

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

Meeting Minutes
Wednesday, June 12, 2019

Opening

The regular meeting of the Joint Operations and Science Subcommittee meeting was called to order at 9:00 a.m. on June 12, 2019 in Visalia, California by Operations Chairman Keith Watkins.

Operations Subcommittee Members Present:

John Gless*	Ted Grether*	Roger Smith
Zac Green*	Kevin Severns*	Keith Watkins

Science Subcommittee Members Present:

Aaron Dillon*	Melinda Klein	Etienne Rabe
Beth Grafton Cardwell	Jason Leathers*	

Subcommittee Members Absent:

Ed Civerolo	Kevin Olsen
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CDFA Staff:

Jonathan Babineau*	Ray Leclerc*	Keith Okasaki*
Ryan Fong*	Magally Luque-Williams*	Maegan Salinas*
Tina Galindo*	Colleen Murphy-Vierra*	Nawal Sharma*
Sara Khalid		

Guests:

Bob Atkins	Colin Flippen*	Sylvie Robillard
Ameer Atrash*	Jim Gorden	Robert Roma*
Kevin Ball*	Subhas Hajeri*	Jason Schwartze
Jill Barnier*	Karen Lowerison*	Cressida Silvers*
Teri Blaser	Peggy Mauk*	Rayne Thompson*
James Cranney*	Mark McBroom*	Jack Williams*
Holly Deniston-Sheets	Neil McRoberts	Judy Zaninovich
Rick Dunn	Curtis Pate	Sandra Zwaal

*** Participated via Webinar**

Opening Comments

Keith Watkins welcomed the Committee, staff, and members of the public participating in person and online and stated that there was a quorum for the meeting. Keith acknowledged that the meeting was being held in compliance with the Bagley-Keene Open Meeting Act.

STRATEGIC PRIORITY 1 – Find and Eradicate Huanglongbing (HLB)

Trend Analysis on HLB Detections

Victoria stated that Plant Data Analysis Services (PDAS) produced a time series map of how HLB detections have expanded. It was noted that data points don't show the outer edges of the survey. Victoria stated that there are ongoing risk surveys in areas without delimitation surveys. She explained that the area of the survey grew slowly while focusing on the core of San Gabriel. She noted that there was lag time in receiving Dr. Gottwald's 2017 surveys, so staff used Dr. Gottwald's previous surveys and their local knowledge to hone in on Orange County areas with risk factors. The program was able to detect the HLB positive trees in Fullerton, Anaheim and La Habra with the interim risk model. She stated that with sufficient staff, teams try to work from the core out and from the edge inwards. In outlier areas, staff are shifted from core areas to the outliers. She stated that Maegan Salinas is doing an analysis of HLB survey work with the information available at the California Department of Food and Agriculture (CDFA). The analysis will need refinement with field staff input.

It was suggested that the movement of the disease follows the movement of the Asian citrus psyllid (ACP). It was stated that only detections have been noted, not where the ACP was introduced, and that detection order may not reflect ACP movement. Victoria requested that CDFA map psyllid detections as well for next meeting. She noted that the direction for the risk survey is to collect psyllids and symptomatic leaf tissue. Delimitation surveyors sample 100 percent of host plants and collect psyllids. Neil McRoberts stated that it isn't unexpected that a low proportion of psyllids have detectable *Candidatus liberbacter* (CLAs). He explained that David Halls found that with 100 percent HLB incidence, only 20 to 25 percent of Florida psyllids have detectable CLAs. David Bartells found that 60 percent of Texas psyllids to have CLAs. He explained that only one-tenth of one percent of California psyllids have CLAs, though that number is rising slowly. It was acknowledged that sampling is skewed toward delimitation surveys and infected trees.

Analysis of HLB Survey

Victoria noted that Maegan Salinas and Cassandra Davis did an analysis of the central valley trapping array in response to over-trapping in parts of Kern County, and now CDFA intends to do a similar analysis for the HLB survey. Maegan stated that she is mapping survey areas to see if they overlap. She explained that the risk-based survey is derived from Gottwald's model, with each Section Township Range (STR) being given a level of risk. She stated that delimitation surveys are conducted in a 400-meter area around HLB find sites.

