

## GROVE MANAGEMENT AND PRACTICES



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The avocado is a member of the laurel family of which the cinnamon and the camphor, and also the California bay tree, are members, and yet the avocado grower looks at his tree as a mighty complex affair. He knows that in order to raise a really good grove, to achieve good production, and to maintain it is a real trial. It requires not only a lot of natural advantages but some luck as well.

We used to think that the amount of avocado acreage available for planting was that amount not already planted to citrus, but in recent years we've had to change this conception. Valencia orange prices have been rather poor and there's some decline. A lot of people are bound to continue raising orchard trees of some kind, and many are turning to avocados. The amount of acreage now that is available to avocados is not really known. It is really astounding to see the number of acres of citrus that are being interplanted. It doesn't make any difference whether it's here, or in Riverside County, or up in Santa Barbara County—planting is very active. Some of it is on high ground and some on low and there is going to be some groves that will be marginal, naturally. But that isn't going to change the planting picture because people are going to plant avocados anyway. What with the present knowledge of varieties there is certainly more choice in planting for the various locations.

Production is the key to this whole thing, and with the situation becoming more competitive, unless a grower has some of the natural advantages, he is probably not going to have a really commercial return. He should at least have either good soil, or a warm location, or an adequate source of not too expensive water. Maybe he should have all three, I don't know.

I think it has been said that the avocado, more than any other subtropical tree, is greatly affected by soil condition. Actually, however, you will find avocados on about every type of soil. We've been told that there should be a minimum of three feet of soil and the deeper the better providing the soil is of medium texture. Unfortunately this is not

always the case, and there is much variability in soils in areas planted to avocados. There are so many ways to handle soil, all with their own peculiar advantages. You can have clean cultivation, non-tillage with weed control, and such a condition as a permanent sod. Clean cultivation is a very common practice although there is less of this in use over the years. Non-tillage with weed control has many advantages. It's expensive unless your trees are large, in which case the trees shade out bigger areas of ground, assisting in the control. It's also generally agreed that a grove is usually a little warmer under this system inasmuch as the ground is better able to take up the daily heat and then to give it up more readily at night during the winter months. Of course this isn't such a factor in the warmer hillside areas.

On your sods there is a definite non-erosion factor and that's probably one of the chief reasons for using this type of culture, in addition to it being a little cheaper. There is a little more cost in maintaining the proper level of nitrogen content and moisture due to the competition of the grasses, but I've heard it said that some growers like this because in developing a young grove this competition has a tendency to hold back the growth of the trees a little, with the result that they sometimes come into bearing earlier. On the other hand, there is a definite rodent problem. You can spot a gopher a long distance away in a clean grove and can take care of him accordingly. There are other factors involved, of course. On a thin soil you tend to reduce the amount of soil available to the avocado root by the use of a heavy Bermuda sod. I think it's generally agreed that the first 12 inches of soil is the most important, for this is where fertilizers and water are first introduced and aeration is present. We know that trees will grow successfully on shallow soils, but problems are increased and there is a tendency for shorter tree life. Deep cultivation and too much weed competition only serve to deny the use of what soil is available to the tree on these shallow types.

As for irrigation, there are just as many experts as there are irrigators, and I certainly don't intend to go into this complex subject. Briefly, it appears that more acreage is going over to sprinklers. It's a good way to distribute water providing your pattern is right, and it's conservative of water which is an important item here in southern California. There are several types of sprinklers in use, and we see them all represented by members in this audience. Like all things, there can be disadvantages, too, and in addition to being expensive to install, a sprinkler system of a permanent type can lead to over-watering as it is so easy to "turn the water on." There can be discrepancies in pressures, too, and many people struggle along with pipe that is too small or inadequate power to get good coverage. The use of portable sprinklers is increasing, and in this method, the grower may experiment with different patterns, and may adjust to both young and old trees.

There's many a good grove under furrow irrigation. One of the best groves I can think of in Orange County is on a hillside under furrows where the grower waters once a week. In fact, he takes water every Monday morning, and that is a controversial thing because a lot of people think that you should let a greater interval elapse between watering. It is thought to be best to allow the ground to more or less rid itself of moisture and to let a little air get back in before watering again. One doesn't want to knowingly encourage root rot and since it is felt that too much moisture is a contributing factor, then it is best to do whatever you can to avoid it. You can't avoid heavy winter rains, but you can at

least assist the water in running off, while we are on the subject. This applies to basin irrigation, too, where if the soil is considered more or less impervious, this practice should not be followed once the young trees are established.

