

Kenya Plant Health Inspectorate Service (KEPHIS)

The Tomato Leaf Miner: *Tuta absoluta*



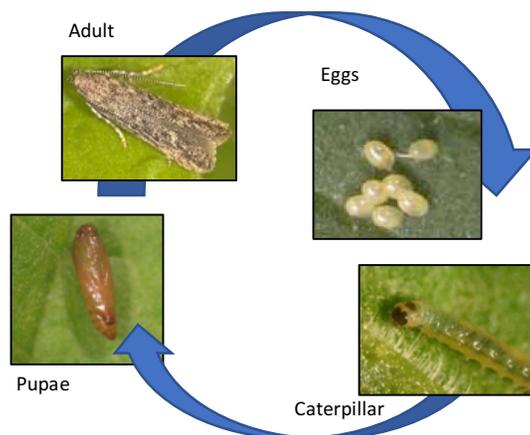
Introduction: *Tuta absoluta*

The Tomato Leaf Miner, *Tuta absoluta*, originated from South America and has spread throughout the Mediterranean Basin and into Africa. Tomato leaf miners can cause losses of up to 80-100% in open or green house tomato fields and attack all above ground parts of the plant. The pest has been reported in all tomato growing regions in Kenya and spreads via seedlings, infected tomato vines, tomato fruits and used containers at markets, repacking points, and distribution centers. Moths can spread on vehicles and farm equipment (crates and net bags). *Tuta absoluta* are capable of dispersing several kilometers through flight.

Tuta absoluta is a very challenging pest to control. Growers need to be able to identify the symptoms of *Tuta absoluta* and be ready to take immediate action.

Life Cycle

Tuta absoluta is a moth with a high reproductive potential, and although its biological cycle depends on temperature, it is capable of over 10 generations per year under optimal conditions. Its life cycle comprises four development stages: egg, larva, pupa and adult, and is completed within 24 days at 27° C and 76 days under 14° C. **Females** usually lay eggs on the aerial parts of host plants, on the underside of leaves or stems and to a lesser extent on fruits. A mature female can lay up to 260 eggs. **Eggs** are small, cylindrical, creamy white to yellow-orange, and 0.35 mm long. **Larvae** are cream colored with a characteristic dark head. **Pupae** are cylindrical in shape and greenish when just formed, becoming darker in color as they near adult emergence. The pupae are often coated with a white silky cocoon. The **adults** identifying characters are the filiform antenna, grey colored scales and black spots present on the anterior wings.



Host Range

The main host is tomato; minor hosts are potato, eggplant, tobacco, peppers while wild hosts include common nightshade and *Datura stramonium* L.

Physical damage symptoms and signs

Tuta absoluta will feed on all parts of the plant including fruit, leaves, stems, and inflorescences. Symptoms of *Tuta absoluta* infestation include abnormal shape, lesions, exit holes, necrotic areas, rolled leaves, leaf mines, and excrement from larvae. Leaf mines are found on both upper and lower parts of leaf lamina. The tunnels marks on leaves are white to cream and with keen observation one can see green caterpillars with well-developed heads inside the tunnel. At advanced stage, caterpillars produce silk like substance used to web and fold the leaf partially which protects last instars larva.



Leaf mine and caterpillar



Leaf damage and caterpillar



Stem feeding damage



Fruit damage

Management of *Tuta absoluta*

Integrated Pest Management is the most sustainable management strategy for *Tuta absoluta*. Integrated Pest Management uses multiple control tactics to provide long-term prevention of pests and their damage.

Pest detection

Proper diagnosis of *Tuta absoluta* is crucial for effective management and should be the first step in any management approaches. The extension service providers, input dealer and farmers need to correctly identify the coalesced lesion which is the typical damage symptoms for *Tuta absoluta*.

Phytosanitary measures

ISPM 5 defines phytosanitary measure as: “any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests or to limit the economic impact of regulated non-quarantine pest”.

To avoid pest spread, quarantine measures and phytosanitary field inspections of seedlings, fruits and packing containers originating from areas where *T. absoluta* occurs are necessary

Host commodities intended for export must be produced in pest free facilities, and internationally bound tomatoes must be packed in insect-proof containers.

Cultural measures



These will involve measures such as Crop rotation with non-solanaceous crops e.g. maize, beans but not Irish potatoes, capsicum or brinjals. Infested tomato fruits and other debris should be buried in deep holes instead of being dumped at farm edges, collection points or in markets. Keep fields weed-free as some weeds have been reported to act as alternative hosts such as *Datura stramonium* and indigenous vegetables like Managu.

Mounting pheromone-based mass trapping devices

Currently there are no registered mass trapping devices for *Tuta* in Kenya. But KOPPERT Kenya and Kenya Biologics have detection devices for *Tuta* available in the country which are effective. The same pheromones can be used on homemade water traps such as plastic containers containing aqueous insecticide solution. Light traps can also be used against the moth



Biological control

Products that have been found to work on *Tuta* in other countries include Neem extract, Bt, *Trichogramma* spp., Entomopathogenic fungi and predatory bug '*Macrolophus pygmaeus*'.

Chemical control

Insecticides use is challenging due to fast development of resistance and Trans laminar damage of the pest. However, products that have been used in other countries and available in the market include, Coragen, Belt, Tracer and Radiant.

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