



# Texas Citrus Producers Board

## Report on major projects



- The Texas Citrus Producers Board (TCPB) was started in 1994. Before **TCPB** no other citrus industry organization existed to tackle production-related problems. There was a referendum held by citrus growers and the **TCPB** was created. There is a 9-member board selected by ballots every other year. Each year the board sets assessment rate that is currently 25 cents per ton and selects projects from proposals submitted by citrus researchers. **TCPB** is a very fair source of funding because all citrus growers contribute to the cost of research projects. Other sources of funding including membership dues paid to Texas Citrus Mutual are only contributed from growers who are willing to join as members.

○ 2004-2005 Board Members

Laura Coffman – Chairman	Mark Fryer	Fred Karle
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- A small amount of industry funds goes a long way. Money provided by the Texas Citrus Producers Board over the years has been leveraged and has helped secure additional funds.
  - **TCPB** funds have helped researchers develop their preliminary data critical to obtaining large grants.
  - **TCPB** funding is also very influential in setting the priorities of individual researchers who generally struggle to find operating funds. Without these funds researchers tend to base their research program on the availability of grant funds that may or may not address industry priorities.

### ***The Budwood Program***

- In an effort to work on the prevention of the *Citrus Tristeza Virus* (CTV) in Texas, the TAMU-Kingsville Citrus Center in cooperation with the citrus industry developed the Texas Budwood Program. The program is vital due to our industry's dependence on the sour orange rootstock, which as of 1995, encompasses about 98% of the trees in the lower Rio Grande Valley. With the establishment of a virus-free budwood program, the tristeza threat that looms over the citrus industry can be mitigated and healthy, disease-free nursery trees can be propagated.
- The objective of the Budwood Program is to obtain budwood from high producing trees and "clean" this budwood of viruses through a technique called shoot-tip grafting.
- The program wishes to ensure that only certified virus-free budwood is used to prevent the spread of CTV in budwood, to ensure that other pathogens which affect these rootstocks are not distributed, and to ensure that other viruses which cause scion diseases are not propagated. Although citrus outside the lower RGV is often grown on tristeza-tolerant rootstocks, it is vital that they be virus-free as well so that they do not serve as reservoirs of infection for the commercial groves.
- Results to date:
  - The budwood is utilized in budding of trees in the Valley and other parts of Texas including the Houston area where citrus is a very popular dooryard tree. An educational program was developed to encourage nurseries to use the virus-free budwood.
  - The growth in demand for budwood for the homeowner market is increasing. So far, demand for commercial varieties are few, however, if there is another freeze, this would change rapidly.
  - The TAMU-Kingsville Citrus Center is currently providing citrus nurseries across Texas with over 100,000 virus-free buds annually, thereby reducing the risk of disease loss. Experience has shown that using only selected, disease-free budwood leads to better quality fruit for both commercial growers and homeowners.
  - Within the next year the use of virus-free budwood will be mandatory for certain citrus varieties where the budwood supply of that variety is sufficient to meet the needs of nurseries in the RGV and elsewhere in Texas.
- In other states similar programs are funded with state support through the state department of agriculture or a university. In Texas the **TCPB** along with the TAMU-Kingsville Citrus Center has been the primary funding source for this program. Without **TCPB** funds totaling over half million dollars since 1994, there would not be a citrus budwood program in Texas and our industry would be even more vulnerable to CTV. *Principle investigators: Dr. John da Graca and Mr. John Watson.*

### ***Rootstocks***

- Almost all the citrus trees in the lower RGV are on sour orange rootstock. With its high-quality fruit, its ability to adapt to a variety of soil types and its tolerance to many diseases, the sour orange rootstock is highly desirable. However, at some point we may not be able to use sour orange due to the fact that the rootstock is highly susceptible to CTV.
  - With the brown citrus aphid (BrCA), a very efficient vector of CTV, being widespread in Florida and in southern Mexico, the likelihood of the CTV reaching Texas is very high.
  - Sour orange rootstock is tolerant to diseases widespread in the RGV including exocortis, tatter leaf and cachexia. Some of the alternative rootstocks are sensitive to these pathogens. Therefore, it is necessary to "clean" the viruses from commercial scions (the purpose of the budwood program) before it is possible to switch to new rootstocks resistant to CTV.
- **TCPB** is funding research to find alternatives to the sour orange rootstock that are being evaluated for:
  - Tree growth and survival
  - Tonnage produced
  - Fruit and juice quality
  - Responses to various environmental conditions like cold temperature
  - Responses to various pests and diseases.

