

MU Guide

Felling, Bucking and Limbing Trees

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Whether you are using your chain saw to cut firewood, trim trees or harvest large timber, you will be performing three basic operations — felling, bucking and limbing of trees. *Felling* involves cutting the standing tree and dropping it in the place you want it. *Limbing* is the removal of the branches from either standing or downed trees. *Bucking* is the process of cutting the downed tree into appropriate lengths. For information on the selection and safe use of a chain saw, see MU publication G 1959, *Basic Chain Saw Safety and Use*.

This publication is not intended for the professional user but rather for the occasional chain saw operator. Wear all appropriate safety equipment when operating the saw. And please remember that if you get tired while performing any of these operations (felling, limbing or bucking), stop and rest! Your safety depends on it.

Felling

Felling a tree can literally make or break your day! Putting the tree where you want it to land facilitates the rest of your operations. There are many documented cases of persons who were cutting firewood and dropped trees on their pickup trucks.

Several factors must be considered when felling a tree. If it is smaller than 6 inches, you may be able to push the tree where you want it to go. If the tree is larger than 6 inches, it will probably be too heavy to guide it to your chosen spot by hand. Indeed, many times the tree chooses where it wants to fall, in spite of your best efforts.

Before attempting to cut down the tree, examine the tree to see if there are any safety hazards present. Typical hazards include excessive tree lean, dead or hanging branches, obstacles around the tree such as utility lines (particularly in urban and suburban areas), and open wounds on the tree stem itself. Wounds might indicate that the center of the tree is rotten or hollow, and felling a tree with a rotten or hollow core at stump height is a task best left to experienced or professional chain saw operators. Since

there is an unknown amount of wood holding the tree up, you may not be able to control the direction of fall of the tree or it may fall prematurely, endangering you and others around you.

Lean. Most trees display some indication of the direction in which they will tend to fall. This is shown by an uneven crown, as when most of the branches are on one side of the tree, or by a lean of the trunk of the tree itself. An easy way to determine the lean of a tree is to stand back 25 to 50 feet and use a plumb line to sight on the trunk of the tree. It is best to do this from two sides.

Wind. The wind will push the crown of the tree. In the fall and winter, the wind has less effect on hardwoods such as oak, maple and sweetgum after their leaves have fallen off. A gusty, erratic wind increases the difficulty of landing the tree where you wish. Strong winds will often force a tree to fall in an unintended direction.

Landing area. Once you have evaluated the lean of the tree, you will need to examine the area where you would like the tree to land. If you are in a forest, you will have to take into account adjacent standing timber (both live and dead), natural openings in the forest, and the terrain that you are dealing with.

Escape path. After you have chosen the place where you want the tree to drop, you need to clear debris and underbrush away from the base of the tree. You don't want these impeding your movement around the base of the tree during the felling process. Locate at least two escape paths on opposite sides of the tree leading away from the expected fall line. Make sure that these paths are free of obstacles such as briars and debris that might trip you.

Undercut. The undercut serves as the guiding or aiming slot for the tree. Basically it is a V-shaped notch placed on the side of the tree in the direction of falling (Figure 1). Either a standard undercut (Figure 1a) or a reverse undercut (Figure 1b) can be used. Typically the first cut is made parallel to the ground and then the slanting cut is made.

In recent years, a modified undercut known as an "open face" undercut has become popular in many areas (Figure 1c). Introduced by Scandinavian felling

