California Avocado Association 1938 Yearbook 23: 113-118

Pruning Practice on the Avocado

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Talk at demonstration on the grove of Ross and Rosa Hodson, La Habra.

Ladies and Gentlemen: Three years ago, many of you attended a demonstration of pruning in this same grove. Since then, there have been many requests for a progress report on this work. In considering the program for this Institute, the committee felt that it might be time to follow up this demonstration with field observations of results and a further opportunity to witness any later modifications of theory and practice.

Before commencing the discussion, we wish to acknowledge the kindness of Mrs. Rosa Hodson, and her son, Ross Hodson, respectively, owner and manager of these groves, through whose courtesy we are allowed to hold this demonstration. It is also through their continued confidence, over a period of years, that I have had the opportunity to carry on the study of this young grove from its planting, and later to try to work out the problems of the older grove across the street which was not pruned in its earlier development.

You are here today to see for yourselves the results of practices, which three years ago brought forth much head-shaking.

PRUNE ACCORDING TO YOUR INDIVIDUAL PROBLEMS

In the beginning, I wish to emphasize the point that must always be dwelt upon in these discussions, that none of you should go home and attempt to apply what you see and hear this afternoon to your own trees under your conditions without considering whether there is real similarity. Undoubtedly there are many points to be made this afternoon that apply generally, but real success in pruning will come only when, like a master-tailor, you take the measure of all the factors involved and cut your pattern accordingly.

Most practical growers are primarily interested in specific problems and definite answers to the questions raised, rather than a discussion oi abstract theory. This afternoon, I hope to meet this need by taking four definite cases, describing the background of conditions and the methods followed, stating the objectives and allowing you to reach your own conclusions. In another two or three years, I hope that we may return for a progress report and further observations.

A FEW FUNDAMENTAL RULES

Briefly, I wish to point out a few fundamental rules that apply to the pruning of avocados under nearly all conditions. Crotches of the V type should be eliminated as rapidly as they appear or very serious breakage is inevitable. Such breakage may be ruinous to the tree. Dead-wood should be kept removed so far as possible. Limbs should not be allowed to unbalance the tree by developing out of their proper sector. All cuts should be made clean and as nearly as possible in line with the contour of the trunk or limb from which they are removed. As most growers now use some form of neutral asphalt coating, they should be advised that both a thick coating and a thick consistency is necessary to prevent checking. Large wounds should be repainted at least once a year until completely covered by the callous.

CASE No. 1

The grove in which we are now standing was planted seven years ago this spring. The nursery trees were grown on selected roots from selected buds, the complete record of which is available.

They are all Fuerte trees on deep, fertile, well-drained soil, planted twenty feet apart on the square. They are not subject to any great wind hazard and in the 1937 freeze were not seriously injured. Most of the damage was confined to the loss of a good crop and the slowing effect on setting of the crop that should have come off last spring. Some trees had small limbs frozen back to some extent, but not sufficiently to seriously interfere with the directional pruning.

A moderate amount of barnyard fertilizer has been applied. The trees were staked during the first three and, in some cases, four years of their growth. The general aim has been to grow them on a modified central leader plan. An effort has been made to so balance and strengthen the framework that heavy crops of fruit would not break the trees down. In this way the need for props and wire bracing has been eliminated.

No pruning was done the first year; very light pruning to balance limbs in the second year. Real directional work was begun in the third year when very rapid and heavy growth of the laterals began. As the trees developed and lower limbs became heavy and in the way of cultural operations, they were removed to facilitate ordinary grove operations. The strong laterals which seemed to have a chance of becoming a part of the permanent framework, were consistently headed to prevent end weight from bearing them down, out of place. This necessitated follow-up pruning in the fall as well as the heavier pruning in the spring to thin out shoots and further shorten limbs. Thus in the fourth and fifth years the trees were pruned semi-annually. At the end of the fourth year or the beginning of the fifth all trees were topped and forced to spread. This is necessary to keep height and consequent picking costs down and to prevent winds from breaking or blowing them over. After the central leader has formed a permanent head at the height desired, a spreading of the framework is desirable and usually results in greater structural strength.

It is admitted that the methods followed here have probably reduced the amount of fruit during early years, but they seem to bs justified by the better structure which will bear

future heavy crops without great loss.

