

ENTOMOLOGY RESEARCH UPDATE - 2014

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Predators

Predators are arthropods that eat pest insects, therefore they are beneficial to have in agricultural fields. Our current research is aimed at characterizing the predator community of asparagus miners and asparagus beetles in commercial asparagus fields.

Who is eating who?

In the 2014 summer field season we sampled weekly in commercial asparagus fields at different distances from the border and collected predators by sweep netting and vacuuming.

Border habitats

The types of borders around fields can have a great impact on the degree of predation of pest insects in the asparagus. We are comparing how different border types (forest, non-crop, other crop, asparagus) influence predation of asparagus miners and beetles.



Postdoc, Jason Schmidt, collecting samples in the border of an asparagus field with an insect vacuum.

Jason and Ari Grode (undergraduate student) sorting suction samples to collect predators for further lab analysis.



Spined soldier bug nymph feeding on an adult asparagus beetle.

Lacewing larva feeding on an asparagus beetle larva in the field.



Asparagus plant volatiles

Volatile chemicals released by plants play an important role in plant defenses. We used exclusion cages and headspace collection equipment in the field to collect asparagus headspace following feeding by common asparagus beetle larvae.

- unique defense compounds are induced in asparagus when fed upon by the beetle.
- we are testing predator response to individual volatile chemical constituents of asparagus.

Common asparagus beetles are host specific to asparagus and damage plants by defoliation and removal of epidermal tissues from axillary shoots and stems.



Our **future research** seeks to build upon our current findings to determine how predators can be recruited and retained in fields for biological pest control of the asparagus beetle using the chemical signals of asparagus.



Asparagus plants (var. Millennium) grown in field cages in East Lansing for volatile collection.

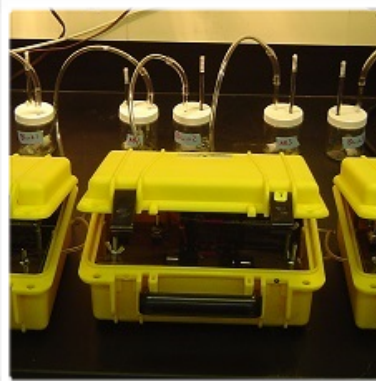


Asparagus plants grown in field cages were bagged for headspace collection (left). Volatiles were collected using a "pull" system using a battery operated pump (right).



Asparagus beetle larva placed on an asparagus plant.

Twenty larvae fed on one asparagus plant for 48hrs prior to headspace collection. Headspace collections were taken for 24hrs following feeding and resulting compounds were analyzed using gas chromatography-mass spectrometry.



Headspace collection from common asparagus beetle larvae was conducted in the lab to consider how their volatile signals may influence our volatile profiles collected from asparagus plants.