California AvoTech

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The Latest on Laurel Wilt

In February of this year, scientists and Extension professionals from the University of Florida put on an international conference to discuss the latest findings on the devastating laurel wilt disease. The purpose of this conference was to offer updates of both basic and applied research on the laurel wilt pathogen and ambrosia beetle vectors to avocado producers, scientists, organizations, institutions and other interested parties; to offer Florida avocado producers and others the opportunity to attend an online meeting focused on laurel wilt and ambrosia beetle vectors affecting avocado production; to focus attention on this devastating insect-disease complex that may have profound consequences for other avocado production areas and regions; and finally, to increase U.S. and foreign research and extension collaborations.

Laurel wilt is caused by a fungus called *Raffaelea lauricola* and it is vectored by tiny ambrosia beetles. The ambrosia beetles carry and farm the fungus to feed their young. Once they find a suitable tree, they hollow out galleries to grow the fungus and raise their young. Trees in the Lauraceae, such as avocados, are hypersensitive to the presence of the fungus and try to wall off the disease, which is found in the xylem portion of the tree. Because the xylem is responsible for transporting water to the tree's leaves, if it is blocked the trees wilt and die. The presence of the disease sets off a chain reaction where the tree blocks the xylem so aggressively and effectively the tree can no longer transport water to its leaves resulting in wilt and rapid death.

Once the disease is in an orchard, it can move by beetle activity or through root grafts among adjacent trees. If trees in the orchard are old enough, their roots are most likely grafted together. Root grafting allows the disease to easily move from one tree to its neighbor and you will often see trees die one by one right down a row. There seems to be no resistance found among different cultivars or races of avocado as every cultivar of avocado that has been exposed to the disease has died.

At this point, there is no cure for the disease and there are no measures that will effectively prevent the disease from attacking individual trees or orchards. There has been some work done with injecting trees with a prophylactic fungicide before the disease arrives. This has been met with mixed results, although some growers continue to use the fungicide and have had good results. Growers are advised to frequently scout their groves and to immediately rogue trees that show symptoms of wilt and beetle activity. Trees that are removed should be immediately destroyed through chipping or burning. Some work also has been done to show that ambrosia beetles prefer shade, so well pruned orchards have less chance of being attacked by beetles.

The University of Florida scientists and Extension professionals that participated in the February laurel wilt conference updated the industry on the latest on laurel wilt. Tropical fruit Extension agent Jeff Wasielewski began the day by explaining a little about the disease and the purpose of the conference. He mentioned that the work done by the UF scientists on this disease was supported by the USDA National Institute of Food and Agriculture.

Dr. Jonathan Crane, tropical fruit specialist, spoke on how laurel wilt has affected the commercial avocado-growing region in South Florida. More than 140,000 trees have been killed either directly or indirectly by the disease. Avocado production has dropped from more than a million bushels per year in the years 2011 through 2015 to

