EXTENSION NOTES

Ontario

MANAGING YOUNG HARDWOOD STANDS FOR SAWLOG PRODUCTION

Careful management of young hardwood stands can greatly increase the future value of trees for sale as sawlogs. This extension note provides detailed information on managing even-aged stands of 20 to 60-year-old trees for sawlog production.

THE MANAGEMENT PROCESS

The goal of the management process is to produce trees that have long, straight stems without branches for the lower five to 10 metres of their length at maturity and are free of defects.

The management process for young stands involves three key steps:

1. SELECTING CROP TREES

The first step in managing young hardwood stands for sawlogs is to select and mark your crop trees. Sawlog crop trees are trees that are grown as an investment for the future. They are usually species of high value, such as oak, ash, maple, basswood, cherry or yellow birch. However, any species that is well adapted to site and stand conditions can be managed for sawlog production.

2. RELEASING THE STAND

Releasing means thinning a stand to give crop trees room to grow by removing trees that would compete with crop trees for water, nutrients and sunlight. Through natural competition, vigorous trees suppress smaller trees, causing them to die before they are large enough to harvest for sawlogs. As a result, of the over 10,000 trees that begin to grow in a hectare of naturally regenerated forest, less than 1,000 may survive to maturity.

Thinning allows larger, more valuable trees to grow to a commercial size in less time. Thinning also promotes the overall health of the stand by removing defective or diseased trees.

Stands are released in an initial thinning and again every 10 to 15 years until they are of marketable size.

Care must be taken not to thin too much. Some competition with other trees is needed to encourage the growth of tall, straight, unforked stems, and to inhibit

the growth of lower branches. If too many trees are removed, new branches may sprout along the stems of the remaining trees, reducing commercial value. Trees removed during thinnings can often be used for fuelwood, poles and other wood products.

3. HARVESTING SAWLOGS

Once your trees have reached commercial size, they can be sold as sawlogs. The length of time it takes to reach commercial size depends on the species of trees, the site conditions and the market.

SELECTING CROP TREES

Select and mark the trees that will be your crop trees. When possible, select crop trees of several different species to maintain the diversity of the stand.

Choose trees of the desired species that have the following characteristics:

- Healthy — free of defects and disease
- Tall and straight
- Dominant (see Figure 2)
- One third of the total height of the tree is live crown
- Relatively small branches when young
- Few or no branches on the lower portions as they mature
- Vigourous growth

Reject trees that have:

- Stem defects such as seams, cracks or crooks
- Permanent insect damage, such as maple borer wounds
- Diseases — obvious cankers or conks (see Figure 3)
- Major forks in the main stem
- Wounds or scars on the stem or exposed roots
- Poorly healed branch stubs (see Figure 3)

Steps for selecting and marking crop trees

1. Start 10 to 20 metres into the stand or from the property line. This leaves an uncut buffer around the edge of the stand to provide shelter and additional wildlife habitat.

