



How to Correctly Prune a Tree



Figure 1. A photograph showing the branch bark ridge (A) and the branch collar (B) on a red maple. (photograph by Thomas Kowalsick)

Correct pruning of trees is a valuable maintenance tool and can help a tree stay healthy. Improper pruning can cause damage that will last for the life of the tree, or worse, shorten the tree's life. Trees that receive the appropriate pruning measures while they are young will require little corrective pruning when they mature. In most cases, mature trees are pruned as a corrective or preventive measure. Routine thinning of a mature tree does not necessarily improve the health of the tree.

The research of Dr. Alex Shigo, Chief Scientist with the USDA Forest Service has provided us with the modern day procedures used in pruning trees. He showed us how trees respond to wounds including pruning cuts. He identified how certain branch tissues develop strong protective zones for preventing decay from entering the trunk. Proper pruning cuts will not destroy these protective zones but instead allow a tree to close over the cut area with minimal internal damage.

Making Pruning Cuts: Understanding how a tree grows is helpful to know how to remove a living or dead branch properly. As a tree grows it sets buds at the end of the growing season, which will become the new growing points for the next growing season. Although the buds are set in various positions one of these usually assumes the dominant role. The others are then subdominant. The dominant bud will form the "leader" and the subdominant buds will become the "branches".

As the dominant and subdominant shoots grow, they separate themselves internally, with a hard woody tissue. This tissue will become obvious externally in the bark as a slightly raised ridge, referred to as the branch bark ridge (BBR) (*See Figure 1*).

The **BBR** is the tissue, which separates the branch from the main stem. Familiarize yourself with the **BBR** since this is one of your guides to proper pruning.

As you look at figure 1 you will also notice the branch collar (BC). Branch diameter decreases the further you move from the branch base. The tree will therefore form a protective layer in the wood around the base of the branch. This protective tissue is called the **BC**, your second guide to proper pruning.

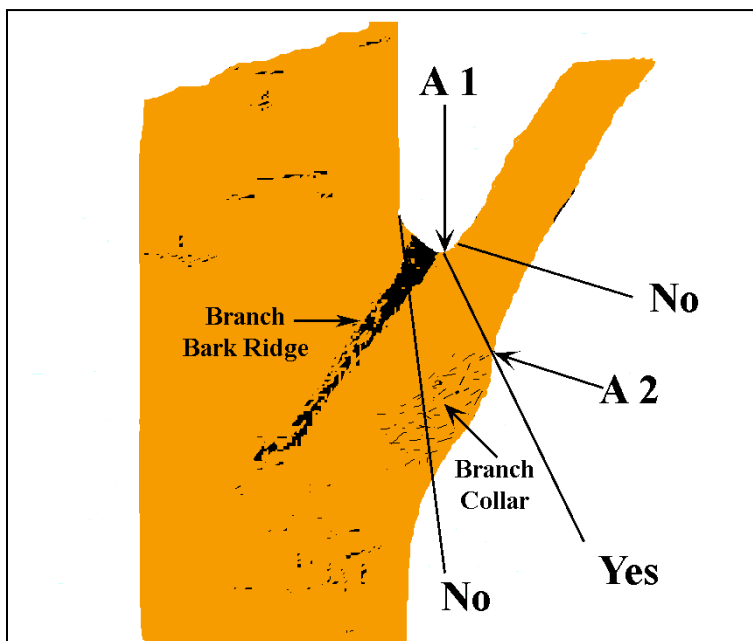
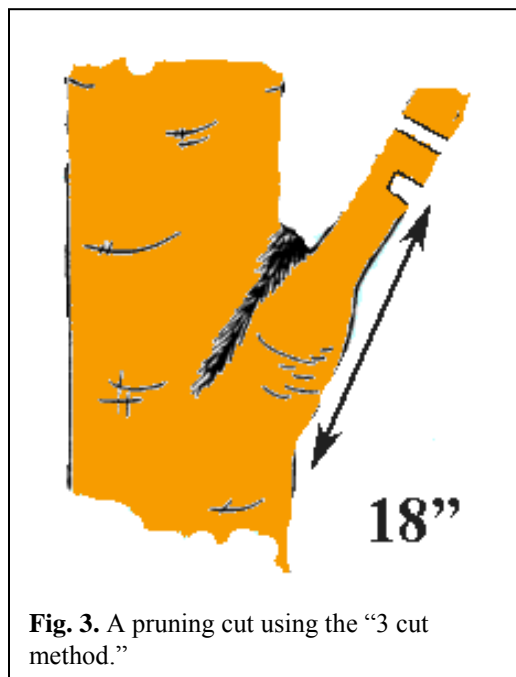


Figure 2. A correct pruning cut – Start at A1 and cut down to A2 (the line indicated by "Yes." Note that this cut does not injure the Branch Bark Ridge or the Branch Collar.