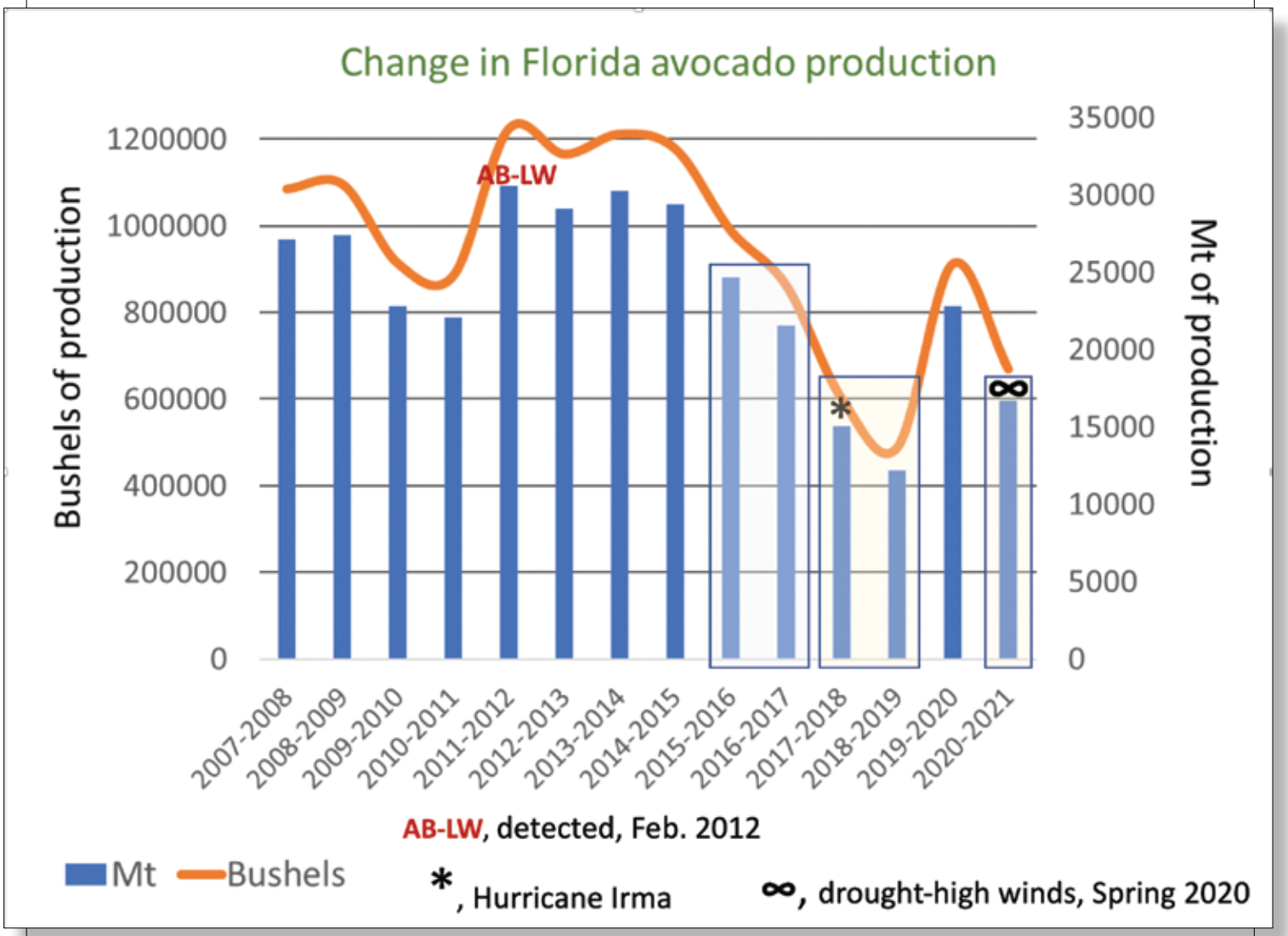

Figure 1.

just over 500,000 bushels in the 2017-2018 season and 600,000 bushels in the 2020-2021 season (Fig. 1). Laurel wilt is not the only reason for the drop in production. These numbers also have been heavily affected by a hurricane that damaged the industry in the 2017-2018 season and poor weather conditions during fruit set in the 2020-2021 season that caused the crop for that year to be less than anticipated. Dr. Crane also talked about techniques used to battle the disease including roguing, pruning, and keeping trees healthy. Dr. Crane also mentioned that as much as 78% of trees lost have been replanted. The replanting of avocado trees appears to be a good sign the industry is still relatively healthy and optimistic.

Tropical fruit entomologist Dr. Daniel Carrillo and Ph.D. candidate Octavio Menocal talked about the different ambrosia beetles that are spreading the disease, as well as how their team has shown the ambrosia beetles that were attacking the avocado trees were different from the species attacking the native Lauraceae trees.

Dr. Bruce Schaefer, plant physiologist, spoke about his studies regarding using different rootstocks and scions to try to find some resistance to the disease. Unfortunately, no pairing has been found that shows any resistance.

Dr. Romina Gazis, Dr. Jeffrey Rollins, and Dr. Pedro Pablo Parra, plant pathologists, spoke about the disease itself and new techniques they are using to learn more about the fungus. Dr. Gazis noted there have been some trees found that tested positive for the disease, declined, and then recovered to the point where they are producing fruit. These trees are being closely monitored and a seedling trial is underway to look for trees with similar attributes.

Fredy Ballen, economist, spoke about the economics of battling the disease. Different price scenarios were presented based on the input a grower is willing to put into an orchard. It was

