

THE BALANCED CARE OF AN AVOCADO TREE

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Dr. Coit: The next item on the program is the "Balanced Care of the Avocado Tree." I have in mind that it is going to be the kind of practical heart to heart talk that we enjoy so much. Mr. W. L. McCulloch, Horticulturist from the Rancho Santa Fe, San Diego County.

Mr. W. L. McCulloch (laying a very clever walking-stick type of soil augur on the table): Anyone who has nerve enough to talk on such a subject needs a weapon of self-defense and this is mine. I will tell you about it later. I have a reputation on the ranch of never being seen without one of these. Many of you have similar ones, I presume. It is quite a help in walking and as one moves from tree to tree, it is easy to test the soil. It is very easy to cover the ground of an orchard with this.

This topic is not mine. It was formulated for me. In fact, I debated somewhat before accepting the title, for it takes either infallible knowledge or great presumption to dictate a balanced program for any living thing. However, the more I thought upon the subject, the more intriguing it became; not because of the words *Care* or *Avocado* or *Tree* but because of the word *Balance*.

The dictionary defines Balance: "To bring or keep in equilibrium; poise; to weigh in the mind by comparison; estimate; deliberate upon; ponder; to keep in due proportion." This, then, is my text.

Balance is one of the most vital qualities in all matter or life. Nature is continually seeking balance in her works. Rivers run to the sea, the sea water is evaporated to the clouds, rain descends and the rivers again run to the sea. It is said that if all the fish eggs which are spawned in the South Seas were to hatch and live as fish, it would only be a matter of a few years before the whole ocean were a solid mass of fish. But nature, in her wisdom, holds them in balance by so-called enemies. Even so-called catastrophes in the world are not entirely such. Earthquakes are merely nature's method of internal adjustments. An earthquake is better than an explosion! Nature does not long permit extremes. An old physics law is "To every action there is an equal and opposite reaction." In other words, nature likes balance and poise.

Man, however, often feels superior to nature and her laws. Most of man's difficulties—physical, social and economic result from man's disregard of nature's laws or balance. Many of man's diseases are directly the products of physical excesses. Poverty and crime can be largely traced to the inequalities of society, born, often-times, of either

greed or sloth. The financial depression through which we are passing is due to the wild excessive inflation and hysteria of past years.

But what has this to do with an avocado tree and its care? . . . To my mind, this idea of balance must be carried into the realm of avocado culture, even as it permeates all the works of nature. The balanced care of an avocado tree should consist of a program which is primarily natural; which is not extreme in any one phase, and which is conducted by a well-balanced man. A well-balanced man, by the way, is usually one who has a good fund of common sense.

I do not wish to lay before you any definite orchard program. I value my reputation and even my life more than that! The condition in the district in which I grow avocados in San Diego County is different than in other parts of the county, and San Diego County avocado growing is different from that of Santa Barbara, Ventura, Los Angeles, Orange or the other counties of the avocado sections. Your experience in these locations is more complete than mine, and as your conditions are different so must your program be different. I, therefore, do not desire to recommend one definite program. I do plead, however, for a balanced, common-sense program.

With this introduction, I wish to consider more definitely the avocado tree and its care from a balanced standpoint. Later, we will discuss certain more specific phases of avocado culture.

I was in an avocado section the other day. Some groves were in excellent condition, others were in a rather poor state. I did not wonder so much about the difference in the groves. We have this condition throughout all of our avocado sections, through one cause or another. What amazed me, however, was to see a man, with all this experience around him, planting out a five-acre piece of ground with obviously inferior trees. That man had lost his balance before he started!

As I drove around I became aware of the various extremes which appear constantly in horticulture. You now horticulture follows styles almost as much as women do. In regard to staking and pruning, I noted the effect of two distinct styles. The trees of one block of groves were staked high and pruned high from the ground. The trees were quite symmetrical but appeared to be dependent entirely on the stake. Another block of trees had no stakes and had branching tops instead of central leaders. Both methods have their advantages, but I wondered at the time if it would not have been better to have balanced the two systems, and evolved a composite of these two.

A few years ago, in our citrus groves, we practiced deep cultivation. Implement companies were constantly inventing new and heavier equipment, until all of a sudden it was discovered that moisture evaporation was not being controlled—valuable roots were being sacrificed and acre costs were rising. The pendulum swung back quickly—not to a central point, however, but to the extreme of little or no cultivation—until weeds and Bermuda grass and poor furrows are again sending the pendulum toward a balance.

The same extremes are true in avocado culture. I was down along the coast the other day and I saw sturdy young trees surrounded by beautiful basins— basins such as a sculptor might be proud of—and not a weed in sight. Not far away was another grove of

sturdy trees, in basins of rather indifferent architecture, and with a *considerable* growth of weeds in the grove. Both orchards at present are equally thrifty. A few years from now the appearance of the trees and the ledger balance sheet will doubtless show the value of a middle course.

