

Crop Tree Management

Quick Reference



Crop Tree Management can produce multiple forest benefits for landowners and society. It is a means of accomplishing stewardship goals on the private, non-industrial forest.



United States
Department of
Agriculture



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Quick Reference

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What is Crop Tree Management?

Crop Tree Management is a system of forest resources management that offers private, non-industrial forestland owners a means of accomplishing single or multiple stewardship goals. It focuses on releasing individual trees that have been selected to produce benefits consistent with stand-specific objectives. This system is based on application of the crown-touching release technique researched and developed by the Timber Management Research Project at the Fernow Experimental Forest near Parsons, WV (See Figures 5, 6, and fold-out). The two figures that follow convey the growth that can be obtained with the Crop Tree Management System.

Species	Growth in Inches per Decade
Yellow-Poplar	3.5
Red Oak	3.5
Black Cherry	2.8
White Oak	2.6
Chestnut Oak	1.8

Figure 1. Research results from the Fernow give an indication of how trees on good growing sites respond to a crown-touching release.

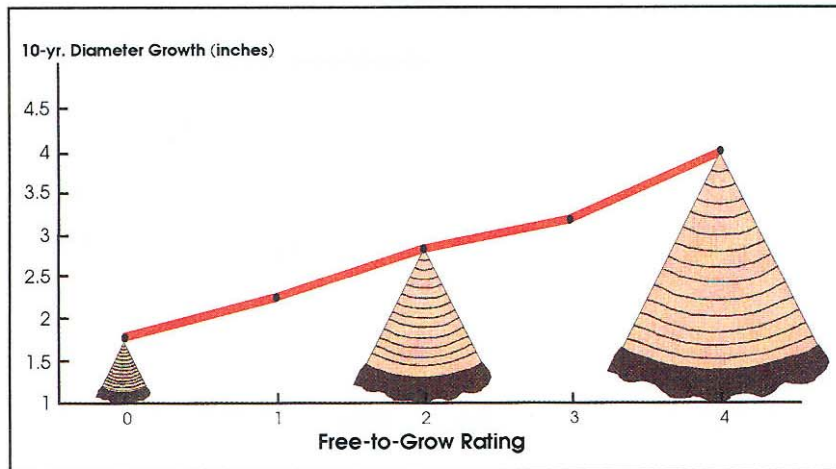


Figure 2. This chart shows the dramatic difference a complete crown-touching release makes in the growth of crop trees. Represented here is the 10-year diameter growth in inches for the 20 best crop trees per acre in a 54-year-old stand.

