POTATO TUBERWORM (PTM)

Phthorimaea operculella

Description:

Adults:

Small (0.4 in or 1 cm in length), narrow bodied, silver grey in color with small brown or black markings on the wings, and a wingspan of 0.5 in (1.2 cm). At rest, wings are held close to the body giving them a slender appearance.

Eggs:

Eggs are smooth, oval, and range from white to yellow in color before hatching. Eggs are laid on foliage, soil, plant debris or exposed tubers.

Larvae:

Larvae vary in color from white or yellow to pink or green as they mature. Mature larvae are 0.4-0.6 in (1.0-1.5 cm) in length with a brown head and dark prothoracic shield.

Pupae:

Smooth, brown in a silk cocoon which is covered with soil particles or bits of plant debris.

Hosts:

Mainly associated with potato, but has been observed feeding on tomato, eggplant, peppers, tobacco, and wild plants like Jimson weed.

Left: Adult PTM (source: Wikimedia). Right: PTM larva on potato (Oregon State University Extension).

Left: Damage on a potato inflicted by PTM larvae. Right: Damage on a potato tuber. (Source: Oregon State University Extension).

Damage:

- Larvae reach potato tubers through cracks in the soil.
- Newly hatched larvae create mines on leaves by feeding on leaf tissue while leaving the upper and lower epidermis of the leaf intact.
- Typical damage results from larvae mining in the tubers. Small larvae enter the tuber at the eyes where frass can be seen in webbing around the eye where a larva has begun to tunnel.
- Larvae feed just below the surface of the potato leaving a dark tunnel. Infested tubers are unmarketable.
- There is some feeding on leaves, petioles, or stems, however this rarely causes damage to the plant. Tuberworms do not tunnel through stems and roots into the tubers.

Phenology:

- Eggs, larvae, and pupae can potentially survive in volunteer potatoes, or in the soil after harvest. Most infestations originate from infested potato plants and tubers left in fields and cull potato piles.
- There are two to eight generations per year depending on climatic conditions. There are usually two generations per year in temperate climates of North America.
- Generation time can vary from two weeks during the summer and up to seven months if the cycle is interrupted by winter.

Life Stage/Degree-Days:

Life Stage	*Average D°F*	*Average D°C*
Egg	97.7 F	54.3 C
Larvae	283.1 F	157.3 C
Pupae	141.5 F	78.6 C
Generation time (egg to adult)	580.3 F	322.4 C

*(Developmental threshold, lower: 50°F or 10°C, source: **UC IPM Phenology Model Database**)*

Lure Type and Maintenance:

- PHEROCON® PTM controlled release septa.
- Replace PHEROCON® PTM lures every 4 weeks.

Lure Storage:

- Store in unopened factory sealed packages in a cool place (< 74° F or 24° C maximum).
- Refrigerate or freeze unopened packages to carry over for annual storage.

TRÉ-1901

TRÉCÉ INCORPORATED
INSECT PHEROMONE & KAIROMONE SYSTEMS
Your Edge – And Ours – Is Knowledge.

© 2021, Trécé Inc., Adair, OK USA • ® is a registered trademark and TM is a trademark of Trécé Inc., Adair, OK 74330 USA

POTATO TUBERWORM (PTM), *Phthorimaea operculella*

Trap Design:

- PHEROCON® 1C, PHEROCON® VI DELTA, OR PHEROCON® IIC.

Placement Time:

- Place traps when tubers begin to form or at least 60 days prior to harvest.

Placement Pattern:

- Place one trap in each corner of the field at least 14 rows or 50 ft (15.25 m) into the field.
- Traps should be placed at the top of the bed.

Trap Density:

- Minimum of 4 traps per field.
- 1 trap per 10 acres or 4 hectares for fields greater than 40 acres (4 hectares).

Trap Maintenance:

- Check traps at minimum once per week, or twice weekly if possible.
- Replace traps or trap liners every 4 weeks or when fouled with dust or insect debris.

Recommendations:

- Monitoring of PTM is a critical part of management to give an indication of presence, population, and distribution, and allows for timing of pesticide applications.
- No economic threshold level has been determined for crop damage or yield loss in fields but the following capture levels are used as guidelines: 15 to 20 moths/trap/night or a cumulative average of 10 moths/trap/night.

Source: Recommendations and certain other sections were sourced from UC IPM Potato Pest Management Guidelines and UF IFAS Entomology Pest Guidelines.

Note, always:

- Use only one lure per trap.
- Count and record captures as recommended.
- Change trap as needed.
- Discard lures in trash far from the area of use and remove trash afterwards.
- Follow recommendations.
- Contact local extension authorities and consultants for regional advice.

TRÉ-1901

TRÉCÉ® INCORPORATED
INSECT PHEROMONE & KAIROMONE SYSTEMS
Your Edge – And Ours – Is Knowledge.

© 2021, Trécé Inc., Adair, OK USA • ® is a registered trademark and TM is a trademark of Trécé Inc., Adair, OK 74330 USA