

**CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.**  
**Minutes of the**  
**Select Committee on Plant Improvement Meeting**  
**Monday, July 8, 2019**

A meeting of the Select Committee on Plant Improvement of the Citrus Research and Development Foundation, Inc. was held on Monday, July 8, 2019, at the USDA/ARS USHRL in Fort Pierce, FL. The meeting was properly noticed and recorded. The meeting was called to order at 1:03 pm by Chairman Jim Snively. Roll was called and a quorum was present. Committee members participating were Tim Dooley, Deeley Hunt, Ed Leotti, Tom Obreza, Pat Ouimet, Daniel Scott and Jim Snively.

Also participating were Liz Baldwin, Brandy Brown, Rick Dantzler, Allison Drown, Fred Gmitter (telephone), Jim Graham, David Howard, Juan Carlos Motamayor (telephone), Michael Rogers (telephone), Brian Scully, Bob Shatters, Tom Stopyra and Ed Stover.

Mr. Dooley made a motion to accept the minutes of the April 12, 2019 meeting. The motion was seconded by Mr. Leotti and it passed unanimously.

Mr. Dantzler made opening statements about what the roles the Select Committee will have with the Plant Improvement researchers. During the first meeting, the committee decided to meet with each group of plant breeders in the different regions to discuss where we are and what is in the pipeline in terms of getting to a greening resistant or greening tolerant tree as quickly as possible.

An idea that has been discussed lately is the use of juice production hybrids, which is a topic that Dr. Ed Stover will be presenting on. There are several breeders and researchers who believe there are tolerant orange-like hybrids. Mr. Dantzler reported that he believes the CRDF Select Committee on Plant Improvement could be a good forum for growers to have some input on what the issues might be as we look more into the use of hybrids.

Mr. Dantzler stated one of the primary reasons of our meeting was to have an interactive discussion on the issues with hybrids and to hear from USDA/ARS researcher Dr. Stover on specifically what he has that might help the industry in the next several years. Also, what new releases of citrus cultivars are in the pipeline, not just hybrids but conventional cultivars, too. Lastly, to hear what CRDF and the Select Committee can do to help get these cultivars as quickly as possible.

Dr. Stover gave a presentation on “Redefining the Orange,” which he reported is a collaborative effort with both USDA and UF breeders, as well as several industry members. Dr. Stover’s presentation can be found on the CRDF website. During the presentation there was lengthy

discussion on sweet-orange-like hybrids vs. “Hamlin” and “Ambersweet.” Mr. Dantzler asked what role CRDF could play. There was discussion on the hybrids possibly being planted as part of the large-scale field trial projects that will soon be underway.

Dr. Stover gave a presentation on the “Federal Breeding Germplasm Program,” and what’s in the pipeline. There was discussion on the list of proposed selections for the Florida Citrus Processors Associations (FCPA) trials. Dr. Stover reported that Sun Dragon has been released. Mr. Dantzler discussed ways for CRDF to possibly help the nursery growers to have enough capital to plant the tolerant orange-like hybrid trees.

Mr. Dantzler gave a brief report on the Gmitter project #18-010, Upgrading citrus genome sequence resources, and where we are in the project pertaining to funding. The CRDF board approved project #18-010 for year 1 funding and years 2 and 3 would be contingent on receiving co-funding from another funding organization. Mr. Dantzler reported that he had reached out to CRB for co-funding; however, while they did not oppose the proposal, they indicated the project could not be fast-tracked and they would require the proposal to go through their regular application process. He also reached out to the Texas Research Institute and they had no available funding. Due to these issues with getting the project co-funded, the CRDF board must decide in early fall if they would like to move forward with the project continuation.

Dr. Gmitter started the project in early February and has submitted his first quarterly report, provided in materials. Mr. Dantzler asked Dr. Gmitter to explain the project to the committee, so it could be discussed further and a recommendation whether to continue the project could be made to the Research Management Committee.

Dr. Gmitter reported that the results from the project will serve the entire citrus research community, people who are working on HLB and particularly those working with CRISPR-based solutions for HLB resistance. The project proposes to develop new genome assemblies, using the latest technology in genome sequencing and assembly, which will produce assemblies that are lightyears ahead of anything else that currently exists. This is important because the quality of existing genome sequences being used for CRISPR technology applications is inadequate, leading to inefficiencies in research. The plan is to use the new PacBio Sequel II system, just released in April 2019. The PacBio Sequel II produces eight times the output of the previous system. This project will also produce a catalog of validated HLB responsive genes for the research community to work with. Dr. Gmitter reported that the work to initiate the project is intensive. The production of DNA needed just to begin the process for sequencing is extremely complicated. We are looking for DNA molecules of 50,000 nucleotides or longer, unlike normal DNA extractions for PCR which are, by comparison, 100-300 nucleotides in length. This requires 1) very young and tender flush, 2) extracting whole nuclei, 3) nanobead technology, 4) a cleaning and prepping process through which the amount of long DNA fragments are frequently decreased by 50% or more, and then 5) sending the samples to UC Berkeley Genome

Sequencing Center for quality control testing before beginning library construction and then sequencing.

There was committee discussion on whether Dr. Gmitter's project #18-010 should be continued, and if the project is continued, what other co-funding could be obtained?

With no further business, the meeting was adjourned at 4:36 pm.

Minutes submitted by Brandy Brown