

Research News...

Basal Pruning Fraser Fir

Dr. Eric Hinesley,
Dept. of Horticultural Science, NCSU

(Editor's Note: Dr. Hinesley will be speaking on this topic at the NCCTA Winter Meeting, February 25-26, 1994)

Several years ago, I began experiments to determine the cause of trunk splitting in Fraser fir Christmas trees. One question that arose from that research was as follows: would pruning branches from the lower trunk early in the rotation cause trees to produce trunks

Mention of trade names is neither an endorsement by the author, the N.C. Agricultural Research Service, or the North Carolinian Christmas Tree Association nor criticism of similar products not named.

with smaller diameter? This would presumably decrease the incidence of splitting, which is usually worse on larger trunks. I also did not know the effect of basal pruning on tree growth and quality.

In 1991, a replicated experiment was established in more than a dozen Fraser fir plantations, ranging in size from 2-3 ft. up to 5-6 ft. Trees were selected for uniformity in each plantation so that

they were all in the appropriate height class when the experiment first began. Half the trees were basal pruned (6-10" handle); the others were not pruned. Pruning was done with #2 Felco clippers and a Felco folding saw with a 6" blade. The time required to prune each plot was recorded, and the weight of branches cut from the bottom of trees in each plot was also measured.

The general protocol of this experiment is to harvest trees at an average sheared height of 7-8 ft. Harvesting began in December 1993, and will continue for 3-4 years as the smaller age classes reach 7-8 ft.

In November 1993, trees scheduled for harvest (four plantations that had been 5-6 ft. tall 2 years earlier) were graded by David Masee (NCDA), and rated for uniformity of the crown base. Trees were harvested in December 1993, and the time required to cut each plot was noted. Each tree was weighed, and measured for height and trunk diameter. Baling time was recorded for each tree.

The following summary provides a general picture. Remember: these results are for trees pruned 2 years before harvest.

1. Over all size classes, pruning time increased in a straight line from 29 seconds per tree in the 2-3 ft. class to 71 seconds per tree in 5-6 ft. trees. This can vary a lot, depending on people, fatigue, equipment used, etc.
2. Weight of branches cut from the handle increased in a straight line from 0.5 lbs. per tree in the 2-3 ft. class to 4.3 lbs. per tree in the 5-6 ft. class.
3. Basal pruning had no effect on height.
4. Basal pruning reduced cutting time 15% to 32% (average of 23%). The reduction was statistically significant in three of the four plantations.
5. Basal pruning reduced baling time 7% to 17% (average of 13%). This difference was significant in two of the four locations. Pruned trees were easier to push into the baler cone, and were also a little easier to grasp. **Note:** if the metal jaws on the baler cable or chain are dull, they will frequently slip off the trunk, and greatly increase baling time. Sharp jaws with proper taper cut into the trunk are less likely to slip.
6. Basal pruning had no effect on trunk diameter.

...continued on page 7

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Research News...

continued from page 6...

7. Average fresh weight was 44-55 lbs. Basal pruning reduced harvest weight 1%-14% (average = 8%). The difference was significant only in one of the four plantations. At most locations, the average difference in harvest fresh weight was about equal to the weight of branches removed from the tree 2 years earlier.
8. Basal pruning had no effect on the grouping of trees into USDA grades, or the quality of the base of the crown. Pruning 2 years before harvest allows ample time to even out any roughness in the base of the crown that arises from basal pruning.

We can conclude from these results that pruning 2 years before harvest does not affect growth during the last 2 years of the rotation. Pruning when trees are too small might result in stunting. However, 3-4 more years will be required in this experiment to determine the effect of basal pruning on Fraser fir of all ages.

Acknowledgments: Thanks to all Christmas tree growers who have kindly permitted this research in their plantations. Trees harvested in 1993 were grown by Sam Church, Kermit Johnson, Bruner Sides and Homer Sides. Special thanks to Jerry Washington (Alleghany Co.), and to the growers who provided labor and equipment for baling.

Figure 1. Fraser fir that was basal pruned 2 years before harvest. The trunk is well shaped without excessive taper or large bulges near the base. This handle is easy to grasp with a baler, and fits easily in a stand. Basal pruning 2 years before harvest had no significant effect on trunk diameter, and many trees still had noticeable knots and bulges where branches had grown.



Figure 2. Fraser fir that was not basal pruned during the rotation. Branches were removed just before harvest to illustrate the swelling and bulges that often develop around the base of branches near the groundline. This particular tree represents an extreme case, but is a good illustration of the problem. Pruning the handle early in the rotation reduces this type of swelling and deformation. An alternative is to cut the tree above the swelling, but this takes several inches off the merchantable height.



Figure 3. Fraser fir not basal pruned during the rotation. This increases cutting time, increases baling time, and makes the tree more difficult to put in a stand. Many of these branches also break when the tree is pulled through the baler.

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