

# Postbloom fruit drop: Vigilance is important for management

By Megan Dewdney

Prior to the 2014 season, the last major outbreak of postbloom fruit drop (PFD) occurred in the 1990s, approximately 25 years ago. During the early spring of 2014, I started to get calls asking me about how to control PFD, especially in navel oranges, raising the problem on my radar. Unfortunately, most growers did not know there was a problem until it was too late in 2014, and they had buttons (persistent calyxes) instead of growing fruit.

As a refresher, PFD is caused by the fungus *Colletotrichum acutatum*. The inoculum survives as dormant infections between bloom periods on the buttons, leaves and twigs. When flowers are present and open on a tree, the fungal survival structures start to germinate and form spores. These spores are moved via rain to the next flowers where they are able to germinate and produce many more spores. The fungus is highly dependent on rainfall, especially frequent rain events when flowers are present in the grove. Infection usually happens within 24 hours of a weather event, and symptoms occur approximately four to five days later. Flower symptoms of PFD start with water-soaked lesions on petals that turn from peach colored to orange-brown as they age. The fungus

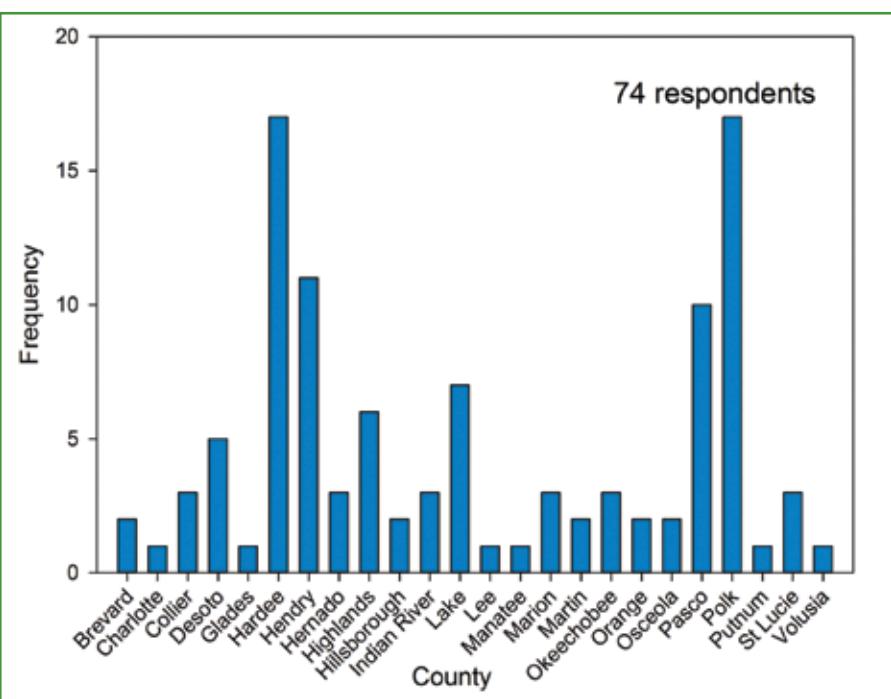


Figure 1. The Florida counties where postbloom fruit drop was observed in 2014.

continues this cycle for as long as there are susceptible flowers available.

While windblown rain is the main means of disease spread, human activity contributes to long-distance spread through equipment movement. Workers with petals in their picking bags can also contribute, especially if work is done while the canopy is wet.

Trees, groves or cultivars that have

extended blooms, multiple blooms or off-season blooms tend to have more problems than groves where the bloom is restricted to a short period. At the end of bloom, the fungus causes the young fruitlets to abscise, leaving the buttons. The fungal population will diminish with the end of bloom, but *C. acutatum* will survive on the tree until more flowers are present.

