

# Some Other Biocontrols



Natural Enemy ID  
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# Other Predators

## *Anystis baccarum*

### (Crazee 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 Banker 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.



Photo 75397414, (c) Asiel Olivares

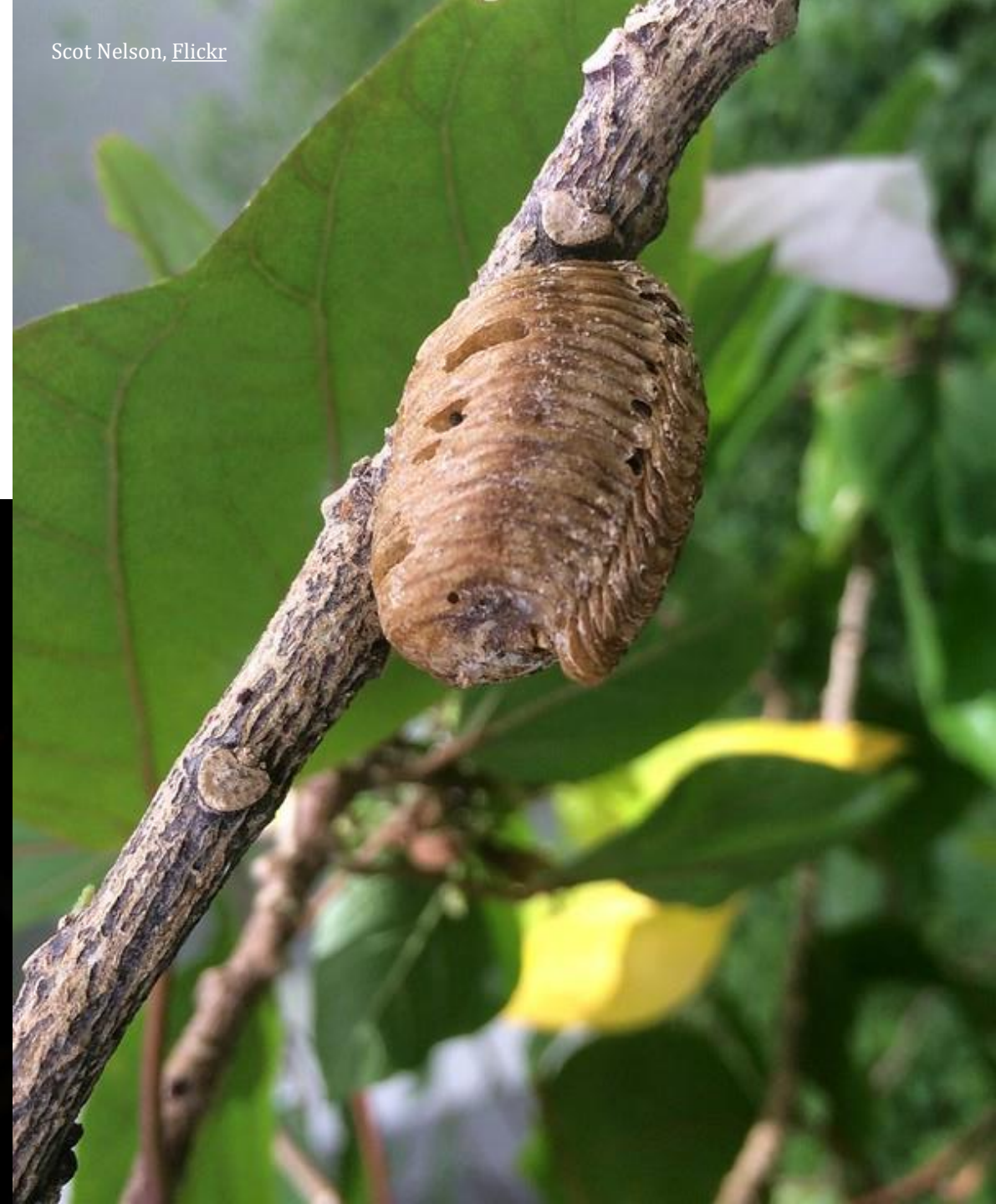
# Mantids

- 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 within 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.

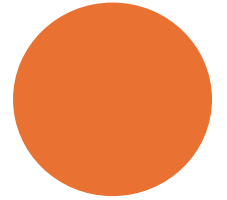
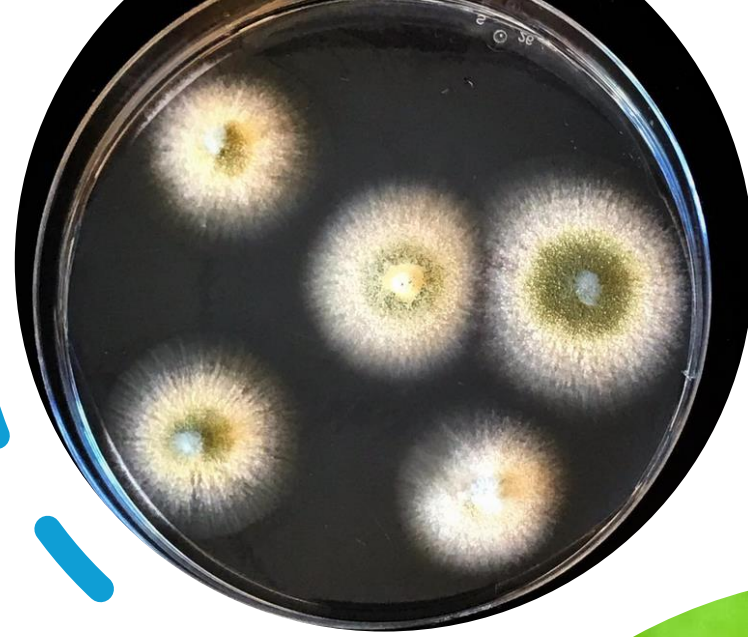


