

1989-90 ANNUAL REPORT - ALMOND BOARD OF CALIFORNIA
RESEARCH PROJECTS

Project No. 89-H1: Effects of Water Supply and Irrigation Strategies on Almonds

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Long Term Objectives: (1) Determine the relationship between seasonal consumptive water use and the growth, yield and quality of almonds. (2) Evaluate irrigation strategies to maximize plant performance given limited water supply on a short term and sustained basis. (3) Further define crop coefficients (K_c) to be used for advanced irrigation scheduling techniques.

First Year Objectives: (1) Irrigate crop at full estimated water use. (2) Measure yield and quality parameters of each plot. (3) Assign plots to replications based on crop performance. (4) Install neutron probe wells and calibrate. (5) Install experimental irrigation system.

Interpretive Summary:

Almond orchards in California are highly dependent upon adequate irrigation to produce acceptable and consistent yields of a quality crop. The quantity and proper timing of irrigation water to provide adequate moisture for the orchard is of paramount importance in maximizing not only yield and quality but orchard longevity, while minimizing the effects of insect and disease pests.

Incentives for enhanced irrigation management from a grower's perspective lie in reduced energy use and maximizing the use of the available water supply. These incentives have been emphasized (for the grower) by drought conditions in the mid-1970's and over the past few years.

To determine the relationship between consumptive water use and almond performance on a sustained basis requires imposition of treatments and evaluation over four seasons. During this past year, the experimental area was irrigated at full estimated crop water use, using the existing solid set sprinkler system. No irrigation treatments were imposed. Yields were measured to assess pre-treatment variation, which allows for a more sophisticated blocking of treatments. This technique will reduce the error term and therefore make the experiment more sensitive to changes in plant performance as a function of the imposed treatment.

Results of yield measurements and subsequent blocking resulted in no significant differences between treatments and a desired highly significant difference between blocks or replications (Table 1). Neutron probe calibration has been completed (Figure 1).

This experiment is conducted in cooperation with San Joaquin Delta College using their farm as a test site. A contract allowing use of the site was signed on January 1, 1990. Installation of the experimental irrigation system designed to deliver specific quantities of water to each plot is now being installed.

Table 1.

Treatment	Yield Kernels/Acre (lbs)	No. Worms	No. Doubles	No. Shrivels	Kernel Wt. (gms)
1	2550 A*	1.0 A	0.50 A	0.75 A	1.41 A
2	2645 A	2.8 A	0.25 A	0.50 A	1.35 A
3	2567 A	1.8 A	0.50 A	1.25 A	1.41 A
4	2512 A	2.8 A	0.25 A	1.50 A	1.43 A
5	2652 A	1.5 A	1.00 A	3.25 A	1.42 A
6	2663 A	1.0 A	0.75 A	1.75 A	1.43 A
Blocks					
1	3155 A	2.0 A	1.20 A	1.50 A	1.37 A
2	2770 B	2.0 A	0.30 B	1.30 A	1.41 A
3	2350 C	1.7 A	0.30 B	1.20 A	1.41 A
4	2118 D	1.5 A	0.30 B	1.00 A	1.45 A

* Common letters among means within rows denote no significant difference at $p \leq 0.05$.

Neutron Probe Calibration Delta College Almond Orchard

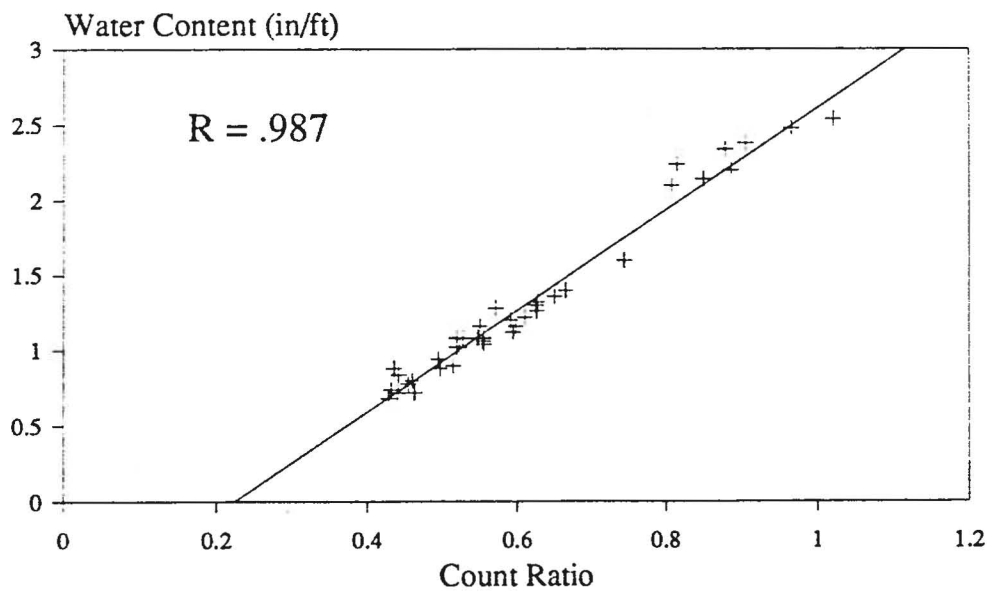


Figure 1.