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Potato moth Phthalimide operculella (Zeller, 1873) (Lepidoptera: Gelechiidae) of Solanum tuberosum L. (Solanaceae).

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Potato moth *Phthalimide operculella* (Zeller, 1873) (Lepidoptera: Gelechiidae) of *Solanum tuberosum* L. (Solanaceae).

The potato moth is one of the main health challenges facing the crop in all producing countries. Especially in tropical and subtropical climates with higher temperatures, as the insect is favored by the hot and dry periods that occur during the potato development cycle. The potato tuber moth or potato moth *Phthalimide operculella* (Zeller, 1873) (Lepidoptera: Gelechiidae) is a cross-infested pest, as it is found both in the field and in warehouses, damaging foliage, and tubers. Adults are small moths measuring 10mm to 12mm in length and gray/yellowish in color with small, irregular black spots. The moths fly at night, carrying out oviposition on plant debris, in the soil, on leaves, in exposed tubers and even near the tuber buds. To do this, they can enter cavities in the ground to perform the posture. Each female can lay around 300 eggs with an incubation period of five to ten days (Figure 1) [1-10].

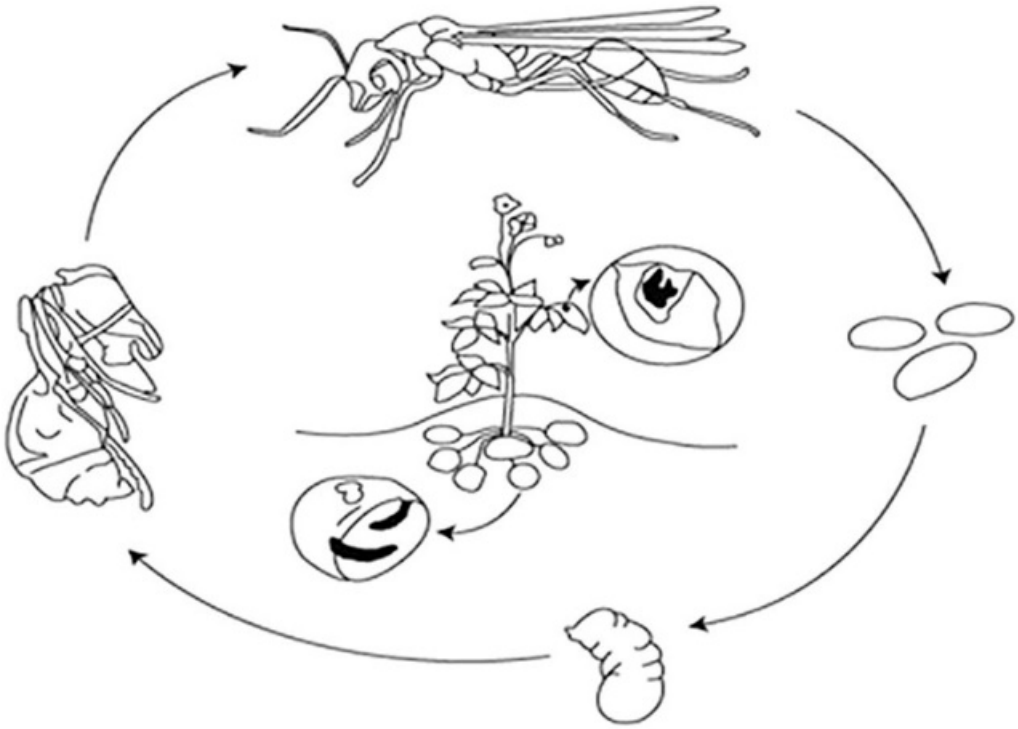

Figure 1. Life cycle of *Phthalimide operculella* (Zeller, 1873) (Lepidoptera: Gelechiidae). Source: https://www.ucanorte.pt/destaques/artigos-tecnicos/a-traca-da-batateira/.

It is in the larval stage that damage occurs, as the caterpillars settle on the leaves, stems, and tubers for a period of ten days to 20 days. During this period, the youngest caterpillars feed on the leaves, perforating the parenchyma, internally undermining the stems, causing loss of leaf tissue and death of the plant's growing points. The pupae measure around 8mm, have a caramel color and a smooth structure. This stage can vary from five days to ten days, depending on temperature conditions. In this pupal stage, where metamorphosis occurs, the caterpillar transforms into an adult. The time required for the insect to complete a life cycle is 20 days to 40 days (Figure 2)

Figure 2. The developmental stages of the potato tuber moth,*Phthalimide operculella* (Zeller, 1873) (Lepidoptera: Gelechiidae): (A) egg, (B) larva, (C) pupa, and (D) adults—female (left) and male (right). Source: Photos: Courtesy of CIP.

Among the measures recommended to reduce the potato moth population in the field and, in this way, minimize damage both in the field and in the store, the following stand out:

1) Good soil preparation; 2) Planting time; 3) Planting depth; 4) Stacks; 5) Irrigation frequency; 6) Pheromone traps; 7) Harvest period; 8) Storage of healthy tubers; 9) Start-up and harvest period; 10) Destruction of cultural waste; 11) Chemical control.

Losses in warehouses can reach 30 to 40% of stored tubers. Among the control measures recommended for controlling potato moth in warehouses, the following stand out:

1) Warehouse cleaning; 2) Store healthy tubers; 3) Repellent plants; 4) Pheromone trap; 5) Use of diffuser lights.

Spray the entire interior with pyrethroid insecticide applied with a motorized backpack atomizer, preferably equipped with a centrifugal pump, so that the spray reaches any height. You can also mist the warehouse with insecticide containing smoke, using devices called thermofoggers. Space spraying or fogging aims to kill adult moths to prevent them from laying eggs on potatoes to be stored [1-10].

Younger caterpillars attack the leaves, creating mines until they begin to dry out. Later they abandon the leaves, starting to attack the fruits, where they make galleries, destroying them. Control: Spraying with specific insecticides, registered for crops (Figure 3) [11]

Figure 3. Photos 1 Symptoms of potato tuber moth,*Phthalimide operculella* (Zeller, 1873) (Lepidoptera: Gelechiidae): (A, B) larvae infestation on leaves and (C, D) on tubers. Source: Photos: Courtesy of CIP.

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[11] Potato pests. Tagged adult, Africa, development, egg, infestation, larva, larvae, pest, *Phthorimaea operculella*, potato pest, potato tuber moth, pupa, risk atlas for Africa, tuber, Zeller 1873.