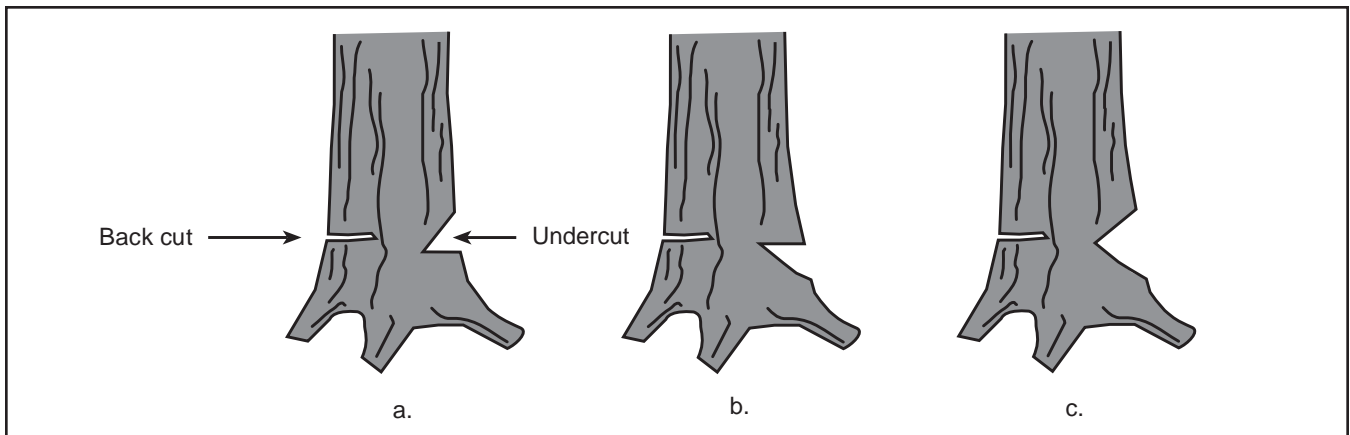


Figure 1. Three types of undercuts. Note that in each case, back cut is slightly (1–2 inches) above hinge point of undercut.

specialists, it is easier to make, provides good guidance and has additional safety features. Instead of ending up with a 45-degree opening, the undercut provides nearly a 90-degree opening. When the tree starts to fall, this modified undercut allows additional room for the tree to fall before the top and bottom of the undercut come together.

For trees that are essentially straight, the undercut should be about one-fourth of the tree's diameter in depth.

Back cut. For all three undercuts, the back cut is made slightly above the hinge point of the undercut (Figure 1). The back cut releases the stresses on the back of the tree allowing the tree to fall. **NEVER** make the back cut lower than the undercut because that reverses the roles of the two cuts. **NEVER** cut through the undercut, because you will lose all control over the tree at that point.

As the saw nears the undercut, there should be a small amount of wood left. This is referred to as “hinge” or “holding” wood (Figure 2). The tree actually pivots on this hinge and the width and angle of the hinge can be used to guide the direction of the tree's fall. By leaving an angled hinge, the tree will start to fall on the narrow section of the hinge while the wood at the thicker section of the hinge is still intact. The tree is therefore pulled toward the thick section. This is an art and requires practice.

Once the tree starts to fall, shut off your saw and move down your chosen escape path. Do not stand at the base of the tree and admire your work. Falling trees have been known to bounce backward over the stump catching the unwary operator.

A leaning tree presents special problems. The difficulty of these problems depends on the direction and the degree of lean. Be aware that if you try to do a conventional back cut on a leaning tree, there is a good possibility that the tree will split and fall prematurely, with the potential of serious injury to you. Consult a professional arborist.

Limbing

When removing unwanted limbs from standing timber, the basic safety rule is **NEVER** to limb above your shoulders; that is, do not attempt to cut off branches above the height of your shoulders. Cutting above your shoulders requires that you hold the chain saw at or near arm's length, and you lose control over the saw in this position. Proper limbing techniques to reduce damage to the tree are covered in MU publications G 5160, *Pruning Forest Trees*, and G 6866, *Pruning and Care of Shade Trees*.

Other safety rules apply to limbing a tree that is lying on the ground. The first thing you should do is evaluate the fallen tree. If the tree has become lodged or wedged in adjacent trees and has not fallen all the way to the ground, do not walk underneath the tree. It may fall without warning. Trees that are “hung” are especially dangerous and need to be removed by mechanical means. They can be pulled down with a cable and a tractor suitably equipped to protect against roll-over and falling objects.

