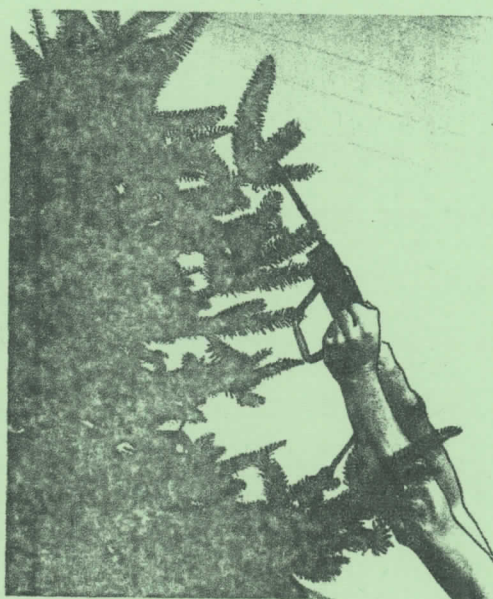
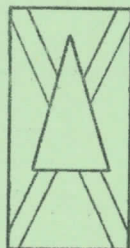


# Electrical Shearing of Christmas Trees



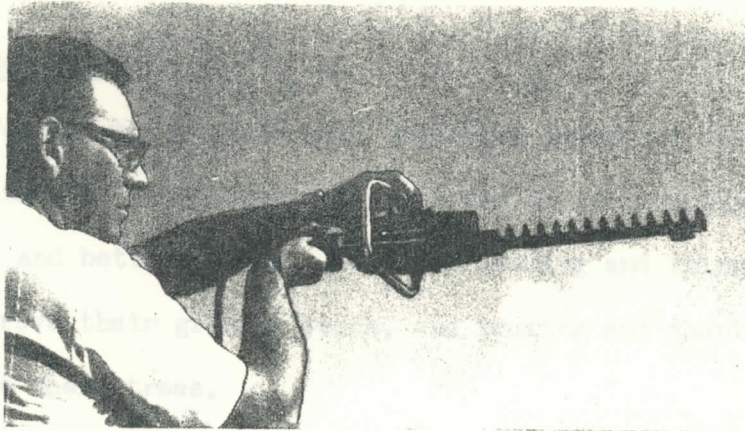
Prepared by G.L. Saunders and L.L. Wright



EXTENSION DIVISION, DEPARTMENT OF LANDS AND FORESTS  
PROVINCE OF NOVA SCOTIA

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## ELECTRICAL SHEARING OF CHRISTMAS TREES



### SUMMARY

The practice of shaping Christmas trees is gaining acceptance in Nova Scotia. Growers are becoming aware of its potential for improving their profits per acre and per tree. Although manual shearing tools are adequate for jobs entailing only a few acres, it may be that on repeated larger operations, mechanical shearing with power equipment is cheaper and faster.

In a Lands and Forests experiment in Kings County with a portable 300-watt gasoline generator and a pair of electric hedge trimmers, it was found that under normal conditions one man could shear from two to four (three-foot to ten-foot) balsam fir trees a minute. The combined cost of generator and one set of shears is under \$300. A lightweight electric reciprocating saw was also found to work well for weeding and thinning, but was considered inferior to lightweight, gasoline-powered saws.

Note: Where brand names are used in this report, no special endorsement is intended.

## Introduction

People who grow and sell Christmas trees are turning more and more to cultivation practices to achieve higher yields and better prices. They are weeding and thinning to improve their growing stock, and pruning and shaping to improve their trees.

For shaping or shearing trees, the tools most commonly used are of three kinds: garden shears (with a wavy cutting edge), keen knives of the machete type, and small hand pruners. A skilled worker using shears or the knife in cultivated stands from three to ten feet tall can treat one or two trees a minute, provided spacing is not too great and the treatment not too heavy.

This is a good rate, but it cannot be maintained for long periods. After several hours with the hand clippers, elbows and shoulders grow fatigued. Efficiency then drops. To a lesser degree, the same is true of knife-shearing--with the added danger of injury as tiredness increases. When efficiency drops, so does quality. This causes a rise in the operator's cost per tree.

Therefore, on large jobs there is a case to be made for some mechanical system of shearing and shaping Christmas trees. This is especially true where repeated shearing is done, and where the work is concentrated into a few weeks.



Many growers in the eastern United States, where large plantations of Christmas trees are common, have adopted such equipment with enthusiasm.

#### A Portable Generator

Mechanical shearing is being made more feasible by recent developments in the design and production of compact electric generators. Such a portable generator, coupled with suitable electric shears or saws, could conceivably reduce cultivation costs on larger operations, or when used cooperatively on smaller operations.

