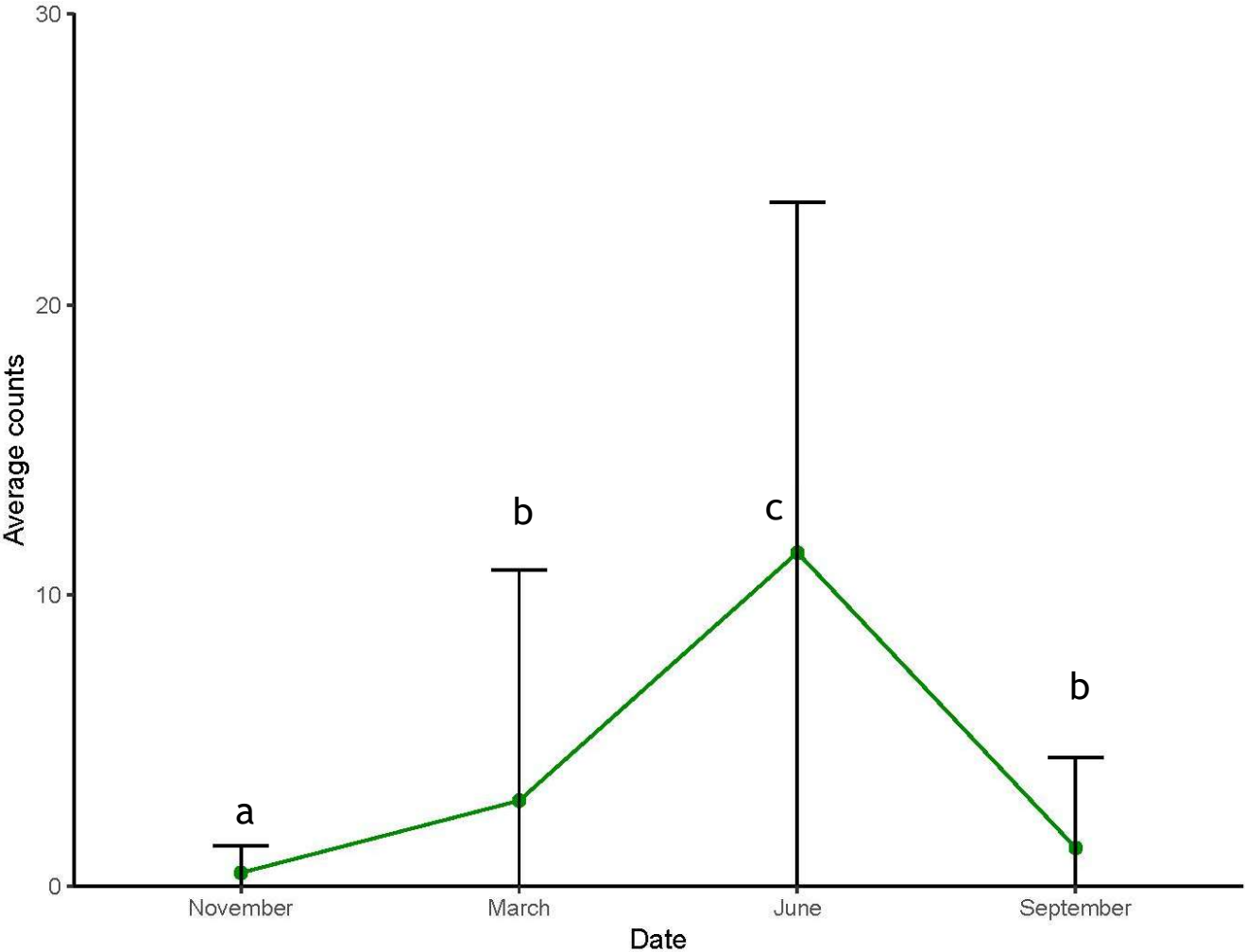
Diamondback Moth Abundance by Plant Type



