Beneficial Nematodes for Healthy & Sustainable Crops

Collaborative Research Project with Ronin Farm & the Helms Lab at Texas A&M University
Funded by Southern SARE On-Farm Research Program and Texas A&M Entomology

What are we doing?

Introducing beneficial entomopathogenic nematodes for biological control and enhanced plant resistance to improve pest management in cucurbit crops

What is Biological Control?

Using natural enemies like predators, parasitoids, & entomopathogens to kill insect pests.

You can attract, conserve, & introduce natural enemies.

Green lacewing, Lady Beetle, Parasitoid Wasp

Biological Control with Beneficial Nematodes

Entomopathogenic nematodes or EPNs are tiny insect-killing worms that live in the soil.

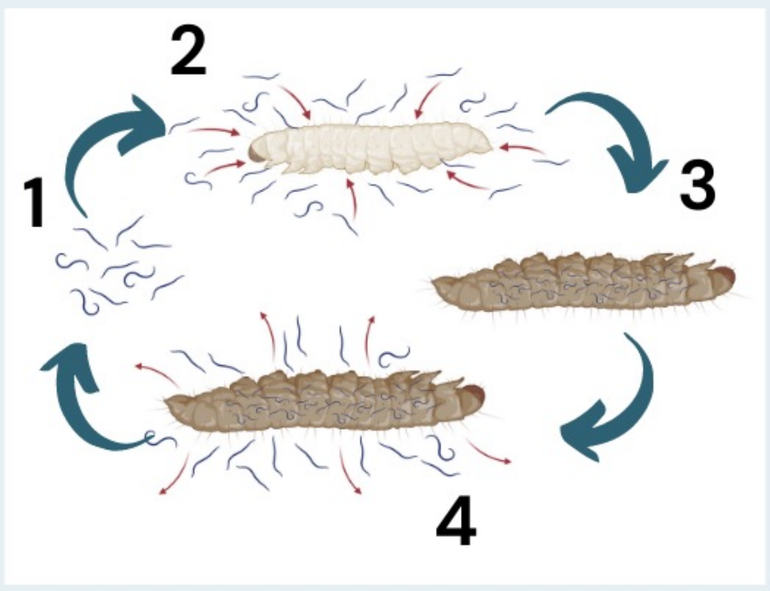
EPNs only kill insects. They're safe for humans, pets & wildlife.

1. The EPN "infective juvenile" stage hunts for insect prey using odor cues from insects or roots.

2. After finding a host, EPNs crawl inside.

3. EPNs release symbiotic bacteria that help them kill and consume insects. The insect dies and changes color within 48 hours.

4. After a few generations (~7 days), new infective juvenile EPNs are released and begin searching for hosts.

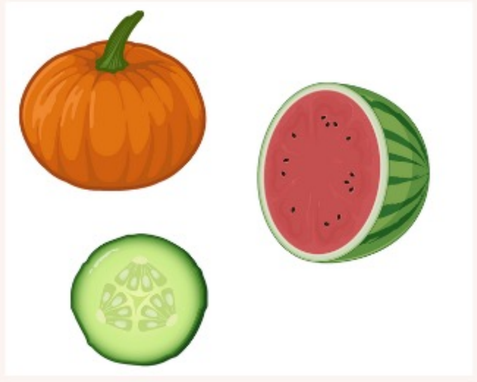


EPNs improve plant resistance!

Our research shows plants exposed to EPNs become more resistant to herbivores and pathogens.

Cucurbit Crops

Cucurbit crops include cucumbers, melons, pumpkins, & squashes.



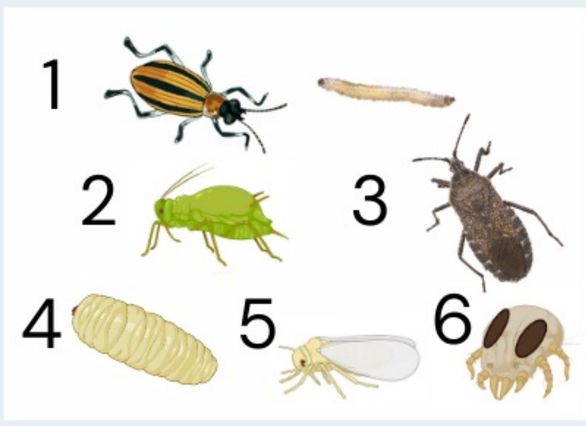
Texas is a top 10 cucurbit producing state in the U.S.

In this project, we will measure plant growth and yield to determine how EPN introduction affects production.

Cucurbit Pests

Many pests attack cucurbit crops, including:

1. Cucumber beetles
2. Aphids
3. Squash bugs
4. Vine borers
5. Whiteflies
6. Spider mites

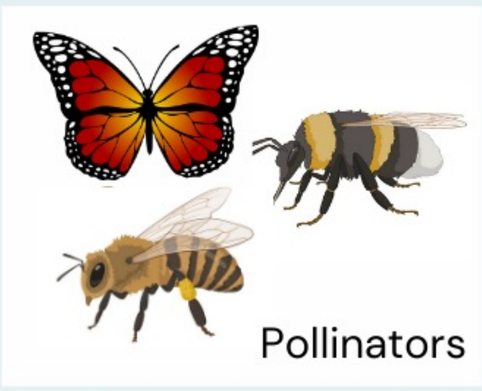


We will survey pests to evaluate the effectiveness of introducing EPNs for biological control and boosting plant resistance.

Pollinators and Beneficial Arthropods

Cucurbit crops require pollinators to produce fruits.

Natural enemies provide important biological control services.


Pollinators

We will survey pollinators and natural enemies to make sure our EPN introductions don't harm the beneficial insects.

Our Goal is to maximize the benefits of EPN biocontrol

EPNs can provide multiple benefits by directly killing insect pests and boosting plant resistance to improve crop yield.