

Avocado Breeding—Progress Report

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The objectives of this project are (1) to produce new avocado varieties, superior to Hass in productivity and equal in quality, with fruit of optimum maturity year 'round, and (2) to provide to researchers seeds that will prove to have sufficiently increased *Phytophthora* root rot resistance to be a better commercial solution to the root rot problem. Cooperating personnel include Fred Guillemet and Dr. John Menge.

To expedite the process from seedling discovery to commercial release, some seedling research plots no longer functional at the Irvine South Coast Field Station are being topworked to promising selections. Hass, Pinkerton, and Gwen have been added to create standards for later comparisons. One plot with over 60 new selections, each replicated 2-6 times, will offer valuable information in the years ahead. All additions were screened rigorously for desirable traits of high yield and fruit quality. The original seedling tree may have experienced environmental or cultural stress, or both. Therefore, best-guess analysis was required before entry into the test plot, although all selections are potentially exciting. These selections should begin setting fruit spring '91.

In order to learn as much as possible about the Gwen variety, a 1981 patent, regular contact with Gwen growers, handlers, and other research personnel has been valuable. The commercialization of Gwen is still in its infancy; but horticulturally, semi-dwarf Gwen has proven extremely valuable for breeding and research. Gwen progeny are precocious and high-yielding. In cooperation with the Avocado Society Variety Committee, information gained from the Gwen introduction is helping us to guide the path for future avocado introductions.

While on sabbatical leave from the Volcani Center, Israel, Dr. Emanuel Lahav, avocado breeding project leader, assisted our search for improved varieties. Dr. Lahav was extremely helpful and eager to share Israeli research data. More exchange is scheduled in the near future. Personal invitations were extended to us to visit their current research program and facilities.

A big disappointment this year was the loss of our Mentone plot. A severe freeze virtually destroyed 70% of the planting. The remaining trees could not easily be maintained by our staff. Additionally, new property ownership left future access uncertain. Over 100 precocious flowering types were selected and successfully propagated. The balance of the plot was abandoned.

The bulk of the breeding program now remains in the hands of a few large growers and on university grounds. Care and maintenance of these sites has been excellent.

Phytophthora-resistant Rootstocks

Spring '90 weather conditions were favorable for fruit set in the breeding plots. Rough estimates indicate at least double the production of the previous year. In addition, plot size and tree number were approximately doubled this past spring. Two new UCR selections have been successfully grafted in the plots, and cross-fertilization could begin as early as next year.

Miscellaneous

A major experiment has been instituted to determine dwarfing potentials of avocado, applying various grafting and pinching/pruning techniques. Initial response looks good. Combined with the project, two smaller studies were conducted: (1) Parafilm 'm', an elastic wax tape, used as a grafting aid; and (2) comparison of traditional and new field topworking methods. Results from both proved promising and will be published.