Crop Tree Management Seven-Step Process

Step 1

Identify Landowner's Property Goals

Step 2

Establish Stand-Specific Objectives

Step 3

Develop Crop Tree Selection Criteria

Step 4

Inventory the Property

Step 5

Explain Proposed Treatment to Landowner

Step 6

Decide Number/Acre of Crop Trees to Release

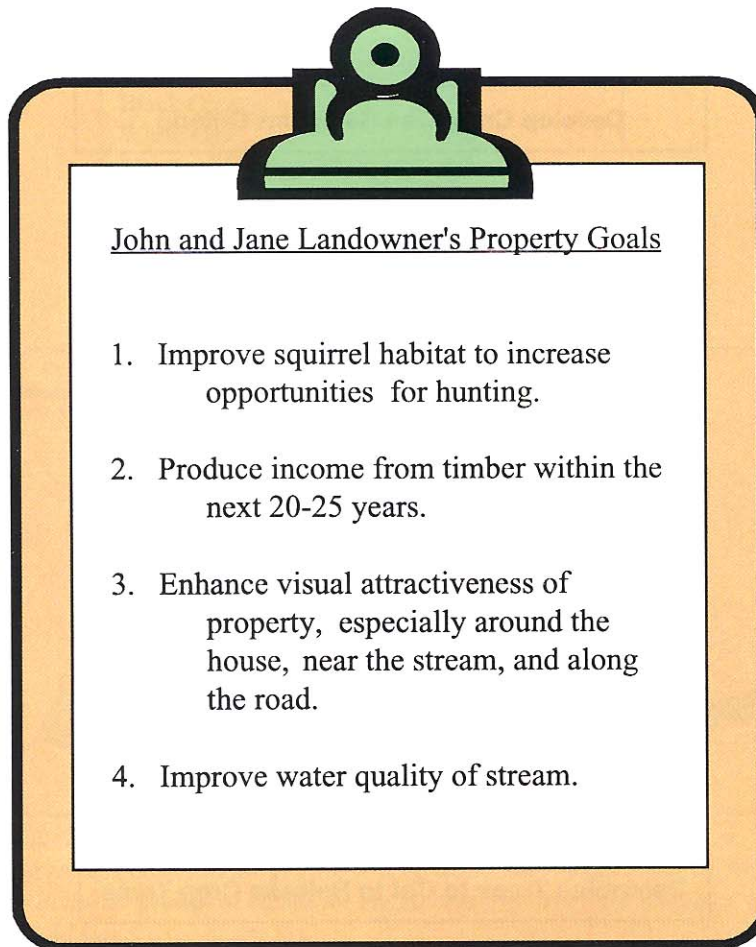
Step 7

Determine Trees to Cut to Release Crop Trees

Step 1

Identify Landowner's Property Goals.

Talking with landowners to discover their interests helps you to develop a management plan that will satisfy their needs. Ask questions to determine property goals. You might even suggest some possibilities and explain how current and future benefits could be obtained. Because clear communication between you and the landowner is vital, avoid use of technical forestry terms. Use plain English to explain the benefits of forest management.



Step 2

Establish Stand-Specific Objectives to define how each stand will be managed to meet the landowner's overall property goals.

Stand: A

Type: Oak-hickory

1. Increase production of winter-storable food for squirrels.
2. Provide shelter for squirrels.
3. Accelerate the growth of potentially high-value crop trees so they will be financially mature in 20-25 years.

Stand: B

Type: Northern Hardwood

1. Increase production of winter-storable food for squirrels.
2. Provide shelter for squirrels.
3. Increase the amount of attractive fall foliage that is visible from the house, stream, and road.
4. Increase the effectiveness of the riparian zone as a nutrient filter that reduces non-point source pollution.

Step 3

Develop Crop Tree Selection Criteria.

Once you have established the stand-specific objectives, develop selection criteria for each crop tree category. Use these criteria to guide your selection of crop trees. You will sometimes find trees that meet multiple crop tree selection criteria, which makes them very desirable choices for management.

Sample Crop Tree Selection Criteria for John and Jane Landowner's Property

Wildlife

Mast-Producing Trees:

Dominant/Codominant trees

- large, healthy crown

Hard-mast producers

Cavity Trees:

Any species, size class, and crown position OK

Timber

Dominant/Codominant trees at least 25 feet tall

- large, healthy crown
- no dead, upper-crown branches
- stump sprouts OK
- u-shaped connections OK

High-quality trees

Aesthetic

Species that produce colorful foliage and attractive flowers

- large, healthy crown
- some dead, upper-crown branches OK
- stump sprouts OK
- understory trees OK

Near house, stream, and road

Water Quality

Dominant/Codominant trees

- large, healthy crown
- some dead, upper-crown branches OK
- stump sprouts OK

Species that are good nutrient accumulators

- young trees

Step 5

Explain the Proposed Treatment to the Landowner.

Proposed Treatment for Stand A

1. Release 15 hard-mast producing wildlife crop trees per acre, 10 of which also qualify as timber crop trees. Choose a variety of species with large, healthy crowns.
2. Retain all actively-used squirrel den trees (look for scratch/chew marks), and retain two additional trees per acre with the best potential to develop into den trees.
3. Release 15 additional timber crop trees (total of 30 crop trees released per acre).

Establish a few one-fifth-acre plots. Select crop trees on these plots and temporarily identify them with a band of brightly colored flagging. Explain to the landowner how these crop trees will meet the property goals. After you have talked about the ribboned crop trees, walk around the plots again. This time, identify (with a contrasting color of flagging) all of the trees that need to be removed to fully release the crop trees. Be sure to explain that only the trees in direct competition with the crop trees will be removed; those with crowns that do not touch the crop trees will remain in the stand.

