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Avocado Tree Structuring

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Introduction

I have still not lost the sense of satisfaction when returning to the graft site to discover succulent shoots emerging from previously dormant scion buds. It wasn't so many years ago that any concern about my horticultural expertise stopped there. After all, I had successful graft take; I had skillfully performed my role as a grafter. The rest of the job was straightforward: stake and tie, or was it?

Two years ago, in an effort to standardize an experimental plot of grafted trees, it occurred to me that it might be desirable to train the new grafts to a single central leader (much as is done with grafted nursery trees). Beyond the technical problems of trying to get avocado to perform like its cousin, the apple, would the form of a central leader have any real advantages? And might any pruning to the young graft to promote a central dominance be harmful, retarding early graft development? By experimentation, I have concluded that pruning, if properly performed, will cause no significant reduction in early graft growth and that the training procedure has distinct advantages.

This article is limited to field-grafted trees; it represents the essence of a planned publication that will additionally address regrowth on stumped trees, newly planted nursery trees, pruning methods, and height-control principles. It is the intent of this article to expose tree structuring information to avocado growers. This information should be individually field tested to fully appraise the techniques and personal benefits.

Economics

One might question the economic benefits of pruning and training the avocado. Current avocado literature suggests minimum pruning; and few, if any, commercial growers have implemented the pruning teachings of Pehrson, Miller, Platt (see Literature Cited), and others. It is generally assumed that since the majority of avocado trees have not been "trained," the topic is basically a non-issue or of little value.

When one examines mature avocado groves, it is quickly evident that a branching problem exists. Typical avocado branching is irregular; often trees have extended low-lying limbs, and leaf canopy forms are variable and result in variable light penetration. Limb breakage is common, fruit losses considerable.

In contrast, a well developed central leader system results in lateral branches that generally exhibit very little bark creasing at the axillary point of attachment, resulting in significantly stronger crotches, reducing limb breakage. A central leader system creates

uniformly shaped trees, increasing the total per acre leaf canopy and production potential, and enhances protection from elements like heat and wind. The appropriate timing for training the central leader corresponds with normal cultural control of root suckers; and other than staking costs, materials and labor expenses are minimal.

Graft Care Options

After grafting, normal healthy scion shoots expand rapidly and should be staked to prevent them from breaking off or bending over. As an alternative to staking, some growers prefer to cut back the entire developing graft. This temporarily halts the vertical expansion of a few dominant leader branches and will force multiple secondary branching (see Figure 1), thereby making the graft more spreading. This practice of "heading-back" young grafts to eliminate the necessity of staking can have merit, especially where follow-up care may be less than ideal, although it does delay the graft somewhat. A more important question might be: How do the advantages of central leader training compare with *both* the heading-back method and the standard stake-and-tie procedure?

Fig. 1. Young graft headed back.

The Central Leader

When training a central leader, one dominant shoot must be selected from among the several that typically emerge from the successful graft. The shoot should be central, strong, upright, and not appear to have basal swelling or other problematic traits. Once this preferred shoot has been selected, pinch the terminal growth shoot tips of all the

other shoots using the thumb and index finger. This procedure can be done any time over a fairly long period during the initial graft development, but it is simplest and best when the shoots are less than approximately three inches long. At this time, only a very small portion of the terminal shoot needs to be removed (see Figure 2).

Fig. 2. New graft

Fig. 2. View 'A'

Unlike pruning, pinching terminals will not cause a reduction in graft growth if one dominant shoot is left to continue growing. However, the growth of the pinched shoots will be significantly reduced for about three to four weeks as the dominant shoot develops unrestricted. After the selected shoot establishes obvious dominance, the secondary shoots can generally be removed (see Figure 3). Pinching is technically easy and quick and can be successfully applied to all grafts. Occasionally a selected shoot will not respond as a good "leader." The graft may require a second pinching, or another shoot must be selected.

