

## PRODUCING CHRISTMAS TREES FROM ROOTED CUTTINGS

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*Highland Holiday Trees  
Highland, California*

Highland Holiday Trees is a choose-and-cut Christmas tree plantation in the Highland area of San Bernardino County. There are spaces for about 12,000 trees on approximately 10 acres of land, including parking lots and service roads. The first Monterey pines (*Pinus radiata*) were planted in 1966. The plantation was enlarged as air pollution made the citrus business progressively poorer.

The original plantings were made with seedlings, most of them obtained from the California Division of Forestry Nursery. As many of the replacements as possible are from rooted cuttings from selected trees. These selected trees are called "Mama Trees", as this term is more meaningful to customers at sales time than "seed trees," or "clone trees". Overhead for taxes and interest on investment is over \$700 per acre per year. This makes it imperative that every tree space be kept filled with a tree that will sell in three or four years. The high culling rate necessary with seedlings does not make this possible.

Two Mama Trees have now been selected from over 30,000 seedlings. Over 200 different trees were tested in the propagation beds for rooting ability. The first criteria for selection is vigor. If the seedling is not a fast grower, its progeny won't be. Cuttings from a potential Mama Tree must root at least 50 percent, and up to 80 percent under ideal conditions. Rooted cuttings must not show damage from air pollution until they are at least five years of age. The trees must have good color and needle density. Trees are preferred that have upright growth habits and that branch or bifurcate frequently. The tree must have apical dominance. Severe, hot, dry winds in our area during the late fall make it essential that the tree be resistant to twisting. Over the years, two different "gene banks" have been established where tagged rooted cuttings from the best Mama Trees are grown. Their development into saleable Christmas trees can be evaluated.

Propagation beds are filled only once a year, in January, because that is when the propagating wood and the weather are best. The beds have about five inches of sand and vermiculite over fiberglass screen and heating cables. The beds are open at the top for ventilation, and the mist is on for two seconds every 2½ or five minutes, depending upon the weather.

The branches for the cuttings are kept damp and cool until they are processed. The preferred cutting wood is about the size of

a pencil and showing quite a little brown color. The cuttings are from three to six inches long, depending upon the wood. Large cuttings are preferred as they soon develop into large vigorous plants. Needles are stripped from the lower 1½ inches, and old cuts are recut before dipping in 4000 ppm IBA solution.

Cuttings with the terminal buds are preferred because: they continue to grow while in the propagation bed; they get off to a very fast start; and they require a minimum of hand pruning to develop a single leader. Cuttings with side branches or buds also get a fast start, but they require more hand work to develop the single leader. Other cuttings will root just as well but are much slower developing as the buds must break. This may take from two to three months. They will also require hand pruning to develop the single leader.

Cuttings are normally lifted in 90 to 100 days. They are root-pruned and planted in a sandy planting mix in quart cans. After hardening off, they are held for three or four months before transplanting into gallon containers. The largest of these will go into the field as replacements after Christmas sales, and the smaller ones will later be transplanted into containers 16 inches tall for planting the following year.

These procedures have worked well at Highland Holiday Trees. Culling has been reduced from about 20 percent for yearling seedlings to almost nothing for the rooted cuttings. Although air pollution is increasing, loss of trees due to air pollution damage is much less due to the high percentage of trees being propagated from trees resistant to air pollution. Less time is spent trying to salvage trees that lack apical dominance because cuttings are not taken from that type of tree. Rooting procedures favor large cuttings, a fast-draining rooting medium, frequent mist, good air movement, and bottom heat.

MODERATOR MAIRE: Many thanks, Fred, for you and Mae being here with such a fine presentation. Following Fred's work and the work he did over a number of years in selecting these trees and finding certain ones that looked much better and selecting those that seemed to root, as well as other qualifications, the problem came up now — how can this be done on a commercial basis in the commercial nurseries. So we solicited the cooperation of a couple of our Los Angeles area nurseries and asked them if they would please cooperate with us. Dick Puffer, who has been a Christmas tree farm advisor, is now in San Bernardino County and has worked with Fred very closely; he has worked with me also and the two of us have worked on the commercial application of propagation of these Monterey trees that Fred had selected. So Dick is going to present the information that we had on the results of commercial application. Dick Puffer, Farm Advisor in San Bernardino County.