

GREENHOUSE PEST ALERT
The European Pepper Moth, *Duponchelia fovealis*
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What is the European Pepper Moth?

As its name suggests, the European Pepper Moth, *Duponchelia fovealis*, is a moth that is native to southern Europe and Northern Africa. It was first found in North America in 2004 in San Diego County, CA, and was subsequently eradicated. It was discovered again in 2010, and has since been found in 15 states. It has not been reported in Kentucky, but it has been found in neighboring states. It is not yet clear whether the moth is establishing in the landscape, or if it is restricted to greenhouses and containers.



The adult moth has a wingspan of just under an inch, is brown and white, and relatively nondescript. However, one characteristic that is easily observed is that the hindmost white line on the wing has a distinctive backward-pointing bend (white arrow). The males have white bands that complete encircle the abdomen (red arrow), and have very long abdomens, which they hold curled up at the tip while at rest (yellow arrow).

Why is it a concern?

It is not known how much economic damage the European Pepper Moth might inflict in North America. Based on its broad host range and its status as a pest in European greenhouse agriculture, European Pepper Moth was initially categorized as a pest of quarantine significance, requiring regulatory action. However, now that it is clear that the pest is already widespread in the US, traditional containment and regulatory approaches have been discarded as impractical. Instead, a task force has been formed to develop appropriate pest management practices and disseminate this information to affected stakeholders.

What plants might be attacked?

Unfortunately, the list of species attacked by the European Pepper Moth is long: it has been recorded from more than 70 host species in a wide range of plant families. It is very likely

that additional species are also affected. This table includes some of the most important greenhouse, nursery and field crops, but is not exhaustive.

African daisies (<i>Gerbera</i>)	<i>Kalanchoe</i>
<i>Amaranthus</i>	Lettuce (<i>Lactuca</i>)
<i>Anthurium</i>	Lisianthus (<i>Eustoma grandiflorum</i>)*
Azalea (<i>Rhododendron</i>)	Marjoram (<i>Origanum majorana</i>)*
Basil (<i>Ocimum basilicum</i>)*	Orchids (<i>Phalaenopsis</i>)
<i>Begonia</i> *	Pepper (<i>Capsicum annuum</i>)*
Blackberry (<i>Rubus fruticosus</i>)*	Poinsettia (<i>Euphorbia pulcherrima</i>)*
<i>Coleus</i>	Pomegranate (<i>Punica granatum</i>)*
Corn (<i>Zea</i>)	Roses (<i>Rosa</i>)
Cucumbers (<i>Cucumis</i>)	Squash (<i>Cucurbita</i>)
<i>Cyclamen</i>	Strawberries (<i>Fragaria</i>)
English daisy (<i>Bellis perennis</i>)*	Thyme (<i>Thymus</i>)
Fig (<i>Ficus triangularis</i>)*	Tomato (<i>Solanum lycopersicum</i>)*
Geranium (<i>Pelargonium</i>)	A large variety of aquatic plants
<i>Impatiens</i>	

* Plant species for which European Pepper Moth is considered a pest

What is the life cycle?

The moth lays tiny whitish eggs (less than a millimeter) in small clusters on the undersides of leaves. As the eggs develop, they turn red before hatching. Larvae are tiny upon hatching, growing to a length of about 1 inch before pupation. The larvae have a dark head capsule, and their bodies vary in color from creamy white to brown (depending on what they've been feeding on) with dark spots.