A small generator suitable for this purpose, and now available in Canada, is the Honda Motor Company's Model #300 (Fig. 1). This 39-pound, four-cycle gasoline motor produces 300 watts of power, has 110-volt and 12-volt outlets, and can

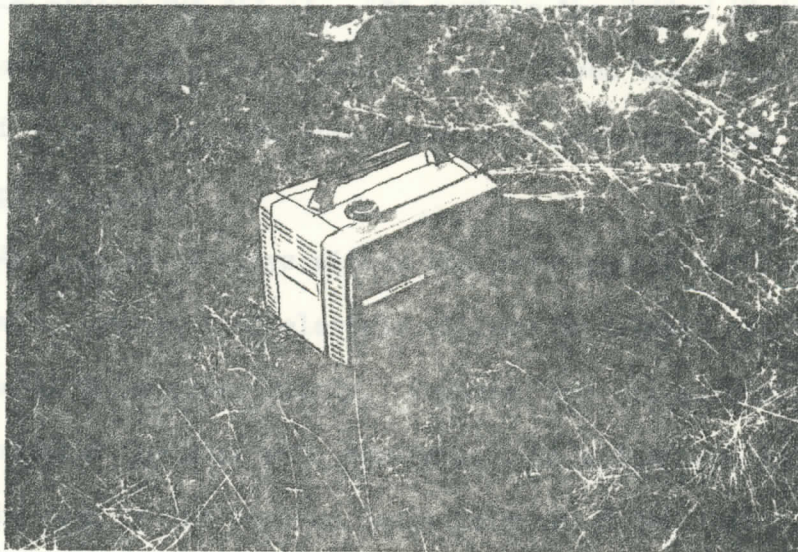


Fig. 1: Portable Gasoline Generator

run one set of electric shears. The cost is about \$225. retail. (Honda also makes an 80-pound unit which generates 1,000 watts and costs around \$400.).

At normal speeds the Honda 300 generator will run for about five hours on one tank (3.5 Imp. pints) of gasoline. Thus the gas consumption is one Imperial gallon in about 11 hours. Although the gasoline apparently will not spill if the unit is overturned, it might be noted that the low placement of the exhaust port poses a potential fire hazard in dry grass or brush.

Another lightweight gasoline generator is the 35-pound Niagara Alternator sold by Nasco Limited, Fort Atkinson, Wisconsin. This two-cycle machine develops 900 watts. Two sets of shears can thus be easily run off it. The cost in the United States is \$136. The same company sells a shearing kit (Nasco Tree Shaper) consisting of a generator, two shears and a 40-foot extension cord.

#### Electrical Shears

As long as it stays within the power specifications of the generator, any sort of electric clipper or trimmer can be run from a portable power supply. However, not all electric trimmers are suitable for work with conifers. One which appears adaptable to this work is the Sunbeam Hedge Trimmer, Model HT 100, drawing approximately 2.5 amperes at 120 volts (300 watts). A similar tool is made by McGraw Edison (Canada) Limited, and draws 2.6 amperes at 115 volts (299 watts).

The blade on these trimmers is usually 14 to 16 inches long. Because the body is commonly made of plastic and aluminum, they weigh not much more than ordinary hand shears. The retail price is around \$45. Figure 2 illustrates the type.

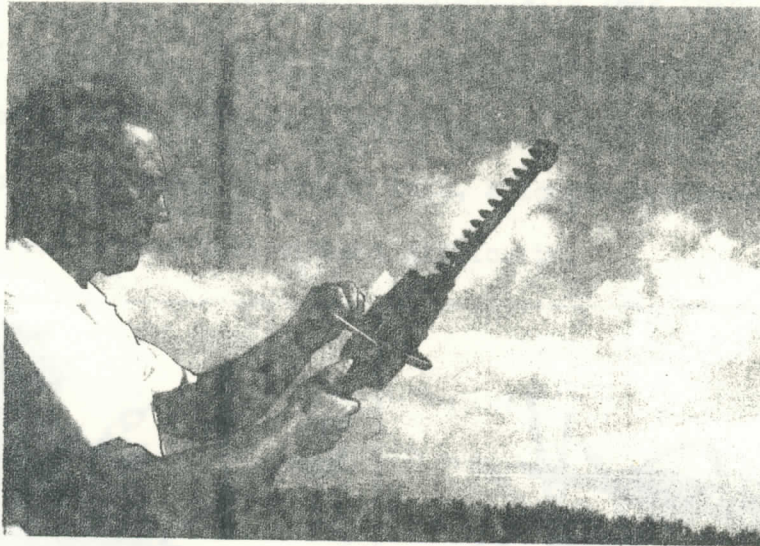


Fig. 2: Electric Hedge Clippers

#### Electrical Shearing Experiment

To test an electric hedge trimmer and a portable generator in Christmas tree shearing, an experiment was recently made by Extension Division field staff. It was carried out in a stand of cultivated balsam fir of three to ten feet in height and roughly six-by-six foot spacing. A Sunbeam Trimmer with an ordinary hedge-clipping cutter bar was employed. Using a 20-foot extension cord, the operator was able to shear up to four trees a minute where spacing was close, fewer where extra movement was necessary. Two trees per minute would appear to be a rough average rate for cultivated stands of natural fir in this height range.