In general, most growers try to get on about three or four inches of water whether by sprinklers or by furrows. In the La Habra area they consider that on an average, good-bearing avocado grove there is a loss or use of about 18 to 20 inches of water a year. That is from the April to October period with the figure running to from 30 to 40 inches in the inland areas. Naturally, we're not getting that much rainfall every year so we do have the problem of this replacement. A good bit of it is just good common sense. I remember a grower telling me that after he made a heavy tree removal in his grove he went right on watering just as heavy as before. He said that he forgot that with only half the trees he should have eased off, and that he was afraid that he might have brought on some root trouble by this action.

We do a lot of worrying about fertilization, and much is written about the matter. However, from what I've seen, it seems to me that too much fertilizer is applied to some groves. Nitrogen being the element commonly deficient in California soils, it is tempting to put on too much. Your trees get "vegetative." There is a grove east of Santa Ana that is a good case in point. It is as good a grove as one could find—on rich, deep soil that formerly was in walnuts. You couldn't find a better place. The trees were of good origin, selected buds, and yet the grove went 8 years without setting a crop in the first period of its life. The grower was very concerned, felt very bad, and blamed the nurseryman. He was raising some terrific trees and they were not setting avocados. I asked him what he was doing by way of nitrogen and water and he said that he was going to hold off for awhile. He did, he held off for a year on fertilization went light on water and the trees settled down and commenced to bear. He'd been a great fellow for organics, commercials and liquids and had always prided himself on his lima beans and his orange trees—the best looking beans and orange trees around. But it didn't work so well on his avocados, at least not at that location and on that particular type of soil.

It is considered adequate if from 150 to 200 pounds of nitrogen per acre is applied per year. But what kind are you going to put on? There again it becomes controversial. I know of another grove where the grower makes it a three-way proposition, and he raises a lot of fruit. He puts on about half of his requirement with a commercial type and balances off with some organic and anhydrous ammonia. I think that generally speaking, it is wise not to use any one fertilizer exclusively, that the best results come from rotating from time to time—getting your requirements in various forms.

Pruning should be at the convenience of the grower. If he is cultivating his grove and wants to get his trees away from the tractor, that's one thing. If he doesn't want to pick fruit from trees that are too high, then he will want to do some trimming. If he likes to walk around under his trees without knocking his hat off, then he can arrange that too. But I certainly agree with Walter Beck that these young groves that have been allowed to keep their leaves for awhile are certainly the ones that are outstanding. There is a grove up at Corona that is an example of this. They've allowed every leaf to stay on for the first five years, and are just now doing a little low branch removal to facilitate getting their irrigating water through. I truly believe that as you make a leaf, so do you make a rootlet, and as you make the top, so do you create the bottom of the tree. I agree that

you should probably control your tree, but this matter of pruning pretty well revolves around the type of culture you employ.

There isn't quite the amount of trouble with winds down here as up north, where windbreaks are our salvation. We can't live without them, and we hate to have to live with them. They're a darned nuisance. They are in there all the time in the sub-soil, and to give your avocados a chance you have to be continually controlling the gum tree roots. Or you can feed and water these roots to keep them satisfied to stay nearer home. Either way it's a chore, and you never get the production from the adjoining avocados, although I do think the avocado is a better competitor than the orange tree in this instance. At the same time, if you don't have adequate protection you are really out of luck and the last few years prove that particularly. It isn't always the fruit that is lost on the ground as much as it is the scarring and the consequent loss of grade. And it can happen in one night. Any interval of planting windbreaks much beyond 400 feet is usually unsuitable and leads to bad results on the last few rows of trees where the turbulence can develop. I

It all adds up to one thing. You can be the best farmer in the world, you can have the best soil and the best temperatures, the biggest wire fence to keep the deer out, and you can have your trees in beautiful shape, but if you don't have the necessary temperatures during the setting period you are still out of luck. Even the best of groves will set a light crop. It's strictly a highly complex field and perhaps it's a little more complex now than it was before.