European Pepper Moth

Duponchelia fovealis

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European pepper moth

- Native to coastal wetlands in parts of southern Europe, the eastern Mediterranean region, northern Africa, and the Canary Islands
- Expanded its range to include other parts of Africa, the Middle East, northwest India, Europe, Canada, and the United States
  - Detected in San Diego in 2004 and again in 2010
  - Detected in Florida in the fall of 2010
- aka Southern European marshland pyralid
- Known greenhouse pest in Northern Europe and Canada

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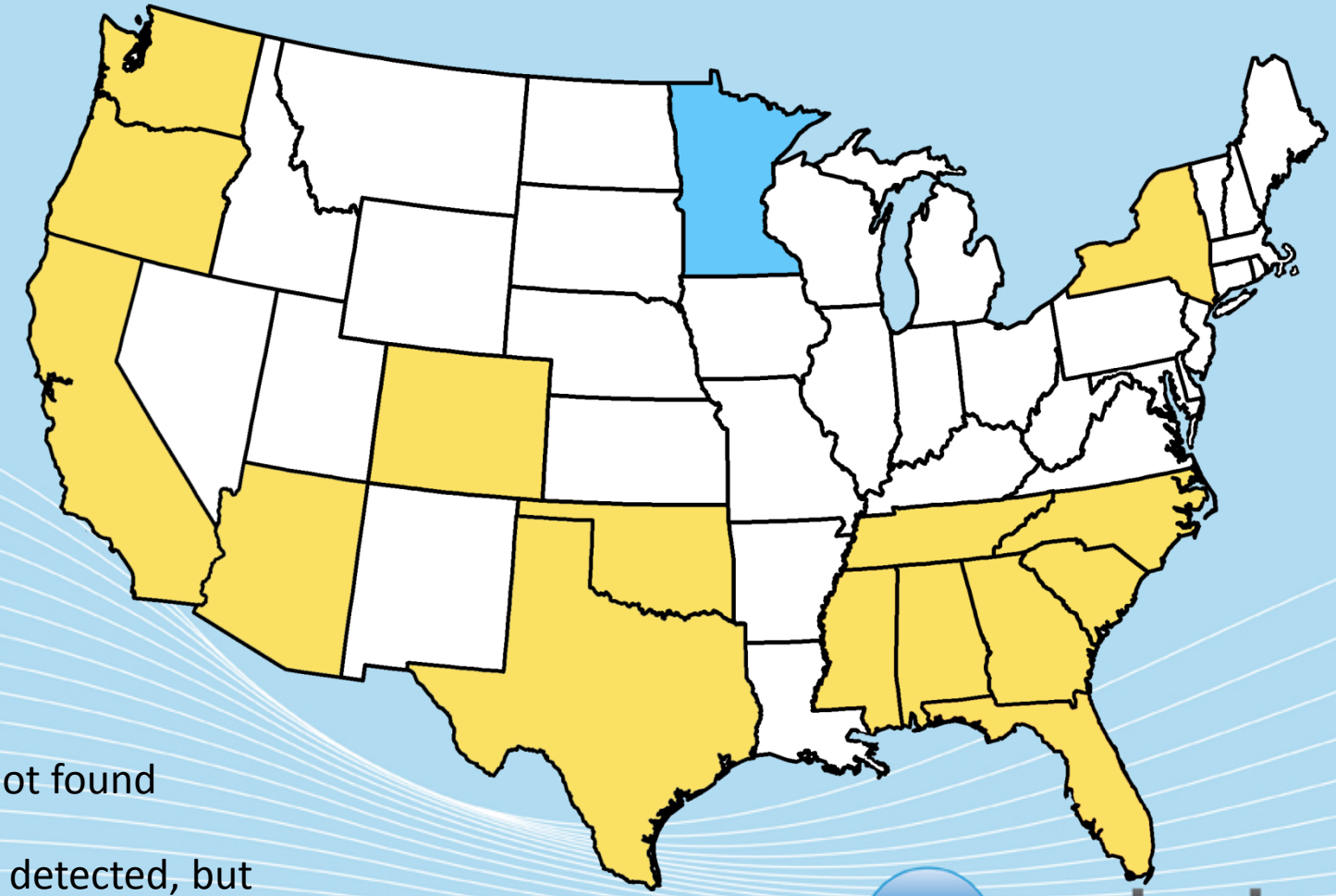
European Pepper Moth Distribution in the U.S.



