

The state of black spot in Florida

By Megan Dewdney

As fruit ripen in the fall, grove managers and their crews will need to keep their eyes open for citrus black spot, especially in the quarantine areas. Citrus black spot is a serious fungal foliar disease of citrus that can cause fruit blemishes and significant yield loss.

All types of citrus except Tahiti lime and sour orange are symptomatic, but lemons and late harvested sweet oranges are the most affected. There are several symptom types on the fruit, but leaf symptoms are quite rare.

The most common fruit symptoms are hard spot, false melanose, cracked spot and virulent spot (Figure 1). Since hard spot lesions are the most characteristic fruit symptom, scouts should look for this symptom while inspecting, especially during and after color break. Hard spots are small (one-quarter inch diameter) lesions with necrotic centers with a brick-red to chocolate-brown border. False melanose looks much like melanose, but the lesions tend to be dark brown rather than reddish and are smooth to the touch. Cracked spot often covers large areas of the fruit surface with

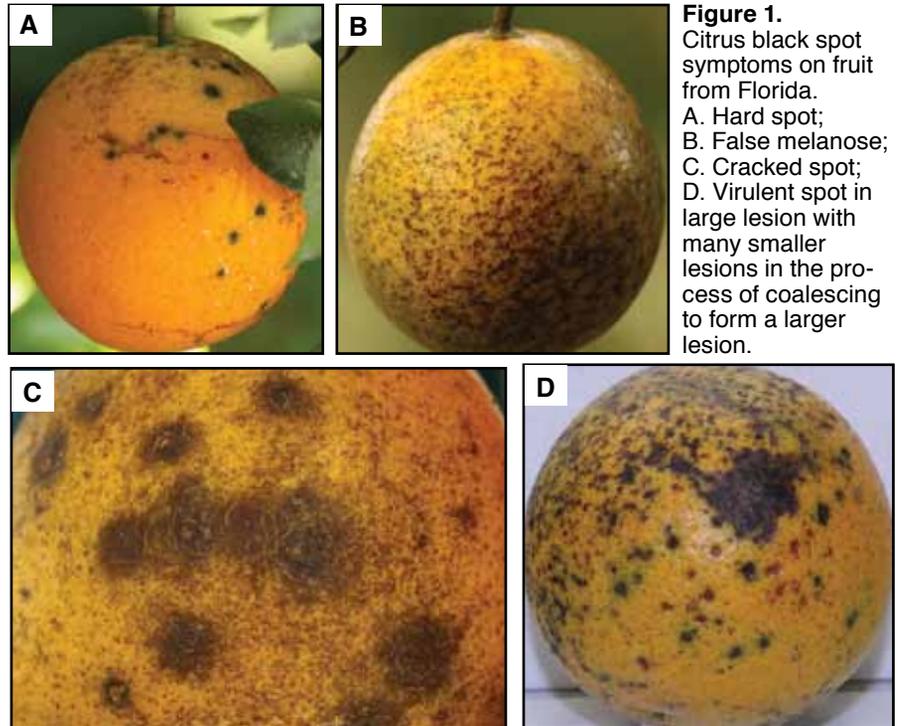


Figure 1. Citrus black spot symptoms on fruit from Florida.
A. Hard spot;
B. False melanose;
C. Cracked spot;
D. Virulent spot in large lesion with many smaller lesions in the process of coalescing to form a larger lesion.

a fine network of cracks on a dark-brown, diffuse lesion. Virulent spot is a dark brown, leathery lesion on the fruit surface that can often cover much of the fruit surface. False melanose

and cracked spot can occur on green and mature fruit, but other symptoms are most common after color break. None of these symptoms affect the internal quality of the fruit for juice.

Despite the rarity of the leaf symptoms, the most important spores come from the leaf litter as it decomposes. These infections are not visible to the eye and are often termed latent infections. The majority of spores are released between mid-March and late-August. Fruit are susceptible for five to six months after petal fall and must be moist to be infected. The fruit ripening process along with warm weather and sunlight stimulates appearance of symptoms.

When scouting for symptoms in a grove canopy, a good rule of thumb is to look for symptoms on the sunny side of a declining tree where symptoms are most common. The warm weather last year stimulated symptom production earlier than expected in some groves, and if December is warm again, the same pattern is expected.

SPREAD WITHIN FLORIDA

Citrus black spot was discovered in Southwest Florida in March 2010. The disease was found originally just south of Immokalee in one grove during a Citrus Health Response Program (CHRP) multi-pest survey (MPS). Further surveys to determine the extent of the infection in 2010 found that it was in a relatively restricted area around the original grove except for one tree



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found in southern Hendry County.

CHRP conducted delimiting surveys and transportation corridor surveys at that time. These areas were quarantined and fruit trucks were required to be tarped before they could move citrus (for information on regulations, consult the black spot chapter in the Citrus Pest Management Guide).

