

THE USE OF ELECTRIC CHAIN SAWS IN ARBORICULTURAL EDUCATION

by John Ball

Abstract. Few colleges offer arboriculture training with chain saws. However, this training provides valuable skills that are utilized by commercial arborists everyday. An electric chain saw has many advantages over its gas counterparts for training. A procedure for utilizing electric chain saws in arboricultural training is outlined.

Résumé. Peu de collèges offrent une formation en arboriculture en utilisant des scies mécaniques. Cependant, ce type de formation permet d'acquérir des aptitudes importantes utilisées à chaque jour par les arboriculteurs commerciaux. Lors de la formation, l'utilisation d'une scie mécanique électrique présente plusieurs avantages par rapport à la scie mécanique alimentée au gaz. Une procédure pour l'utilisation d'une scie mécanique électrique lors de la formation en arboriculture est présentée.

One of the most versatile and efficient tools of the arborist's trade is the chain saw. Hand saws are advantageous for light pruning because of their weight and flexibility, but for cutting large branches throughout the day there is no substitute for the speed and power of a chain saw. However, the same characteristics that make chain saws efficient wood cutting machines also make them dangerous if used incorrectly. Each year in the United States an estimated 22,000 injuries occur due to improperly operating a chain saw (2).

While chain saws on the ground are dangerous, this same machine in a tree can be extremely hazardous. Starting, kickback and a host of other problems are compounded when working in the tight confines of a tree. The knowledge and dexterity necessary to utilize a chain saw in a tree are not quickly mastered and injuries often result from putting a chain saw in the hands of an inexperienced climber (6). Since chain saws are standard arboricultural equipment, it is essential for arboriculture students to become trained in their safe operation. While it is important for a student to become familiar with chain saws, the instruction is a demanding task for the teacher and is often neglected. Many schools, do not include hands-on instruction in the operation of chain saws. A check through the literature on arboricultural education found no mention of chain saw instruc-

tion (5, 7, 9). Use of chain saws in trees is not specifically addressed in Andresen's proposed arboriculture course (1). Instructors who do provide this training may find few educational aids. The proper method of using chain saws in trees is absent from several of the more common arboriculture textbooks (3, 4, 8). This article will address one possible approach to the instruction of chain saw use in a tree.

A student must be proficient in both climbing and the use of a chain saw. Combining these two activities compounds the hazard for the beginning arborist. As competent climbers, students should be able to properly tie knots, ascend and descend a tree and know rigging techniques. In addition, the student must be familiar with the use of chain saws. They must know how to avoid kickback injury, how to properly hold a saw when starting and how to hold it while making pruning cuts.

Once these skills are mastered on the ground the student can begin instruction with the chain saw in the tree.

There are a number of problems associated with the use of chain saws in trees. Chain saws can be difficult to start while in the canopy of a tree. Injury can occur if the operator attempts to drop start the saw or if the saw slips when it is started. Chain saws are also heavy and noisy. It is difficult to hear instructions over the sound of the saw and the weight hinders the novices' attempt to work in the tree. To reduce these difficulties, electric chain saws were utilized for student instruction.

Advantages and disadvantages of electric chain saws. Electric chain saws offer a number of advantages over the gas chain saws:

- They are generally less expensive to purchase and operate.
- An arboriculture class may be able to purchase two electric chain saws for the price of a similar gas chain saw.
- Electric chain saws are lighter than gas chain saws, making it easier for students to carry them.

- The saws are also quieter, so that instructions or warnings can be easily heard over the engine sound.
- Electric chain saws can easily be started by the student and stopped by the instructor.

Starting an electric chain saw in the tree merely requires the flip of a switch. There is little danger of the saw slipping while being started and there is no need for the saw to be warmed up on the ground. The electric chain saw is also simple to stop either by the operator or by the instructor standing on the ground. If the student operator is proceeding in a hazardous manner, the instructor can shut off the power source. Hence, rather than trying to signal or shout over the sound of the gas chain saw, the instructor can interrupt the power. The student can then be informed of the hazard and proper procedures discussed before the power source is reconnected. This is a major advantage of an electric chain saw as an instructional tool. Since the instructor retains control of the saw, accidents can be reduced.

