

CALIFORNIA CITRUS NURSERY BOARD
Progress Report
Fiscal Year 2008

Project Leaders: Georgios Vidalakis and Tracy Kahn

Project Title: Extending Knowledge on Citrus Commercial Varieties and Related Citrus Germplasm

Project Objectives:

1. Convert the static CCPP and CVC web sites to data-driven dynamic sites for better administrative management and distribution of information to the user.
 2. Combine in a functional manner the three citrus collection databases of the Riverside citrus agencies. Harmonize activities, vocabulary, and formatting of the citrus information distributed to the industry.
 3. Enhance the CCPP and CVC websites with photographs, descriptions and variety evaluation data for all varieties available from the CCPP and initiate efforts to photograph all of the remaining accessions and digitize the historic card records for these accessions of the Citrus Variety Collection.
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Converting Static Websites to Data-Driven Dynamic Websites

Initially, a detailed analysis of the current types of data available in the static websites of CCPP and CVC was carried out. These websites contain text descriptions, pictures, numerical data of fruit characteristics and a level of categorization of the varieties. This information together with the new desired functionalities that will be offered by the Data-Driven Dynamic Websites (like extended searches and calculation of statistic data on the fly) defined the specifications for the design of the new relational database. It has to be mentioned that the design of the database is the most crucial part of a data-driven application. Even if the database belongs to the backstage part of the application, its scheme affects the efficiency and functionality of the data-driven websites. Therefore, a MySQL database was very carefully designed for the needs of the CCPP to store not only the data that are publicly available through the CCPP website, but also to cover much more detailed information about the varieties that currently is used for internal research purposes. This information (such as diseases status, detailed fruit characteristics and historical data for the varieties) is currently in Excel format that makes its management very insufficient. The main advantage of this scheme of database is its flexibility that allows the users – without the need of the database administrator – to add dynamically new fields for a table. For example a new type of fruit characteristic (e.g. from 2009 and on to measure also the density of the fruit on the tree), or many levels of categorization of the varieties can be added. This feature gives freedom to the CCPP or CVC administrators to adjust the database in their future needs, without the intervention of the database administrator. After the design of the database, a web interface was created using the php scripting language for the CCPP administrators only. At this stage, the CCPP administrators can create new/edit/delete data regarding the varieties and the fruit characteristics through this web interface. An import utility of the excel data is going to be developed to facilitate its insertion in the database. Currently, we are in a test process for the adjustment of the interface to the user's needs and soon a similar database will be designed for the CVC. At the same time a web interface for the public domain regarding the search and the comparison of the fruit characteristics has been developed, but it is not yet published since some modifications are needed, as shown from the test phase.

Connecting the Three Riverside Housed Citrus Collection Databases

The three California Citrus programs (CCPP, CVC and NCGRCD) decided the set of unique identifiers of a variety based on which the connection of the three separate databases should be established. Moreover, a common vocabulary for the citrus types, as well as the fields for the public domain were decided. Based on this information the common database – named Riverside Citrus Database (RCD) has partly been designed covering mostly the needs of the CCPP. In the next steps the design of the RCD will be completed and the web interfaces for the management of data will be implemented.

Enhancing the CCPP and CVC Websites

Under the direction of Tracy Kahn and Toni Siebert there have been a number of enhancements to the Citrus Variety Collection website ([://www.citrusvariety.ucr.edu](http://www.citrusvariety.ucr.edu)). This year Toni Siebert determined which varieties available from the CCPP were not included in the CVC website. There are now descriptions for 120 of the varieties listed on the CCPP budwood order form. Many are now in the new format which includes the following: common variety name, scientific name, VI number (CCPP order number), CRC number (CVC accession number), PI number (Plant Introduction number), source, parentage/origin, rootstocks of accessions in the CVC, notes and observations and availability. A small portion of the descriptions for the 120 varieties are in the old format which includes the history and characteristics. There are also links to CVC evaluation data, the CCPP data and the USDA Germplasm Resources Information Network (GRIN) page when available. All of the 120 varieties have at least one photograph and those with new photographs have photos of a tree, whole fruit and cut fruit. All of the citrons, Satsuma mandarins, sour oranges, late navels, and Valencia orange are complete. Toni started to update the grapefruit and papeda accessions. There are still 105 varieties listed on the CCPP budwood that need descriptions and photographs. But there are accessions in the collection that are not available through the CCPP that now have descriptions in the new format as well.

The list of accessions in the CVC including varieties available from the CCPP are organized by "type" (sweet oranges, mandarins and hybrids, rootstock varieties, specialty varieties, etc.) and alphabetically. Within the "type" organization there are also categories for "Varieties Developed at UCR" and "New Accessions by Year" which has all new accessions back to 2000. T. Kahn and T. Siebert had originally proposed to scan the original CRC cards of current accessions into the computer, but we decided that since the information is available in the CVC MS Access database that this would not be necessary, but we may scan the CRC cards for accessions that are no longer in the collection if time is available during the second year to preserve this information.

This year the CCPP in collaboration with the LREC personnel collected evaluation data from 42 different varieties in biweekly intervals during the set and maturation period of the fruit. In addition, a total of 600 pictures of the tree, fruit, and fruit on the tree of 200 varieties were also collected. These data were not posted in the existing static html CCPP website in anticipation to the new dynamic php website. This will save time and effort from formatting data twice for an application that will become absolute in the near future.