

AN ALTERNATIVE TO THE METHOD PRESENTLY USED WHEN GRAFTING YOUNG AVOCADO TREES

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Abstract

This paper presents the results of cleft grafting young avocado trees, based on two years of work. Over one hundred seedlings were cleft grafted, together with 25,000 side-veneers during the 1972-73 winters to the 'Brooks Late' and 'Booth 7' varieties; ninety per cent being 'Brooks Late' and the remaining 'Booth 7'. The later were kept shaded, whereas the 'Brooks Late' were not. All of the 'Booth 7' thrived and made good healthy trees. The following winter more than 4,000 seedlings were cleft grafted to several of the commercial varieties, including the two already mentioned, all of which were kept under partial shade. Cleft grafting increased the number of trees a grafter can complete by at least 3 to 1 vs. the conventional methods.

Asexual propagation of desired avocado varieties is not new. The grafting of avocado trees has been practiced for the past seventy-six years (7). Yet, the methods used decades ago are those which prevail today; i.e. budding, side-veneer graft, and side graft—any of which takes a great deal of patience and skills. Budding, the same method used in citrus (7), is the least popular. Side-veneer and side graft are done in somewhat the same manner (5, 7). Side-veneer is by far the most desirable among the grafters and nurserymen in Florida, since it can be done at various growth stages of the rootstock. Whichever of the three mentioned methods is used, the actual grafting is but one step of the several that it takes to complete the grafting of a young avocado seedling.

The seedling is first grafted. Two weeks later the apical end of the rootstock is pinched to promote lateral growth. Once the graft has taken, the tape holding the scion and rootstock is cut; the rootstock is then cut diagonally above the graft and the cut treated with tree paint (7).

Seeking for a more efficient and economical method, a study of cleft grafting was performed (1, 2, 3, 5). Its method and results are below outlined in detail.

Materials and Methods

During the 1972-73 winter over 25,000 seedlings were side-veneer grafted at J. R. Brooks Nursery. An additional one hundred seedlings were cleft grafted to the 'Brooks Late' and 'Booth 7' varieties; 90% being 'Brooks Late' and the remainder 'Booth 7'. The following winter more than 4,000 seedlings were cleft grafted to several of the commercial varieties, including the above two. Simultaneously, more than 20,000

seedlings were side-veneer grafted to the same varieties.

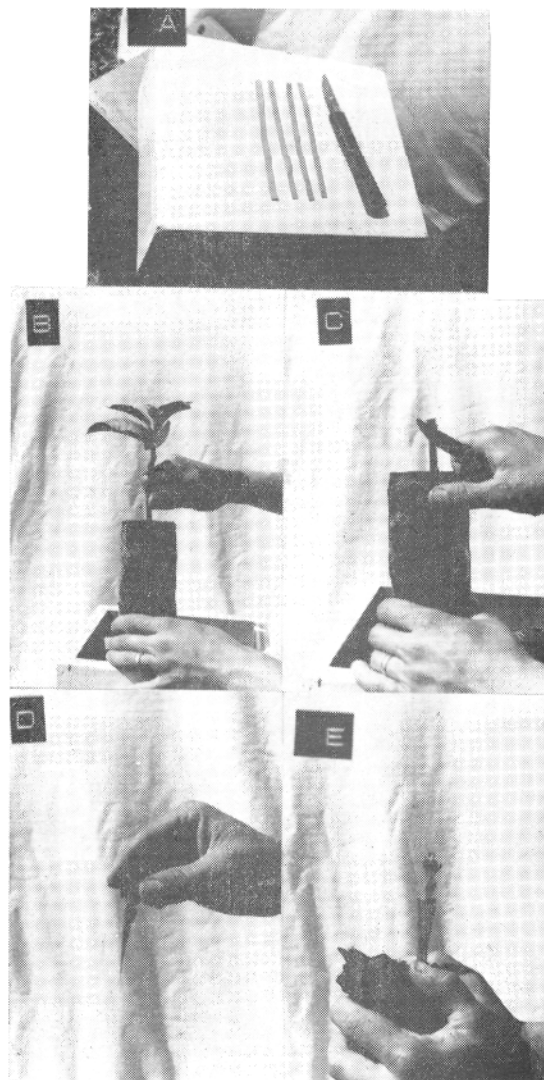


Fig. 1. A—Budding Rubbers and Knife; B—Seedling Being Topped; C—Topped Seedling Being Split; D—Cut Scion; E—Scion Inserted Into Seedling.

