

Outcrossing in Avocado: Is there a relationship with yield?

Michael T. Clegg

FUNDING: 11-1-92 to 10-31-93 PROJECT EXPENDITURES AND CURRENT STATUS: All funds will be expended effective October 31, 1993.

PROGRESS REPORT:

During the past year we arranged to make collections of avocado fruit materials from orchards in the Temecula/Escondido area and from the Santa Barbara/Ventura area. Fruit yield was estimated from each sampled tree. The collected fruit materials were then used to make DNA preparations for use in the PCR based RAPD assay to detect the level and source of outcrossing in avocado orchards. We have assayed material from one set of orchards, and are beginning to process the collections from other orchards. Our preliminary data, based on one location and one year, do suggest a positive relationship between outcrossing and yield, but this needs confirmation over both more years and different locations.

This project has required that we develop methods for the purification of DNA from individual embryos dissected from individual avocado seeds. Considerable time was invested in developing these techniques. The project also required that we invest considerable effort in exploring the use of the polymerase chain reaction technique (PCR) on avocado materials. We have screened a large number of RAPD primers for markers that can discriminate pollen donated by ZUTANO, BACON or FUERTE parents. To date, we have unique markers for BACON, but we are still in the process of identifying unique markers for FUERTE and ZUTANO. Owing to the technical problems associated with the RAPD methods (noted in our report on the mapping project), we hope to be able to replace the RAPD markers with microsatellite markers in future years.

PRACTICAL APPLICATIONS AND SUMMARY: The major goal of this project is to ask whether there is a relationship between outcrossing and avocado yield. This question will be addressed by correlating outcrossing rates with yield on sample trees located known distances from potential pollen sources. A second goal is to ask which of the BACON, FUERTE or ZUTANO pollen sources may be most effective in fertilization of HASS fruit. The project is designed to provide practical guidance on orchard management and composition.