

## What to Do With Tall, Crowding Trees In Orchards Previously Thinned

**H. Leonard Francis**

*Research Coordinator, California Avocado Society; and proprietor, L.F. Grove Management, Temecula, CA.*

Most California avocado growers have a problem. It is actually a problem of avocado growers around the world: The darned avocado trees just keep growing! All of us accept the fact that avocado orchard thinning, in one form or another, must be done. Eventually, half the trees will be removed, giving twice as much room for the remaining trees. Granted, in California this initial removal of every other tree might finally happen when the remaining trees are twenty years old. Usually, by the time the orchard thinning is completed (3 to 5 years), one-half to three-fourths of the trees are crowded again (*Figure 1*).



*Figure 1.  
Avocado  
orchard  
before  
“two  
branch”  
pruning.*

Most avocado" groves were planted on a 16-foot by 20-foot pattern, or some similar spacing. It is unusual to see an orchard planted since 1970 that was spaced more than 20' x 22'. The thinned 16' x 20' grove ends up with trees spaced at 32' x 25.5' when removal is on the diagonal, or 32' x 20' if removal is of alternate closest rows (*Figure 2*).

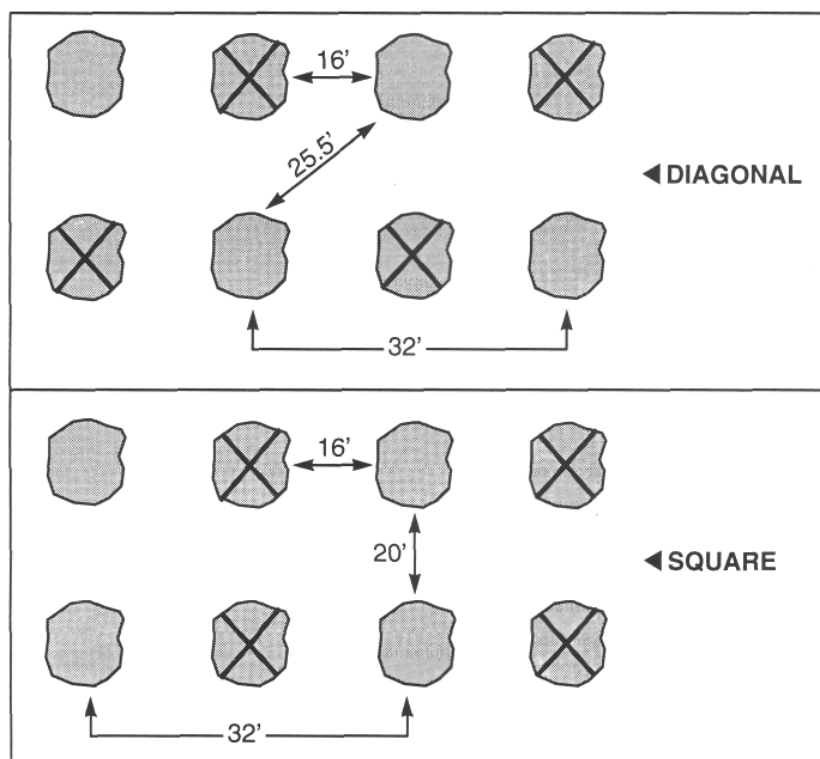


Figure 2.

As a University of California Farm Advisor in 1968, I had the experience of walking through a Fuerte grove on the San Joaquin Fruit & Investment Company grove in Irvine, California. The trees were spaced 44 feet by 50 feet, if I recall correctly. The grove had been thinned twice, with half the existing trees removed each time. This left only 20 trees per acre. The trees were huge. They were 30 feet tall and 35 feet wide, with sides all the way around, pruned only up two feet from the ground to allow good furrow irrigation. I saw an orchard with similar spacing and tree size in South Africa in 1992. These groves are the ultimate. The trees were not crowded, were never pruned, and were fruitful.

Today, land in California is not as available or as fertile. Growers want to get as much out of their land, and *each* of their trees, as possible. Once the initial orchard thinning has been accomplished by removal of half of the original trees, growers want to get the most from the remaining orchard without removing more trees. Pruning is the answer: *judicious pruning*.

If sixty trees per acre are left after the first thinning, it will take only three to five years before the trees are again crowding each other.

Typically today, growers either do nothing—letting the trees continue to crowd, lose their sides, and grow taller and taller; or they do major pruning, stag-horning their trees back to 8-10 feet tall, with branches only 3-4 feet long. The stag-horned trees are left to regrow, yielding virtually no fruit for two years, fruiting for three to four years, and then five or six years after the major pruning, becoming crowded again.

*These alternatives are not the answer.*

## Pruning Programs in Other Countries

In Israel, growers want to maintain their trees at 18-20 feet in height. They are using various methods of pruning to do so. One method is to hedge and top prune annually, just as we do with lemons (*Figure 3*).



