

**CALIFORNIA CITRUS PEST AND DISEASE PREVENTION PROGRAM JOINT  
OPERATIONS AND SCIENCE SUBCOMMITTEE MEETING**

Meeting Minutes  
Wednesday, March 4, 2020

**Opening:**

The joint meeting of the Operations and Science Subcommittees was called to order at 9:00 a.m. on March 4 by Chairmen Keith Watkins and Dr. Etienne Rabe.

**Operations Subcommittee Members Present:**

John Gless\*                      Roger Smith                      Keith Watkins

**Operations Subcommittee Members Absent:**

Zac Green                      Kevin Severns

**Science Subcommittee Members Present:**

Dr. Ed Civerolo                      Dr. Melinda Klein                      Dr. Etienne Rabe  
Aaron Dillon

**Science Subcommittee Members Absent:**

Dr. Beth Grafton-Cardwell      Dr. Jason Leathers                      Kevin Olsen

**CDFA Staff:**

Jonathan Babineau*	Anmol Joshi*	Keith Okasaki
Tina Galindo*	Sara Khalid*	Lea Pereira*
David Gutierrez	Magally Luque-Williams*	Michael Soltero*
Amelia Hicks	Dr. David Morgan*	Claudia Vasquez
Victoria Hornbaker	Alex Muñiz*	Jennifer Willems
Gavin Iacono		

**Guests:**

Craig Armstrong*	Rick Dunn	Brianna McGuire*
Bob Atkins	Sara Garcia-Figuera*	Dr. Neil McRoberts*
Kevin Ball*	John C. Gless*	Sylvie Robillard
Jill Barnier*	Subhas Hajeri*	Dr. Etienne Rabe
Teri Blaser	Dr. Melinda Klein	Cressida Silvers*
Brad Carmen	Jessica Leslie*	Roger Smith*
Natalie DeAngelo*	Karen Lowerison*	Judy Zaninovich
Holly Deniston-Sheets	Joey Marroquin*	Sandra Zwaal*
Aaron Dillon*	Mark McBroom*	

**\* Participated via Webinar**

Keith Watkins and Dr. Etienne Rabe welcomed the Subcommittee, staff, and members of the public participating in person and online.

### **DATOC Progress Update on Southern California Analysis**

Brianna McGuire stated that the Data Analysis and Tactical Operations Center (DATOC) has made four different estimates of exposure from 2018 to 2020. She explained that using limited techniques, DATOC found that between 2,500 and 18,000 trees were exposed as of ten months ago. Using broader techniques, DATOC hypothesized that half of all trees in Southern California may be exposed. She stated that their work combined empirical and model-based techniques to present both data-driven and model-driven work. She explained that she would look at distance matrices between infected and noninfected trees, threshold cycle (Ct) value changes and rates of neighboring property infections.

Brianna explained that of 299,651 plant samples analyzed, 1,771 were positive as of December 31, 2019 (0.59 percent). Out of 159,000 Asian citrus psyllid (ACP) samples analyzed, 159 were positive (0.1 percent) in the same time frame. She explained that sites with positive detections are typically visited twice, the second visit occurring a median of 72 days after the first. She explained that over time the average Ct value has decreased by an average of -0.55 per year; from 29 Ct in 2016 to 26 Ct in 2020. She stated that research from Florida has shown that *Candidatus liberibacter asiaticus* (CLAs) titer in a tree is seasonally dependent, but if California tree titer were seasonally dependent, then the graph should show a vertical gradient in the trees. She suggested that there can be any titer in any season because of the wide vertical range, indicating that California's mature trees do not exhibit seasonal titer differences but rather the amount of inoculum in the scenario. The Ct value decreases by an average of 0.55 per year when the epidemic gets over 200 finds. She stated that CLAs titer changes by an average of -0.97 per year, meaning that titer in ACP is decreasing faster with more seasonal mixing. She stated that the cumulative distribution curve tends to stabilize quickly in shape; since January 2019, distance between infected tree finds has not meaningfully changed. After 800 finds the distances have only decreased by 15 percent at most, meaning the program is at its limit to detect new dynamics in this disease system. After 1,000 finds, 90 percent of all positives are found within 130-meters of another positive find and 95 percent of all positives within 240-meters. She added that 25 percent of all trees within 40-meters of a positive find test positive. The maximum number of infected trees within 240-meters of another infected tree are 28.5 percent. This relationship between percent of positive trees found at specific distances has not changed over the course of 500 finds and one year. 17 percent of infected ACP are found within 20-meters of an infected tree. Dr. Neil McRoberts stated that most ACP data comes from within delimitation areas, suggesting recolonization by ACP after treatment.

