

Avocado Improvement through Detection and Elimination of Viruses Progress Report: Year 1 of 5 Year Project

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The Problem and Its Significance

(Excerpt from Project Leader's Proposal Summary)

With the exception of avocado sunblotch viroid, there has been little attention paid to viruses of avocado. Evidence for viruses was presented by us in 1983. We feel that additional work is needed in this area in order to better describe the kinds of viruses that infect avocado, and what they do to the plant, and how or if they could be eliminated by some kind of shoot tip propagation. The basis of graft incompatibilities can have several explanations, one of which can be a virus involvement. Some care could be exercised with respect to virus incidence at a time when new varieties may be released. Rootstocks are of special importance, since these could become the source of unwanted viruses throughout the industry.

In addition, viruses can be used as tools of biotechnology for crop improvement.

Attention has been drawn to problems of a possible virus-like nature associated with some, but not all, selections of the 755 rootstock series. To this end, dsRNAs were isolated from trees of 755 growing on their own roots in a commercial grove and trees of 755 on Topa Topa and Duke in the Increase block at the University of California at Riverside. dsRNA pattern #2 was detected in most trees, including ones with and without disease symptoms. An additional previously undetected low molecular weight dsRNA was very prominent in one tree, and attention will be given to this when these trees are retested.

A grove of Hass on either 755 or Duke rootstocks was also tested. In this grove, the trees on 755 were showing decline. The only dsRNA detected in the Hass scions was dsRNA pattern #3, which is a typical result for Hass. At this time, no information has been obtained which would indicate that a distinct virus is associated with problems when using 755 rootstocks.

The use of Lula as a nurse seedling on which to propagate rootstocks raises the question of whether viruses could be transmitted to rootstocks from the Lula plants. The two Lula plants in the Increase block (3478 and 3483 on Ganter) have been tested and found to contain dsRNA #2. Seedlings grown from seed of these plants have been obtained, and some have been tested for the presence of dsRNA #2. Some, but not other, seedlings seem to be free of this and other dsRNAs, but confirmation follow-up tests are needed before this can be verified. If these seedlings are free of dsRNAs, then

they or others derived in this way could be developed into certified trees to be used as a supply of "clean" seed for Lula.

dsRNAs of patterns #1, #2, and #3 have been purified in sufficient amounts to serve as reagents for cDNA cloning. Initial attempts to clone dsRNA #2 have not met with success, but this is not unusual for this kind of work, and additional efforts will be made.

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