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Question Box.

Annual Meeting, May 8th, 1934

Judge Halm: The Question Box has always been of great interest to us all. Perhaps the one man who is most capable of handling that, and answering the majority of the questions is Dr. J. Eliot Coit, so I am going to turn the meeting over to Dr. Coit at this time.

Question: What would be the result with the Dailey System of grafting of using scions from different sources and combining them into one tree?

Counter-Question: Of the same variety from different trees, or from different varieties?

Grower: I saw that picture of a number of different grafts growing up on a stump, and top-worked together, were some suckers?

Dr. Coit: With scions of different varieties growing from one trunk of a tree, you would like to know what would be the result if these different varieties were combined into one trunk? Professor Hodgson, will you answer that?

Prof. Hodgson: Mr. Dailey does that sort of thing. I think there would be no other result than the mechanical union of these different varieties. The tree itself consists of the scion or strain—whichever was permitted to make the top—the others would simply be branches and eventually combine together.

Dr. Coit: A number of years ago a German botanist, Hans Winkler, grafted the tomato and nightshade together. By stimulating the point of union, he finally secured a shoot, the base of which straddled the union in such a way that tissue from both sides was used in the growth of the shoot. The resulting plant developed branches, some of which bore tomatoes and others nightshade berries, and some in turn bore curious oddities made up of a mechanical mixture of the tissues of the two. This kind of plant mixture he called a "Chimera." However interesting scientifically, no very practical results came from this work. It occurs to me that with Mr. Dailey's method of grafting, if scions of two or more varieties were combined, that occasionally an interesting avocado chimera might appear. However, I don't see much, if any, practical application to this.

Considering this method of grafting from another angle, it occurs to me that where a number of growing scions are grafted together by approach, that there would be a lot of space between their point of union and the cut end of the stock. If this was not looked after continually, and kept well waxed over, there might be much opportunity for decay to become established.

Mr. Dailey, let me ask you how old are the oldest grafts you have made in this way, and have you had any such difficulty?

Answer: I started this work in Fresno County four years ago. I was working with pecans and also with persimmons, peaches, and things of that sort. There is no irregularity of healing over—it becomes perfectly smooth in a remarkably short time. Last Fall, Prof. Hodgson and Mr. Rounds visited trees that I had worked on—twelve-inch stumps. They saw how quickly those stocks were healing over—on such large stumps.

Question: There seems to be a difference of opinion about leaving the low branches on trees, when it comes to the matter of picking time. Will it be an advantage to have them close to the ground or have them high enough to cultivate under the trees and pick with a ladder, or to have them down so one can pick from the ground?

Dr. Coit: The question as you heard it concerns the comparative economy of harvesting fruit from a tall tree or one that is kept lower down. Fuerte trees have very strong lateral branches which Mr. Newman has aptly called "strong-arms."

The lower shoot on the limb takes a lead and grows out and begins to droop. It has been my own custom to cut off those drooping shoots from the Fuerte and encourage the weaker upright shoots, with the result that we arrive at a moderately high spaced tree but not one that is too high. The whole question of efficiency in economic harvesting has not yet been a very urgent question with this new industry, but I suspect that next year it may be a live question. Has anyone anything further to contribute on that—the comparative economy and efficiency— of upright or drooping trees? To what extent do you think trees should be kept down in order to save money in climbing up after the fruit?

Carter Barrett: I thoroughly agree with your remarks in that regard but perhaps a word of caution in some of these cases. Some growers who have thought the way to keep some of their trees down was to cut them off and certain varieties and seedlings particularly will stretch higher up in the air with less side branching if you cut them off than if you leave them alone, so before you behead your trees one should consider all angles of it. I have seen trees beheaded and later the new shoots went thirty feet higher than they were and straight up in the air.

Question: How can we tell when the avocado tree needs water—trees three months

old to five years old.

Mr. McCulloch: About the only answer I can give is to test your ground. We have laboratories now which will furnish you the **moisture equivalent**. In my own personal testing, I use the small soil auger which shows whether dry or wet. Some people maintain that a person cannot tell whether soil needs water merely by the feel of the soil, but I believe that if a person works at it long enough he will become educated to his own soil.

Dr. Coit: I might add that I know growers entirely new to agricultural matters who adopt the very common sense policy of taking two samples in duplicate and having one tested at a laboratory. The grower then takes the other can, opens it and feels it with his hand until he senses about how moist that water content in his soil should feel. From that he can learn to use the soil auger and test with his hand with fair enough accuracy.

Question: I'd like to ask if an avocado tree needs water most before blossoming or after blossoming.

Dr. Coit: I am going to give you my opinion on that. No doubt some of you differ with me. I am perfectly willing, and reserve my right, to change my opinion if data comes up to show that I am wrong. From many observations made and collected in notebooks, I am of the opinion that avocado varieties generally, and Fuerte in particular, sets its fruit better if it is kept somewhat on the dry side as to soil moisture during the blooming and setting period. Then, as soon as what we term "red stems" appear on the young fruits, indicating that the fruit has a good seed in it, and there are enough red stems on the tree to indicate a good crop, then begin to water and water more liberally. In my own grove I adopted a policy of scanty moisture during bloom. . . . We just gave them frequent light irrigations until the fruit was set. In the summer-time, beginning the first of July it is my opinion we should water avocados more generously. With trees of equal size, give them more water than citrus. If your soil has good sub-drainage, irrigate well in summer and early fall. Does anyone disagree or wish to take issue on that? (No answer.)

Question: In the matter of commercial fertilizer, will the tree only assimilate so much and the rest merely be lost or will it do any good, or injure the tree?

Answer: A very great excess is likely to injure the tree but how much of an excess did you have in mind?