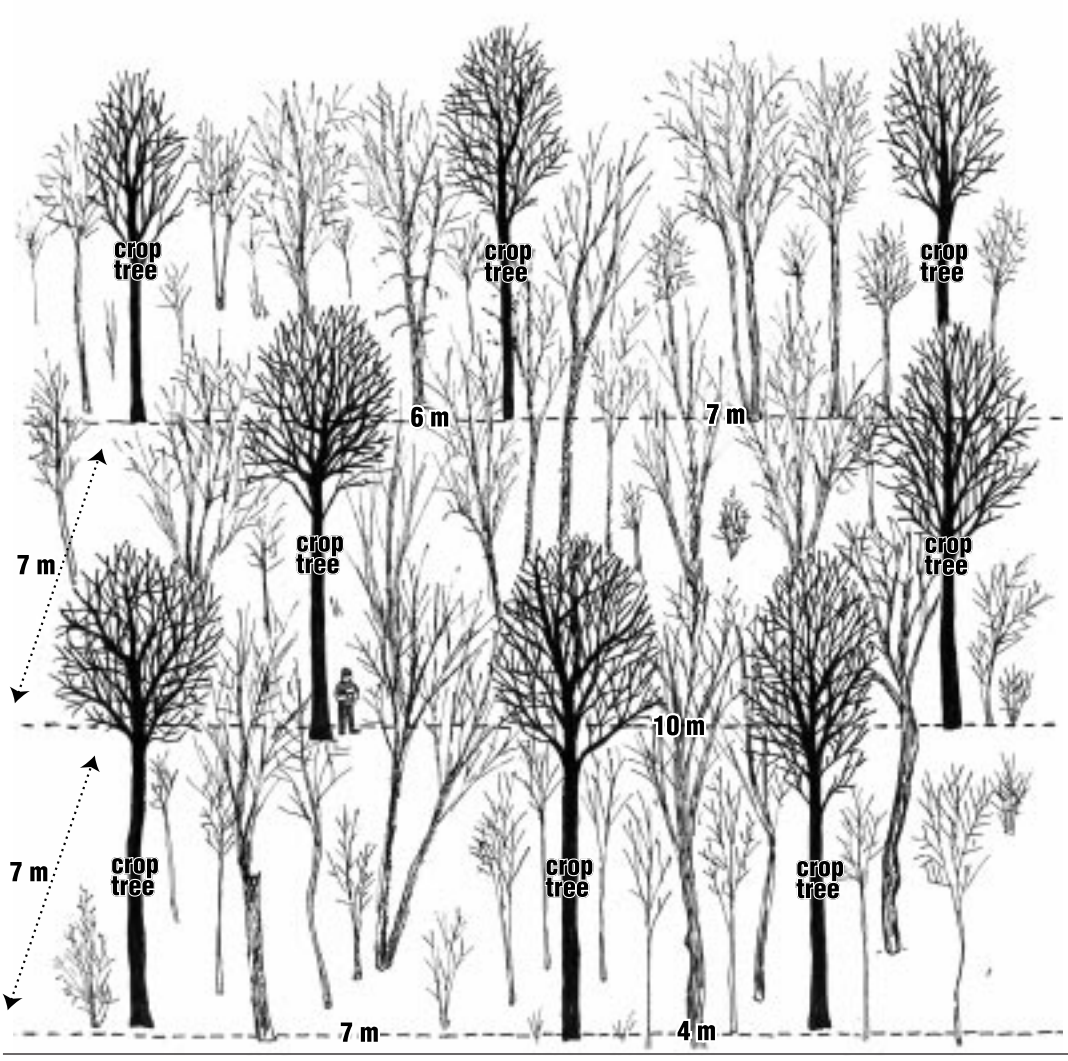


Figure 1 — As you walk through the forest, try to pick trees that are about seven metres apart. Give priority to picking high quality crop trees, rather than picking trees that are exactly seven metres apart.

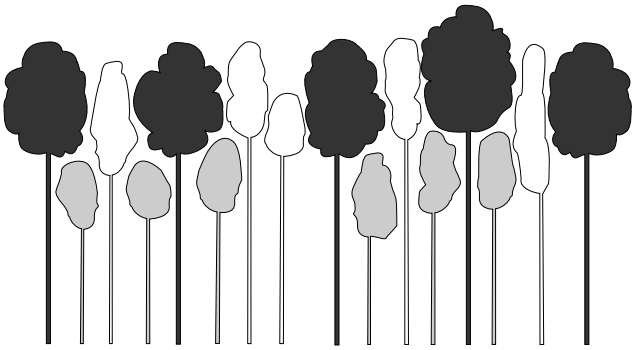


Figure 2 — Dominant trees (indicated by a dark colour in this illustration) are the tallest, most vigorous trees in the stand. The crowns of dominant trees get the most sunlight, allowing dominant trees to suppress the growth of neighbouring trees. Dominant trees make the best crop trees.

Figure 3 — Trees with conks (dish shaped fungal growths), poorly healed branch stubs and cankers (wounds) should not be chosen as crop trees.

2. Evaluate the trees nearest you. Select a crop tree and identify it by tying a ribbon around it at breast height, or by using a spot of paint. Blue is the standard colour for crop trees in Ontario.

3. Pace about seven metres along a line parallel to the edge of the stand or property line. Mark the closest crop tree within a 1.5 to two-metre circle from where you stop. If there are no high quality trees within the circle, pick the best tree you see or move a little farther along until you find a good crop tree.

4. Follow this procedure until you reach the far end of the stand. Then, return along a second line about seven metres from, and parallel to, the first line.

5. Continue selecting crop trees until you have selected trees throughout the entire area.

In general, try to pick crop trees that are about seven metres apart. Sometimes, two high quality crop trees should be left close together (less than five metres), while others may be up to ten metres apart. This is because crop tree quality is more important than spacing.

RELEASING CROP TREES

Fine-branched species, such as yellow birch and black cherry, are thinned when the crowns of neighbouring trees begin to touch each other. This usually occurs when stands are 15 to 25 years old and stems reach an average diameter of 15 centimetres. In addition to giving the crop trees room to grow, thinning prevents damage caused by branches whipping each other in high winds. It also helps trees to develop crowns that are greater than 30 percent of their total height.

Do not thin coarse-branched species, such as maples, oaks and ashes, until they are 25 to 40 years old, or about 20 centimetres in diameter. If released too early, they can develop persistent lower branches that reduce the portion of the stem that can be sold as a sawlog.

