

# Some Other Biocontrols



Natural Enemy ID  
Greenhouse Scout School  
**Session 7: March 27, 2025**

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# Other Predators

## *Anystis baccarum* (Craze Mite)

- Newly available (select states)
- Has erratic searching behavior 'whirligig mite'
- Generalist (attacks aphids, thrips, mites, and more, other biocontrol agents and each other)
- Need lots of prey and disperse well throughout crops.
- Research is ongoing



F. Piednoir; iNaturalist



I. Tuunainen, iNaturalist

# *Dicyphus hesperus*

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- Predatory bug (as adults and nymphs)
- Attacks whiteflies, primarily.
- Will also feed on two-spotted spider mite, thrips and moth eggs.
- A bit slow to establish (often supported with mullein banker plants)
- Used primarily in vegetable production.
- Might cause plant damage in high numbers.

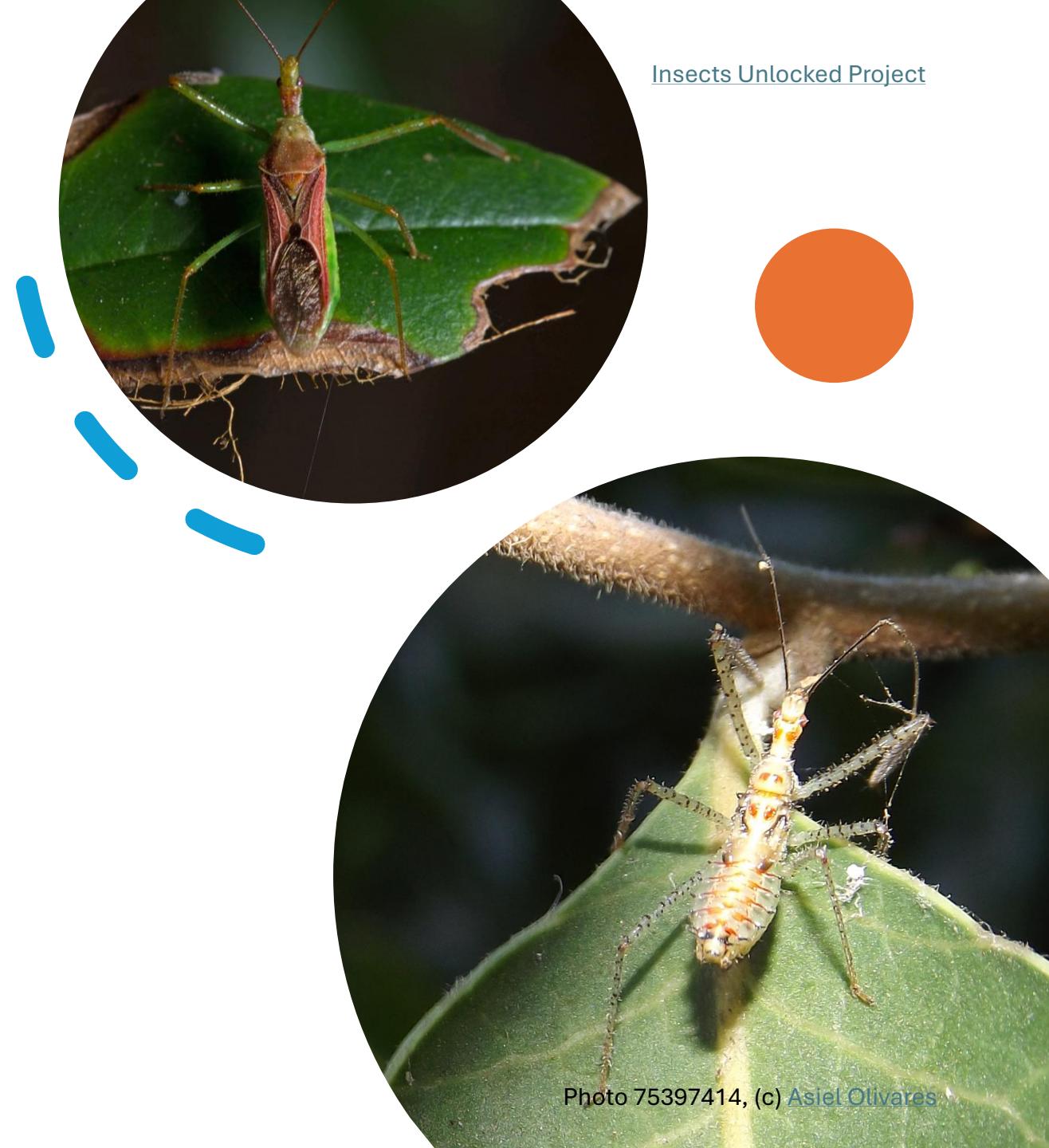


# Mullein Bunker Plants



# Assassin Bugs

- Many species, Leafhopper Assassin Bug (*Zelus renardii*) commercially available.
- Generalist predators that will feed on leafhoppers, aphids, caterpillars, thrips, mites and more.
- Effective in many ecosystems (gardens, fields, orchards, greenhouses, high tunnels).
- Live ~2mo and eggs take about 10 days to hatch (they come as eggs).
- Predatory as nymphs and adults.



# Mantids

- Generalist predators that will feed on just about anything and themselves.
- Usually sold as egg cases
- Predatory as nymphs and adults.

Kai Squires, iNaturalist



Scot Nelson, Flickr



# Other Parasitic Wasps

## *Trichogramma* spp.

- Parasitize moth eggs
- Adults < 1 mm, larvae develop entirely within moth eggs
- Parasitized eggs turn dark
- Several species commercially available for various moths and climates.



# *Diglyphus isaea*

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- Parasitizes leaf miner larvae (warm weather releases)
- All stages but adults hidden within mines on foliage.
- Adults dark metallic blue/green but appears black; legs black/yellow; 1.5-2mm in size
- Adults also host feed.



# *Dacnusa sibirica*

- Parasitizes leaf miner larvae; prefers 1-2<sup>nd</sup> instars, (cool weather – spring/fall releases)
- Adults dark brown to black in color; 2 -3mm in size; long antennae; wings longer than abdomen.