- No sampling
- Sampled but not found
- Intercepted or detected, but not considered established

Map based on Pest Tracker – Accessed 3/3/2014 - http://pest.ceris.purdue.edu/map.php?code=ITBMGZA#

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Pest of many herbaceous ornamentals and field crops






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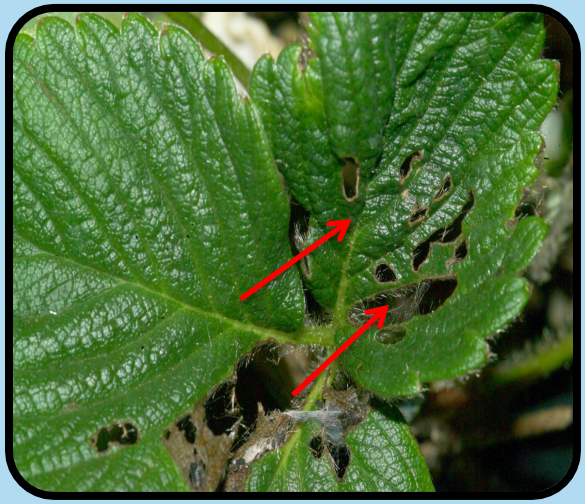
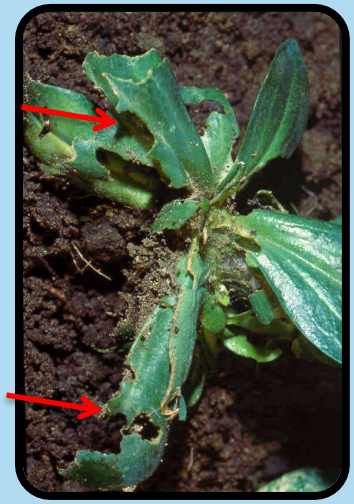
Damage to leaves

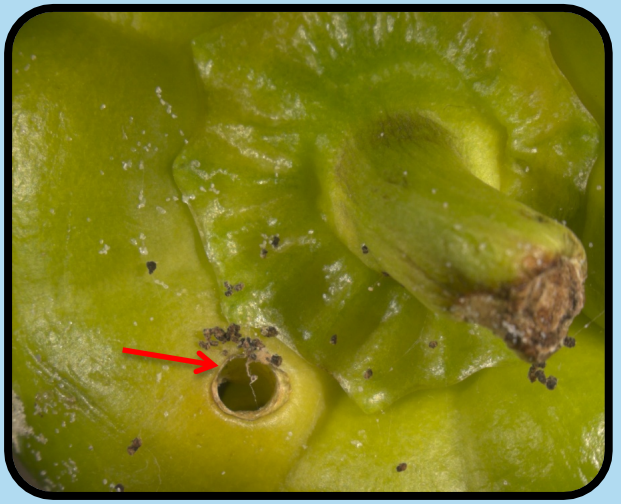


Strawberry



Eustoma

Damage to fruit



Pepper

Damage to stems

Eustoma

Note the larva girdling the stem

Image credits:
Strawberry - Carmelo Peter Bonsignore, Università degli Studi Mediterranei di Reggio Calabria;
Pepper fruit - Marja van der Straten, Plant Protection Service, Wageningen, The Netherlands;
Stem damage - Bryan Vander Mey, Department of Entomology, University of California, Riverside;
Both Eustoma images - Henk Stigter, Plant Protection Service, National Reference Centre, The Netherlands

