PP-214

UF UNIVERSITY of FLORIDA
IFAS Extension

Field Identification of Citrus Canker Symptoms and Decontamination Procedures [1]

Mongi Zekri, Holly Chamberlain, Pete Timmer, Pamela Roberts and Rosa Muchovej[2]

Identifying Citrus Canker

Citrus canker, caused by a bacterial pathogen *Xanthomonas axonopodis* pv. *citri*, is a serious disease of most citrus varieties. The disease causes necrotic lesions on leaves, stems, and fruit (Figure 1 and Figure 2).

Figure 1. Necrotic lesions on citrus leaves.

Figure 2. Necrotic lesions on citrus fruit.

Severe infestation can cause defoliation, premature fruit drop, twig dieback, general tree decline, and very bad blemishes on fruit. Trees infected with citrus canker become weak, unproductive, and unprofitable.

The citrus leafminer (*Phyllocnistis citrella*) has increased the vulnerability and susceptibility of citrus trees to citrus canker. Leaves and stems damaged by

1. This document is PP-214, one of a series of the Plant Pathology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date October 2005. Visit the EDIS Web Site at http://edis.ifas.ufl.edu.

2. Mongi Zekri, Citrus Extension Agent IV, Hendry County Extension Office, LaBelle, FL; H. L. Chamberain, coordinator, Educational/Training Programs, Southwest Florida Research and Education Center, Immokalee, FL; L.W. Timmer, professor, Plant Pathology Department, Citrus Research and Education Center, Lake Alfred, FL; P.D. Roberts, assistant professor, Plant Pathology Department, Southwest Florida Research and Education Center, Immokalee, FL; R. M. Muchovej, agronomist, Southwest Florida Research and Education Center, Immokalee, FL; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL.

the citrus leafminer become more sensitive to infection because the wounds allow easy penetration of the bacterium into the tissue (Figure 3 and Figure 4). When feeding galleries of the leafminer on leaves become contaminated with the bacterium, the number and size of individual lesions greatly increases and results in enormous inoculum production.The lesions on the leaves sometimes fall out, leaving holes.

Figure 3. Leaves and stems damaged by the citrus leafminer become more sensitive to infection because the wounds allow easy penetration of the bacterium into the tissue.

Leaf Symptoms. Lesions appear within 5-7 days under optimal conditions. The early symptoms on leaves appear as slightly raised tiny blister-like lesions (Figure 5). As the lesions age, they turn tan to brown and a water-soaked margin appears surrounded by a yellow ring or halo (Figure 6). The center of the lesion becomes raised and corky. The lesions are usually visible on both sides of the leaf.

Stem and Twig Lesions. Stem lesions often indicate that the infection has been present for a long period of time. Stem lesions serve as a reservoir for persistent inoculum (Figure 7). Symptoms on twigs and fruit are similar and consisted of dark brown or black raised corky lesions surrounded by an oily or water-soaked margin (Figure 8). As the lesions mature, they appear scabby or corky (Figure 9).

Figure 4. Leaves and stems damaged by the citrus leafminer become more sensitive to infection because the wounds allow easy penetration of the bacterium into the tissue.

Figure 5. Early symptoms of citrus canker on leaves appear as slightly raised, tiny blister-like lesions.

Figure 6. As the lesions age, they turn tan to brown and a water-soaked margin appears surrounded by a yellow ring or halo.

Figure 7. Stem lesions serve as a reservoir for persistent inoculum.

Figure 8. Twig lesions--dark brown or black raised corky lesions surrounded by an oily or water-soaked margin.

Figure 9. As twig lesions mature, they appear scabby or corky.

Fruit Lesions. Lesions are dark brown to black and raised, often surrounded by yellow halos (Figure 10, Figure 11, and Figure 12). Symptoms may differ with the citrus cultivar. Lesions cause blemishes and early fruit drop, thereby reducing fruit yield. Citrus canker is highly contagious and can be spread rapidly by wind-driven rain, storm events such as tornadoes and tropical storms, flooding, equipment, and human movement within groves.

