Project Number 81-J1
Project Title: Freeze Protection - Irrigation, Primary Equipment Purchase

81-J1

Annual Report to the Almond Board of California

Tree and Crop Research,

on Freeze Protection Irrigation

by Richard L. Snyder, Project Leader

OBJECTIVES

We are now entering the first season of our frost protection study and our first year objectives are to:

1. Identify the most beneficial temperature at which to start ground sprinklers for frost protection.

2. Determine how microclimatic factors within a ground sprinkled orchard are affected by the sprinkling process, and identify which factors are most beneficial to frost protection.

3. Determine the relative effectiveness of low-pressure heads, conventional heads and possibly microjets for frost protection.

4. Investigate the control of ice-nucleating bacteria in conjunction with ground sprinklers as a method of frost protection.

INTERPRETIVE SUMMARY

Because we are entering the first year of our frost experiments we have no data to report at this time. We have acquired some sophisticated meteorological equipment for our studies and did some preliminary tests on the effects of ground sprinkling on microclimate during freezing temperatures in a study in the Owens Valley. The minimum temperature during our preliminary tests were only slightly below freezing, however, so the results are of little significance.

Experimental plots for our intensive research were instrumented in an orchard north of Chico in late December. During January, while the trees are dormant, we hope to have some freezing nights to test the relative effects of varying sprinkler starting temperatures on the orchard microclimate. Low-head sprinklers will be used for these tests.

During February and March, comparisons will be made between conventional and low-head sprinklers as to their relative effectiveness for frost protection. Anticipated application rates will be 0.12 to 0.16 inches per hour for the conventional and 0.08 inches per hour for the low-head sprinklers. If time permits, a comparison with microjet sprinklers will be attempted. These will be compared with an unsprinkled plot.

In each of the plots, half of the Nonpareil variety trees will be sprayed for ice-nucleating bacteria control. This will allow us to compare the effects of no sprinklers and various sprinkler methods in combination with bacteria control on frost protection.

In addition to the plots being studied near Chico, another experiment will be conducted during February and March in Stanislaus County to investigate the use of sprinklers and bacteria control.

COOPERATIVE EXTENSION
UNIVERSITY OF CALIFORNIA

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REPLY TO: Land, Air, Water Resources
241 Veihmeyer Hall

December 30, 1981

Robert K Curtiss
Associate Research Director
Almond Board of California
POB 15920
Sacramento, CA 95852

Dear Bob:

Enclosed is my annual report for our frost protection study. As you can see we don't have any results yet but the main experiment is set up on the Henigan Farm north of Chico. Hopefully, we will have some good results; weather permitting.

Sincerely,

Richard L Snyder

Richard L. Snyder
Extension Biometeorologist

RLS:kp

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