# EVALUATION OF AN AVOCADO ORCHARD THINNING PROGRAM

H. Leonard Francis
University of California Farm Advisor for Orange County.

An orchard thinning program can increase production and returns to the avocado grower. Trees of an avocado orchard that become so large they shade the sunlight from the skirts of surrounding trees will force all leaf and fruit area into the tops of those trees. An orchard thinning program is necessary under these conditions.

CHART 1   RESULTS OF A THINNED FUERTE AVOCADO ORCHARD IN SAN DIEGO COUNTY
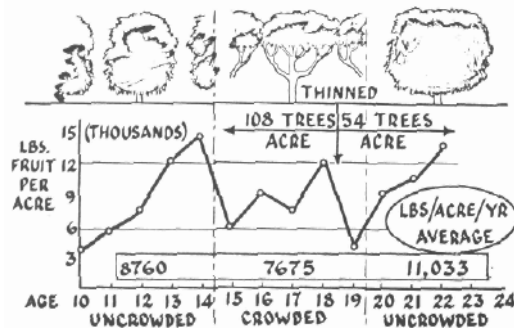
The reasoning is logical. Fruit of the avocado are borne only in foliage areas of the tree. When the skirt area is lost, a notable reduction in fruit production will result. Chart 1 illustrates the results from an orchard that experienced a crowded condition and underwent a tree removal program. The orchard is located in San Diego County and the trees are Fuerte avocados. Notice how production continued to increase until the trees started to crowd. Only moderate production was obtained under the crowded condition. Of equal importance is the fact that picking becomes much more difficult and costly when fruit is only in the tops of the trees.

When the orchard was thinned by 50%, production naturally decreased. Theoretically it should have reduced production only 50%, but this was an off-year for the entire avocado industry, as a result of the on-crop of the eighteenth year, and presented an even poorer showing for the thinned grove than mathematically projected.

Observe, however, how production per acre increased all the way back up to the original maximum before crowding.

Why should 54 trees per acre produce more than a crowded condition of 108 trees per acre? Total fruiting surface is what has to be considered, not number of trees. One acre of avocados having a complete canopy of foliage in the tops and no skirt foliage will mathematically have only 43,560 square feet of fruiting surface. If we concede that at

least one side of the acre is open due to a road or whatever, we can add 5225 square feet for a wall of fruiting surface twenty-five feet tall, a total of 48,785 square feet of fruiting surface per acre for a crowded grove.

CHART 2   REMOVAL OF EVERY OTHER TREE ON A DIAGONAL
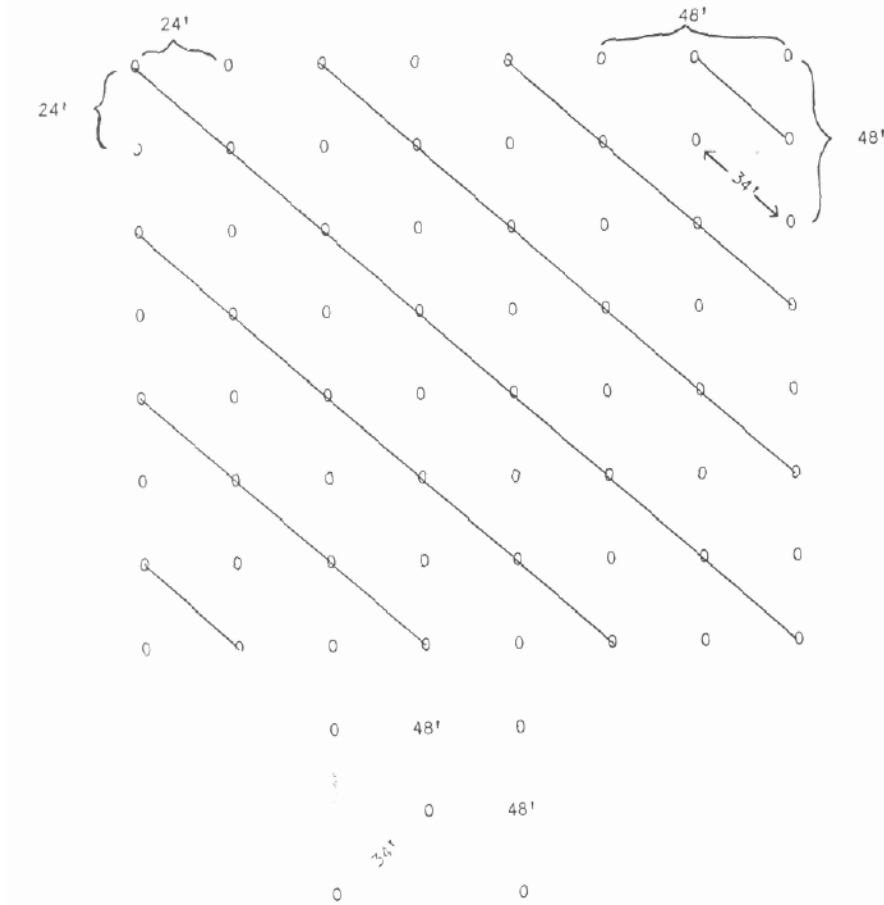
A typical tree spacing of many avocado groves in California is 24' x 24' for 80 trees per acre. A removal program of every other tree on a diagonal would result in a 48' x 48' diamond pattern with a tree in the middle, 34 feet from the surrounding trees (illustrated in Chart 2). This would leave forty trees per acre and an uncrowded condition that would allow regrowth of skirt foliage and fruiting surface.

An assumed size for the remaining trees will he 25 feet tall and 30 feet wide (these are real figures for a grove in Orange County). Using the formulas for determining the area of a cylinder and a circle, the figure of 3061 square feet per tree is derived. This figure represents the possible fruiting surface of the tree. Forty trees per acre times 3061 square feet equals 122,440 square feet of fruiting surface per acre. This compares with 48,785 square feet per acre of a crowded grove, a 250% increase.

As illustrated in the production chart, it takes at least two years for a thinned orchard to

reach the average production obtained before thinning, and three years before it surpasses that figure. The per acre average for each condition interval reveals much higher production for the uncrowded, thinned period than for the other conditions.

If the groves are to be removed within four years after the thinning operation, this program would not be economical due to expense of removal and reduction in production for two years. Any grove with a life expectancy of over four years, however, should benefit from tree removal if it is suffering due to overcrowding conditions.