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AN OVERVIEW OF POTATO TUBER MOTH: *Phthorimaea operculella* (GELECHIIDAE: LEPIDOPTERA) DAMAGE SYMPTOMS AND THEIR MANAGEMENT

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INTRODUCTION

One of the main obstacles to the commercial cultivation of potatoes is insect infestations. At least 101 arthropod pests are said to cause damage to potatoes, according to Simpson (1977). One of these, *Phthorimaea operculella* (Zeller), the potato tuber moth, is a significant pest both in the field and in storage. According to Graf (1917), this species and its host are believed to have originated in Western South America; but, according to Anon (1968), it is now widespread. Through seed potatoes that were shipped from Italy to Bombay in 1906, it was introduced to India. In Peninsular India and Meghalaya, the insect severely damages crops, which has a negative impact on exports (Saxena and Rizvi, 1974).

Category and distribution of the pest

The most destructive pest of potato. It is a cosmopolitan pest. The pests are present throughout the world.

Alternate host

Tomato, Tobacco, Brinjal, Potato, Sugar beet and Solanaceous weeds.

DAMAGE SYMPTOMS

The moth affects potato plants in two different ways: by eating the tubers and mining the foliage. In tubers, larvae deposit eggs close to the eye buds, weakening or breaking the stem and creating irregular tunnels deep inside the tubers.

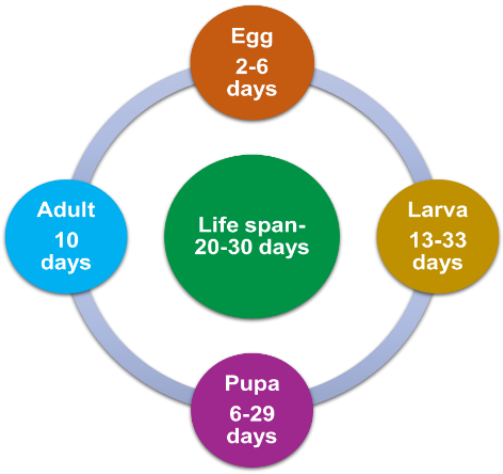
BIOLOGY

Eggs: The habits of adults are nocturnal. When winter finally arrives, moths abandon godowns and fly to fields where they lay their eggs singly adjacent to exposed tuber eyes and on the ventral side of leaves. There are 150 to 250 eggs laid by a single female. Eggs are minute, oval, and yellowish.

Larva: Caterpillars are pinkish-white to pale greenish when fully developed.

Pupa: Pupation takes place in rough silken cocoons.

Adult: Small silvery-bodied moths in their adult stages. Greyish-brown with tiny dark dots and hairy fringes on the forewings. White hind wings that are filthy. There are at least 5 to 7 generations in a year.



Leaf mining symptoms with the larva inside

Tunnels in potato tubers

Adult

Management

- Choose healthy tubers, prevent shallow planting, and plant them at a depth of 10-15 cm.
- Use intercropping with chilies, onions, or peas.
- Practice earthing up at 60 days after planting to prevent female moths from laying their eggs on the exposed tubers.
- Place 20 pheromone traps per hectare in the field.
- Remove contaminated tubers and destroy them.
- Chelonus blackburni, an egg-larval parasitoid, should be released twice, 40 and 70 days after planting, at a rate of 30,000/ha.
- To manage foliar damage (ETL is 5% leaf damage), apply NSKE 5% or quinalphos 2 ml/l.
- Spray Bacillus thuringiensis @1 kg/ha at 10 days interval
- Only good and clean tubers should be kept in well-ventilated, cold, dry places with temperatures no higher than 21 °C. Cold storage is much better.
- Placing pheromone traps in the godowns.

- Cover the tops of potato leaves in godowns with Lantana or Eupatorium branches to deter ovipositing moths.
- Use 1 kilogram of quinalphos or endosulfan dust per 100 kg of seed tubers to treat the tubers.
- Use carbon dioxide (CS2), carbon tetrachloride, methyl bromide, or a combination of these gases to fumigate godowns that are airtight.