

Maine Non-industrial Private Landowner Practices Crop Tree Management

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Brooks Mills, a forest landowner with about 440 acres near Holden, Maine, visualizes a veneer tree in each of his 2-in and larger selected crop trees. A long time and vigorous advocate of crop tree management, Brooks is a strong believer in (1) identifying crop trees at an early age; 2) numbering with paint to allow subsequent measurements of diameter growth, and marking at breast height (approximately 4.5 feet) with bars of paint to facilitate layout of yarding trails and help minimize logging damage; 3) weeding around them to remove competitors especially less desirable species such as red maple and American beech; 4) pruning side branches with a hand clipper early and pruning saw later, but still retaining a 60 percent live crown ratio or greater for good growth; and 5) thinning them as appropriate when the crowns touch in advancing age. Brooks' density goal is to eventually support 75-100 crop trees per acre at a 20-25 foot spacing between trees.

Identifying crop trees occurs in stands as young as 10-15 years, and perhaps 15 feet tall. It is very important to locate these trees and weed around them at an early age. In a recent tour of Brooks' property by the Small Woodlot Owners Association of Maine (or SWOAM), a marked and weeded red oak crop tree of about 4 inches diameter at breast height (dbh) was contrasted with nearby oak saplings there were unmarked and unweeded during the initial crop tree identification process. The vigor of these latter trees was markedly less than in the marked crop tree, and they were smaller emphasizing the importance of identifying and weeding these trees early. Competing trees are weeded out using



Caption: Field tour of Brooks Mills' woodlot near Holden, Maine.

a small saw or scouring tool to girdle the tree (see photos below).



Caption: Release of competing and/or less desirable species by hand saws and scouring device.

Pruning these young trees at this early age is also important in developing the desired characteristics of an eventual veneer tree (see photo below). Quality can be greatly increased if the branches can be pruned off as early as possible; between 4 and 6 inches is a good time to begin with hand snips.



Caption: Brooks Mills prunes a young crop tree on his Holden, Maine woodlot.

These pruning activities are continued as the crop tree grows and matures using a pole saw and even a ladder to reach as high as allowable (see photos below). Ladders are especially useful in pruning softwoods where twelve foot or longer logs are preferred.



Caption: Silky saws for pruning trees (Insert showing saw teeth). (Photos by SWOAM).

In addition to weeding and pruning, Brooks Mills thins around his selected crop trees to remove poorer quality trees, which he sells for profit as firewood and pulpwood. Some mature trees may be harvested at the same time as his thinning activities to make the entire operation more economical. Brooks conducts his harvests with a 4x4 tractor with logging winch, loader bucket and forks. He trucks his firewood, short length pulpwood, and logs with a one-ton dump truck. As an example of Brooks' returns from the use of this equipment to harvest and process wood plus federal cost-sharing, an initial investment of \$2000 to purchase a 63 acre woodlot in 1969 resulted in stumpage returns of over \$18,000 since 1978, and \$3800 in cost sharing for stand improvements and water bar installation. This resulted in a grand total of \$21,8000 or an eleven-fold return on the original investment.

Brooks currently has over 2000 trees that have been measured for growth. His interest in tree growth and annual rate of return on his crop trees has led to his collaboration with Neil Lamson, formerly a silviculturist with the Northeastern Area State & Private Forestry, in publication of "Bantic – The Brooks and Neil Tree Investment Chart" (see sidebar article below).

Bantic- The Brooks and Neil Tree Investment Chart

By Brooks Mills and Neil Lamson

“The Brooks and Neil Tree Investment Chart (BANTIC) is a Microsoft Excel spreadsheet that computes the volume, value, and annual rate of return of standing trees. The user enters current log prices by top end diameter (dib) and grade (2, 3, 4 clear faces). The spreadsheet automatically computes volume, value, and annual rate of return for trees from 10 to 30 inches diameter breast height (DBH) having logs with 2, 3, and 4 clear faces (CF). The user can create a separate sheet for any number of species by using the COPY SHEET feature in Excel. The spreadsheet uses the International 1/4-inch volume table to compute volume; however, the user can enter any desired volume table for 10-foot logs and the spreadsheet will use those volumes.

BANTIC computes volume and value of the first two 10-foot logs in the tree. Ten feet is commonly the minimum length for veneer log specification, thus it becomes the shortest length log that can bring the premium veneer log prices. Most hardwood trees contain very little, if any, quality sawtimber or veneer above 20 feet. Also for hardwood trees that contain veneer logs, most of the value is contained in the butt 20 feet. Including the value of logs above 20 feet would not increase the value substantially and would not change the rate of return.

BANTIC has three applications: determining financial maturity, calculating stand value, and evaluating cultural treatments. The rate of return calculations can be used to determine when to cut trees that are financially mature. The user simply compares the rate of return found in BANTIC to an alternative rate of return. Stand value can be estimated from stand inventories by using the values for various species computed by BANTIC. BANTIC can also be used to evaluate cultural treatments. For example, consider the cost of removing low value trees from a sawlog-sized hardwood stand that would result in increasing the residual tree growth rate from 2 inches in 10 year to 2 inches in 5 years. Data from an inventory of the stand could be used to compute the treated and untreated future stand values and evaluate the profitability of the treatment.”

Ultimately, the mature crop tree is the goal of Brooks' management activities (see photos below). Brooks defines a crop tree as:

- 1) High valued tree species that enjoys good market demand for saw and veneer quality logs. In Maine, this applies to red oak, sugar maple, yellow and white birch, white ash, big-tooth aspen, and also can include red maple, basswood, beech, butternut and black cherry. Softwoods especially white pine and red spruce are also good crop trees.
- 2) A vigorous tree in the dominant or codominant crown class for less shade tolerant species such as white birch, white ash, big tooth aspen, butternut, and black cherry. More tolerant trees can also be brought along from more suppressed conditions if no better quality trees are nearby.
- 3) A tree with a straight and relatively defect free trunk that will produce one or more 10 foot logs with 2, 3, or 4 clear faces (prefer 12 feet or longer for softwoods).
- 4) A tree species best suited to the site so it will develop well.



Caption: Hardwood and softwood crop trees on Brooks Mills woodlot near Holden, Maine.

Brooks Mills is determined to manage his woodlands wisely and to pass on management responsibility to his son, John, who is a consultant forester in Maine. Brooks summarizes his forest management objectives as follows:

- 1) We are building a quality forest one individual crop tree at a time.
- 2) We do it by cutting what everyone else generally leaves (low value trees) and leaving what everyone else cuts (high value trees).
- 3) High value trees should be cut when they are slow growing and mature, showing defects, or a sudden slowdown in growth rate, or when their removal will help one or more nearby trees with greater potential value. This harvest will sweeten the value of the cut and the openings created start the forest cycle again.
- 4) We try not to lose sight of our potential crop trees despite the rest of the forest around it.
- 5) Since a tree is always worth more as a seed source than anything else, we try to take advantage of that, for a tree can always be harvested after the regeneration is established.

In conclusion, long-term forest management is a watchword for Brooks Mills. Existing crop trees on his woodlands are symbols of what Brooks wants to produce on a continuing basis. Brooks serves as a model for other landowners desirous of practicing sound stewardship on their woodlands.