

# TREE/SHRUB PRUNING

## DEFINITION

Tree/Shrub Pruning is the removal of all or part of selected branches, leaders, or roots from trees or shrubs.

**Figure 1.** Clear-stem pruning of red oak improves sawlog quality for future wood products.



## PURPOSES

Some common reasons for pruning are:

- Improve the appearance of trees or shrubs, e.g., ornamental plants and Christmas trees.
- Improve the quality of wood products.
- Improve the production of plant products, e.g., nuts, fruits, boughs and tips.
- Reduce fire and/or safety hazards.
- Improve the growth and vigor of understory plants.
- Adjust the foliage and branching density or rooting length for other specific intents, such as wind and snow control, noise abatement, access control, and visual screens and managing competition.
- Improve health and vigor of woody plants e.g. disease, insect and injury management.

## GENERAL PRUNING CRITERIA

### Safety Considerations

Always wear a hardhat with eye protection.

Never prune trees that are touching or near utility lines. Consult the utility company for assistance with such trees.

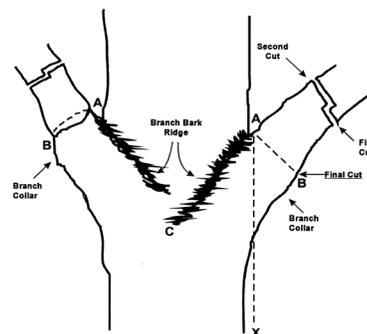
Use an insured, professional tree surgeon for work on large trees, around buildings, utility or power lines, and other obstructions.

### Pruning Technique

Except for Christmas tree shearing, prune trees according to the following steps:

1. Locate the branch bark ridge (See Figures 2 and 3).
2. Find A (outside edge of branch bark ridge).
3. Find B (swelling where branch meets branch collar). If B is difficult to determine, drop a line from A: the angle XAC is equal to the angle XAB.
4. Make first cut as an undercut several inches beyond branch collar.
5. Remove limb with second cut made slightly above first cut.
6. Make the final cut on line AB.
7. Do not cut behind the branch bark ridge.
8. Do not leave stubs.
9. Do not cut into the branch collar.

**Figure 2.** Hardwood Pruning Guidelines



Use tools intended for the purpose of pruning and appropriate for the size of the limbs being removed.

### Other General Pruning Criteria

Comply with applicable federal, state, and local laws and regulations during the installation, operation, and maintenance of this practice.

Do not cut into the branch collar, prune flush to the stem, or leave branch stubs, as this can result in delayed wound closure, and increased tissue damage and decay.

Do not leave debris and vegetative material on the site after treatment that will present an unacceptable fire or pest hazard or interfere with the intended purpose and other management activities.

Burning of removed vegetation shall be done according to the WI NRCS Conservation Practice Standard (WI NRCS CPS), Prescribed Burning (338).

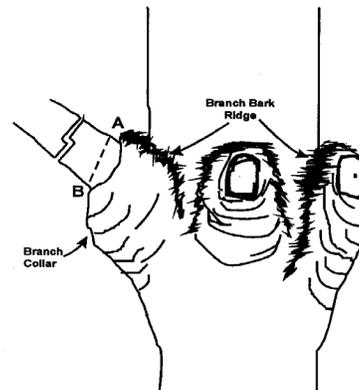
Ground vegetation and/or conditions must be left in a manner to address erosion and other natural resource concerns to acceptable levels.

To reduce the risk of spreading oak wilt disease and Dutch elm disease, do not prune oak and elm species between March 1 and October 1, except as required to repair limbs and branches broken unintentionally during that time frame, e.g., storm damage, or where delaying pruning would be a safety hazard. If pruning is required on these species between March 1 and October 1, disinfect pruning tools between trees (see information in “Considerations” section).

Do not paint or dress pruning cuts, except following growing season pruning on oaks or elms as described above. Use latex paint or commercial tree wound dressing.

Do not remove more than one third of the live crown at one time. Do not prune higher than half the total tree height.