In 2011 surveys, the disease was more severe than in 2010 in the Collier County areas but the borders of the affected area had not expanded substantially. We think that this is in part because much of the crop had been harvested in 2010 by the time the surveys had been conducted.

In 2011 in Hendry County, the area expanded substantially again in part because the 2010 surveys were conducted late in the season, and it was possible to detect more disease earlier in the season. In 2012, there was further expansion of the affected areas in Hendry County, mostly to adjoining, already affected blocks, but in Collier County, there was a jump to north of Immokalee. In the new areas, disease was generally restricted to a few trees with a small number of symptomatic fruit.

The 2013 survey found that again the disease had spread to a new area, the Felda area of west Hendry County, but that the borders of the two main areas had changed little and disease intensity had not increased. Most surprising was a find in Polk County. Two lesions on one fruit in a single tree were found in far southern Polk, leading to restrictions on fruit movement from that area as well. No new samples have been submitted or changes to maps have been made since April 2013.

LOOKING AHEAD

It is not known what 2013–2014 will bring, but it is hoped that there will be few expansions of the quarantine areas. CHRP will continue its 10-mile buffer around the quarantine zones and transportation corridors surveys this year for any new disease outbreaks. In addition, 20 percent of the remaining citrus production acreage will be inspected utilizing the MPS design, giving a combined total of approximately 288,000 acres scouted during the current harvest season.

REGULATORY CHANGES

There were some changes to the regulations for fresh fruit export to the European Union (EU) from groves in Hendry, Collier and Polk counties. A fresh fruit harvesting permit remains a requirement, including a pre-harvest survey; however, since citrus black spot has been found in these counties, the

CRDF Commitment of FY 2013–2014 State Legislative Funding to Accelerate HLB Solutions



By Harold Browning

The Florida citrus industry successfully made its case for the need of support from the state of Florida in its battle with huanglongbing (HLB), resulting in a legislative research funding commitment for the fiscal year July 1, 2013 through June 30, 2014. This one-year commitment of \$8 million is specifically targeted to accelerate near-term research projects so they are advanced sufficiently to offer some more immediate assistance to the industry. In addition, the funding was designated specifically for HLB research. In presenting the rationale for this funding request, industry and CRDF representatives made several points that guide the use of these funds:

- The annual CRDF peer-reviewed proposal process is lengthy (seven months) and therefore cannot be used to obtain a new set of short-term projects for funding consideration in a one-year funding cycle. The outcome is that components of the current project portfolio are most appropriate for support.

- Projects being considered by CRDF's Commercial Product Delivery Committee (CPDC) are eligible for funding, and in fact, are supremely positioned for acceleration and enhancement support. As reported below, many CPD projects are being advanced through the planning and commitment of funds from the legislative initiative, and transition from research to delivery has been fostered.

- It was communicated that, although the legislative commitment is significant, the investment of this funding in 12 months of research is unlikely to bring about significant closure on research to delivery of a final solution or product, and therefore, the case was made for incremental funding to enhance and accelerate ongoing efforts.

- It is our goal to commit and spend this important funding from the Florida Legislature.

Planning that accompanied the request of the Legislature included preliminary review of the CRDF research project portfolio, and identified projects that might qualify for one-year enhancement funding. Following approval of the funding, this portfolio review was repeated and updated, leading to a list of recommended projects to be supported. These projects were reviewed internally and submitted for consideration by CRDF's Research Management Committee (RMC), whose recommendation was forwarded and approved by the board at its July 2013 meeting. Forty-nine near-term projects were approved at a cost of \$4,015,109.

CRDF then reached out to investigators to solicit their ideas on how to accelerate their research further. These plans also were submitted for review by RMC and approved by the board of directors in August and September, 2013. This led to approval of 27 project enhancements at a cost of \$1,990,946.

The CPD effort to identify projects that could be enhanced with this funding followed a similar path, with project investigators being requested to forward ideas on how their projects could move forward to field use more quickly. In some cases, new projects or participants were recruited during the CPD considerations to accelerate development of tools for HLB. These were brought forward for approval by the board, and 19 projects were approved at a cost of \$1,711,389.

The resulting commitment from 2013–2014 legislative funding totals \$7,717,444 of the \$8 million, and discussions are under way to complete the commitments as well as to monitor the implementation of this funding.

Harold Browning is Chief Operations Officer of CRDF. The foundation is charged with funding citrus research and getting the results of that research to use in the grove.



Column sponsored by the Citrus Research and Development Foundation

EU requires an additional inspection within the entire counties of Hendry, Collier and Polk for black spot in conjunction with the citrus canker survey.

A harvesting permit for grove blocks and/or sub-blocks and their buffers found apparently free of citrus canker and citrus black spot will be issued and is valid for the remainder of the harvesting season, provided that harvesting begins within 120 days of the date of the pre-harvest survey. If a grove block, sub-block or buffer is found positive for either disease after July 1, the fruit will be disqualified for EU markets for the remainder of the harvesting season.

