Thrips

Thysanoptera: Thripidae
Thysanoptera – "fringe winged"
Thrips mouthparts – a unique type of piercing-sucking mouthpart.
Thrips Mouthparts

- **Single mandible**
  - 2nd mandible vestigial
  - penetrates leaf surface

- **Paired maxillae**
  - punctures cells below surface

- Labium forms a supporting cone

- Functions to “puncture – poke – suck”
Thrips injuries – Silvery scars with small dark fecal spots
Leaf injuries by thrips

Photograph courtesy of USDA Forest Service
Example of a hypersensitive response to thrips leaf feeding on cabbage
Fruit scars caused by thrips feeding

Photograph courtesy of University of California

Photograph courtesy of University of California

Photograph courtesy of Utah State University
Several species of thrips feed on flower buds and flowers. Most are in the genus *Frankliniella*.
Most thrips have a broad host range. *Gladiolus* thrips restrict their injuries to *Gladiolus*.
Thrips Life Cycle

Simple type, with a twist (non-feeding stages)
Instar I and II Nymphs – Feeding Stages

Instar III and IV Nymphs – Nonfeeding Stages in Soil

Egg – inserted into plant tissue

Adult
Eggs are inserted into leaves, petals
Ovipositor (used to insert eggs into leaf tissues)
Thrips oviposition wounds

Pansy spot on Idared apples

Thrips "pansy spot" on mature Idared apples (Utah State University)
The first two stages feed on plants
The last two stages do not feed.

They typically occur in the soil or at the base of leaves and similar protected sites.
Thrips Transmission of Viruses* to Plants

- Tomato spotted wilt
- Impatiens necrotic spot
- Iris yellow spot

* Viruses transmitted by thrips are in the virus family Tospoviruses
Ring spot symptoms on foliage – tomato spotted wilt virus (TSWV)
Ring spot symptoms on foliage – Impatiens necrotic spot virus (INSV)
Ring spot symptoms on fruit
Leaves may show necrotic lesions without ringspots.
Wilting and stunting associated with tomato spotted wilt virus

Photograph courtesy of Gerald Holmes CA Polytechnic University, San Luis Obispo
Characteristics of Thrips Transmitted Viruses

- Thrips are the only insect vector
  - Humans do not spread the virus
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  – Humans do not spread the virus

• Thrips can only acquire the virus if they feed on an infected plant in their first nymphal stage (Instar I)
  – Adult stages can not acquire the virus
Thrips can only spread viruses if the first stage nymphs were developing on a plant that was infected with the plant virus.
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• Thrips that have acquired the virus can transmit it for the rest of their life
Management of Thrips-transmitted Viruses in a Greenhouse

- Make intensive effort to identify all sources of the virus and destroy them
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Management of Thrips in a Greenhouse

- Exclude thrips
- Trap thrips that are present in the greenhouse
- Use insecticides to kill some of the thrips
Excluding Thrips

Tight sanitary procedures, screening, etc
Thrips Trapping

Typically involves use of either bright yellow or baby blue colored sticky cards
Western flower thrips trapped on a yellow sticky card
Large areas of sticky colored tape used to suppress thrips populations
Thrips

Biological Controls

• Life stages on foliage
  – Some predatory mites

• Life stages in soil
  – Insect parasitic nematodes (*Steinernema feltiae*)
  – Soil predator mites (*Hypoaspis* spp.)
Some predators used to control leaf feeding stages of thrips:

- **Neoseiulus cucumeris**
- **Amblyseius swirskii**
- Minute pirate bugs (*Orius* spp.)
Insect parasitic nematode
Steinernema feltiae

Some predators used to control soil dwelling stages of thrips (Instar III-IV)

Soil predator mite Stratiolaelaps scimitus (= Hypoaspis miles)
Insecticides for Thrips Control

Egg and non-feeding stages are protected from insecticides

Insecticides are marginally effective for thrips control

They are poor for control of thrips transmitted viruses (e.g., impatiens necrotic spot)
Thrips

Chemical Controls

• Spinosad (Spinosysns)
  – Some chemically related synthetic insecticides (e.g., spirotetramat, spinetoram)

• Some Insect Growth Regulators (e.g. pyriproxifen)
Thrips have:

• Unique wing type
• Unique form and function of mouthparts
• Unique metamorphosis pattern
• Odd name
Stop this!
Thrips is both singular and plural

One thrips, two thrips, ..... million thrips
What Bugs
Grangshaw
By: Amanda Lash
"Oh look as this beautiful butterfly emerges from its cocoon!"
"Did he say cocoon? What is he teaching the youth of America?"
“It's not a cocoon, it’s a chrysalis!”
“Alright you're free! Stay out of trouble Mr. Cranshaw.”
"Look a thrip!"
There is no such thing as a thrip, it's THRIPS!

not again