The seedlings grafted in the 1972-73 winter were grown in one gallon (3.8 liter) containers. They varied in height from 8-15 inches (20-30 cm) and had the approximate thickness of a pencil. The scions used for both methods came from the same trees and were about 3 inches (7.5 cm) long. The apical buds as well as three or four lateral buds were kept on these scions. The seedlings used for the first trial were cut to about 3½-4 inches (8.9-10.2 cm) from the soil line (Fig. 1B, 1C). Each of the rootstocks was cut lengthwise down its center, where a wedge-like-scion was inserted (Fig. 1C, 1D, 1E) (4). The scion and rootstock were bound together by means of rubber strips ¼x5 inches (.6x12.7 cm) (4) (Fig. 1A, 2). No care was taken to cover the entire cut on the rootstock when wrapping it.

In the first trial, the trees cleft grafted to the 'Booth 7' variety were kept under partial shade. The ones grafted to 'Brooks Late' were kept in full sunlight.

The procedure for the 1973-74 winters was slightly different. This time all of the seedlings were grown in 4.5x8x.001 inches (11.4x46x.003 cm) polyethylene bags (Fig. 3) (1). Both methods of grafting were carried on while the seedlings were in their purple or green stage vs. the hardwood stage. Their average size was about 6 inches (15.2 cm) tall, but with the same thickness as above. The 4,000 cleft grafted trees were kept under a 50% saran shade cloth (6). Once the apical bud had begun to swell, the trees were acclimated to sunlight, starting with three hours in the morning for three days. On the fourth day, sunlight exposure was increased to a half day. After the seventh day or soon thereafter, they were exposed to full sunlight and transplanted into 8x18x.004 inch (20x460.012 cm) polyethylene bags (Fig. 4) (1).

Results and Discussion

The percent take of the cleft grafted trees that were not shaded was disastrous; not quite 40%. Most of these trees were badly sunburned. In most instances the rubber strips used for wrapping deteriorated under full sunlight. This resulted in either desiccation of the scion or prevention of a callus formation (3, 6). The trees that were partially shaded thrived and made good, healthy trees. The wrappings did not deteriorate until long after the healing process had taken place.



Fig. 2. Rubber strip used for wrap.

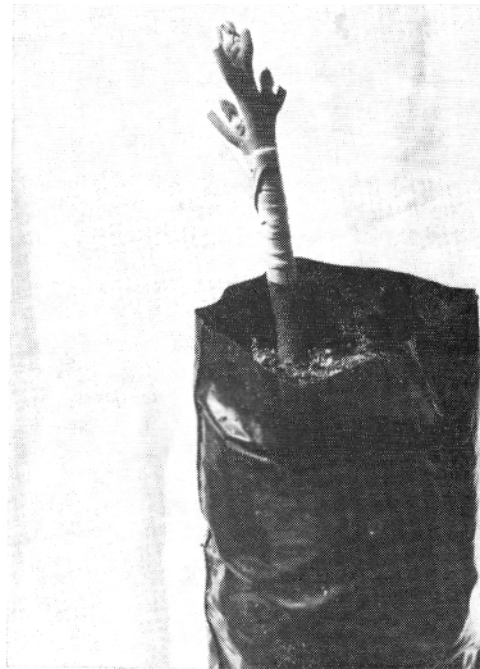


Fig. 3. Completed graft in polyethelene bag.



Fig. 4. One year old tree in large polyethylene bag.



Fig. 5. Insertion of scion yields a very strong tree requiring no special handling.

Throughout these trials, it was observed that an individual with little or no experience could cleft graft rather easily and that if a tree did not take, it could be regrafted below the original graft, leaving no scars on the rootstock. The insertion of the scion within the rootstock allows for a very strong tree that requires no special handling at the nursery (4) (Fig. 5). The eventual deterioration of the rubber strips and not having to cut and paint the rootstock reduced to one the number of steps needed to complete a tree. In short, cleft grafting increases the number of trees a grafter can complete by at least 3 to 1 vs the conventional methods (6).

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