

Exotic Plant Pest Alert

Elsinoe australis (Sweet Orange Scab)



**SOS Symptom
Recognition Training**

Presented by:
Maria D. Perez,
Plant Pathologist
Identifier Specialist
USDA, APHIS, PPQ
2010

The Pathogen

- The disease is commonly referred to in the USA as Sweet Citrus Scab or Sweet Orange Scab(SOS).
- The causal agent is *Elsinoe australis*, which is the teleomorph stage of the fungi.
- It's also known to have an anamorph stage called *Sphaceloma australis*.
- Can be confused with other diseases like Citrus Canker and Citrus Melanose .

Means of Movement and Dispersal

- The pathogen is easily dispersed by rain.
- Insects also can spread the pathogen when carrying spores of fungi on their bodies.
- The pathogen is easily carried on infected Nursery stock such as ornamental citrus plants and fruits.



The Hosts



**The Species Exhibiting the Most Severe Symptoms:
Sweet Oranges**

**The Most Tolerant Species:
Sour Oranges and Hybrids**

The Species Exhibiting Moderate Symptoms:

**Grapefruit
Lemons
Mandarines
Limes
Satsumas
Fortunella**

Recognizing:Foliar Symptoms

- The leaves are rarely affected.
- Leaf and twig lesions are initially funnel-shaped pockets, later scab-like, smooth, glossy, occurring on both sides of leaf, up to 2 mm diam. (Sivanesan & Critchett 1974, Wilson 2007)



Pictures taken at Houston, PIS from positive samples. To be used only as a training tool for symptom recognition.

More Foliar Symptoms



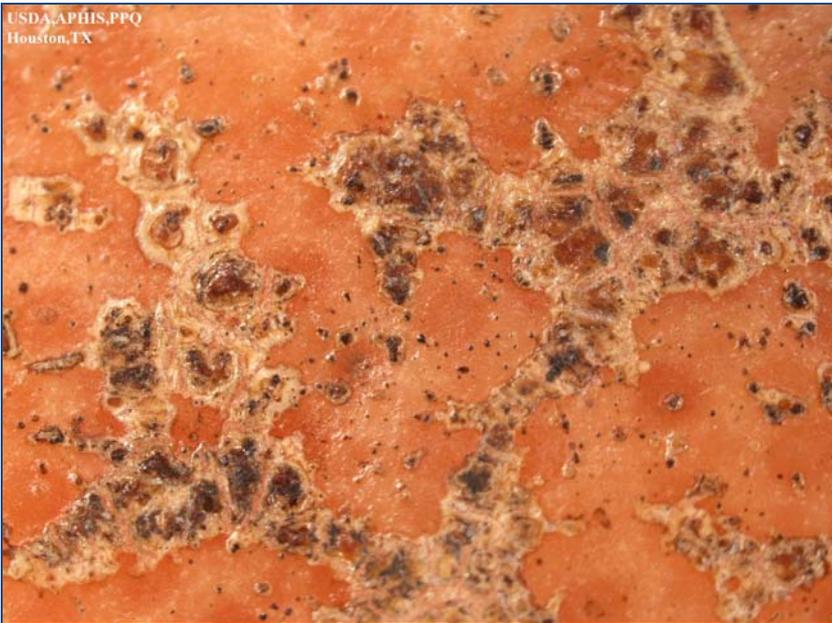
Pictures taken at Houston, PIS from positive samples. To be used only as a training tool for symptom recognition.

Recognizing:Fruit Symptoms

- The lesions appear as circular and somewhat flat scabs on top. Each scab develops cracks around it and remains distinct from other scabs.