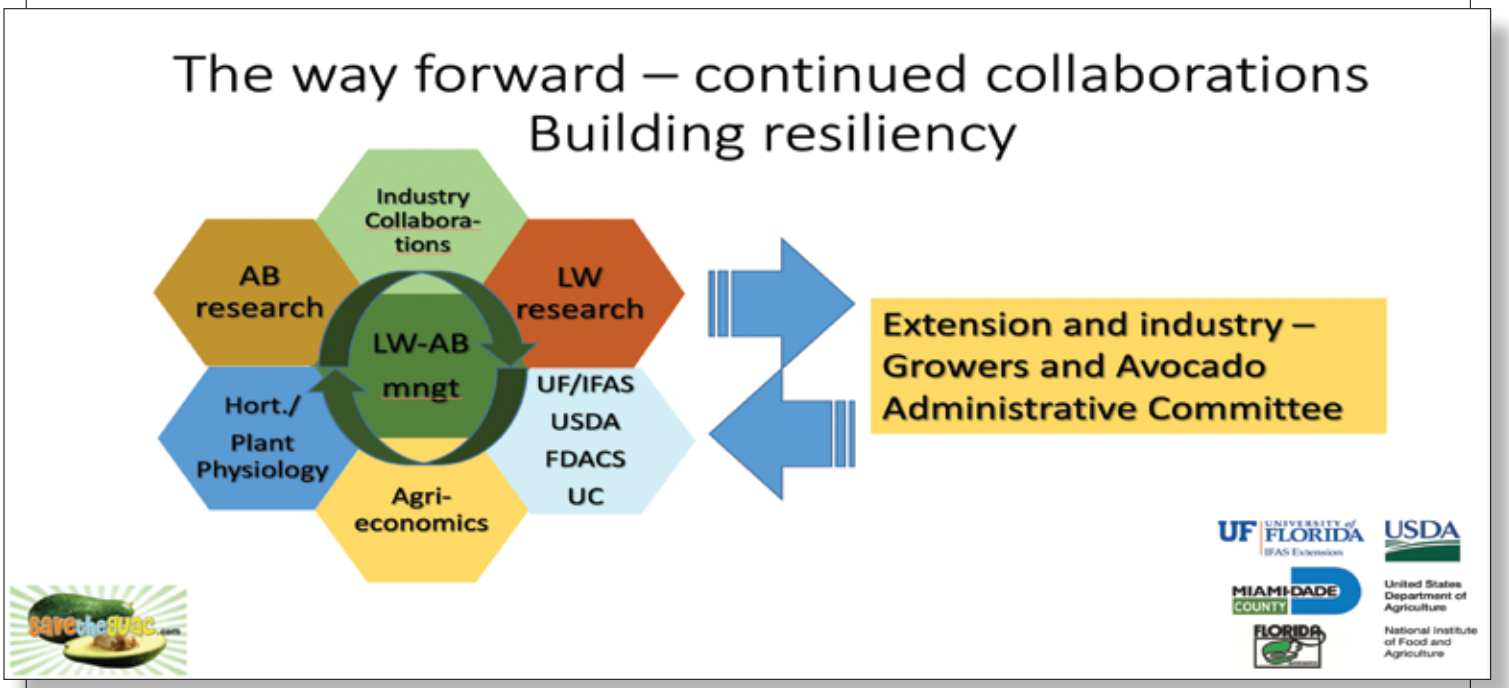

Figure 2.

determined that a higher input of resources into a grove allowed a grower to have a higher output and possibly stave off some of the financial damage caused by laurel wilt.

Entomologists Dr. Lukasz Stelinski and Dr. Kristen Stelinski spoke on the challenges and opportunities of pesticide alternatives for ambrosia beetle management, as well as ambrosia beetle microbial communities associated with the fungus.

The UF scientists and Extension professionals rounded out the day by taking questions and reaching out to growers and professionals from other states and countries to offer their knowledge on this deadly disease. Opportunities to establish working relationships between postdoctoral associates and visiting scientists are being sought to increase the research effort into the control of the laurel wilt pathogen and ambrosia beetle vectors. If your institution is interested in funding a postdoctoral associate and/or visiting scientist to join our research team please contact Dr. Jonathan Crane at jhcr@ufl.edu. It will take everyone working together to combat laurel wilt (Fig. 2).

It has been shown that California has an ambrosia beetle capable of spreading the disease, as well as a native tree, the California bay laurel, *Umbellularia californica*, that would be susceptible to the disease. These two factors will make it easier for laurel wilt to spread to avocado orchards in California.

At the present time, the disease has only spread as far west as eastern Texas. It is possible that the disease could present itself in California at any time if someone brings contaminated wood from Texas to the west, or it could show up over a longer period of time through natural beetle movement. It's thought that ambrosia beetles with the laurel wilt pathogen could move south into Mexico and then come back northwest to the avocado orchards of California.

In any case, it is imperative growers and regulatory agencies in California are ready for the disease and that they have a plan to quickly remove and destroy trees infected with laurel wilt. Having a plan in place now will greatly lessen the impact of the disease on the California commercial avocado industry.