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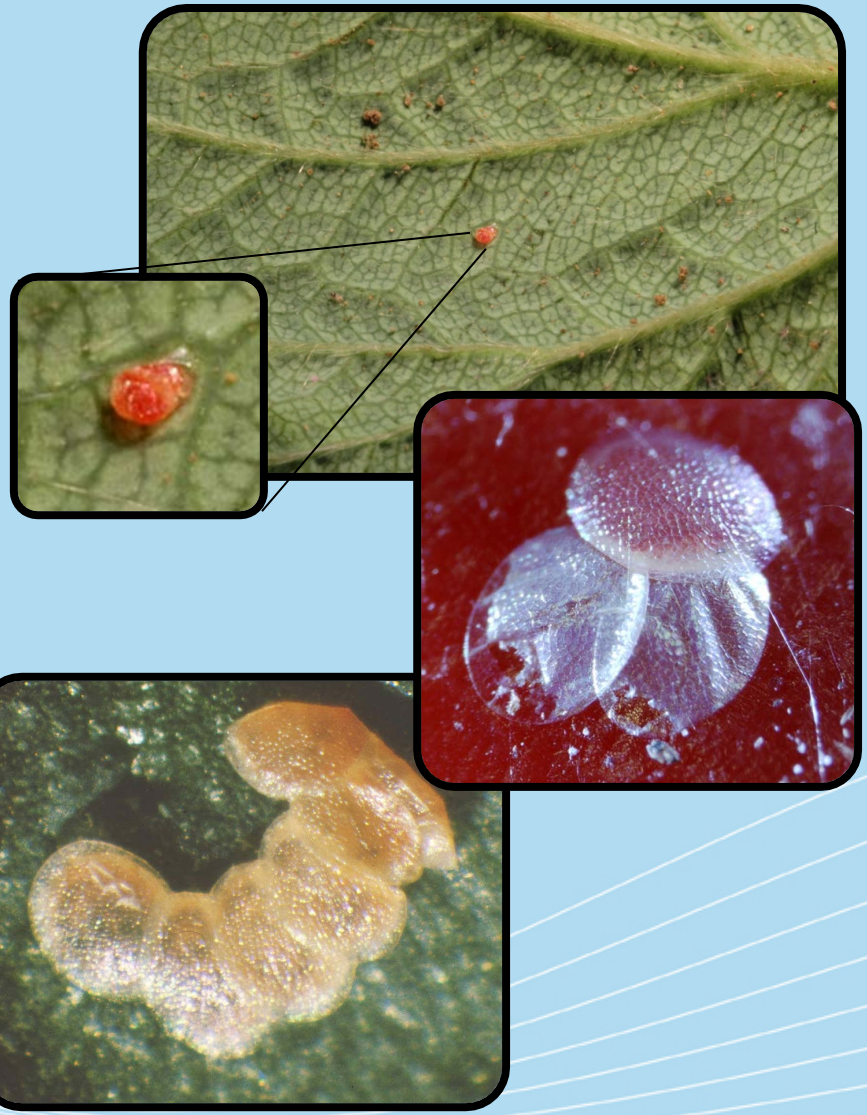
Identification

- Eggs
  - Very small
  - Whitish green when laid turning pink, then red, then brown as the egg gets closer to hatching
  - Laid singly or in groups of 3-10
    - Which overlap
  - Mostly found on undersides of leaves
    - Can also be found on the stems, at the base of the plant, in the upper soil layer



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middle image – Lance Osborne, Mid-Florida Research and Education Center, University of Florida
bottom image - Pasquale Trematerra, University of Molise, Italy.

