

Orange Sizes and Irrigation

tests in Riverside County indicate irrigation practices may have influence on fruit size

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The most important single factor that an orange grower can control and utilize to improve fruit sizes is the application of irrigation water.

Other factors which affect the size of oranges—such as air temperatures, winds, rain or the lack of it and time of bloom—are uncontrollable for the most part and there is little a grower can do about them. There are certain other factors, however, such as irrigation, cultivation, and fertilization over which the grower does have some degree of control.

Length of Run

There are many conditions in irrigation which affect the fruit sizes in an orchard. Penetration of water into the soil is one of the most important, and the length of the irrigation run and methods of applying water have a decided effect upon penetration—particularly in the lower part of the orchard.

Length of the irrigation run must be considered when applying water to an orchard. If a long irrigation run is not handled properly, the result will be small sizes on the bottom half of this run. The longer the run, the longer it takes the water to reach the end of the rows, and therefore, the less time it has to penetrate the soil.

If water is held on the end of the run long enough to penetrate to a desirable depth, trees near the irrigation stands will receive more water than is needed, and usually leaching and loss of water occur below the root zone. In cases where fertilizer is applied in the water, less fertilizer would be received by trees at the end of the run.

Fruit measurements were made in a series of studies to determine the effect on size of oranges on trees near the irrigation stand at the head of the row, and on trees near the end of the row. Great differences were found in some groves during the experiment.

Tests near Corona

One grove near Corona had a 22-tree—440 feet—irrigation run. The fruit was measured on trees down the irrigation run, and then the average value by size was determined to give an average return per packed box.

Fruit Measurements Made in Orange Grove near Corona

Tree No. from Pipeline	Distance from Pipeline	Size Oranges Per Box	Av. Return Per Packed Box Based on 1948 Prices by Size
2	20 Ft	252	\$1.63
12	220	288	1.39
21	400	344	1.21

The above table shows that the difference between Tree 2 and Tree 21 was 42¢ a box. This indicates improvement in water application would be desirable to bring up returns on the bottom half of the orchard.

Differences of two to three sizes were found on many groves between the top and the bottom of irrigation runs of 11 to 12 trees in length.

In another grove in the Corona area the fruit was measured on trees at the top and at the bottom of the irrigation run. The average difference between sizes of fruit was about .25 of an inch, or about two packing sizes. It was observed that there was a smaller number of fruits on the trees at the lower end of the irrigation run.

Water Application

One of the best ways to shorten the irrigation runs is by adding additional pipelines; particularly on long runs of 15 trees or more. Many growers use runs from six to 10 trees in length to improve water distribution and to get better water penetration.

Another method that can be used is the cut-back system, although it requires a little more hard labor and effort. Where four or more furrows are used and after adequate penetration is secured in the tree furrow—for example, five to six trees down from the pipeline—the water can be run down the center furrows and then cut back into the tree furrow past the fifth or sixth tree. The water runs easier with less loss from penetration in the center furrows, and therefore, excessive water loss around the top few trees is avoided. This enables a grower to get the water to his trees farthest from the

pipeline quicker and without excessive loss.

A pointed rod or probe can be used to measure the depth the water has penetrated in the tree furrow so that it can be determined when to switch the water to the center furrows.

A third method used to increase fruit size at the bottom of a run where water deliveries permit, is to use the alternate middle irrigation system.

If the irrigation time is normally 30 days, for example, one half of the water is applied every 15 days. Every other middle between the trees is irrigated on one irrigation, then 15 days later the other, or dry middles, are irrigated.

By this method the soil is irrigated no more often than before, but the trees receive water twice as often. This prevents stress upon the trees during hotter periods when the soil would normally dry out before a scheduled irrigation.

Moreno Valley

Fruit on trees at the upper end and at the bottom of the irrigation run were measured in a grove in Moreno Valley in which the grower used the alternate middle irrigation system.

The irrigation run was 15 trees long. Fruit on trees on the bottom of the run in this particular case happened to be slightly larger than on the trees at the top, although the difference is not too significant. The trees at the bottom of this run received sufficient water to prevent stress and loss of fruit sizes.

Conclusions

From the results of these studies it would seem that adequate penetration of moisture should be obtained on the lower half of an irrigation run.

With few exceptions, a better job of applying water usually can be done after a careful analysis of each individual situation.

At the present differential of price by size of citrus fruit, the improvement of one size can often make as high as 50¢ to \$1.00 a box to the grower, particularly in the smaller size range.

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