FACT SHEET



- The probability is low that a single rootstock will match all these qualifications so different rootstocks are being evaluated for use in different conditions. Historically, it has taken from 35-50 years to develop and release a new rootstock. Currently, some data from trials planted in 1997 have been collected in which 12 rootstocks have been grafted with Rio Red Grapefruit. Trees on C-22 have shown to be very promising, producing most of the fruit inside the tree canopy, and some preliminary data shows higher yields than all the others including sour.
- **Growers are encouraged to take a corner of their grove and try themselves to see how some of these rootstocks perform in different conditions. Contact the Citrus Center or the TCPB if you are interested.** *Principle investigator: Dr. Eliezer Louzada.*

#### **Citrus Tristeza Virus (CTV)**

- Tristeza is a devastating disease of citrus which has caused the loss of over 100 million sour orange trees worldwide. This has resulted in major economic loss, the latest figures estimated to be well over one billion dollars. Grapefruit on sour orange rootstock is vulnerable to various types of CTV including stem-pitting strains of tristeza. The virus is a serious threat to the citrus industry, especially in Texas.
- Tristeza-infected citrus was introduced into Florida prior to 1900 but decline was first reported in the early 1950s. The decline on sour orange rootstock in Florida has increased with the arrival of *T. citricida* in 1995 and has eliminated all of their citrus on sour orange rootstock. About 10% of Florida's citrus was on sour orange rootstock. CTV strains have also been identified in Louisiana and Alabama. In Louisiana, 159 samples were positive of the 881 tested and in Alabama 17 of 75 trees tested were positive.
- **TCPB** in cooperation with scientists and regulators have come up with measures to counteract the potential danger before the disease gets here. Trifoliolate orange is known to be resistant to CTV and researchers are in the process of isolating that gene. A molecular breeding/biotechnology approach is being taken to give resistance to CTV. The goal is total resistance.
  - Approach 1: Pathogen-derived resistance, which takes genes from virus and inserts it into the citrus.
  - Approach 2: Clone gene from trifoliolate orange, which is known to give complete immunity to all known strains of the virus.
- There are over 100 million transgenic plants in the U.S. Eventually we'll see more products directly consumed that are from transgenic fruits and vegetables. How does this affect you? We can't solve the problems out there without this type of research. *Principle investigator: Dr. Erik Mirkov.*

#### **New varieties**

Texas has established a special reputation in the U.S. and world marketplace through the development of new varieties like the Rio Red. To keep ahead of the competition it is essential that Texas continue to be on the cutting edge of new variety development that meet grower and consumer needs. Citrus does not lend itself to traditional breeding programs so researchers have to take advantage of its tendency to mutate. In the past most of the new varieties have come from growers finding those mutations.

- **TCPB** is funding a project to fuse cells between grapefruit and oranges, and vice versa. That can't be accomplished using traditional techniques, which usually takes from 8 to 20 years.
- Grafting new varieties on established trees with an extensive root system allows the trees to mature faster and speed up the evaluation of the new varieties. To capitalize on the quicker growth of trees with established root systems, the techniques used include cutting off the canopy of trees and budding onto the branches (commonly referred to as top working) and cutting an established tree below the bud union and budding the new scion onto the new growth from the rootstock.
- **TCPB** is funding a project to screen and develop the new cultivars from mutations found in the same breeding block where the Rio Red originated. One promising new cultivar from this block is temporarily being called Texas Red. *Principle investigator: Dr. Eliezer Louzada.*

#### **Other projects**

- Some of the other projects associated with the Texas Citrus Producers Board include:
  - The health benefits of grapefruit
  - Grapefruits interaction with certain medicines commonly used to treat certain heart ailments.
  - Plant nutrition/fertilizer
  - Management of the Citrus Blackfly through the use of parasites.
- TCPB funds have benefited way beyond the dollar amount of the projects themselves. The seed money that TCPB provides has been essential in getting money from USDA and other federal programs.
  - "If you don't get the research started somehow, you're not going to get the federal dollars"  
-Dr. Erik Mirkov, Texas Agricultural Experiment Station in Weslaco.



#### **For More Information**



Texas Citrus Producers Board

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*If you no longer own citrus and would like to be taken off of our mailing list, please notify us by calling 1-800-FARM (3276) or email Ray Prewett at [ray@valleyag.org](mailto:ray@valleyag.org).*