

Informational Hearing

Senate Committee on Agriculture
Senator Cathleen Galgiani, Chair

***Crisis in the Golden State: Asian Citrus Psyllid's
Threat to Destroy California Citrus***

Sacramento, California

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SENATOR CATHLEEN GALGIANI: Good afternoon ladies and gentlemen. Welcome to the Senate Committee on Agriculture's informational hearing titled "Crisis in the Golden State: Asian Citrus Psyllid's Threat to Destroy California Citrus."

California leads the nation in ag productivity, where the farm gate value for agricultural products is \$53.5 billion. Despite this growing market, California is consistently faced with challenges that we must overcome, such as the introduction of deadly pests and the diseases that threaten our valuable crops and disrupt local economies.

Today's hearing focuses on one particular pest, and that is the Asian citrus psyllid and the disease that it carries, Huanglongbing. Asian citrus psyllid and Huanglongbing have been detected in multiple counties throughout the state, requiring emergency quarantines in both ag and residential areas. And more importantly, Huanglongbing has been detected in multiple trees in the LA Basin,

fueling fears that HLB will continue to spread with the growing Asian citrus psyllid population that we have here in the state.

The challenge to stop Asian citrus psyllid from spreading can only be addressed through local, state, and national collaboration and communication. We have witnessed the massive devastation of Florida's citrus industry, where the Asian citrus psyllid was first found in 1998; and within two years, half of the industry was decimated.

There have been detections of Huanglongbing in every citrus-producing county in Florida, costing \$7.8 billion and nearly 8,000 jobs. California cannot afford to sustain this problem and the similar damages, so we must work together to find a sustainable way to manage and control this pest and protect our citrus trees.

Today's hearing will provide a thorough examination of the multiple Asian citrus psyllid and Huanglongbing finds in California and bring to light any further needs or support that can be provided for the eradication effort.

With that, I would like to invite our first panel to come forward. With us we have Alyssa Houtby with California Citrus Mutual and David Roth, President of Cecelia Packing Corporation. And I would also like to thank our first witness, Andrew Meadows, who is being Skyped in with us today from Florida Citrus Mutual. Welcome, Andrew, and thank you.

MR. ANDREW MEADOWS: Thank you very much for having me. Good morning to the committee. I appreciate this opportunity to testify. Again, my name is Andrew Meadows. I'm Director of Communications for Florida Citrus

Mutual. We are Florida's largest trade organization, representing about 6,000 growers.

As the original speaker mentioned, we first found the Asian citrus psyllid in 1998 and did not detect the actual disease, HLB, until 2005; so there was a seven-year lag period. At the time, a lot of growers and industry were in denial. We were just coming out of a major battle with citrus canker. We were all fatigued about that and really didn't have the energy to deal with a new disease.

Well, here we are 11 years later. Our production is down to about 76 million boxes of oranges, 10 million boxes of grapefruit, and 2 million boxes of specialty citrus. That compares... About 12 years ago, we had a record orange crop of 242 million boxes. So we have had significant decrease in production.

Twelve years ago when we produced that record orange crop, we covered about 850,000 acres. We're down to 500,000 acres now. Some of that decrease can be attributed to the hurricanes; again, canker development in Florida; and development pressure. But certainly, a significant amount is due to HLB and the devastation that it causes. Some estimates have pegged the losses at \$4 billion and 8,000 jobs. That's a bit of a dated report, so all assumptions would point to those figures being higher.

Right now, growers are fighting. It's expensive to fight HLB. Back before the disease hit, it cost about \$500 an acre to grow citrus in Florida. That number, with all of the inputs--the fertilizers, the chemicals--has shot up to about \$2,000 an acre now.

When we finally got out of our denial phase here in Florida, we summoned the National Academy of Sciences and asked them what can we do. They're some of the foremost agricultural scientists in the nation. One of their primary recommendations was to form entities called citrus health management areas, or CHMAs, where growers cooperatively work together to fight the psyllid--spray rates, timing, what chemicals they use to avoid resistance. These CHMAs have given us some success. Psyllid counts were down. Recently, they've been up for a variety of reasons, but CHMAs have really helped us out. And growers working together, former competitors, and colleagues getting on the same page with each other was really a ground-breaking occurrence here in Florida; and it's helped us survive the last 12 years.

We've also had some success with heat treatment, where you actually heat up the tree to knock back the bacteria. We have steam doing that. We have tents doing that. That's shown a moderate amount of success. Some growers have found that the trees can rebound if they look at their water quality and use better quality water on the trees. So we're having a little bit of success. But again, it's an extremely challenging time.

The trees are stressed; they're fighting. If you'll recall, HLB attacks the vascular system of a tree so it can't uptake nutrients. It's basically starving itself when it dies. So now, we're seeing a new fungal disease called postbloom fruit drop all over the state. It's not a new disease; but now, because the trees are stressed, it's causing major problems for our growers. And you ride around the citrus areas, you'll see basically postbloom fruit--which is the small fruit, the tiny

pea-size, and golf-ball-size fruit--dropping off the trees. And that's next year's crop. So we're very, very concerned about next year's crop at this point in time.

Abandoned groves are another major concern here in Florida. These are groves that were either bought for development that never got off the ground after the real estate bubble or growers have just walked away. There's still trees in the ground, providing feeding grounds for the psyllid--reservoirs of the disease, if you will. We've got 130,000 acres of abandoned groves.

If you'll remember, I said we have 500,000 acres of producing groves. So that's almost 20 percent are abandoned, serving as breeding grounds for the psyllid. And we've been struggling with this problem for quite some time. We have been able to remove some of those groves. But because ownership is all over the place and, you know, everybody has different plans for their property; it's been tough to get those trees out. But we are working on it both with our state and federal regulators.

The good news in all of this is that our state and federal officials and regulators have been absolutely lockstep with us in this fight. On the state level, our legislature, Senate leaders, House leaders, our Commissioner of Agriculture Adam Putnam have been terrific. They understand the importance of our industry to the state of Florida, particularly the interior, the rural communities across Florida. They've appropriated, just in research funding, \$20 million over the last five years to go directly to citrus research to beat this disease, just \$8 million this last session in 2016. So again, I can't say enough about our state legislature and what they've stepped up to the plate for the Florida citrus grower.

On the federal level, our congressional delegation has been tremendous. Two years ago, they helped pass the farm bill, which included five years and \$125 million in funding for citrus research. We're in year two right now of that funding. That has funded disease research, everything from bactericides to genetic engineering to RNAi to the heat treatment I mentioned before. That has been a godsend for our industry and has helped fuel really a Manhattan Project-type funding program for us. And it certainly has been a shotgun approach. We're looking at everything right now that can possibly affect that psyllid as well as the bacteria.

You probably know, I know, we've been working with California Citrus Mutual in an effort to tweak the IRS Code right now to stimulate re-plantings. You know, we need to get more trees in the ground. We've lost dozens of packing houses. We've lost processing capacity.

And just a side note, our industry is, about 95 percent of our oranges go to juice--Tropicana, Minute Maid, Florida's Natural. California, as you know, is primarily a fresh-fruit industry with the majority of fruit going to the fresh market.

But we are looking to get more trees in the ground. We've got to support that infrastructure. This IRS tweak would allow growers to expense the costs of re-plantings immediately. And we'd like to get 20 million trees in the ground over the next 10 years--again, to support that infrastructure up and down the interior of Florida.

Again, I mentioned the research. We've got the best minds at the University of Florida, the USDA; I know your research institutions in California are working extremely hard on this problem as well. I always joke that if you're a citrus researcher and you're not funded right now, you probably need to get in another profession because we have appropriated and granted a lot of funds right now. And we have had some success, as I mentioned before.

Growers themselves--I mentioned the federal and state funding--I know California has a research assessment for growers. Florida growers have committed over \$100 million over the last 10 years. That's money that would previously have gone toward marketing our products. But the decision was made that if we don't beat this disease we're not going to have a product to market, so we need to put that money towards research. So they've got significant skin in the game.

In closing--I know I have about 10 minutes and I'm getting close--but there is, you know... I've outlined a lot of doomsday scenarios here, and it is very challenging, but there is optimism out there. I mean, our growers are extremely resilient. They're multi-generational families, fourth and fifth generation growers, who are "all in" right now. You know, we've beat hurricanes; we've beat other diseases. Of course, you probably remember the freezes of the '80s--some of you--which devastated Florida's industry. We came through that. We're going to come through this.

You know, we still represent a \$10 billion economic industry. Every year we contribute \$10 billion to the state's economy. We still support 62,000 jobs.

All of the communities down the interior of the state--the Sebrings, the Lake Placids, the Lake Wales--they rely on citrus. And you can't find somebody who citrus doesn't touch in those communities; and they're relying on our leaders and our researchers and our growers to find solutions. And I'm confident we will. I'm confident that we're going to have a future, but it's certainly going to take a partnership between state, the federal officials, as well as regulators to get this done. But we're going to get there. And again, I appreciate your time.

SENATOR GALGIANI: Thank you very much. I had a couple of questions for you. You talked about success with the heat treatment, using steam and tents.

MR. MEADOWS: Yes.

SENATOR GALGIANI: Can you tell us a little bit more about that, how that works and the time...

MR. MEADOWS: Sure.

SENATOR GALGIANI: ...and the cost of that?

MR. MEADOWS: Sure. Actually, there are prototypes out there and there are... It's actually formed sort of a cottage industry right now of tents or, for lack of a better term, sort of a canvas cover that is put over the trees. Some of the prototypes use steam to actually heat the tree up with the steam. Some just use the solar power to heat up the tree and put a tent that covers maybe four trees at a time. Now, that won't kill the bacteria, but it will knock it down and allow that flow to take those nutrients up to the tree. So it's another tool in the toolbox. It's not a silver bullet. But in combination with the other inputs and solutions I

mentioned, you can grow a crop right now; but it is tough. It's not a long term... We don't have a lot of data on it; but anecdotally, it's showing trees are responding to it well. And it's another tool.

SENATOR GALGIANI: So when you're using the canvas covers and the steam treatment or the solar, is it that you have to permanently keep the trees covered in that way or what's the timeframe or is it unknown?

MR. MEADOWS: It's you do it twice a year. And you heat it up to--I'm not sure what the--I think it's 120 degrees for four hours, and then you treat it later in the year. So it's once every six months. You don't have to keep the tree under the heat. You heat it up and then you take it off, and the tree responds to that. And then you get it in six months again. So, no, it's not a consistent heat.

SENATOR GALGIANI: Is there any sense of how long this treatment every two years can keep these trees alive? And how long has it worked at this point in time?

MR. MEADOWS: Right, right. We don't have enough data on it. It's still... I don't want to call it experimental because it is being used fairly widely, but we're still looking for year-over-year data. As you know, collecting data on this type of research takes several years. But anecdotally, we are seeing that the trees are responding. The flush, the new growth, is better--better leaves, better yields on the trees. But it is still in the, quote, "experimental" process. We don't have a lot of year-over-year data at this point.

SENATOR GALGIANI: Thank you.

SENATOR TOM BERRYHILL: Yeah. I've got a question. How much...

MR. MEADOWS: Yes, sir.

