

Integrated Pest Management for Commercial Horticulture

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PEST ALERT - 2013

Introduction

The European pepper moth (EPM), *Duponchelia fovealis* (Zeller), a relatively new invasive species, has been confirmed in a Maryland greenhouse operation. Greenhouse managers and Extension people working with greenhouse growers should be alert and monitor for this new pest. How much economic damage the European pepper moth might cause in the United States is still unknown, but we do know that this pest is being detected in many states in greenhouse operations.



European pepper moth caterpillar (above) and moth caught in pheromone trap in greenhouse (below)

Since this pest has rapidly spread across the United States and Canada, traditional containment through quarantine, has been discarded as impractical. In 2011 extensive monitoring was conducted in several counties in Georgia and Florida. The European pepper moth has been found infesting lantana plants in a greenhouse in Georgia. While EPM was found in greenhouses in those states, it has not been found in field production of fruits or vegetables.

It might be that the insect is adapted to the close growing conditions in a greenhouse environment and not suited for most field production situations. In greenhouse environments the foliage touching the substrate surface may make ideal conditions for this moisture loving pest. The moth is native to both freshwater and saltwater marshlands of southern Europe, the eastern Mediterranean region, the Canary Islands, Syria and Algeria. The larvae of this moth have been recorded on more than 70 host species in a wide range of plants families.

In the United States, the moth was first detected on begonia in San Diego County, California in 2004. This population was eradicated. In 2010, it showed up again in San Diego County. By September 2011 it had been detected in 17 counties in California. It has also been detected in Alabama, Arizona, Colorado, Florida, Georgia, Kentucky, Mississippi, New York, North Carolina, Oklahoma, Oregon, South Carolina, Tennessee, Texas and Washington. European pepper moth has also been recorded as a problem in greenhouse grown chrysanthemums and other cut flower species in Ontario. It is not known whether this pest is mainly a greenhouse problem or whether it could cause damage in field and landscape plantings.

In June 2013, European pepper moth larvae were found infesting zonal geraniums and petunias in Central Maryland in a commercial greenhouse. Two

alert greenhouse managers found the caterpillars boring in the base stems of plants and submitted samples to our lab. We identified the caterpillars with help from Lance Osborne who is an entomologist at University of Florida and USDA-ARS. A Maryland Department of Agriculture taxonomist, Gaye Williams, subsequently confirmed our identification of this pest. We are working with the growers to bring this infestation under control.

In the late summer and fall of 2013, the European pepper moth have been caught in traps by compost areas. Larvae have also been found damaging poinsettias by foliar feeding and boring into the base of plant stems.

Be on the lookout for the European pepper moth. If you are a commercial grower of ornamental plants in Maryland, let me know if you suspect this caterpillar is active in your crops. Contact me at sgill@umd.edu or 410-868-9400.

Plants Hosts

European pepper moth has a wide host range. The plant hosts listed below is not an all-inclusive list. It focuses on plants most likely to be found in nurseries, greenhouses and home gardens in Maryland.

- Amaranthus*
- Anemone*
- Annona*
- Anthurium*
- Bacopa lanigera*
- Begonia tuberosa*
- Begonia elatior*
- Bellis perennis* (English daisy)
- Beta vulgairis* (beets)
- Capsicum annuum* (pepper)
- Chrysanthemum*
- Cineraria*
- Coleus*
- Cucumis* (cucumbers)
- Cyclamen*
- Euphorbia pulcherrima* (poinsettia)
- Eustoma grandiflorum* (lisianthus)
- Ficus triangularis* (fig)
- Fragaria* (strawberries)
- Gerbera* (African daisy)
- Heuchera* (coral bells)
- Impatiens*
- Kalanchoe*