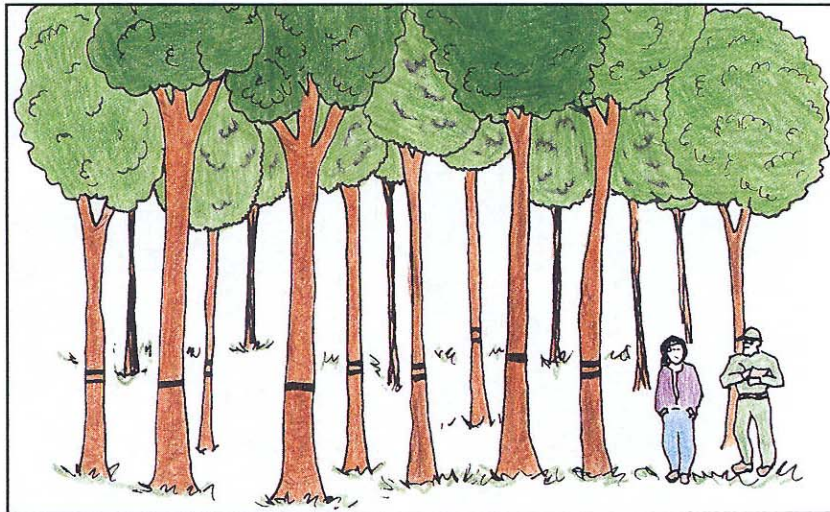


Figure 3. Helping the landowner visualize the proposed treatment on a small scale is the best way to get your client's feedback. Here, the crop trees are identified with one band of ribbon, and the trees to be cut are double banded. If adjustments need to be made, now is the time to do so.

Step 6

Decide How Many Crop Trees to Release per Acre.

The number of crop trees to release per acre depends on how many trees meet the selection criteria and how many the landowner wants to release. If you inventory the property and find 30 trees per acre that meet the crop tree selection criteria, but the landowner wants to release only 20 per acre, then you must drop 10 per acre of your initial choices from consideration. Adjust the intensity of cutting by adjusting the number of crop trees selected for release.

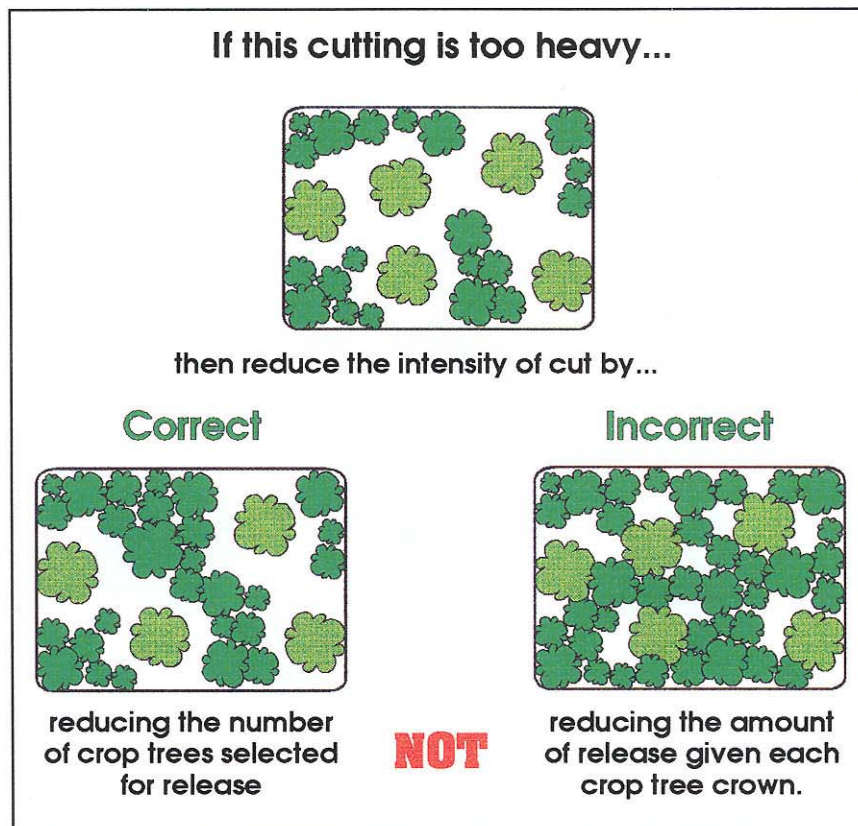


Figure 4. If the landowner indicates that a lighter cutting is desired, adjust the intensity of cutting by releasing fewer crop trees. Don't be tempted to compromise the system by selecting more crop trees than you can fully release.