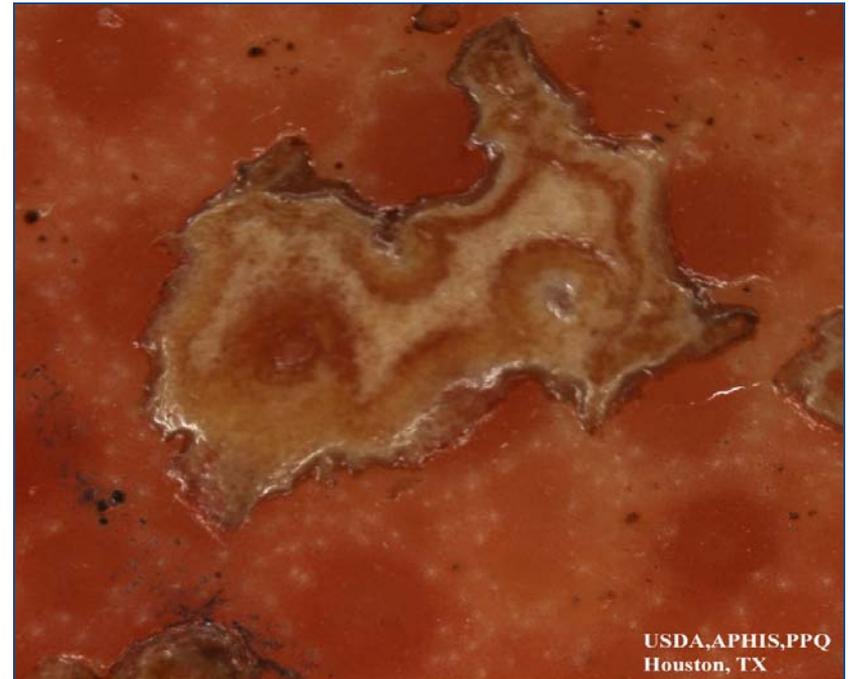
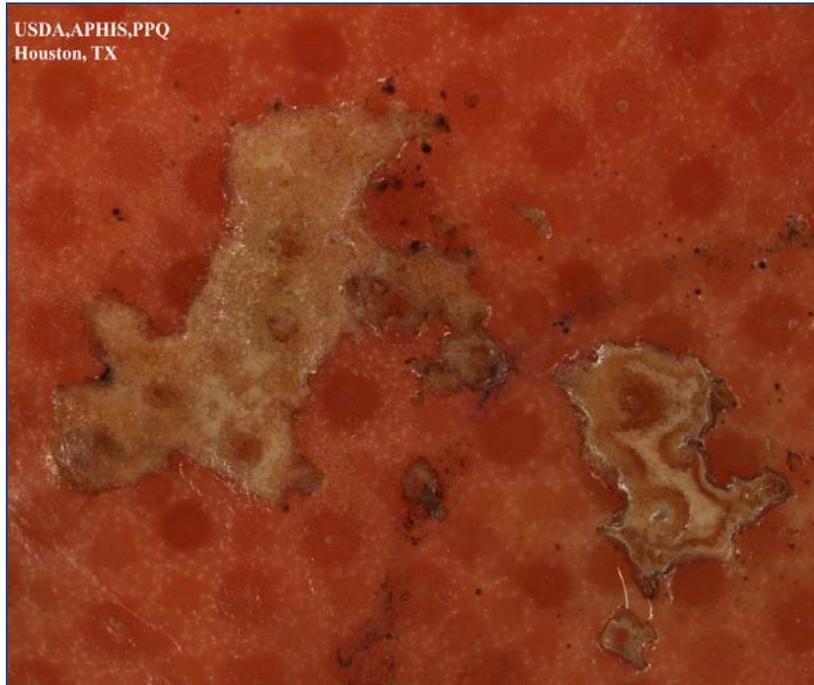


More Fruit Symptoms



Pictures taken at Houston, PIS from positive samples. To be used only as a training tool for symptom recognition.