SENATOR BERRYHILL: How much per acre does this cost? And who's... What burden does the cost go to? The grower? Or is the state putting in any money? Feds putting in any money? I mean, it's going to be an astronomical cost to be able to treat 1,000 acres of citrus.

MR. MEADOWS: In general, it's costing us about \$2,000 an acre to grow citrus right now. That's full-blown management. That's a Mid [Florida Citrus Foundation] program. Again, 10 years ago that was \$500 an acre. So we are not getting direct funding from the state or the federal government to fund production. But as I mentioned, we have garnered significant research dollars, support dollars at the state level. So I guess it's all... If you look at it as all one pie of money, that certainly helps--money that otherwise the grower would have to put up. But no, we're not getting direct production grants or anything like that.

SENATOR BERRYHILL: Okay. Thank you.

SENATOR GALGIANI: Any other questions of this witness? Okay. Thank you very, very much. That was very insightful. And you mentioned some things that I know I have not heard of up to this point. So I really appreciate your testimony.

MR. MEADOWS: Thank you. And Anne has my contact information if there are any follow-up questions, certainly.

SENATOR GALGIANI: Thank you. And our next witness is Alyssa Houtby, Director of Public Affairs with California Citrus Mutual. Thank you.

MS. ALYSSA HOUTBY: Good morning. Thank you, Madam Chair and members of the committee. This morning, I'm grateful you had the opportunity to hear from Andrew first about what the experience has been in Florida with regards to the Asian citrus psyllid and Huanglongbing.

I, myself, had the opportunity to travel to Florida earlier this year. And let me tell you, until you've seen it firsthand, you can't fathom the destruction that this disease has resulted in in Florida. There's whole communities that are almost like ghost towns now.

As part of my trip to Florida, I worked with a film crew on a documentary that we're going to show you now. And this just gives you a taste of what the Florida grower is going through right now. And I have to say, I was impressed and encouraged by their optimism. They are true farmers. They are not giving up. But nevertheless, this has been extremely damaging to their industry as a whole. So we'll get that video played for you right now.

VIDEO SOUND: Since the onset of the disease, we've gone from almost 242 million boxes in the state of Florida to now less than 70 million boxes. It's a dramatic change.

My name is Kyle Story. I'm a fourth generation citrus grower from Central Florida.

The first signs of HLB, or "greening," that we found was in 2005. We thought they were a nutritional deficiency in the tree. And we know now that that was the first signs of HLB. Our first reaction was to immediately adhere to the advice of certified crop advisors--the folks

that we trust--and they advised us to spray for psyllids. Looking back on it, it was one of the wisest decisions we made. Ten years ago I'd tell you I wasn't a farmer. Today, what we do in Florida to raise citrus is farming.

CHMAs are citrus health management areas. On a voluntary basis, you're trying to control psyllids on a much larger level. And 100 percent participation in those area-wide spray programs, those CHMAs, is essential to psyllid control. We were very concerned for a long time here in Florida about what your next door neighbor was doing and the term "bad neighbor." We should have been more concerned about our "neighborhood." Neighboring groves that are abandoned are very problematic for the industry.

I'm Mark Wheeler. I'm a fourth generation citrus grower and fifth generation agriculturist here in Central Florida. We discovered HLB in our own groves back in probably late 2008, early 2009. We felt like the infection was relatively low, but we knew it was coming, and we were aggressive about pushing out trees at that point in time. We found early on that if you were spraying a block and your neighbor wasn't at the same time, well, the psyllids just moved from your block to theirs. And then a week later, when he sprayed his, the psyllids came back to yours.

We haven't been battling the disease long enough to know what an average tree age would be. You know, we're able to treat the younger

trees with a drench for the psyllid for the first couple years. And where we'll shake out, it's hard to know. But, you know, we're shooting for 15 to 20 years. And we're planting... Most growers are planting a little higher density these days because--the trees that were planted by my grandfather, they were expected to live 60 to 80 years and be productive all through that life, but, unfortunately, I don't think that's going to be the case going forward.

There's a lot of folks in the industry who maintain that the small producer won't survive. And I, personally, think it's the engaged producer is going to be the one who survives. We're in a different reality, and we have to embrace that. We have the world's most brilliant minds and scientists working on this disease. We've secured almost \$200 million in funding for this research. And we feel that with all that brain power and with all those resources, with all the grower initiative that we see in each and every field, we're going to have to be successful.

My biggest advice for California and their citrus industry is to be vigilant about psyllid control. We now know that the psyllids can fly up to four miles in a 24-hour period. They can fly as high as a three-story building.

As far as combating the disease, our advice to producers in California is just psyllid suppression. Visit with your neighbors, set up a CHMA. And, you know, scout and know where the psyllid is. And just accept

the fact that you're probably going to have the disease--if you don't have it already. The quicker you can hop on psyllid suppression, the better position you'll be in.

Twenty years ago, we were oversupplying our market; and you didn't want to help your fellow grower; and so you wouldn't openly share with them your growing practices, of what you were doing right or wrong. Today, we're an open book. It's okay to make a mistake, but I made it for you. I hope one day to get back to the point where I don't want to share. That'll mean that we got to the other side. So if you have the opportunity to protect your neighborhood, sit down and talk with your fellow grower about the importance of psyllid control and the cost-effectiveness of it down the road. It's vital to the future. [End of video]

SENATOR GALGIANI: Thank you.

MS. HOUTBY: You can see the landscape in Florida has changed significantly since the onset of this disease. And I fear that that is what California will look like if we don't act now to protect our citrus trees. So again, I want to thank you for the opportunity to speak before you today and for your interest in this subject and bringing the issue up to the legislature as a whole.

HLB is a certain death sentence for California citrus trees and our citrus industry if it is allowed to spread. Despite millions of public and privately funded research, there remains no cure for the disease--which means our best defense against HLB is to prevent further spread of the Asian citrus psyllid.

Citrus industries around the world are in crisis. In Mexico, every citrus-producing state is infected with HLB. In Brazil, over 65 million trees have been removed due to this disease. In the United States, 90 percent of Florida citrus groves are infected. And the disease has spread to Texas, Louisiana and now California. It's been less than a decade, 2008, since the first Asian citrus psyllid was discovered in California. And today, there are quarantines in place for the psyllid in all or portions of 21 counties. Despite our efforts, ACP is now endemic in Southern California and continues to move north along the Central Coast and into the Central Valley. Last fall, ACP populations exploded in Kern County, and we're hearing of new finds in Tulare County--which is the largest citrus-producing county--almost weekly. In 2012, the industry's worst fears were realized when HLB was discovered for the first time in a backyard citrus tree in Hacienda Heights. More recently, 20 trees were discovered to have the disease in San Gabriel, and it's generally assumed that there are more positive trees in that area.

But early on, the industry realized that a proactive and comprehensive approach would be necessary to stop HLB from devastating our industry, as it had and continues to do in Florida. In 2009, the industry worked to pass Assembly Bill 281, which created the Citrus Pest and Disease Prevention Program within CDFA and authorized a mandatory assessment on growers. The industry now raises approximately \$15 million per year for residential and urban trapping treatments, biological control releases, and survey work to control the spread of the psyllid. The program also receives federal funding of approximately \$10

million per year. However, the scope of this issue is increasing at a rapid pace, and additional resources are necessary to maintain the program's effectiveness.

Citrus growers are currently paying the maximum allowable assessment, but it's not enough. Our 2015-16 budget for the program is \$17.6 million. However, the projected revenue from assessments is only \$16 million. Currently, the industry is sponsoring a bill, Senate Bill 822, to increase the grower assessment cap from 9 cents per 40-pound carton to 12 cents per carton. Based on current production levels, this could result up to a \$5 million increase in funding from the industry alone. Over 75 percent of these funds go directly to urban areas for the survey work, for trapping, and for residential treatments. Commercial efforts and the costs of complying with quarantine regulations fall directly on the grower on top of this assessment fee.

Psyllid control is the industry's biggest priority. Growers are currently operating under regional areawide management strategies in which all growers in a defined area coordinate management efforts to maximize the impact on psyllid populations. Furthermore, current regulation requires that farmers growing within a quarantined area to take specific mitigation steps before moving bulk citrus loads out of the quarantined area to be packed in a commercial packing house.

A growing challenge, however, that we're facing now in regards to psyllid control is the willingness of homeowners to allow CDFA to treat their backyard trees. By and large, homeowner cooperation has been positive, but there are some areas where homeowners are opting out of treatments at an increasing rate.

A common reason given is concern about pesticides. I fear that the misperceptions around pesticides and their impact to pollinators, specifically, are directly influencing their decisions not to treat their trees. And here in California, we have more citrus trees in backyards than we do in commercial production. The industry is spending nearly \$1 million per year to educate homeowners about the issue and about what they can do to protect their trees. If we lose the battle in backyards, we will lose this battle overall; and we will lose our citrus industry.

I would be remiss not to mention that this program is truly a cooperative partnership between industry; state, federal and county governments; universities; and, of course, the general public. None of the countries or states I mentioned earlier have such a robust partnership that includes direct outreach to homeowners. In our view, this partnership must continue in order to prevent HLB from taking hold.

In closing, I want to reiterate that the industry's approach to ACP and HLB has always been a proactive one. When talking about this disease, we often refer back to what has taken place in Florida. In one sense, California has the benefit of time that Florida did not. However, the Florida industry has managed to limp along for over a decade with near total infection, but I assure you that California citrus will not survive with HLB as long as the Florida industry has. We are a fresh market industry. In fact, we produce 85 percent of the nation's fresh citrus supply. Whereas, Florida is primarily a juice market, so that affords them a little flexibility in the quality of the fruit that they send to market. We don't have that

flexibility here in California. So from our perspective, we do not have the benefit of time that Florida also did not have.

We all remain optimistic that science will deliver a solution, but at this point, science is not keeping up with the urgency of the situation. We are in crisis mode now and will take every action necessary with the support of our partners to save California citrus. Thank you.

SENATOR GALGIANI: Thank you. I have a question.

MS. HOUTBY: Okay.

SENATOR GALGIANI: So if a homeowner doesn't want to allow CDFA to come in and treat their tree...

MS. HOUTBY: Right.

SENATOR GALGIANI: ...what happens if the homeowner just says, you know, this is beyond me, I don't know how to deal with it, I don't want to have to deal with it, I just want the tree gone? Is there funding to take the tree out?

MS. HOUTBY: As a private industry, we're partnering with Bayer Crop Science to offer that option to homeowners. They can request that their tree be removed. And we're looking into another program in the San Gabriel area specifically to get those highly likely positive trees out of the ground as soon as possible.

In areas where there is not HLB – I'm thinking specifically along the Central Coast – where there are populations of the Asian citrus psyllid in close proximity to commercial groves, there's a lot of people opting out of treatments. And they're

opting out because they're afraid that the pesticides that CDFA is applying will impact pollinator health.

Now, we know that the science does not suggest that that is fact. And the manner in which these products are applied are per the label requirements and very safe and effective against the Asian citrus psyllid. But it's common perception that these pesticides are harmful to pollinators and that has directly caused an increase in opt outs, which will jeopardize the efficacy of our program if that number of opt outs continues to grow.