Step 7

Decide Which Trees to Cut to Release the Crop Trees.

To determine which trees must be removed to release a crop tree, simply look up into the crop tree crown and envision it divided into four separate quadrants, or sides. Evaluate each of these four sides for interference from neighboring crowns. A crop tree that has only one or two feet between its crown and a neighboring crown is not free to grow in that quadrant. If there is doubt about whether an adjacent tree is touching and competing, cut it.

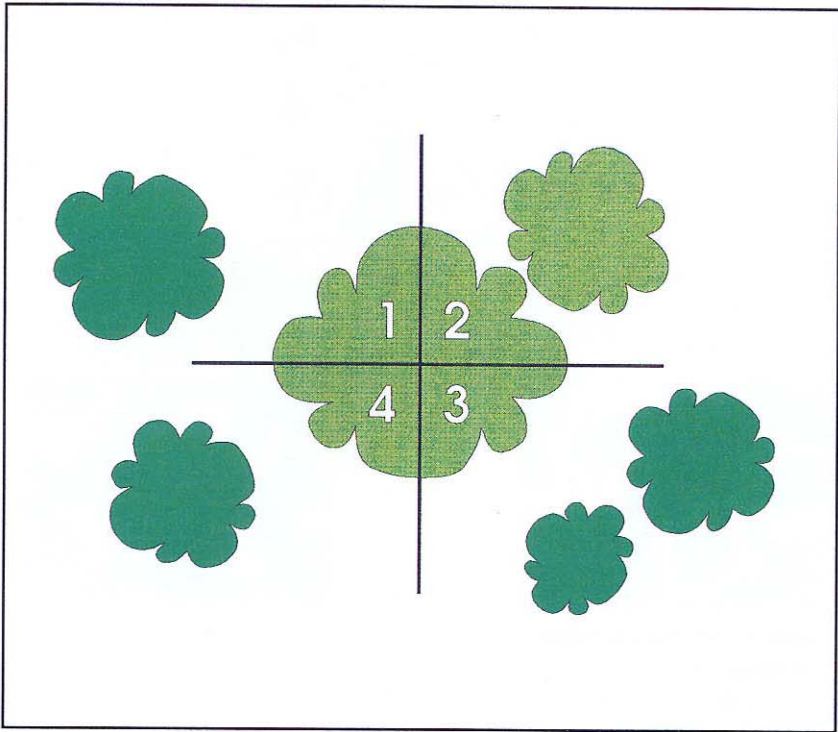


Figure 5. The crop tree crown in the center of this illustration has been separated into four quadrants, or sides. A free-to-grow rating is determined by evaluating each side for competition from neighboring crowns. This crop tree is free to grow on three sides.

A crown-touching release essentially involves removal of all trees with crowns that interfere with, or touch, the crop tree. However, in the event of two crop trees occurring close together with adjoining crowns, it is acceptable to consider the two as one crown, and then release fully around the dual crown. This means the two crop trees each receive a three-sided release rather than a four-sided release, as otherwise recommended.

