

Moisture Requirements of the Avocado

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The irrigation of land for the purpose of producing commercial agricultural crops became necessary when the agriculturalists among men extended their plantings to the more arid regions, where insufficient rainfall was the limiting factor in the production of those crops. Irrigation in western United States dates back some 87 years, and it has been practiced in the growing of avocados for about 27 years.

The early day irrigation practice of avocado growers was quite varied, both as to time of application and total amount of water applied. Some growers applied large amounts of water, and others considerably less. The irrigation interval was from one week to six weeks, and in many cases soil type and size of tree had no definite relation to the irrigation practice. Many avocado growers copied the citrus grower in his orchard practices, and at a time when citrus growers were applying more irrigation water than was needed for the best development of their groves.

Other avocado growers determined the irrigation interval and the amount of water to apply by consulting the calendar and using their best judgment. The irrigation interval was based largely on a time factor rather than on the actual water use factor.

In early literature on avocado culture it is difficult to find statements in regard to amounts of water applied per irrigation, or per season. It is only within recent years that actual measurements have been made as to the amount of water used by avocado trees.

The late Sam Beckett of University of California conducted studies on the seasonal use of water by mature avocado trees. Some of these studies were carried on during the seasons of 1932 and 1933 in the La Habra-Whittier area. The results for the year 1933 showed a total water use of 16.6 acre inches per acre from May through October; with the peak use of 3.85 acre inches per acre coming during the month of July. The period of maximum water use may come during July one year and August the next year and it will be determined largely by climatic conditions.

Seasonal Requirement Varies

The seasonal amount of irrigation water applied to avocado groves of similar age and growing in the same locality varies from eight acre inches per acre to twenty-four acre inches per acre. Some of these groves are getting more water than they need and a few not enough. In a year of normal rainfall fifteen to eighteen acre inches per acre of irrigation water should be sufficient for the needs of mature trees growing in the intermediate zone providing the irrigation efficiency is 75 to 80%. In the interior districts more than this amount of water will be needed, while in the coastal areas less. This

amount of water must be applied intelligently for best results. To do this the grower should know the physical characteristics of the soil he is working with; i.e., its water holding capacity, penetrability and wilting point. He should be aware of water losses due to run off and deep percolation. If he does not feel capable of determining these things for himself there are organizations which can do it for him.

Root System

The avocado grower through the various cultural practices in his orchard is attempting to create an environment in which his trees will grow and produce maximum crops. In doing this he should be as familiar with what takes place in the root systems of his trees as he is with what takes place in the tops.

A block of Fuerte avocado trees in the La Habra area has been observed growing without irrigation and producing some fruit over a period of six years. These trees are growing on medium clay soil, probably an Altamont clay loam, of good depth. They received their first and only irrigation during the six year period in the early summer of 1939. The September 1939 heat wave burned the foliage of these trees very slightly, while a few supposedly well cared for groves in the vicinity were damaged considerably by the heat. These un-irrigated trees although much smaller for their age and less fruitful than the well cared for trees, had become adapted to a semi-arid environment and were therefore better able to withstand the excessive heat and low humidity, even though the available moisture in the soil may have been considerably lower than in the well cared for groves. This observation is given to show the adaptability of the avocado and its survival under arid conditions. It is not a suggestion for cultural practice in a commercial grove.

Conclusion

To irrigate efficiently and intelligently the avocado grower should know the physical characteristics of the soil he is working with and adopt a method of applying water which will best suit his needs. Furrow, basin, and. sprinkler irrigation all have a place in irrigation practice, and the method to use should be the one which will enable the grower to irrigate with the greatest efficiency under his particular conditions of soil, topography, and climate.

Over irrigation will cause serious injury to avocado trees especially if they are growing on poorly drained soils. This injury will not show in the above ground portions of the tree until after a considerable portion of the root system has been damaged. The recovery of trees affected with water injury will be slow, at best, and can only be brought about by careful and intelligent irrigation practice.