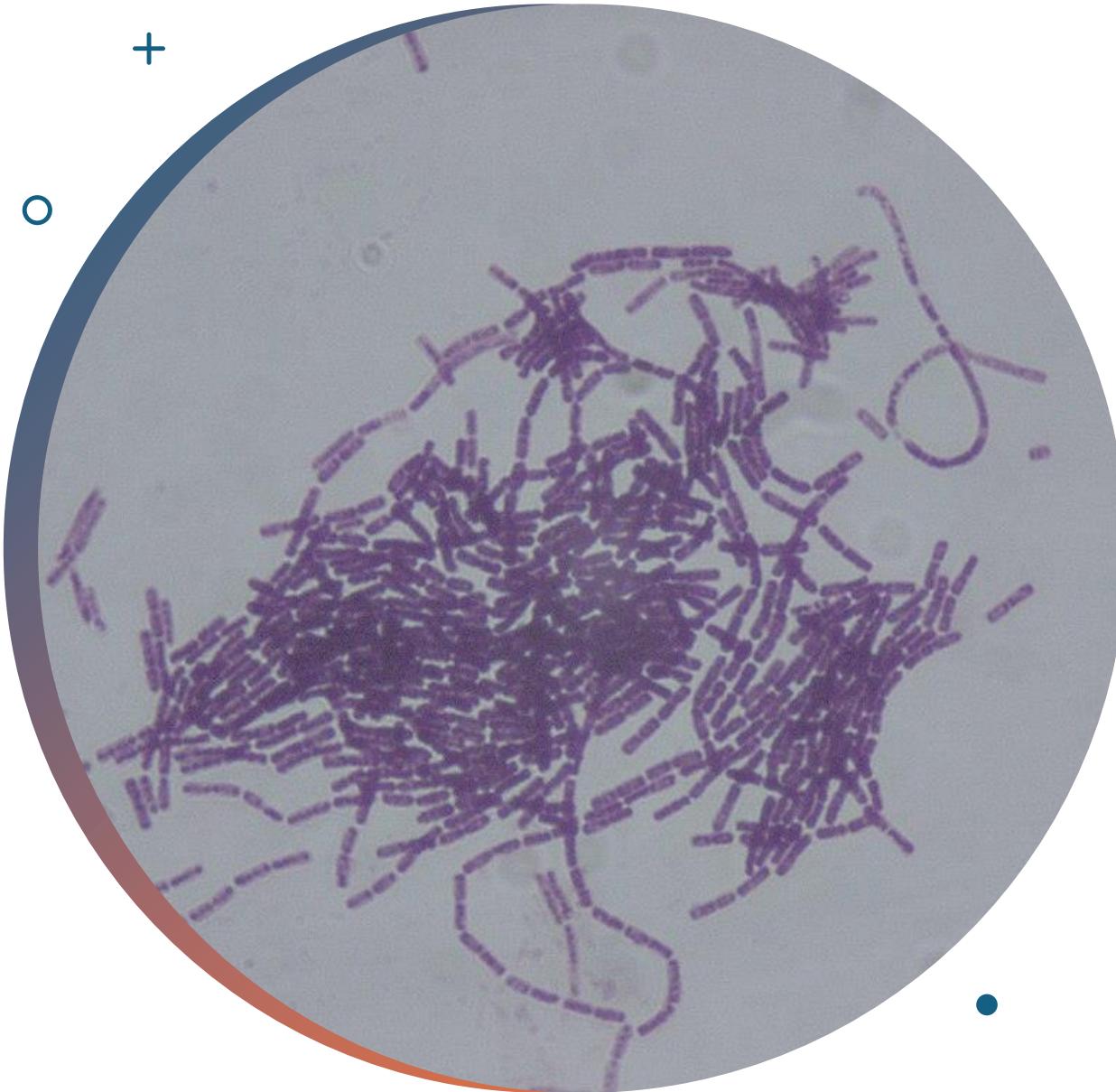


# Other Pathogens

## Entomopathogenic fungi

- *Metarhizium brunneum* (thrips, whiteflies, thrips, aphids, mites and others). Does well for soil-based pests.
- *Isaria fumosorosea* (aphids, whiteflies, thrips, mites, flies and many more.)
- Spores need to contact host to be effective. They then penetrate exoskeleton, grow inside and release toxins killing pests, then emerge and sporulate to infect others.
- Other species can just show up.





# *Bacillus thuringiensis* (*B.t.*)

- Bacteria
- Produce spores & protein crystal toxins that kill pests
- Must be consumed to work
- Death occurs through starvation.
- Many strains available, primarily targets larvae (beetles, moths and flies).
  - *B.t.* var 'israelensis' (mosquitoes, black flies, & others)
  - *B.t.* var 'kurstaki' (many different caterpillars)

Aphid mummy created by a *Praon* sp., a wasp parasitoid



The Common Flower Fly, *Syrphus ribesii*, is a Syrphid.



Tobacco hornworm parasitized by wasp parasitoid (*Cotesia congregata*)



The Swift Feather-legged Fly, *Trichopoda pennipes*, is a Tachinid.

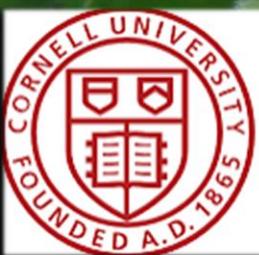
To Know Them  
Is To Love Them!



Syrphid fly maggot attacking aphids.

Photos by CF Sullivan, UVM

# Thank You!



Cornell University



This work is supported by the National Institute of Food & Agric., U.S. Dept. of Agric., through the Northeast Sustainable Agric. Research & Education program under subaward number ONE22-419), UVM Extension and College of Agriculture and Life Sciences.

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