Management of Tomato Insects

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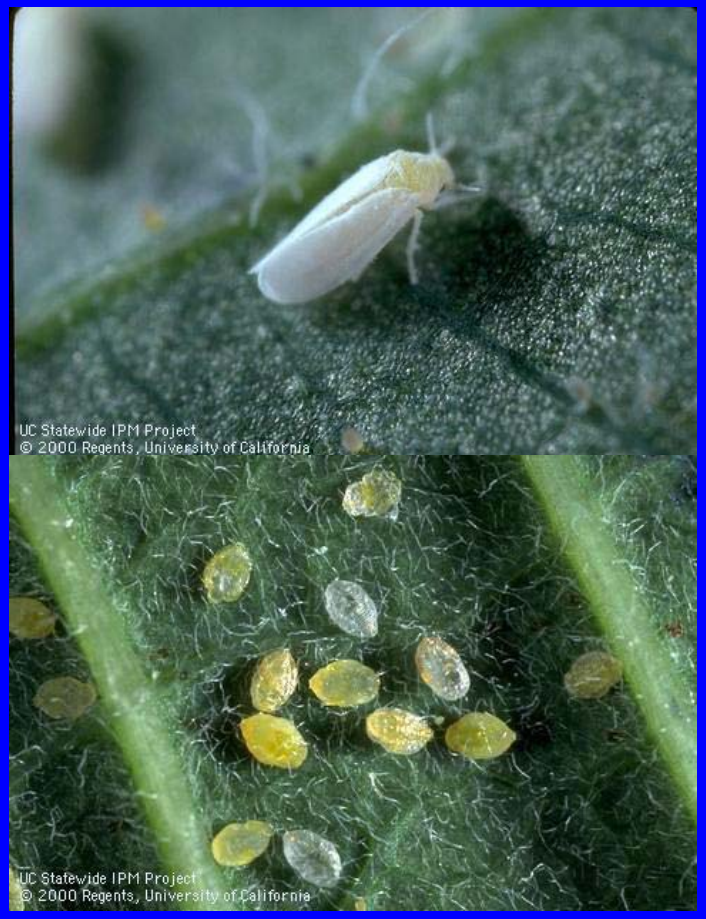
Whiteflies

- Wingless immatures; Winged adults.
- Eggs are laid on the bottoms of leaves.
- 1st stage larvae move, later stages and pupae are fixed to the under-surface of leaf.
- From 21 to 60 days to complete life cycle.



Plant Hosts of Whiteflies

- Whiteflies have a wide host range - many weeds, crops, and ornamentals.
- Cotton is a preferred host of WF's as are other members of the hibiscus family like hibiscus and okra.
- Melons, squash, cucumbers, tomatoes, peppers, eggplants, and cole crops can be hosts for WF's.

Management

- Natural enemies will provide some control if virus or honeydew aren't problems. Death of natural enemies will result in a resurgence problem.
- Tank mixes of pyrethroids and OP's are effective but a last resort due to resistance problems and effect on natural enemies.
- Rotate classes of insecticides and use physical agents.
- Combine chemical, cultural, and biological control.

Many MoA's for Whitefly

- Neonicotinoid materials –effective, soil application is easier on beneficials. Foliar spray will damage honey bees, fairly short PHI's; systemic. (4)*
  - Most have foliar and soil applied forms.
  - Resistance is an issue now.
- Pyriproxyfen (Knack®) - insect growth regulator. (7C)
- Buprofezin (Courier®) - IGR (chitin synthesis inhibitor). (16)
- Pymetrozine (Fulfill®) – aphids; WF suppression only. (9B)*
  - Cross-resistance noted in whitefly only not aphids.
- Spiromesifen (Oberon®) - will control mites as well. (23)
- Chlorantraniliprole (Coragen®) – suppressive against SLWF.
- Five different IRAC classes but (*) indicates cross-resistance; phi's vary.

Newer Chemistry

- Sivanto® (4D) - a ‘bee safe’ material; can suppress tomato yellow curl virus.
  - Can be soil applied; suppressive against chili thrips.
- Verimark® (28) – needs 1 – 3 days to be absorbed to be active against whitefly.
  - Suppression of foliage-feeding thrips.
- Movento® (23) – has broad and russet mite activity.
  - Suppression of thrips.
- Closer® (4C) – high rate against whitefly.
  - Suppression of thrips.

