Vegetable Diagnostics 101: Insects and Diseases
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For more information on Small Farms, visit our website at: http://smallfarms.ifas.ufl.edu/ or contact your local County Extension Agent.

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Identification of Pest and Beneficial Arthropods
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University of Florida/IFAS/
Gulf Coast Research and Education Center
Arthropods – Insects and Mites

Need to know:

● Life Cycle

● Damage

● Host range

Yellow calyx – Pepper weevil damage

Strappy leaves – broad mite damage
Scouting – twice a week

Strike the plant onto a light surface to detect small, cryptic pests
Monitoring with Yellow Sticky Cards

- Aphids
- Whiteflies
- Leafminers
- Fungus gnats
- Shore flies
- Thrips
Use yellow sticky cards to monitor establishment of biocontrol agents.

Whitefly parasitoid
Silverleaf whitefly, *Bemisia tabaci* biotype B
Silverleaf whitefly, *Bemisia tabaci* biotype B

- Adult
- Eggs
- Crawler
- Red-eyed nymph
- Nymphs
Silverleaf whitefly – adult and eggs

www.bio-bee.com
Whitefly nymphs – mid instar and red-eyed (final instar) nymph

*Bemisia tabaci*
Silvering of cucurbit leaves caused by feeding of the silverleaf whitefly, *Bemisia tabaci* Biotype B
Tomato yellow leaf curl virus – vectored by silverleaf whitefly
Squash leaf crumple virus – vectored by silverleaf whitefly
Whitefly parasitoids

Encarsia formosa

Eretmocerus eremicus

Eretmocerus mundus

Photos: Lyle Buss
Scouting for commercially-available naturally enemies - Parasitism

Silverleaf whitefly exuvia with T-shaped exit hole (left); red-eyed nymph (right). Photo: Yankai Li.

Whitefly nymphs and nymphs parasitized by *Encarsia formosa*. Arrow points to round exit hole of left by parasitoid. Photo: Yankai Li.

*Encarsia formosa* adult. Photo: Lyle Buss
Amblyseius swirskii, predatory mite: attacks whitefly, thrips, broad mite, others

Photo: Lyle Buss
Western flower thrips (*Frankliniella occidentalis*)

Lyle Buss
Western flower thrips larva

Western flower thrips prepupa

Lyle Buss
Thrips life cycle

- **Egg**
- **Larvae**
- **Pupae**

In plant tissue

In soil/container media
Florida flower thrips vs Western flower thrips

Antennal characteristics are used.
Thrips damage

Stippling

Bronzing

Leaf abrasion and frass
Thrips damage – bronzing and distortion
Thrips-vectored tospoviruses

Tomato spotted wilt virus
Photos: Gary Vallad

Ground nut ring spot
Combine biocontrol agents that attack different life stages of the pest.
Orius – Minute pirate bug
Orius nymph
Two spotted spider mite, *Tetranychus urticae*

Spider mite eggs
Spider mite damage

Eggplant

Strawberry
Scouting for commercially-available natural enemies - Predation

Two-spotted spider mite with eggs
Y. Li

Amblyseius californicus feeding on spider mite eggs. Spider mites in lower right.
L. Buss

A. swirskii egg
Y. Li
Phytoseiulus persimilis
- only eats mites
“Persimilis”

Amblyseius/Neoseiulus
- can survive on pollen or prey
“Californicus”

A. californicus

P. persimilis

Photos – Lyle Buss
Aphid colony – note honeydew and caste skins
Aphids have cornicles

Green peach aphid alate –
Scott Bauer – USDA ARS

Cotton or melon aphid (Aphis gossypii)
Cindy Fake - UCCE
Parasitized aphids – Aphid “mummies.”
Aphid parasitoids

All images UC IPM
Ladybird beetle life cycle