

Permanent Cover for Avocado Orchards

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The remarks I am about to make come from the experiences we have had in developing our own avocado grove of ten acres. After planting avocados we irrigated in furrows for two years, because small trees require more water at the base of the trees than sprinklers can deliver; but when the trees were well established we installed a permanent sprinkling system. The reason for this move was to be able to get a better distribution of water.

After the avocado trees had grown for a few years they developed a number of large limbs that reached well out into the middles; then many smaller limbs near the ground developed too low to permit the tractor and tools working under the trees. A decision had then to be made; either we had to stop cultivation or cut away all low limbs. As these lower limbs bore much of the fruit and were much less expensive to pick than higher ones, we were reluctant to cut them away. Another problem also presented itself—how to avoid destroying the feeder roots every time we disked. Now a man can get by with one arm or one leg, and an avocado tree without some of its fiber roots; but neither man nor tree does so well under these handicaps. These two problems that were confronting us caused us to stop cultivation of our grove.

Within two years after the stoppage of cultivation, the Bermuda grass had spread over all the ground between the trees; in some places after the high spring growth it reached a height well above the knees. Now we knew that both grass and trees were competing for the available moisture, but we did not know how much water was required.

During the very hot and dry summer of 1930, the trees began to show signs of distress; the leaves in late summer had not reached their normal size, and also looked pale. In September a hot east wind blew and afterwards the trees looked very bad indeed, with many burned leaves.

Several friends who visited our grove, after looking it over, felt the trouble might be that too much water had injured the roots of the trees, causing a lack of sap flow during the hot days. But about this time I visited another nearby grove and found there even more damage done from the heat than our grove had suffered; and to my surprise, I found out this owner was using less water than we were.

I went home and commenced a very thorough examination of the root zone of our trees. I dug many holes all over the grove. Although I did not find any damaged avocado roots, I did find a large number of grass roots going many feet deep into the soil. A core of dirt made with a balling spade, after the dirt was washed away, left a rape of Bermuda grass fiber roots as large as my thumb.

Irrigation

By 1931 I was convinced that the whole trouble, instead of being too much water was not enough water. At this time we were using 10 shares of Yorba Linda Water Company stock, which amounts to 103,000 cubic feet of water for every 30 days. By 1935 we had increased our number of shares to 17. Here I wish to mention that we now had blue gum wind breaks around the grove as well as inside of it, and they require heavy amounts of water.

Since we have been using this increased amount of water there have not been any burned or dead leaf tips, not even in 1939 which was a much hotter summer than any since the grove was planted.

Each year since 1935 the trees have produced heavier crops (excepting, of course, in 1937 the year of the freeze) and have improved all the time in wood growth.

The soil on our land, before the avocados were planted was very heavy, tight and sticky, with very little humus in it. Now, under the trees and away from the sun (and this comprises better than 60% of the ground surface) there is a veritable mat of fibre roots on top of the ground and extending to a depth of several inches. When putting on fertilizer it is our practice to put all organic stuff in the shade under the trees where the falling leaves soon cover it over, making an ideal place for the roots to grow —where they are never cut or disturbed.

A number of years ago sulphate of ammonia was the cheapest form of nitrogen we could buy, so we used that chiefly. As dairy fertilizer became cheaper, we used enough of that to give at least four pounds of nitrogen to each large tree, and in some years we used even more than that. I preferred using organic fertilizer to the sulphate of ammonia for I realized the latter killed the fish worms and I did not want them destroyed.

Today our soil is very friable, very much so under the trees, and, as a whole, is in the best physical condition it has ever been. We feel this causes better sets of fruit, and as the top foot of soil is the richest of all, we can't see any justification for stirring it up, killing the bacteria, and destroying the fibre roots by cultivation.

After nearly 14 years of no cultivation we would not go back to the old method even if we could have it done without charge. One of the gains of no cultivation that was not at first appreciated, but which has proved of great value, has been the stoppage of erosion; no loss of the top soil has occurred since the ground has been protected with the cover crop.