Do you see smaller trees that have been bent over and trapped by the felled tree? Do you see branches holding the tree partially in the air? Is the tree on level ground? If you have just felled the tree, are there dead branches or other debris hanging above you that may still fall to the ground? These are called

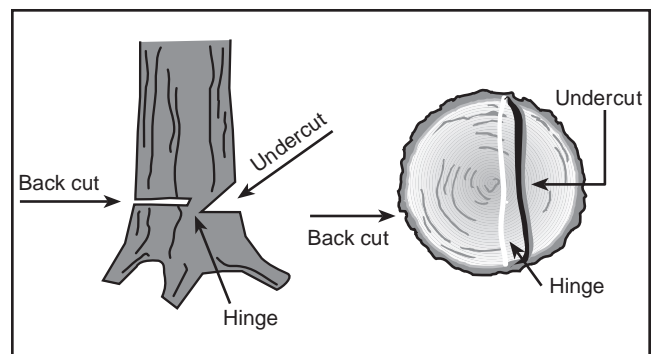


Figure 2. The direction a tree falls can be closely controlled with properly made undercuts and back cuts.

widowmakers for good reason. There are well-documented instances of debris falling several minutes after the tree has been felled and severely injuring or killing saw operators.

You may want to wait a few minutes to allow any additional debris to fall to the ground. This allows you to take a short rest as well.

Once you have evaluated the obstacles and hazards, start at the bottom of the tree, working your way to the top, removing branches on the opposite side of the tree from you as you go.

Never stand on the downhill side of a fallen log. If you cut a branch that is holding the log in place, the log could roll downhill and trap you. Whenever possible always cut on the opposite side of the log from you. This places the log between you and the saw and provides additional protection for you.

Keep sight of the tip of the saw to prevent kickback! See MU publication G 1959, *Basic Chain Saw Safety and Use*, for information about kickback and other safety concerns in operating a chain saw. Periodically put the saw down and remove debris so that you have clear vision and movement around the tree.

Try to cut the limbs off as flush as possible with the trunk of the log. This makes the log much easier to roll or move. If the limbs are in a position where flush cuts are not immediately possible, remember to remove the branch stubs later.

Depending on the species and size of tree you are dealing with, some of the branches may be very heavy. When they are removed from the log, the log may shift its position unexpectedly. You need to have good footing and be standing in a balanced position that allows you freedom of movement.

Smaller trees that are bent over and trapped by the weight of the fallen log are referred to as springpoles (Figure 3). There is a tremendous amount of stored energy in these springpoles and they present one of the greatest hazards encountered during the limbing process. There are two ways to release this energy safely. One is to use an axe to cut the springpole at the apex of its bend. The other is to use your chainsaw to do the same thing. In either event, refer to the diagram in Figure 3b for the way to locate the apex of the springpole.

Branches can also serve as springpoles, and the same guidelines apply to these as well.

If you are cutting the branches and trunk into firewood, you may want to start at the top of the tree so that some of the branches are off the ground. That way, the wood drops to the ground and the saw is kept away from the ground as much as possible. Again, this is a place where good footing, good balance and ease of movement are important.

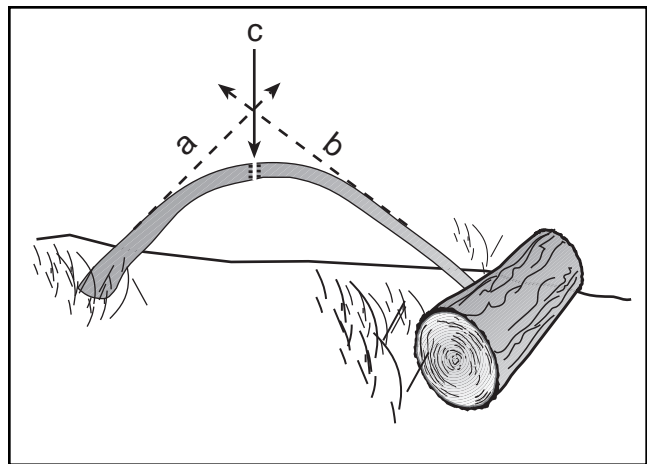


Figure 3. To locate the apex of the bend, imagine straight lines (a and b) coming out of the bent over springpole. These lines intersect at some point away from the tree. Draw a third line (c) so that it bisects the angle formed by lines a and b. Cut where line c touches the top of the springpole.

Bucking

The process of cutting the tree into useable lengths, known as bucking, often occurs as the tree is being limbed. This is often the case when the limbs of the crown are to be used as firewood. In the case of firewood, make sure you know the needed length of wood before you leave home. When cutting full-size products, such as sawlogs and veneer logs, you must also leave a trim allowance when bucking logs. For an 8-foot log, a trim allowance of 4 to 6 inches is common. The trim allowance is provided to allow the ends of the boards to be cut square at the mill. Because many bucking cuts are angled, the trim allowance permits sawmill operators to recover the desired board lengths.

