

# CALIFORNIA CITRUS NURSERY BOARD

## Grant Report December 2009

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**Project Title:** Annual citrus tristeza virus index at the University of California Lindcove Research & Extension Center.

### Objectives:

Provide funds for the leaf collection by LREC staff and ELISA testing by the Central California Tristeza Eradication Agency to detect CTV-positive trees at the Lindcove Research & Extension Center with tree removal to follow detection.

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### Report

To protect the Citrus Clonal Protection Program (CCPP) field plantings and other research programs from citrus tristeza virus infections (CTV), an annual index of all trees (not part of the CCPP) has been conducted on the 175 acre University of California Lindcove Research & Extension Center (LREC) since the early 1990s. This survey and ELISA testing is supported by yearly funding from the California Citrus Nursery Board. During the period of 1990-2006, an average of 3 CTV-positive infected trees were found and removed each year in the research blocks and for a 14 year period, no CTV-positive trees were found in the CCPP foundation blocks, demonstrating that tree removal at the Center was providing protection of the foundation block from this disease (Fig. 1). This low level of CTV incidence at the field station and lack of CTV in the foundation block allowed budwood to be released from the field trees in the foundation block 2-3 times/year. During 2006, 2 CTV-infected trees were found in the foundation blocks. During 2007, 48 CTV-infected trees were found in the research blocks and 4 CTV-infected trees were found in the foundation blocks. During 2008, 75 CTV-infected trees were found in the research blocks and 8 CTV-infected trees were found in the foundation blocks. All of the infected trees were removed in the year that they were found to be infected. The CTV positive finds in the foundation blocks in 2006-08 caused the CCPP program to stop releasing budwood from the foundation blocks and instead release budwood from the LREC screenhouse. The screenhouse trees produce far fewer buds and fewer varieties than the field trees and so this change has had an impact on availability of budwood for the citrus nursery industry. The sudden increase in the incidence of CTV-infected trees at the field station is thought to be due to several factors. First, there has been no CTV-infected tree removal in the commercial citrus orchards surrounding LREC since

1998. Surveys of the citrus orchards in the ½ mile surrounding LREC indicate that the incidence of CTV has increased from an estimated 0.14% of trees in 1998 to 1.2% in 2007. Thus, there are many more CTV-infected trees surrounding the station. Secondly, a number of growers have planted pomegranates among the citrus orchards within ½ mile of the field station and these orchards produce heavy populations of winged cotton aphids in the spring, the primary vector of CTV. The presence of more aphids during the spring when virus titer is high increases the likelihood of transmission of the virus. Finally, weather conditions have been cool and wet in the spring for the past few years, favoring aphid survival and lengthening the time that the flush, that is attractive to aphids, is present on the trees. Our conclusion is that the research plots and foundation block that are vital to the citrus industry are experiencing an epidemic of CTV.

In 2008, the Tulare County Pest Control District voted to provide funding to initiate a program of 2 aphid treatments per year for citrus and pomegranates in a 2-3 mile radius around LREC, applied during periods of flushing and aphid activity. This management program is designed to protect the integrity of the foundation blocks and research blocks. During September and October 2008, Admire (systemic imidacloprid) was applied to both commercial citrus and pomegranates by the growers and to backyard citrus and pomegranate trees by RESCOM, a private pest control company. Additional treatments of Assail (acetamiprid) were applied to the same citrus orchards in the spring of 2009. These treatments are being undertaken to reduce the number of aphids and so reduce the spread of virus from the neighboring orchards to LREC trees. Because it takes 1-2 years for titer to be detected in an infected tree it will take 1-2 years to determine if these pesticide treatments reduce aphid transmission of CTV. Since aphid control outside of LREC was initiated in fall 2008, we expect to see reduced numbers of CTV-infected trees in the spring 2010 CTV testing. While citrus budwood is currently only being released from the greenhouse trees, continued protection of the open field trees is essential for evaluating true-to-type characteristics and normal growth patterns of the varieties under San Joaquin Valley conditions. The Tulare County Pest Control District provides funding for testing trees ½ mile around LREC and treating trees in a 2 mile radius around LREC. CCNB provides funding for testing the trees on site at LREC.

**Fig. 1 Number of CTV-infected trees removed at the Lindcove Research and Extension Center**

