TOMATO LEAFMINER (TA)

Tuta absoluta

Description:

Adults:

Adults are 0.2-0.3 in (0.5-0.7 cm) with silvery brown colored scales and black spots on the anterior wings. Females live for 10-15 days, and males 6-7 days.

Eggs:

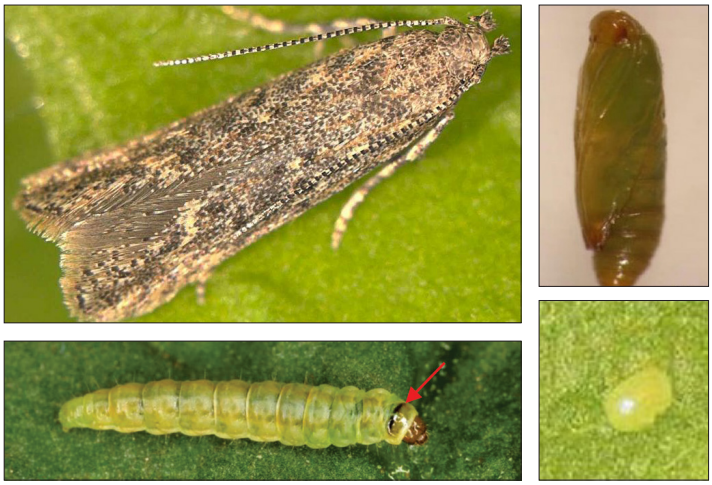
Eggs are tiny, cylindrical, and creamy white to yellow in color. Eggs are mainly laid singularly or in small groups on the underside of leaves or on stems, sometimes on fruit.

Larvae:

Freshly hatched larvae are light yellow or green and tiny, at only 0.02 in (0.05 cm) long. As they mature through four larval instars, they become a darker green color and have a characteristic dark band posterior to the head capsule.

Pupae:

Pupation may take place in the soil, on the leaf surface, within mines, or in packaging material. Pupae are greenish when first formed, becoming darker as they develop. Often coated with a white silky cocoon if pupation does not take place in the soil.



Top left: TA adult (source: NVWA plant protection service, bugwood.org); top right: TA pupa (source: H. Genc, 2016); bottom left: TA larva, note the dark band on the head capsule (source: D. Visser, ARC-VOP); bottom right: TA egg (source: Tosevski et al. 2011).

Hosts:

Major host crop is tomato, but can also feed and develop on eggplant, potato, sweet pepper, tobacco, and other wild host plants in the Solanaceae family such as nightshade.

Damage:

- Infestation of tomato plants occurs throughout the entire crop cycle with feeding damage caused by all larval instars.
- After hatching, young larvae penetrate leaves, aerial fruits, or stems where they feed and develop.
- Leaves: larvae feed on the tissue of leaves forming irregular serpentine-shaped leaf mines. Leaf damage decreases photosynthesis and yields.
- Stems: larvae can form extensive galleries in the stems which affect plant development.
- Fruit: larvae typically enter under the calyx and tunnels the flesh, leaving galleries clogged with frass.

Left: TA larvae damaging leaf; center: tomato infested by larvae (source: Tuta absoluta bulletin; UC Davis Department of Entomology). Right: damage to field tomato plants (source: R.J. Nieuwenhuis).

Phenology:

- Up to 10-13 generations, persistent throughout the year under optimal conditions.
- Can overwinter as eggs, pupae, or adults depending on environmental conditions.
- Larvae do not enter diapause when food is available, or climate conditions are suitable.

Lure Type and Maintenance:

- PHEROCON® TA controlled release lure.
- Replace PHEROCON® TA lures every 8 weeks.

Lure Storage:

- Store in unopened factory sealed packages in a cool place (< 74° F or 24° C maximum) for short periods or refrigerate longer term.
- Refrigerate or freeze unopened packages to carry over for annual storage.

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TOMATO LEAFMINER (TA), *Tuta absoluta*

Trap Design:

- PHEROCON® VI Delta trap.

Placement Time:

- Traps should be placed 2 weeks before planting and used to monitor at all stages of crop production.

Placement Pattern:

- Greenhouse: Place traps on a suitable pole, stake, lath, or suspended from a string or rope inside greenhouse; position trap with respect to vegetation height near ground level.
- Open field planting: place traps in upper canopy of tomato plants at a height of 2.6-4 ft (0.8-1.2 m) high in shaded areas.

Trap Density:

- Minimum of 2 traps in greenhouses smaller than 1 acre (0.4 hectares).
- Use 2-4 traps in greenhouses larger than 1 acre (0.4 hectares) with one trap placed every 5-10 acres (2-4 hectares).
- In open field tomato crops, use 2-3 traps per 2.5 acres (1 hectare).

Trap Maintenance:

- Count and record insect captures weekly.
- Remove captured insects from liner and stir adhesive when checking traps.
- Replace trap liners every 4 weeks, or when fouled with dust or insect debris.

Recommendations:

- Without adequate control, infestations can result in 90-100 percent losses of field-produced tomatoes.
- Cultural control measures such as removal of alternate hosts near fields and greenhouses, plastic mulches, removal of symptomatic leaves and fruit, using double doors in greenhouses, and keeping infested greenhouses closed after harvest should be followed to reduce infestation levels.
- Destroy previous crop residue after harvest.
- Avoid using the same insecticide and rotate chemical classes to reduce chances of resistance to insecticides.

Source: Recommendations and certain other sections were sourced from A Field Guide to The Management of Tomato leafminer (Tuta absoluta), CABI Invasive species compendium for tomato leafminer, and Best Management Practices to Control – Tuta absoluta and Recommendations to Manage Insect Resistance.

Note, always:

- Use only one lure per trap.
- Count and record captures as recommended.
- Change trap as needed.
- Discard lures in trash far from the area of use and remove trash afterwards.
- Follow recommendations.
- Contact local extension authorities and consultants for regional advice.

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