

# Second Year Shearing on Freeze Damaged Fraser Fir

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Fraser fir Christmas trees damaged by the 2002 freeze will need special care in pruning and shearing this year if they are to be rehabilitated. The kinds of corrective pruning that were necessary last year, such as the removal of multiple tops and horns, will be magnified as the entire tree responds to last year's injury in this year's growth. As I write this, buds are elongating. Many more than usual are vertically-oriented and are destined to produce a horn that will need to be removed. In addition, budset in many areas is so heavy that the resulting growth will produce a "witches broom" that will either need to be pruned back to a few shoots or be removed completely. In most cases, growers will contend with too much growth as opposed to last year's problem of too little.

**Selecting the Top:** At this time, most freeze-damaged trees appear to have buds that will make a new top. However, those terminals that were severely damaged last year may be so weak that any shoots emerging from them will also be stunted. A basal shoot or central shoot off of a lateral branch might produce a more reliable terminal under such conditions. Follow the vigor in the tree as much as possible. As in any tree, where there are choices among shoots, select a top that has good vertical orientation, height, and budset along its entire length. The best top is not necessarily the highest shoot. Take time for careful examination. By the end of June buds can be seen or at least felt if lightly grasped by the hand. Select a terminal bud at about the right height only if the shoot has straightened adequately. If the top still needs to straighten, leaving the natural bud on it until mid-to-late August will aid that process.

The rule-of-thumb has always been that once you select the best top, all other terminal shoots should be removed. This usually hasn't taken long since most pruned Frasers only put up about three tops on the average. This year could be different. Looking at bud angle and size, my fear is that many lateral branches on freeze-damaged trees will turn up as multiple tops or horns. If you lose too many laterals as horns that have to be cut out, it could leave the top too open. It would be better to pick a lower shoot on last year's terminal to avoid leaving a gap.

**Top to Lateral Branch Ratio:** Many freeze-damaged trees entered 2003 with a short, damaged top and heavy "shoulders" in the top whorl of lateral branches. The ideal 2 : 1 balance between top and laterals was shifted in these trees from the termi-

nals to the branches. Tops on such trees continue to lose their natural dominance. Horns proliferate around the base of the terminal and on lateral branches. The central leader weakens further and may even die back. With freeze-damage, a short top may be unavoidable, but then you should trim the laterals accordingly. Try to approach the 2 : 1 top-to-branch ratio even on damaged trees.

However, remember that cutting the top and lateral branches sets the shearing cone for the entire tree. Short tops and short laterals are followed by hard shearing that can remove an excessive amount of growth. Do not cut so deep into a tree that it becomes a salvage cut into old wood or leaves most foliage with few remaining buds. Hard cuts this year will often produce horns the following year. A little imagination regarding the ability of a terminal shoot to catch

up to normal-length lateral branches can be important to preserving next year's potential for growth. Sound pruning and shearing is an important part of rehabilitation of such trees, but working with the natural vigor of the tree is equally so.

**Corrective Pruning:** A well-shaped Fraser fir has a simple symmetry with branches radiating out horizontally from the trunk with only little shoots

growing vertically from the dense branches. Many freeze-damaged trees have over-compensated for the loss of dominant shoots in the top of the tree and on the end of every branch. Shoots that should have grown horizontally have become vertical horns or strong diagonal cross-overs. Where three shoots should have existed more than a half-dozen developed. Ideally, all of this abnormal growth should be cut out. Realistically, dominant horns, cross-overs, or witches brooms need to be removed. The most vigorous growth will occur

in the top third of the tree requiring the greatest attention, but horns may show up all the way down to the bottom whorl in freeze-damaged trees. Cutting them out this year could prevent a hole developing in the normal foliage behind them next year.

Field conditions are seldom as simple as a recommendation on paper. While cutting out abnormal growth is appropriate, the assumption is that "normal" growth is present to fill the gap. This may not be true on the worst-damaged

trees. For instance, a horn might cover a bare side of a trunk that has no shoots or developing buds to fill it in. Rather than cutting the horn out completely, it could be cut back to a whorl of lateral

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*Excessive verticle growth in the form of multiple tops and horns.*

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branches that can fill the bare spot. Similarly, if the only growth to come out on a branch is a witches broom, thinning would be more appropriate than complete removal.

**Timing:** Last year, early pruning yielded no great advantage because shoots took longer to commit to their new relative position on the tree (such as a lateral shoot turning up to replace a freeze-killed terminal) and early pruning was likely to be too severe. In a Mitchell County timing study, tree response was often other than what was expected such that much of the early pruning was bypassed by vigorous growth lower on the tree.

However, 2003 will be characterized by an excess rather than a deficiency of growth. Barring a 2003 climatic event, I believe early pruning could help some freeze-damaged trees grow better this year. Early pruning has the advantage of being done on tender growth that can be rolled out with fingers and thumb. Since the focus will be on removal of entire shoots where density is too great, the work could begin shortly after budbreak is complete in late May or early June.

Where trees have witches brooms or excessively dense branching, these areas could be thinned by hand. More nutrients and water would then be committed to remaining shoots to yield more normal (less stunted) growth. Where trees have produced an excessive number of horns, their early removal will shift resources to horizontally-oriented growth on branches and to selected leaders where they occur on the terminal.

Early work should be focused on these problems of vigor in the wrong place or direction and not on regular pruning and shearing.

When immature shoots are pruned, a depth of cut takes more potential growth than if the shoot were allowed to approach maturity in late June or early July. To prune tops and laterals and to shear the sides of Fraser fir, wait until new growth is at least 75 to 80% of the length of last year's foliage. Foliage should be stiff enough to exhibit a clean perpendicular cut from the knife. Thus, working freeze-damaged trees will likely require more than one trip to the field to maximize potential gain to each tree.

**In Conclusion:** While many of us know a little more about rehabilitating freeze-damaged trees than we did a year ago, the second year is very different from the first year after a freeze. Much of what I presented here is based on observation of budset and bud angle on damaged trees over the past year and this spring. We enter the 2003 shearing season together, hopefully with fewer surprises ahead of us than last year. I will be working with county agents in freeze-damaged trees on three studies that we initiated last year as well as studies that will be established to address second season issues. I look forward to continuing the discussion on rehabilitating freeze-damaged trees with you at county shearing workshops this summer.



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