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IRRIGATION AND FERTILIZATION MANAGEMENT OF AVOCADOS

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The avocado irrigation and fertilization project commenced in the spring of 1987 at two sites: Corona Foothill Properties near Corona (Riverside county) and Cashin Properties near Valley Center (San Diego county). Historically, water usage can be as much as 55% of production costs and may increase in the next decade.

This project utilizes an integrated approach to determine the amount and cost of irrigation water applied in relation to fertility management, yield, and fruit quality. The three irrigation treatments are 80%, 100%, and 120% of evapotranspiration (ETc) . The crop coefficients (Kc) in the formula ETc = ETo x Kc are determined at Corona Foothill on a weekly basis using CIMIS ETo's and are correlated to tensiometer and neutron probe site readings. An initial determination of water costs (high, low, and median) were obtained from San Diego County Advisor Weisheit and are updated annually.

At the Corona site, the interrelationship of the irrigation treatments to nitrogen and zinc nutrition and any deep percolation of nitrogen is being monitored. Selected trees in each irrigation treatment at the Corona location are monitored annually for the relative amounts of bloom, fruit set and post harvest quality. These data will be correlated to yield, leaf analysis the prior fall, and the relative amount of starch in the leaf.

At the Valley Center site three fertilizer trials have been initiated using a single irrigation treatment of 100% ETc. The first trial will evaluate the interaction of nitrogen and phosphorus nutrition, the second trial will monitor the possible influence of potassium nutrition and the third will involve differential nitrogen rates.

The projected time line for 1990-1991 is as follows:

Corona	Valley Center
1990:	
Continue 1989 studies	Continue 1989 studies
Continue economic studies at three harvests	Economic studies
1991:	

Continue 1990 studies, data analysis	Continue 1990 studies
Project completion	Project completion

Short Term Relevance

The irrigation crop coefficients for mature avocado trees were determined for 1987, 1988, and 1989 from actual water usage.

Actual water use in 1987 for the three treatments were 80% ETC, 28"/A; 100% ETc, 30"/A; and 120% ETc, 36"/A. Water use for 1988 was 24", 25", and 26", respectively; while that for 1989 was 23", 28", and 33", respectively for the three treatments. The average crop coefficient, Kc, varies from .35 in January to .55 in June and July.

Crop coefficients, water use, and soil moisture levels will be presented at the March 21, 1990 Avocado Society meeting.

Yields for the 1990 crop harvested in November 1989 and January 1990 indicate a significant and linear relationship to applied water. Yield results, root studies by depth and nitrogen movement will be discussed studies by depth and nitrogen movement will be discussed at the avocado update.

Long Term Relevance

The long term goal of this project is to integrate fertility, water use, and other management techniques with yield, quality, and dollar return to growers.

Long term expectations:

- water management efficiency determinations (CU's)
- refine monthly crop coefficients (Kc's)
- refine fertility needs (as related to tissue analysis) and any losses to deep percolation
- related to nitrogen application o relationship between productivity, cost input and dollar return
- relationship between fruit maturity, size, storage quality, and production practices