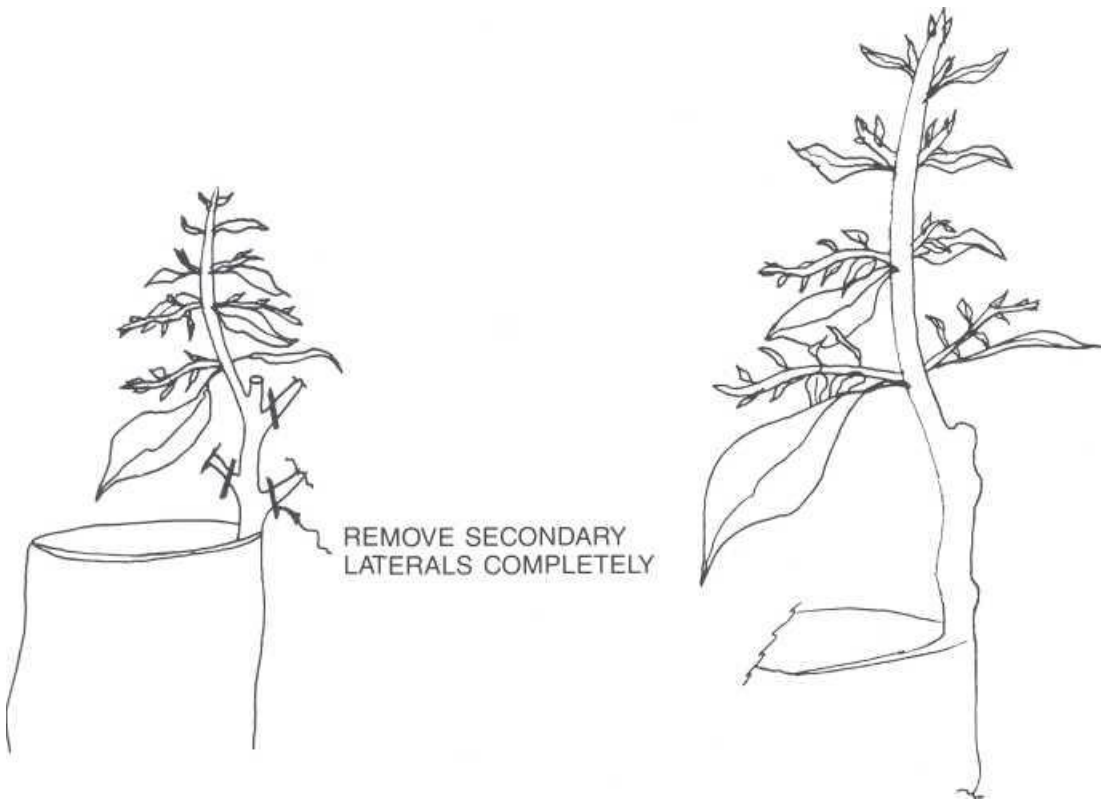

Fig. 3 & 4. Central leader 3-4 weeks after pinching.

The central leader training system can stand alone as a tree form suitable to growers who are not concerned about overall tree height, or who may be more interested in maximizing tree density with erect trees closely spaced. Other growers may desire less tree height and prefer to increase tree diameter, especially for cultivars that tend to be narrow and upright,; the central leader system works effectively here, also. At about a height of three to six feet, the dominant terminal portion can be pinched back similarly to previous pinching descriptions. This will slow the upright push and elongate *all* the laterals, as they compete for dominance. Thus, as a result of a relatively simple "heading" back, the entire tree form can be significantly altered (see Figure 4). One study where this height control technique has been applied appears to express the altered growth form as a possible production increase. It is early in the field study, and it would be premature to speculate on the benefits; but the fact that differences can be seen is very interesting and may prove to be economically beneficial. One additional requirement for maintaining proper tree form with the central leader system, especially with respect to the headed central leader, is the need to suppress lateral branches that will otherwise compete with the central leader for a share of the dominance. These laterals can be kept in control easily by bending them down physically with one or both hands. It requires a little experimentation, and the degree of bending will change somewhat throughout the growing season as the branches are either actively growing or dormant. The end result will be lower weeping form limbs (see Figure 5). Suppression of these lower limbs will prevent these branches from becoming major scaffold limbs later in the tree life and will result in a reduction of those troubling low-lying branches so typical of avocado.

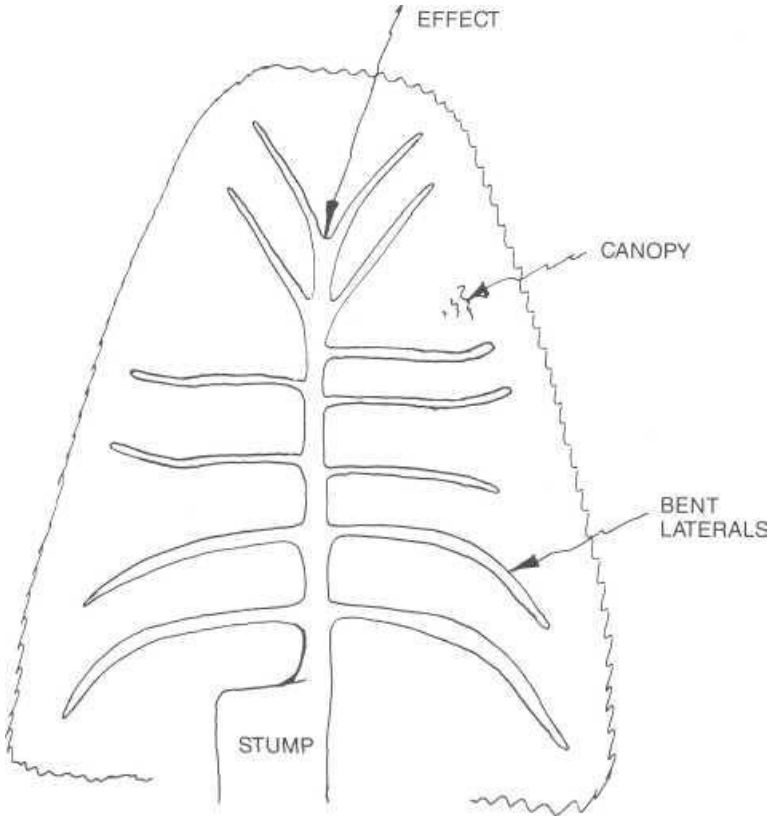

Fig. 5. Structured tree.

Conclusion

The philosophy behind developing a central leader avocado is to achieve greater control of tree form that will result in increased profits to the grower. A "disciplined" tree will result in greater grove uniformity and will contribute to increased light distribution to the tree canopy, resulting in increased production. Traditional pruning differs from initial tree structuring. Pruning for purposes other than tree structuring can play a part in achieving a degree of vegetative control, although this should be conducted independent of the preceding discussion on tree shaping.

The idea of managing the tree form may appeal to you, but it may appear to be after-the-fact information. Your trees may be nursery-grafted or may have been field-grafted many years ago, and thus appear unsuitable for training. The truth is, measures can be taken to improve after-the-fact tree forms not unlike techniques used to develop a central leader tree structure; but this subject, along with related matters, will have to be reserved for a later lengthy article.

References

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