***Tuta absoluta* is a serious tomato pest that also damages aubergines, potatoes and can use other Solanaceae as host plants.**

MORPHOLOGY AND BIOLOGY

Egg: It is creamy white, sometimes yellow, turning a darker shade when close to hatching. It is cylindrical with an average length of 0.36 mm and width of 0.22 mm.

The eggs are individually laid and rarely, they can be found in groups of 5, preferably on the underside of young or fairly mature leaves (Notz, 1992). The average duration before hatching is 4.5 days at a temperature of 24.6 °C.

Larva: The prothoracic shield has a dark stripe on its backside. The newly hatched larva is creamy yellow to later turn a greenish colour. Its size varies from 0.9 mm at the beginning to 7.5 mm at the end of its growth period.

Once the larva emerges, it starts walking and finds its penetration point. It then breaks the epidermis and penetrates into the leaf, consuming the mesophyll. They can spread very quickly to other plants by hanging on silk threads and then being transported by the wind. The average growth period lasts 12.01 days, therefore they need to go through 4 stages.

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Egg

Larva

Pupa: Newly formed it is green, turning a dark brown colour when the adult is about to emerge. The female pupa is larger than the male pupa, measuring 4.67 mm and 4.27 mm long and 1.37 mm and 1.23 mm wide, respectively. Larvae that are ready to pupate, stop feeding and begin to spin a cocoon.

This can happen in the leaves, inside the mines, on the ground or in the fallen leaves. The average growth period for male pupae is 7.80 days and for female pupae 6.72 days.

Adult: Both sexes have ashen forewings with shades that vary from blackish to grey. The hindwings are a bright black colour with dark cilia. The head, thorax and palps are ash grey with dark shades. The length of the back wings is from 4.5 to 4.7 mm.

They are nocturnal, remaining hidden amongst the leaves during the day. When they are annoyed, they begin an erratic and short flight. Copulation starts immediately after the adult emergence.

Fertility is high with an average of 241 eggs per female and a fertility rate of almost 100%. The vast majority of eggs are laid during the first 10 days at the beginning of oviposition. Life expectancy for males is 27 days and for females is 24 days.

ECONEX TUTA ABSOLUTA

SOLUTIONS OVERVIEW

CODE	TRADE NAME	
VA220	**ECONEX TUTA ABSOLUTA 0.50 MG 60 DAYS** Pheromone diffuser with a duration of 60 days.	
VA275	**ECONEX TUTA ABSOLUTA 0.80 MG 60 DAYS** Pheromone diffuser with a duration of 60 days.	
VA328	**ECONEX TUTA ABSOLUTA 1 MG 90 DAYS** Pheromone diffuser with a duration of 90 days.	
TA273	**ECONEX FOLDING WHITE TRIANGULAR WITHOUT SHEETS**	
TA248	**ECONEX SHEET FOR TRIANGULAR**	
TA242	**ECONEX DISPOSABLE WHITE TRIANGULAR**	
TA246	**ECONEX WATER TRAP (ECO)**	

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South American tomato pinworm

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35 1986-2021 Anniversary

DETECTION AND MONITORING

Traps should be placed 2 or 3 weeks before planting, using 1 to 2 traps per hectare. The traps can also be placed on a plastic box near the tomato plants, but at a low height.

For the detection and monitoring of the *Tuta absoluta* is recommended the trap **ECONEX FOLDING WHITE TRIANGULAR WITHOUT SHEETS** or the **ECONEX DISPOSABLE WHITE TRIANGULAR** together with the ECONEX TUTA ABSOLUTA pheromone diffuser.

MASS TRAPPING

The **ECONEX WATER TRAP (ECO)** is the trap recommended for mass trapping because of it effectiveness, large capacity and low maintenance. It has to be used together with the ECONEX TUTA ABSOLUTA pheromone diffuser.

To carry out mass trapping, the number of traps per surface area should be increased, depending on location and homogeneity of the plots. A trap controls an area between 250 and 500 m^2. This means a density of 20 to 40 traps per hectare.

