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Thinning the Avocado Grove

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Many avocado groves have reached a stage where too close planting is actually reducing potential production. Also, because of the shading out of the lower limbs, such fruit as is produced occurs in the tops of the trees, thus increasing picking costs substantially. This tree top fruit, furthermore, is subject to greater wind damage than fruit produced on lower branches.

In addition to the groves which are already crowded, many other groves are rapidly approaching that stage.

The question of thinning out excess trees is, therefore, of immediate and vital importance to many hundreds of growers.

When the subject is mentioned, the first reaction of the grower is often that he cannot afford to cut out half or more of his trees because of a loss of production—and income. In reality, perhaps, he cannot afford not to. There are many examples throughout the avocado producing districts where, when a systematic program of tree elimination has been followed, the total production has actually increased by the second year after the excess trees were removed.

Visualize a one-acre avocado grove as the top of a table, on which 108 rubber balloons are placed in such a manner that no balloon touches another. This would be illustrative of a young orchard planted 20'x20'. Now, visualize these balloons increasing in size as air is pumped into each, to double their original diameter. The sides of the balloons, having no place else to go, will flatten themselves against one another; the top portion will be forced upward. Note, however, that the top portion gains relatively little completely exposed area. The situation is now illustrative of the same 20'x20' planting some years older than the original example.

Sunlit Areas Compared

If a light (representing the sun) were to be suspended over the balloon "orchard", it would be found that in the first instance the top and a large part of the sides would receive the rays. In the second instance, however, only the top would receive light rays.

When this illustration is applied to an avocado grove, the purpose of excess tree removal may more readily be seen. While the trees are young, they have the maximum possible leaf area exposed to the sun. As their size increases, however, the side areas intermingle, and become shaded out. All that remains is an umbrella of foliage at the top. This area is the only portion capable of bearing a satisfactory amount of fruit. It has already been pointed out that the area of the canopy cannot greatly increase, which

means that the fruiting area is thereby restricted. Observation has been made by Raymond H. Marsh, horticultural expert, that the completely intergrown grove will have a bearing surface of approximately 48,000 sq. ft. per acre; whereas ideal trees (roughly half-spherical in shape, with the lower limbs of adjacent trees just meeting) would permit a bearing surface of approximately 68,000 sq. ft. per acre.

Not only does the crowded grove result in a loss of perhaps 30% of the potential bearing surface, but the bearing surface that does exist constantly moves upward as the tree grows. The picking problem thus becomes more and more difficult.

There's the problem; what can be done about it?

First, develop a pattern. If it can possibly be done, the pattern should retain regularity and spacing for the trees which will remain. Even though this will require elimination of some desirable trees, and the retention of some poor trees—which will ultimately be grafted or removed—the desirability of this procedure will be realized in the years to come.

Production Records Aid

Tree production records should be carefully analyzed. (If they have not been kept, the lack will prove an unfortunate disadvantage). Various removal programs should be plotted on paper, to ascertain which program will result in the retention of the greatest number of good, productive, non-diseased trees. That done, paint a band around the trunk of each permanent tree, as identification. Identify in some manner, also, each of the permanent trees which will require future top working or replacement. These will include poor-producing and sun-blotched trees (the latter to be replaced).

One of two programs can now be followed with respect to the unmarked trees. If crowding has not already occurred to a severe degree, the intersets can be heavily pruned to prevent their interference with the permanent trees. Thus, for a while at least, some production may be had from trees designated for ultimate removal. More often than not, however, it will be advisable to remove the intersets completely, as thinning is seldom considered early enough to make the first program practical.

One of the most amazing things about an orchard thinning program is the rapidity with which the new growth on remaining trees will fill in the void left when an interset tree is removed.

Drastic Treatment Needed

In some cases, where crowded conditions have existed for many years, it will be found that the trees which remain after thinning will not have branches under 10 to 20 feet from the ground. The heart-breaking treatment for that situation may require that the trees be cut back almost to the stump to force branching lower down, or in some instances it may be advisable to graft the tree. In either case, of course, no production will result for some time. Fortunately, most growers will not encounter the need for such drastic treatment.

The number of trees to be removed will depend, of course, both on the size of the trees involved and upon the nature of the soil in which they are growing. Large, vigorous trees growing on deep soil may require that **every tree** in **every other row** be removed. In the case of the 20'x20' planting used in the illustration, such a program would result in a spacing of 40'x40'. The original 108 trees per acre would accordingly be reduced to 27 trees per acre. On the type of planting under discussion, such a heavy reduction is not as serious as it first appears; for, as pointed out, new growth on the remaining trees will fill in the void and the **production per acre** may ultimately equal or exceed the production from the original planting, when this has occurred.

If the soil is shallow, and trees cannot attain the size of their sisters on deeper, better soils, a 40'x40' spacing may not completely utilize the land. Under such a condition, it would probably be preferable to remove every **other** tree in **every row,** beginning with the first tree in the first row, the second tree in the second row, the first tree in the third row, etc. The result will be a staggered planting with distances of 40' between trees in one direction and 28' in the diagonal direction. This pattern provides space for 54 trees per acre.

Contours Present Different Problems

All of the foregoing has assumed that the original planting has been on a square pattern. If the original planting is on a contour, the pattern of tree removal must necessarily be based upon individual conditions.

A third alternative, which may have some merit, and which on occasion has given satisfactory results, is the complete removal of every other row in the orchard in one direction only. This will result in a hedge-row planting. Shading will continue to exist between trees in the row, taut both sides of the row itself will be open to the light. This orchard pattern will permit the retention of 54 trees per acre (spaced 20'x40').

Contour plantings may present another possibility, in that the distance between contours is often from 24 to 30 feet, whereas trees in the rows are at shorter distances. Removal of alternate trees in each row, in such instances, will probably result in satisfactory spacing.

Regardless of which of the foregoing methods is utilized, it is very probable that some of the permanent trees are not satisfactorily productive, and some may even be sun-blotched. In the former instance, the nonproductive trees should be grafted at the earliest possible date to a more productive type. If the tree is sun-blotched, the only satisfactory solution is to remove the tree entirely, and replace it. This is a rather difficult matter, as the irrigation and fertilization needs of the young replacement trees are vastly different from the needs of the older trees surrounding them. Considerable nursing is necessary to bring a replacement tree along satisfactorily. There are some growers who prefer to start seedlings in the permanent tree space, instead of planting a nursery tree, and to graft the seedling tree when it has attained a good size.

The real moral of this story is not for the grower whose trees are already crowded. It is for the fellow who can still visualize the problem before it actually occurs. The advice to him is to mark the trees that are to be left permanently, and to start cutting back on the

alternate ones that are eventually to be removed, until only a stump remains. Thus, loss of production is held at minimum during the changeover.

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