More Fruit Symptoms

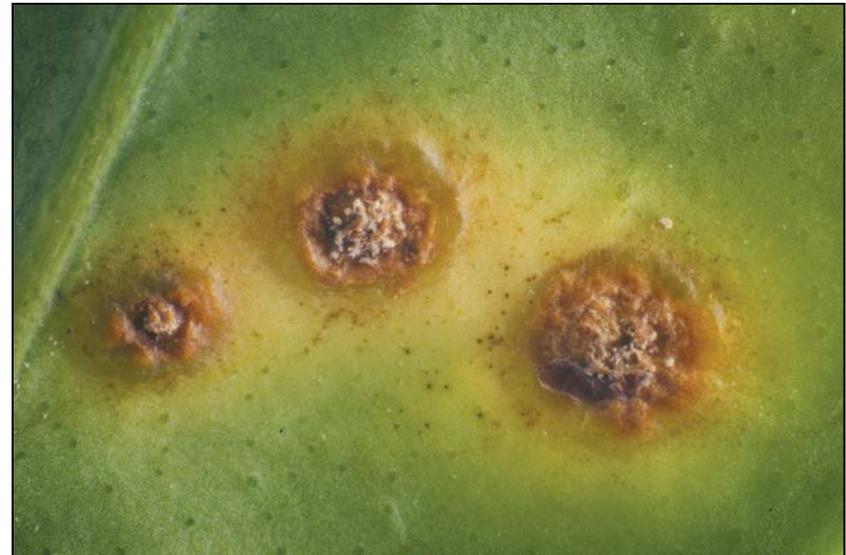


Pictures taken at Houston, PIS from positive samples. To be used only as a training tool for symptom recognition.

Symptoms of Other Diseases

Xanthomonas axonopodis pv. citri (Citrus Canker)

- Symptoms on leaves and fruit are brown, raised lesions surrounded by an oily, water-soaked margin and a yellow ring or halo.



Symptoms of Other Diseases

Elsinoe fawcettii (Sour Orange Scab)

The lesions may be single or irregularly grouped. The crests of these wart-like growths usually become covered with a scabby, corky tissue pale in color (Figure 1), but sometimes dark if colonized by other fungi. The infected spots often run together and cover large areas with a corky, scab growth. Badly infected leaves become crinkled, distorted, and stunted (Figure 2).



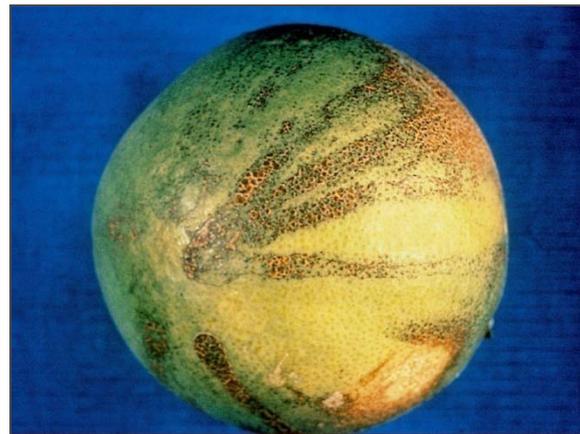
Symptoms of Other Diseases

Diaporthe citri (Melanose)

- Spots on the fruit are at first small, light brown, and sunken; later they become dark and raised.
- The fruit symptoms sometimes can develop as: 'fried egg' symptom, star shape, melanose tear-streaked pattern and "mud cake" type of melanose,
- The leaves start as small, circular, dark depressions with a yellow margin. Later becoming raised and turn dark brown



"Fried Egg" Symptom



"Tear Stained" Symptom



"Mudcake" Symptom

Collecting Samples

- 1) **Contact homeowner for permission to enter property.**
- 2) **Provide homeowner information sheet about SOS**
- 3) **Disinfect shoes with GX-1027 before entering area.**
- 4) **Locate Suspect(s) tree.**
- 5) **Collect symptomatic leaf and/or fruit sample(s).**
- 6) **Place sample inside pre-labeled resealable bag.**
- 7) **Place bagged sample inside another resealable bag.**
- 8) **Place flagging on sample trees.**
- 9) **Disinfect prunes and equipment used with clorox solution.**
- 10) **Disinfect hands and shoes with GX-1027**
- 11) **Take GPS reading and complete record sheet complete with location map.**
- 12) **Place record sheet between resealable bags.**
- 13) **Store sample in cooler until return to Incident Command Post (ICP).**
- 14) **Upon arrival to ICP, place double bagged samples in walking cooler until further processing.**

