“Let’s Manage Some” Blue Ribbon Hardwoods No. 5
Michigan State University
Cooperative Extension Service
Natural Resources Series
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April 1969
8 pages

American basswood

Black cherry

Black walnut

Northern red oak

Sugar maple

White oak

Yellow birch

Yellow poplar

"LET'S MANAGE SOME"

BLUE RIBBON HARDWOODS

No. 5 of a Series

Extension Bulletin E 624
Natural Resources Series April 1969
Cooperative Extension Service
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TIMBER MANAGEMENT TERMS

Crop Tree — Selected tree of good form and potentially high commercial value, in which an investment is made to alter conditions to accelerate its development and growth beyond what could be expected under natural stand conditions, usually in the pole or large sapling size class.

Crown — Upper part of a tree, including the branches and their foliage.

Cull Tree — Tree that does not have, or cannot be expected to produce, at least one merchantable 12-foot sawlog.

D.B.H. — Diameter at breast height, 4½ feet above the ground.

Deformed Tree — Tree that has not, or will not, produce a 12-foot log; tree with a major defect in the bole which will make it susceptible to breakage before reaching merchantable size; tree leaning at such an angle (45° or more) that the top cannot obtain enough sunlight to maintain normal growth.

Dominant Tree — Tree with the crown extending above the general level of the crown cover, receiving full sunlight from above and some from the sides; larger than average tree in stand.

Logging Remnant — Cull tree left in the stand by previous loggers — too defective for harvest, yet taking valuable space.

Old Growth — Stand consisting mainly of mature and overmature trees, some of which have been essentially uninfluenced by human activity.

Pole Size Tree — Young tree, 4 to 11 inches in d.b.h.

Quality Tree — Desirable tree of a valuable species, of excellent form and free from degrading defects or damage.

Sapling — Young tree, 2 to 4 inches in d.b.h.

Seedling — Young tree grown from seed and less than 2 inches in diameter.

Stocking — Number of trees present in a stand as compared to the desirable number for optimum growth and management; thus, well-stocked (adequate number of trees), over-stocked (too many trees) and under-stocked (too few trees); usually expressed in number of trees per unit of area.

Suppressed Tree — Tree with the crown entirely below the general level of crown cover, receiving no direct light either from above or the side.

Timber Stand — Aggregation of trees occupying a specific area and sufficiently uniform in species composition, age, arrangement and condition so as to be distinguishable from the forest or other growth on an adjoining area.

Veneer Log — Log of sufficient size and minimum taper or defect which can be used to produce either rotary-cut or sliced veneer sheets; usually 16 inches or more in diameter.

Weed Tree — Tree of a species that will persist in a stand but is undesirable in terms of foreseeable management objectives.

Wolf Tree — Tree with a short, over-developed, widespread crown extending more than two-thirds of the way down the bole of the tree and occupying valuable growing space.

Let's Manage Some

BLUE RIBBON

Figure 1 — Under proper management, this young second-growth stand of northern hardwoods can supply much valuable veneer and sawlog material.

HARDWOODS

By Melvin R. Koelling
and Lester E. Bell

Figure 2 — Timber stand improvement practices should be initiated as soon as crop trees can be recognized. Crop trees in this stand are selected before beginning thinning operations.

Quality hardwood trees, which provide much of the raw material used in the production of valuable veneer, furniture and other quality wood products, are becoming increasingly difficult to obtain. Large, old-growth, natural stands are being depleted while many younger, second-growth trees have not reached sufficient size to provide large sawlog and veneer material. And, because of increasing demand from wood-using industries, many hardwood trees are cut before their full potential is attained.

Valuable hardwood species, like American basswood, black cherry, black walnut, northern red oak, sugar maple, white oak, yellow birch and yellow poplar are found on much of the forested land of Michigan (Fig. 1). These forest stands are generally well-stocked with young trees, seedlings, saplings and poles, which have grown since the lands were cut-over 40 to 50 years ago. Even though stocking of quality trees is generally good, many stands are too dense to allow maximum growth. Others contain weed trees, defective trees, logging remnants or low-value species which occupy growing space that could be utilized by more valuable trees. Too sparsely stocked stands waste growing space and result in limby trees with poor form.

Since much of our future supply of quality hardwood raw material must come from such forest stands, efficiency of production and potential value must be increased. This can be accomplished through the application of certain cultural practices. This publication, the fifth in a series on Blue Ribbon Hardwoods, describes some of the more important forest management practices which the forest land owner can apply to increase growth and value of existing hardwood stands.