Due to citrus black spot expression occurring and detectable at color-break, the timing of the pre-harvest survey in Hendry, Collier and Polk counties has also changed and will be conducted just prior to harvest. It is a change from previous years where a pre-harvest survey for citrus canker could be requested after July 1 and the issued permit in citrus canker-free groves was valid for the entire season as long as the harvest commenced within a 120-day window. Language on the Citrus Fruit Harvesting Permit has been changed to reflect the addition of citrus black spot to the regulations.

TRAININGS FOR SCOUTING

The University of Florida exotic

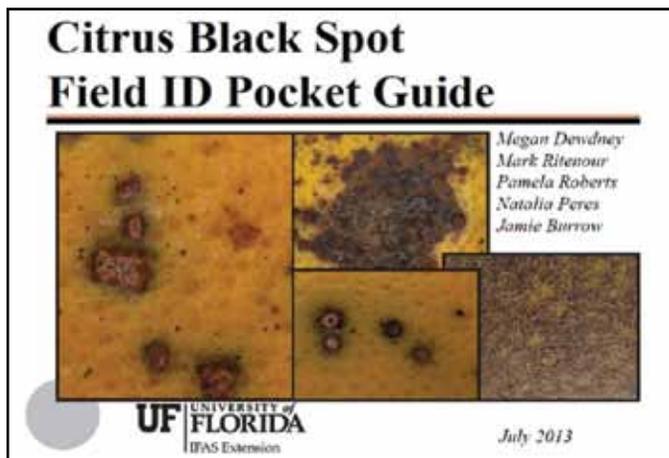


Figure 2. Front cover of the new citrus black spot pocket guide available through the University of Florida IFAS exotic citrus pest and disease Extension program.

citrus pest and pathogen Extension program is happy to help anyone prepare to scout groves. We provide free training in coordination with CHRP for all grove staff and are happy to travel to your grove operation or a central location. Topics covered in the training include symptom recognition, basic disease cycle information and what varieties are most susceptible.

We try to make the training interactive and measure how well individuals perform before and after the training presentation. This information is available to managers. We also have fresh fruit samples when they are available and if the training is conducted in the quarantine areas.

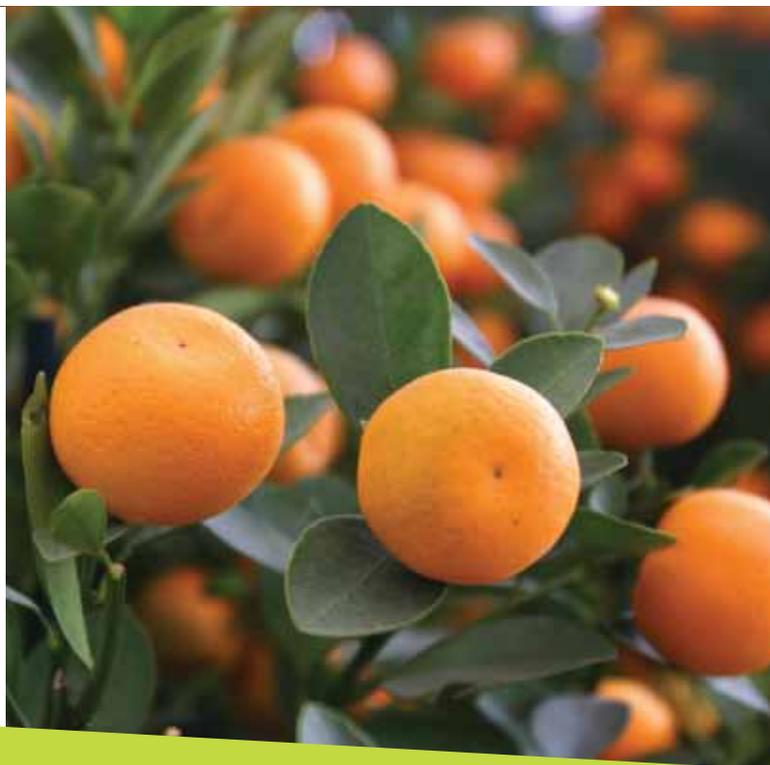
We also give the participants black spot identification sheets and a hand lens to better see small structures. Most recently, we published a citrus black spot pocket guide that gives basic disease information and symptom photos (Figure 2) that can refresh the training information. These can be obtained at Extension events and trade shows, or by contacting Jamie Burrow. If you are interested in training members of your grove operation — no group too small — please contact Jamie Burrow at (863) 956-8648; jd Yates@ufl.edu

Megan Dewdney is a University of Florida-IFAS assistant professor of plant pathology at the Citrus Research and Education Center in Lake Alfred.

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