

Phthorimaea operculella belongs to the Gelechiidae family which is native to America and has spread throughout the world. It affects all types of Solanaceae plants such as tobacco, aubergines, tomatoes, peppers and especially potatoes.

Its attacks are very serious because the caterpillar lives inside the potatoes and the damage is revealed when the potatoes are stored in warehouses.

MORPHOLOGY AND BIOLOGY

The adult potato tuber moth is a small butterfly measuring 7 to 9 mm long. Its wings are a grey colour with black spots and frayed edges.



Phthorimaea operculella
larva



Phthorimaea operculella
adult

The larva is a whitish-pink colour with a brown head. They pupate inside a light-coloured cocoon. The eggs are oval and a white colour that later darken.

They prefer to grow in warmer climates where they can produce up to 7 generations each year. The females attack the potatoes at night and have a very short life.

They prefer to lay their eggs inside potatoes, but they can also lay them in the stems and other wild or cultivated Solanaceae.

The larva penetrates the plant and lives as a miner in the leaves and stem. It creates galleries at the base of the buds in potatoes. Inside the potato, the caterpillar excavates superficial galleries and then deeper galleries.

At the end of its growth period, it usually abandons the gallery to pupate, although it can also do this inside the potato.

In places with higher temperatures such as warehouses, the cycle is repeated in winter. In colder conditions, for example in fields, it overwinters as a pupa.

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ECONEX PHTHORIMAEA OPERCULELLA 2 MG 40 DAYS



SOLUTIONS OVERVIEW

CODE	TRADE NAME	IMAGE
VA042	ECONEX PHTHORIMAEA OPERCULELLA 2 MG 40 DAYS Pheromone diffuser with a duration of 40 days.	
TA001	ECONEX POLILLERO	
TA273	ECONEX FOLDING WHITE TRIANGULAR WITHOUT SHEETS	
TA248	ECONEX SHEET FOR TRIANGULAR	
TA242	ECONEX DISPOSABLE WHITE TRIANGULAR	



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ECONEX PHTHORIMAEA OPERCULELLA 2 MG 40 DAYS

www.phthorimaeaoperculella.eu

Potato tuber moth

BIOCONTROL



DESCRIPTION

CODE	TRADE NAME
VA042	ECONEX PHTHORIMAEA OPERCULELLA 2 MG 40 DAYS Pheromone diffuser with a duration of 40 days. OMDF register number: 075/2013

Natural rubber diffuser with capsule shape, individually packaged in an aluminium sachet with labelled specifications.

Once removed from the packaging, **the diffuser needs no activation or opening**, just placed correctly in the trap.



ECONEX PHTHORIMAEA OPERCULELLA. Packaging and pheromone diffuser

DETECTION AND MONITORING

1 to 2 traps per hectare should be placed at the same height as the crops or on a specific support. The traps should be placed in spring.

MASS TRAPPING

- **Potato crops in fields:**

The males of this species are specifically captured in order to reduce mating, meaning that the unfertilised females will lay unviable eggs. This greatly reduces the population of the pest.

For mass trapping, the amount of traps per surface area must be increased, depending on the location and homogeneity of the plots. One trap controls a surface area between 500 and 1.000 m². This means a density of **10 to 20 traps per hectare**.

On the borders of the plots, it will be necessary to place a barrier of traps separated 10 to 15 metres from each other.

- **Stored potatoes in warehouses**

For an effective use of the traps, it is necessary to have knowledge of the biology of the insect.

The traps should be placed where there is more possibility of finding the potato tuber moth, as well as in specific phases of the food production process in which a fast detection of the insects' presence is important. It is also convenient to place traps in warehouses with a smaller quantity of stored produce. In places where the moths are most active, traps should be monitored weekly to observe the amount of captured insects. In other areas, every 15 days.

In warehouses, the density of traps is a minimum of 3 traps and a maximum of 9 traps per 1.000 m². Enclosures near to the infected

area should have traps, as well as the corridors that are connected to this area. If the corridors come from the infected area, they should have 2 traps (one in front of the other)

NECESSARY MATERIAL

A trap **ECONEX POLILLERO**, **ECONEX FOLDING WHITE TRIANGULAR WITHOUT SHEETS** or **ECONEX DISPOSABLE WHITE TRIANGULAR**, and a pheromone diffuser **ECONEX PHTHORIMAEA OPERCULELLA 2 MG 40 DAYS**.



ECONEX POLILLERO



ECONEX FOLDING WHITE TRIANGULAR WITHOUT SHEETS



ECONEX DISPOSABLE WHITE TRIANGULAR

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 pheromone diffuser is placed inside the trap on the sheet or adhesive surface.

DAMAGES

The damages caused in the stem are not very serious. On the contrary, damages to the potatoes that are stored in warehouses can be very important.



The insect attacks the potatoes when they are stored in warehouses or they come already infested from the field. After removing the potatoes from the field, they must not be piled up. It is recommendable to cover them with the potato plant as well as eliminate the remains of the crops and the infested potatoes.

The potatoes that have been attacked are easily recognised because the larva excrements can be seen near the buds and in the entry holes of the potato. At first, the excrements are white to later turn a blackish colour, giving the potatoes a characteristic appearance that reveals the presence of the insect.

Although it has been said that the moth also attacks the stem, the most serious damage is carried out inside the potatoes, when they are piled up in fields or warehouses. This is because the galleries excavated by the larvae are later invaded by different types of fungi and bacteria that cause the potatoes to rot, subsequently losing them.

PERIOD OF USE

To achieve a good level of control of *Phthorimaea operculella* it is advisable to combine two methods: detection and monitoring; and mass trapping.

In spring, 1 to 2 traps per hectare should be placed for the detection of the pest and observation of its population levels. With tolerance thresholds established in each area, the moment to adopt control measures, in this case mass trapping, can later be defined.

The tolerance threshold for *Phthorimaea operculella* 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 plots.

FACTORS THAT INFLUENCE THE NUMBER OF TRAPS NEEDED

Pest population, bordering crops, level of control required, etc.

An important factor is crop size. In small and irregular sized crops a greater number of traps will be needed.

Another important factor is the distance between plots that have *Phthorimaea operculella*. In such cases the crop boundaries should be reinforced, so a trap density of about 20 traps per hectare may be needed. More traps may be needed in the case of mass trapping.

STORING THE DIFFUSERS

The diffusers must be stored in its original packaging without opening it in a refrigerator at 4 °C; or in a freezer at -18 °C, in which case they remain effective for 2 and 4 years respectively.