

INCREASED PRODUCTION AND PROFITS BY TOPWORKING

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In avocado growing good production and profits go together. Without good production avocados can not be profitable. Poor producing healthy trees can be made productive by grafting (topworking) them to a variety which bears well in the local area.

In each of the avocado growing areas of California there is one or more varieties which produce larger, more profitable crops than all other varieties. In the more frost free areas of Los Angeles County such as La Habra Heights and the foothills around the San Gabriel Valley, Hass produces better than any other variety. Zutano appears to be the most consistent producing variety for areas in the county too cold for Hass. Most avocado trees in the county are of the Fuerte variety which only occasionally produces good crops.

In many areas of Los Angeles County topworking Fuerte trees to Hass does, after a few years, greatly increase production and growers' profits. To illustrate this, the average annual production of both Hass and Fuerte trees in each of four orchards located in La Habra Heights is shown below. Included in this comparison is the greater income per acre from Hass than from Fuerte when both varieties sell for the same price per pound and cost no more per acre to produce.

Two of these orchards show how Fuerte trees can be topworked to Hass which in a few years out-produce the original Fuerte trees and make more money for the avocado grower. In every orchard where the production of both varieties has been compared under reasonably similar conditions, Hass produced two to four times better than Fuerte. The average seasonal price per pound and grade of Hass from La Habra Heights have been equal or better than Fuerte. Heavy production plus high returns from fruit have made Hass so profitable in Los Angeles County that many growers have or are planning to topwork their trees to Hass.

PRODUCTION	Greater Annual Income per Acre from Hass than Fuerte					
	at 10¢ lb.	at 15¢ lb.				
ORCHARD NO. 1: 10 year average—Fuertes 24 years old Hass topworked 14 years ago <table border="1" style="margin-left: 40px;"> <tr><td>Fuertes</td><td>— 53 boxes</td></tr> <tr><td>Hass</td><td>— 197 boxes</td></tr> </table>	Fuertes	— 53 boxes	Hass	— 197 boxes	\$576	\$864
Fuertes	— 53 boxes					
Hass	— 197 boxes					
ORCHARD NO. 2: 4 year average—all trees 9 years old <table border="1" style="margin-left: 40px;"> <tr><td>Fuertes</td><td>— 76 boxes</td></tr> <tr><td>Hass</td><td>— 159 boxes</td></tr> </table>	Fuertes	— 76 boxes	Hass	— 159 boxes	\$332	\$498
Fuertes	— 76 boxes					
Hass	— 159 boxes					
ORCHARD NO. 3: 4 year average—Fuertes 18 years old Hass topworked 7 and 8 years ago <table border="1" style="margin-left: 40px;"> <tr><td>Fuertes</td><td>— 119 boxes</td></tr> <tr><td>Hass</td><td>— 151 boxes</td></tr> </table>	Fuertes	— 119 boxes	Hass	— 151 boxes	\$128	\$192
Fuertes	— 119 boxes					
Hass	— 151 boxes					
ORCHARD NO. 4: 4 year average—all trees planted 12 years ago <table border="1" style="margin-left: 40px;"> <tr><td>Fuertes</td><td>— 149 boxes</td></tr> <tr><td>Hass</td><td>— 295 boxes</td></tr> </table>	Fuertes	— 149 boxes	Hass	— 295 boxes	\$584	\$876
Fuertes	— 149 boxes					
Hass	— 295 boxes					

(A box is the standard 40 pound field box. In each orchard all trees are healthy, given good care, crowding is not a problem, and 85 trees constitute an acre.)

In other areas of Southern California many orchards of poor producing, healthy trees of Fuertes and other varieties can be topworked to Hass or any other variety satisfactory for the local area. In a few years these topworked orchards will be producing large, profitable crops.

EXPECTED PRODUCTION FROM HASS

If healthy trees are topworked and good cultural care is given these trees, the following *approximate annual production per acre* of 85 trees can generally be expected from Hass in the La Habra area:

- 2 to 3 years after topworking... 15 to 20 boxes, 40 lb. field boxes per acre (first crop)
- 5 years after topworking..... 60 to 100 boxes per acre
- 7 years after topworking..... 100 to 150 boxes per acre
- 10 to 20 years after topworking... 150 boxes or more per acre annually.