Brianna stated that very few cities with positives have no infected neighbors. In most cities with many infections, over 25 percent of positive find neighbors (next door or behind) end up infected. Overall, 19.8 percent of all neighbors in infected cities are positive. She stated that some cities are hyper dense, with 45 percent of neighboring properties reporting Huanglongbing (HLB) positive trees. She noted that in some cities, infection sites on edges (cul de sacs, on the edges of parks or schools) tend to have higher infection probabilities. She explained that infection intensity at a site plays a role in local transmission mechanics. HLB sites with over five infections result in 70 percent of all neighbors having one to three infections present. She stated that in cities with over five infections, percent infestation will increase by 0.05 percent and Ct values decrease by 18

percent. Corona is an outlier, where Ct values are more varied but tend to be lower. She added that San Gabriel's Ct value drops ten times slower and its percent infection is between seven and ten times less than any other city.

Brianna stated that she worked with the public-facing webidemics to simulate how the disease progresses over time. With the parameters set to Florida grove conditions, some trees were culled but the inspection didn't spread at all over the course of a year due to frequent sampling and aggressive culling. With the parameters set to California conditions (four to five years with a 25 percent chance of finding the disease, resampling sites four times over the course of the epidemic and culling dead trees), the infected, cryptic or exposed trees outnumbered dead culled trees by over 2 to 1; with 3,500 trees in the field that were infected, cryptic or exposed. She added that running models at 80 to 95 percent find radii found that removing all trees within 60 to 80-meters does not remove all infections but that removing all trees within 130 to or 240-meters does. More healthy trees were culled in the 240-meter culling radii, but more trees died of natural causes in the 130-meter radii, meaning there were more trees left infected for longer in the 130-meter culling radii. After running those models 100 times, she found that culling radii increases result in more healthy trees and fewer dead trees, shorter epidemic duration and fewer infectious trees. The program would cull more healthy trees at 240-meter radius, but have fewer trees dying in the field. She suggested an optimum culling radius of 105-meters. She noted that more resampling would provide better information about spread and Ct dynamics but may not result in better control. She stated that 60-meter mass removal would remove a maximum of 36,000 trees; 80-meter mass removal would remove a maximum of 44,000 trees; 105-meter mass removal would remove 50,000 trees; 130-meter mass removal would remove 60,000 trees; and 240-meter mass removal would remove 93,000 trees.

Neil stated that the cumulative distance distribution function has stabilized with the inclusion of few dense finds since Drs. Tim Gottwald and Weiqi Luo's original 400-meter analysis. This results in the smaller 95 percent confidence, but this has been stable for the last 800 finds. It was stated that the last 800 finds were over a much shorter time than the previous 800 finds; Neil explained that the program can only wait and see if it remains stable. Neil stated that the analyses suggest that the program is having a measurable effect on the infection dynamics. He explained that the data on how Ct values change in cities provides justification for tree removal without testing due to the positive feedback between trees, vectors and pathogens and the rapid decline in Ct value in the dense clusters. The confidence interval data gives guidelines on where to set the clearing radius. He suggested this data provides a basis to remove more trees faster.

Holly Deniston-Sheets stated that DATOC used the agent-based model to study CDFA survey data for San Gabriel to determine the efficacy of control measures. She ran the model with four different parameters: no control, tree removal only, insecticide applications and under both tree removal and insecticide applications. The results to date are not conclusive until more runs have been completed, but it indicates that vector suppression via repeated insecticide applications is a vital aspect of disease control. Tree removal alone may make things worse over a certain percent of infection and appears unlikely to significantly limit disease spread. She suggested that the 77 HLB positive tree finds in San Gabriel may have four times that number in potentially infected trees. Victoria added that the San Gabriel genotype is a tight genotype (Type 2) which is very clustered.

### **Update on Ethyl Formate Registration Progress**

Etienne stated that Ethyl Formate registration has lagged since January due to an issue with residues. Dr. Spencer Walse and Jim Cranney intend to send the report to the Environmental Protection Agency (EPA) by the end of March 2020. He added that Jim is hopeful that EPA will approve Ethyl Formate in 12 months rather than the maximum 19-month process.

