

AVOCADO IRRIGATION AND NITROGEN FERTILIZATION PLOTS AT THE CITRUS EXPERIMENT STATION

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The very considerable expansion of the avocado industry in recent years has created an acute need for specific information concerning management practices. In 1952 work was initiated on about an acre of high sloping ground east of the Experiment Station buildings at Riverside. The California Avocado Society made it possible to get the experiment started at an earlier date by using its research funds to purchase the trees for this experimental planting.

The original plans were made to study the relative effects of various irrigation practices. When the question of how to fertilize irrigation plots was raised, it became evident that the cooperation of C.E.S. Staff members in this field would materially contribute to the experiment. A working arrangement with the following individuals has been concluded: Dr. T. Embleton and Dr. W. W. Jones of the Department of Horticulture will make periodic leaf analyses, and Dr. F. T. Bingham of the Department of Soils and Plant Nutrition will make soil chemical analyses. Plans for fertilizer applications will be worked out from the data obtained. Paul Moore of Horticulture, and J. C. Johnston of the Extension Service, will be consulted in connection with tree training and other grove practices. Marvin Rounds has already given valuable advice. His contacts with the California Avocado Society have been a real contribution.

While Riverside has not been considered an important avocado growing *area*, the soil and planting conditions resemble those of many of the plantings near Fallbrook. Standard balled Hass trees on Mexican root stock were obtained from the Brokaw Nursery in June, 1952. Figure 1 shows the appearance of the trees on February 4, 1953. During the first two years, all of the trees were irrigated and fertilized uniformly. In 1952 small basins around the trees were used and water was distributed from a garden hose. About 10 gallons of water per week were found to be sufficient. By 1953 a permanent type sprinkler system was installed with a riser by each tree. A spitter type sprinkler head for 1/3 circle was used, and water was applied when the average reading of several tensiometers placed 1-foot out from the trees at a depth of one foot reached 1/2 atmosphere (500 on a mercury manometer or 50 on a dial type tensiometer).

The sprinkler system was designed to irrigate 9 plots of 14 trees per plot. In 1954 three irrigation treatments were applied on the various plots replicated three times. Based on soil moisture tensiometers and Fiberglas resistance blocks, irrigations were applied when tensions reached M, 1, and 10 atmospheres. These treatments resulted in applying irrigations 34, 18, and 13 times to the respective treatments for the 1954 season. The amounts of water added were adjusted somewhat to the degree of dryness of the soil prior to irrigation, but the measured values turned out to be 10.3, 6.6, and 5.8

acre inches per acre for the three treatments respectively.

In addition to the irrigation treatments applied in 1954, each of the plots had six trees which received a low level of nitrogen fertilizer, and six trees received a high level of nitrogen. In addition, two trees on each plot received no nitrogen. The last treatment will give a wider range for comparing the results of leaf and soil analyses.

Since the treatments have been carried out for only one year, there are not sufficient data to report tree responses, and the trees are as yet too young to have produced any significant number of fruits. Future results of the treatments will be reported by the various staff members. Figure 2 shows the growth obtained by June, 1955, when the trees were just three years old.