To use these lightweight electric shears takes little effort. There is no clipping or slashing motion as with the hand shears or the knife. A slow, rythmic passage up and down and around the trees is the only arm movement (Figs. 3, 4). Fatigue is therefore substantially less than with manual equipment. Twigs under .25-inch in diameter are severed without noticeable resistance. The vertical reach is about nine feet; to extend this, a longer handle could be fitted to this tool without difficulty.

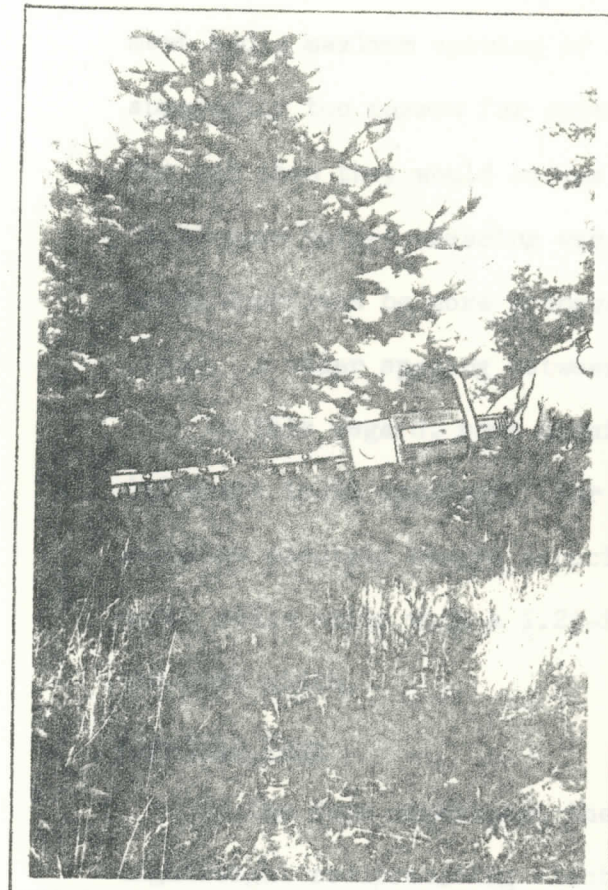


Fig. 3: Shearing Lower Foliage



Fig. 4: Shearing Upper Foliage

The danger of injury from the cutter blade is slight. Caution should however be observed in not exposing the shears to rain or heavy dew. The manufacturer warns that heavy moisture could cause a short circuit. For the same reason, damaged electrical cord should be repaired or replaced promptly.

It was observed that shearing the coarse foliage of conifers requires more widely spaced cutting teeth than for shearing hedge foliage. The Sunbeam 100 model used in this experiment had a maximum opening of one-half inch. This gap was apparently too narrow for cutting balsam fir twigs effectively. Now and then they would escape the teeth, requiring a second or third pass before shearing was accomplished. This problem would doubtless be more pronounced with the bulky foliage of pines. A wider spacing between teeth is therefore recommended.

In this regard, some manufacturers of electric shears offer different tooth spacings. For example, Nasco Limited, which supplies electric shears especially designed for Christmas tree work, sells units with a 1.25-inch tooth gap. This is probably the best width.

#### Electric Saws

In the same experiment the generator was used to run a lightweight reciprocating electric saw for thinning, weeding and underpruning. The Wen and Skil Saws are typical examples.



These draw 300 to 500 watts, and can be fitted with blades of varying lengths and tooth patterns. They sell for around \$50. retail, and weigh six or seven pounds.

The one used in this test had a four-inch blade. It easily cut stems and branches up to three inches in diameter. A blade of six to eight inches should extend the cutting range to six inches without undue strain on the generator. Both the Wen and Skil saws, and possibly other types as well, as available through most of the larger hardware stores. In general, they are useful in Christmas tree work, but not as fast as the light-weight chain saws--which now weigh as little as six pounds.

#### Extension Cords

Cord length affects shearing efficiency, though not markedly. The shorter the cord, the more time will be spent in moving the generator, especially in wide-spaced stands. This lowers productivity. Therefore the cord should be at least 20 feet long. In situations where a longer cord is desired, a 40-foot, reel-mounted cord is on the market

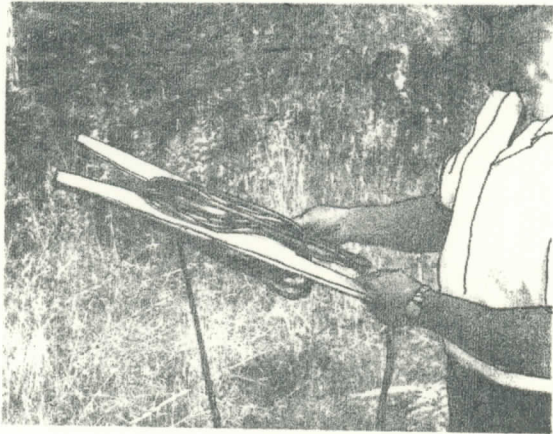


Fig. 5: Homemade Cord Winder (Nasco Limited). This cord has the valuable feature of rewinding automatically. A point to remember about extension cords is that the two-wire type is too light for Christmas tree work. The heavy three-wire kind is safer, and causes much less resistance in the line.