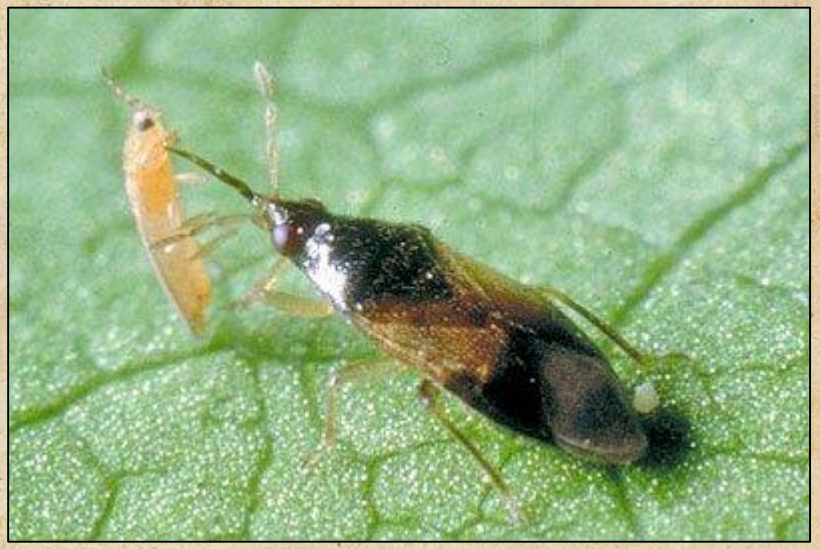
All About
All Natural Thrips Killers



&
Are They Any Good When I Get Them?

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Tri-State Greenhouse IPM Workshop
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Predatory Mites

Neoseiulus = Amblyseius cucumeris & swirskii

What do they do?

Consumes thrips eggs & immatures on foliage

- Prefers thrips 1st larval stage

Also feed on pollen (*swirskii* on whiteflies) & broad & cyclamen mites

Will establish when pollen & prey present

Predatory Mites

Stratiolaelaps scimitus (Hypoaspis miles)

What does it do?

Consumes thrips pupae in media

Also feeds on soil debris & other soil organisms (esp. fungus gnat & shorefly larvae)

Long lived, can survive several weeks with little/no food

Predatory Mites

Neoseiulus = Amblyseius cucumeris & swirskii

- Beige
- More effective at cooler temp (66-80°F), humidity 65-72%
- Apply early in season

Stratiolaelaps scimitus (Hypoaspis miles)

- Clear white
- Most effective during warmer temps (77-82°F) & higher humidity (70%)
- Apply later in season

- Dark tan above, light tan below
- Optimal soil temp (60-72°F), moist conditions
- Apply all season

Non-Predatory Mites

Most predatory mite products are shipped with grain/bran mites as prey

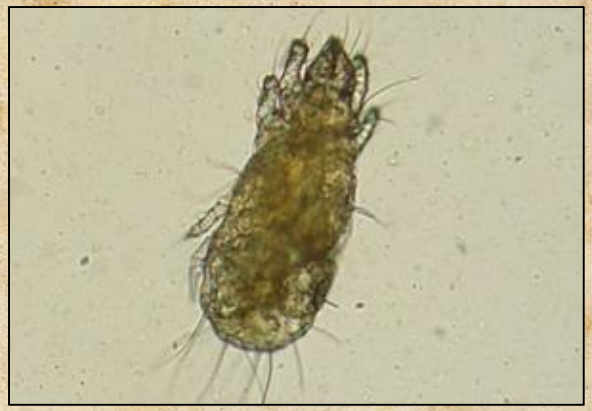
General Characteristics

Grain mites

- Smaller & Slower
- Oval shape
- Hairy

Predatory mites (*cucumeris/swirskii*)

- Larger & Faster
- Teardrop shape
- Not hairy



Grain Mite

Predatory Mite

Predatory Beetle

Dalotia (Atheta) coriaria

What does it do?

Adults & larvae consume thrips pupae in media

Also eats fungus gnat and shorefly larvae

Can be cannibalistic

Adults nocturnal & fly well

Effective at wide temp. range (54-95°F)

Combine with *S. scimitus* for best results

Adult

Appearance

Adults dark brown-shiny black, covered with fine hairs

Larvae white – orange/brown

3-4 mm long

Larva

Predatory Bug

Orius spp.

What does it do?

