

Tomato Leafminer (*Tuta absoluta*)

The tomato leafminer moth is a pest of tomatoes and other vegetable crops, including eggplants, peppers, and potatoes. It is considered an economically damaging pest in many areas where it is present, including South America.

Tomato leafminer larvae can feed and develop on tomato fruit, leaves, or stems. As the larvae feed, they create tunnels—called “mines”—under the plant tissue surface (see fig. 2). This feeding injures the affected tissue and weakens the plant’s ability to sustain itself through photosynthesis. The larvae reduce crop yield and fruit quality in two ways: directly, through their feeding; and indirectly, by providing a pathway for disease-causing micro-organisms to enter the plant. Even a small amount of damage can make fruit unmarketable as fresh produce.

This pest is distributed throughout Europe, the Middle East, and South America. In Spain, adult moths have been found more than 6 miles (10 kilometers) from tomato fields, suggesting they can move long distances by flying or drifting with the wind. Because the larvae develop within the plant, this species is difficult to control with pesticides. The U.S. Department of Agriculture (USDA) is working closely with stakeholders to survey for the tomato leafminer as part of an early detection survey program.



Figure 1. Tomato leafminer adult (sized approximately one-fourth inch [7 mm]). (National Reference Centre, Plant Protection Service Wageningen, the Netherlands, Marja van der Straten)



Figure 2. A mine (also called a gallery) caused by a tomato leafminer larva (Ministerio de Medio Ambiente y Medio Rural y Marino, Madrid, Spain, JM Cobos Suarez)

Description

The tomato leafminer has four life stages: egg, larva, pupa, and adult. Eggs are cylindrical and creamy white to yellow in color. Their length, 0.015 inches (0.36 millimeters [mm]), is about one-third of a dime’s thickness, and their width, 0.009 inches (0.22 mm), is about one-fifth of a dime’s thickness. Initially, larvae are cream in color with a dark head. As they grow, they become greenish to light pink,

and in their last growth stage, they have a black line behind the head. Adult tomato leafminers are small, brown or silver moths with black spots on their wings (see fig. 1). The adult’s body length, from the head to the tip of its folded wings, is about one-fourth of an inch (7 mm).

Life Cycle

The adult female tomato leafminer can lay eggs on any host-plant part that is above

the ground. Larvae hatch from the eggs and feed until they are ready to become pupae and begin their development into the adult stage. The larvae do not undergo a delay in development known as “diapause” unless food is unavailable. Depending on environmental conditions, the tomato leafminer can pupate in the soil, on leaf surfaces, or in the mines they create. The pupa may be covered by a cocoon. The insect’s developmental cycle from egg to adult varies due to a number of environmental factors and may take 29 to 38 days. In areas with mild winters or in greenhouses, the tomato leafminer may produce up to 12 generations each year.

Symptoms and Signs

USDA encourages growers and producers of tomato and other host plants to look for the tomato leafminer and report any suspicious findings. Host plant leaves, stems, buds, or the calyx (leaf-like structures at the top of tomato fruit) should be examined for larvae (see fig. 3). Leaves also should be examined for leaf mines. Initially, the tomato leafminer larvae create irregular mines that are about half the width of a pencil line. The mining occurs between the upper and lower leaf surfaces, resulting in clear patches that are often partially filled with larval waste. As each larva develops in its mine, the mine becomes wider and may show some finger-shaped protrusions along the edges.

Growers should be aware that the tomato leafminer’s damage and life stages are very similar to several leaf-mining insects



Figure 3. Tomato leafminer larva (Ministerio de Medio Ambiente y Medio Rural y Marino, Madrid, Spain, JM Cobos Suarez)

already present in the United States. Its leaf mines may appear similar to those caused by the tomato pinworm (*Keiferia lycopersicella*) and leaf-mining fly larvae. For this reason, leaf mines and other signs of damage are not definitive indicators of a tomato leafminer infestation. If tomato growers are following the appropriate control methods for *Keiferia* in their State, they should look for damage that is unusually severe.

Signs of a potential tomato leafminer infestation include:

- Damage to tomato plants or fruit that resembles tomato pinworm damage but is more severe than usual and is not controllable using the usual insecticide regimen.
- Large numbers of small moths matching the description above that take flight when tomato plants are disturbed.

For more information about how to identify this pest, consult *The Tomato Leafminer Field Screening Aid* developed by USDA’s Cooperative Agricultural Pest Survey (CAPS) program (available at http://caps.ceris.purdue.edu/screening/tuta_absoluta). An additional CAPS publication, *The Tomato*

Leafminer Identification Aid, is a more advanced identification tool. It can be accessed at http://caps.ceris.purdue.edu/screening/tuta_absoluta_id.

Report Your Findings

Proper identification of the tomato leafminer is important. This species is very similar to many species in the same family, including the tomato pinworm (*Keiferia lycopersicella*) and potato tuber moth (*Phthorimaea operculella*). Both species are present in the United States and may be found in tomato fields. **If you observe the signs of a tomato leafminer infestation described above, please contact your local extension office or State Plant Regulatory Official as soon as possible.** To locate an extension specialist near you, visit USDA’s National Institute of Food and Agriculture Web site at www.nifa.usda.gov/Extension. A directory of State Plant Regulatory Officials is available on the National Plant Board Web site at www.nationalplantboard.org/member/index.html.

The Cooperative Agricultural Pest Survey (CAPS) conducts science-based national and State surveys that target specific exotic plant pests, diseases, and weeds identified as economic and environmental threats to U.S. agriculture and/or the environment. The U.S. Department of Agriculture is the primary funding source for CAPS activities, providing funds to State departments of agriculture, universities, and other entities through cooperative agreements.