CROP TREE SELECTION

Young stands of northern hardwoods respond very well to thinning based on selecting and releasing crop trees. Increased growth on the remaining trees following thinning is often 40 to 60 percent greater than on unreleased trees. This greatly increases their value since total growth on an area is placed on a smaller number of higher value trees.

Select Early

Each acre of woodland is capable of growing a given amount of wood each year. This growth may accumulate on quality trees, defective trees or trees of an inferior species. The earlier cultural operations

Figure 3 — Hardwood stand in which crop trees have been selected and released from competing trees which were cut for fuelwood. The value of the fuelwood was sufficient to pay for the cost of thinning.

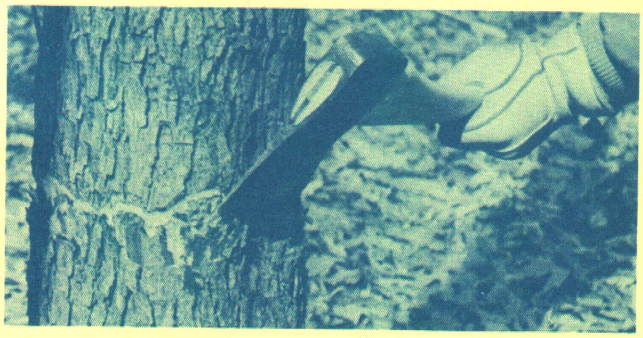


Figure 4 — To be effective, a girdle must completely sever the cambium around the entire tree. Girdled trees will usually die completely within one to two years.

are started in the life of the forest stand — by removing cull trees and selecting and releasing future crop trees — the shorter the time period to maturity.

Thinning should be started as soon as crop trees can be recognized (Fig. 2). This is usually possible when the forest stand reaches an average d.b.h. of three inches. Crop trees should be selected before any cutting or improvement operations are initiated. The best trees of the highest-valued species should be selected, with some thought given to proper spacing. All adjacent, competing trees can be eliminated by girdling, poisoning or cutting. Potential crop trees should occupy or be given an opportunity to occupy a dominant position in the stand. In addition, they

Figure 5 — Thinning a clump of black cherry trees. Smooth, sloping cuts should be made to reduce the likelihood of decay.

Figure 6 — Basal sprays of herbicides may also be used to kill undesirable trees. To be effective, the entire circumference of the lower 12 to 18 inches of the trunk must be saturated to the point of run-off.

should possess a relatively large crown, straight bole, be free of acute forks in the main stem and possess no major cull or defective material. Removal of vines and poorly formed, insect or disease-damaged trees and trees of low commercial value will provide more growing space, sunlight, moisture and nutrients for the selected trees. Thus, increased growth rates will be on selected trees of good quality, resulting in a considerable increase in the value of the remaining trees.

REMOVING UNWANTED TREES

Unwanted trees should be eliminated in the most economical, effective and safest method possible for the season of the year in which the work is being done.

Often, much of the material removed in timber stand improvement operations can be sold. Pulpwood, charcoal, chemical wood and fuel wood are frequently obtained when thinning hardwood stands (Fig. 3). If a market is not available or thinning products are not salable, it may be desirable and more economical to kill the trees without removing them from the forest stand. Several methods are available:

Girdling

A girdle must sever the cambium layer completely to insure a complete kill (Fig. 4). A girdled tree dies slowly and tends to come down in pieces, thereby doing less damage to the residual stand. Stump-sprouting from girdled trees is not a serious problem for northern hardwood species, especially trees over 10 inches in diameter. Girdling may be accomplished by using an ax, power girdler or chain saw.

Cutting

In addition to being more hazardous than girdling, felling trees with an ax or chain saw may be undesirable because of heavy slash accumulations on the ground. This is especially true in dense sapling or pole size stands. Felling can be advantageous for trees under three to four inches d.b.h., which can usually be felled faster and cheaper than they can be girdled, representing a savings in time (Fig. 5).

Herbicides

The use of growth-regulating chemicals to kill unwanted trees probably represents the fastest and most satisfactory way to improve hardwood timber stands through thinning. Several commercial "brushkillers", containing mixtures of 2,4-D and 2,4,5-T in an ester or amine form are available. Ammonium sulfamate or ammate can be used effectively during certain times of the year. Chemical thinning can also be readily accomplished by injecting cacodylic acid with a special hatchet or applying it in a girdle or frill.