In years of large crops, 10 year old Hass trees will produce 300 boxes per acre.

HOW SHOULD TOPWORKING BE DONE?

Only healthy trees should be topworked. Diseased or weak trees can not be expected to grow well or produce satisfactory crops after top-working. Trees affected with root rot, sunblotch, severe iron chlorosis, or weak, stunted trees should never be topworked. Such poor trees are not likely to produce enough fruit after grafting to pay for the grafting and care given them.

Carefully examine the orchard for weak and diseased trees. These trees should be marked. If only a few exist, scattered throughout the orchard, they should be cut off even with the ground and left to die. In case there is a section in the orchard where most of the trees are diseased, that section should be marked so no topworking is done in that area.

Once all trees unsatisfactory for topworking are removed or conspicuously marked, the remaining trees can be cut back for topworking. Cutting back consists of cutting each tree to an upright stump about three to four feet tall. This can be done a few days to several weeks prior to grafting. At the time of grafting the commercial propagator ("grafter") will cut the stump to the right height.

The best season for grafting in La Habra Heights is February, March, April, and May. Commercial propagators should be contacted several months before grafting is desired. Many propagators have their time contracted many months in advance. Normally it is cheaper and more satisfactory to get a commercial propagator to do the work than for the grower to attempt to do his own grafting.

In Los Angeles County it has been found generally more profitable to topwork a crowded Fuerte orchard to Hass than to thin it. All healthy trees growing on the hillside soils of Los Angeles County can be top-worked if they are over 18 feet apart. If trees are closer than this they should be thinned before topworking starts.

It is not advisable to topwork alternate trees since the remaining trees left will grow together before the grafted trees become large enough to produce fruit. Also, it is difficult after grafting to cut out the remaining alternate trees without breaking the tops of newly grafted trees.

Since topworked trees use small quantities of water the first two years after topworking, they should not be topworked in the same rows where trees not grafted are located. It is not practical to supply different quantities of water to grafted and ungrafted trees on the same sprinkler line unless each sprinkler can be individually shut off. Therefore, the most practical system is to graft entire rows of trees served by one sprinkler line. In this manner it is convenient to withhold water from grafted trees until the soil in their root zone approaches dryness. Usually it is midsummer before the first irrigation needs to be given to newly grafted trees. Over irrigation at the time of grafting may set the stage for root rot development.

After the grafts have started to grow out of the paper covering placed around them, at the time of grafting, they should be tied to prevent breakage. To do this nail securely to the trunk of the tree a six to eight foot long grape stake, two by three, or two by four stake. This stake will serve as a support for tying the new top for the next three or four years. Tie all growing graft shoots to the stake the first year.

The following spring after grafting select the most vigorous and strongest shoot to be the framework for the new top. If it is growing un-branched, pinch out the center at about four feet above the ground. This will induce branching. Cut back all other shoots to a length of approximately two feet. These remaining shoots should be kept short but left to grow for another year. In case the main shoot chosen for the top breaks off one of the remaining shoots can be trained for the new top. Let suckers grow the first year as long as they do not outgrow the new top. It is important to grow leaves on the stump so carbohydrates may be manufactured to feed the roots. This is the reason for letting as much growth as possible develop the first year. Remove all suckers after the first year so the new top will soon develop maximum size early.

Inspect grafts weekly and keep them well tied to stakes. More good grafts are lost due to breakage than to any other cause.

COST

The actual grafting usually costs about three dollars per tree for a guaranteed job. In addition to this, cutting the tree down, cutting up the large wood and brush cost from three to six dollars per tree. This is assuming the use of a chain saw and leaving the brush lay in the orchard. The cost varies considerably depending on the size of tree and degree of fineness to which the brush and wood are cut. The stake needed for supporting the graft costs about fifty cents. This makes a total of about seven to ten dollars per tree or only about \$3.50 per tree if the grower buys the stake and hires only the grafting done.