

Chain Saw Safety

Subodh Kulkarni, Ph.D.
Program Associate -
Machinery

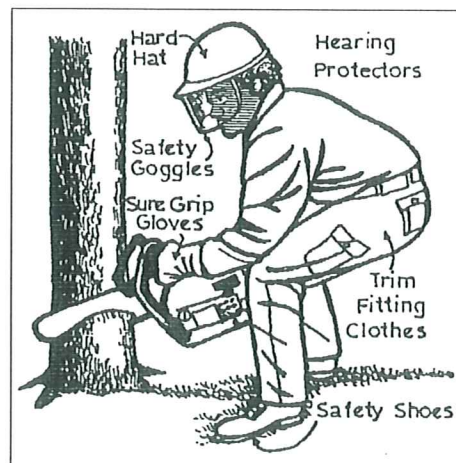
A skilled woodsman quickly reduces a large tree to manageable pieces. Inexperienced chain saw operators can gain some of these skills with training and using safe, efficient cutting practices. Even seasoned woodcutters should revise techniques that are hazardous. One analysis of chain saw accidents revealed that 70 percent of those injured had more than one year's experience. To avoid injuries, possibly even death, practice safe woodcutting while clearing, thinning, cutting firewood or cleaning up trees downed by a storm.

You should be well prepared before going into the woods. Cutting firewood, thinning timber stands or clearing is worthwhile and rewarding if done properly, but they can also be dangerous. Felling, limbing, bucking and trimming trees are hazardous tasks if not done carefully. This fact sheet gives basic safety precautions for reducing common woodcutting hazards. Each year a number of serious injuries to Arkansans could be prevented by following fairly simple precautions.

Preparing to Use the Saw

You should be well-prepared before using a chain saw. Know how to operate the saw before you use it. Read and understand the operator's manual. Observe an experienced operator in action. Then use a saw for a period of time with supervision. Obtain the following personal protective equipment before starting to work and wear all protection while sawing.

- ▶ A **hard hat** to protect your head from falling limbs or branches. The best helmets have a face guard.
- ▶ **Safety glasses or goggles** to prevent injury from flying wood chips. Wear these during wood splitting also, to preserve your eyesight.
- ▶ **Ear muffs or ear plugs** to protect ears from permanent injury. Noise from some gasoline-powered chain saws can exceed 100 decibels.



- ▶ **Lightweight gloves**, preferably leather, to protect hands from abrasions and cuts.
- ▶ **Heavy work boots** or shoes with high tops and steel toes.
- ▶ **Trim-fitting clothing** free of ragged edges. Loose clothing will readily snag on limbs or get caught in the saw. Woodcutter's chaps are recommended to give leg protection during a mishap.

*Arkansas Is
Our Campus*

Visit our web site at:
<http://www.uaex.edu>

Make sure that your saw is in top operating condition. Keep the chain properly sharpened. Maintain proper chain tension; carefully observe it, especially during the first half hour of cutting. The lower chain span should just touch the bottom bar rails. Raise up on the bar tip while tightening the bar fasteners. Follow manufacturer's recommendations for service and maintenance.

Fueling the Saw

Good fire safety practices are necessary when refueling the chain saw. Refuel the saw in an open area after it has cooled, at least 10 feet away from where you wish to restart the saw and resume cutting. Fuel the saw at least 20 feet away from fires and lighted cigarettes. Use proper funnels and spouts to prevent spills. Wipe the saw dry of any spilled fuel before cranking it.



Starting the Saw

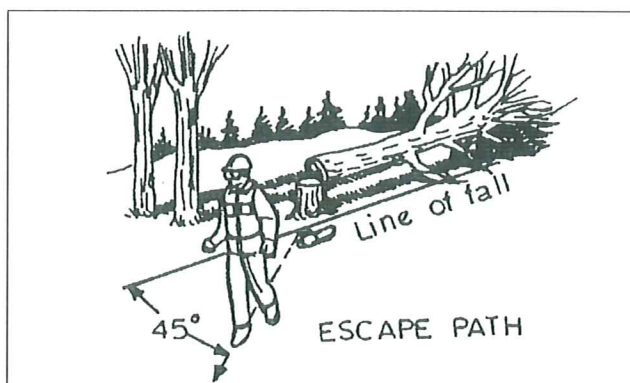
Place the saw on a clear, firm, flat surface as close to the work area as possible. Get a good footing. Follow the owner's manual recommendations for starting the chain saw. Place your foot in the handle to restrain the saw if designed with this intention. **Never start the saw on your knee;** too many experienced woodsmen have slipped and cut their legs.