Some disadvantages of utilizing electric chain saws are the need to have an electric cord in the tree, the need to have a closely located power source, and the relative lack of power of such chain saws. These difficulties are not insurmountable and certainly do not outweigh the advantages. While the cord may at first appear to be a nuisance in the tree, it actually poses very little problem. The electrical cord generally follows the safety rope through the tree so there is rarely a problem with tangled ropes and cord. If hung separately the student might cut the cord. The location of the power source need not cause difficulties since extension cords may be 200 feet long. Portable generators may also be utilized, but might negate the noise and cost advantage. Since electric chain saws do not deliver the power, the student is required to spend more time making each cut. It took ten students 60 percent longer to cut through a 15 cm diameter cottonwood (*Populus deltoides*) limb with an electric saw than it did for a similar horsepower gas saw.

Procedures for use of electric chain saw:

SAFETY RULES:

- The instructor is always present during the operation of power equipment.
- Work activities are discussed among the climber, groundperson and instructor. Each agrees upon the procedure as to where the cuts will be made, in what order and how the ropes will be placed. This discussion helps reduce confusion and having to shout instructions back and forth.
- The climber, assisted by the groundperson, then begins the climb. The climber may elect to carry the electric chain saw or have it raised up on a bull rope to make the cut.
- While working in the tree with the saw, the climber utilizes a five foot long lanyard. The length allows the saw to fall free of the climber in the event that the saw is accidentally dropped. One clip of the lanyard connects it to the saddle, a clip at the other end is connected to the saw's rear handle. A third clip is placed just ahead of the clip attached to the saw. This clip can also be connected to the saddle so the saw hangs at the climber's side while he or she moves through the tree. The extension cord is connected by an overhand bend through the end of the electric chain saw cord. This prevents the saw from becoming accidentally unplugged while being used in the tree.
- The saw is never raised or lowered by the extension cord. The bull rope is used to prevent damaging the extension cord or the plug of the chain saw.
- When the climber is in place to make the cut, he or she ties in with the tautline hitch or lanyard, sometimes both if the geometry of the tree permits.
- Once the climber is prepared to make the cut, he or she shouts "ready" and the extension cord is plugged into the power source. As an additional safety measure, the extension cord is only plugged in while the cut is made.
- After the cut is finished, the climber shouts "done" and the extension cord is removed from the power source. This procedure is repeated until the work is completed. The saw is then lowered by the bull rope or carried down by the climber.

The electric chain saw has been part of the tree trimming instruction at our institution for two years or about 45 students. Students who have completed electric chain saw training may then ad-

vance to the gas chain saw. While the gas chain saw is a common arborist's tool, the electric chain saw is an important link between hand and power saws. Hanging 50 feet from the ground, operating a saw that can cut through flesh in seconds is a stressful situation for both the student and the instructor. However, this training is invaluable if the student wants to become an arborist. The use of an electric chain saw provides a greater margin of safety for the beginner.

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Abstract

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"We're looking for a few good men." So says the recruiting campaign for the US Marine Corps. So is the tree care industry. The situation hasn't improved in the last 10 years. And based on the latest unemployment data as well as the projected numbers for the available labor force for the next 10 years, it isn't going to get better. In the Northeast, unemployment is close to 3 percent. If our economy continues to be strong, the unemployment rate will continue to stay low—and competition in the labor market will remain as tough as it is now, or get worse. Our labor force is very unstable. People come to work, decide they don't like tree work, and find better opportunities or leave for some other reason. As a consequence, turnover in the tree care industry is unbelievably high. High turnover is a very costly and dangerous problem. New people need to be trained—not only technically, but in safe practices as well. Tree work is hard work under all kinds of weather conditions. Why would anyone want to work hard when they can work easier or smarter for the same money—or more?