



CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.
Plant Improvement Committee Meeting
Minutes
Tuesday, December 3, 2024

A meeting of the Plant Improvement Committee of the Citrus Research and Development Foundation, Inc. was held on Tuesday, December 3, 2024, at the Bert J. Harris Agriculture Civic Center Auditorium, 4509 George Blvd, Sebring, FL 33875. The meeting was called to order at 10:53 AM by Chair Joby Sherrod. Roll was called and there was a quorum present. Committee members participating were Steve Callaham, Peter Chaires, Aaron Corkum, Chris Gunter, Steven Hall, George Hamner, Gio Ijpkemeule, Nate Jameson, Wes Johnson, Sean McCoy, Trevor Murphy, Brandon Page, Erin Rosskopf, Joby Sherrod, Jim Snively, Sarah Spinosa, Pete Spyke, and Rosa Walsh.

Mr. Sherrod noted that approval of the minutes of the May 30 and July 15, 2024 meetings were available in member packet for review and approval. Mr. Snively made a motion to accept the minutes as written. The motion was seconded by Mr. Murphy and passed unanimously.

Mr. Dantzler noted that CRDF has approved two projects that are relevant to the discussions today. One of those was the project that we are participating in with Coca-Cola, where they have evaluated 500 accessions and narrowed that down to approximately 55, which are going to be taking those to large-scale, stage-two field trials. CRDF also commissioned the breeders to do an inventory of all the germplasm that existed in the field trials across the State, and from that are trying to discern exactly what it is that we have and what needs further evaluation.

The third project that CRDF has funded is to assist the University in clearing out space from their 127 acres at CREC and surrounding areas. The vacated space will make room for several large-scale trials, including those discussed above.

Mr. Dantzler noted that Dr. Ping Duan previously offered an education session on culturing CLAs.

Wes Johnson, Coca-Cola, made a presentation on primarily Mandarin hybrids for Juice. He noted that he gave a more detailed presentation at ICBC which is available for viewing, Coca Cola is hoping to plant 1,000 additional acres with what they have learned.

Matt Mattia, USDA, ARS, Ft. Pierce, made a presentation on selections and data and what should be done moving forward.

John Chater, UF-IFAS-CREC, Lake Alfred, gave a presentation on promising rootstocks and scions, reporting on what was in the field, where the gaps were, and what needed to be done to move the winners forward.

Mr. Chaires asked if Dr. Chater had sufficient funds to do what he needed to do. Dr. Chater responded that with breeding a tree crop, it is like a bottomless pit of need. A major challenge is the timeline where we get the funds to plant the trial, and then we do not get the funds to follow the trial after it is established. We have had trials that are looking good, but then we are unable to get them funded; that long-term funding is a major problem. He said he had what he needed to start sequencing apparent winners and to start mining the data for other variants and genes.

Mr. Chaires asked, "So if you had a breeding program with recurring dollars annually, how much would you need annually to run a program long term?" Dr. Chater said \$750,000 to \$1.5 million would fund a world-class citrus breeding program that has multiple large-site trials.

Mr. Spyke noted that there was a lot of land available at IRREC with irrigation embedded and everything ready to go. Also, if Citra is not too far north, they can do a large trial as well. Jim Boyer is a superb manager there. There is also available land in Quincy and the City Block at CREC. There are 5- to 7-acre parcels that have been cleared under the CRDF consolidation project that are available.

Mr. Dantzler noted that CRDF had \$375,000 in available funding from this year's budget for new research, Items which had been suggested so far were:

1. A trial that crosses the five most promising rootstocks with the five most promising scions and compare them against industry standards.
2. More funding to Dr. Dutt to ramp up his transgenic work.
3. Reach out to researchers who are searching for OTC replacements to see if they have found anything particularly promising that needs validation funding. We have only heard from Batuman and Heck.
4. Penicillin efficacy work.
5. Another year for Dr. Turgeon from Cornell to prove his concept of binding CLAs to single-chain antibodies which allows the plant to kill CLAs with its natural defenses. He has transformed 16 lines which Dr. Levy is growing in the greenhouse.
6. Validation to determine if OTC and streptomycin as a combined product work as well as we think it does.
7. Using graft transmissible dwarfing and viroids to upregulate natural immune response.

Wes Johnson suggested crossing the best 5 rootstocks with the 5 best scions in new trials.

Pete Spyke said his operation is growing many trees that look great, which he will be happy to show anyone.

Aaron Himrod asked John Chater what gene targets are needed. Dr. Chater responded that Dr. Kelsey and Dr. Messina could answer that, that the next step is sequencing – find gene targets – RNA expression. He believes UF and USDA will find gene targets by the end of the 3-year Grand Plan project. The data from the conventional breeding projects feed sequencing efforts.

Brandon Page shared that Dr. Lukasz Stelinski is using a Bt toxin to kill psyllid nymphs when they feed on the tree. There are two genes that have been identified that can do this. Transformations have been successful, so we have transformed trees that express both of these genes, either by themselves or hopefully stacked together in the same transformation. If an adult Psyllid comes to it and feeds on it, it will still be able to vector the pathogen, but it will likely receive a lethal dose of the Bt toxin and die over time. It was suggested that IFAS help fund this project.

Dr. Chater was asked how much money was needed for gene sequencing. When it comes to gene sequencing and looking for these genes and variants that we will use for CRISPR to design the tree, you can sequence things with short read sequencing and it can be very cheap. It could be hundreds of dollars per accession, and you get some genetic information that you can utilize. Sometimes it takes what is known as deep sequencing, and it can take thousands of dollars per accession in order to sequence those. Once you have sequenced those, you do the next step and start looking at the gene expression or RNA expression, which then brings thousands of more dollars into this type of research. So, it can be expensive to do this type of work.

Mr. Dantzler noted that while we once believed that OTC and streptomycin together killed 99% of the bacteria, we started seeing some things that made us wonder if that was the case. So, we pulled together scientists that work in this space and they are not convinced that it is as settled as we once thought. They are pulling together a proposal to give to CRDF to answer this question.

John Updike – Aren't we encouraged by the Grove First project? Why pursue materials that need regulation if they are close to compounds that do not require regulation?

Dr. Chater asked if the Grove First compounds are proprietary.

Mr. Dantzler asked Wes, Matt, and John if they could identify the top three, or ten, of what they are working with.

It was suggested that we pursue legislative funding for several of these long-term projects.

With no further comments, the meeting was adjourned at 1:16 PM.

Minutes submitted by Barbara Thompson.