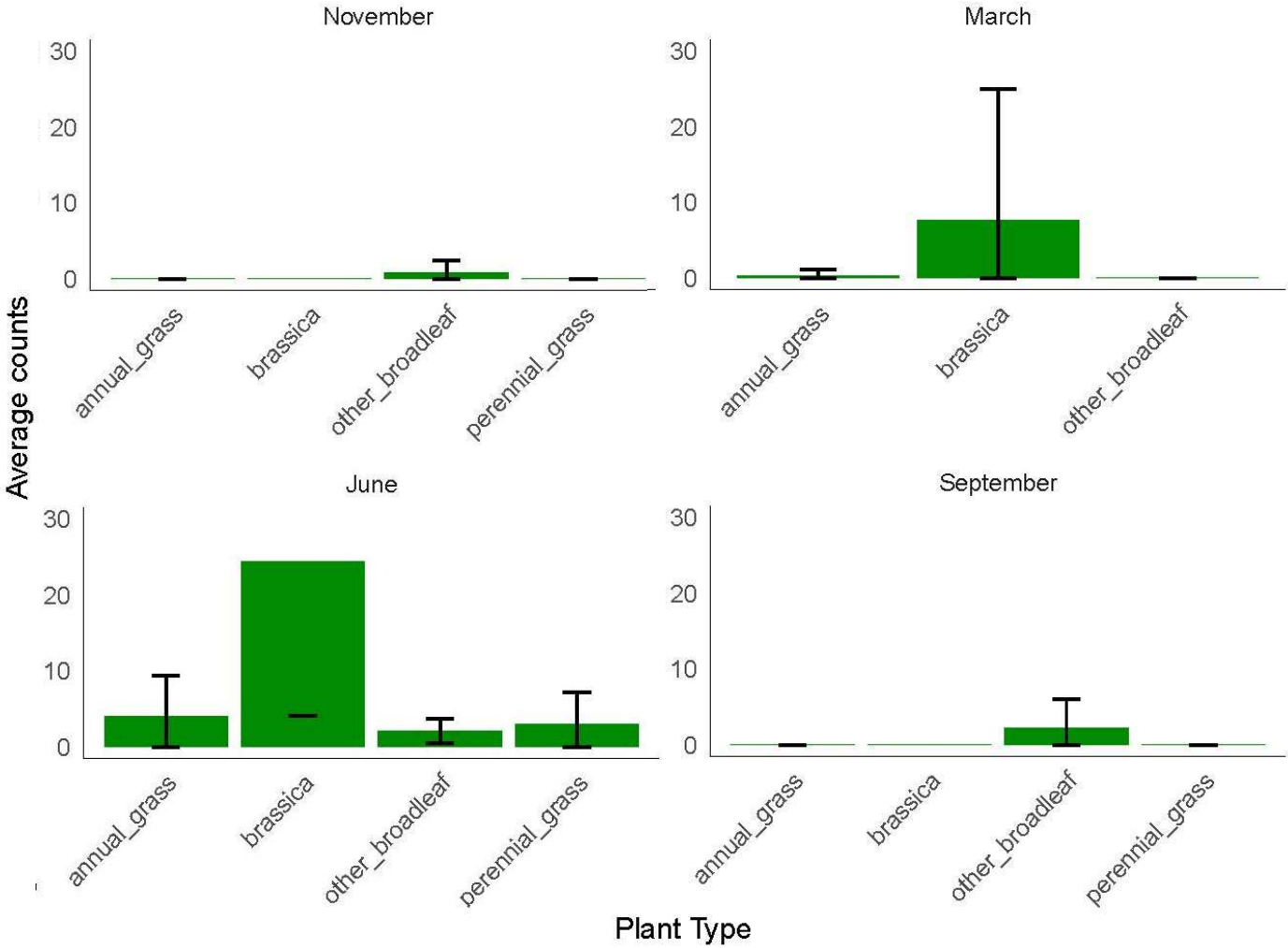
Diamondback Moth Brassica Preferences



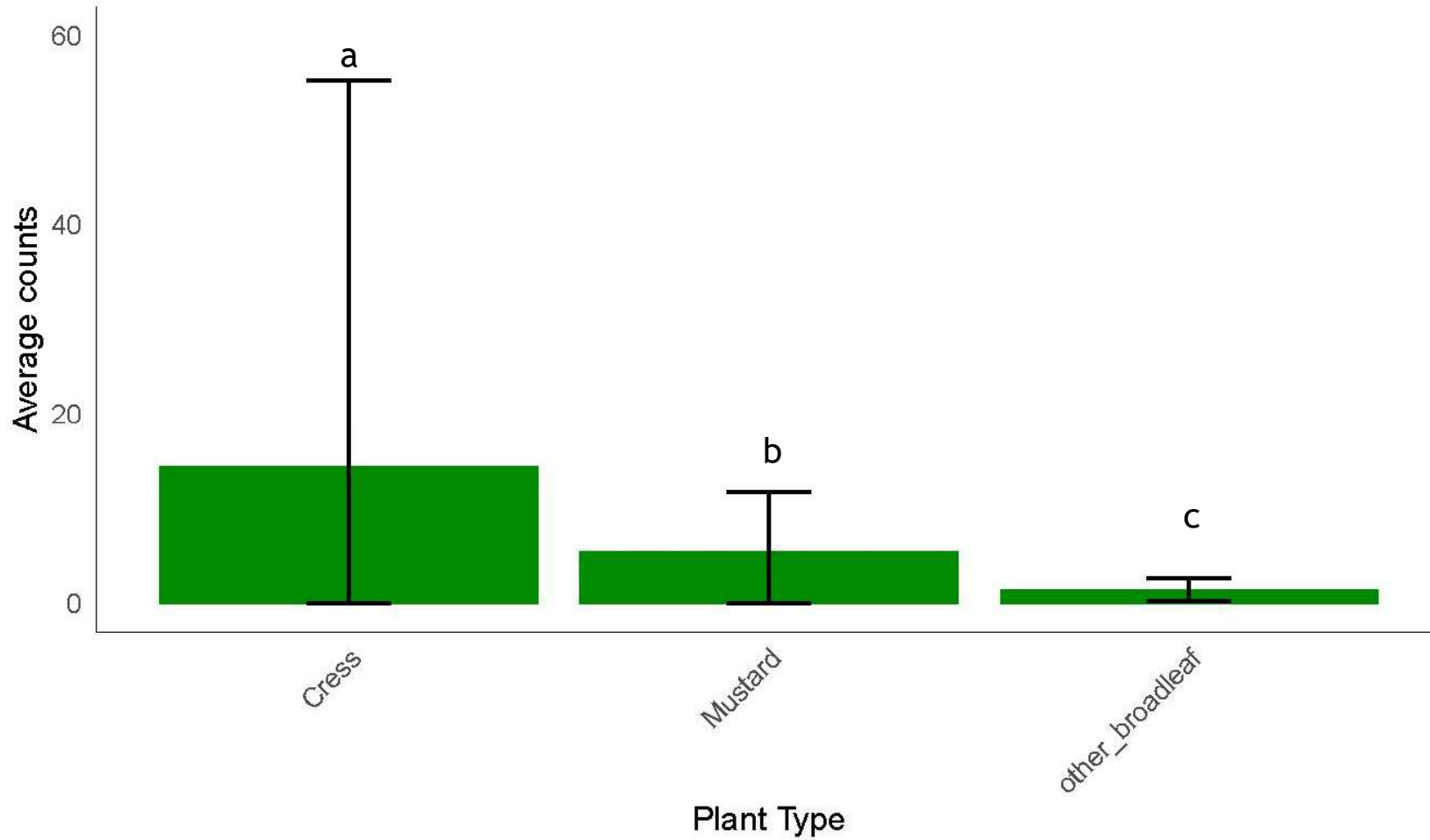
