

Crop Rotation

Do not plant solanaceae crops (such as Egg plant, Irish potato) and some legumes (such as Beans) immediately after harvesting a crop from the same family. Plant crops from a different family to break the pest life cycle. Collaborate with the neighbours who are growing similar crops and practice area wide management. (Community crop rotation is highly recommended)

Irrigation

Over head irrigation in the evening or early in the morning will disturb the moth from laying eggs.

Soil Aeration

Aeration will expose the pupa to sunlight for desiccation (wither/dry and die) and also to natural enemies that will kill it. This can be done through ploughing, discing, forking, hoeing and ridging.

Biological Control

Biopesticides such as Metarhizium anisopliae Met69' and Trichoderma asperellum that boosts the natural defenses of the plant against Tuta Absoluta may be used in IPM. These can be applied as aerial sprays while others can be used for soil treatment such as the bio-products known to control the pupa as pupation takes place in the soil.

Insecticides

This should be the last resort as Tuta Absoluta develops resistance very quickly in an event of misuse or misapplication of the insecticide. Refer to back page for recommended active ingredients that are known to control the pest. It is highly recommended to alternate insecticides from different groups to prevent development of resistance.

Caution

1. To prevent the build up of insecticides resistance, avoid treatment of 2 tuta Absoluta consecutive generations with insecticides from the same chemical grouping and 'Always use the insecticides at recommended rates as indicated on the label.
2. For the safety of users when using insecticides, remember the golden rules and as provided for under the Environmental Management Act No. 12 of 2011: 1. Exercise caution at all times, 2. Read and understand the product label, 3. Practice good personal hygiene, 4. Wear appropriate personal protective equipment (PPE) and 5. Keep insecticides locked and out of reach of children
3. With regards food safety for consumers, observe the specific product's pre-harvest interval (PHI) stated on the pesticide label, which tells you when the crop is safe for harvest after spraying of insecticides.

Agro Chemicals - Prevention And Control Tuta Absoluta - Tomato Leaf Miner

Trade Name	Active Ingredient	Chemical Grouping	Stage of Control
Denim Fit	Emamectin Benzoate + Lufenuron	Avermectins + Benzoyleureas	Larvae and eggs
Steward/ Devacarb	Indoxacarb (Oxadiazine)	Oxadiazine	Larvae
Coragen	Chlorantraniliprole	Diamides	Larvae
Ampligo	Chlorantraniliprole + Lambda-Cyhalothrin	Diamides + Pyrethroids	Larvae
Delegate	Spinetoram	Spinosyns	Larvae
Ag Tap/Suntap 500sp/Cartap	Cartap Hydrochloride	Nereistoxin Analogues	Larvae
Legacy 480 Ec/Terminate 4tc/Mo-Durs	Chlorpyrifos	Organophosphate	Larvae
Emamectin Benzoate/ Emma 50sg/ Benzo Extra/ Prove	Emamectin Benzoate	Avermectin	Larvae
Cyferfos 500 Ec/Lancet 505ec/Cyclone	Chlorpyrifos + Cypermethrin	Organophosphate + Pyrethroid	Larvae and Adult
Acephate	Acephate	Organophosphate	Larvae
Crown	Chlorfenapyr	Pyrroles	Larvae and eggs
Attitude	Indoxcard + Acetamiprid	Oxadiazine + Organophosphate	Larvae
Vapcomic	Abamectin	Avermectin	Larvae
Dictator Plus	Tetradifon + Propargite	Unknown + Organophosphate	Larvae and eggs
Plantmate	Phorate	Organophosphate	Larvae
Atom	Deltamethrin	Pyrethroid	Larvae
Halt/Looper Kill	Bacillus Thuringiensis	Biological	Larvae
Oxy-M 2.4 Sl	Oxymatrine	Biological	Larvae
Tracer 480 Sc	Spinosad	Microbial Pesticide	Larvae
Orosorb	Orange Oil + Borax	Organic Citrus Oil Extract	Larvae
Nimbecidine	Azadiractin	Botanical Extract	All Stages
Nevo	Prosuler Oxamatrine	Organic	Larvae

Acknowledgements

ZARI wishes to sincerely thank the FAO through the African Solidarity Trust Fund (ASTF) for facilitating the printing of these brochures. Special gratitude's are also extended to the Zambia National Farmers' Union (ZNFU) and the Tuta Task Force for their technical contributions.

For more information, contact: The Director - Zambia Agriculture Research Institute Mount Makulu Research Station Private Bag 7, Chilanga.

Telefax: +260 211 278141/278130,

Email: mwalemp@yahoo.com/ mtmaku;u@zamnet.zm,

www.pqpszambia.gov.zm OR Any nearest Agriculture office.



