

NATURAL RESOURCES CONSERVATION SERVICE

TREE/SHRUB PRUNING DESIGN PROCEDURES

(660DP)

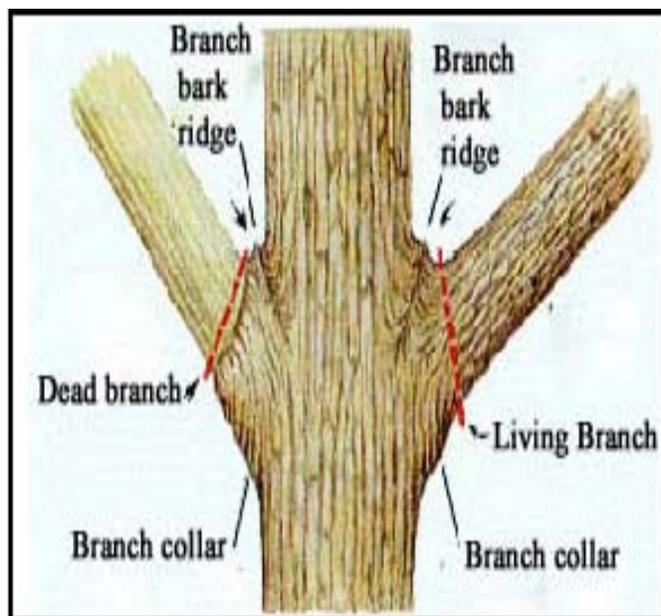
INTRODUCTION

Tree and shrub pruning is undertaken in order to “produce strong, healthy and attractive plants.” The procedure involves removing all or parts of selected branches or leaders from trees and shrubs (NE Forestry Tech Note 71).

GENERAL PRUNING GUIDELINES

1. Remove branches close to the main stem but avoid cutting through the branch bark ridge (Fig. 1).
2. Pruning is generally restricted to branches less than two inches in diameter.
3. Remove a small live or dead branch by use of pruning shears (Fig. 2a). Remove a large live or dead branch by use of three cuts (Fig. 2b).
4. Remove no more than one-fourth to one-third of the live crown in any one pruning.
5. Give pruning priorities to high value species, such as black walnut, bur oak, and pecan (crop trees).

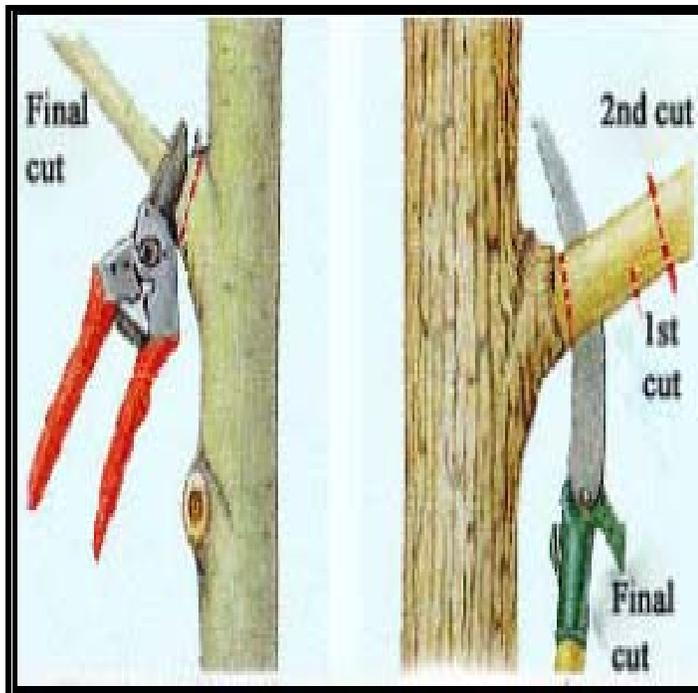
Figure 1 – Diagram indicating where to prune live and dead branches



The dashed red lines indicate where to cut to minimize stress to the tree being pruned. Always cut outside the branch bark ridge and the branch collar.