Grower: Well I'm a novice in this and I need advice. My trees are four years old. Say

you should have five pounds of fertilizer. Now suppose I could afford to give my trees eight pounds. Beyond the possible expenditure, would I be subjecting the tree to injury?

Dr. Coit: Is Mr. Rounds in the room? The question is if you have an avocado tree say of two, three or four years of age and you are applying fertilizer to it and you apply in excess of what that tree can use beneficially, to what extent will the tree be injured or will it just be a matter of hurting your pocket-book, or will the excess hang around until the tree can use it?

Mr. Rounds: That is too much for me.

I have injured citrus trees, about two to four years of age, by putting on too much sulphate of ammonia, so that it came in contact with roots of the tree. That is the assumption that I made and I believe that too much soluble commercial fertilizer would probably cause damage. I have always assumed that because of concentration any salt might do the same thing.

Question: What do you consider the economic amount to apply to a normal size three-year-old Fuerte tree?

Dr. Coit: The economic amount to use would depend on fertility of soil, drainage, and things of that sort.

Mr. Rounds: A great deal depends upon whether you have sandy soil or heavy soil. With sandy soil you won't need so much. With young trees the matter to be considered is the amount of area covered by the application of fertilizer. I have seen relatively small amounts, a fraction of a pound, do a lot of damage to small trees because of the way it was put on—a few inches away from the trunk of the tree or just a handful in the furrow on each side of the tree. The same amount of fertilizer, if scattered out in little wider area, won't do any harm at all. But because some people they get it too close to the tree, it is too concentrated and affects the roots.

Dr. Coit: That is a very excellent point. Cover the whole ground in case of bearing or full size trees. However, in case of basin irrigation where basins are filled from contour furrows, it is the custom of a good many to drop the soluble nitrate right at the entrance to the basins where the stream of water will dissolve it and carry it all through the basin.

Carter Barrett: I want to give as my opinion that the use of commercial fertilizers and concentrates on avocados should be very sparing. The most successful and paying groves that I know of are based on the use of organic materials—manure. That properly applied, and consistently followed up will practically eliminate commercial concentrates,

and the orchard will be greatly improved. I think one of the tendencies of people is to lean toward commercial fertilizers because it is profitable for the salesmen to promote them, and secondly it is easier to apply. And there aren't the objectionable features of odors, etc. But I am firmly of the belief that the groves I know of which are truly successful from a money producing standpoint, are based almost entirely on a manure program.

Question: Could we get Mr. Barrett to tell us how the manure is applied in the proper way and at the proper time. I would like to get his system in that respect.

Carter Barrett: Well the situation as I see it is largely a question of using a quicker acting material such as chicken manure, or something of that sort in the Spring when you need extra stimulus and a good heavy application of dairy or barnyard manure in the middle of Fall, say along in October or early November, so it has a chance to break down through the winter and become available at the time the heavy strain comes—during the blossoming period. Several groves besides the one I have in mind, use this system with the result that they are as productive as any in the country today.

Mr. Rounds: There is one statement further regarding fertilization. I agree with the use of organics on **young trees**, with a small amount of supplemental material, if we are going to use any. There is one thing I have seen which is objectionable, especially the intermixing of the manure with surface soil. In many cases organic material applied by means of a spade-fork, or something that goes rather deep into the soil. I think many times, especially with two year old trees, the mistake is made going down so deep as to disturb the surface roots and retard their development. I think another thing we should do is caution the turning under of this organic material and surface soil around young trees.

Dr. Coit: I would even go further for avocado trees. The manure need not be turned under at all. The less digging and hoeing the better off your trees are in the long run.

Carter Barrett: Are you speaking of young or old trees?

Dr. Coit: Old or young trees either one. I know of young trees having no soil stirring from the day they were planted which have carried on very well indeed. But of course young trees need to be kept from competition from weeds.

Question: Would you recommend the mulching system?

Dr. Coit: I would say that I can take you not very far from here to a Fuerte grove

nineteen years planted, which has never had the soil touched at all—has had nothing but leaves of the trees and all of the trash from the ornamental grounds, grass mowings, spread around. Irrigation is by a low type sprinkler on a hose, three or four of them moved around under the trees. The soil has never been stirred and those trees have made a wonderful growth. I have always felt that citrus trees profited by a certain amount of tillage or soil stirring but I also feel that the avocado tree has suffered from stirring around its roots.

On our own grove, the middles were cultivated the first year. The land is steeply sloping. That winter the erosion was so bad, I have not cultivated for four years. Sowed the land permanently to burr clover which reseeds itself every year. Irrigation furrows are permanent. If they occasionally become choked with clover and weeds, I have a horse with single shovel plow come in and ream out the furrows. A few large weeds which detract from the appearance of the place are occasionally cut with a hoe by hand before they seed. I do not intend to cultivate my soil again. The results are quite satisfactory. On some deep valley loams, there is not so much objection to cultivating.

Question: Is the soil around your trees that which bakes and hardens?

Dr. Coit: No, the soil is classified as Vista sandy loam.

Question: What would you do with soils that bake?

Dr. Coit: Now I am afraid that we are getting into a subject that will lead us into technicalities as to what you mean by "baking." There are any number of phases to that question that perhaps would lead me to be careful, so instead of prolonging the topic, I withdraw. I might say however, just in passing—I feel from many years of experience with persons of middle-age or elderly people who have lived in cities, and have lately come into agricultural activities, that such people are prone to over-emphasize the imagined harm of actual hardness of the soil. In other words, they want to be continually digging up the soil to make it soft. That point in itself and alone I don't worry so much about. If the tree is thriving—and the soil absorbs water readily, what difference does it make whether it is hard on top or not?