Lygus bug abundance over time



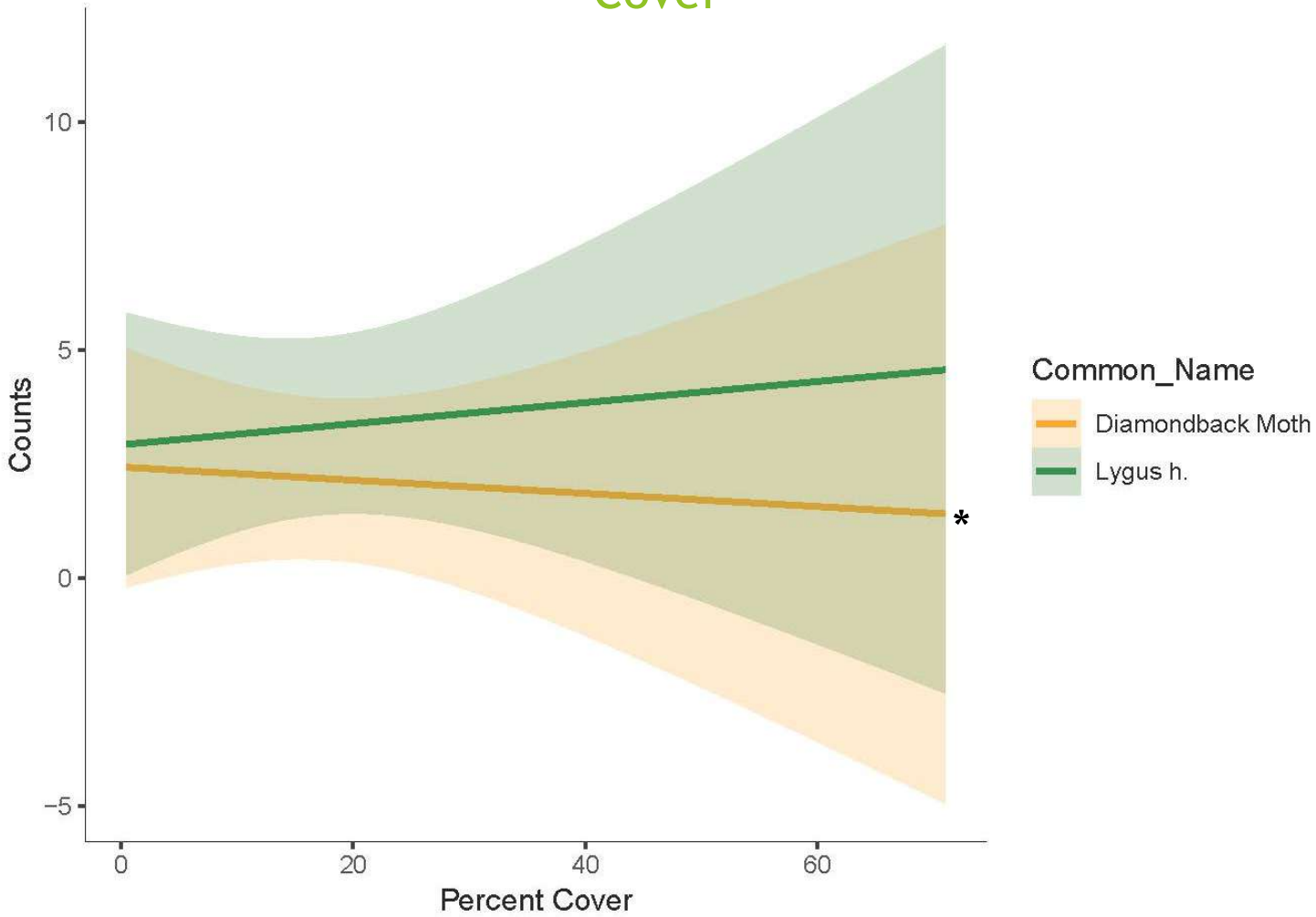
Lygus Bug Abundance



