The annual Citrus Showcase is the single largest educational forum for the California citrus industry. Nearly 1,000 growers and industry members attended the one-day March event in Visalia, California, to hear updates on critical issues impacting the industry. The 2014 Showcase was not only the biggest in the show’s 20-plus year history, it also focused on some of the biggest issues the California industry has faced in its history.

“Fighting back” was the appropriate overarching theme of the day. It applied to fighting back against the Asian citrus psyllid (ACP) and huanglongbing (HLB), onerous water regulations, and false perceptions being promulgated by activists, to name just a few topics.

This year’s workshop content nearly doubled as California Citrus Mutual and the Citrus Research Board provided concurrent sessions throughout the day.

**WATER WARS**

The day kicked off with a new addition to the Showcase, “Breakfast with Water.” State Water Resources Control Board (SWRCB) President Felicia Marcus addressed an attentive and eager crowd about the State’s current water woes from ground water management to the drought. “Groundwater contamination should not be a legislative issue, but it is,” she insisted. “Tagging agriculture as the problem is not a solution.”
The discussion continued in the breakout session, “Offensive Water Regulation Requires Strong Offense by Industry.” Speakers Dr. Joel Kimmelshue and Tess Dunham provided an overview of the Irrigated Lands Regulatory Program (ILRP), specifically regarding the recently adopted General Orders regulating discharges from irrigated lands and nitrogen use reporting.

But, the topic on everyone’s mind was the drought and how much, if any, water can be expected to flow through Friant-Kern Canal to South Valley agriculture. Marcus stated that the SWRCB had yet to make any decisions as far as allocations, but indicated that a zero allocation is not off the table yet. “The drought is out of anybody’s present scope of knowledge to deal with. The magnitude was never properly anticipated,” she explained.

Marcus referenced the Governor’s drought package, which provides $687.4 million to support drought-relief programs primarily for the urban sector. “Our approach to the drought is to help people do what needs to be done without imposing regulations that impede their ability to do so.”

Time will tell if that is, in fact, the case.

**GMOS — A SOLUTION OR CONTROVERSY?**

A genetically engineered solution to HLB has encouraging potential from a scientific perspective, but could become a public relations nightmare if not handled correctly. How does an industry such as citrus overcome the negative public perceptions surrounding genetically modified organisms (GMOS) if, or when, a genetically modified HLB-resistant tree becomes the industry’s best hope for survival?

That was the question posed by Dr. Cathy Enright, executive vice president for the Biotechnology Industry Organization (BIO) during her presentation at the Showcase luncheon. Enright’s firm, which comprises agricultural groups and biotechnology companies, is tackling this issue head on in the midst of negative perceptions and attacks by the media.

The citrus industry is in a good position though, according to Enright. “My experience tells me that your story will not fall flat; it will be embraced.”

But, shying away from the issue and not sharing that story is a disservice to the citrus industry itself, warned Enright. The biotechnology industry has experienced this first-hand in recent years with the influx of GMO labeling initiatives across the country.

To counteract the false claims that have been promulgated by the media, Enright’s firm developed a public outreach campaign designed to open the dialogue about GMOS. Since the campaign’s inception, BIO has favorably impacted the amount of anti-GMO bias in the news.

It is still uncertain if GMOS will, in fact, be the solution for huanglongbing, but Enright’s message of openness and transparency transcends all issues from a public relations standpoint.
“Consumers relate to eating oranges and drinking orange juice,” said Enright. “They must understand the potential threat that the Asian citrus psyllid and huanglongbing have on the supply of those products.”

FIGHTING BACK AGAINST ACP AND HLB

There is no question that ACP and HLB pose the biggest threats to the California citrus industry. What is being done now from a proactive standpoint to stop the psyllid from spreading will determine the future of the industry. There is no greater indication than what has happened – and is still happening – in Florida, that California’s suppression and eradication approach has so far been the right one.

Florida Citrus Mutual Executive Vice President and CEO Mike Sparks reminded workshop attendees about the devastation that HLB has caused to the Florida industry. He emphasized the need to establish an area-wide treatment program in California to more effectively knock down ACP populations and prevent the insect from spreading further. Similar programs have been effective in some areas in Florida, but East Coast growers were admittedly too far behind the issue to see the results that entomologist Dr. Beth Grafton-Cardwell is confident California will see by implementing such a program.

Additionally, Dr. Mary Palm of USDA-APHIS discussed the research efforts underway at the federal level as part of the newly formed HLB Multi-Agency Coordination (MAC) Group. She explained that California’s situation is much different than that in other parts of the country where HLB has taken hold. In California, stopping the spread of ACP must remain a priority, and APHIS is committed to investing in research and programs such as biological control in order to meet the California industry’s needs.

THE CALIFORNIA BIOLOGICAL CONTROL PROGRAM FOR ACP

When the Asian citrus psyllid was first detected in southern California in 2008, the immediate response was to conduct chemical treatments with the goal of eradicating the insect. Because ACP was found in residential areas, repeated treatments were not sustainable.
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The three speakers in this workshop provided an update on an alternative program to manage ACP using the biological control agent, *Tamarixia radiata*, a parasitic wasp that only feeds on ACP. Also reported on in this session was the future release of a second bio-parasite, *Diaphorencyrtus aligarhensis*, which will occur as soon as federal approval is finalized. The California biological control program partners, including the Citrus Research Board (CRB), University of California, USDA-Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA), are working to develop and coordinate methods for the mass-rearing and release of these beneficial insects.

