Crop circles: Rethinking Stand Management

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Crop circles - Overview

Crop tree release
- Precommercial (tree)
- Pole/sawtimber (tree)
- Mature sawtimber (tree and stand)

Upper canopy survival
Diameter growth
Volume growth
Tying it all together

Crop tree release

Figure 2. Side (left) and top (right) views of tree crowns following crop-tree release. Crop-trees are indicated by “C”, cut trees are shown in light grey.

Most value is on few trees

Idea – Gary Miller USDA FS NRS
Oak crop tree studies
CT-DEP, Division of Forestry
Northeast Utilities
Metropolitan District Comm.
Ferrucci & Walicki, LLC
Torrington Water Company
Dr. Charles Larkin

**Precommercial (1988)**
- Sawtimber oak (1995)

Oaks may dominate over time

**Initial**
- Crown class
  - Dominant: 186
  - Codominant: 313
  - Intermediate: 379
  - Suppressed: 372
  - Combined: 1250

**Initial 18-yr later**
- Control (no release)
- Crop tree release
  - Upper canopy trees
    - Other
    - Beech
    - Birch
    - Maple
    - White oaks
    - Red oaks

Most codominants lost without release

**Crown class at canopy closure**
- Dead
- Sup
- Int
- Cod
- Dom

Few oaks at start
Oaks may dominate over time but you can choose which trees will remain.
You can choose which trees will remain

Most codominant oaks, including those with good form, will die without release.

One (1) release doubles odds Codominants will thrive.

Increased growth → Reduced rotation

Pole/sawtimber crop tree release

Dbh Growth by Year
Stocking reduced to B-line

You can teach an old dog new tricks

Volume growth quickly recovers

Cutting methods study
Shelterwood

Multi-aged crop tree AKA Coppice with standards

Tying it all together

- Most oaks are lost without management
  Crop tree management allows you to select the winners (do not invest in low quality).
- Growth increase is proportional to release
  Complete crop tree release maximizes growth.
- Oaks from 4 to 20+ inches respond
- Best investment is made on codominant stems with grade potential
Rotations periods much shorter

Most value is on few trees

Summary

• Most economic (and often ecosystem service) value is concentrated on few trees.

• Crop tree management focuses limited management $$$ on high value trees.

• Stand rotations can be dramatically shortened.

• Therefore – crop tree management can increase stand and regional productivity