

DEVELOPMENT OF A PHENOLOGICAL MODEL FOR CALIFORNIA 'HASS' AVOCADO

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We currently have underway a long-term project to develop a phenological model for the 'Hass' avocado in California. This project was initiated partly in response to California interest in the Whiley Australian avocado phenological model (Whiley *et al.*, 1988; Whiley and Wolstenholme, 1990). Planning began in December 1991, and the field trial was installed in spring 1992 at the UC South Coast Research and Extension Center in Irvine, California. This project utilizes the 'Hass'¹ Clonal Rootstock Trial conducted by M. L. Arpaia, G. S. Bender and G. W. Witney.

A randomized complete block design was selected using four clonal rootstocks, Duke 7, D9, Thomas and Topa Topa. Ten small rhizotrons (35 cm x 40 cm viewing area) per rootstock were installed to monitor root extension during the growing season. The northeast quadrant of the tree was selected and care was taken to ensure that each of the forty installations was uniform as to orientation and distance from the trunk. Ten branches in the same quadrant (Northeast) were tagged in 1992 to study the timing, duration and amount of vegetative growth on each of 10 trees. We modified the experimental design in 1993, when we tagged 20 branches in the northeast quadrant from each of 5 trees. The timing of flowering each year is also monitored.

Figure 1 summarizes the data that we have collected since February 1992. Note that the approximate timing of bloom was similar in both years. In 1992, when the trees were carrying a very heavy crop (refer to our report, "Avocado Clonal Rootstock Production Trial"), the trees exhibited very little growth during the spring, concomitant with early fruit set and growth. The trees did exhibit a late summer vegetative flush, although this flush was of short duration. Root growth in 1992 peaked in June and then declined. No root growth was detected during the Winter of 1992 - 1993. A different pattern was observed in 1993. The bloom during the spring of last year was extremely light and resulted in a very light fruit set (yield data will be collected in April 1994). We observed two distinct vegetative flushes (April-May and August) in 1993. The August growth flush was of longer duration than the Fall flush observed in 1992. The intensity of the two vegetative flushes in 1993, as measured by growth rate, is similar to the growth rate measured during the Fall 1992 vegetative flush. In 1993, following the peak of the Spring vegetative flush we observed the initiation of root activity. We observed root growth throughout all of 1993 and through the first part of January 1994. The growth rate of the roots was similar throughout the year. We have not observed any consistent significant

differences in either vegetative or root growth related to rootstock.

References:

Whiley, A. W., J. B. Saranah, B. W. Cull and K. G. Pegg. 1988. Manage avocado tree growth cycles for productivity gains. Queensland Agri. J. Jan-Feb:29-36.

Whiley, A. W. and B. N. Wolstenholme. 1990. Carbohydrate management in avocado trees for increased production. S. African Avocado Growers Assoc. Yrbk. 13:25-27.

Figure 1. Phenological events for 'Hass' avocados at UC-REC from 2/92 - 1/94.