Maegan noted that ideally both surveys are efficient and do not overlap. She explained that there is some overlap since delimitation surveys are based on circular buffers and risk are grid-based. Her analysis used 15 percent increments of overlap and found that there are areas of 60 percent overlap between risk and delimitation areas. She noted that this data doesn't consider areas where actual samples are being collected since surveys are based off symptomatic hosts. She stated that her analysis found 17 STRs with over 60 percent overlap which should have a recommended survey sampling of 1,550, though information from field staff may revise that model. Victoria explained that risk survey is not performed where active delimitation surveys are taking place. It was suggested to suspend risk surveys in already-infected areas and focus on delimitation surveys.

Colleen Murphy-Vierra stated that STRs are not necessarily square and are not always equal in size. She explained that the statewide trapping grid is an alternative that is already developed and well-known within CDFA, and the system can be broken down into sub-mile squares if necessary.

She and Maegan have discussed developing a model based on this statewide trapping grid. Victoria noted that in Gottwald's model, STRs are only used to develop the risk model. She explained that Gottwald recommends how many samples to take and the sites are sampled randomly within the STR. Neil stated that two risk-based surveys were created, one for residential and one for commercial citrus. He explained that the commercial risk survey would show the areas of highest risk closest to commercial groves. Victoria noted that the risk-based survey in use is biased 20 percent towards commercial citrus. Colleen stated that the Situation Status (SitStat) dashboard and map are based on counties rather than cities. She explained that Magally's data will be added to the SitStat to see which grids have been surveyed in prior months. She stated that other websites could be made to demonstrate overall progress.

Discussion on HLB+ Tree Removal in Residential Areas in Southern California

Etienne Rabe stated that risk-based survey is not very effective in finding HLB-positive trees. He explained that the survey finds a percentage of HLB-positive trees, minus a number of owner refusals and non-Polymerase Chain Reaction (PCR) but infectious trees. He stated that he has asked the Finance Subcommittee to isolate the cost of Southern California HLB efforts, but he estimated it at \$10,000,000 to \$15,000,000. He asked the Data Analysis Tactical Operations Center (DATOC) to analyze and report out at what point efforts have become ineffective. He asked Neil McRoberts to model how effective HLB-combating efforts are, and to decide if it is worth the money spent. It was asked if California has enough data points on HLB compared to Florida and Texas. It was noted that tree removal on this scale has not been attempted in Florida or Texas. It was explained that factors where the disease arrives remain the same across states, but the local conditions in the risk-based survey model gains more weight the more data points the state has. Etienne suggested that DATOC outline their methodology and timeline at the next meeting. Victoria suggested DATOC look at the Committee's previous strategic planning, because the scenarios did not include trigger points to switch between scenarios.

STRATEGIC PRIORITY 2 – Control ACP movement, Enforce Regulations

Review Grate Cleaning Protocol

Nawal stated that the grate-cleaning protocol will follow the pilot project. He outlined three steps: the approval process, compliance, and how to implement and enforce the protocol. He explained that each grower will give their proposed cleaning method in writing, Victoria and CDFA's pest exclusion quarantine staff will review proposals and share them with the origin and receiving County Agricultural Commissioners (CAC). If all parties agree to the proposal, CDFA will issue a special compliance agreement exhibit, which the grower will sign and add to their compliance agreement. CDFA or the CACs may suspend or terminate the grate cleaning protocol at any time for not meeting the ACP-free performance standard. He explained that the grower must submit the ACP-Free Declaration Form to CDFA, the origin and receiving CAC offices 72 hours in advance of each shipment. CDFA or CAC staff will perform random spot inspections of the fruit cleaned using the grate cleaning method. He explained that spot checks finding any bin with more than ten stems and leaves or any shipment with an average of eight stems and leaves per bin for the entire load may result in rejection of the load. Receiving CACs may take action including Notices of Violation, Notice of Proposed Action or the suspension or revocation of the grate cleaning method. He specified that according to Dr. Beth Grafton-Cardwell, any stem less than half an inch in length

is not a risk factor for ACP. He noted that the eight-leaf average is the same tolerance that United States Department of Agriculture uses for citrus shipments from Mexico into the United States.