NECESSARY MATERIAL

When the population of the pest is small, we recommend the trap **ECONEX FOLDING WHITE TRIANGULAR WITHOUT SHEETS** or **ECONEX DISPOSABLE WHITE TRIANGULAR** for detection and monitoring.

The trap ECONEX FOLDING WHITE TRIANGULAR WITHOUT SHEETS is activated by placing an **ECONEX SHEET FOR TRIANGULAR** at the base of it. The sheet is impregnated with a pressure sensitive adhesive, solvent free, in which insects are trapped. The trap ECONEX DISPOSABLE WHITE TRIANGULAR is coated on its inner face with a layer of contact adhesive, solvent free, for the retention of the insects

Both traps will be operative until pheromone depletion or saturation of the sheet or adhesive surface.

The **ECONEX TUTA ABSOLUTA** pheromone diffuser is placed inside the trap on the sheet or adhesive surface.

ECONEX WHITE TRIANGULAR
with captures of *Tuta absoluta*

ECONEX WATER TRAP (ECO) is the best option for mass trapping. It is made up of 2 pieces: a tray of 5 cm high x 34 cm diameter with a 3.5 liter capacity, and a cage to place the pheromone diffuser.

ECONEX WATER TRAP (ECO)

In this wet trap, you have to pour water into the tray and we recommend adding a film of oil to the water to increase the captures. The pheromone diffuser is introduced into the cage which is placed in the centre of the trap.

ECONEX TUTA ABSOLUTA PHEROMONE DIFFUSER:

Active ingredients of the *Tuta absoluta* pheromone: E3, Z8, Z11-tetradecatrienyl acetate: E3, Z8-tetradecadienyl acetate (90:10).

Duration of the diffuser: Once the trap has been placed, the diffuser lasts 60 or 90 days (depending on the chosen product) in field conditions.

Product storage: The diffusers must be stored in its original packaging in the refrigerator at 4° C; or in the freezer at -18° C, in which case they will last for 2 and 4 years respectively.

SYMPTOMS AND DAMAGES

The larvae attack the fruits and the leaves by entering inside them and feeding on the mesophyll. This produces the typical and irregular damage of a leaf miner and consequently, it withers. When the attacks are severe, the damaged leaf looks burnt, which could be confused with disease.

The damage produced by *Tuta absoluta* to tomatoes, potatoes and aubergines causes a devastating effect on the economy.

Tomato fruit damage

Tomato leaf damage

Tomato stem damage

PERIOD OF USE

To obtain a good level of control of *Tuta absoluta* it is advisable to combine two methods: detection and monitoring; and mass trapping.

2 to 3 weeks before planting, 1 or 2 traps per hectare should be placed to detect the pest and observe its population levels.

With tolerance threshold established in each area, the moment to adopt control measures, in this case mas trapping, is later defined.

The tolerance threshold of *Tuta absoluta* is very low and depends on the area. In general, it is approximately 3 captures per trap and per week. For mass trapping, traps should be placed throughout the tomato plots.

FACTORS THAT INFLUENCE IN THE NUMBER OF TRAPS NEEDED

The pest population, the bordering crops, the level of control required, etc. One important factor is the size of the crops. In small and irregular crops, a greater number of traps are required than in larger and more uniform plots. Another important factor is the distance between plots that have *Tuta absoluta*. This means that the borders of the plots must be reinforced and it could be necessary to place 40 traps per hectare.

ECONEX WATER TRAP (ECO)

TRAP ASSEMBLY

1

Put the pheromone diffuser in the cage and place the cap on top.

2

Place the cage in the trap by inserting the end of the cage into one of the central support holes, pressing until they fit firmly together.

3

Fill the tray with water, leaving 2 cm from the top.
You can also add 50 cm^3 of vegetable or olive oil to the water (optional).

4

Place the trap on the ground or on a plastic box near to the tomato plants.