Adults & nymphs consume thrips adults & larvae on foliage

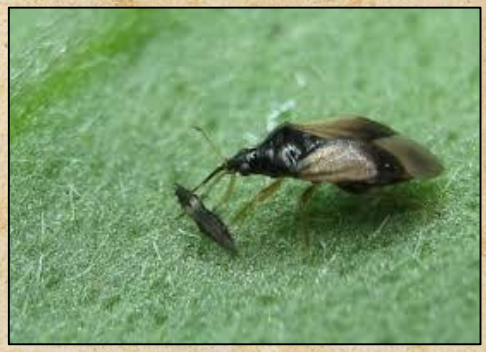
Generalist predators (also eats aphids, mites, pollen/nectars)

Pierces & sucks pest juices

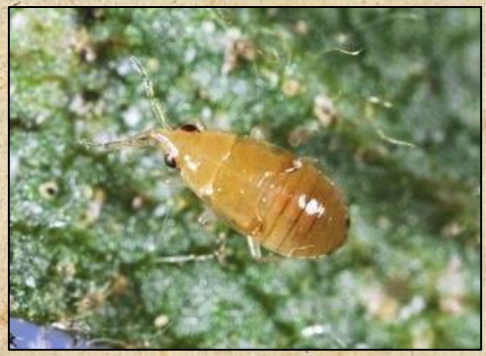
Subject to seasonal affective disorder (diapause) in response to shorter day lengths. Optimal temp (62-84°F) & day length (>12 hours)

Needs food source (banker plants) to establish early in season

Appearance



Adults, black, grey, white & brown



Nymphs red/brown

Nematodes

Steinernema feltiae

What do they do?

Occupy water filled spaces (needs moisture)

Attack thrips pupae in media (larvae on foliage)

- Also gnat larvae in media

Infective larvae (3rd stage)

Enters host, kills by releasing bacteria, then eats their broken down tissues

UV light damaging, apply late or cloudy days

Optimal temp (58-78°F) for bacteria efficacy, nematodes tolerate wider range

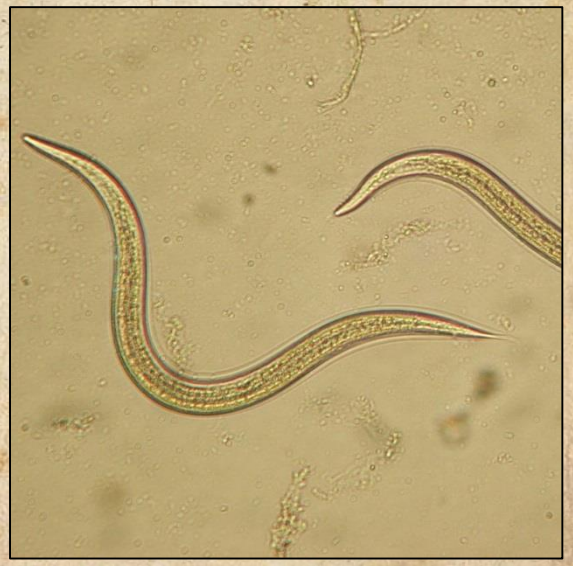
Repeat applications needed (active 2-3 wks)

Appearance

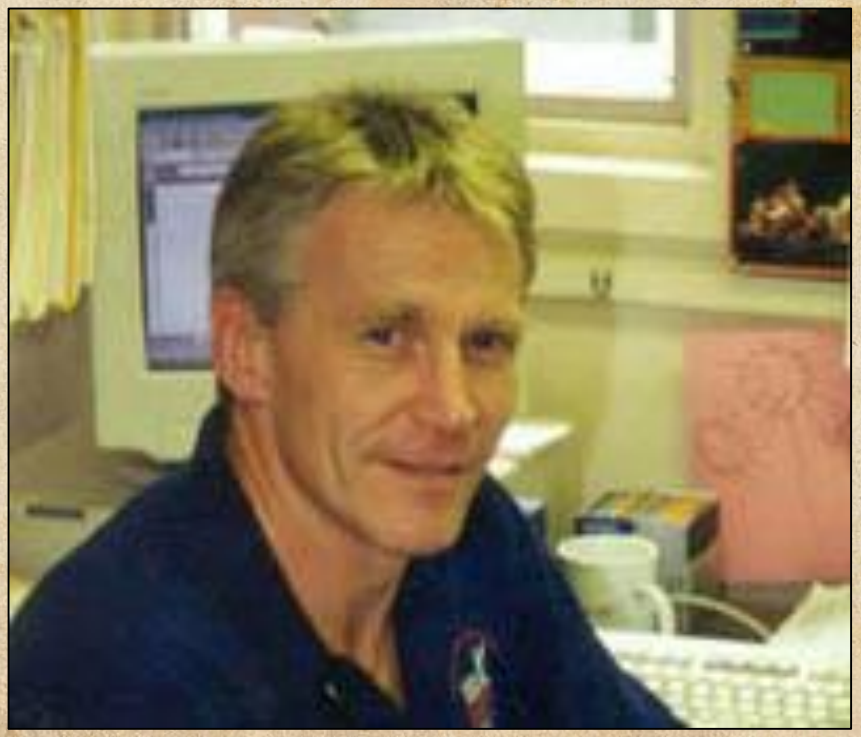
Worm-like

1mm long

Generally clear



Take It Away Michael!!