Application Scenario

- Use an adulticide when adults are first noted or are prevalent on an infested crop.
- After nymphs are noted, growth regulator-type materials should be applied; tank mixes for both.
  - Some growth regulators have little effect on adults other than to suppress egg laying.
- Rotate physical materials, contact, and systemic materials.
  - Rotate chemical classes!
- Translaminar uptake is important, because the whitefly spends most of its time under the leaf.

Thrips Biology

- Thrips are small insects with feather-like wings.
  - They feed by rasping away the fruit or leaf surface.
  - Their eggs are inserted just under the surface of the leaf or fruit.
  - Immature thrips look similar to adults without wings.
- Thrips feed on flowers or foliage of many weeds; they move into the crop when these weeds age.
  - There can be continuous movement back and forth between weeds and crops through the season.
- Thrips can vector virus diseases such as TSWV.
  - Weeds act as the reservoir for the virus.

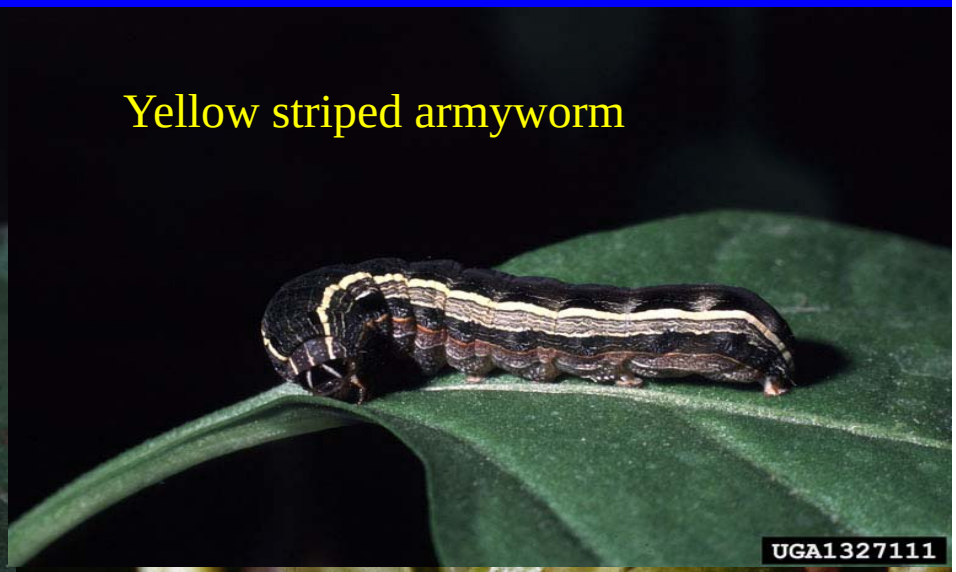
A thrips and thrips damage on tomato.

J. E. Funderburk U. Fl.

Chemicals for Thrips

- Radiant® (5) is effective against thrips, is easy on natural enemies, and is very good for caterpillars.
- Pyrethroid sprays – no longer effective against thrips.
- Monitor® (1B) - has state label for leafminers but has activity against thrips mainly foliage-feeding species.
- Other older, toxic chemistry: Lannate® and dimethoate.
- Rimon (15) – has some caterpillar activity, too.
- Venom (4A) – soil or foliar application.

Caterpillar Pests of Tomato



Management of Caterpillars

- Caterpillars are the major pests of tomato.
- Reduced reliance on strict pyrethroid programs will reduce secondary pests such as thrips, whiteflies, and aphids.
- Armyworms and corn earworm are main problems.
- Rimon® (15) and Intrepid® (18) – different IRAC groups rotation; Intrepid® is good for big caterpillars.

Other Control Materials

- Proclaim® (6) – expensive but effective.
- Avaunt® (22A) – recommended for beet armyworms.
- Spintor®/Radiant® (5) – will manage thrips, too.
- Belt®, Coragen® and Verimark® (28) – in the same IRAC group; Coragen® and Verimark® have activity against other pests.
- These materials are ‘softer’ in respect to natural enemies.

Spider Mites

- Acramite® (25)– bifenazate - mites only;3 day phi, only one application/season.
- Oberon® (23) - spiromefisen – activity against whitefly, too.; 3 applications/season.
- Kanemite® (20B) – NO SURFACTANT ON TOMATO.
- Portal® (21) – 2 applications/ season.
- Agri-Mek® (6) – 2 applications in 5 days (no egg activity); resistance issues.