SENATOR GALGIANI: So are very many homeowners opting to go ahead and remove the trees? Is that happening?

MS. HOUTBY: We're seeing a slow interest into it. We haven't promoted it for very long. And honestly, people love their citrus trees. So it's a hard sell to ask them to take them out, and it's not one that we really want to have to sell. But if they're not willing to treat, our only option, really, is to ask them to take the trees out of the ground.

Now, there's some organic options that I'm sure the panelists that are going to be speaking today can mention. But the pesticide treatments are the most effective, so that's our best option.

SENATOR GALGIANI: Okay. Any questions?

SENATOR BERRYHILL: Yeah. Back in the day when my dad was Director of Agriculture, they had a beetle problem, they had medfly problems. When we had to go into backyards, they didn't have any say about it. Have the laws changed where now we can't go in if they say no?

MS. HOUTBY: I'm going to defer that question to CDFA because they are going to have a much better handle on what the regulations are now and what they are able to do by law.

SENATOR BERRYHILL: Now, the treatments that you have for these trees, we don't have anything that actually kills the bug?

MS. HOUTBY: No, the neonicotinoid pesticides do kill the bug. And we apply them systemically so that...

SENATOR BERRYHILL: Okay.

MS. HOUTBY: ...so it's in the system. And when they pierce or suck on the tree...

SENATOR BERRYHILL: So when you have a regional spraying program, everybody sprays the same night or whatever, ...

MS. HOUTBY: Yes.

SENATOR BERRYHILL: ...within two days or whatever... It is a systemic. And are those bugs gone, then, or do they fly other places or what's the deal?

MS. HOUTBY: Well, that was one of the arguments for the areawide management strategies. Because when growers are all treating in a general area, you have a much better chance of...

SENATOR BERRYHILL: But that's not mandated?

MS. HOUTBY: No, that's not mandated. That's a voluntary program that the industry is employing.

SENATOR BERRYHILL: Okay. So ultimately, in your opinion, what does your industry need from us to help this program along and to get rid of this terrible disease?

MS. HOUTBY: In our view, this is a state issue. This is not just an industry issue.

SENATOR BERRYHILL: Right.

MS. HOUTBY: We need the State of California to support our efforts. This issue is growing at an exponential rate, and we feel the industry has taken the proactive approach of funding this program itself. We've had support from the federal government, and now we're asking for support from the state government through the General Fund, as well.

SENATOR BERRYHILL: Your industry has been fantastic as a self-help industry. How much money are you guys talking about, or do you even know?

MS. HOUTBY: Well, we're funding about \$15 million per year.

SENATOR BERRYHILL: Right.

MS. HOUTBY: It could be up to 20 if our legislation passes. We're asking for \$5 million from the General Fund. We think it's a drop in the bucket, but it's time that the State step in and support these efforts.

SENATOR BERRYHILL: Okay.

SENATOR GALGIANI: And this is for residential and urban.

MS. HOUTBY: Yes.

SENATOR GALGIANI: This isn't even for treatment and detection and...

MS. HOUTBY: Right. I'm glad you clarified that.

SENATOR GALGIANI: ...industry groves. We're talking about backyard trees...

MS. HOUTBY: Exactly.

SENATOR GALGIANI: ...that the industry is paying for the efforts for backyard trees for homeowners.

MS. HOUTBY: Exactly. All these funds go into residential and urban areas. And growers are responsible for paying for treatments and regulatory compliance on top of what they're paying into this backyard residential program.

SENATOR BERRYHILL: Great.

SENATOR GALGIANI: Any other questions? Okay.

SENATOR BERRYHILL: I'm good for now.

MS. HOUTBY: Thank you.

SENATOR GALGIANI: Okay. Thank you very much. And our next witness is David Roth, who is President of Cecelia Packing Corporation.

MR. DAVID ROTH: Thank you Madam Chairman and committee. I'm going to try to bring a different perspective to this. I run a packinghouse. I also farm personally, and I run and man, operate, a 2,150-acre citrus growing farm that we own personally – that I don't personally, but that the company owns.

And so looking at the direct costs on some of these things, going into the dollars and cents of what this industry as just a little one percenter as me, we pack about a million-two to a million-three cartons a year. That includes navels, Valencias, blood oranges, Cara Caras, and some different tangerine varieties. In doing that, I employ about 85 people in the packinghouse almost year round. I

employ 150 people almost year round in the fields harvesting the fruit. I also employ about 12 people in the office staff. And in our farming division, I have another 10 people working day and night, spraying, whatever we have to do, irrigating. This is a major contribution within our little teeny community of roughly two to three million, four million dollars that our company pays people for labor helping the citrus industry.

And the Asian citrus psyllid – we are not in denial. We know that this is a major issue in our surrounding growers, [talk at the] coffee shop, whatever. Citrus Mutual has done an excellent job of getting out the word, and we have taken notes. We are in different spray areas, which will be talked about later. If they find the pest, then we do a mandated, five acres, 800-yard spray thing. And everybody tries to get that done. But we don't have the CHMAs that the Florida people have and that seems to be working. And I think we're talking more and more about getting a spray program. Whether it's us or other community growers in a vicinity to go ahead and spray on a timely basis so that we're just not pushing the bug from one street, across the street to the neighbor. We need to encircle this and really kill a number of areas.

The latest find -- or one of the finds that you guys have maybe take notes of -- we've got it clear up in here -- to Tracy now. In the past, it starts off easily down at the border. And in the past, how it deals with the packinghouse -- I have some of the lemons that I pack or handle, we have to send down to Ventura or to Corona. And so the problems in dealing with what we have from going to one district that's not infected to a district that is infected -- we're having to spray five

or ten acres, go out and pick it, cover it, tarp it, and take it into a different community that is -- related to whether it's a zone that has had finds, we are [in] an ACP zone or not. And so going down the freeway...

SENATOR BERRYHILL: So excuse me real quick. So what you're saying is, once you got that fruit picked, then you got to fumigate it before you send it down there?

MR. ROTH: Well, we have to spray it, and then they have to tarp it. Because if it goes between--in a zone that there is no APC [sic] found, then you would potentially contaminate that area. So if you start up here, and we're in a zone, and you go down 99--which is half the problem--and head over the hill--which is a problem--if we go into a non-pest zone, then those trees need to be sprayed and brought and handled properly through the right channels.

SENATOR BERRYHILL: And your plant is where?

MR. ROTH: I'm in Orange Cove, but I do have lemons that go into Ventura and go into Riverside. And so if you cross a zone that doesn't have the pest, you must either spray, tarp and do those things. Which, what I'm bringing up is, it is a problem for all these growers to know all the regulations that is going, happening.

The regulations kind of came into the packinghouse first. We are kind of like the first hit. We have to... We had to sign up. Every grower has an ACP number. And then it went from that into the truck drivers. And all of our trucking companies have to be known -- that they have a piece of paper in their truck and how they have to deal with it. Of course, the packinghouses... There's

a couple of packinghouses that are out of the zone, so everything that they bring into the zone either needs to be sprayed or tarped. So this is no picnic, for what we're having to face, and this has only been in the last couple of years. And I'm just talking in the packinghouse side. Give you an idea of how much money it's costing us, the regulations that we're going through. Haven't even gotten to the grower yet. Sorry. Haven't even got to the grower yet.

So those are the things that we are affected by this pest. And the packinghouses contribute. We give... We are assigned the bill for the nine cents per carton that [will be going] to twelve cents. Our grower base -- it's gone to the packinghouse, just write that check out for every grower and then pass those down the road [to CDFA] for that.

So our industry is really in not denial. We are trying to do the best destiny we possibly can and go in the right direction. We have to treat probably five or seven times a year. If you're moving out of district, you probably have to treat five acres. If you have 40 acres and you pick five, then you have to spray that 40 acres probably six or seven times to move the fruit from a district through a non-infected district to another district. Very costly, very problematic in some of the areas that we're dealing with as a packinghouse. And our packinghouse personnel saying, well, what am I doing today? You need to tell this grower we're going to pick in three days, and then it rains. And then it's just endless. So there's a thought process that has to go into this pest.

We have to cover our loads. The paperwork, we have three different kinds of paperwork moving through. One, the grower has a number. Then the

packinghouse has to apply to the county and get all those right regulations. And then the truck driver itself has paperwork to move fruit through. So this is all packinghouse problems.

In the packinghouse itself, we're supposed to... All debris, leaves and trash that come from the field is supposed to be double bagged and put into a incinerator that will burn the leaves and trash. Of course, when it gets to the incinerator, they take it out of the bag. They dump the leaves in because they can't burn plastic. So it's kind of circling the wagon.

We do try to control not only ACP, but we're faced as a packinghouse, as a citrus industry, with a host of other pests that [have slowed down our exports to] Korea has slowed us down in [sic]. Japan wants lighter MRLs on our--on its fruit. There's a number of things that we just have to watch. ACP is the biggest one, but it also is not the only one that has locked us out of some of our export opportunities.

And so some of these things that you're taking -- or have down the road we hear -- taking out of toolbox, which is the neonics and those type of sprays. We have to spray five times a year. And we cannot not spray. These are very, very important. And the pesticides are important to the industry. And, you know, with Cecelia Packing alone probably feeding five [hundred], 400 people -- with their children and everything -- out at a rate of about three or \$4 million in payroll (one way or the other through the farm labor contractors, the packinghouse)... and that--it's something very, very significant. And I'm just a one percenter in the industry. Thank you.

SENATOR GALGIANI: Thank you. I'm looking through my notes for the name of the new disease that's resulted in very, very small, pea-sized fruit in Florida. The secondary disease.

SENATOR BERRYHILL: Yeah. He said postbloom, I think, yeah.

SENATOR GALGIANI: Yes. Has there been any sighting of that in California yet?

MR. ROTH: No. The only HLB that there is in existence is down--to our knowledge, at today--is around the San Gabriel down in Southern California. They're trying to get the trees out as fast as they can, obviously.

SENATOR BERRYHILL: What's this doing to the price of product at the market, and what's it going to do to the price of the product at market?

MR. ROTH: At this given time, because we're not majorly affected, we are still able to grow; and the volumes have been relatively consistent. This year, we had a very nice crop. We've got tangerines that are affected, would be affected. Any citrus is affected with HLB/ACP.

And so at this time in California, we have put up a gigantic front because we knew this was coming out of Florida. And we have tried not to step backwards from the attack. We've tried to really attack forwards. And when we find and know... there's pests in Dinuba--that brought me, my packinghouse in because I was in a five-mile radius. Just barely got me in. They just found another find over off Reed, about another five miles. But I have 300 acres that's in the Navelencia north of Orange Cove and east of Fresno. I've got 300 acres in there that--it's clean, no finds, no anything. So I can bring that fruit into any

contaminated district, but I can't... I don't want any fruit to go into that district; and, luckily, there's no packinghouse or anything like that.

SENATOR BERRYHILL: Yeah. So because of your, because of the industry's hard work, is it your estimate that we're kind of, we're on the front side of this thing, anyway? I mean, we've put up a good front. It seems to me as we're just sitting here--and it's early in this hearing--but it's the backyard trees that are the problem.

