



GROWER RESEARCH REPORT

JULY 2020

A Message from Rick Dantzler, COO of CRDF

I flew the flag proudly last Saturday - July 4th - but it was a different kind of Independence Day.

Normally, the day would have been filled with outdoor cookouts throughout the county, including political speeches from candidates in local races, culminating in fireworks displays at night, but COVID-19 changed all that. With the number of cases in Florida climbing, July 4th celebrations were, by and large, kept to private affairs.

It is also a presidential election year and the election is just four months away. The nominees for both major parties are all but decided, important state and congressional races are heating up, and football season is just around the corner (hopefully). For as long as I can remember, times like this were among the most exciting and fun for me, but this year it feels different. Division and rancor seem to rule. Political debate rarely stays spirited; instead, it turns angry and sometimes ugly.

Here is a nice little truth that runs against the rule, though, and it is a testament to how the Florida citrus industry is viewed. One on one with policymakers, partisan division and rancor falls by the wayside, at least with citrus. During the time I have been in this job, I have not run across a single person who wants to do us harm. To the contrary, everyone wants to help. Sometimes they can't, but it isn't because they don't want to. Instead, they are willing to do whatever they can to keep our industry healthy.

And so it was this year with the Florida Legislature and Governor DeSantis. CRDF is again receiving \$8 million for research, and other facets of the industry received funding, as well. This is remarkable considering the fiscal impact of COVID-19, and much of this success is because of the efforts of Mike Sparks, Matt Joyner and the entire Florida Citrus Mutual crew. CRDF is not allowed to lobby so we rely on others in the industry to speak for us, and no one does it better than our friends at FCM.

CRDF never takes for granted the funding it receives from growers through the box tax, legislators through the state budget, or members of Congress and executive branch officials through USDA programs. Our approach is that it must be earned every year, and that is our commitment to you.

BAYER CROP SCIENCE PROJECT:

I have written a great deal about the Bayer project in previous Grower Reports so I won't go into detail, but here is a brief review. I am mentioning this because good things are happening.

In 2017, CRDF, Coca-Cola and Pepsi agreed to financially support a project by Bayer Crop Science. It was a three-year project at a cost of more than \$12 million. It was the most expensive in CRDF's history and remains so.

The project has two primary objectives: to develop a plant defense modulator (PDM) compound that switches on the tree's natural defenses to fight liberibacter, and to develop an anti-bacterial microbial compound that attacks liberibacter directly.

Results are encouraging. Work on the PDM is quite advanced, and Bayer is confident they are onto something that will work not just on citrus but also other commodities. This is important because bringing a product such as this to market can cost up to \$250 million, so Bayer needs the product to work on other commodities to justify such large development costs.

Work on the anti-bacterial product is not as mature, but with project funding Bayer has built a high-throughput system to test compounds and are running approximately 500 through the system per quarter. There are three field trials in Florida to test promising leads of anti-bacterial and PDM products.

To fund the project until a decision on the NIFA grant is made, the three funding partners plus a new one, the California Citrus Research Board (CRB), agreed

The Mission of the Citrus Research and Development Foundation is to "Advance disease and production research and product development activities to insure the survival and competitiveness of Florida's citrus growers through innovation."

to provide bridge funding until December 31, 2020.

We submitted a pre-proposal for NIFA review and were invited to present a full proposal, due on July 13th, which we are working on as I write this. Receiving the NIFA grant is critical to the future of this project, so keep your fingers crossed.

NUTRITION PROPOSALS:

At a January board retreat, CRDF chose to focus for this year on plant improvement as we continue our effort to breed our way out of the HLB problem, and to fund additional research on nutrition to help growers bridge the gap to when such greening resistant and tolerant trees are forthcoming.

Regarding plant improvement, an effort is underway to create a new paradigm for plant breeding. It will likely involve a standing committee to coordinate plant improvement efforts and a focus on the last stage of plant improvement testing that may involve a greater role for CRDF.

Regarding nutrition, CRDF has invited 10 researchers to submit full proposals out of 16 pre-proposals that were received in response to a Nutrition RFP. We will soon be receiving the full proposals and evaluating them.

The Nutrition RFP included three broad categories: Nutrient application to soil vs. foliage application; Mode of fertilization to soil; and Nutrient impact on fruit quality. Naturally, each of these categories has numerous sub-parts. This comes on the heels of the latest release of the IFAS Nutrition Bulletin, so it will be interesting to see if there is anything new.