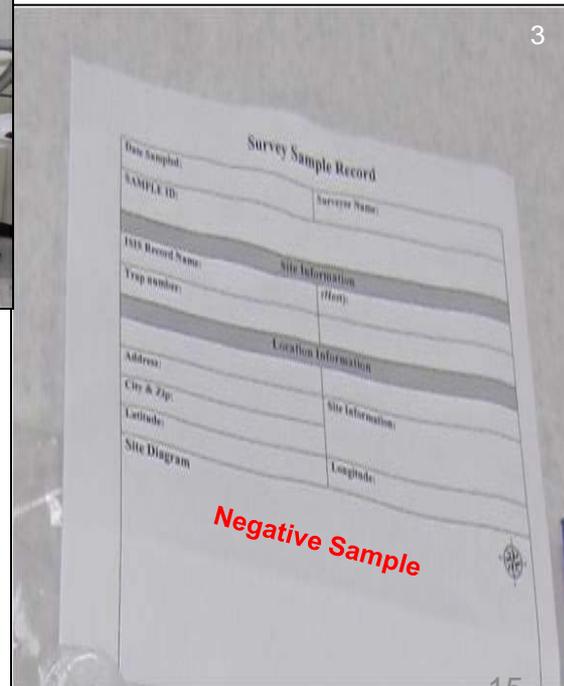
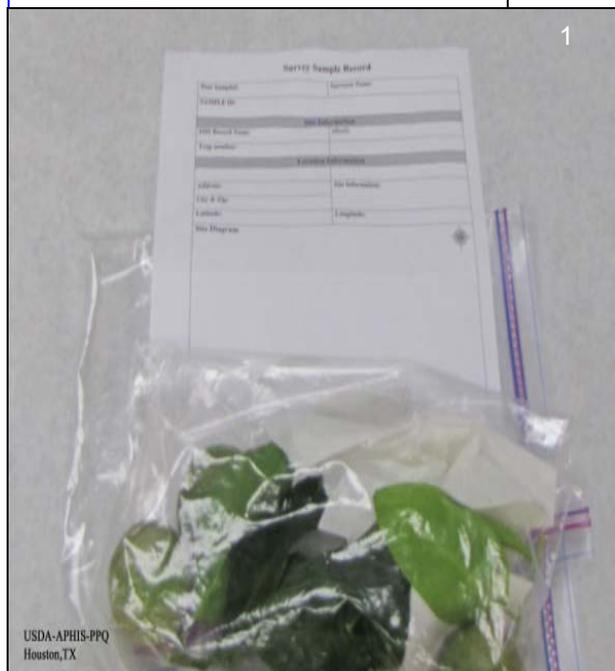
Sanitation is Necessary

Since crews will be visiting many properties, sanitation is always a good practice.

- **Cleaning of shoes and hands with Galex solution (GX-1027 Soap) before entering and exiting property as well as between acquiring samples from trees in the same property.**
- **Disinfecting the equipment with Clorox solution before entering property and between acquiring samples from trees in the same property.**