Foliar sprays are quite effective on brush and younger trees. On larger trees up to four inches in diameter, basal sprays may be used satisfactorily (Fig. 6). The entire circumference of the lower 12 to 18 inches of the trunk and root collar is sprayed to the

Figure 7 — Liquid herbicides can be applied by equipment which creates a frill and applies the herbicide in one simultaneous operation. The active ingredient being used at left is 2,4,5-T while cacodylic acid is being applied at right.

point of run-off. Basal sprays can be used effectively to treat fresh cut stumps and prevent sprouting if the stump is sprayed immediately after cutting.

On trees larger than four inches in diameter, herbicides may be applied on frills around the circumference of the tree. Hand-operated equipment is available to create the frill and apply the herbicide in one simultaneous operation (Fig. 7). Control may also be obtained by applying some of the herbicide solution in ax or chain saw frills.

CROP TREES PER ACRE

Normally, a stand is stocked sufficiently to permit development of good crop trees when there are at least 40 trees per acre. If particularly high-value species, such as black cherry, black walnut and yellow poplar are present, fewer trees may be selected. In fact, with black walnut, selection and intensive care of single trees is often desirable and highly profitable.

Figure 8 — Young black walnut pruned to a height of approximately 17 feet. Research has shown that pruning the bole up to 50 percent of its total height will greatly increase quality without affecting rate of growth.

The maximum number of crop trees to select per acre varies for each species, depending on size, soil conditions and the market for wood products obtained in thinning and improvement cutting operations. Fewer crop trees should be selected in a stand with an average diameter of 12 inches than in a stand with an average diameter of six inches. Likewise, more trees can be left per acre when the forest stand is growing on well drained, productive soils than when growing on poorly drained, infertile soils. If a market is available for products removed in thinning and improvement cutting operations, extra crop trees may be retained when initial selections are made. In subsequent years, these can be removed in successive preharvest cuts to the number of crop trees which will be carried to maturity. In such cuts, the choicest, best-formed trees are usually left for a final crop tree harvest for veneer or high grade sawlogs.

SPACE AMONG CROP TREES

As discussed previously, the amount of growing space given each selected crop tree will vary with the diameter of the tree. A simple formula which may be used to determine spacing distance among trees:

d = 1.67 x d.b.h.

d = spacing distance between trees in feet

d.b.h. = diameter at breast height in inches

Using this formula, the following table has been prepared to indicate proper spacing for crop trees of varying diameters.

D.B.H. of Selected Crop Tree (Inches)	Space From Tree To Adjacent Tree (Feet)	Approximate Number of Crop Trees Per Acre
3	5.0	1742
4	6.7	970
5	8.4	617
6	10.0	435
7	11.7	318
8	13.4	243
9	15.0	194
10	16.7	156
11	18.4	129
12	20.0	109
13	21.7	93
14	23.4	80
15	25.0	70

These values represent an ideal spatial arrangement which in actual practice may be difficult to achieve. Individual tree characteristics and position within the stand often necessitate other spacing arrangements. However, attempts should be made to maintain an optimum distribution whenever possible.

All selected crop trees within a forest stand will not be of the same size, nor will they remain in the same size class in relationship to each other after their selection. Differences in species and site conditions will result in growth rate variations and consequently tree size. This is a desirable condition since most of the Blue Ribbon Hardwoods respond well to management under an uneven-aged, mixed-stand, forest condition. In addition to favoring reproduction and early seedling growth, uneven-aged management provides the farmer or small landowner with periodic instead of infrequent harvest and thus, more frequent financial returns.

To bring about an uneven-aged condition, crop trees of varying sizes should be selected. As the trees increase in size, subsequent cuttings will be necessary to maintain proper growing space among crop trees. In other words, the larger the tree, the more room it needs to grow. These cuttings can do much to achieve an uneven-aged stand through regulation of stand density, size distribution, and reproduction encouragement of desirable species.

For hardwood management on large commercial or industrial tracts, even-aged management is often practical. This is primarily the result of a uniform tree size distribution in second-growth stands, which allows for a more fully mechanized operation and creates an economic savings. Such operations are usually integrated so that utilization of small size and low quality material is obtained. Particular emphasis must be given to promoting regeneration with desirable species in even-age management.

