

Peruvian Virus Knocks Potato Tuber Moth

Insect pests are a severe problem for potato farmers all over the world. According to researchers at the International Potato Center (CIP), in Lima, Peru, of all the potato pests (including tuber moths, aphids, leafminer flies and Andean potato weevils), the widely distributed potato tuber moth (PTM) *P. operculella* is one of the most devastating.

The larvae of *P. operculella* attack the foliage and infest the tubers in both field and store, rendering them unusable. *P. operculella* is reported as a pest mainly in warm environments, but severe infestations also occur in cooler areas such as the highlands of Peru, Colombia, Kenya, and Nepal. Potato losses can be as high as 86% in Tunisia, Algeria, and Turkey despite the use of insecticides.

CIP is now promoting an integrated control program to minimize and maybe even exclude the use of insecticides for the control of PTM. One control technique in the program employs a granulosis virus.

CIP researchers identified the granulosis virus from potato stores in Lima. Infected PTM larvae can be recognized by their opaque, milky white color, and by their behavior. Infected larvae do not move violently when disturbed. The effect of the virus on PTM larvae is lethal since they fail to pupate. In their experiments, CIP researchers have been using low cost facilities for propagating the virus.

The researchers have found that the simplest means of infecting healthy PTM larvae with the virus is to pulverize diseased larvae, mix them with water, and apply the solution to plants in the field or to potatoes in storage. The researchers have found that 20 pulverized diseased larvae per liter of water is effective. In two field trials using this mixture, the percentage of larvae infected ranged from 70% to more than 90%. Foliar damage was reduced significantly in both trials. For storage experiments, the researchers used an application mixture of the granulosis virus at 20 larvae per liter and 1 kg of talc for 200 kg of potatoes. Seventy-five to ninety-eight percent of the larvae became infected, and both tuber and sprout damage were significantly reduced in the stored potatoes. The treatment was as effective as the synthetic pyrethroid Deltamethrine dust.

Another experiment was conducted to determine the persistence of viral activity on field potatoes. The researchers treated the potato plants with a mixture of twenty-five crushed larvae per two liters of water, and waited thirty days before introducing PTM. Ninety-one percent of these larvae became infected. At ninety days after treating the plants, 78% of the introduced larvae became infected. Researchers at CIP also studied the persistence of virus in granulosis storage. They found that the virus remains effective for 6 months when stored at room temperature (16+/- 2.5°C).

Other strains of the virus from Australia, India, and Tunisia are being studied as well. Research continues with the virus and other techniques to build a multifaceted strategy for controlling the potato tuber moth.

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