MR. ROTH: I would like to acknowledge that. Southern California has more trees in it than we--in their backyards--than we do farming it. And I would... I think that is part of it. They do not have a spray program. They do not care about pests. They pull an orange off and eat it and that's the life. Where ours is trying to control 40, 50, 2,000 acres at a time. And you're right, the backyard is the issue.

We do not... We feel very--I don't want to say comfortable--we feel like we are doing what we absolutely can to control it. We are funding it. That makes us feel good. Florida has done a tremendous amount of education and spent money back there for understanding how the pest lives and grows. So I feel positive that Florida, California has worked together to give us a little head start.

But with it moving from LA to Central California and along the roadways--99, 65, you kind of hear that, Tracy's 99--they're bringing... You have a few of these problematic areas that you're finding hitchhikers.

SENATOR BERRYHILL: Yeah.

MR. ROTH: And we really need to find a good, consistent way to figure out how to control it and/or stop it.

SENATOR BERRYHILL: Yeah. We had... In the winegrape industry, we had a heck of a problem with the glassy-winged sharpshooter, and this reminds me a little bit of the same, the movement as it moved up the valley. So I'm sure you're doing some of the same things and probably modeling the same...

MR. ROTH: Yeah. We have glassy-winged sharpshooter down in Kern County. So when I pick oranges down there, they have to... We have certain criteria...

SENATOR BERRYHILL: Right.

MR. ROTH: ...we have to meet. And hold the fruit in a sweat room and make sure that there's none have flown out and that type of stuff. So all the time we're having to look for something.

SENATOR BERRYHILL: Yeah. If it's not one thing, it's another.

MR. ROTH: It is.

SENATOR BERRYHILL: All right. Thank you.

SENATOR GALGIANI: Are either of you able to describe for us how it works in practice with CDFA going out to residences and talking to homeowners about their trees? How do you know how they know who has an orange tree or any kind of a citrus tree in the backyard?

MS. HOUTBY: Actually, I think Victoria Hornbaker, who's on a panel after us, is going to touch on that. But I will tell you, it's a very--it's a great process. It's very transparent and open. Homeowners are invited to a public meeting

where they are individually walked through the steps that they'll be experiencing as CDFA crews come into the neighborhood and treat their trees. And it's in partnership with the Department of Pesticide Regulation to assure the homeowners that the products that will be applied are safe and applied in a safe manner. It's a really good approach.

And in addition to that, the industry is funding about a million dollars a year in public outreach and education. That goes hand in hand with what CDFA is doing with treatments, just educating people about what this pest and disease means for all of California citrus trees. So we're really trying to build a good relationship with the homeowners and being as transparent as we can be.

SENATOR GALGIANI: Thank you. Any other questions? Okay. Thank you very much. And we'll move to our second panel: State, Federal and Local Response. And with us today, we have Victoria Hornbaker, Citrus Program Manager, from the California Department of Food and Agriculture; Beth Stone-Smith, Program Manager, California USDA, APHIS, Plant Protection and Quarantine; Melissa Cregan, Deputy Agriculture Commissioner, Fresno County; Rick Harrison, Pest Control Advisor, Crop Production Services, CAPCA State Treasurer. Thank you.

Also, I wanted to mention, for any members of the public who would like to testify, we have some sign-up sheets here that you can go ahead and do. And that way, at the end of our panels, we can hear from you as well.

So Victoria Hornbaker, if you can go ahead and start, please. Thank you.

MS. VICTORIA HORNBAKER: Madam Chair, members of the committee, thank you for allowing us to come and testify for you today. So I am the Program Manager for the Department of Food and Agriculture, which means that I work very, very closely with the folks that are sitting at this table with me, as well as with industry and members of the public.

It's a very cooperative program, as Alyssa stated. So our program continues to be cooperative. We are funded through grower assessments and through a cooperative federal agreement. Our proposed revenues for this year, revised proposed revenues, are \$27 million, with 63 percent of that projected funding coming through grower assessments and 37 percent coming from the federal CHRP funding.

ACP was first detected, as you know, in 2008 down along the border in San Diego. CDFA responded very aggressively to those initial finds. We established 20-mile radii quarantines around those finds. We did mandatory treatments. We did intensive trapping, arrays and surveys.

Over the course of the following six years, up into 2014, ACP--regardless of the activities we were doing--has spread rapidly through Southern California. As counties became more heavily infested and quarantine areas expanded, all of Southern California counties, from Imperial in the south to Santa Barbara along the coast, were deemed infested and placed under a contiguous quarantine. So the whole Southern California area is now a contiguous quarantine.

Despite all efforts, ACP continues to move north along the Central Coast and the Central Valley with numerous detections in Tulare County, facilitating

the entire county to be placed under quarantine in 2014, as well. That same year, the program noted expansions of ACP detections and partial quarantines in San Luis Obispo, Santa Clara, and San Joaquin, and Madera counties. In 2015, the program further expanded with detections in San Benito, Stanislaus, and San Mateo counties. And then in 2016, we've had a find now in Kings County. So that's our newest county that's been added. As well as, we've experienced multiple finds in Kern County and Fresno County and Madera that are causing pretty expansive quarantine expansions.

There was a question earlier about our treatments. And in the past, treatments for other pests may have been mandatory; and up unto a point, our treatments were mandatory for ACP. However, our primary entomologist--based on all the data available to him and due to the distribution of ACP throughout different parts of the state--has determined that eradication for the Asian citrus psyllid is not feasible. And as such, our response in that program has switched from an eradication strategy to a suppressive strategy.

So right now, we have four response scenarios that we employ. We have the voluntary area-wide treatment program, similar to the CHMAs that were mentioned by our partners from Florida. We have psyllid management areas. So we have growers throughout Southern California who are neighbors who have developed these psyllid management, or PMAs. And they do their very coordinated treatments within a two-week timeframe. When those growers all do that, CDFA partners with them; and we do a 400-meter treatment on all residential properties around those groves. We feel like we're giving them some

relief from the immediate reinfestation from the residential areas. As you know, in many of our--commercial groves are very, very close to urban residential areas.

So our next scenario, that we, is a voluntary international border response program. So we do maintain a two-mile trapping buffer along the U.S.-Mexico border, and we do 400-meter treatments on ACP finds in those areas.

I have included a map in your packet that shows the latest HLB finds in Mexico. Previous to this map that you have in your packet, the closest HLB find in Mexico was about 500 miles away in Baja del Sur. We now have finds in Baja California in the municipality of Ensenada. So it is about 70 miles away from our border now.

We also maintain voluntary treatments in response to ACP detections in areas not considered generally infested, so areas north of Southern California. In those, we do 100--we trap very intensively. So we're setting out a trapping array of 100 traps per square mile where we can find hosts. We do survey work and treat within 100 to 400 meters of the find.

And then to answer your question, we still do maintain some mandatory activities in our program and those are in response to HLB finds. So when we have an HLB find, we do a mandatory 800-meter survey, treatment, and trapping around those find sites.

SENATOR BERRYHILL: That's in any given tree in a backyard or...

MS. HORNBAKER: Yeah. So for instance, in San Gabriel... Now, we actually, yesterday we had another confirmed positive; so we're up to 21 trees in San Gabriel. Whenever we have a positive find, that elicits the response. We set

that 800-meter area up. We do survey where we collect plant samples and any psyllids that we find from every home in the 800-meter area, and we treat every ACP or HLB host plant in that 800-meter area. And we do not allow people to opt out. Those are mandatory.

SENATOR BERRYHILL: Can you kill that aphid at that point in time if you catch it early enough?

MS. HORNBAKER: Yeah. I mean the treatments are effective on the psyllids, definitely. The problem is we have no cure for the disease. So the only thing that we can do--and what we do--is we remove the trees. So the positive tree, we'll do a mandatory removal. For the most part--in fact, out of San Gabriel, the 21 trees, we've only had to serve one warrant to remove a tree. The rest of them, the homeowners, are all--they collaborate with us and say, yeah, I understand my tree is dying. Please go ahead and take it out for me. So that's really, you know--it's unfortunate that they lose their tree, but the tree is in the process of dying.

So in addition to our response scenarios, the CDFA has worked with researchers at USDA and the University of California to develop a number of biological control methods. The program currently is producing two biocontrol agents. They're called *Tamarixia radiata* and *Diaphorencyrtus aligarhensis*. Those are little, tiny wasps that don't sting humans; but they do lay their eggs on the young immature stages of ACP, and they also feed on the adults in young stages of ACP.

To date, we have released over three million *Tamarixia* and over 250,000 *Diaphorencyrtus aligarhensis* throughout Southern California. The main goal of this is to establish classical biocontrol with these agents, basically releasing them in a large enough quantity so that they become established in those areas and will organically take care of ACP populations. It's not a silver bullet, but it is something that we're using in areas, for instance, like the LA Basin, where we have just a tremendous number of ACP and we're not treating because treatments aren't feasible.

The overall objective of our program is to detect and eradicate HLB. Until 2015, we had only the one HLB detection in Hacienda Heights. That tree was removed. We continued to intensively survey that area. We have not had an additional find there. In 2015, however, we did have a find in San Gabriel.

We're constantly doing survey work. We have trained surveyors. We send them to Florida, we send them to Texas. They learn what symptoms to look for HLB. So they go out in these areas and based on risks that... We have a researcher out of Florida that's developed a risk model for us. We survey different areas at different concentrations. So for instance, we had surveyors working in the LA area in San Gabriel, and they pulled sample from a kumquat tree of psyllids. The tree itself did not look classically symptomatic, so they didn't pull samples from that tree of the tissue. But the psyllids came back in the inconclusive range, and so that prompts us to go back and actually pull plant tissue. And at that point, we determined that that tree was PCR positive for the bacteria that causes HLB. So that prompted our 800-meter survey. We found

nine additional trees in 2015 based on that survey, so that brought us to 10. In the beginning of 2016, we went back to resurvey the area. And now we've got 11 additional trees in the city of San Gabriel. So it's... There's a map in your packet also that shows the quarantine area. Our quarantine area has now been increased to 177 square miles in LA County and three square miles in Orange County for HLB.

So what does that mean? It's basically an area where we don't allow nursery stock to be sold, citrus nursery stock. We have really stringent controls on what goes into and out of an HLB quarantine area. We even worked with the Rose Parade organizers to make sure that they weren't using any fresh citrus leaves or fresh potted citrus plants because they were going to go through that quarantine area on the parade route. And they were willing to work with us and, I think, you know, partnered with us really well.

So we continue to work very closely with USDA, the University of California Extension to implement our best management practices. We really look to USDA and the UC to provide us with a lot of the background information. And, you know, we are also working with stakeholders on the potential to expand diagnostic capabilities. It's something that we're hearing folks need as they want to be able to test their own groves. So we're working on that. We're also working with the potential to expand biocontrol to private entities as well. Right now, it's just being done by USDA, the University, and CDFA.