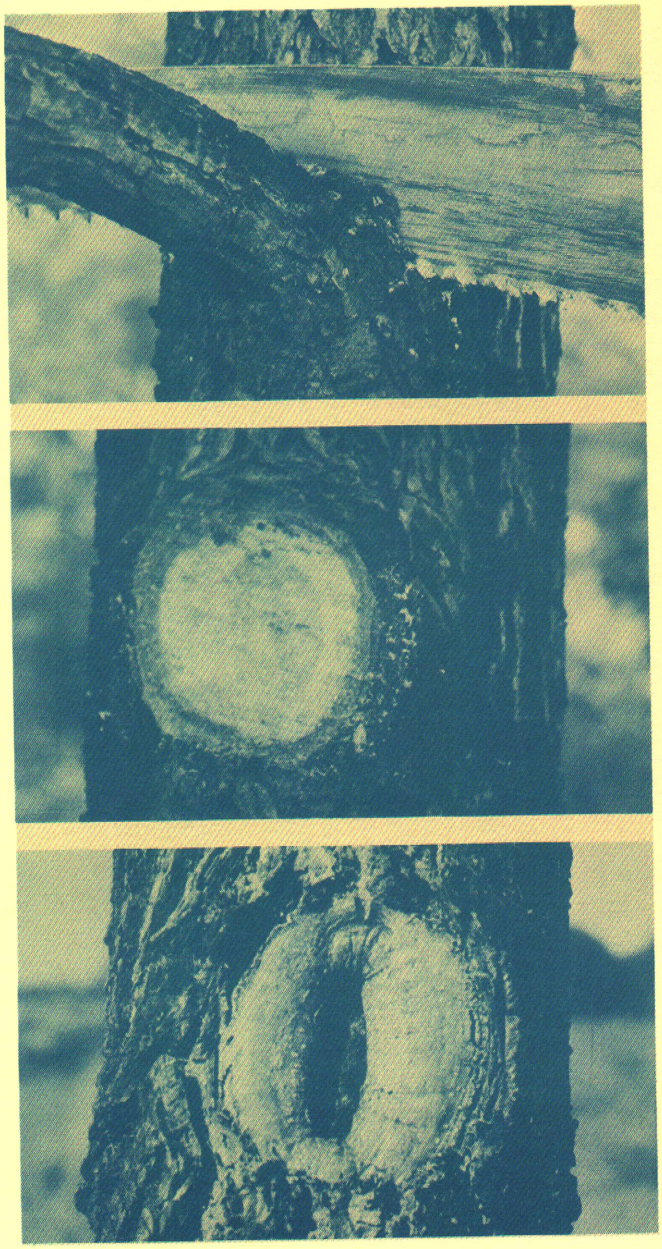
PRUNING TO INCREASE VALUE

To produce high quality sawlog and veneer log material, all limbs should be removed from the lower bole of selected crop trees. Research studies have shown that pruning the bole of the tree up to 50 percent of its total height will improve the quality of the wood produced without reducing either height or diameter growth (Fig. 8).

The time necessary for healing of the limb scars is closely related to the size of the scar and the growth rate of the tree. Scars from live-limbs heal faster than similar sized scars on dead limbs. Scars from trees released from competing growth heal faster than scars on trees not released. The faster the growth rate, the more rapidly scars will heal.

All pruning should be done with a pruning saw which leaves an oval-shaped cut, flush with the stem of the tree (Fig. 9). Live-limb scars, less than one inch in diameter will normally heal completely within two to three years. When pruning dead limbs, the cut should be made closely enough to slightly injure the live tissue surrounding the limb. This will stimulate callous formation and bring about more rapid healing.

Figure 9 — Careful pruning will encourage rapid healing and increase bole quality. Pruning cut made flush with main bole (top), results in minimum wounding to the bole (center), which may be nearly healed after two years on thrifty tree (bottom).



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Blue Ribbon Trees is a promotional and educational program sponsored by Michigan State University, the Michigan Department of Natural Resources and related forest industries to encourage commercial production of high quality hardwood trees.

FOR ADDITIONAL ASSISTANCE

In working with Blue Ribbon Hardwoods you may need additional help; if you do, contact the following:

For educational assistance:

— Your local County Extension Director — Cooperative Extension Service

For on the ground forestry advice:

— Your local Area Forester — Michigan Department of Natural Resources

For soils work or site selection:

— Your local Soil Conservationist — County Soil Conservation District — U.S. Soil Conservation Service

For financial assistance:

— Your local county office of the Agricultural Stabilization Committee — Agricultural Conservation Program

For information on forestry and tree farming:

— Extension Forester, Cooperative Extension Service, Michigan State University, East Lansing, Michigan 48823

— The American Forest Institute, 1835 K Street, N.W., Washington, D.C. 20036

— The Fine Hardwoods Association, 666 North Lake Shore Drive, Chicago, Illinois 60611

— The American Walnut Manufacturers Association, 666 North Lake Shore Drive, Chicago, Illinois 60611

Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U. S. Department of Agriculture. George S. McIntyre, Director, Cooperative Extension Service, Michigan State University, E. Lansing, Mich. 48823.

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