ARE THERE POSSIBLE CURES TO HLB ON THE HORIZON?

Yes. As you will read in my August Citrus Industry column, there are reasons to be hopeful. As I say there, I am coming up on my two-year anniversary in this position with CRDF. Curing this disease or at least making it functionally irrelevant has proven to be more difficult than I thought. Still, I have never been more sure that it will happen, and I am determined to make it happen while we still have a critical mass of citrus growers for the industry to recover much of its former glory.

How will it happen? Here are five likely ways.

1. Genetic modification. Scientists are either very close or have already identified the genes that allow *Liberibacter* to do its damage. Through CRISPR editing, these genes can be turned off to make trees less affected. Views of what constitutes a genetically modified organism are changing, thus minimizing potential marketing or regulatory issues.

2. Trunk injection of an agent that either kills *Liberibacter* or inhibits its growth to the point that it becomes inconsequential. What is injected does not have to be the bactericides which have already been approved for foliar application. There are numerous compounds — some completely nat-

ural — that could kill or inhibit *Liberibacter*. Getting to it is the challenge, which is why I support aggressively testing the newest and most promising models of injection devices. Not only could naturally occurring pesticide-like products such as antimicrobial peptides be injected directly into the phloem (where *Liberibacter* lives within the tree), like we have recently read about from UC Riverside, but such devices could also possibly deliver micronutrients. Wouldn't it be great if we were able to give plants grams of micronutrients instead of pounds?

3. Delivery to the tree of either antimicrobial peptides or genes from plants such as spinach by using citrus tristeza virus (CTV). CTV is endemic in Florida and lives in the phloem of citrus trees, so it can deliver treatments against *Liberibacter*. Much of the regulatory hurdle to activate this tool has already been cleared, too.

4. Development of resistant scions. Breeders have already developed orange-like hybrids that look, taste and smell like conventional round oranges (*Citrus sinensis*) and some are virtually HLB resistant. If transport and processing issues can be resolved, if these hybrids prove to be as nutritious as *Citrus sinensis*, and if we don't create foreign competition that cuts our own throats, this could be a segment of the citrus industry that would be mostly unaffected by HLB.

5. A novel way to kill the Asian citrus psyllid or render it unable to transmit HLB. Remarkable progress is being made in altering bacteria in the gut of the psyllid that either kills the psyllid or makes it virtually harmless to citrus.

Are there others? Sure, but these are five that hold real promise.

CRDF is making a concerted effort to focus on research that offers the potential for a cure. For 10 years we have built the library of knowledge on HLB from virtually nothing to where we now know an awful lot about the disease, but unless we can transfer this knowledge to something that helps you, what has been the point? Please know that I remind myself of this every day.

We are going to cure HLB or make it functionally irrelevant; you can mark my words.



The Citrus Research and
Development Foundation's

Virtual Educational Session

hosted by
Florida Citrus Mutual

8:30 am -8:45 am – Intro and Rundown of CRDF
Rick Dantzler

8:45 am – 9:00 am – Direction of CRDF
David Howard, Graves Brothers Co./Chairman of the CRDF

9:00 am – 9:20 am – Kaolin Red Clay and Psyllid Control
Dr. Christopher Vincent, IFAS

9:20 am -9:40 am – Reducing psyllids improves tree health even when
trees have HLB: IPM approaches
Dr. Lukasz Stelinski, IFAS

9:40 am - 10:00 am – Citrus Outlook Update
Dr. Marisa Zansler, FDOC

10:00 am – 10:25 am – Update from USDA/ARS focusing on a broader
definition of citrus, oak leaf extract and rootstocks
Dr. Brian Scully, Dr. Ed Stover and Dr. Robert Shatters

10:25 am – 10:30 am - BREAK

10:30 am -11:30 am - Grower Panel
Moderated by David Howard

- Update on Field Trials from Brandon Page , CRDF
- Larry Black, Peace River Packing Co.
- Rob Atchley, DUDA
- Daniel Scott, Scott Citrus Management

11:30 – 11:45 - Latest from Citrus Research and Field Trials (CRAFT)
Kristen Gunter/Tamara Wood

11:45 - Conclusion
Rick Dantzler

July 22
2020

8:30 a.m. - Noon

Join Zoom Meeting
[https://us02web.zoom.u
s/j/89936797582](https://us02web.zoom.us/j/89936797582)

Meeting ID: 899 3679
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