## SURVEY RESULTS

As the growing season progressed in 2014, there was greater concern about PFD; therefore it was decided to conduct a survey to find out the magnitude of the problem. The first thing I wanted to know was how widespread the problem had become. Of the 129 respondents, 78 percent reported PFD was a problem in their groves. These groves came from all of the major citrus-producing counties and many others besides. The majority of cases were in Polk, Hardee, Hendry and Pasco counties (Figure 1), and blocks between 1 and 100 acres were most frequently affected. This is not to say that larger acreages were not affected, just that it was less frequent. The majority of operations reported that less than 50 percent of their acreage was affected by PFD, but a significant proportion — 27 percent — indicated

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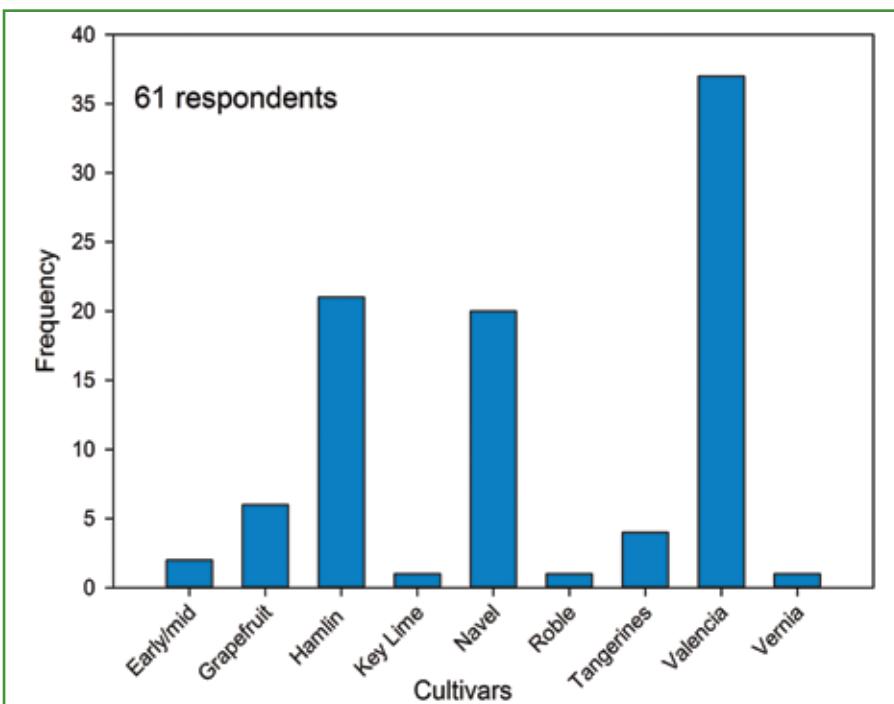
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**Figure 2.** The cultivars in which postbloom fruit drop was reported in 2014.

that 90 percent to 100 percent of their groves had been afflicted.

All citrus species and cultivars can be affected by PFD, but severity varies with the cultivar. In Florida, historically the most commonly affected cultivars have been Valencia and navel oranges but Tahiti limes can also be highly susceptible. Hamlin oranges, grapefruit and tangerines historically have been less susceptible. In 2014, 61 percent of growers reported (Figure 2) that Valencia had been affected, along with 33 percent reporting that Hamlin and navel also had PFD. Less than 10 percent of growers reported PFD in their grapefruit, tangerines and other cultivars. Note that while this is a relatively low number of Valencia blocks affected, the proportion of navel blocks is quite high based on relative acreage of the two cultivars.

### CONTROL OPTIONS

There are not many PFD control options since Topsin M was removed from the market. The main products are the strobilurin fungicides (Abound, Gem and Headline) that work best when combined with ferbam. There is a label limit of four applications of strobilurins allowed in a growing season for all purposes and a limit of three applications (no more than 6 lbs. of active ingredient/acre) of ferbam. See the Florida Citrus Pest Management Guide for details (<http://edis.ifas.ufl.edu/cg007>). There is little to no data on the efficacy of the newer fun-

gicides, Quadris Top and Pristine, that have a citrus label. Products that have limited or no efficacy against PFD but were used by some growers in 2014 include spray oils, urea, copper and fosetylal (Aliette).

### APPLICATION TIMING

One of the keys to getting the best PFD control possible is application timing. To make timing decisions easier, the PFD model is available online (<http://pfd.ifas.ufl.edu>).

If you have buttons or a large proportion of your flowers with symptoms, it is too late for effective disease control. In 2014, many growers did not realize there was a problem until late during flowering and treated at full bloom or later (figures 3 and 4, see page 8). Control will be better if applications are made when disease severity is low.