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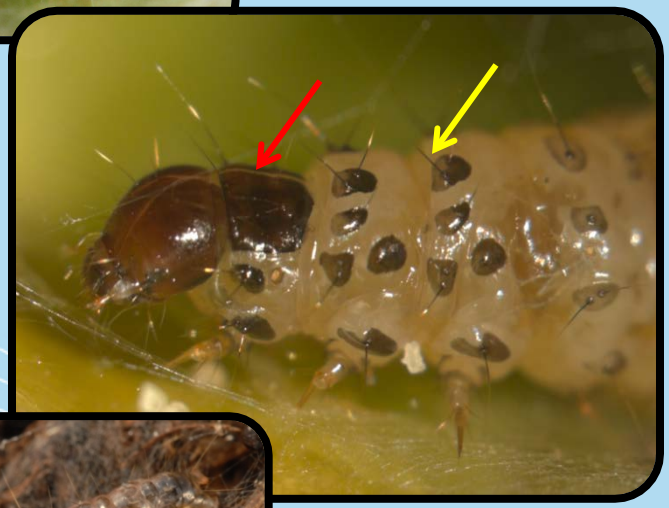
Identification

Color of larvae feeding on live plant material



Color of larvae feeding on detritus

- Larvae
  - Pink body with dark brown to gray spots and dark head
  - Turn creamy white or light brown with spots as they mature
    - Color depends on what they feed upon
  - 20-30mm long when fully developed

Image credits:
Top – Henk Stigter, Plant Protection Service, National Reference Centre, The Netherlands
Middle image - Marja van der Straten, Plant Protection Service, Wageningen, The Netherlands
Bottom - Lyle Buss, Department of Entomology and Nematology, University of Florida

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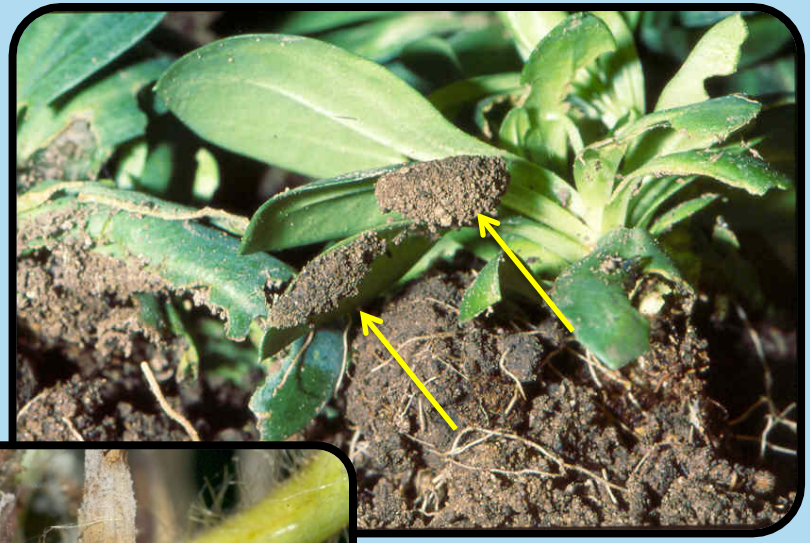
Identification

- Pupae
  - 9-12mm long
  - Yellow-brown in color
    - Gets darker closer to emergence time
  - Makes a cocoon of webbing with soil and frass in it
  - Found on undersides of leaves, at the edge of the pot, or in the upper soil layer



Pupal cases indicated by yellow arrows

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top image - Henk Stigter, Plant Protection Service, National Reference Centre, The Netherlands
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bottom image- James Hayden, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