Thin a stand until it is close to the stocking levels recommended in Table 1. From this table you can see that 835 trees a hectare is the best stocking level for a hardwood stand with an average stem diameter of 15 centimetres. Of those trees, 200 to 220 should be crop trees.

To thin a stand with a mixture of species, follow this procedure:

1. Cut all trees that were not selected as crop trees that have crowns in the main canopy that are touching the crown of a crop tree. If two crop trees are close together, consider their crowns to be one, and release them as if they were one tree.

2. Cut unhealthy, low quality, leaning, forked or cankered trees between the crop trees to reach the desired stocking level as outlined in Table 1. However, don't thin where the stand is already sparsely stocked.

3. Thin dense pockets of stems of roughly equal quality. Retain those with the best developed crowns, particularly fine branched species such as black cherry and yellow birch.

   Sometimes you may leave one or two neighbouring trees when you are trying to correct a small fork or branch of less than five centimetres in the main stem of a crop tree. These neighbouring trees can be removed in the next thinning.

Older stands of all species with average stem diameters greater than 25 centimetres are approaching the size needed for commercial sawlogs. At this age, they may not benefit from the thinning procedures for managing young stands outlined in this extension note. Before cutting stands of older trees, talk to local forestry consultants or experts at your local office of the Ministry of Natural Resources. They can help select the trees to cut and those to leave growing for the future.

HARVESTING

Work safely in your woodlot. Using a chainsaw is hard, dangerous work. Falling trees and dead branches are hazards you should guard against.

When releasing crop trees, be sure not to damage any of the trees that are left standing with equipment or trees that are being removed. Stem wounds caused by swinging logs, tractors, cables and falling trees can allow infection to occur.

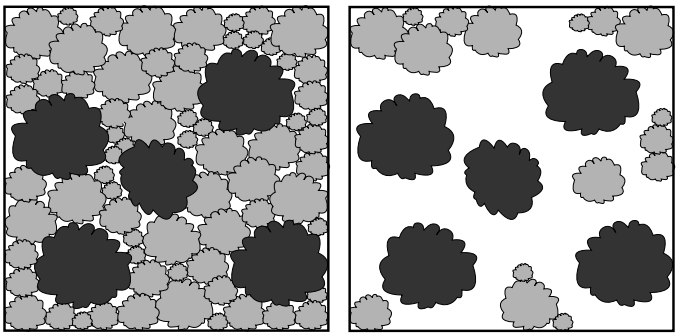
The best times to harvest are in the late summer, fall and winter. Never harvest from the middle of March to the end of July. During this period, the bark of hardwoods can be easily knocked off and your site may be damaged by heavy equipment. This is also the most important nesting period for birds, and logging operations will disturb them.

NEXT STEPS

Depending on the quality of the site, the stocking level and the growth and health of the trees, you should thin the stand every 10 to 15 years until the average stem diameter reaches 25 to 35 centimetres.

Because larger trees require more growing space, the second thinning should reduce the total number of trees in the stand to 230 to 390 a hectare. About 140 to 180 of those trees should be crop trees that are 7.5 to 8.5 metres apart. At this stage, each crop tree is usually released from only two competitors in the main canopy (that is, on two sides). Retain some neighbouring trees for their potential to produce at least medium quality sawlogs. Remove unhealthy or undesirable species, but maintain the recommended stocking levels.

As your trees reach maturity, consult with a local forestry consultant or the Ministry of Natural Resources for assistance with managing and harvesting older stands.



The illustration at left is an aerial view of the stand before the crop trees have been released. The crop trees are the dominant trees with large crowns. The illustration on the right shows the same stand after it has been released. The only trees that were removed were trees that had crowns in the canopy that touched the crowns of crop trees. Leaving some non-crop trees to grow is needed to maintain the best stocking level in the stand (see Table 1) and to ensure a supply of new crop trees in the future.

TABLE 1
STOCKING GUIDE FOR EVEN-AGED HARDWOOD STANDS

Average Stem Diameter 1.3 m Above the Ground (centimetres)	Number of Crop Trees per Hectare	Total Number of Trees per Hectare	
		Average	Maximum
15	200 to 220	835	920
17	"	720	790
19	"	600	670
21	"	515	570
23	"	450	500
25	"	390	425
27	140 to 180	355	390
29	"	315	350
31	"	290	320
33	"	260	290
35	"	230	260

Further reading:

A Silvicultural Guide for the Tolerant Hardwoods Working Group in Ontario. Science and Technology Series, Vol. 7. MNR 1990. ISBN 0-7729-6939-6

A Tree Marking Guide for the Tolerant Hardwoods Working Group in Ontario. Science and Technology Series, Vol. 8. OMNR 1993. ISBN 0-7778-0133-2

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