Neil suggested that the Subcommittee keep an open mind about the threshold level and revisit it if necessary. He explained that of the 117 loads including in the pilot project, there was an eightfold difference in the average leaf number to the worst-case bin. He stated that rather than the average being a good predictor, many results from the pilot project were lower than expected while some results were much worse. He explained that the variance of max leaves per bin was 126 with the average max of seven leaves per bin, resulting in a massive inflation of variance over the average variance/mean ratio of 18.6. If the ten leaf per bin threshold is drawn through the distribution, in that data set 22 percent of results are higher than the current threshold. He stated that roughly 210,000 bins were moved between quarantine zones in the pilot project. Of the 117 loads inspected, an average of 68 bins per load were inspected. Using this dataset, 602 loads have at least one bin over the threshold. This would result in 11,815 leaves intercepted but 9,246 leaves would be allowed to move in loads deemed acceptable. He explained that he was most concerned about 20 of the 117 loads that included a worst bin outside the 95 percent confidence around the mean data; bins that were below the ten-leaf threshold and were not rejected. These loads were not unacceptable on the basis of their worst bin but had a lot of variance on the number of leaves per bin. He noted that the inspection rule should be written with some degree of confidence that it won't allow bad cases through.

Motion: To recommend that the grate cleaning protocol as presented.

First: Roger Smith

Second: Ted Grether

Motion passes: All in favor.

Nawal stated that movement of bulk citrus into HLB quarantine zones from any ACP quarantine zones currently requires no ACP mitigation beyond tarping, because moving out of the HLB quarantine area requires double mitigation. He explained that according to DATOC's model, there was a high risk in any zone-to-zone movement. He suggested changing protocol to include mitigation, since these loads could be moving ACP into an HLB zone. Victoria recommended moving this issue to the full Committee agenda.

Ethyl Formate Update: Bulk Fruit Movement Mitigation

Jim Cranney explained that Evergreen has a Section 18, but it was stated that application of Evergreen is too complicated and impractical for the average grower. The Department of Pesticide Regulations (DPR) wants to cancel the Section 18 due to lack of use. It was noted that the Section 18 is supposed to be an emergency measure. Jim explained that he met with DPR three weeks ago to request information about a Section 18 for Ethyl Formate. DPR wanted to ensure it wouldn't go unused like Evergreen. He stated that the California Citrus Quality Council (CCQC) and the Registrant both put a lot of resources into the Ethyl Formate registration, and there are also ethical issues to be considered. He noted that the response and interest for Ethyl Formate was very positive at an industry operations meeting in Bakersfield. Jim explained that Dr. Spencer Walkse has done commercial-level trials for the Ethyl Formate by tarping bins on the ground in groves, stacking bins and applying the fumigant. It was noted that Ethyl Formate is more effective and easier to use than any mitigation measures currently available.

Etienne explained that some additional information for the Ethyl Formate will only be available at the end of the year. Ethyl Formate should be ready for use by the end of 2019 or early 2020. He noted that even with a Section 18, Ethyl Formate would require six to nine months before it was ready. He asked the Subcommittees if a Section 18 for Ethyl Formate was necessary, and recommended that they allow the Section 18 for Evergreen to lapse. Victoria explained that if the Evergreen Section 18 lapses, the registration would be canceled then. There is no need for a use through date when no one is using the product.

Bactericides in Citrus

Jim stated that there have been new developments in bactericides. He explained that at the 2017 HLB Conference in Orlando, there was discussion on antibiotics and predictions that HLB would spread into Riverside. He consulted with CCQC's board and was encouraged to move ahead on Section 18 for bactericides. He recommended only using bactericides in high risk areas close to HLB infections. He noted that bactericides serve as preventative use on grove borders in combination with aggressive ACP control, ACP and HLB monitoring and tree removal, and may be used on whole grove treatments in the future. He stated that this would be a stewardship program and an attempt to get zero residues on the fruit. Bactericides are used in Florida for tree health and yield, but would be used in California to stop or slow the rate of infection. He stated that Jim Adaskaveg is working on a Multi-Agency Coordination (MAC) grant to study the situation in California. He explained that bactericides worked with mixed efficacy in Florida due to the large percentage of infected trees, a specific adjuvant sometimes going unused, growers not always using the recommended six applications, tank mixes disrupting acquisition in the tree, and that cost was a major factor with the decline of the Florida citrus industry. He explained that the California approach would be to apply bactericides prior to infection. Research shows that bactericides kill ACP and interfere with transmission and acquisition of CLAs. CCQC is coordinating with Sunkist, Wonderful, Jim Adaskaveg, Beth Grafton-Cardwell and California Citrus Mutual on an outreach campaign to educate consumers about the use of bactericides. CCQC is also forming a working group with both California and Florida, participating in the US Delegation Task Force on Antimicrobial Human Resistance and meeting with the Environmental Protection Agency (EPA) on this issue. He requested assistance to develop talking points, FAQs, other support documents and web content. He stated that CCQC requested \$60,000 from the Citrus Research Board (CRB) to fund these activities but the request was denied. He noted that \$60,000 was the minimum, and a more reasonable budget for this campaign would cost \$100,000.