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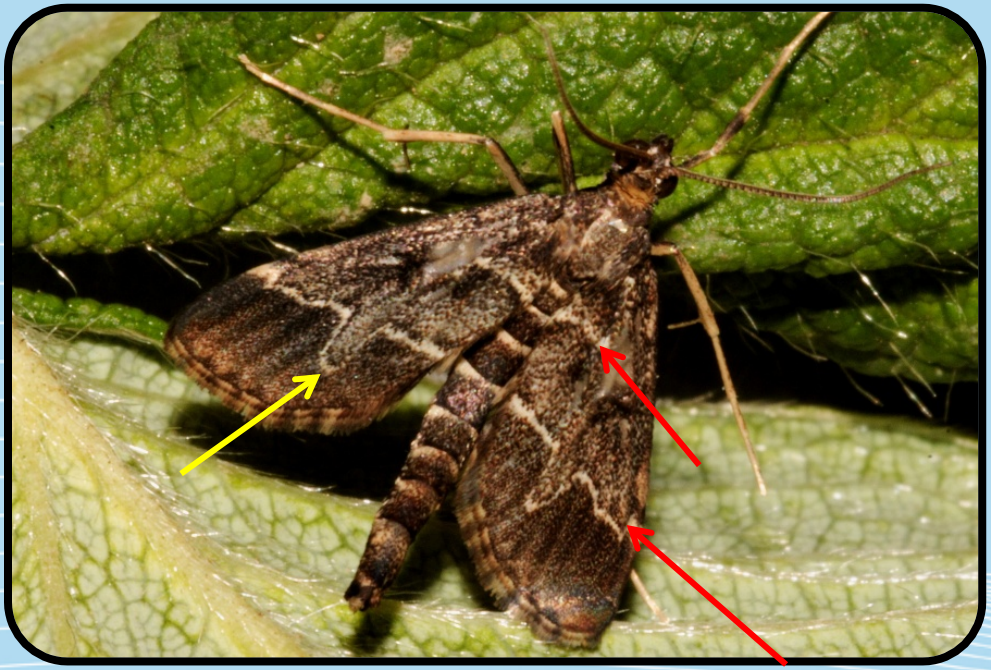
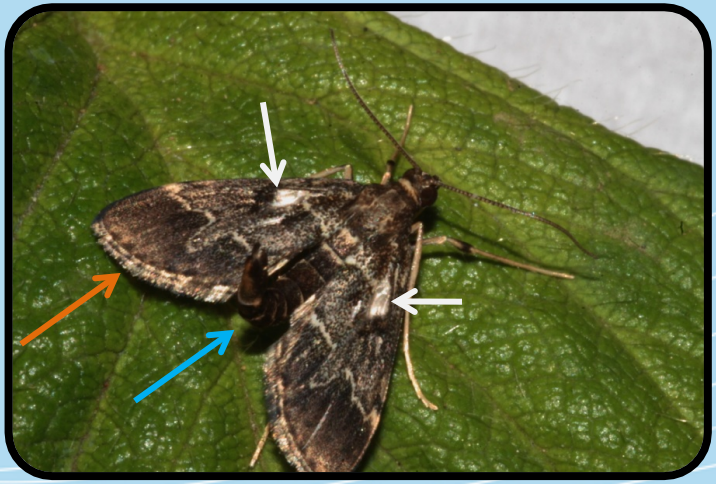
Identification

- Adults
  - Look for the striped abdomen and the “finger”





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Life cycle

4-9 days

3-4 weeks

1-2 weeks

1-2 weeks

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Hibernation and Dispersal

- In colder climates – it is primarily a pest of greenhouses
- In warmer climates – it is usually found in the field
- Hibernation and diapause are unknown
- Dispersal
  - Movement of plant material spreads this pest
  - They are also good fliers

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Monitoring

Image credit:
Dr. Peter van Deventer, Plant Research International, Wageningen, The Netherlands