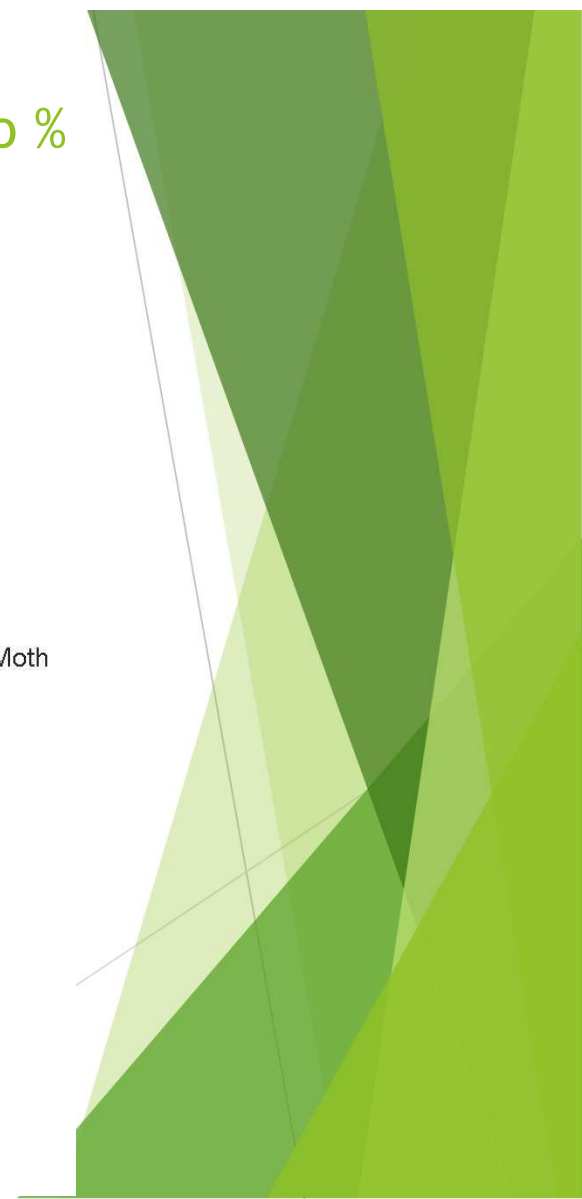
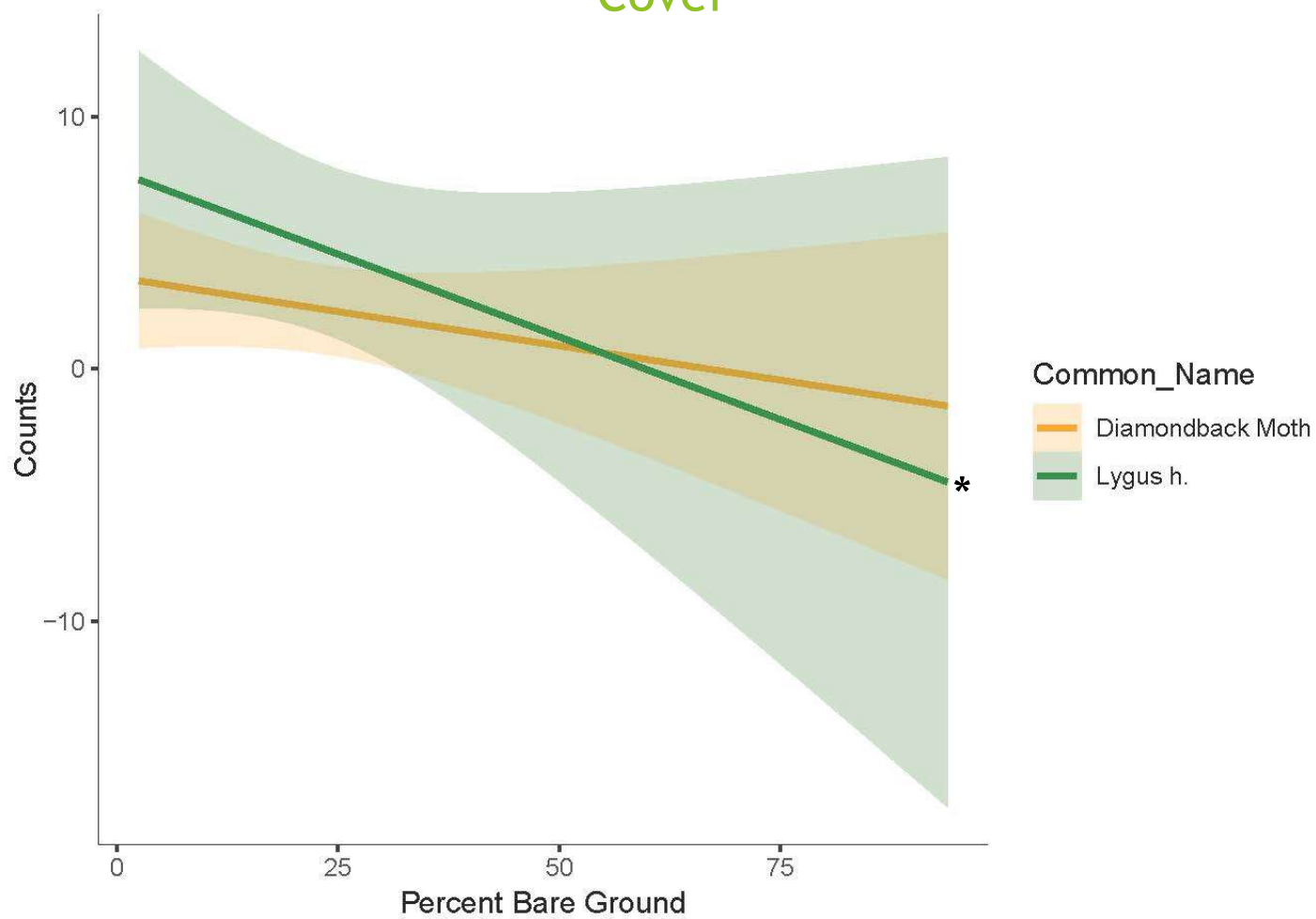
Lygus Bug Brassica Preferences