CDFA continues to support nationwide research objectives that will benefit the California citrus industry, including working on resistant citrus varieties,

early HLB detection technologies, and inoculum removal techniques. CDFA also continues to maintain certified clean nursery stock certification and compliance agreements to allow movement of nursery stock within and from quarantine zones if specific mitigations are met. We maintain a similar set of compliance agreements, as was explained earlier, for bulk citrus movement. CDFA also continues to work closely with California Citrus Mutual and communications contractor Nuffer, Smith and Tucker to conduct a robust outreach communication program to growers, elected officials, and residents in California. The goal is to continue to educate the public about the potential threat of ACP and HLB on both commercial and residential citrus. I provided a couple little things in there, in your packet, that shows some of the stuff that they've helped us produce.

And we continue to work with our cooperators to improve our trapping and survey capabilities in new ACP- and HLB-find areas and work to overcome our challenges that are presented to us by these expansions.

SENATOR GALGIANI: Do we have any questions at this point? Okay. We'll go... Thank you very, very much. And we'll go ahead and take our next witness, Beth Stone-Smith, Program Manager, California USDA, APHIS, Plant Protection and Quarantine.

MS. BETH STONE-SMITH: Lots of acronyms.

SENATOR GALGIANI: Thank you.

MS. STONE-SMITH: Good morning. Privilege to be here, thank you for the invitation. As stated, my name is Beth Stone-Smith; and I'm a program manager

with United States Department of Agriculture, Animal and Plant Health Inspection Service and, specifically, Plant Protection and Quarantine, which works to deal with invasive insect pests and plant diseases.

Specifically, a couple of programs I work with is the glassy-winged sharpshooter, Pierce's disease program; European grapevine moth; and then I handle the funding that comes in through our agency and is given over to CDFA and the counties to do much of the work that they're doing here.

So as already mentioned by multiple speakers, this is a very cooperative program. We rely on our partners at the state and at the county level to implement regulations and implement survey activities.

I'm going to give you a little bit of background on ACP/HLB, which we've already heard pieces of so I won't go into great detail but just to give a little bit of background there. And then I'll give a little bit of background on what we've done, actions we've taken, and then a little piece of the funding and how that comes in through the federal side.

So already mentioned, ACP was discovered in Florida back in 1998. And despite efforts, it spread by 2001 to 37 counties and subsequently has spread to other states. We have it not only in Florida and Texas but also detections in Louisiana, Alabama, Georgia, Mississippi, South Carolina, Arizona, Hawaii, and of course California, as well as some island nations like Puerto Rico and U.S. territories of Samoa. Specifically, in California, you've already heard we have quarantines, either whole or partial, in 22 counties in California.

And then on the HLB side of the problem, in 2005, you've already heard about Florida's situation there. And by 2015, they had HLB detections in 37 counties out of their 67 counties in the state. So we've already heard background on the trouble there. Currently, all of Florida and Texas are quarantined for HLB. And Victoria and others have already given background on our detections here in California, where we have two quarantine areas that kind of mesh and meet up together down in the Los Angeles County area, both the Hacienda Heights and the San Gabriel finds that Victoria's already talked about.

So some of the actions that the federal government has taken--and this program obviously has had separate pieces in each state, as each state has had its detections and has had their issues spread and has had their problems--there's been pieces of funding. But a larger effort was put in place back in 2014 called the Multi-Agency Coordination Group, or MAC. And this is a group not only with APHIS, we are kind of... We call ourselves the action agency side of USDA, whereas Agricultural Research Service will do more basic research.

So with APHIS and with ARS, the Agricultural Research Service, along with the National Institute of Food and Agriculture and state departments of agriculture, they formed this group to make it a single point of contact for all activities going on. That not only helps California learn from Florida, it helps with all of the research that's going on so there isn't duplicative efforts. The information's being shared. All that. And it also sparked a greater sense of urgency for the citrus industry to have this large coordinated effort across multiple states led by federal entities.

So in addition to that MAC implementation, we also have biological-control-agent work being done, as Victoria already mentioned. The survey and regulatory enforcement measures, we had some of those mentioned here. Stemming the movement of ACP around the state is critically important, as the industry has told us, and so those regulatory measures like tarping of loads and treatments being mandated before things can move are part of those regulatory enforcements to not allow ACP to spread freely.

As far as the funding goes, on the MAC side of the program, there's been \$20 million provided so far in the last couple of years with 30 projects being carried out by state cooperators, universities, and private companies. Obviously, the focus of those projects is to have real-time, practical solutions for growers in the near term. So not only is there background research being done to kind of do building blocks on information, but there's near term--we need information now--focus on a lot of this research for growers. More than three million of that funding comes to projects that are in California, specifically.

And then the other piece of funding that's big for us here in California, we've heard people say the word CHRP, that's another acronym, Citrus Health Response Program. That's a line item under our federal budget that receives funding and that funding is spread out across the states that have citrus, the largest amount of funding going to Florida and California. And that's certainly reflective of the activities that are going on as well as the immense amount of citrus acreage in both of those states. And there's been \$37.8 million in those Citrus Health Response Program funds disbursed in fiscal year 2015. Much of

that is that 10.8 million. You've heard that number thrown around. That goes directly to CDFA for their activities. That's included in our number for California. And then we do have some staff with our agency that does some nurseries certification work to try and keep nurseries who produce citrus stock in compliance with regulations and keeping them in business so that they can move their product.

So a couple of folks mentioned other federal agencies that are heavily invested in this. I believe it was Andrew from Florida Citrus Mutual that mentioned the National Institute of Food and Agriculture, because of the 2014 Farm Bill, is giving \$125 million over the next five years to citrus-related issues. We have collaborations that Victoria mentioned on the border with Mexico and with Mexican agricultural agencies to help not only survey for ACP and HLB; but we also have staff that works for international services, that works directly in those countries to try and facilitate information so that we know what's going on to reduce the risk of what's going to be happening or could be happening in our state.

There's just the last piece some of my folks put in here on future projects, and much of that has already been mentioned. The thermal treatments, Andrew mentioned already, on trees is something that has worked in Florida, specifically. There is some work that's been done on dog teams sniffing out trees that are HLB positive. The benefit of a dog being able to sniff that out is that you know early on that the tree is infected, and you can remove that inoculum.

Part of the two-pronged approach is not only reducing the vector, ACP, but you have to remove that inoculum in the system so that they're not spreading it around. So having dogs that can detect those kinds of things would be very valuable to implement.

SENATOR GALGIANI: Excuse me. Removing the "inoculum," you said?

MS. STONE-SMITH: Yes. So the tree is...

SENATOR GALGIANI: What's that?

MS. STONE-SMITH: The tree has that bacteria in it that the insect is feeding on and moving around, so they want... When they detect HLB, they remove the tree, so you're taking out that bacteria. It's considered an "inoculum." The insect can't pick it up and move it around if it doesn't have it sitting there to feed on, much like our glassy-winged sharpshooter/Pierce's disease issue. Same dynamics.

And so just in conclusion, I appreciate the opportunity to be here. As has already been stated, a highly cooperative program. I think one of the benefits I've experienced working my career in the great state of California is--not only the dynamics with the state Department of Agriculture and the counties and university--we really benefit from that local-level entities of getting things done. We've seen things in other countries in USDA and even in other states where the coordination is not such that things get done at that local level. So we really benefit from that. Any questions?

SENATOR GALGIANI: Thank you. Any questions?

SENATOR BERRYHILL: Yeah, I do. I was going to ask a question; I figured I didn't need to. But you are collaborating with Mexico in this whole deal, and that is working out? I farmed there for a few years in the late '80s, and it was helter skelter.

MS. STONE-SMITH: Yeah.

SENATOR BERRYHILL: And I don't know...

MS. STONE-SMITH: Working out is...

SENATOR BERRYHILL: ...how that's changed anymore.

MS. STONE-SMITH: Yeah.

SENATOR BERRYHILL: But it's pretty tough to get your arms around it, I would think.

MS. STONE-SMITH: It is, absolutely. But the effort certainly needs to be made...

SENATOR BERRYHILL: Yeah.

MS. STONE-SMITH: ...so that we can get as much information as we can out of them.

SENATOR BERRYHILL: Yeah. Thank you.

SENATOR GALGIANI: Okay. Thank you very much. And our next witness is Melissa Cregan, Deputy Agricultural Commissioner, Fresno County.

MS. MELISSA CREGAN: Thank you, Madam Chairman, members of the committee. At the local level, from our perspective, pest exclusion--it starts with "exclusion." We really try to keep these pests from coming in and getting established.

We realized the movement of Asian citrus psyllid fairly early, in 2009, when we had a detection of Asian citrus psyllids on curry leaves that were found in a shipment from our express parcel carriers. And actually, one of our dog teams found that shipment. And so our Exclusion Division, we have folks every morning who get up at, you know, report to the terminals at 5:00, 6:00 o'clock in the morning; and they look for packages that are going to be distributed throughout California that may have plant material in them and with that pest. Because folks who put, you know, oranges, citrus in a box in Florida to send to their aunt in Fresno, you know, they don't necessarily understand that there could be pests that they would be moving.

So you know, that's a very important program that we have. Funding for that program comes through the, comes through several areas, but the farm bill for the dog teams. There's a small amount of funding that comes through CDFA for non-dog team functions. In Fresno County, that's about \$50,000 a year. It doesn't pay for the staff of... You know, when that division's fully staffed of, you know, five to six inspectors, you know, \$50,000 doesn't get us very far. So a lot of that money, then, is local funding through the county's general fund that we use for those sorts of activities.

We also inspect incoming nursery shipments. That's another area where we see risk of Asian citrus psyllid or other exotic pests moving in.

Our next level of defense at the local level is our pest detection trapping. We have several general detection programs, one specifically for Asian citrus psyllid. We put out about 3,100 residential traps throughout the county. Those

are serviced monthly. It takes us about five full-time trappers to get those serviced.

As well, the glassy-winged sharpshooter program uses the same type of trap and often the same hosts. So we have those traps screened for Asian citrus psyllid as well. We have about 1,600 of those traps in commercial citrus. We have about 50 traps in packinghouses, 80 in nurseries, and another 600 residential. So all told, within the county of Fresno, just the county of Fresno, we have about 5,400 traps where we're looking for Asian citrus psyllid.

And then when we take those traps down, we service them, we send them to the state lab, where I imagine some unfortunate people have to sit there and scan over these traps because, as you know, this pest is very small. And so they look for these pests and then they let us know, let the state know, who informs us when a suspect has been found.

So once a suspect is identified, you know, we work with our state and federal partners to distribute information. They want to know where our current traps are because once we have a find the state takes over and puts out our delimitation traps. So they want to know where our current traps are. We have to transfer all that information to them. They want to know where commercial citrus is within, usually, a five-mile radius of that find. So we pass on that information. We develop quarantine boundaries cooperatively with CDFA to, you know, obviously try to contain that pest.

And then within that, we'll... It was mentioned before, the problem of abandoned groves. And, you know, that's going to continue to be a challenge. And, you know, I'll touch on that here in a little bit.

Activities that we directly, at the county, we sign up [packing] sheds that are outside of the quarantine area with compliance agreements, and those are the ones that really feel the biggest impact. Is if they are outside of a quarantine area and they're supplying groves, or within the quarantine area, they have to do the spraying and the tarping and all of that. So we have a limited amount of resources, that we can do sort of spot checks at those packinghouses to make sure that they're doing the correct paperwork and following the correct procedures, tarping the loads, doing the treatments. But we have no funding for that. None of these programs fund that sort of follow-up to check compliance with these sorts of programs. Our funding only covers detection trapping. And so at the county level, we have a limited resource to do those sorts of activities.