As you can see, we are already upon the threshold of a serious tree thinning problem. Twenty feet is entirely too close for Fuerte trees, even temporarily, on soil of this deep, rich type. We would not be in quite the difficulty we find ourselves had it not been for the freeze. We have no records of individual tree yields by which to proceed intelligently with the thinning of the trees. A good crop was lost in the winter of 1937, the newly formed wood after that trial was not mature enough to set last year, and this next crop is the first by which we can judge the bearing qualities of individual trees. We will try, by pruning severely on the diagonal, to allow all trees to remain another season in order to obtain a better basis for thinning intelligently. That is as long as they can go without severe injury to all of them, through loss of lower laterals and fruiting surface.

CASE No. 2

The grove which we will now consider is located about two miles from here—in La Habra Heights—where soil, wind, and other local conditions are similar to this grove. The trees are mostly Fuerte. Three years ago it came into the hands of the present owner. At that time it was badly run down from lack of proper watering and fertilizing and as it had been unpruned, was a veritable jungle. The trees were seven years old at that time.

We did a job of very heavy pruning in order to remove large interfering and low lying laterals, badly crossed limbs and split crotches. The owner then began heavy fertilization, using large quantities of both organic and commercial fertilizers. Abundant water has also been used. Following the initial pruning, a few trees were thinned out where headed limbs had developed too many shoots, but most of the grove received no further attention until after the freeze, when some of the trees in the lower portion of the grove had a small amount of frozen dead-wood removed. The trees have grown tremendously and carry a heavy crop this fall.

Becoming alarmed over the weight of the crop, the weight of the foliage, due to rank growth and the breaking of several V-type crotches which had escaped the first pruning, the owner has adopted a program of pruning which began last month (September) and which calls for semiannual attention hereafter. Rather than prop or use wire bracing, we are removing all riders or sucker growth from the tops of lateral limbs, cutting the heavy new growth of laterals back to the fruit line, and cutting back most of the heavy shoots projecting beyond the contour line at the top of the tree. This has all been done without the sacrifice of any fruit to speak of. It has been done roughly and is to be followed up in the spring (after the fruit is off) by the removal of interfering limbs that now carry fruit. It is one approach to the problem of how to enable trees to carry very heavy loads of fruit without propping. The time to do this has been determined, experimentally, to coincide with a maximum weight development of the fruit which the trees can support without help and yet be late enough to eliminate a great amount of further growth this season on the part of the trees.

Many of you may feel that it is foolish to use water and fertilizer in the large amounts used on this grove only to produce growth which is to be cut off. But on the face of it,

the results seem to justify such a course. Not only is the grove carrying a heavy crop, with the fruit much above the average of the neighborhood in size and quality, but there is a total absence of the large clusters of fruit seen so often in heavily bearing trees. Nearly all vigorous Fuertes which have not been under stress during the past season will have the fruit rather evenly distributed. Great clusters of fruit are a sign of weakness, not something about which to congratulate ourselves.

Have we any experience to justify this course of action? In a way, I think that we have. For about eight years, I have been requested by the owner of a very fine Fuerte tree in Pasadena to remove most of the new top growth each fall. It is in a location subject to violent, gusty winds. It has borne heavy, consistent crops each year in spite of this. It has been heavily fed and watered on well-drained soil. At first it responded by making wild vigorous growth each season, but the last two or three years has settled down to a normal growth of harder, more rapidly maturing wood with no diminution of the quantity, nor of the size and quality of the evenly distributed fruit. It has been cut back to the fruit line, much as the La Habra trees have been, for a period of years and seems to have achieved balance.

I would also cite Mr. Anthony's younger trees at Fallbrook. There are few, if any, finer developments in the state. He makes it a practice to prune in late June and July, his season being earlier than ours and has headed all laterals back, so that they are self-supporting, as high as he can reach from the ground. Neither the vigor of the trees nor their fruiting has been injuriously affected.

CASE No. 3

We are now in Mrs. Hodson's older grove and our primary interest here is not so much in pruning as in the evident need for the best method of thinning out such a dense, overplanted grove. These trees are growing on the same rich, deep soil, have been well fertilized and have had adequate water. They are planted twenty feet apart on the square and have borne excellent crops on the average. With some heating, in 1937, they had a good crop last year but are not set as heavily this year as usual because of delayed effects of the freeze and the shading of their overcrowded condition.