### **Mapped ACP/HLB Activities by Region**

Amelia Hicks presented maps of CDFA survey and treatment activity created in response to the January 29 Pest Control District (PCD)/Task Force (TF) meeting. She explained that Northern California has one Citrus office in Sacramento; Central California has offices in Fresno, Visalia, Shafter and Camarillo; and Southern California has offices in Commerce, Cerritos, Lincoln Heights, two offices in Riverside and one in San Diego, with one Coachella office proposed at the PCD/TF meeting. She stated that there are 14 counties with ACP regulatory agreements; regulation in other areas is handled by CDFA staff. The nursery stock map showed Nursery Stock Cleanliness participants and USDA-approved screen houses, which do not always overlap. Keith Okasaki added that the Nursery Stock Cleanliness program is run through CDFA's nursery program, made up of nurseries with mother stock in a CDFA-approved structure. Victoria explained that the map is also broken up by the nursery quarantine zones: the ACP-free Zone 1, low-risk Zone 2 and high-risk Zone 3. Victoria presented a map of bulk citrus ACP quarantine zones and explained that negotiations with USDA to remove counties with over two years without ACP detections from quarantine continue. Amelia presented a map of areas covered by grower liaisons (GL) and PCDs and the California Citrus Tristeza Eradication Agency in the Central Valley. She presented a map showing ACP and HLB treatments in the last 12 months, GL outreach and coordinated treatments, GL outreach and area-wide ACP treatments, and HLB positive tree removal. She presented a map showing grove trapping by contract, CDFA risk surveys and commercial grove surveys. She presented a map with a focus on overlaps between glassy-winged sharpshooter traps, commercial grove traps, border traps, CDFA traps and county traps. Victoria noted that CDFA outsourced trapping to the Cooperative Agricultural Support Services. She stated that last year, trap numbers were reduced thanks to an analysis of trap overlap.

### **HLB Quarantine Organic Fruit Moving to Farmers Markets**

Mark McBroom explained that southern counties are seeing HLB quarantine fruit in farmers markets. He stated that stems and leaves are being shipped from hot zones and believes that all ACP from the HLB quarantine zone should be considered hot. He stated that fruit sellers at farmer's markets must present a certificate of authenticity, but he isn't certain how rigid those requirements are. County staff only inspect farmer's markets twice a year. Keith Okasaki stated that there are county agricultural staff stationed at farmer's markets, working with their exclusion and detection deputies and providing reports to the county and CDFA. It was noted that gunny-sackers and farmer's market sales without a compliance agreement increase when fruit is left on the trees. Victoria explained that CDFA can suspend compliance agreements, and county staff can levy fines.

Keith added that there is a new round of county agreements going out shortly, and CDFA can provide direction to focus on farmer's market fruit coming out of the HLB quarantine area. Victoria noted that CDFA's county agreements are specific to ACP and/or HLB. They cannot be used for

pesticide enforcement. Keith explained that the scope of work details the regulated establishment of growers, haulers and packers; farmer's market vendors are regulated, and county agricultural staff's regulatory and quarantine activities are reimbursable through county agreements. He suggested that CDFA could create a compliance agreement specific to producers coming out of quarantine zones. He added that there has not been a meeting on that subject because there weren't many producers included in the HLB quarantine area.

### **Movement of HLB Quarantine Fruit for Processing**

It was stated that some growers in the Corona area cannot move fruit unless they wet wash it. It was suggested that the quarantine area must expand along the 91 corridor to allow those growers to get to a packinghouse. The situation as it stands results in commercial acres that cannot be harvested due to portable wet wash facilities not existing. Mark stated that growers do not have wet wash lines or other recourse and suggested bringing a packer into the HLB quarantine zone to ensure no one is losing business due to compliance requirements. Victoria explained that the quarantine is based on the five-mile radius around finds and would need to discuss arbitrarily bringing packers into an HLB quarantine zone with CDFA's legal team.

### **CLOSING COMMENTS & ADJOURNMENT**

The meeting was adjourned at 11:32 a.m. The next Operations meeting will be held by webinar on April 8, 2020 at 9:00 a.m. and the next Science meeting will be held on May 6, 2020 via webinar.