

Arizona Cooperative Citrus Registration-Certification Program Celebrates Silver Anniversary

H. H. McDonald

Abstract

New methods of determining the content of virus and virus-like disorders in citrus trees are heralding a new era of the Arizona Cooperative Citrus Registration-Certification Program (ACCRCP). It has been 25 years since the first budwood was released to participating nurseries. During that time, the program has relied on indexing using various indicator plants. Last year, indexing was begun in the laboratory using the ELISA unit for tristeza tests. Efforts are now being made to obtain antiserum for stubborn disease which currently has no reliable indexing method using indicator plants.

Introduction

The ACCRCP was originally organized and implemented by the late Ross M. Allen, Professor of Plant Pathology during the 1960's. After a year of planning, including the development of a statement of policy, rules and regulations, and designation of responsibilities of the three agencies involved, a committee of growers from both Yuma and the Salt River Valley were ready to put the certification program into operation in the fall of 1965. The first application for foundation budwood was dated September 30, 1965. This growers' committee which became the Arizona Citrus Advisory Council, also serving as the Citrus Commodity Committee of the Arizona Crop Improvement Association, still guides the program and dictates the policy. The three agencies which cooperate to coordinate the program are the University of Arizona, which provides the facilities and offers technical assistance; the Commission of Agriculture and Horticulture which is the regulatory agency; and the Arizona Crop Improvement Association (ACIA), which prints the tags and provides the bookkeeping.

Materials and Methods

The original foundation trees were acquired and laboriously indexed to certify that they were free of the virus and virus-like disorders included in the program. Since that time, the program trees have been indexed on a 3 year schedule using standard indexing procedures. To date there has been no evidence that the foundation block trees have become infected with any of the seven pathogens for which routine tests had been conducted.

During recent years, new testing procedures have been devised that eliminate the older more laborious indexing procedures that require the growing and maintaining of large numbers of citrus seedlings. Buds from the candidate trees must be introduced into these indicator plants, observed for prolonged periods and interpretation of sometimes rather hard to see and read disease symptoms. This process takes six months for some pathogen, and up to 5 years for one performed in the field.

The new testing method is the ELISA serological test. Last year the Plant Pathology Department and the AACRCP purchased a new unit to test program trees and for other uses by the department. This test can be run in a day utilizing tissue obtained from program trees. It is feasible to use ELISA to test for stubborn

disease, a virus-like disorder that is carried in the budwood of diseased trees. Since no reliable indexing method using indicator plants is now available for this disease, using the ELISA procedure will make it possible to certify citrus trees for another disorder that is not now being included.

Two-hundred-sixty citrus accessions in the certification program and candidates for the program were tested for the tristeza virus by the ELISA technique in 1989. Of these, 241 were negative, 24 were positive and only nine were strong positive. Of those found to be positive, only two were program trees. No buds have ever been issued from these two trees. They were immediately eliminated from the program. Some of those foundation block trees tested had been part of the program for approximately 25 years. This suggests that vector spread of this serious virus disease has not been a serious problem.

Results and Discussion

Availability of budwood from foundation block trees has become a problem in recent years. The trees did not receive proper fertilization for a few years because of a bare farm budget. This has improved in more recent years, but it has still left the trees with deadwood and a decreased vigor. Storms in the summer of 1989 compounded the problem by seriously damaging many of the trees. Because the program did not have the funds for proper pruning, the College of Agriculture, the ACIA, the farm, and the program cooperated to provide the funds and labor. The operation began with the ACIA, the program, and the farm crew pruning as they could schedule the time. In January, 1990, a team became available from the local prison to work approximately 6 hours per day for 6 days to finish the operation. To promote the growth of more budwood, those trees in the program were pruned lightly on the terminals in early March. Again the prison labor accomplished this, working about 240 man hours.

More than 3-3/4 million buds were propagated under the program during the first 25 years. We hope that with improved indexing methods and improved condition of the trees, we can provide sufficient budwood free of the virus and virus-like disorders in the future.