*Figure 3. Second year of annual pruning - topping & sidewall. The trees were originally 25-30 feet tall. Len Francis and Cliff Lahav, Farm Advisor for Jordan Valley in Israel.*

This is a fairly new program for them. In effect, they are removing one year of tree growth to maintain tree size. These trees continue to fruit. Harvesting efficiency is their main reason for pruning. Most Israeli groves are 25-30 tall before the initial pruning. That first pruning can remove half of the foliage and severely reduce production. The major advantage of this practice is that it is mechanical, requiring low labor input (*Figure 4*).



*Figure 4. Orchard in Israel undergoes first severe hedging and topping to reduce tree size.*

Most other Israeli growers utilize selective hand pruning in their program to maintain tree size. Usually, only one-third to one-fourth of the grove is pruned each year. The Israeli, too, are new to the need to prune, and many of their groves are also tall and crowded—but they have started. Shorter trees are important to the Israelis because they do most of their own harvesting.

**In Australia**, grower Graham Anderson pruned 30-foot tall, 25-foot wide trees that had not yet lost their side branches. The grove had had the initial 50% tree removal thinning. His objective was to open the center of the trees by cutting out about half of the major branches—the tallest and longest branches—leaving the other branches untouched. The unpruned branches continued to bloom and fruit. One year after the pruning, some of the new interior branchlets had grown, and some had set fruit *Figure 5*).



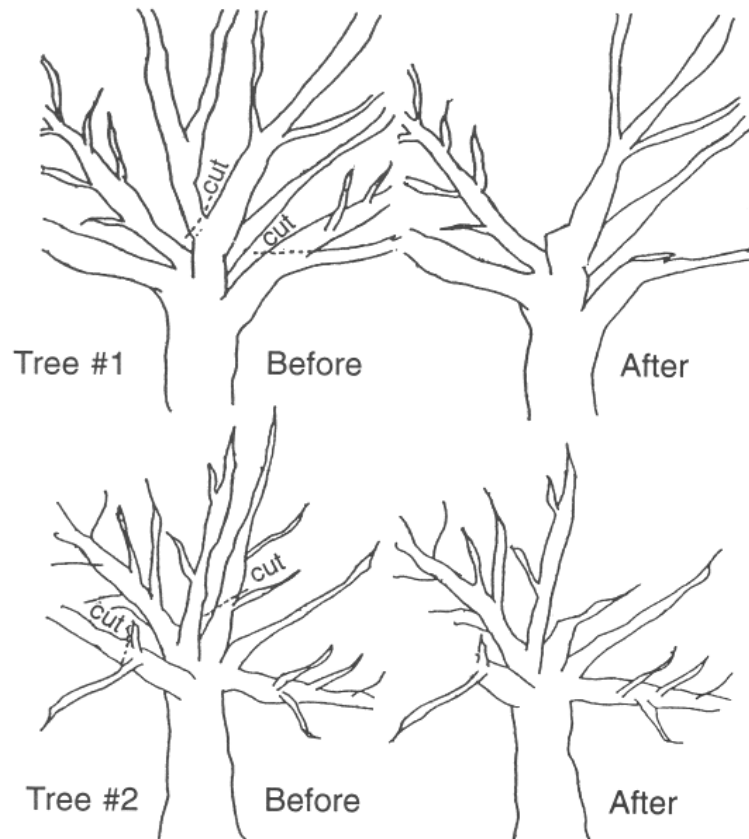
*Figure 5. Opening the interior of a 40 year old tree.*

## **My Program**

After seeing the various Israeli and Australian techniques, I devised and am using in my own company, a program that best fits California's crowded grove situation. Before trees lose all their side branches, two to three years after the first orchard thinning has been done, start an *annual* selective pruning program. The program is to prune only two branches per tree each year: the tallest branch and the most lateral branch. In three years, this program will establish and maintain tree height and width.

*Figure 6* illustrates the first pruning. In the next year, the next tallest and most lateral branches will be pruned. Always cut back to a secondary branch, or remove the pruned branch completely, trying not to leave a stub. After a maximum of three years, cutting

two branches each year, the trees will be at or near optimum height and width, and fruiting will have occurred each year.



*Figure 6.*

Continue the pruning of only two major branches a year, and it will not be necessary to perform massive pruning or further tree removal. Just one of the benefits will be more interior fruit.

There is pruning equipment available that allows this program to be used on hillside groves. The most basic is a rip-cut hand saw and a ladder. Hand pole saws work, but require a lot of effort. My company has used two different pole chainsaws. Each of these chainsaws allows an operator on the ground to prune branches at 13-17 feet. Both are operated by just one person who carries the complete unit on his back, or to his side. One unit costs around \$800; the other costs \$2,200.