I provided you guys with a map that shows the Fresno County overview. Fresno County, so far, is not completely quarantined. Unfortunately, this year is driving us to that full county quarantine fairly quickly. It was sort of a slow progression.

In Tulare County, they had some quarantines along the border that overlapped into Fresno County. That was in about 2013. Our first find was right, actually, at the very corner of Fresno County. It was about 50 feet into our county from what would be considered Tulare County. And that expanded our

quarantine up into the Orange Cove area, which, you know, as it is named, has a lot of citrus and packing sheds.

Things were quiet from 2013 until 2014. We had no other finds within the county. In 2015 was when we had our next find. That was in somewhat of the Orange Cove area. It was about half a mile outside of that quarantine area that was from the 2013 finds. So that expanded the quarantine again. And then very late in 2015, December, we had our first find in the city of Fresno. So now we have... We switched from having the contiguous quarantine area with Tulare County to having another quarantine area which eventually became contiguous with the quarantine in Madera. So now we're starting to link up quarantine areas.

Now, in 2016, I believe we're up to six finds as of last Friday. This map shows the current quarantine area that we have mapped out. So where you see the finds in Selma and up in Clovis, we don't currently have the quarantine area, the boundaries drawn for that yet, because the finds are so new. But pretty much what that's going to do is connect a large section of the county. We'll have easily over 50 percent of our citrus production area under quarantine at that point. And we'll be looking probably towards a full-county quarantine probably within this next year. Again, that decision gets made cooperatively through the county agricultural commissioner and CDFA.

So with that spread, you can kind of see on the map that the psyllids are being found along major freeways for the most part. A lot of them are being found in residential areas, the majority of them now. And so, really, our biggest

challenge at the local level, as we see going forward, is going to be dealing with urban psyllids in that situation. Because the growers, obviously, they're very aware of the problem. They're very educated on it. They know what they need to do, and they're putting in a lot of work. Our residential community is less informed. And, you know, we try to compensate for that through outreach. We do a fair amount of media. We do television interviews for local news. We do radio spots. We have a monthly newsletter that we send out to any interested parties can sign up for. We attend the public meetings when there are going to be treatments. And then we also meet with elected officials for cities and the county officials to let them know kind of what will be going on when there are finds in their communities.

One of the challenges that was brought up is going to be our residential nursery industry; and that currently when a quarantine is declared, the trees are being sold at these residential nurseries, they're tagged by CDFA. And the tag says, you know, don't take this out of the quarantine area. Unfortunately, a lot of our residential folks, they don't know where the quarantine area is. To them, this is kind of like the tag on your mattress that says do not remove. They don't pay a lot of attention to it, unfortunately. And, you know, I think when we start seeing HLB arise it's going to be the hardest to control it in the cities, just because we have a lot less control over them. We don't have a lot of enforcement tools. You know, I can't follow every citrus tree that's bought in a citrus nursery and follow them home to make sure they aren't taking it outside of the quarantine area. We'll never have those sorts of resources.

And then, also, another problem that we have are trees that are being sold at nonretail nurseries, at swap meets, roadside vendors. These are people that are grafting trees at home, and it's illegal. They're not, you know, allowed to be doing these things, but the amount of resources it takes to control these sorts of situations is... It's just tremendous. And again, we have no funding for that sort of control. All of that comes... If we do it at the local level, all of that will be having to be funded by the counties. And every county is in a different financial situation as to how feasible it is to direct your resources to that problem.

You know, also, a lot of these swap meets... There's no requirements on the swap meet managers like there are with our certified farmers' markets where there's some responsibility on the market manager to make sure that certain things are being complied with. The swap meets, there is nothing like that. So we can go and we can clear out all the citrus in any given day at a swap meet; and then the next week, they'll all be right back because they know we don't have the resources to be there. And if we can get the information on the person, correct information, we could go down the road of a civil penalty for selling that citrus, but the resources that takes... Is time consuming, as well. And now, we've gotten rid of one small grower and there's probably five, ten more that will just take their place in our county alone.

So that's really where I see our biggest challenge coming from. And I don't know that I can really offer any ideas necessarily at this point as to how we can control that. But it's a problem that we're going to need to address because that's where we're going to have these diseased trees being sold, is not likely in our

commercial nurseries, but these outlets that are difficult to pin them down. They'll be on a different street corner throughout Fresno on any given day, and how do you find them? You know, that really is our challenge.

So I think, you know, I'll wrap up with that. Is just that at the county level, there are fundings, you know, to find these psyllids. But then, once we find them, our resources are pretty limited as to what we have to deal with them at that point. It's kind of all in the hands of CDFA to do the treatments. And then, you know, we've got to do as much surveillance as we can at these markets where trees are being sold. And, you know, that's difficult.

SENATOR GALGIANI: So looking forward, you go into an area and you do the trappings and you find some have, some do not. Looking long term at this, you have multiple homeowners who have these trees. How far are we going to go where year after year the state and the industry is paying to have these trappings done to see if there are pests in residential trees? I know we're addressing the immediate problems and the immediate concerns, but has there been thought to how long are we going to allow for homeowners to have these trees in the yards? And what's the responsibility of the homeowner? Because, right now, the industry is bearing the full responsibility for all of the expense associated with the detection and protection for residences and their orange trees.

MS. CREGAN: You know, I don't know how directly I can answer that question. We do a lot of outreach to homeowners to let them know that this isn't just a citrus industry problem, and this is a California problem. And that I have three citrus trees in my own yard. I like them. I want to keep them.

I recently went out to a residence on a... We had sort of a tour for some foreign officials. And this woman was telling me the story of her grapefruit tree. And this thing was, you know, 20 feet tall. And she's telling me about how she bought this when they moved into the house. I mean this tree had sentimental meaning to her. And so going to her and asking her to remove that tree... Again, that's one of those situations, I don't think that that would be a successful ask.

And then we would be in the position of can we mandate that trees will be removed from residences? I don't... You know, I don't know if Victoria can speak to that.

MS. HORNBAKER: Yeah. I mean I can just say that we have the authority to remove trees that are diseased, and we have used that authority in San Gabriel on one property that did refuse to volunteer the tree. I don't think that authority would expand to trees that are not diseased. That would all be voluntary.

SENATOR GALGIANI: What about trees where the pest is present and not diseased yet?

MS. HORNBAKER: That's a difficult one because we don't... Just because you have the psyllid doesn't mean you have the disease. You can have the psyllid, and it can be, you know, a generally infested area; and if the disease is not brought into that area, the psyllid can persist and the trees will continue to live. The only issue is when the psyllid carries that disease into an area and then the trees become diseased.

SENATOR GALGIANI: So the psyllids aren't always carrying the disease?

MS. HORNBAKER: Correct.

SENATOR GALGIANI: Okay. Any questions?

SENATOR BERRYHILL: Yeah, I have a question. You know, in the mid '80s, when there was talk of shutting down all the border stations in the state because they were expensive to run, we managed as an industry to keep them open. Have we determined where these pests, because this is, I mean, it's the... We got the citrus problem today; we had the glassy-winged sharpshooter a couple years ago. Would those border stations... Do we know where this thing... Did this thing come from Mexico? Did it come from... Do we even know where it originated from? And would the border stations, in your opinion, are they a tool to keep this kind of stuff from coming in?

MS. HORNBAKER: Yeah, they definitely are a tool, and we rely really heavily on the border stations and the counties with their dog teams. The problem I think that what we have is we have multiple international ports of entry into our state. We're a state that has a very diverse populace. People that...

SENATOR BERRYHILL: Yeah. But we have pretty strict laws as far as fruit and stuff coming in from out of the country.

MS. HORNBAKER: Yeah, we definitely do. But I can tell you, I was at San Francisco Airport a couple years ago doing a talk with the border protection folks there and their beetle brigade. And they had a table set with just citrus stuff: fruit, dried fruit, leaves, different things. And I said, "Wow, is that like a month's worth of stuff?" "No, Victoria. That was from yesterday."

So yes, there are very strict rules about what you can and can't bring into the state. But many people either, you know, they're just unaware of those rules

or they think it's just, you know, I'm going to bring this piece of my home country back with me or my vacation memory. This delicious fruit that I had, I'm going to bring some and graft it onto my tree. So I think people do it, you know, either it's a naiveté, they don't know, or they just don't feel that they're going to be doing anything to bring pests in or to damage our industry here.

But there are many, you know, multiple, like I said, international ports of entry. There's internet sales of just about anything and everything, you know. And as much stuff as we catch coming through UPS and the U.S. Postal Service and FedEx, there's many things that we don't catch.

MS. CREGAN: Well, and to add on to the U.S. Postal Service, that really is a problem within our dog team program in that mail is protected by federal laws, that you have to have a search warrant to open a piece of mail. And so we have dog teams, and they can only work in certain post offices that have an MOU with the Postal Service. And then once they hit on one of these packages, they have to try to contact either the sender or the receiver and get permission to open that package. Or if they can't get permission, then they have to get a federal warrant, and that's a long process.

So again, you know, the resources that it takes to catch this material coming in... Our express carriers, we can open whatever we want; but the mail, Postal Service, is a completely different animal. And the limited amount of post offices that we are working in, we're definitely finding pests of concern. And, you know, we're trying our best to get into more post offices and find a way to deal with that issue. But, you know, it's definitely far from where it needs to be.

SENATOR BERRYHILL: Yeah. I guess my point is: It is costly once you have these infestations; but when all of a sudden you get fruits and vegetables quarantined and we can't export them, now you're really talking some real money. So anything that we can do as we move forward in trying to figure out how to keep this stuff from happening, anything we can do up front is cheap compared to what happens once you get these outbreaks. And we warned of this way back "in the day" that, you know, we're just an accident waiting to happen; and we're seeing it. So I don't know, maybe we should be concentrating on a few more resources up front to try to keep this stuff from happening.

SENATOR GALGIANI: Okay. Thank you very much. And our next witness is Rick Harrison, Pest Control Advisor, Crop Production Services, CAPCA State Treasurer.

MR. RICK HARRISON: Thank you, Madam Chair and committee members. As stated, my name is Rick Harrison. I've been a pest control advisor for 16 years in Ventura County. I also serve the California Association of Pest Control Advisors on their executive board as the treasurer.

My roles as a PCA consist of field checking. I walk orchards and monitor pest populations and beneficial insect populations. I trap for pests such as Asian citrus psyllid. And I monitor the edges of fields primarily. There's an edge effect, what they call an "edge effect," with Asian citrus psyllid, where you see a lot of the pest, the beginning of the pest population forming at the edges of fields. So that's the first place that I look and also when the trees are flushing with new growth.

They are very persistent insects, and they will find the smallest leaf that you can imagine and lay eggs on that. The problem with Asian citrus psyllid is it reproduces very fast. It can go from an egg to an adult in as little as two and a half weeks, and each adult can lay up to 800 eggs.