In my own district our avocados at first were like "Topsy"—"they just grew," and some did not even do that. Someone, sometime, somewhere, had said that avocados did not need pruning—in fact, should not be pruned. When I came we had avocado vines instead of trees. Now, I do not want to become involved in any pruning debate here today, but I do know this: we do not have vines any more, neither do we have beautiful symmetrical apple trees, but we are *gradually* shaping the trees to a point where the limbs are self-supporting, and the fruit can be picked instead of dug!

Yes, and we hear of the balanced fertilizer program. No, you are wrong, I am not a fertilizer salesman! If we would put on all the stuff we are advised to do by all the men who sell fertilizer, we should certainly have a balanced orchard and a balanced set of books; in fact, so balanced that we would all be closed out! I have sometimes wished I had a salesman's door in my office which ostensibly led into a private conference room—but which actually opened onto the street again! I listen to all these salesmen, though, and often glean considerable wheat from a lot of chaff. To return, however, to the question of a balanced fertilizer. One school advises only nitrogen and organic matter; another school a complete nitrogen-phosphoric-potash fertilizer; still another will recommend a soil amendment only. As far as I can see, our old weighing balance must again be used. We all know manure is more or less a complete fertilizer, so we can at least include that. It is also agreed that nitrogen is vital and quite often lacking, so a nitrate can be included in our program. In regard to the other elements and soil amendments, I do not believe anyone can advise you completely. For my own part, I seek to combine all the schools of thought and thus attempt to preserve a balance; for, from my own experience, all are somewhat extreme.

The subject has led us around in a rather general way. For the rest of our time let us consider the avocado tree and its care a little more concretely. Perhaps we can formulate a program which, though general, may yet be specific enough in certain essentials.

LOCATION

Successful fruit culture starts before the tree is planted. Good selection of location is first. I know of certain districts where altitude is the main consideration. Freedom from frost is a good prerequisite in site selection, but if the hilltop is more shallow and rocky than the lower colder levels, the results may be equally disastrous. Soil must be considered. Clay soils are worthless, soils with hard pan or clay subsoil are also bad, but good trees *can* be grown on sandy soils, loams, decomposed granites, and adobes. All of them, however, require good drainage and different cultural treatment.

It is doubtless unnecessary to state that none but the best nursery trees should be planted. I believe much of the trouble experienced in the past years has been due to weak tree stock—poor root or poor bud. It is indeed gratifying to see the uniform aspect

of many of the younger groves throughout the country. We have our nurserymen to thank for this improvement.

The method of planting will vary according to soil, location, and your own experience. There is nothing inherently sacred in the furrow, the basin, or the overhead system, nor is the mulched grove inherently superior to the cultivated grove or the cultivated to the mulched. If proper judgment and balance is used and soil considered, *good* trees can be raised under all of them. For well drained hillsides, without terraces, I prefer a sprinkling system. On terraced land, until trees become large, basins are doubtless best, later furrows can be used. On flat sandy soil types, such as we have along the coast, the basin system is quite satisfactory. On the other hand, overhead or low sprinkling systems are very satisfactory in many of these sandy soils. On heavier soil types I prefer furrows after the trees are established.

Let us presume now that the site has been selected, the trees planted and the system of irrigation decided upon. The next decision to make is tree protection. When cold ocean winds must be contended with, protection *is* necessary—individual protection when young, tree or lath windbreaks later. If, however, the trees are on a warm, well protected slope, I personally do not feel that any protection is needed.

STAKES

Shall stakes be used? The small tree undoubtedly needs a stake, and the stake should remain for several years. I do feel that there is a limit to tree staking, however. A tree which is so firmly supported throughout its early life that it falls down when the stake is removed has not been properly supported and trained. I have seen trees tied to twenty-foot lengths of two-inch pipe. The trees looked like bean poles, they were so slender.

Some varieties of avocados do not naturally develop vigorous leaders. When such a leader *can* be developed, well and good, but if vigorous branching occurs without a central leader, it is not wise to attempt to change entirely the nature of the tree. Proper pruning and wire supports will aid immensely in creating quite a satisfactory tree. *My* practice is to aid the young tree to develop a proper leader, but to remove the stake as soon as possible to create a tree which can stand alone.

PRUNING

This leads to the question of pruning. In the lemon industry we have gone through the whole gamut of pruning programs, from the old Italian Baroni system which cut off most of the tree and most of the fruit, to the more recent *no* pruning idea. Both are extremes, and need modification. We have extremes in avocado pruning as well. Some growers attempt to make an avocado look like a well-pruned apple tree. Others appear to prefer the grapevine system! There *is* a happy medium between these two. Someone has said, "Pruning is not altogether a science, it is an art as well," and to my mind science and art must also be modified in practice. If this is so, certain local conditions will alter pruning practices. Trees in a basin with no cultivation do not need to be pruned as high as in a cultivated grove. Terraced groves will be pruned differently than level groves. Nor would I object if the *personality* of the owner enters into the pruning operation.