Felling the Tree

Plan a safe approach to cutting the tree. Size up the tree. Note the wind direction and the way the tree is leaning. If the tree is leaning, try to fell the tree in that direction when the wind is not blowing against it. If you are inexperienced, try to fell only trees that will fall in a predictable, safe direction. Examine trees for loose, dead limbs before felling. Loose limbs that fall onto the tree cutter are a common cause of serious injuries and fatalities. Either remove the limb first or fell the tree from a position where the limb could not strike you if it was dislodged.

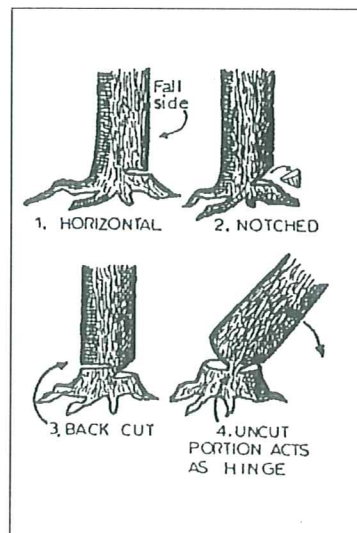
Clear a safe work area around the base of the tree. Remove limbs, underbrush and other obstructions. Be sure to have several open pathways away from the tree for an escape route when the trees begin to fall.

Be sure that clearance in the intended direction is adequate for the tree to fall completely to the ground. A lodged tree is very dangerous. Experienced loggers are often killed by trees that hang up or snag in adjacent trees. A tree springing back from the weight of a falling tree can whip a broken limb toward the cutter with tremendous speed.



After determining the direction of fall and clearing escape routes, cut the tree as follows:

- ▶ Make one cut through trees less than 8 inches in diameter.
- ▶ On larger trees, notch (undercut) at least one-third of the trunk diameter on the fall side of the trunk. Make the lower cut of the notch first to prevent the loose wedge of wood from pinching or bending the chain.
- ▶ Make a felling or backcut on the opposite side of the trunk two inches above and parallel to the horizontal cut in the notch. The tree should begin to fall when you are several inches from the inner face of the notch. Leave a narrow uncut portion to serve as a hinge for controlling the fall of the tree.



If the saw begins to bind in a closing cut, you may have misjudged it. At the very first indication of binding, remove the saw. If it is too late to remove the saw, do not struggle with it. Shut off the engine, and plan a way to remove the saw using wedges.

Wedges are the most dependable way of controlling the direction a tree falls. Using two wedges rather than one is best. Two wedges allow better control and ensure a forward fall of the tree.

The path of the butt of a falling tree is unpredictable. Being struck by the butt, rebounding limbs or broken tops is the second most common cause of death to those felling timber.

Controlling tree fall comes with experience. Get advice and help from an experienced person before attempting a difficult fall. Remember, accident statistics show that overconfidence can hurt experienced loggers. It may lead to dangerous shortcuts, such as not providing clear escape routes from a falling tree. Or it may lead to attempting too much, dulling the senses to danger signals.

Limbing the Tree

The next job is to remove the limbs. Be alert for flexible limbs that wedge and whip a chain saw, and avoid cluttered work areas. Serious injuries may occur during the limbing operation. Some safety tips are:

- ▶ Begin limbing at the base of the trunk. The first limbs cut should be those on top of the trunk. Cut these as far up the top side of the trunk as possible before removing those resting on the ground.
- ▶ Stand on the opposite side of the trunk from the limb being cut. The trunk provides a barrier between you and the saw and helps protect from accidental contact with the chain.