Now refer to **Figure 2** and you will notice that the correct removal of a living branch does not injure the **BBR** or the **BC**. To remove a living branch you should place your shears or saw in front of the **BBR** at point A1 and cut downward and slightly outward to point A2, avoiding injury to the **BC**. Do not leave a stub.

DO NOT MAKE A FLUSH CUT! A cut behind the **BBR** which would be referred to as a “flush cut” will not only injure the main stem, but it will also remove the internal chemical protective layer. When you remove this protective layer by a cut flush with the stem, tree-inhabiting microorganisms (which cause decay) have easy access to the wood above and below the branch. Besides decay harsh cuts can cause internal cracks. These cracks may split outward later in the life of the tree. They are often referred to as frost cracks.

Removing a dead branch from a tree is accomplished in the same manner.



If the branch to be removed is large it may be helpful to eliminate the outer portions first using a “3 cut method”. Refer to **Figure 3**. First, measure approximately 18 inches from the main stem. Then make a cut to the underside of the branch at this point cutting through to approximately 1/3 of the branch diameter at the point of this cut. Now measure several inches beyond this undercut. Next, starting from the top of this branch make a cut that goes completely through the branch at this point. By cutting in this manner you avoid the possibility of the branch snapping and causing the bark to tear from the main stem. Now you can make your final cut as instructed earlier avoiding damage to the **BBR** and the **BC**.

When to Prune: Defective and/or hazardous branches should be removed immediately when discovered. Remedial pruning to remove broken, dead, or diseased branches can be done at any time of year with little negative effect on the plant.

Woody plants do not “heal” in the same way that animals do. Externally, they produce rolls of wound wood over the wound or cut; internally, they compartmentalize or wall off the damaged tissue from the healthy wood. These responses to wounding take place most rapidly just prior to the onset of growth in spring (March-April) or just after the maximum leaf expansion in mid- June.

Plants are stimulated to produce large quantities of unwanted suckers to a much greater degree by winter or early spring pruning than by late spring or summer pruning. Thus, if suppression of growth is desired, or if the plant naturally suckers heavily (i.e. crab apple), summer would be a desirable time to prune.

Tree Wound Paints: Recent research studies indicate that while tree wound paints do not prevent internal wood decay, certain materials such as orange shellac may provide a *temporary* barrier to bark pathogen until a tree’s natural barrier zones form. While the benefits of wound dressings continue to be debated by tree care professionals, most agree that conventional dressing materials are not injurious. Thus, they may be used at the discretion of whoever directs the work.

Hiring An Arborist: Some small tree pruning jobs can be done by a homeowner if you have the proper pruning tools (hand pruners, lopping shears, pruning saws). There are certain types of pruning jobs that should only be performed by a professional arborist such as pruning trees that are near and/or are contacting electric and utility wires, large branch removal, and pruning jobs that require climbing up the tree.

Information on how to hire an arborist including how to find a certified arborist can be found by visiting the International Society of Arboriculture (ISA) web site at www.isa-arbor.com and then following the link to “The Consumer Tree Care Web Site”. This site also has valuable information on all aspects of tree care as well.

Other web sites that can be helpful for those looking to hire an arborist are the New York State Arborists <http://www.nysarborists.com/> and the Long Island Arboricultural Association <http://www.longislandarborists.org/>

The concepts on branch removal and wound closing are the work of Dr. Alex Shigo, Chief Scientist with the USDA Forest Service, Northeast Forest Experiment Station, Durham, New Hampshire.

Reference *Pruning: An Illustrated Guide to Pruning Ornamental Trees and Shrubs*. Cornell University Cooperative Extension. 141IB23. 1/05.

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