Is This Stuff Any Good?

Quality Assurance

Why care?

- Quality impacts efficacy
- Prevent a costly mistake

Upon product arrival

1. Overall package quality (Temp., Smell, Moisture)
2. Individual contents (Movement)

Contact supplier if

- See little-no activity
- Suspect less than 70% product is natural enemies

Is This Stuff Any Good?

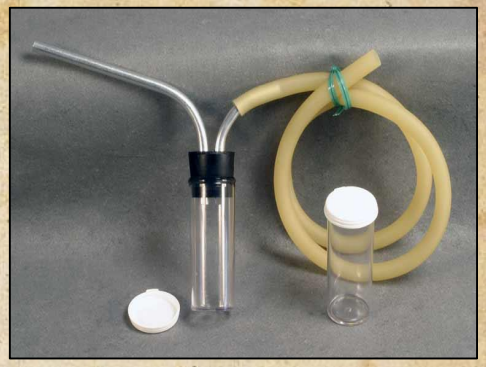
Quality Assurance

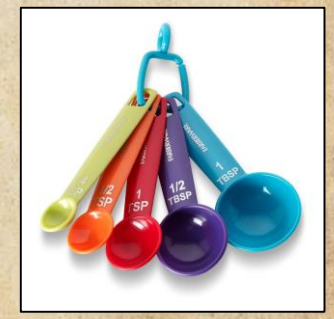
Procedures:

- Ask your supplier
- Grower Guide: Quality Assurance of BioControl Products (Vineland) http://www.vinelandresearch.com/sites/default/files/grower_guide_pdf_final.pdf

Basic Supply List:

- White surface (tray, paper, foam, etc.)
- Hand lens or microscope
- Aspirator (if you want to capture them)
- Sticky cards
- Medium binder clips
- Measuring spoons
- Paintbrush (to pick up nat. enemies)