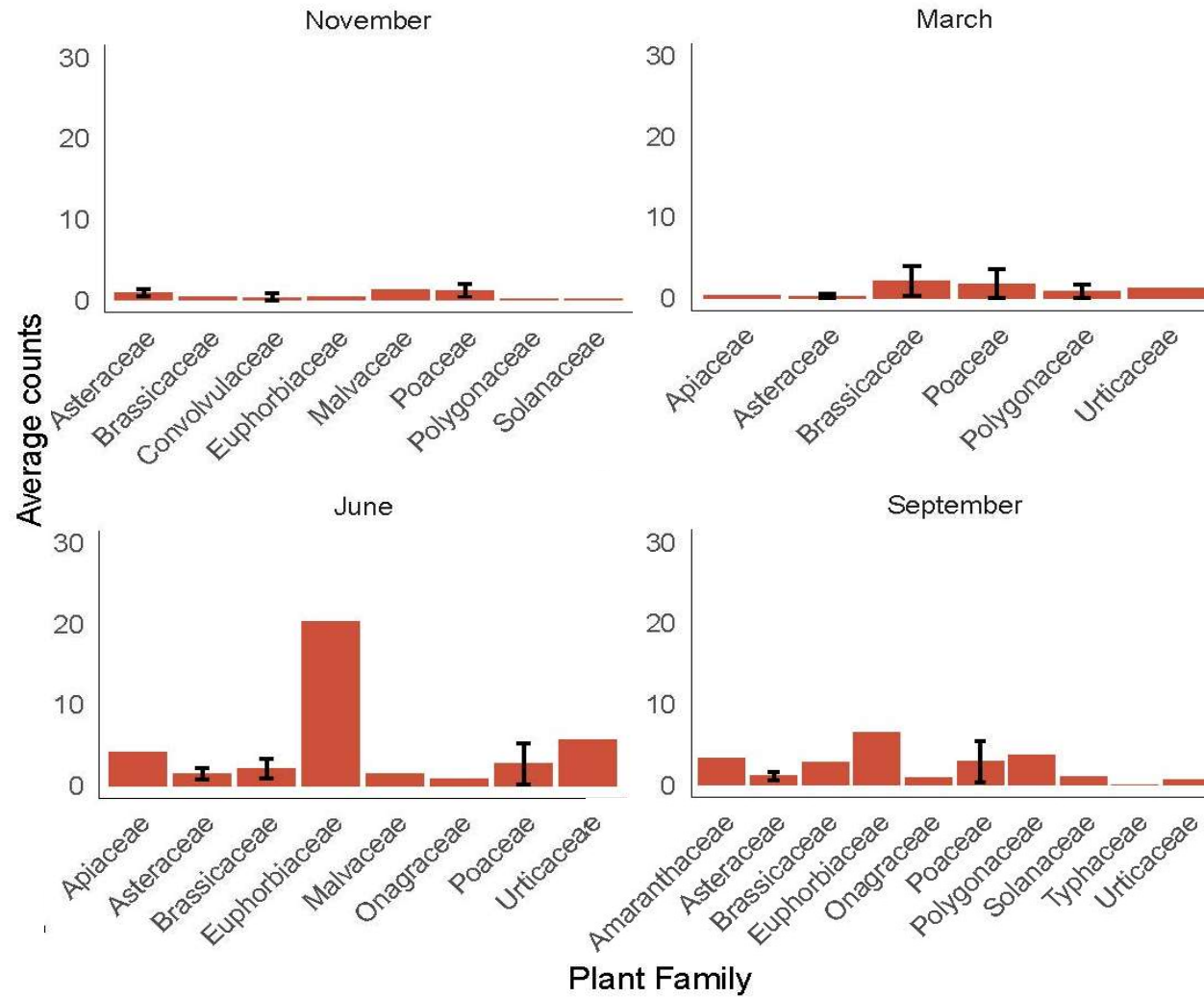
Diamondback Moth and Lygus' Abundance in Relation to % Cover



