Crop Tree Management

How to help your forest grow high quality timber by giving your trees ample room to grow.

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Crop Tree Management

- Crop tree management (CTM) is a widely applicable silvicultural technique used to enhance the performance of individual trees.

(NRCS Forest Service)
Why Implement Crop Tree Management?

• 93% of the value of a stand is in its relatively few crop trees  (Gary Miller USDA Forest Service)

• Assures that most site resources are focused on a small number of selected trees

• Allows Crop Trees to maximize growth potential and maintain dominance or codominance

• You get to pick the winners

• It is recommended to do work in the fall or winter.
Methods of Crop Tree Management

- Crop Tree Release (CTR)
- Commercial Thinning/Improvement Harvest
- Weed Tree Removal
- Basal Area Reduction
Crop Tree Identification

• What are your goals?
  – Wildlife Habitat
  – Timber Value
  – Aesthetics
  – Recreation
  – Mushroom Production
Wildlife Habitat

- Nut or Fruit bearing trees
  - Walnut
  - Oaks
  - Hickory
  - Black Cherry
  - Apple
Timber Value

- Desired species
  - White Oak
  - Black Walnut
  - Red Oak
  - Black Cherry
  - Shagbark Hickory
Size of a Crop Tree

- 4”-12” diameter at breast height
- Young, vigorous trees
- Dominant or codominant position
# Growth Form

<table>
<thead>
<tr>
<th>Poor Form</th>
<th>Good Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppressed</td>
<td>Tall</td>
</tr>
<tr>
<td>Crooked</td>
<td>Straight</td>
</tr>
<tr>
<td>“Stressed” or epicormic sprouts</td>
<td>True</td>
</tr>
<tr>
<td>Multiple Stems</td>
<td>Healthy</td>
</tr>
<tr>
<td>Uneven or Thin Canopy</td>
<td>Full Canopy</td>
</tr>
</tbody>
</table>
Poor Form
Poor Form
Desired Form
Save these trees - they have good form

- One main trunk
- Main branches on lower half of canopy — high live crown ratio
- Live foliage at top of tree

- One trunk

- Branches spaced apart

- One trunk
- Small diameter branches

- One trunk
- Main branches spaced apart
Excurrent growth habit

Possible poor branch structure

One stem

Strong-structured tree with one dominant stem

Decurrent growth habit

Three codominant stems

Weaker-structured tree with three codominant stems
Selecting a Method

Figure 3.7  Visual schematic comparison of even-aged and uneven-aged stands. (Paton 1992.)
Even Aged Stands
Uneven Aged Stands
Crop Tree Release

CTR is the selective and deliberate removal of adjacent, competing canopy trees (neighbors) whose crowns overtop, touch, or infringe upon the growth and development of your selected crop tree’s crown.

1. Identify and flag your crop trees (20-50/ acre for proper 30’-45’ spacing)
2. Paint the competing trees to be killed
3. “Release” the crop tree canopy on 3-4 sides by killing the competing trees

* The goal is to maximize sunlight to increase the growth rate*
Crop Tree Release
Different Levels

Low Intensity Crop Tree Release

High Intensity Crop Tree Release
Killing Trees

Cut and Treat

Girdle and Treat
Killing Trees

Girdle

Hack and Squirt
Killing Trees

Basal Bark

Cut and Coppice
Removing Vines

- Remove vines from crop trees
- Vines will suppress selected crop trees
- Some wildlife use vines, so it is not necessary to remove from non crop trees
- Grape, poison ivy, bittersweet, etc.
- Sever vines in two places to kill the vine
CTR Tips

• **DO** scout for crop trees
• **Do NOT** scout for cull trees
• Visual markers (paint or flagging) help tremendously
• Full sun for your crop trees is better than partial; release on at least 3 sides
• 15 ft. of clearance between canopy's should be adequate for 7-8 years
• It is okay to cut desirable trees if it is in favor of a better crop tree
• When cutting trees it is always better to cut low to the ground
• Always wear PPE
Improvement Harvest

- Rather than cull mature trees consider an improvement harvest
- Focus on over mature, poor form, defective, dead or dying, and lesser desired species
- It is best to contact a consulting forester
- Should ONLY be done on dry or frozen ground
Improvement Harvest

Pros

• Make $$$ off of lesser desired trees
• Possibility to reinvest that money into your property
• Partial management completed for free
• Can open up the canopy significantly
• Can promote desired regeneration
• Can help develop a trail system for future management and recreation

Cons

• Herbicide application doesn’t usually occur
• May damage residual stand
• Invasive species explosions
• Must have something to sell
Harvest Considerations

• Invasive species
• Where do the skid trails go?
• Where are the trees going to fall?
• Timing
• What’s left?
• Professional Foresters can help
Weed Tree Removal

• In a closed canopy forest, shade tolerant species can begin to dominate the understory
• Generally, these trees are lesser desired
• Species such as maple, basswood, elm, ironwood, hackberry, mulberry, tree of heaven, cedar, etc.
• Should herbicide cull trees
• Removing these trees can open up space for desired crop trees
Weed Tree Removal

- These trees use up valuable resources
- Ironwood can take over an understory
  - Can be used as mushroom logs
- Bitternut hickory, to an extent, can take over an understory
  - Can remove poorer formed
  - Can use chips for smoking meat
Basal Area Thinning

• Basal area is the area of a given section of land that is occupied by the cross-section of tree trunks and stems at the base.

• Associated with timber stand volume and growth. Used as a basis for making important forest management decisions such as estimating forest regeneration needs and wildlife habitat requirements.
Basal Area

**DBH** - Diameter at Breast Height - the diameter of a tree measured at 4.5 feet above ground.

**Basal Area** - The cross-sectional area of a tree trunk at DBH, measured in square feet. Used as a measure of stand density (ft²/acre) when the basal areas of all trees in an acre are added together.

**Formula for calculating Basal Area**

\[
\text{Basal Area} = 0.005454 \times \text{DBH}^2
\]

Example: a tree has a 12 inch DBH

\[
\text{Basal Area} = 0.005454 \times 12^2 = 0.79 \text{ ft}^2
\]
Basal Area

• Also found while taking an inventory.
• Professional foresters do this by identifying species, tree class, and size of the trees in your woods
• Decipher the Acceptable Growing Stock (AGS) vs. the Unacceptable Growing Stock (UGS)
• Entered into a Forest Inventory Program (TIGER, IFIDAP, etc.)
• Can be found using a 100% or random sample plots
Stocking Chart
In Conclusion

• Many different ways to manage your crop trees
  – Crop Tree Release
  – Improvement Harvest
  – Weed Tree Removal
  – Basal Area Thinning

• Choose the trees that hold the most value to you
Crop Tree Management

• Be cognizant of what is growing
  – Overstory
  – Midstory
  – Understory

• The increase in light will benefit what is left

• Manage against invasive species first!
Take Away Messages

• Identify the best, most vigorous trees
  – Also being aware of spacing
• Mark “Kill” trees
• Create at least 15’ of clearance on 3-4 sides for crop tree canopies
• Treat lesser desired trees with herbicide
• 93% of the value of a stand is in its relatively few crop trees  
  (Gary Miller USDA Forest Service)
Questions?