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How Often Do You Need To Irrigate Orchards?

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Research conducted from 1958 to 1961 by University of Idaho horticulturists answers some of today's orchard irrigation questions brought on by the water shortage. In that research by the late Leif Verner and this author, fruit yields were maintained even with intervals of 28 to 42 days between irrigations in apple and prune orchards. The number of irrigations for the year were reduced to about half the normal number.

In those studies, we used an instrument called a dendrometer, which measures tree trunk diameter growth. We attached dendrometers to Red Delicious, Rome Beauty and Jonathan apple trees and Italian prune trees, then irrigated some of the trees on a predetermined, regular basis (control) and the rest according to the rate of trunk growth. On a trunk-growth basis, we were able to reduce the number of irrigations by one-half or more with little effect on fruit tonnage or size and no damage to the tree.

The data presented in Table 1 were taken from the original research bulletin and are pertinent to our current short water situation.

Table 1. The responses of several orchards in southwestern Idaho to a reduction in the number of irrigations.

Orchard, variety and age	Irrigation schedule	No. of irrigations in growing season	Yield per tree (boxes of apples, pounds of prunes)	Size of fruit as a percent of control
Reins, Jonathan* 12 years old	Every 10 days**	12	15.7	
	By dendrometer	5	15.2	95
Ady, Rome Beauty 11 years old	Every 14 days**	8	10.1	
	By dendrometer	2	10.1	96
Symms, Jonathan 24 years old	Every 14 days**	9	10.0	
	By dendrometer	4	10.5	88
Mogensen, Rome Beauty 9 years old	Every 14 days**	9	8.5	
	By dendrometer	4	8.0	98
Hollenbeck, Red Delicious 12 years old	Every 14 days**	7	7.1	
	By dendrometer	4	10.4	98
Parma Station, Italian prune 13 years old	Every 14 days**	9	311	
	By dendrometer	5	299	99

*Sprinkler irrigated, 12-hour set; all others rill irrigated, 24-hour set
**Control

The study incorporated some meaningful reductions in the number of irrigations during the growing season. Fruit yield per tree was reduced little, if at all, and only Symms' 24-year old Jonathans produced significantly smaller fruit when number of irrigations were reduced from 9 to 4. Our conclusion was that fruit growth and trunk (tree) growth compete for the water, and that fruit growth takes precedence over trunk growth.

During the trials an irrigation was usually followed by an immediate, measurable increase in the trunk growth rate. The greatest increase was usually measured in the driest plots. Increased growth rate continued for 2 weeks or more at levels above the control with the final result being that seasonal trunk growth in the low moisture plots was almost as great as that in the control plots.

Alfalfa cover crops and dandelions were present in all orchards where the trials were conducted. Although we took no measurements, we observed no serious damage to the alfalfa. However, its growth was less vigorous in some low moisture plots. In some orchards (Reins, Ady and Symms), dandelions wilted between irrigations in low moisture plots; in others (Mogensen), dandelion wilting was not observed.

Fruit growers interested in using dendrometers as an accurate way to measure fruit tree irrigation needs are encouraged to contact their Extension agricultural agent or this author.*

*Basic information from the 1958-1961 studies was reported in University of Idaho Research Bulletin No. 52, "Trunk Growth as a Guide in Orchard Irrigation." Limited reference copies are available in local Extension offices. Data are also available from Dr. Kochan.

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