Some growers love beauty and order in their groves. I do not believe it is *a/ways* wise to disregard symmetry entirely. Pride in the appearance of a grove is sometimes as valuable a commercial asset as a few extra boxes of avocados. We must not, however, forget to look well into the future. I was recently in a sixteen-year-old grove, a most satisfactory grove owned by a man who loved his work and his trees. A heavy crop had just been picked. Some trees were of the main leader type, others were spreading. Although the limbs had numerous wire supports, many of these wires had snapped under the heavy load. The owner, in speaking of his trees and problems, stated that young trees *must* be shaped for the future heavy crops, but *all* shaping and pruning need not be done at one time. It is a gradual process, with the present and future in mind.

IRRIGATION

Irrigation, whenever necessary. In *some* soils two weeks is not an often enough interval. In other soils, a five-week interval may be *too* often. If soil is open and porous, one does not need to worry about too much water from an *irrigation* standpoint. From a *fertility* standpoint, however, *too* much water might be serious. Heavy soils must be watched, or avocados may be suffocated from excessive moisture. If a soil takes water readily on a side-hill, one or two furrows may be all that it is necessary to run. This leads me to one of my pet hobbies. I have made a soil-testing rod out of 3/8" steel with a 3/8" wood bit welded on one end. It is easy to use and tells a whole lot in a few minutes. It does not take the place of a large auger or tube, but it supplements it. Used as a cane in a grove it is a walking aid and a soil moisture rod at the same time. All of my irrigators are required to use them in the process of their irrigation.

FERTILIZER

Fertilizer. When trees are young, mulches and manure are excellent, with possibly some extra nitrogen thrown in. It is hard to beat barn-yard manure and bean straw for young trees. Beware of Bermuda, Morning Glory and Johnson grass in your manure straw. There *may* be good groves covered with a mat of Bermuda but I believe it is in spite of and not because of the infestation.

The question of commercial fertilizer now comes up. For the vigorous growth of the trees use plenty of nitrogen in some form. I think there is some truth in the statement that very vigorous trees supplied with large amounts of nitrogen do not set as heavy crops, but before withholding nitrogen be sure that your trees are strong enough to bear a heavy crop. An excessive crop this year on a weak tree may mean no crop next year, or perhaps even the loss of the tree. Phosphate and Potash? If you listen to one school, Yes; if you listen to another, No! If you experiment and test on your own trees and soil, probably Yes and No. I presume I could give you a well-balanced food formula for an avocado similar to a formula for a baby, but what is the use! We have neighbors with babies living near us—one baby has grown fat and husky on S. M. A., whatever that is, another is fat and husky on canned milk and another is fat and husky on mother's milk! What is the answer? Within certain limits be your own doctor. I do not mean to say to

not follow expert and scientific advice, or even not to listen to salesmen. Remember, however, the last word on fertilization has not been written, so experiment a little on the side yourself.

PEST CONTROL

Although the avocado land salesman said "the avocado has no pests," it is fast getting plenty; thrip, red scale; dictyospermum scale, palm scale, brown mite, and many others. Well, they are here and we must meet them. Thrip, along the coast, is being held in check by nico sulphur dust. Brown mite or red spider can be controlled by sulphur or oil. Red, dictyospermum and palm scale can be sprayed or fumigated with varying results. Experimental fumigation has been somewhat successful with us on palm scale. I would advise an owner, however, not to become panicky in respect to pests. Certain *scale* pests *must* be watched carefully to prevent spread, but mites and thrip will sometimes take care of themselves. I remember one time when I was young in the tree game I sprayed a lemon grove four or five times for red spider in one year. There *was* spider present when I sprayed, but I hardly think it could have been sufficient to justify all that pest control work. We have considerable red spider or mites on the avocados at Rancho Santa Fe but as yet I have not felt the resultant damage was sufficient to justify control. An avocado tree renews its foliage very quickly. It is different from a citrus tree in this respect. Along the coast, however, I am informed that spider and thrip infestations are often too great to be neglected.

Rots and fungi of the avocado trees and fruit are becoming better known all the time. Determinations and classifications of *some* of these rots will doubtless have *only* scientific value. Others may mean the salvation of certain sections. We trust that the scientific men will continue with their research so that control measures may be on hand before serious trouble is experienced.

The avocado tree is now balanced! Before we close our discussion, however, let us weigh and balance the industry itself for a moment. Strange how many people still believe that the laws of economics function everywhere except in the avocado business. Folks were led to believe that avocados were *actually* Green Gold. Land values were inflated and everything was rosy until the old laws of supply and demand began to function. Instead of an avocado *-mine*, the grove owner found he really had *just* an *orchard*. And it is well. "While the growing of avocados portends to be a very good business, no business can long exist with inflated concepts and values. Avocado growing must sooner or later be placed upon the same basis as all fruit growing. The only advantage it has is this: The avocado business is young and can profit by the mistakes of the older fruit industries if it will. The balance wheel has already begun to revolve. Essentials of quantity production and marketing are being studied more and more. The Aristocrat of Salad Fruits must, in time, be also well known as the shortening in the bread, the paste for the ice cream, the stock for the soup! May that time hasten, for then many of the present problems of growing, picking, packing and selling will be automatically solved; local association packing houses then will have been established in each district, picking will be done by expert crews; varieties will have become standardized. Then, in fact, will avocado growing have become an Industry.