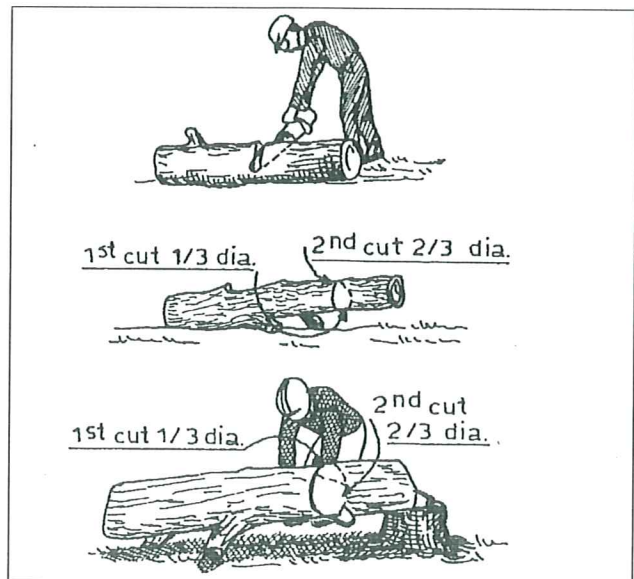


- ▶ Do not hold a running saw with one hand and clear limbs with the other. Shut off the saw and put it down until limbs have been cleared.
- ▶ Cutting branches resting on the ground may be necessary to clear the area as you work. Beware that the tree may sag or roll as a new branch is cut. The likelihood of the tree rolling increases as more branches are removed. Be alert for any trunk movement and be ready to move away quickly if necessary.

Bucking the Logs

Bucking is cutting the trunk of the felled tree into desired lengths. The greatest hazards while bucking a tree are unexpected log roll and saw kickback. Here are a few safety tips:

- ▶ Always be sure of your footing. By keeping yourself in a well-balanced position at all times, you can react to unexpected log movement.
- ▶ Raise and chock the trunk when possible to prevent rolling. Work on the uphill side of the log. Since a log rolls downhill, working on the uphill side provides the greater safety.



- ▶ Bucking procedures differ depending on how you support the log. When the log is flat on the ground, cut it from top, then roll it over and cut it through from the opposite side. When the log is supported on one end, cut one-third of the diameter from the underside to avoid pinching and splintering, then cut the remaining two-thirds of the diameter from the top. On a log supported at both ends, make the first cut through the top one-third of the diameter. The remaining wood is then cut upward from the bottom.

When cutting firewood lengths, several methods can be used. One way is to make cuts about three-fourths of the way through for each length of firewood. By not cutting completely through, several lengths stay together and the log remains rigid. After all cuts are made from one side, roll the log over and complete cuts. Avoid sawing into the ground, which dulls the chain and shortens its useful life.

Splitting the Wood

Splitting wood is a skill that improves with experience. Having the proper tools makes the job easier. Tools used to split firewood include a splitting ax, a sledgehammer, a splitting maul and wedges.

The quickest way to split small, easy-to-split pieces is with an ax. An ax can get stuck, however, in larger pieces. A splitting maul makes the job easier. A splitting maul is a combination of an ax and a maul,

with a wedge on one side and a hammer on the other. Use the wedge side just as you would an ax. The broader wedge keeps the blade from jamming as easily in wood. The hammer side can be used to pound the occasional wedge. You may need a sledgehammer and wedges for larger pieces that are very hard to split.

Felling trees, cutting firewood and operating a chain saw has a high risk of injury. Anyone near these activities should be alert to the hazards and communicate their intentions. Use a sharp chain saw, follow safe practices, maintain clear escape routes and plan ahead to work safely and profitably.

Reference

Peters, P.A. 1991. Chain Saw Felling Accidents. Transactions of ASAE, Vol. 34(6), pp. 2600-2608. St. Joseph, MI.

Acknowledgment is given to Gary Huitink, former Extension agricultural engineer, and John Langston, Extension engineer emeritus, for their work on the original fact sheet and to Richard DeSpain, Extension illustrator, for all of the illustrations.

Printed by University of Arkansas Cooperative Extension Service Printing Services.

DR. SUBODH KULKARNI is program associate - machinery, Biological and Agricultural Engineering, University of Arkansas Division of Agriculture, Little Rock.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director, Cooperative Extension Service, University of Arkansas. The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, national origin, religion, gender, age, disability, marital or veteran status, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.

FSA1009-PD-1-11RV