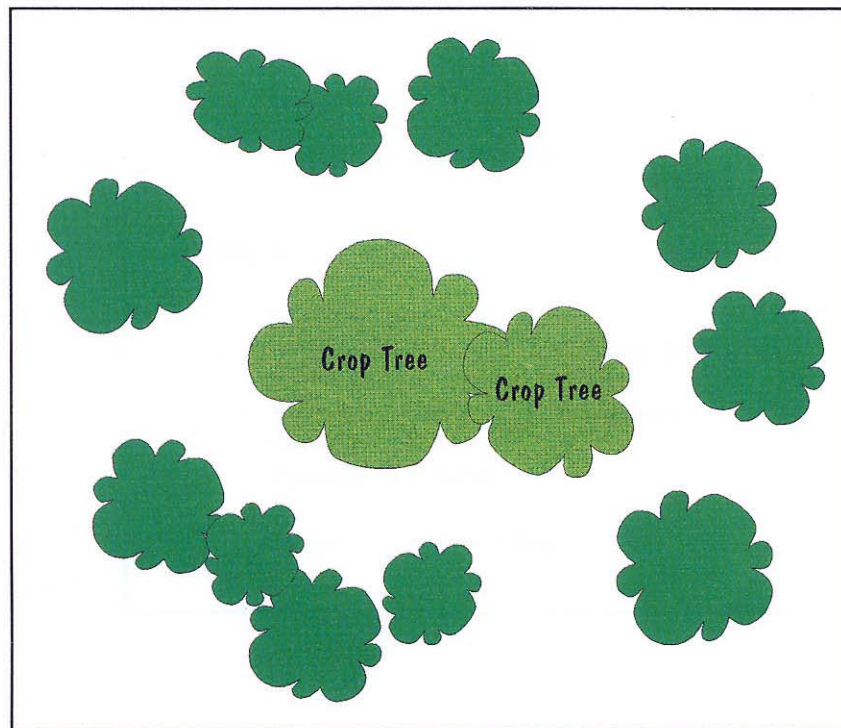
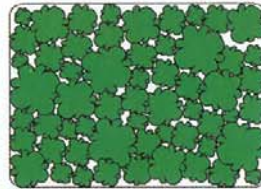


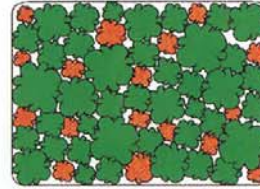
Figure 6. The only exception to the four-sided crown-touching release rule is the occurrence of two crop trees with adjoining crowns. When this is the case, consider the two crop tree crowns as one, and release fully around the entire perimeter of the dual crown.

Area-Wide Thinning

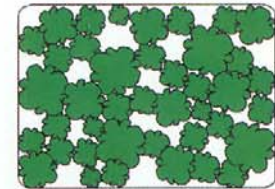
Crop Trees Selected



Cut Trees Marked

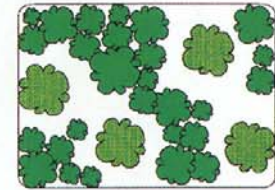
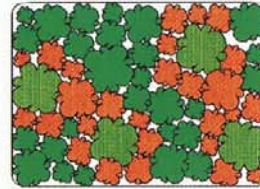
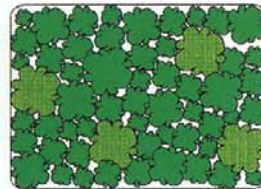


Cut Trees Removed

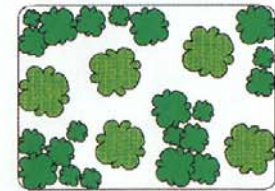
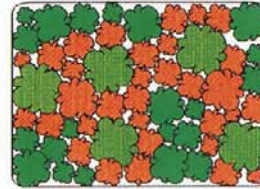
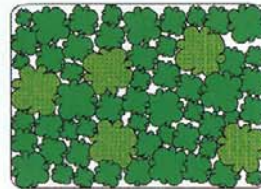


Crop Tree Management

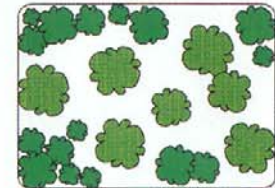
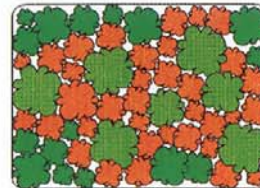
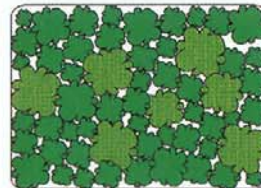
Minimum Number of Crop Trees Released



Moderate Number of Crop Trees Released



Maximum Number of Crop Trees Released



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