Etienne explained that CRB's charter does not allow it to fund work that is not research-related. He doesn't dispute the need for the money to fight this information campaign, but that other citrus experts are skeptical of the efficacy of the two antibiotics. Neil explained that a New York Times article put the issue on the radar of the Public Policy Board of the American Phytopathology Society (APS), who have offered their help and perspective to the citrus industry. He recommended engaging with them as an impartial, well-informed outsider perspective. It was suggested that not handling the public response and public relations to bactericides correctly would hamper future controversial products. Victoria explained that Nuffer Smith Tucker (NST) was unable to assist CCQC in combating misinformation on bactericides because it is outside the scope of their current contract. A new Request for Proposal (RFP) would need to be prepared to get assistance through CDFA. She noted that NST does not defend the program's use of pesticides,

but rather explains to the public that the pesticides are used per the label and that the pesticides have been vetted through EPA and DPR. It was suggested that it is better for the APS to explain matters than the citrus industry itself, but that having a fact sheet for the master gardener program and other programs would be useful. Etienne suggested that Jim bring a proposal to the Committee for funding.

STRATEGIC PRIORITY 4 – Improve Data Technology, Analysis and Sharing

DATOC Update

Holly Deniston-Sheets stated that recently, DATOC suggested guidelines for how the program is to respond if HLB is found in or near commercial groves. DATOC suggested sampling the perimeter of a commercial grove if HLB was found within 400 meters and sample that perimeter twice a year based on differences in bacterial titer seen in infections in other areas. She explained that using the 1,047 CLas-positive samples available from March 2012 to December 2018, DATOC found no differences in Ct values by season. DATOC suggested that the twice a year sampling be reduced to one sample per year. It was suggested that once the HLB infection travels to more extreme climates there may be more of a seasonal difference in bacterial titer peak times. Holly also recommended revisiting the analysis if significant numbers of commercial CLas-positive trees are found.

Motion: To recommend the DATOC proposal to scale back surveys from two samples per year to one sample per year based on the data that shows there is no seasonal variability in Ct value.

First: Keith Watkins

Second: Ted Grether

Motion passes: All in favor.

Dog Team Visit

Peggy Mauk explained that the project was funded by CRB to expand canine surveys and test dog alerted trees. She stated that the objectives were to screen and identify potential positives, follow them with other early detection technologies (EDTs) and put together an Action Plan on how to get ahead of the disease. The project used qPCR, the dogs, secreted proteins and metabolomic compounds. She stated that during the dog team visit in 2017, 3 percent of 1,699 trees were alerted by the dogs. She explained that during the 2019 dog team visit, 3,903 trees were surveyed at University of California Riverside campus in less than three days; 31 blocks surveyed of which seven were tree for tree, four mixed tree for tree and perimeter and one tree for tree plus transects. There were 289 canine alerts. She stated that 2,577 trees were surveyed at the Lindcove Research and Extension Center; 26 blocks surveyed with 24 perimeter, one tree for tree, and one mixed perimeter and tree for tree. There were zero alerts. She explained that there was no correlation between Phytophthora-infected trees and canine alerts. A tree for tree survey of known stubborn-infected trees were negative. She noted that during the 2017 visit one of the 245 dog alerts was a viroid, and during the 2019 visit 31 of 165 dog alerts were viroids. It was also noted that Lindcove has two viroid blocks, and there were no dog alerts. This data indicates no positive correlation between viroids and dog alerts. She explained that there was a blind test where a female dog was sat at every tree within a row in which there was only one known dog alert tree, and a follow-up dog only sat at the dog alert tree. This data indicates no positive correlation between dogs sitting due to smelling other dogs.