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Inspection

Pull the pot off in containerized plants

Look for cocoons along the bottom edges of the containers

Look in the detritus around the crop

Look in the detritus around the crop

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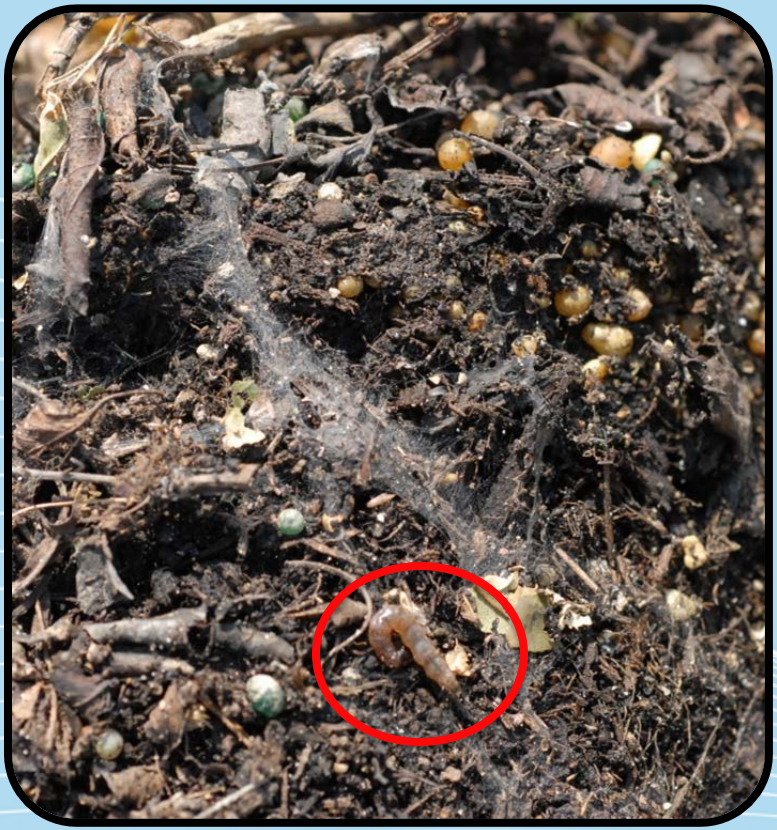
Inspection

- Pull the pot off containerized plants and look for webbing and caterpillars



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Inspection

- Look for adults in “sheltered” areas

A large grouping of plants can provide a nice “sheltered” area for adults

An adult on the side of a container, note the upturned abdomen

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Chemical Control

- Targeted spraying may be best
  - Shape of plants, spacing of plants, and caterpillar behavior determines efficacy of the chemical control
- Monitoring populations to determine spraying schedule is important

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Image credits:
Top - Carmelo Peter Bonsignore, Università degli Studi Mediterranei di Reggio Calabria
Bottom - Jim Bethke, Department of Entomology, University of California, Riverside

Biological Control

- Larval stage
  - Bt, entompathogenic nematodes, and a predatory beetle
- Egg stage
  - Predatory mites, a predatory beetle, and parasitoid wasps
- All are available commercially

Image credit:
Beetle: David Cappaert, Michigan State University, www.bugwood.org, #5403465
Nematodes: Tesfamariam Mengistu, Department of Entomology and Nematology, University of Florida
Mites: Lance Osborne, Mid-Florida Research and Education Center, University of Florida

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Cultural Control

- Removal of plant debris
- Removal of lower leaves that come into contact with soil surface
- Using drier growth medium

Image credit:
Julieta Brambila, USDA-APHIS-PPQ

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Look Alikes - Adults

Hymenia perspectalis

Udea rubigalis

Spoladea recurvalis

Nomophila nearctica

Duponchelia fovealis

Eupithecia miserulata

Image credit:
Udea rubigalis, Hymenia perspectalis , Eupithecia miserulata, and *Nomophila nearctica* - James Hayden, Florida Department of Agriculture and Consumer Services, Division of Plant Industry and Thomson Paris, graduate student, Department of Entomology and Nematology, University of Florida ; EPM - Kurt Ahlmark, FDACS Division of Plant Industry, Bugwood.org - #5499609, *Spoladea recurvalis* – Lyle Buss, Department of Entomology and Nematology, University of Florida

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- Cooperative Agriculture Pest Survey (CAPS) Program
- National Plant Board (NPB)
- States Department of Agriculture
- Extension Disaster Education Network (EDEN)
- Center for Invasive Species and Ecosystem Health (Bugwood)
- National Plant Diagnostic Network (NPDN)
- U.S. Department of Homeland Security (DHS)
- U.S. Forest Service (USFS)

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