So in our area, in Ventura County, we have started with the area-wide treatments where we're basically working from the east end of our county and spraying every PMA, which is a pest management area. Each location needs to be sprayed within a two-week period. And then after that two-week period, and the people have, commercial citrus has been treated, CDFA will come in and treat the homeowners around there.

Right now, we are just finishing our winter treatments. We have approximately two weeks left on that. And in areas where we began the winter treatments in January, I'm already on my third spray because the pest comes back so fast.

The pesticides that we have available are very effective. However, they don't last long. Of the pesticides that we use, the pyrethroids and the neonicotinoids seem to be the best. The problem with these chemicals is, if we're continually spraying the same materials over and over to control the pests, eventually resistance to the pesticides can happen. And I believe they're starting to see a little bit of that in Florida now.

These pyrethroid sprays do upset our natural enemies. So when we do a spray, we're creating other problems. We see other pests come up that we normally don't even have to treat for. So these treatments that we're putting on

are a cost to the grower, and then we're also creating another treatment down the line that's another cost for the grower. So eventually, it's my fear that we're going to get the growers to not want to treat anymore because they feel like they won't be able to afford it.

SENATOR GALGIANI: So are you saying that the treatment in itself reduces the resistance to yet another disease?

MR. HARRISON: So basically what happens is, in Ventura County we have a very unique system where it's a coastal community, the weather is very nice, and we have a lot of beneficial insects that control other pests, such as spider mites and red scale. And then when we go and spray these chemicals for the psyllid, we're knocking those beneficial insects out; and you have flare-ups, basically, of the other pests.

SENATOR GALGIANI: I see. Thank you.

MR. HARRISON: So I also deal with organic citrus, and the organic... There are organic pesticides available to use. Many of them are very short-lived. The two best materials that I've seen don't really control the insect for more than a week, if that, if you're lucky. So I don't think, or I hope... I would hope that organic would stay around, but it's not looking so positive.

SENATOR GALGIANI: The organic treatments?

MR. HARRISON: Yeah.

SENATOR GALGIANI: Okay.

MR. HARRISON: Something that has been difficult for us is getting releases of parasitoids. Like we heard earlier, Tamarixia is a very effective

parasitoid for the larval stages of Asian citrus psyllid. The biggest concern for me is we are not allowed to have private industry rear the insect, and I don't know if CDFA has the capability to keep up with the demand that's necessary.

We have a lot of homeowners that are very close to citrus, commercial citrus. And in my mind, that would be the ideal situation for Tamarixia releases, is to release in homeowners' citrus.

Something that I deal with, CAPCA, is educating PCAs, facilitating the success of the PCA through education. And in order for me to maintain my license, I have to have 40 hours of continuing education that is, I guess, certified through the Department of Pesticide Regulations. And it's becoming difficult for a lot of the courses to be approved by Department of Pesticide Regulations recently.

And I think my last thing is, in order to reduce the spread of the disease, we need to reduce the population of psyllids and prevent the movement of infected psyllids into our area or any growing area.

SENATOR GALGIANI: Okay. So the Tamarixias are not able to be reared by the private sector at all, so there's just a reliance on CDFA for those bugs?

MR. HARRISON: That's correct.

MS. HORNBAKER: So currently, the biocontrol program, there's CDFA. We have a rearing facility at Mount Rubidoux. We're in the process of almost having one built at Cal Poly Pomona. USDA does some rearing, and they're doing what we call "field insectaries," where they actually tent trees and rear the Tamarixia in the field in these tents.

They also have partnered with, under USDA, a private insectory in Southern California to develop what we're calling the "technology transfer." The idea is that once this is developed--and I think we're very close to that--that that technology can be transferred to other private insectories. And we're hopeful that we can get them to where they need to be to start rearing Tamarixia.

It is a very labor-intensive insect to rear, very different from many other biocontrol agents. You require nursery plants, you require a colony of ACP, and you require Tamarixia to continually rear the Tamarixia. But that is something that's in our short-term plan, is to get this technology transferred over to any insectory, private insectory, that's willing and able and interested and then help facilitate the permitting process for them to start rearing Tamarixia. Because we do see that the goal of our program is really the urban residential area, and that private insectories could fill the niche for growers.

SENATOR GALGIANI: Okay. Thank you. Any other questions? Okay. Thank you very, very much. And we are moving into our last panel, "Developing Solutions to Combat Asian Citrus Psyllid/Huanglongbing." And first we have Beth Grafton-Cardwell, Ph.D., Director of Lindcove Research and Extension Center and research entomologist at UC Riverside. And following the presentation from Beth Grafton-Cardwell, we have Neil McRoberts, Ph.D., an associate professor of plant pathology at UC Davis. Thank you.

DR. BETH GRAFTON-CARDWELL: Thank you, Madam Chairman and committee. Thank you for inviting me today to speak about this. I did provide a

PowerPoint handout for you. If you want to follow along with that, that might help with the discussion.

My name is Dr. Beth Grafton-Cardwell. I'm a citrus integrated pest management specialist hired by the University of California, Riverside but stationed up in the San Joaquin Valley where for the past 26 years I've been studying citrus pests and how to manage them in the best possible way.

I am also director of the Lindcove Research and Extension Center in Tulare County, and that particular center has two roles. It provides a place for researchers to come and conduct research on citrus trees; and it also houses the citrus clonal protection program, which is a screened-in area of trees that they release budwood that has been tested for diseases; and they release that to the nurseries, who then make the trees that go out to the commercial growers as well as the homeowners. So it's a way for the citrus industry to insure that people start with disease-free trees. And so it's a very important aspect of that particular center.

Now, I'm going to go backwards a little bit into some details of the biology of the psyllid and Huanglongbing because I think it helps explain why we have the research directions that we have and why this is a really difficult research problem.

There are two ways that Huanglongbing disease can spread. It can spread by grafting diseased plant material from one tree to another or by the Asian citrus psyllid. The Asian citrus psyllid picks up the bacteria, and when it's feeding, into its body; it re-circulates and increases. And then when it feeds on other trees,

sometimes, not always, but sometimes it passes that bacteria into the next tree and passes it on.

And HLB is a deadly disease. It causes the fruit to become small, uneven in size and color; and it renders the juice completely unpalatable. It becomes bitter, and it can't be marketed. And then as the disease progresses in the tree, it eventually kills the tree. And currently, we have no cure for that disease. Trees can die in as little as five years--we expect citrus to live 100 years. So it's very shocking for us to have a disease in North America that can kill trees that quickly. We estimate there are about 30 million commercial citrus trees and probably 20 million residential trees in California, so the disease is affecting everyone. And as it progresses through the state of California, it's going to change the landscape of California because we have so many trees that are citrus.

The disease was first discovered in Florida in 2005, and it swept throughout that state, largely because Florida did not do anything to manage the psyllids. Now, it's estimated that 100 percent of commercial citrus orchards in Florida have some level of the infection. And, as you heard from the Floridian, that acreage has declined by 50 percent. Production is down more than 60 percent. And their industry is being threatened to collapse because there isn't enough fruit to keep the... sustain the juice plants.

California first discovered the disease in 2012 but has managed to confine its spread to Southern California for the moment. California is doing better at controlling Huanglongbing compared to Florida because it proactively instituted quarantines and regulations to help prevent spread of the disease.

The citrus nurseries have moved a large part of their production inside of protected structures, either screenhouses or greenhouses; and they're treating plants with pesticides before they ship them out to the retail markets. And all this is to insure that the trees are protected as they're sitting out there in the open so that psyllids don't come in and establish on them and then get bought by homeowners and moved around the state.

Plant material in the form of trees or bulk citrus cannot move freely out of the quarantine areas, which in this particular picture, number five, is shown in blue are the quarantine areas. So presumably, where you have infestations of psyllids, you don't want bulk citrus that hasn't been treated or nursery trees that haven't been treated moving out of there and carrying psyllids with them.

Commercial citrus orchards are being treated with insecticides. Residences are being treated with insecticides if they're in a zone that is new to the insect or near commercial citrus. And that's in an effort to locally eradicate the pest, especially in those new regions.

In areas where the psyllid has become well established, such as Southern California, parasite releases--you heard about the little *Tamarixia*--are being made. And homeowners are being asked to treat on their own for ants to protect this, those parasites, and apply insecticides when they can to help control the psyllids. But it's a really difficult problem. As you all know, it's very difficult to get the urban population to control pests. And they have a hard time understanding what this insect is. It's as small as an aphid. Most of them barely know what an aphid is, much less what a psyllid is.

I've spent my whole life studying the insecticides that control insects in citrus. And many insecticide groups kill psyllids if you make a direct hit on that particular psyllid. However, the psyllids are extremely tiny, and they move about, and it's difficult to achieve perfect coverage with any spray. Therefore, it's important that insecticides with lasting residues are used so that the adults that fly in from a neighboring field or the nymph that emerges from inside its little nymphal case and comes out as an adult, and somehow has escaped that direct hit, they get hit by the residues that are still on the leaves.

Research worldwide is showing that the neonicotinoid group and the pyrethroid groups are absolutely the longest lasting in terms of their effect on psyllids, and that's why they're used quite a bit. They're used in both the residential treatment program and commercial growers as well use them quite a bit. So maintaining registration of these insecticides is absolutely critical for management of psyllids in both backyards and commercial citrus.

Most citrus varieties bloom for only about four weeks out of the year, so bee health can be easily preserved by careful timing and use of these insecticides. And regulations are in effect to protect commercial citrus. And CDFA is very careful not to spray these insecticides on blooming trees in backyards.

So a lot of the concern about pesticides related to bee health is, really, people are not very well educated in how the products are used and how they can be used safely and protect bees. So I think that's an important point to make.

SENATOR GALGIANI: Yes.

DR. GRAFTON-CARDWELL: Because of my expertise in pest management of citrus, much of my time is spent developing the treatment guidelines for citrus growers and homeowners for how to respond to the Asian citrus psyllid and Huanglongbing disease. And these guidelines are available from University of California, Ag and Natural Resources website and UCIPM, University of California, Integrated Pest Management, websites on the links I've shown in my handout if you want some more information.

Now, let's get to the disease. Why is this disease so rapidly spreading and so scary? This disease spreads extremely fast because when the psyllid lays its egg on the leaf it also feeds, and it may deposit the bacteria right next to where it lays the egg. So when the egg hatches and the nymph emerges, it's feeding on a localized bacterial infection and picking it up immediately. And it retains that bacteria in its body when it molts and becomes an adult and flies away. And it's carrying that disease for six weeks.

Now, we can't tell if that tree is infected or not, immediately, because when we go out to test it we grab a leaf from the tree and that may not be where that localized bacterial infection is. It may take a year for that bacteria to circulate the tree to the point where when we pull a leaf and test it with a biochemical test, we go, "Oh, yeah, the bacteria is there." And so during that time that we can't detect the disease, the psyllids are already spreading it to additional trees. So when we say we have 21 trees that are infected in San Gabriel, there's probably a lot more than that that are infected; but they're in the early stages of infection, and we can't detect it yet.

Ultimately, all this spraying for psyllids is just a stopgap. And ultimately, what we need is a cure for the disease. Suppressing the psyllid with insecticides is extremely difficult because it's small. There's a lot of them. We can't really tell where they are. And it doesn't stop disease spread because it only takes a few psyllids to spread the disease. And that's why biological control techniques and organic insecticides are weak, because they're not killing all of the psyllids. And if it only takes a few to spread the disease, it just keeps spreading.