**Figure 3. Conifer Pruning Guidelines**



### **Additional Criteria Applicable to Shearing or Shaping Christmas Trees**

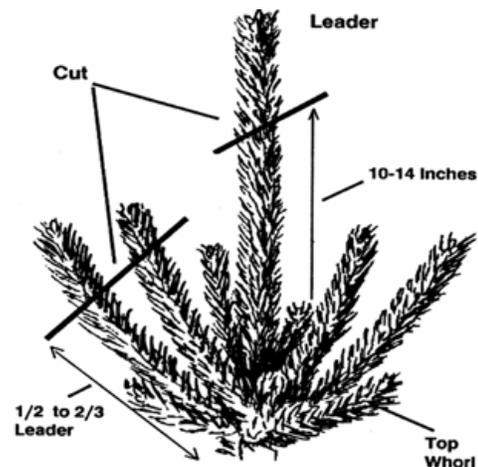
Shear spruce and fir after the season’s growth is complete and throughout dormant season (usually between November 1 and April 1). Shear spruce and fir just above a bud. Shear when temperatures are above freezing.

Shear pines during the active growing season just before terminal growth is completed (usually between June 20 and July 20).

Cut terminal leader back to 10 to 14 inches with a 45-degree angle cut. Cut the lateral branches of the top whorl from 1/2 to 2/3 the length of the leader (see Figure 4).

Trim lightly during year of harvest.

**Figure 4. Christmas Tree Shearing Detail**



**Additional Criteria Applicable to Corrective Pruning of Hardwood Seedlings**

Prune seedlings in the late winter or early spring before the new terminal has grown more than 3 inches.

Prune seedlings only as needed to select one leader and to remove dead branches.

If a quality seedling is not apparent after 3 growing seasons, cut the tree off 1 inch above the ground during the dormant season. After stump sprouts appear, select the best sprout to leave and remove all others.

**Additional Criteria Applicable to Clear Stem Pruning for Sawlog Production**

Selective pruning with subsequent thinning of crop trees under favorable growth and market conditions has been shown to be an economical venture yielding returns of up to 12 percent.

Prioritize pruning of stands based on site quality and species.

Preferred pruning time is late winter before bud break.

Pines should be at least 16 feet tall before pruning; hardwoods should be at least 16 feet tall and 5 inches DBH (Diameter at Breast Height, 4.5’).

Prune vigorous, well-formed, single-stem dominant and co-dominant crop trees up to the number of crop trees per acre required to provide full stocking at maturity. (Note: This may vary depending on market purpose, but for sawlogs will normally be between 40-151 trees per acre; see Table 1.)

**Table 1. Number of Crop Trees and Growing Space Recommended for Timber Production based on DBH (Diameter at Breast Height, 4.5’)**

DBH (in.)	Hardwoods		Pines	
	No. Crop Trees (per acre)	Distance Between Trees (ft.)	No. Crop Trees (per acre)	Distance Between Trees (ft.)
10	151	17	170	16
11	134	18	151	17
12	109	20	134	18
13	90	22	121	19
14	82	23	109	20
15	70	25	99	21
16	60	27	90	22
17	56	28	82	23
18	48	30	76	24
19	43	32	70	25
20	40	33	64	26
21	36	35	60	27
22	32	37	56	28
23	30	38	52	29
24	27	40	40	30

Prune to develop a single straight stem. Prune to a minimum of 10 feet; prune up to 18 feet if possible. It may be necessary to implement multiple pruning treatments over several years to reach a 10-foot or 18-foot height.

Prioritize pruning based on species and local markets. In Wisconsin, the following species are favorable for pruning: sugar maple, northern red oak, white oak, black cherry, black walnut, yellow birch, tulip poplar, red pine, and white pine.

If possible, prune limbs when they are 1 to 2 inches in diameter to expedite wound closure; wounds of greater size may take up to 10 years to heal and introduce decay into the butt log.

**Additional Criteria Applicable to Pruning to Reduce Fire Hazard in Conifer Stands**

Remove all the pruned branches from a 15-foot border strip.

## CONSIDERATIONS

Improper or excessive pruning may reduce the value of the timber, and cause trees/shrubs to be less healthy by increasing the incidence of disease or insect infestation.

Begin shearing Christmas trees when trees are 3-5 years old (approximately 3 feet in height) and continue until trees are marketed.

For consumer preference, shape Christmas trees so that the base is two-thirds as wide as the overall height (i.e., a 6-foot high tree should have a base that does not exceed 4 feet wide).

Limbs one inch in diameter or less will normally close within one or two years. Limbs in excess of 2 inches in diameter may take 10 years or to close.

Time pruning and shearing to minimize disturbance to breeding and nesting wildlife species.

To prevent the spread of pathogens, shearing and pruning equipment should be disinfected between pruning individual trees by dipping tools in 1 part bleach to 9 parts water or 70 percent denatured alcohol. (**Note:** bleach can corrode metal, and should be washed off equipment with soap and water after use.)

Review the estimated cost and projected economic benefits of the project before starting a pruning or shearing project.