- Lactuca* (lettuce)
- Limonium* (sea lavender)
- Lysimachia*
- Malva sylvestris* (mallow)
- Ocimum basilicum* (basil)
- Origanum majorana* (majorum)
- Oxalis acetosella* (common wood sorrel)
- Pelargonium* (geranium)
- Phalaenopsis* (orchid)
- Rhododendron* (azalea)
- Rosa* (rose)
- Rubus fruticosus* (blackberry)
- Senecio*
- Solanum lycopersicum* (tomato)
- Thymus* (thyme)
- Zea* (corn)

Damage By Larvae

The eggs are laid on foliage and hatching larvae of EPM initially feed on lower leaves near soil level, making round or crescent shaped holes. This is damage that can be monitored visually in an IPM scouting program. Older larvae consume whole leaves or they can feed on roots or at the base of the plant at soil level. In some cases they girdle the base of a plant. With some vegetables and fruits the larvae bore into



Damage on petunia (above) and on poinsettia on right (below)



Damage on to base of poinsettia stem (above); while feeding larvae will roll leaves and feed within it (below)

the fruit. Later instar larvae burrow into soft woody or herbaceous stems causing damage in which fungi can enter. In the zonal geranium brought into our lab, the stems had visible holes and this is what workers first detected. As the larvae prepare to pupate they web silk together usually on foliage close to the soil.

Life Cycle

The moth is active at night and lays white eggs in small clusters on the undersides of foliage, usually close to a main vein. Eggs have been recorded on stems and on the tops of leaves but usually are found on undersides of foliage. The egg clusters are in groups of 3 to 10 and are usually laid in overlapping patterns. The eggs turn pink, then red as the embryo develops and end up brown colored just before hatching. The larvae have a dark colored head capsule and a dark colored hardened dorsal plate just behind the head. On segments just behind the head there are two rows of transverse spots. There is at least one stout hair sticking out of each spot. The larvae feed mainly at night and avoid light. When we placed live larvae under a dissecting microscope with a

light source they were actively trying to move out of the lit area. As the larvae grow their body color changes from a creamy white to a dirty brown color. The larvae lose their spots just before pupation. The length of development depends on temperature, but in a greenhouse at 68 °F the egg stage is 4 – 9 days, the larval stage is 3 – 4 weeks, one to 2 weeks for pupation and adults for one to two weeks. Females mate soon after emerging. The males and females are strong fliers and have been recorded to fly several miles.

Monitoring

It is important to scout plants regularly to look for larvae, girdling of stems and rolled leaves near the base of the plant. Larval feeding damage causes wilting and plant collapse. Pheromone lures are available from Koppert Biological Systems (800-928-8827) and Griffin Greenhouse and Nursery Supplies (800-888-0054) to monitor for moths. Place lure in a deltoid trap (photo)



A pheromone lure is placed in a deltoid trap like this one

near suspected infestation. If you are unsure of the identification of this moth or caterpillar, take it to your local Extension entomologist.

Control Options

Cultural Control:

Removing debris and lower leaves will reduce habitat for the larvae. The problem is that most plants grown in greenhouses are grown to have leaves all of the way down to the soil level. If this moth becomes established in the greenhouse then making the effort to remove lower foliage will help reduce larval populations.

Chemical and Biological Control:

Fortunately this caterpillar is susceptible to several classes of pesticides. Young larvae feeding on foliage are fairly easy to hit with pesticides. Older larvae which bore into stems or fruit are less accessible to insecticides and therefore are more difficult to control. Repeated sprays of *Bacillus thuringiensis*

can be directed to foliage to kill larvae feeding on the foliage. Spinosad materials should also be effective in controlling the caterpillars. Acephate in preliminary trials has been shown to be one of the more effective materials for control.

References:

Feature Creatures: European Pepper Moth

Stephanie D. Stocks and Amanda Hodges, University of Florida, http://entnemdept.ufl.edu/creatures/veg/leps/european_pepper_moth.htm

Greenhouse Pest Alert: The European Pepper Moth, *Duponchelia fovealis*

Jen White, Extension Entomologist, University of Kentucky Cooperative Extension Service, www.ca.uky.edu/entomology/entfacts/entfactpdf/ef324.pdf

European Pepper Moth in Maryland

by

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