

## NATURAL RESOURCES CONSERVATION SERVICE

### CONSTRUCTION SPECIFICATIONS

## FOREST STAND IMPROVEMENT

### 1. Scope

This work consists of pruning crop trees and the manipulation of species composition, stand structure, and stocking by cutting or killing selected trees, vines, and under-story vegetation. This specification will be used to carry out this practice. Practice application will be documented in the technical notes and narrative statement in the conservation plan. Livestock will be excluded from this practice.

### 2. Improvement Methods

Give first priority to thinning areas that have highest potential for wood crop production. In dense, young native or planted stands, it is often necessary to thin the trees so that stand may be opened up and the remaining trees can grow at a faster rate. Thinning will be prescribed where needed.

In many stands where trees of undesirable species are competing for soil nutrients, moisture, and growing space with desirable trees, thinning will be prescribed. The undesirable trees will be cut or killed to reduce the competition with the better trees.

The future value of any individual tree is directly related to the kind of product that can be manufactured from the tree. Limbs and knots have a major downgrading effect on timber quality and consequently on value. To improve the future value of the stand, individual trees may be designated for pruning, if such pruning will materially increase the market value of the mature tree.

If trees are to be planted in an established stand, it may be desirable to plant the area first. When the seedlings are established, open up the overhead canopy by thinning.

Trees may be cut down or killed standing. Herbicides should be used to prevent sprouting of undesirable species. Otherwise, sprouts can provide wildlife browse and cover. All treatments should be made at a height comfortable to the applicator.

Herbicide treatments may be applied anytime except in the spring during heavy sap flow. Basal bark treatments can be applied anytime of the year. Care should be taken to avoid off-target herbicide damage through excess herbicide contact with the soil and through root grafts. Root grafting is more common in shallow or rocky soils where trees are closely spaced and between the same species.

Methods to kill trees include but not limited to: (Figure 1)

- **Double chainsaw girdle:** Trees may be double girdled without herbicide when a total kill is not required. Make two cuts one to two inches deep and about three inches apart. Treating trees immediately after "leaf out" is the best time for this treatment.
- **Single chainsaw girdle:** Make a single cut one to two inches deep and apply herbicide with a squirt bottle following label directions.
- **Cut stump:** Apply herbicide within one to two hours of cutting. Stumps less than 10 inches in diameter should be sprayed until the point of runoff. Stumps larger than 10 inches in diameter need only the outer three inches treated. Stumps that are not treated at the time of cutting can be re-cut and herbicide applied.
- **Hack and squirt:** Cutting slits with a hatchet around the tree and applying herbicide into the slits with a spray bottle. Number of slits required is dependent on diameter size and herbicide used. Frills can completely overlap on harder to kill species.

- **Hypo-hatchet and tubular tree injectors:** Special tools designed to automatically inject herbicide as slits are cut.
- **Basal bark:** A treatment for only ester based herbicides generally designed for thin bark trees less than six inches in basal diameter. A backpack sprayer applies the herbicide and several different application techniques can be used. Diesel fuel, Kerosene, or penetrating oils are generally added as carriers. This treatment generally involves applying herbicide to the bottom 18 inches of a tree to ground level.

When applying herbicides it is important to follow label directions.

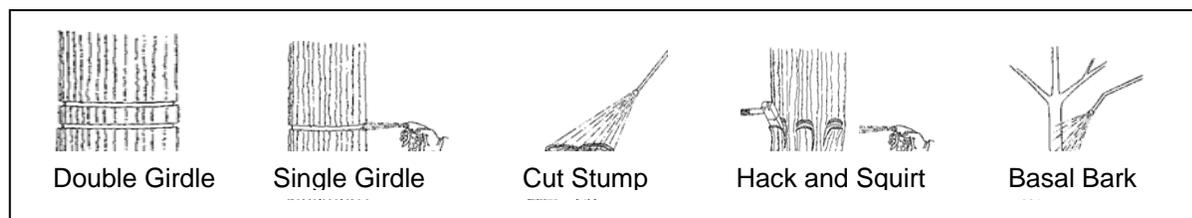


Figure 1 Illustration by: Randall B. Heiligmann

### **Additional Criteria to Improve or Sustain Timber Production:**

Thin stands at 10 to 15 year intervals to maintain a fully stocked condition based on Central Hardwood Notes Stocking Chart for Upland Central Hardwoods and Central Hardwood Notes Estimating Bottomland Hardwood Growth and Yield. Use Manager's Handbook for Black Walnut General Technical Report NC-38 for appropriate stocking levels in black walnut plantations.

Thin so that five to seven feet exists between tree crowns on three to four sides of selected crop trees.

Prescribed fire may be used to:

- Remove undesirable hardwoods
- Reduce fuel build-up
- Expose mineral soil for natural regeneration
- Improve wildlife habitat

Refer to Conservation Practice 338, Prescribed Burning, for additional guidance. A prescribed burn plan will be prepared.

### **Pruning:**

Pruning is removing limbs to produce the maximum clear lumber or veneer in the butt log. Prune only selected hardwood trees where high-value species are grown on good sites.

In pruning lower limbs of young trees, don't remove too much of the food-producing leaf surface of the tree. At least one-half of the living crown of the tree should be left intact. In general, trees should be pruned before they reach eight inches in diameter. Limbs to be removed should be pruned before they reach two inches in diameter to reduce the wound size, to ensure proper closing and to lessen the impact of entry by insects or disease organisms.

Refer to Conservation Practice 660, Tree/Shrub Pruning, for additional guidance.

### **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. The seven steps in the crop tree management approach include:

1. Identify landowner's property goals
2. Establish stand-specific objectives
3. Develop crop tree selection criteria
4. Inventory the property
5. Explain proposed treatment to landowner
6. Decide number/acre of crop trees to release
7. Determine trees to cut to release crop trees

A crop tree inventory will provide an estimate of the number of crop trees and trees needing to be cut or killed per acre for planning purposes. Guidelines for conducting an inventory and completing a Crop Tree Tally Sheet can be found in Crop Tree Management in Eastern Hardwoods in References.

In stands where there are no suitable crop trees, heavy site preparation and regeneration maybe necessary. Occasionally two crop trees may be left adjacent to each other. In those cases treat their crowns as a single crown and apply a crown touching release.

### References:

Electronic Field Office Technical Guide, Section IV, Conservation Practices

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FSI Contractors, <http://www.kansasforests.org/rural/lib/contract.pdf>

Determining the Profitability of Timber Stand Improvement Investments, William B. Kurtz and Carol B. Trokey, School of Natural Resources, <http://muextension.missouri.edu/xplor/agguides/forestry/q05151.htm>

Timber Stand Improvement, Bruce Palmer, Missouri Department of Conservation, <http://mdc.mo.gov/documents/forest/3-660.PDF>

Forestry Reference Handbook, David W. Countryman and Jerry Kemperman, Iowa State University, <http://www.extension.iastate.edu/publications/PM1850.pdf>