Predatory Mites

Quality Assurance

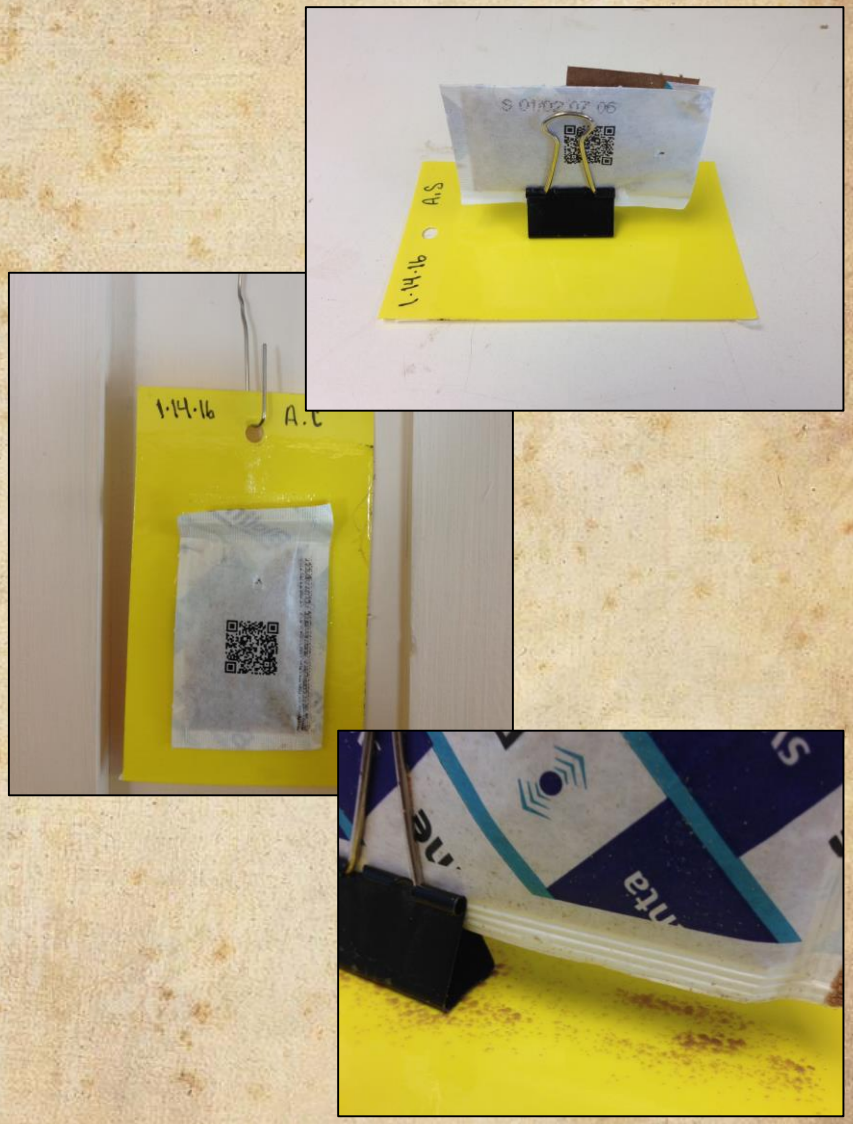
Sachets

1. Suspend sachet upright using binder clip over a sticky card

2. Stick sachet to sticky card & hang (paper clip or twist tie)

Place at room temperature (not in sun), 60-90% humidity

Inspect weekly for predatory and grain mite emergence



Predatory Mites

Quality Assurance

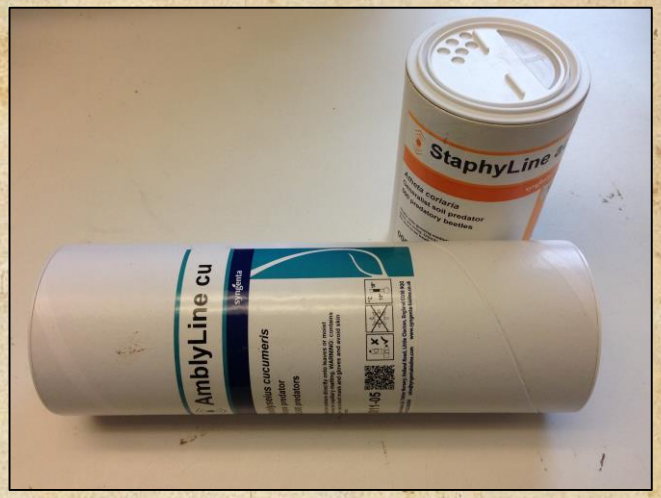
Bulk (Tubes, Bags)

Mix well by gently turning package

Make a 6in diameter circle out of soap on white surface

Take 1 tsp of product & spread in center of soap ring under warm light

Count moving predators (not grain mites)



Predatory Beetles & Bugs

Quality Assurance

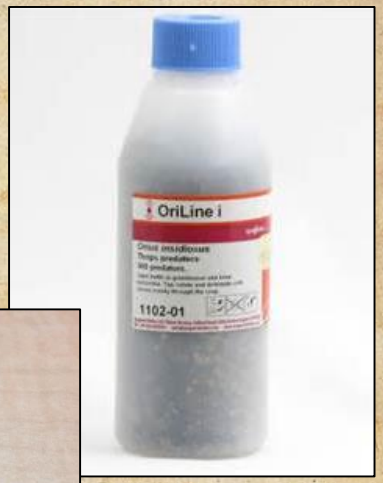
Bulk (Tubes, Containers)

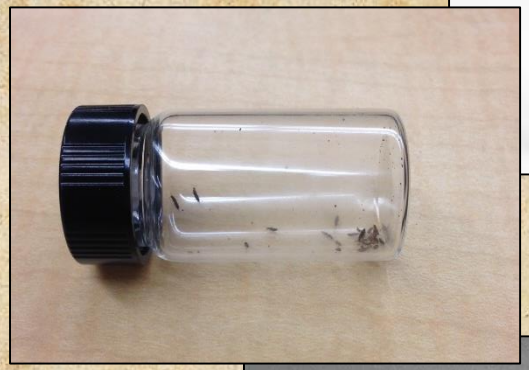
Mix well by gently turning package

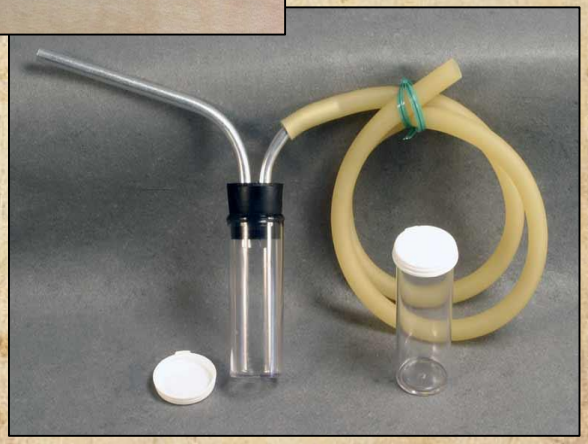
Take 2 tbsp. & spread on white surface

Count moving predators

- Use an aspirator – If re-capturing them desired







Nematodes

Quality Assurance

Sponge or Plastic Containers

Place droplet of room temperature water on glass slide or place 1tsp water in Ziploc bag

Mix a pinhead amount of product with the water

Wait 5-10 minutes

Place prepared product against black background then look for moving or S-shaped nematodes

Questions?

THANK YOU!!!

Visit our Website!
http://www.uvm.edu/~entlab/

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