



By Chris Oswalt

Using computer models to help control citrus diseases

It's hard to believe that winter is almost over, and spring is just around the corner. With spring quickly approaching, a grower's thoughts turn to the spring flush and bloom.

FLOWER BUD INDUCTION ADVISORY

Specifically, growers are concerned with the number of bloom waves that may occur and the length of time that the waves are exposed to favorable conditions for postbloom fruit drop (PFD). To assist them, growers use the University of Florida Institute of Food and Agricultural Sciences (UF/

IFAS) Flower Bud Induction Advisory service. The service is based on a long-time model developed by the late Gene Albrigo. This year, Tripti Vashisth has stepped in to provide these advisories.

The advisory service considers the accumulated hours of temperatures below 68 degrees since last fall, which in Florida citrus induces the formation of flower buds. It also allows the grower to input the closest Florida Automated Weather Network (FAWN) location, variety, expected yield, tree age and date. The model and advisories can be accessed at crec.ifas.ufl.edu/flower-bud-induction/flower-bud-induction-2020.

As we head into spring, the information growers will find quite helpful is the actual flowering date and the duration of the flowering. A good scenario would be to have a single concise bloom during a period of low leaf wetness and rainfall. These conditions are less favorable for PFD development and could result in a minimum number of fungicidal sprays for this pathogen. Concurrently, the model helps growers know when to expect the beginning of the spring flush containing the vegetative flush that Asian citrus psyllids (ACP) require for reproduction. Knowing this additional bit of information can help potentially better time ACP control measures on the most critical flush of the year.

Once growers have an idea of what to expect based on the flower bud induction model, they can leverage additional models/tools to better control citrus fungal diseases. There are two other tools that growers can use to help them time their disease-control measures.

CITRUS ADVISORY SYSTEM

The first is the Citrus Advisory System (agroclimate.org/tools/cas), which predicts the current risk for PFD at many of the FAWN locations across the state. Once a FAWN station is selected, the model requires some site-specific information to determine the PFD risk. Although the model doesn't allow for site-specific data input, the value for leaf wetness (one of the most critical parameters) is closely related to dew point temperature. Dew point temperature is relatively consistent over large geographical areas. The model output will



The University of Florida's Flower Bud Induction Advisory service helps growers make decisions about postbloom fruit drop and Asian citrus psyllid management.

indicate when fungicidal applications would be most warranted to protect bloom and fruit set.

CITRUS COPPER APPLICATION SCHEDULER

The other model, the Citrus Copper Application Scheduler (agroclimate.org/tools/citrus-copper-application-scheduler), helps growers determine the need for additional applications of copper fungicides. This model works not only for fresh fruit fungal diseases, but also for determining the need for copper sprays for citrus canker disease.

The Citrus Copper Application Scheduler helps growers determine the need for additional applications of copper fungicides.

This tool was developed after years of data. The model factors in the date of a copper application, the amount of copper applied, the subsequent rainfall, citrus variety and the expansion of the fruit or fruit enlargement. The first four factors are relatively straightforward, but the fifth one is the most critical to determining when to make subsequent copper applications. The model determines the amount of peel expansion that occurs and determines if there is too much space or cracks in the protectant cover of copper on the fruit surface. An additional advantage of this model is uploading your own weather (rainfall) data.

In conclusion, Florida citrus growers have several computer models that can help them greatly enhance their disease and insect management programs. With this additional information and guidance, growers could save money while getting a bigger bang for their buck. 🍊

Chris Oswalt is a UF/IFAS citrus Extension agent for Polk and Hillsborough counties.

Making HLB Functionally Irrelevant



By Rick Dantzler, CRDF chief operating officer

My goal for the Citrus Research and Development Foundation (CRDF) is to eradicate HLB or make it functionally irrelevant. Either through base hits that lead to runs or all at once with a homerun, one way or another we will eradicate greening or make it functionally irrelevant.

One way to make it functionally irrelevant is through the development of greening-tolerant rootstocks and scions. The CRDF Select Committee on Plant Improvement, chaired by John Gose, is working hard to make sure growers receive the data they need to make informed choices about what to plant.

Working with the plant breeders CRDF funds, the Select Committee is discussing standardizing plant breeding trial design and measurement criteria throughout the plant breeding pipeline. This would make replicated data — especially in the last phase where trees are shown to either work in a commercial environment or not — available for growers to see how new genotypes compare. The goal is not to stifle the creativity of plant breeders in the early stages, but to create uniformity in evaluation so that a tree that looks particularly good will have enough replicated data to allow an informed decision about how good it just might be.

Over the last six years, CRDF has had three last-stage field trials that growers have said have been among the most helpful to them in deciding what to plant. Given the success of these trials, the CRDF board, with initial encouragement from our president David Howard, has decided to conduct more trials of the latest and most promising rootstocks. The goal is to include up to 20 rootstocks grown on three industry-standard scions: Valencia, Vernia and Hamlin. These three scions were the top three budded scions in 2019–2020. With Hamlin being particularly susceptible to HLB, it will give a quick indication of HLB tolerance in the rootstock.

I have visited many of the breeders' trial sites, and there are many rootstocks from which to choose. Robust trees with good fruit, few thorns and very low titer counts lead me to believe we are close to having new and better orange cultivars that can be grown profitably — even when growers aren't receiving premium prices for their fruit. In other words, trees that make HLB functionally irrelevant.

These rootstock trials will require grower-cooperators. If you are interested in hosting one of these trials, please contact us. CRDF will pay for the trees, planting costs and tree wraps.

Overseeing these trials will be CRDF's Brandon Page, a highly motivated and dedicated employee who understands the last stage of field trials as well as anybody. I am excited about these trials and the work that is to come from the Select Committee.

A thought that has surfaced is that a scion trial could be just as valuable as a rootstock trial. My sense is the Select Committee could very well turn its attention to scions after completing its review of rootstocks. So, don't be surprised if CRDF embarks upon a scion trial in the relatively near future.



Column sponsored by the Citrus Research and Development Foundation