Ministry of Agriculture

Tuta absoluta TOMATO LEAF MINER

Detection And Management



Researching Soils, Crops and
Water in Zambia

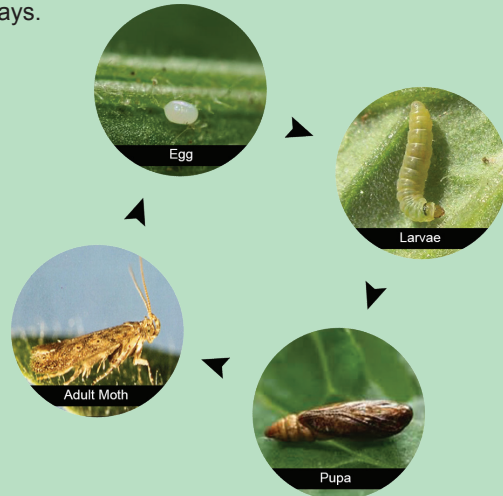
Plant Protection And Quarantine Division

What Is It?

Class: Insecta
Order: Lepidoptera
Family: Gelechiidae

Life Cycle

It has a high reproductive potential and completes life cycle in 30-35 days.

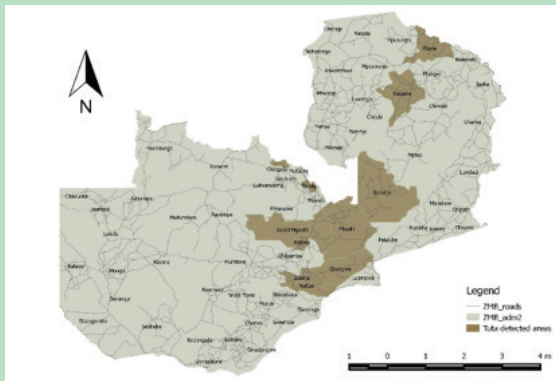


Description

It is a serious worldwide pest of Solanaceae crops such as tomato, potato and egg plant. It is a small silverfish – grey moth of about 1cm in size. The larvae is creamish— green with black head and it is the destructive stage.

Distribution

Peru, Spain, Italy, France, Morocco, Libya, Egypt, Morocco Sudan, Nigeria, Niger, Ethiopia, Kenya, Senegal, Tanzania. In Zambia, it was first detected in 2016. Currently in Zambia, it has been detected in Lusaka, Chongwe, Kafue, Chilanga, Serenje, Kabwe, Kapiri Mposhi, Ndola, Kasama, Mbala and Chililabombwe districts.



Hosts

Tomatoes, Tobacco, Pepper, Beans, African eggplant, African nightshade and Irish Potato. Others are wild tomato, wild tobacco and solanaceous weeds such as Jimson weed/thorn apple (*Datura Stramonium*) and black night shade (*Solanum Nigrum*). Tuta Absoluta attacks seedlings, mature plants and fruits.



Damage

Larva feed on the surface and inside the leaves making mines. When the larvae bore into the fruit, tiny holes are seen on the fruit. Inside the fruit the larvae destroys the flesh and make it susceptible to bacterial and fungal pathogens, leading to fruit rot. On fruits, one larva attacks multiple tomato fruits, and can damage all the fruits in a cluster.



Management Of Tuta Absoluta

The best approach is to practice Integrated Pest Management (IPM) i.e Use of more than one tactic to control the pest. Some

of the tactics that may be used to control Tuta Absoluta are:

Legislative

This gives the legal power to prevent the introduction and spread of eminent threats such as Tuta Absoluta. Therefore, it prohibits and prevents the movement of tomato seedlings, fruits and empty crates across borders and between affected parts of the country as provided for under the Plant Pests and Diseases Act CAP 233 of the Laws of Zambia.

Scouting Of The Pest

Scout the fields regularly (at least weekly) and through out the cropping season. Scout for larvae and eggs on the leaves, fruits, terminal buds and stems. Pheromone traps can be used to monitor the presence and population of adult Tuta Absoluta moths.

Mass Trapping

Sex pheromones and yellow/red sticky traps can be used for monitoring and mass trapping of the pest respectively.



Sanitation

Ensure the field is clean by weeding and removing alternative weed hosts. Remove all affected tomato fruits, leaves and other plant parts and bury them at a depth of knee high (not less than 50cm deep). For tomato seedling producers, avoid recycling growing media or sterilize before you recycle.

Restricted Movement And Dispersal Of Infected Plants

Tomato seedlings, fruits and used containers (crates) are known to be high-risk pathways for the introduction of this pest. Restrict the movement and dispersal of infected plants. Clean containers after use. Plastic crates or containers are easier to clean and disinfect hence highly recommended.