Peggy stated that when comparing 2017 and 2019 visits to Field 5 A-H, in 2017 the dog alert survey pattern found no alerts on the western edge and multiple alerts on the southern border. In 2019, there were several adjacent trees alerted, with three trees being alerted both times. She stated that the dog alerts in 2017 have been tested three times, in 2017, 2018 and 2019, but there have been no confirmations on any of the alerts. 2017 found no alerts during a perimeter search of the Biocontrol Valencia 21D grove while 2019 tree to tree search found 27 percent of trees received dog alerts. The dog alert trees had leaf samples taken. 2017 found two dog alerts from transects of the Lemon Variety Trial 13F grove while 2019 found multiple perimeter dog alerts from a tree to tree search. She explained that processing samples were divided equally so that all parties had the same sample. In 2017, 15 tree samples were triple alerts, with Hartung alerts overlapping 70 percent and Ma alerts overlapping 30 percent with canines. In 2019, samples from 289 trees have been taken, processed and are ready for analysis. She noted that one tree was sampled due to symptomatic yellow leaves, but all assays were negative for HLB-associated pathogens. She stated that dogs alerted when passing by caged trees on windy days but only alerted when taken inside the cage on calm days. She noted that one non-dog alert caged tree is now an alert. She noted that a citrus relative, hesperethusa, was found negative by Ribonucleotide Reductase (RNR) primers but found positive by Lee's primers. A tree in the Biocontrol grove also gave questionable results, with one sample out of 40 having a Ct value of 38. She explained that the cages will be removed due to drawing negative attention. She explained that scent pads have been developed to train the dogs without known positives. The program is working on a MAC proposal for implementation of secured BSL 3 training facilities. She stated that Monique Rivera will initiate ACP trapping especially on urban interface areas.

Peggy stated that bactericides have translaminar movement, so psyllids feeding on a treated tree will eliminate CLAs in the psyllid and recent infections in the leaf. She noted that trees with multiple treatments of fireline/firewall for almost three seasons and two antibiotic-treated trees remain dog alerts. She noted that in this small sample size the fireline/firewall bactericides do not appear to interfere with the dogs' ability to alert. She explained that her teams are spraying the outside edge of full-canopy orchards with donated bactericides and spraying tree by tree in smaller orchards. Victoria stated concern at the lack of an alert protocol about what constitutes an alert, but Peggy explained that if a dog looks to be getting fatigued or sitting on all the trees, the teams will switch out the dog and overlap sections with a new dog to ensure nothing is missed. Neil suggested doing spatial analysis on the data to see if it matches with spatial analysis in Florida and Texas.

Review CDFA Situation Status (SitStat) Maps

Colleen stated that CDFA collected all data into the SitStat except for some treatment data. The SitStat includes risk survey, delimitation, trapping and treatment data. She noted that the risk survey data deviates from proposed STRs due to lack of host material. She explained that she will produce a how-to help document on SitStat functions. She stated that the map is zoomable with multiple layers based on city or county boundaries. She noted that she would prefer a web-based map format rather than paper maps due to security concerns. Victoria noted that that surveyors collected live psyllids in known ACP areas rather than grove trapping. Colleen stated that she has treatment block data, but it is not yet on the Enterprise server. She noted that she will be attending an ESRI training conference to improve the SitStat presentation. Victoria stated that when they get

the web-based Citrus Surveyor app for CDFAs surveyors, the SitStat data will automatically populate.

PDEP HLB Maps

Magally Luque-Williams explained that of the 27 counties in Cycle 1 of the risk-based survey, 19 counties are complete. Surveys are ongoing in Fresno, Kern, San Diego, Riverside, Los Angeles, San Bernardino, Tulare and Orange. She stated that there were Orange County delimitation surveys active in Anaheim, Garden Grove, Westminster, Santa Ana and Huntington Beach.

Mapping Out Periods of Treatment

Ray Leclerc stated that August 1 to September 30 was the window Beth Grafton-Cardwell recommended for optimal areawide treatment. He noted that there have been fewer areawide treatments than preferred in the last one to two years. He explained that the first step is defining areawide treatment such as area participation and ACP detections. Once the scope of the project is defined, he and Tina Galindo will ensure there are enough staff and contractors to perform the treatment. He expected to come up short of one hundred percent participation for the 60-day period and recommended prioritizing the high priority areas first. He explained that he would explore options, beginning with contracting staff for a baseline and looking into hiring additional staff or finding temporary space to put them, contacting vendors, or other CDFAs staff on travel. Etienne suggested calendaring the optimal times first to understand what is happening when before attempting to fill in additional staff.

Closing Comments and Adjournment

Keith Watkins adjourned the meeting at 12:26 p.m. The next Operations meeting will be held by webinar on July 3, 2019 at 9:00 a.m.