These trees, now twelve years old, were not pruned until they were eight years old. In the meantime, because of lack of formative care in the early years, Mr. Hodson resorted to considerable wiring to try to hold the trees together, when the great weight of foliage and crops caused severe breakage. You can see the results, which are very disappointing in many of these trees, and it is not hard to understand why we determined to control the situation in the younger trees by cutting rather than by wire or props. Even though done along best lines, wiring as a solution is inferior to training and pruning.

In the beginning we had to cut very heavily in an effort to correct the results of the earlier neglect. We shortened many heavy laterals, removed others which were too low and also removed much of the early wiring. Many cross-limbs and bad type of crotches were removed during the following years and the length of limbs and leaders constantly shortened to reduce the bearing down effect of extended weight. An effort has also

been made to obtain a more open foliage canopy with only moderate success.

Probably one of the most important reasons why growers should keep some kind of tree production records is to enable them to know which trees to remove when thinning becomes necessary. Unfortunately, in this case we have no written records, but Mr. Hodson has done all the picking himself and has a better-than-average knowledge of the performance of individual trees.

During two different seasons, each of us made an inventory of the trees and rated them 1,2,3,4, according to bearing and also as to tree condition'— vigor, shape, freedom from disease, size, etc. Thus a certain tree might be rated 1-3, for tree condition but only 3 on bearing record.

From these records two maps were drawn. One showed tree condition, the other tree production. A study of these maps shows the rows that have the greatest number of good trees.

I have long held that it was wasteful to remove trees systematically by rows, if it destroyed too many good trees and left too many poor ones. Certainly twenty feet is ample for cultural operations and one often finds certain trees adjoining which may be pruned in future as one tree, the poorer trees about them being removed.

We have already cut down some of the larger trees which had no fruit and were sunblotched or otherwise handicapped. The trees about these open places have shown a tendency already for the lower foliage to respond in better color and condition. We believe that in two or three years the thinned-out grove will produce more and better fruit which may be more cheaply harvested than all the trees, left in their present crowded condition, could possibly produce.

CASE No. 4

This case is a study of methods used in the control and topping of very large Guatemalan type seedlings and some eighteen-year-old grafts from them and of the Dickinson variety. The grafts have gone up almost as high and straight as the seedlings

I refer to the trees in Mandeville Canon on the former Oakley property. These trees were planted in 1911. The soil is very deep, well drained and rich. The trees have made an amazing growth and many were fifty to seventy feet high last year. The greater part of the fruit was in the tops of the trees and quite out of reach by any method that could be devised. It was very expensive to get what could be reached and quite impossible to do anything but allow a considerable portion of it to drop.

Some eight or nine years ago, Mr. Oakley had many of the trees topped, but did not follow up the work. The result was that great shoots, twenty to thirty feet high, ran straight up into the tops of the trees with no side limbs of any size.

Last fall, we again topped these trees, bringing them down almost to the point where they were topped before. This summer we have followed up the work by thinning out the shoots in the tops after they are hardened, and shortening those remaining. In the spring we also girdled some of the long bare leaders at about the halfway mark so that some lateral growth would be forced out to fill in fruit wood. This girdling has been only

partially successful.

The results to date seem to be a hopeful chance of holding the tops within reach and a considerable increase in the amount of fruit set on the lower portions of the trees where it may be harvested economically. These trees still have plenty of light.

CONCLUSIONS

Concluding this discussion, I would like to say that the definite cases cited offer only one approach to the problems involved. There are probably others. Those that have been described may not fit your problem, but they may indicate to you some of the considerations necessary in attacking any pruning problem. Neither I nor anyone else can decide correctly on a program for any particular grove without first making careful study of all the factors. Once such a program is worked out, I believe it wiser to follow it consistently than to jump about from one idea to another. As you go over the trees from year to year, you will find many reasons to modify some of your practices. If your program is sound, the time should arrive when the trees strike a growth balance and only very light annual pruning should be necessary. In some cases this may take from fifteen to twenty years.

But, one fact remains. Whatever your theoretical attitude towards pruning, you won't be able to sit idly by and do nothing about it. The trees will force your hand and you will have to do more later, that will be injurious, than if you had followed a moderate program from the beginning.