Screening Suspect Samples

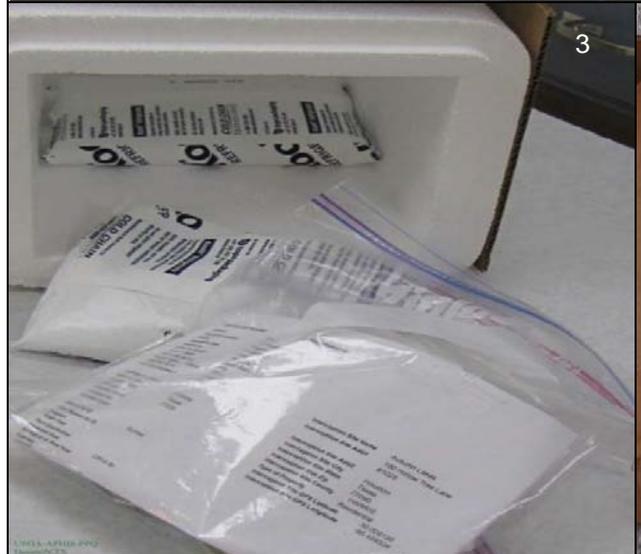
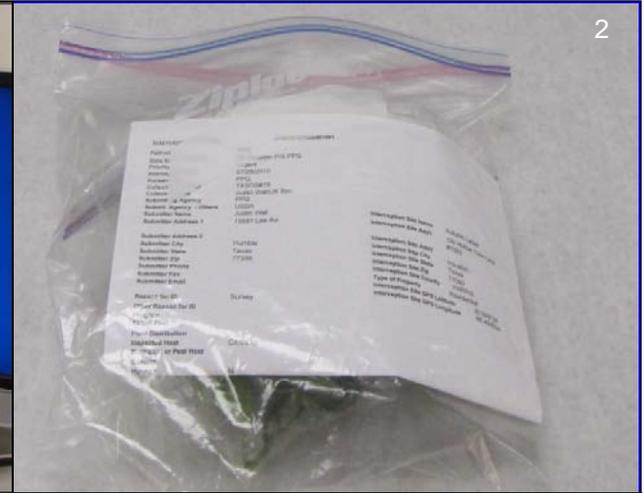
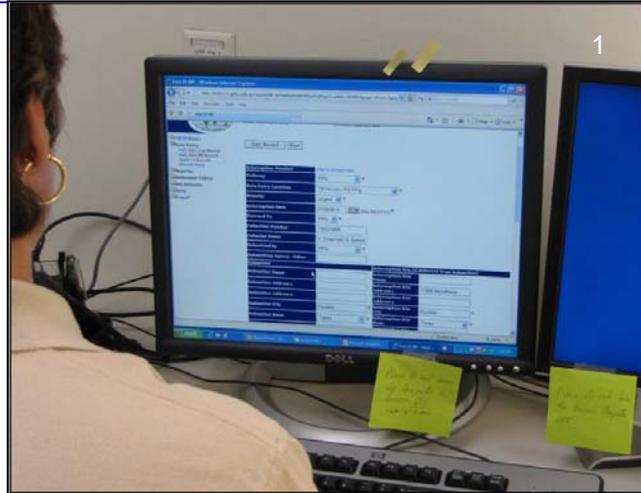
- 1) Remove Field Record Sheet from double bags.
- 2) Screen Field Sample for Suspect Symptoms.
- 3) Make marking for Negatives Samples on Field Record Sheet.



Forwarding Suspect Samples

- 1) Prepare IBP Record for Suspect Samples using the Field Record Sheet information.
- 2) Place IBP Record between plastic bags.
- 3) Place Suspect Samples inside ice box or sturdy cooler with ice pack.
- 4) Ship sample overnight to Molecular Lab for processing.

Dr. Mary Palm
USDA/APHIS/PPQ/PHP/PSPI
PPQ Molecular Diagnostic Lab
B-580, BARC-East
Powder Mill Rd.
Beltsville, MD 20705



Literature Reviewed

- **APS. 2000. Compendium of Citrus Diseases. 2nd Edition. APS Press.**
- **<http://www.doacs.state.fl.us/pi/enpp/pi-pest-alert.html>**
- **<http://www.paddil.gov.au.html>**
- **<http://www.edis.ifas.ufl.edu>**