Organic matter from decomposition of tree limbs will improve soil condition.

To maintain plant growth and sustain vigor, pruning may be done in two or more timed intervals.

Branches removed may be used for other purposes.

Pruning between October 1 and March 1 reduces the likelihood of introducing disease into the tree wound. Note: Pruning of pine in forest stands during growing season increase the chance for attack by bark beetles and root collar weevil.

## OPERATION AND MAINTENANCE

Periodically inspect plant condition and take additional actions as necessary; e.g., additional pruning, pest management, nutrient management, and forest stand improvement.

### For More Information

Additional information on this subject may be obtained in the following references:

Bedker, Peter J., J.G. O'Brien and M.E. Mielke. 1995. How to Prune Trees, USDA-FS Publication NA-FR-01. Northeastern Area State and Private Forestry. Radnor, PA. [http://www.na.fs.fed.us/spfo/pubs/howtos/ht\\_prune/htprune.pdf](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_prune/htprune.pdf)

Kesner, Charles D and K.L. Lamkin. 1986. Renovating Old, Abandoned Apple Trees. Michigan State University Extension Bulletin E-1941. East Lansing, MI. <http://archive.lib.msu.edu/DMC/Ag.%20Ext.%202007-Chelsie/PDF/e1941-1986.pdf>

Kielbaso, J. James and M. Koelling. 1975, Pruning Shade and Ornamental Trees. Michigan State University Extension Bulletin E-804. East Lansing, MI.

Koelling, Melvin R..1991. Shearing Recommendations for Christmas Tree Producers. North Central Regional Extension Publication No. 310. East Lansing, MI. <http://www.for.msu.edu/extension/extdocs/shear.htm>

Koelling, Melvin R. and L.J. Dornbush. 1992. Growing Christmas Trees in Michigan, Michigan State University Extension Bulletin E-1172. East Lansing, MI. <http://forestry.msu.edu/extension/ExtDocs/xmastree.htm>

## TREE/SHRUB PRUNING SPECIFICATIONS

### General Information

Client/Operating Unit: \_\_\_\_\_

Farm No.: \_\_\_\_\_ Treatment Acres: \_\_\_\_\_

Proposed Treatment Acres: \_\_\_\_\_ Field No.: \_\_\_\_\_ Program: \_\_\_\_\_

Farm/Ranch Location: \_\_\_\_\_

Specifications Date: \_\_\_\_\_ Planned Installation Date: \_\_\_\_\_

### Purpose(s) (check all that apply)

- Improve the appearance of trees or shrubs, e.g., ornamental plants and Christmas trees.
- Improve the quality of wood products.
- Improve the production of plant products, e.g., nuts, fruits, boughs and tips.
- Reduce fire and/or safety hazards.
- Improve the growth and vigor of understory plants.
- Adjust the foliage and branching density or rooting length for other specific intents, such as wind and snow control, noise abatement, access control, and visual screens and managing competition.
- Improve health and vigor of woody plants e.g. disease, insect and injury management.

### Tree/Shrub Pruning Installation Details:

Pruning Method (e.g., shearing, crown raising, etc.): \_\_\_\_\_

Pruning Date/Season: \_\_\_\_\_

Equipment Used: \_\_\_\_\_

Species or Type of plants to be pruned: \_\_\_\_\_

No. of trees and/or shrubs to be pruned per acre: \_\_\_\_\_

Avg. pruning height, if applicable (ft. or %): \_\_\_\_\_

### Additional information, including O&M, necessary to install this practice:

Installed according to general criteria and applicable specific criteria listed in this Conservation Design Sheet.

## REQUIRED DOCUMENTATION AND VERIFICATION

- Practice amount applied is field verified

by: \_\_\_\_\_

on: \_\_\_\_\_

- Before payment is made, the following information is required to be in the case file:
  - ≡ Photographs of established practice must include:
    - » Statement “Photo was taken in the field by (enter name)”
    - » Date photo was taken in the field
    - » Statement of what the photo represents if it needs clarification
  - ≡ Field verification is documented and a certified planner verified “as installed” this practice meets NRCS standards and specifications.

### Practice Certification (NRCS USE ONLY)

I certify that the practice as installed is complete and meets the applicable Wisconsin NRCS Conservation Practice Standard and all applicable practice specifications. Any changes to the original practice design have been approved and are documented on the original practice design “as installed.”

\_\_\_\_\_  
Certified Planner (print)

\_\_\_\_\_  
Certified Planner (sign)

\_\_\_\_\_  
Date