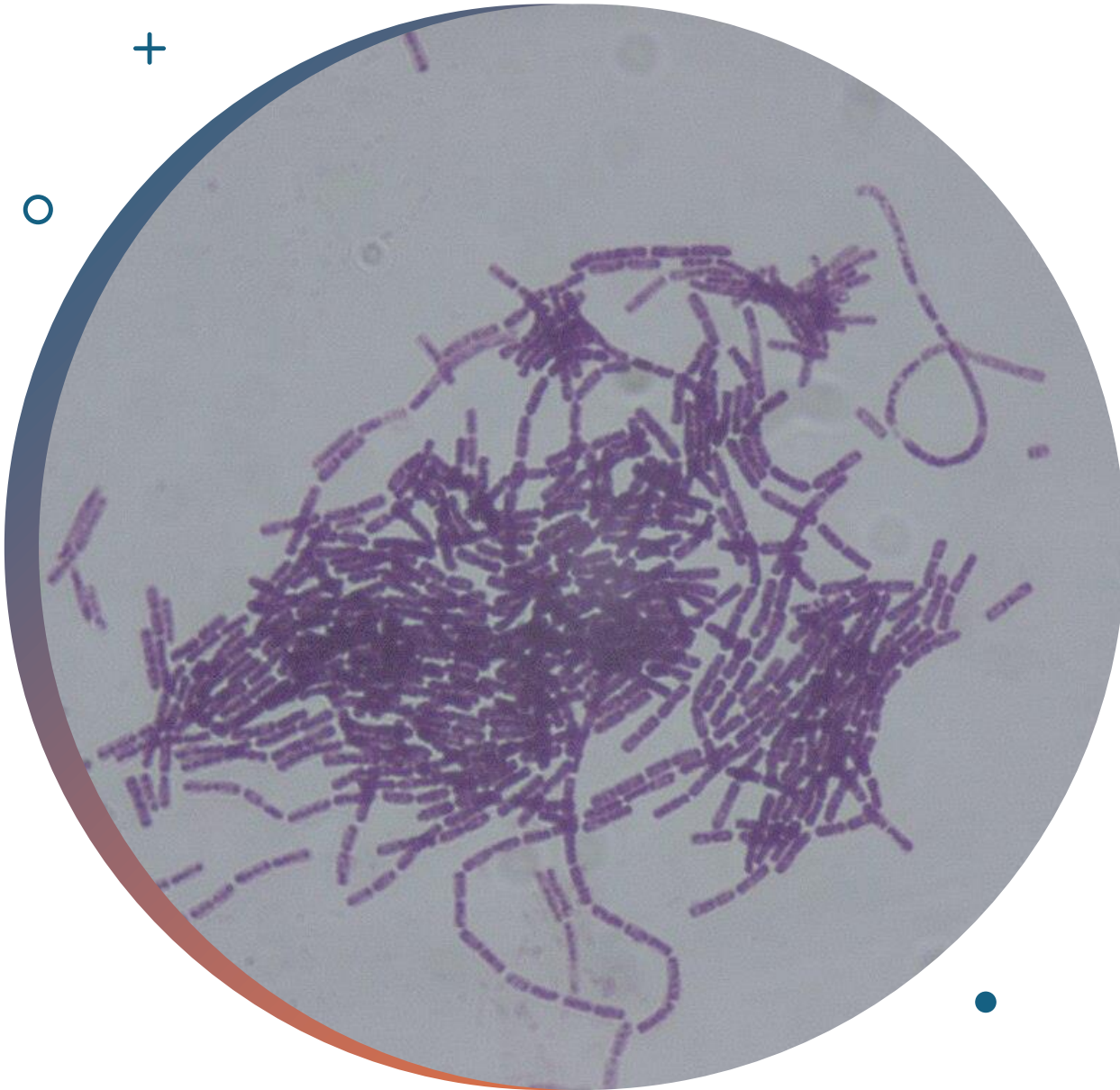


# Other Pathogens

## 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*)



# To Know Them Is To Love Them!

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

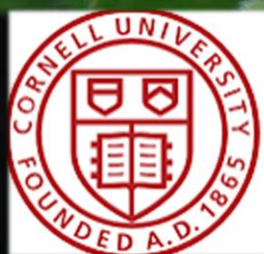


Syrphid fly maggot attacking aphids.





# Thank You!



Cornell University



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