At best, psyllid control is just buying time for researchers to develop solutions to the disease problem. And there are literally hundreds of scientists around the world looking at every conceivable way to control this particular disease. They're looking at altering the plant through both traditional breeding methods and genetic engineering so that it can withstand the bacteria. They might be using spinach genes that carry an anti-HLB gene on them into the plant. They may be using traditional methods, such as... Okay, in Florida, we have all these varieties of citrus, and these two varieties seem to be doing a little bit better than the rest of them. Let's encourage those varieties and look at the genetics of those varieties, and maybe we can make a "super" citrus plant. They are using a genetically engineered citrus virus to act like an inoculation and carry anti-HLB genes into citrus trees. That's another method they're looking at. They're attempting to alter the psyllid so that it can't pick up the bacterium. And the thought with that would be they would release this new psyllid into the environment, and it would outcompete the wild psyllids, and it would reduce the amount of bacteria in the environment. They're looking at the use of antibiotics to

reduce bacteria in the plant. They're looking at odors that attract the psyllids and could maybe attract them to a trap that would kill them. And the fact sheet that you have in your particular, in the front of your set of handouts, talks about all of the University of California research and extension programs that are going on right now paying attention to this pest and disease.

In the end, it's likely to take multiple tactics and, quite probably, genetic engineering to stop HLB from decimating citrus, California citrus. However, a lot of these tactics that are being looked at are still five to ten years out. And you've heard that in less than ten years 100 percent of Florida citrus was infected with the disease. So we don't have a lot of time. We have to work very, very fast. There are millions of dollars in federal funding committed to fight HLB, and more are needed to address the disease before it gets a foothold in California.

One of the most important research areas for California is to develop and validate what we call "early detection techniques" that will find the bacterium soon after the tree becomes infected. EDTs may use dogs or machines that kind of sniff the profile of the tree and say, oh, it's changed, it's not healthy anymore. Or they may grind up plant material and look for proteins that the bacteria produces or chemicals that the tree produces because it says, I'm being affected by this disease and I'm putting up an immune response. These sorts of responses move throughout the tree fairly quickly. So instead of finding a tree that's infected with a biochemical test after nine or twelve months, we might be able to find it's infected after two or three months and kind of get ahead of the disease spread. So I think that funding is critically needed for these early detection

techniques to bring them to fruition before the disease spreads any further. These techniques could be used by growers or homeowners to detect which trees are early in their infection and get rid of them and so slow the rate of the disease spread.

Remember, Florida and Texas did not have these tactics in place when the disease first appeared. They couldn't attack the disease and remove the trees fast enough, and now they have high levels of infection. California has an opportunity to stay ahead of the disease.

And then, I'll just finish with a great resource for keeping abreast of the research activities going on in California and beyond, is *Citrograph Magazine*. It's produced by the Citrus Research Board, and many of the articles are written by grower-funded researchers, and it's written for California growers.

I'll finish by saying that California is in a much better situation than Florida, who did nothing up front, because of the regulations restricting pest and plant movement, the huge commitment of resources by the California citrus growers, and the amazing cutting-edge research that's taking place in California. Anything that the Senate Ag Committee can do to further these activities is very much appreciated. Thank you.

SENATOR GALGIANI: Thank you very much. Any questions? Okay. And next we have Neil McRoberts, Ph.D., Associate Professor of Plant Pathology from UC Davis. Thank you.

DR. NEIL MCROBERTS: Good morning, Madam Chairman. Thank you for inviting me here. Thank you to the members of the committee to be here and

hear the evidence. So I'm going to try and act as cleanup hitter here and pick up on a few points other speakers have mentioned and pick up on a couple of things in particular that Beth covered.

I'm a plant disease epidemiologist. I joined the faculty in Davis in 2010. Before that, I was in Edinburgh in Scotland where I ran a research program that was focused on sustainability research for the Scottish government, policy and related research.

The work that I do on HLB I started in 2012, collaborating with the Citrus Research Board here in California and with Beth; and we worked closely together in developing a lot of the practical programs that are being put in place to try and combat this disease.

And as much as I'm a plant disease epidemiologist and obviously professionally fascinated by the bacteria itself, I would say that I think the major components in stopping the disease spread here in California are not anything to do with the insect or the bacterium itself; but actually, there are human elements that dominate the dynamics of the disease. And we've heard a lot about them this morning, and I think there's a great deal that the state can do to enhance the control efforts that are going on.

For example, at the moment, because the citrus that's grown in commercial orchards is all produced from certified material, the probability of there being infected trees in groves is very, very low. And the major sources of inoculum, the major sources of infected trees, are likely to be in urban areas. And, you know,

we know there are infected trees and where affected trees in Hacienda Heights and San Gabriel bears out that idea.

And so it's a difficult job to actually keep all of the growers focused on the idea that they're fighting a disease which isn't actually there at the moment. They have day-to-day concerns. The things they were already concerned about didn't go away when HLB arrived in the state. They have to think about all of those things already.

So as much as it's true at an industry level--the industry is very, very committed to help itself to fight this problem at the ground level with thousands of individual growers--it's very difficult to keep all of them focused on the problem that this disease poses for the industry. And so you can never have too much extension when you're facing a problem like this. Extension is expensive, but boots on the ground go a long way to getting growers organized. And ultimately, as you heard from Florida, it's the local organization of growers to do the right thing at the right time and to stay together to act as groups to behave as good neighbors to one another. Those things will actually achieve some success.

But there's a long lead-in time-- in an ideal world we'd never get there-- but there's a long lead-in time to those... a lot of those guys actually having to do things to combat the disease. And so the network of grower facilitators who work with the growers is fairly thinly stretched. There aren't a large number of those people who have to keep the growers focused on the problem. Bob Atkins and his team do a fantastic job, but more boots on the ground would make the job easier, and it would make it more effective. And it would significantly increase the

chances of the psyllid management area program succeeding in its objectives. So there are cooperation problems, coordination problems at a local grower level that more resources would help with.

We've heard a lot also today about the interaction between different agencies involved in trying to combat the disease. And again, while it's true that the interactions are fantastically successful, more can be done to help and ease some of the problems there are with those interactions. Each of those institutions involved has its own constraints, its own objectives; and those have to be compromised to some extent to achieve success.

For example, the status of a tree as positive or negative for HLB is a legally defined definition that is dependent on a particular diagnostic test result. It has to be that way in order for there to be a legal basis for the regulatory agency to be able to take action and, for example, issue a warrant to say the infected tree can be removed. "Infected" has to have a legal definition.

Unfortunately for the growers, there's often a long delay, as Beth just explained, between when a tree becomes initially infected and when that legally defined definition of infected will be reached. And so there's a certain amount of tension between the growers and the regulatory agencies. It's natural for both that this should occur because the growers would like the trees to be detected faster and removed quicker from the urban area than it's currently possible to do. But it would be very difficult to establish a legal basis for the early detection technologies to say for definite the tree was infected. And of course, that gets us

into very difficult water then when it comes to trying to force individuals to have trees removed from their properties.

And so there are some complex issues that need further analysis and further work and a lot of facilitation as we work towards trying to get rid of the HLB from the system. I have to say, as an epidemiologist, I believe that objective is actually possible in California. I believe we're not yet past the point where we could stop the progress of the disease in its tracks. But it will require even better collaboration and cooperation in future between the agencies involved. And at a fairly high level, some direct intervention to ease the wheels of collaboration between the private sector and the regulatory agencies would go a long way to help with that.

One example where extra resources for enforcement would be effective is in the area of the issue of fruit movement that we heard about from the director of the Cecelia Packing Company. As he explained very eloquently, those regulations to require growers to clean and tarp loads before they're moved between areas are costly; but they're also very, very necessary to help slow down the spread of disease. So on the one hand, the industry can see that those things are beneficial; but on the other hand, they impose unwelcome costs and constraints on the industry.

Currently, if you spend some time in the San Joaquin Valley, it's not that difficult to see untarped truckloads of fruit being moved around, essentially because there's very little, if any, enforcement of those regulations. There simply aren't resources to enforce those regulations. And human nature being what it is,

human beings cut corners. And so some extra regulations for enforcement would--I'm sorry--some extra resources for enforcement would go a long way to help and would cut down those kinds of opportunities for human agencies to move food--sorry--to move the problem around.

Beth Stone-Smith and others got into talking a little bit about the dynamics of the psyllids and how much bacteria they carry and where they are in relation to the infection. Dr. David Bartels, who works for APHIS in Texas, is actually coordinating studies where he takes all of the psyllid sample results and maps them out. And he has some very good data showing where there are clusters of psyllids that have suspect levels of results from PCR tests. Either Beth or myself could put you in touch with Dr. Bartels if the committee wants to see that data. It's available in a readily digestible form. And Dr. Bartels is carrying on doing those analyses. And that data, which shows us where those suspect psyllids are, is being used by CDFA and by USDA ERS to evaluate the risks and to help coordinate the survey program. But those information will let you see exactly what portion of the psyllid population have the bacteria and what portion don't.

And the story that happened in Florida was that initially very few of the psyllids have much bacteria in them because there are few infected trees for them to get it from. But as the proportion of infected psyllids increases, more trees become infected, and we get into a kind of feedback system where eventually a very large proportion of the psyllids end up with the bacterium. And the disease spreads in an uncontrolled way.

We're not yet there in California, and I believe the opportunity still exists to stop us from getting there. But again, action is required immediately to do all of the things that need to be done to prevent it from happening.

Just again, picking up on the idea of tagging trees, which was mentioned, and the relatively low level of effectiveness of tagging trees, a research proposal has just been submitted to the Citrus Research Board to look at that issue, to look at tag design. And also to help maybe use--to gather information from the tags using smart phone technology to actually look at where plants are moving to, who's buying them, and those sorts of issues. So there is some work in prospect --again, it would be industry funded--to have a look at the efficacy of the tagging process to try and prevent the spread of the disease.

I have to say that a lot of the problems to do with urban spread of the disease are connected with some fairly prickly socioeconomic issues. There are some high-risk, if you like, communities within the population. And the reason that those are high risk are for cultural reasons, for language reasons. These are statistical relationships of risk. There's no implication of elevated levels of wrongdoing by any sectors of the community. But an effective program of outreach to those communities requires a sufficient level of translation of native language speakers, who can speak directly to those communities and help them understand the problem. And probably, an insufficient level of resource has gone into that issue so far in order to make that kind of program truly effective.

So I'll stop there, but I hope I've illustrated that there are a very wide range of non-disease and vector issues that are intimately tied up with how successful

the control program is likely to be, many of which have, at least in theory, policy level solutions through funding.

SENATOR GALGIANI: Okay. Thank you. Any questions? Okay. You've given us a lot of food for thought and a lot to think about moving forward. So I appreciate your testimony very, very much and look forward to working with you on some possible solutions as we move forward. Thank you.

And at this time, we'll go ahead and take any public testimony or comments. Seeing none, we'll bring the hearing to a close. Thank you very much.

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