USDA-APHIS PPQ’s Ken Bloem highlighted biological control successes and failures in the past and identified the pros and cons of both parasitoids against ACP. In his analogy of super heroes, Bloem likened *Tamarixia* to Robin, rather than Batman. He advised growers in the San Joaquin Valley not to be too anxious in wanting to release *Tamarixia* in this area. This agent is host specific: no ACP means no *Tamarixia*. Bloem concluded by saying, “Biological control strategies should not be considered stand-alone tactics, but rather they should be incorporated as part of an overall integrated pest management program for ACP and HLB.”

Greg Simmons, USDA-APHIS PPQ, described the progress made by the California team to improve the mass-rearing of *Tamarixia* through the development of greenhouse and field production systems. These advances have resulted in the 1,000-fold increase from 2011 to 2013 in the number of agents available for release.

CDFA’s David Morgan concluded the session by explaining the targeted release site strategy and the implementation of more efficient methods used by personnel. A major component in rearing biological control agents is to have sufficient plant material for the insects. Currently, there are three locations where plants are produced – Riverside, Pomona and Arvin. Morgan was optimistic that 2014 looks promising. Rearing facilities are ramping up and producing an increased volume of *Tamarixia*. This will result in a greater number of agents released throughout southern California, where *Tamarixia* continues to become established. All speakers cautioned that biological control cannot be the sole answer to ACP and HLB management. Fighting and winning this battle requires a combination of approaches.

**IS THERE HOPE FOR RESISTANCE IN CITRUS TO HLB OR INFECTED ACP?**

Florida citrus breeders and growers have been seeking citrus and citrus relatives for possible resistance and/or tolerance traits against HLB and its vector, infected ACP. Two Florida breeders, Ed Stover of USDA-ARS in Fort Pierce and Fred Gmitter from the University of Florida, shared their results in the pursuit of a tree that can survive the insect and disease pressure in the Florida environment.

Stover reported on progress evaluating cultivars and other scion types as Florida possibly faces living with HLB forever. The Fort Pierce Research Center’s very own test blocks are under severe pressure from the presence of ACP and HLB, making it a suitable setting to evaluate for HLB resistance and tolerance. Promising field trial data with new “Sweet Orange” hybrids of a very different genetic makeup led as a possibility. Also, under severe HLB and citrus canker pressure, two grapefruit varieties, “Triumph” and “Jackson,” were less adversely affected.
Promising GMO technology was touched upon by both speakers. Given the current negative perceptions, Gmitter promoted the use of genomic-based information as a tool to develop resistance in conventional breeding. Stover suggested that “GMOs including transgenics will be the ‘organic’ of the future,” albeit perhaps a distant future, given the expected reduced use of pesticides and fertilizers that would be needed to keep GMO trees healthy and productive where HLB is endemic.

Gmitter has searched throughout China looking for HLB resistance and/or tolerance in “survivor” or “miracle” trees. He further reported on the “Rootstock Effect” – 17 rootstocks have potential to impart tolerance to their scions. Four will be planted and evaluated this year. Gmitter closed with a cautionary note for those expecting HLB-resistant trees in the short term that have all the best commercial properties that growers and consumers want: “There will be no one single solution; it will be a working mosaic of solutions.”

PROGRESS ON PRE-SYMPOMATIC DETECTION OF HLB

Since ACP can spread HLB long before visual disease symptoms become apparent, the CRB has funded several projects to develop technologies that can detect the pathogen before the symptoms are expressed. The Winter 2014 edition of Citrograph featured an expanded article on this work, including a glossary and illustrations the reader might wish to consult. At the Showcase, there were reports on the significant progress of these technologies.

UC Davis’ Carolyn Slupsky opened the session with an explanation of the many approaches to detecting diseased trees, including host plant responses, proteins produced by the pathogen, metabolic compounds and small RNA molecules. She described the longitudinal study currently being conducted within the contained research facility at UC Davis that will compare the newly-developed detection methods to real time PCR, the current “Gold Standard” testing method.

Alexander Aksenov reported on the development of the electronic volatile organic compound detection sensor, also known as the “VOC sniffer.” Data has been collected with the prototype near potentially HLB-infected trees in Florida, Texas and the single HLB find in Hacienda Heights, California.

UC Riverside’s Wenbo Ma concluded the session describing her process of identifying proteins secreted by the HLB bacteria. Her method is simple and can be conducted by a grower or nurseryman. A citrus shoot is cut and pressed to a membrane. Many imprints can be made to one membrane. The membrane then is exposed to specific antibodies, and if the bacterial protein is present, a dark mark appears on the membrane. A similar method already is in use to detect citrus tristeza virus.

The Citrus Showcase was sponsored by JKB Energy, Dow AgroSciences, Farm Credit Associations, Fruit Growers Supply, Yara North America, 2,4-D Task Force, Syngenta, Pace International, Southern California Edison, Valent, Bayer Crop Science, Sinclair Systems, and Deerpoint Group, Inc.

Alyssa Houtby is the director of public affairs for California Citrus Mutual. Chad Collin is with the Citrus Research Board, where he serves as director of board and grower communications and also as associate editor of Citrograph.