Figure 2 – Illustrations of pruning cuts to remove small and large branches

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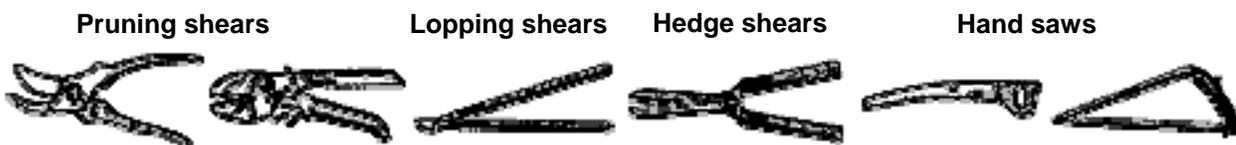


(a) Small Branch

(b) Large Branch

(a) A small branch may be removed with pruning shears. (b) A large branch requires three cuts to prevent tearing down the trunk: Cut 1- undercut 12-24 inches from the branch collar. Cut 2- Make a top cut within one inch of the undercut. Cut 3- cut just outside the branch collar and branch bark ridge.

- Use proper pruning tools when pruning, i.e., hand pruning shears, loppers, pruning saws, etc.



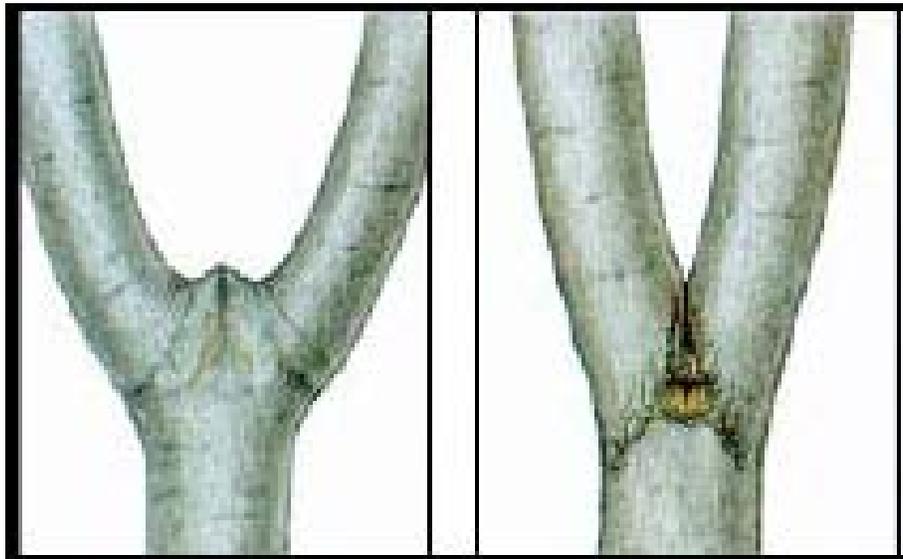
Pole saws



Small chain saws

7. Generally do not treat cuts with wound dressing.
8. Branches with strong U-shaped angles of attachments should be retained. Branches with narrow V-shaped angles of attachment often form included bark and should be removed, see figure 3 below.

Figure 3 – Example of branches to retain or remove



(a) U-shaped strong union should be retained

(b) V-shaped weak union should be removed.

9. Lateral branches should be no more than one-half to three-quarters of the diameter of the stem at the point of attachment.
10. Avoid improper pruning cuts that cause injury and bark ripping (See NE Forestry Tech. Note 71).

PRUNING FOR TIMBER PRODUCTS

Prune only merchantable timber stands for which the pruning cost/benefit ratio is positive. As a guide, refer to Section II-Forestland Interpretations, Guide to Suitable Soils for Wood Crops, which lists site indexes by Soil Series and Vegetative Zone.

1. Common merchantable timber tree species in Nebraska include:
 - Hardwoods (deciduous): black walnut, eastern cottonwood, green ash, hackberry, oaks, hickories, silver maple, black cherry, and basswood.
 - Softwoods (conifers): ponderosa pine, eastern redcedar
2. Do not prune all trees in a stand of young, adequately stocked timber. Select potential “crop trees” and prune primarily these crop trees.
3. Generally, prune side branches from the ground, up. Damaged or “problem branches” may be selectively pruned at any location on the trunk.