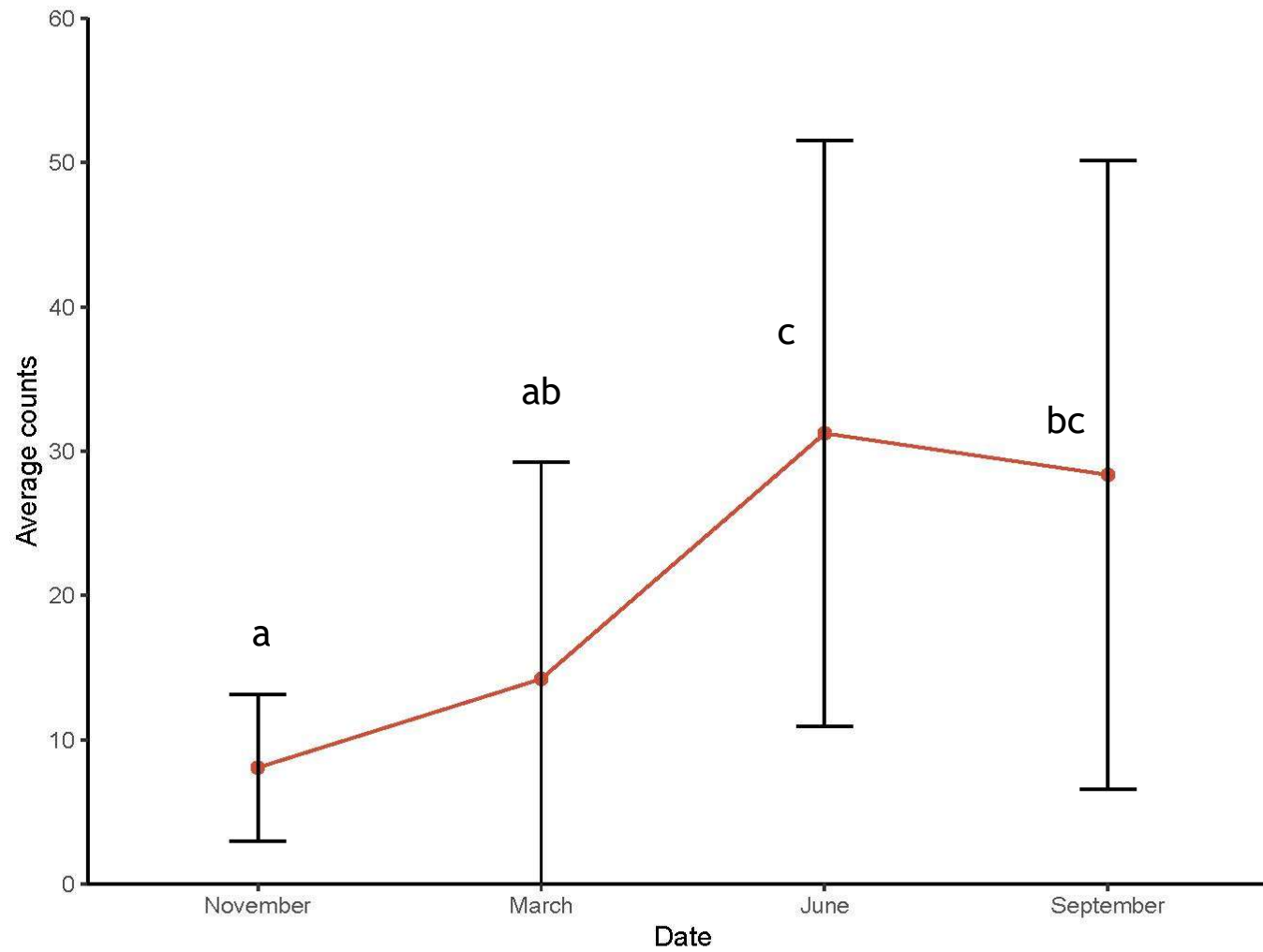
Diamondback Moth and Lygus' Abundance in Relation to % Cover