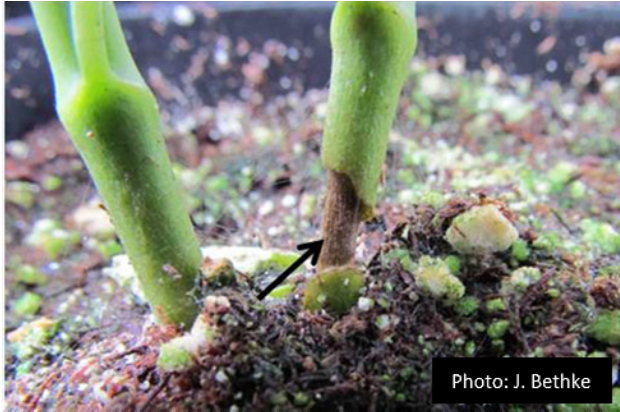


The larvae prefer moist locations, and feed on detritus as well as live plant material. After about 4 weeks (depending on temperature), the moth constructs a messy cocoon of webbing and soil particles and pupates. The cocoons can sometimes be found on the undersides of leaves, or on the edges of pots. At 68°F, it takes about a month and a half for the moth to complete its lifecycle, meaning that 7-8 generations are possible per year at this temperature in year-round greenhouses. At higher temperatures, the moth will have shorter generation times.

What kind of damage is inflicted?

Larvae feed in a variety of locations, including leaves, roots, stems and fruit. While young, they mostly feed on leaves, where they make round or crescent-shape holes. Older larvae can consume whole leaves, or may feed below the soil surface, leaving little outward sign of damage. Other times, the larvae bore into stems and fruits, or may girdle stems as shown below,

potentially killing whole plants.



How can I control infestations?

As with most greenhouse and nursery pests, the first line of defense against infestations is exclusion. Always examine new stock for signs of infestation, and maintain a period of isolation from established crops, if possible. Examine the pots (top and bottom) and soil surface for signs of webbing, and leaves and stems for chewing damage.

Cultural control – Removing debris and lower leaves, when possible, will both decrease habitat availability for the larvae, and decrease humidity at the soil surface. This process will also increase the effectiveness of any chemical controls applied (see below). Additionally, use of drier growth media should decrease the moist microclimate that is favorable to larval growth.

Chemical control – European Pepper Moth differs from many greenhouse pests in that it has not shown resistance to any major pesticides. Consequently, most chemicals labeled for lepidopterans (moths and caterpillars) will be effective against adults when applied as an aerosol, or when placed where adults will encounter them. However, the sheltered and secretive feeding locations of the larvae make effective application of larval pesticides difficult. Young larvae, which feed in more exposed locations, are more susceptible than older larvae.

At this writing, only limited pesticide efficacy trials are available, but a nice preliminary study by Bethke and Vander May (see references) found that acephate was most effective at controlling larval populations. However, it should be noted that the application procedures used (backback sprayer applied to pots turned on their sides or drench from above) were costly and efficacy might be considerably reduced using alternative (less expensive) application methods. Also, acephate is not labeled for many crops, so always be sure to check the label before use.

Biological control – Numerous biological control agents are commercially available for control of European Pepper Moth. In general, natural enemies that are labeled for attacking lepidopterans should be effective against European Pepper Moth. These include microbes (*Bacillus thuringiensis* - Bt), predatory nematodes that attack larvae (*Heterorhabditis bacteriophora* and *Steinernema* spp.), predatory beetles that attack eggs and larvae (*Dalotia* or *Atheta coriaria*), parasitoids that attack eggs (*Trichogramma* species), and predatory mites that attack eggs (*Hypoaspis aculeifer*, *Hypoaspis miles*). [Entfact 125](#) lists vendors that sell these organisms. Please consult with your distributor as to appropriate application rates, as well as conditions that best promote the efficacy of these living "good bugs."

How can I monitor for infestation?

Water traps baited with pheromone are considered to be the most effective for capturing adult moths (Van Deventer, 2009), but delta and funnel traps also work. European Pepper Moth baits and traps can be purchased from Koppert, Biobest and Syngenta. Please see [Entfact 125](#) for contact information for these companies.

References

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Comments, corrections and updates are welcome. Please contact Jen White at the Entomology Dept., University of Kentucky

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Of course, ALWAYS READ AND FOLLOW LABEL DIRECTIONS FOR SAFE USE OF ANY PESTICIDE!

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