



SILVICULTURE FIELD TIP

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Field Tip No. 10

January 1998

White Pine: How to Prune for Blister Rust

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White pine blister rust is a fungal disease of white pine. Live needles are the first to be infected; then the fungus grows into the twig and towards the stem of the tree. A blister rust canker is the result of an infection that has been growing under the bark of a branch or stem for several years and is cutting off the supply of food and water to parts beyond the infection. White pine blister rust causes branch death, stem cankers, and topkill and can be fatal. This disease becomes more common and more serious as you go north and east in Minnesota, but blister rust can occur anywhere in the state where late summer weather is cool and moist.

Pruning is one of the most effective ways to reduce blister rust infections and tree mortality. Pruning is beneficial on any size tree. However, it is most beneficial when started on young trees and continued until all the branches on at least the lower nine feet of the stem have been removed. Most blister rust infections occur within nine feet of the ground because cool, moist conditions favor infection. Pruning removes the lower branches that are most likely to become infected and also removes branch infections that already exist. Here is how to prune your white pines:

When

- Branches can be pruned almost anytime of year. The best time to prune live branches is during the fall and winter when the tree is dormant. Spring is the only time trees should **not** be pruned when the bark is easily damaged and the shoots are expanding.
- Begin pruning the lowest branches off the trees when they are four or five years old and two feet or more tall.

General pruning tips

- You don't have to prune every tree on your site—prune only the best ones.
- Don't remove too much crown. Leave $\frac{1}{2}$ to $\frac{2}{3}$ of the live crown. See Figure 1.
- Do not flush cut the branches. Do not leave long stubs, either. Pruning cuts should be made just outside the branch collar. Use "natural target" pruning methods. See Figure 2.
- Pruning shears work best on branches up to the thickness of your thumb. Larger branches require lopping shears or a sharp pruning saw. Shears should have bi-pass blades (like scissors) rather than the anvil type. The anvil type crushes tissue rather than leaving a clean cut.
- Do not use chain saws, Sandviks, hatchets, bow saws or clubs; this is delicate surgery.
- Do not paint or treat the pruning cuts.

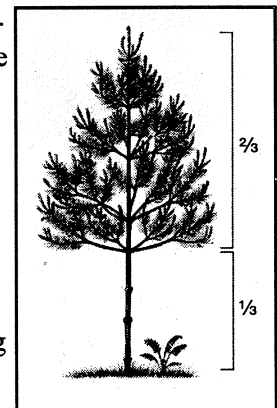


Figure 1. Leave $\frac{2}{3}$ live crown.

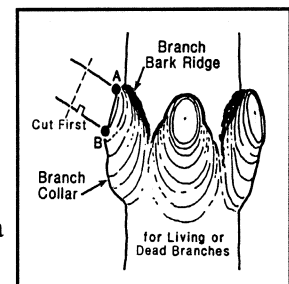


Figure 2. Natural target pruning. Make cut on line A-B.

Pruning to prevent blister rust infections

- Be sure to find and prune off the lowest branches. These often lay on the ground and are hidden in the grass or snow. See Figure 3.



Figure 3. Pruning branch nearest to the ground.

- Pruning should continue to a minimum height of nine feet but you may want to continue up to seventeen feet. Caution: leave $\frac{1}{2}$ to $\frac{2}{3}$ of the tree height with live branches in the upper crown.
- Frequent pruning is most effective because there's a greater chance of removing infections before they reach the main stem. Also, smaller branches are easier to prune.

Pruning already infected branches or leaders

- Pruned branches can be left on site. They won't spread the infection.
- Pruning tools do not have to be sanitized between pruning cuts. Unlike some other fungal diseases, blister rust is not carried from tree to tree on pruning tools.
- Prune off any branches higher up in the tree that show blister rust infections.
- Trees with blister rust cankers on the main stem or on a branch but within four inches of the main stem cannot be saved. See Figure 4. Do not waste your time pruning these trees. An infected tree can not infect other trees. White pines are infected by spores produced on *Ribes* species (gooseberries and currants), not on other white pines.



Figure 4. Infected branch too late to prune.

Pruning will NOT save every tree from blister rust

Some pruned trees will still be killed or topkilled by blister rust because:

- Any live needle can become infected and since the terminal leader has needles on it, the stem can be directly infected through one of these needles.
- An infection can take years to become recognizable, so the stem could already be infected but not recognized as infected at the time of pruning.
- If the leading edge of a branch canker is four inches or less from the stem, the stem is already infected even though you cut the branch off.
- In the northern and eastern parts of the state, the weather is cool and moist enough to allow infections to occur in the crown of even the tallest trees. Even here most of the infections occur within nine feet of the ground. So while pruning is an effective way to reduce blister rust infections on trees, it is not a guarantee that infection and mortality will not occur.