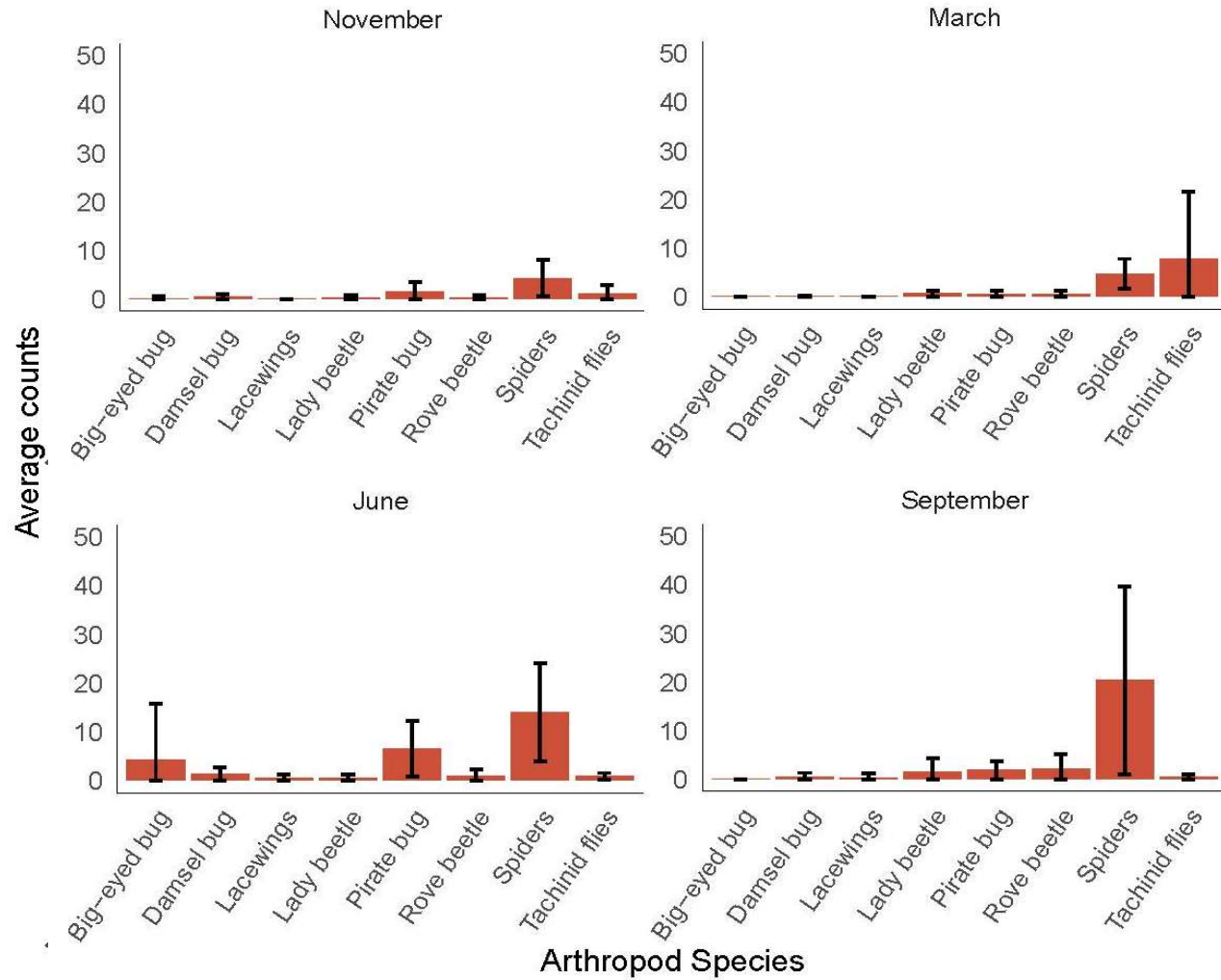
General Predator Abundance



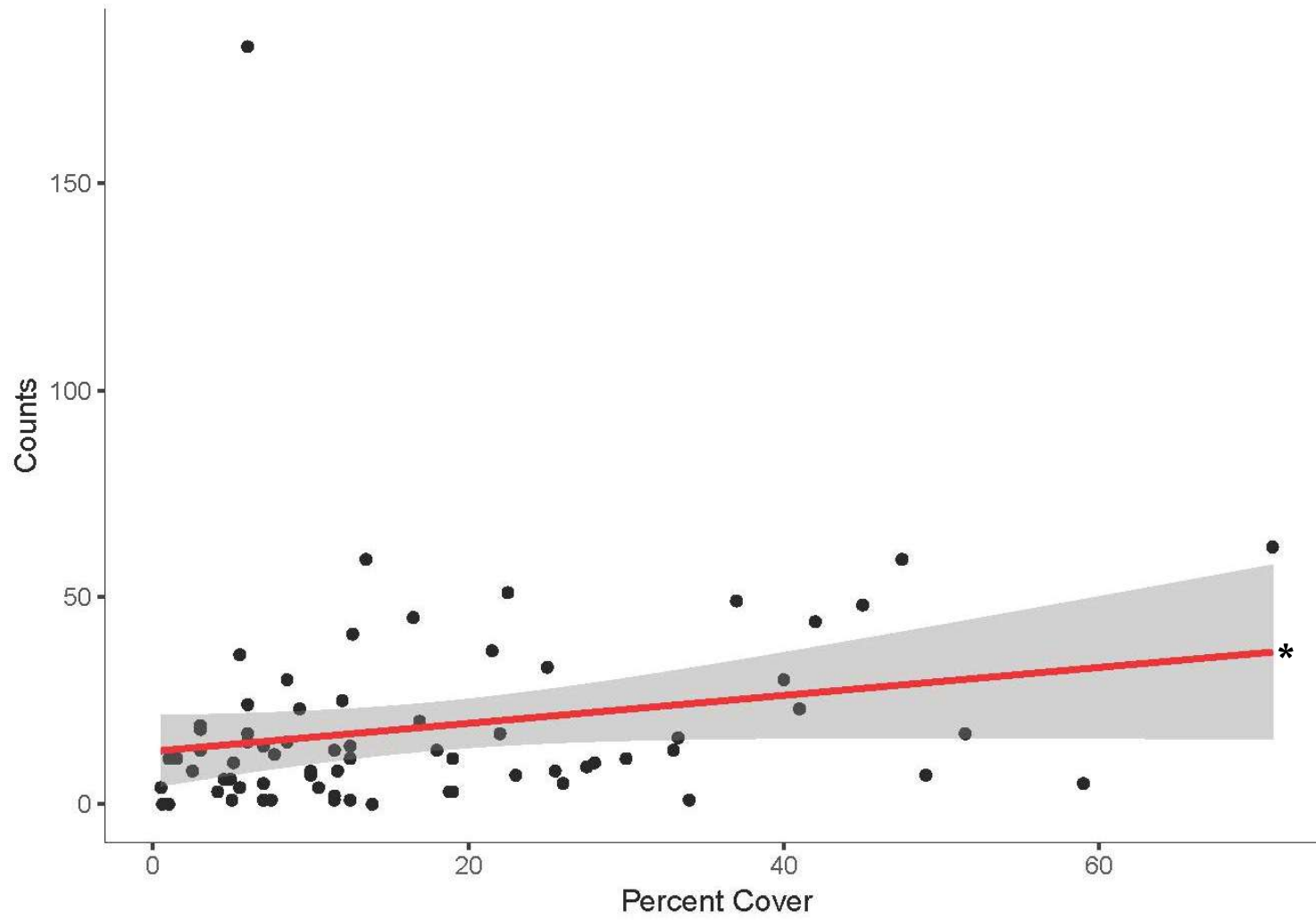
General Predator Abundance Over Time



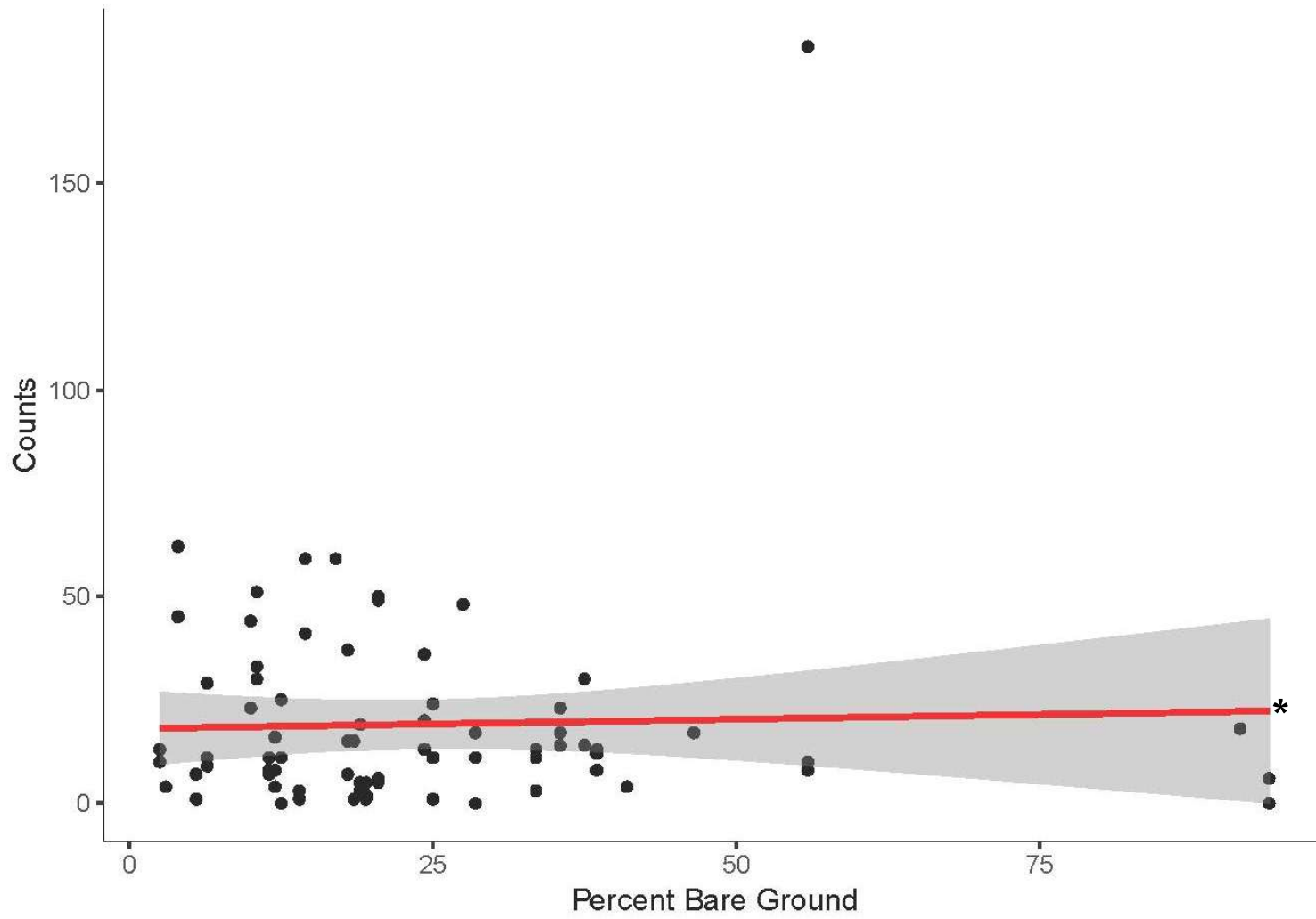
General Predator Species Richness



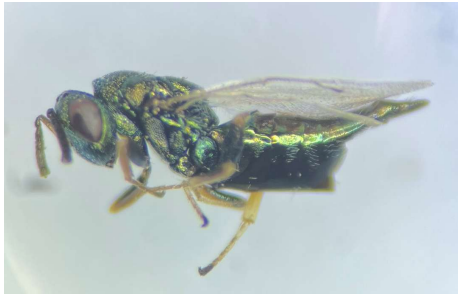
General Predator and % Cover



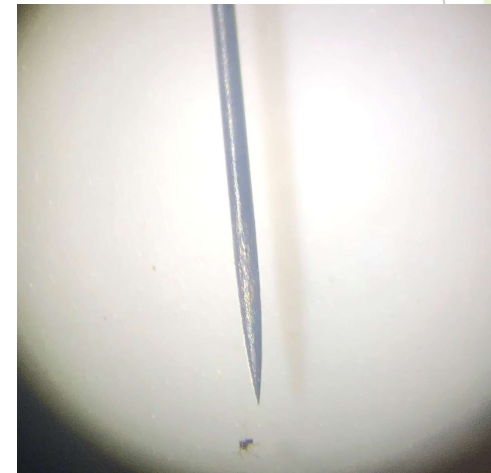
General Predator and % Bare Ground



Parasitoids Wasps- stay tuned!



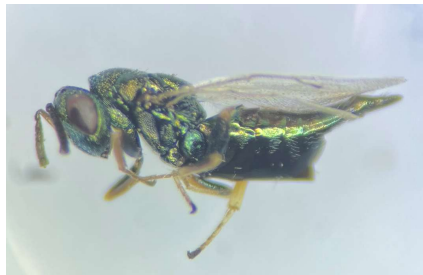
- ▶ Over 4000 parasitoid wasps were collected
- ▶ Still identifying in the lab to Family and Subfamily
- ▶ >18 families have been identified
- ▶ Mostly very small, some very tiny



Conclusions

- ▶ Diamondback moth was not detected in November and June was significantly higher than other months
- ▶ DBM presence in brassicas was sig. higher, as expected Lygus sig. differed by time of year, except March=Sept.
- ▶ Brassicas sig. higher counts of Lygus than other broadleaf plants
- ▶ General predators somewhat differed by moth, but not by plant (generalists)
- ▶ General predator species richness sig. higher in June, but most species present through the year
- ▶ Stay tuned for recommendations for managing ditch vegetation and wasps!

Questions



Thank you!

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