Figure 10. Fruit lesions are dark brown to black and raised, often surrounded by yellow halos.

Figure 11. Fruit lesions are dark brown to black, often surrounded by yellow halos.

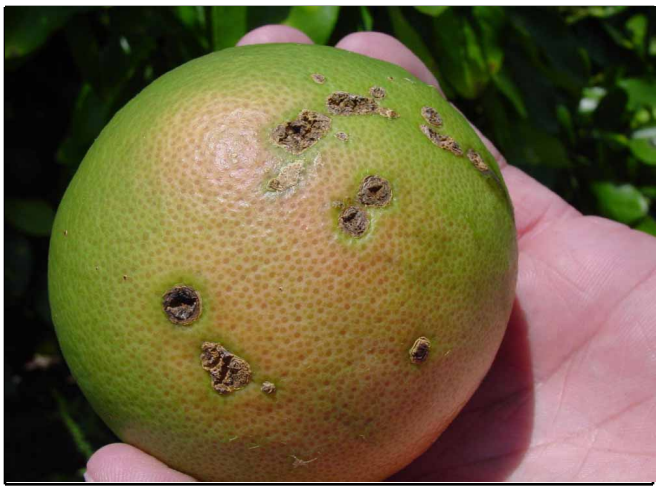

Figure 12. Fruit lesions.

Movement of infected or exposed trees, seedlings, propagative material, and fruit is the primary means of spreading the canker pathogen over long distances.

Contaminated clothing, tools, lawnmowers and other landscaping equipment, ladders, containers, and other items associated with harvesting and postharvest handling of fruit are also potential sources of infection.

Decontamination Procedures

To prevent the spread of citrus canker, it is essential that equipment and personnel working near or contacting any citrus plant material be decontaminated with an approved chemical such as quaternary ammonium (Figure 13).

Personnel Decontamination

- Outside quarantine areas, personnel are required to decontaminate upon exiting a grove (Figure 14).
- Within quarantine areas, personnel are required to decontaminate upon entering and exiting groves.
- EXCEPTION: harvesters/pickers are required to decontaminate upon entering and exiting a grove in or out of quarantine areas regardless of whether an infection is proven to exist.

Figure 13. Field decontamination station.

Figure 14. Personnel decontamination.

Vehicle and Equipment Decontamination

- Outside quarantine areas, state law requires all vehicles and equipment entering citrus groves to be decontaminated upon leaving the grove (Figure 15).
- Within quarantine areas, state law requires all vehicles and equipment entering citrus groves to be decontaminated upon entering and exiting a grove.

Figure 15. Vehicle decontamination.

- A grove owner/caretaker may also require decontamination upon entering groves outside of quarantine areas.

Best Management Practice: Always Decontaminate!

- Anyone who suspects their trees have citrus canker,should call the Division of Plant Industry at: 800-282-5153, 800-850-3781 or 800-293-3101.
- Do not collect samples from suspected trees and take them anywhere including county extension offices because of the risk of spreading more the disease.
- Do not destroy infected trees without reporting to Federal and State officials or inspectors.
- Allow inspectors into your grove or yard to check your citrus trees. Give them permission to remove infected and exposed trees.

Additional Information

For more information on citrus canker, visit these Web Sites:

Citrus Canker Extension Program

http://canker.ifas.ufl.edu

Citrus Canker Eradication Program

http://doacs.state.fl.us/canker

Animal and Plant Health Inspection Service

http://www.aphis.usda.gov/ppq/ep/citruscanker

Crop Alert: A Citrus Canker Fact Sheet for Homeowners

http://edis.ifas.ufl.edu/PP116

2005 Florida Citrus Pest Management Guide: Citrus Canker

http://edis.ifas.ufl.edu/CG040

Citrus Canker Disease

http://www.biotech.ufl.edu/PlantContainment/canker.htm

Plant Containment Facility

http://www.biotech.ufl.edu/PlantContainment/

Citrus Canker Field Identification

http://www.imok.ufl.edu/plant/diseases/cankerid.htm