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4. Generally, do not prune side branches that are more than 1.5 inches in diameter.
5. Begin corrective pruning for a straight central stem on trees less than 1 inch in diameter. Pruning should be completed before the tree reaches 4 inches diameter at any point on the trunk.
6. The preferred pruning time is during the winter (December - February) before bud break.
7. Prune to develop a single straight stem. Continue pruning until a clear log, at least 9 feet long, is obtained. Generally, do not prune higher than 17 feet.
8. Badly deformed trees that are 12 inches or less in dbh should be cut off less than 2 inches above the ground and allowed to resprout. Trees should be cut during the dormant season (October - March). Thin the resulting stump sprouts to select the strongest, straightest stem.

PRUNING FOR NUT/FRUIT PRODUCTION

1. Prune side branches to encourage a low-branched, large, wide crown with strong scaffold branches to support heavy nut/fruit crops and facilitate nut/fruit harvest.
2. The preferred pruning time is during the winter (December - February) before bud break.
3. Generally, prune side branches from the ground, up. Damaged or "problem branches" may be selectively pruned at any location on the trunk.
4. Generally, do not remove side branches that are larger than one half the diameter of the trunk.

PRUNING FOR FUELS REDUCTION AND ACCESS

1. Prune side branches to at least 9 feet to reduce ladder fuels.
2. The preferred pruning time is during the winter (December - February) before bud break.

PRUNING FOR BEAUTY AND/OR ACCESS

1. Pruning may be needed to improve aesthetics or recreational value of an area for:
 - a. Safety
 - b. Opening of picnic areas, trails, and other public use areas.
 - c. Creating vistas in scenic areas
2. The preferred pruning time is during the winter (December - February) before bud break.
3. Generally, do not remove side branches that are larger than one half the diameter of the trunk.
4. Cutting branches back to where they fork (drop crotching) may fulfill tree form or foliage density objectives.

PRUNING (SHAPING) CHRISTMAS TREES

Shaping is the primary technique used to improve the marketability of Christmas trees. It is a highly specialized procedure that varies with the objectives of the grower. Generally Christmas trees are shaped to achieve the desired symmetry and balance.

1. Begin shaping when the tree is about 2 years old. Continue annually until the tree is harvested.
2. Prune young trees to maintain one central leader.
3. Remove basal branches to achieve an 8-10 inch "handle" for customer handling. Basal pruning may be done in any season or delayed until harvest.
4. Common pruning shears, grass hooks, pruning clippers, and/or special shearing knives may be used.
5. Cut the leader back to the desired length, e.g., 10-15 inches, and cut side branches proportional to the desired tree taper, e.g., 2/3 taper.
6. Pruning cuts on the terminal leader should be at a 45 degree angle facing north.

Spruces, Firs and Junipers

Short-needed and/or single needed conifers set buds all along their stems. Therefore:

- a. Preferred shaping is during the dormant season, i.e., October - March.
- b. When possible make cuts just above a bud.

Pines

Since pines set buds only at the end of the current season's growth, the timing of pruning is critical to encourage new buds at the end of the shortened leader and/or branch.

- a. Shape during the active growing season when buds are set and new needles are 2/3 mature length. Actual calendar date varies with species, but is usually early-June to mid-July in Nebraska.
- b. Pruning clippers, hedge shears and shearing knives may be used.
- c. Cut the terminal at a 45 degree angle. Cut it back to the length desired, usually 10 to 15 inches. The top whorl should be cut back to about one-third the terminal length and cut the other side whorls proportionately.

Support References

Bedker, Peter J., Joseph G. O'Brien, and Manfred M. Mielke. 1995. How to Prune Trees. USFS, Northeastern Area State and Private Forestry, NA-FR-01-95. NE Forestry Tech. Note 71, March 2008. http://www.na.fs.fed.us/Spfo/pubs/howtos/ht_prune/prun001.htm

Arbor Day Foundation On-line Tree Pruning Guide. [http://www.arboday.org/trees/pruning/Tree/Shrub Pruning \(660\)](http://www.arboday.org/trees/pruning/Tree/Shrub Pruning (660))