The model is relatively easy to use and has an explanation for every criterion if you are unsure about the information requested. For best results with the model, your most vulnerable blocks should be scouted several times a week during bloom. Bloom intensity should be evaluated, which could be done at the same time as enumerating blossoms for insecticide applications, and at bloom stage (pin head, button bloom or open flowers). All year, off-season bloom should be inspected for any symptoms that indicate the presence of active inoculum in the grove. While 46 percent of respondents



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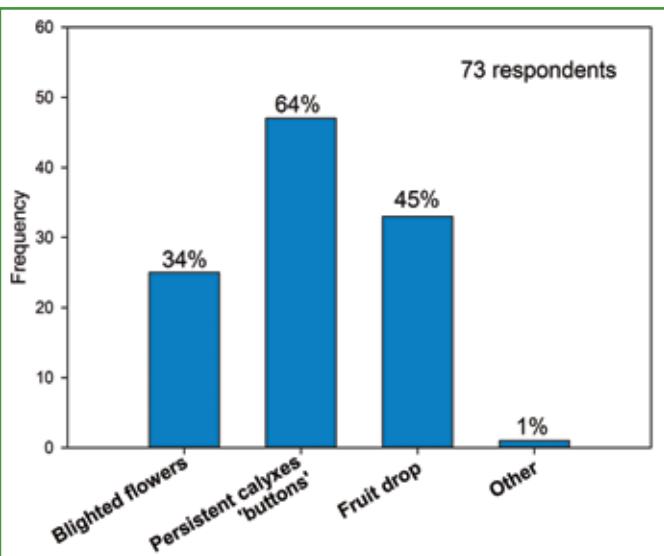
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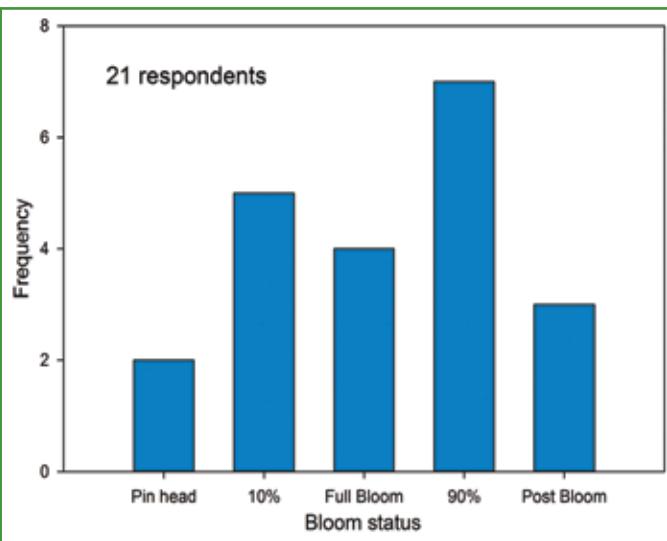


**Figure 3.** The postbloom fruit drop symptoms that were first observed in groves. Fungicide applications would be ineffective at the button or fruit-drop stage.

said that off-season bloom had been a problem in their grove, it is likely higher in the age of huanglongbing (HLB). One of the main causes of off-season bloom is tree stress induced by diseases including HLB, phytophthora foot rot and blight. Off-season bloom allows the fungus to remain at higher inoculum levels than would otherwise be present during the major bloom. If

there is off-season bloom in a block, before treating for PFD, it should be determined whether there are enough affected flowers to be a substantial proportion of the expected crop. If not, it may not be worth treating, since there is a limit on the number of fungicide applications allowed.

Other information that is needed for the model is the disease history for the



**Figure 4.** The stage of bloom present when postbloom fruit drop treatments were applied. Most treatments after full bloom were likely not effective for PFD management.

last five years: Did you observe persistent calyxes, were there declining trees, was there PFD on early bloom, is there PFD now and is it scattered throughout the block? You will also need the rainfall in the five previous days (this is in millimeters; to convert from inches, multiply by 25.4), the hours of leaf wetness (approximate) and how many rainfall events occurred over the past five days. The final piece of information is the time of the last application of fungicide.

#### LOOKING AT 2015

It is difficult to predict if PFD will be a concern in 2015, but growers should be prepared. It is predicted that it will be a weak El Niño year with cooler temperatures and higher than normal precipitation. The fungus needs regular rainfall events and while cool temperatures don't favor the fungus, they do extend bloom. If these predictions are correct and with the inoculum produced in 2014, PFD seems likely.

Be prepared and vigilant. Make sure to have the products you need on hand before bloom. Monitor for buttons and off-season bloom. Most importantly, if you think that you are likely to have a problem, follow the model and apply your treatments before you see significant numbers of damaged flowers in your grove. These are not fool-proof recommendations, but they are the best we have at the moment.

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