If the tree is totally on level ground, then the biggest problem during bucking is avoiding running the saw chain into the earth. If the tree is suspended at one end or the other, then the bucking operation becomes more difficult. Figure 4 shows various techniques that can be used in bucking. In all cases, keep a firm grip on the saw with both hands. Remember to keep a good, even stance on the ground so that you can move quickly if the log starts to roll. Again, stand on the uphill side of the log during this process.

A **sawbuck** is a handy device for safely cutting wood to length. You can find plans for sawbucks in your local library or your owner's manual or you can purchase one from a variety of sources.

Saw transport and storage

For transport, set the saw level with the fuel tank cap up. Be sure the saw cannot tip over and spill fuel or oil. Avoid carrying the saw in the passenger area of a vehicle. Use a chain guard or a carrying case to protect yourself as well as the chain.

For long-term storage, drain the fuel tank in a

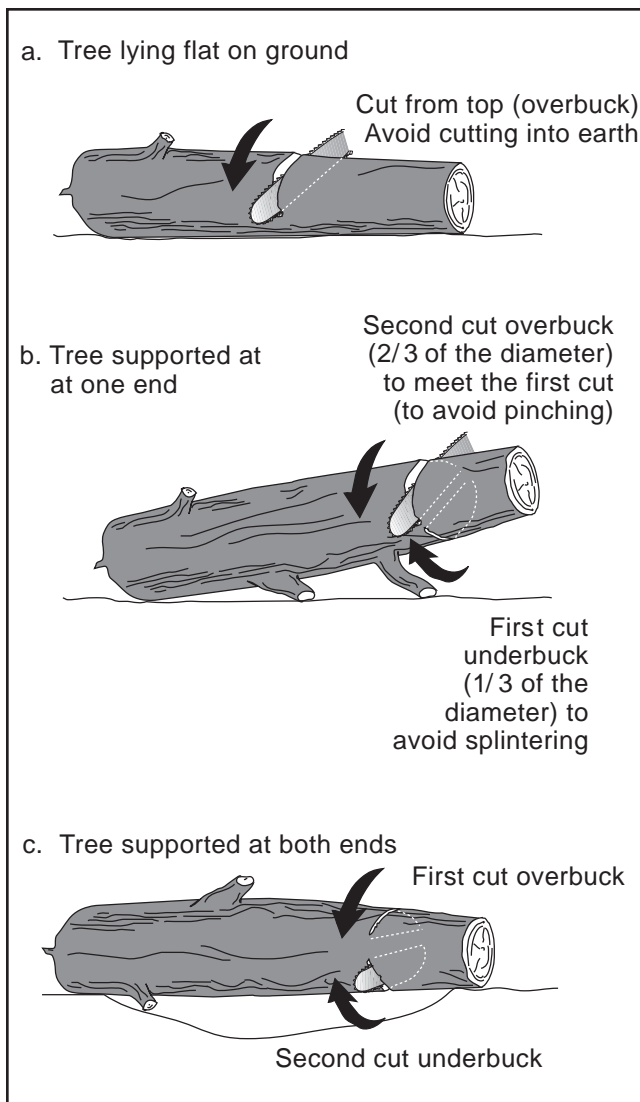


Figure 4. Different bucking procedures apply depending on how the tree lies.

safe, well-ventilated area. Run the saw at idle until it stops; this removes the remaining fuel from the tank. Remove the chain and store it in a container of oil. Disconnect the spark plug wire to reduce the possibility of accidental starting. Store the saw out of the reach of children.

Electrically powered chain saws

Electrically powered chain saws require some additional precautions. Use only a three-wire cord of the proper size with three-pronged plugs and a grounded three-wire outlet. A ground fault interrupter in the power supply line will help prevent fatal shocks.

The soil in the working area should be relatively dry. Avoid working in areas where the foliage or the ground is wet.

Lay out the cord so that it will not interfere with your work. Take care to place it so that you don't inadvertently cut it with the saw or trip over it.

Make sure that the saw switch is in the off position before completing the electrical connection. Always unplug the saw before making adjustments and when the saw is not being used.