

WINDBREAK/SHELTERBELT RENOVATION

(Feet)
Code 650

Natural Resources Conservation Service
Conservation Practice Standard

I. Definition

Replacing, releasing and/or removing selected trees and shrubs or rows within an existing windbreak or shelterbelt, adding rows to the windbreak or shelterbelt, or removing selected tree and shrub branches.

II. Purpose

This practice may be applied as part of a conservation management system for the purpose of restoring or enhancing the original planned function of existing windbreaks or shelterbelts.

III. Conditions Where Practice Applies

This practice applies in any windbreak or shelterbelt that is no longer functioning properly for the intended purpose. Extending the length of an existing windbreak is handled under Wisconsin NRCS Field Office Technical Guide (FOTG), Section IV, Practice Standard 380, Windbreak/Shelterbelt Establishment. For normal and periodic pruning, refer to Wisconsin FOTG Practice Standard 660, Tree/Shrub Pruning.

IV. Federal, Tribal, State, and Local Laws

Users of this standard should be aware of potentially applicable federal, tribal, state and local laws, rules, regulations or permit requirements governing windbreak or shelterbelt renovation. This standard does not contain the text of federal, tribal, state, or local laws.

V. Criteria

A. General Criteria Applicable To All Treatments

Competing herbaceous vegetation will be mechanically or chemically controlled to improve the growth and vigor of trees and shrubs.

Residual plants will be protected during the renovation.

The method used to renovate windbreaks or shelterbelts will vary from planting to planting.

Climate, soil type, species composition, spacing and past management will be considered to determine the degree of renovation required to restore or perpetuate the effectiveness of the windbreak or shelterbelt.

Debris should be removed from the site and disposed of properly if the debris will cause insect, disease, fire or operability problems. Refer to Wisconsin FOTG Practice Standard 384, Forest Slash Treatment.

When the planting is 50-75% dead, either replant between rows after ground vegetation is controlled, or re-locate new planting to the windward or leeward side depending upon the adjacent space and distance from the area to be protected.

B. Additional Criteria for Underplanting-Interplanting

This treatment will be used to replace trees and re-establish density and height in multiple row windbreaks or shelterbelts.

Existing growing space, shade level and root competition will be evaluated and determined to be at acceptable levels to permit unimpeded growth to new plantings.

Species will be selected based on drought tolerance if soil moisture is a concern, shade tolerance and ability to respond with favorable growth upon release. A closer within-the-row spacing is required to obtain the desired windbreak density because of increased mortality due to stressful growing conditions.

C. Additional Criteria for Row Removal and Replacement

This treatment will be applied to the removal of entire rows of dead, dying, or diseased trees or shrubs and their replacement with new plantings.

The objective is to establish new rows within an existing structure.

Where the outside row of a windbreak needs replacement, twin row, high-density plantings will be applied. Trees will be spaced 2 to 6 feet apart within the row and 4 to 8 feet between rows.

D. Additional Criteria for Row Release, Thinning, Pruning, and Coppicing

These techniques involve the removal of individual trees, portions of trees or entire rows of trees in order to release a more desirable adjacent row.

Almost any kind of thinning will encourage the growth of understory vegetation.

Coppicing can work well on tree and shrub species that have good sprouting characteristics. In the case of shrubs, rejuvenation by coppicing can be effective and highly desirable as a means of maintaining plant vigor and windbreak structure. In trees, coppicing can be effective in controlling height growth and maintaining vigor. For some species, continued management of the sprouts may be required.

Pruning in windbreaks should only be done with specific objectives in mind. Where density of the windbreak or shelterbelt is too high, pruning can improve snow distribution. In the case of certain insect and disease situations, pruning can be an effective sanitation method. Pruning may also be used as an aid to under-planting or inter-planting.

E. Additional Criteria for Managing Natural Reproduction

When present in older, multiple row windbreak plantings, natural regeneration can be utilized in the renovation process. It can be thinned to create new rows or left and with proper management released to continue to provide the planned functions of the windbreak/shelterbelt.

F. Additional Criteria for Expansion Planting

Expansion planting is the addition of new plantings on either the windward or leeward side of an existing windbreak. Its main use is to supplement low to mid-level densities of older plantings. It may also be used to build species variation into the windbreak/shelterbelt structure or to serve as a replacement or rotation component. Once the expansion planting is well

established, the adjacent windbreak/shelterbelt can be removed if desired.

VI. Considerations

Additional recommendations relating to design that may enhance the use of, or avoid problems with, this practice but are not required criteria to ensure its basic conservation functions are as follows.

- A. Renovation may be accomplished over a period of years.
- B. Vegetation removed during renovation can be burned as specified by Wisconsin NRCS FOTG, Practice Standard 338, Prescribed Burning.
- C. Debris and other vegetation removed during renovation may be used to produce energy. Consider the energy balance of this action.
- D. Erosion control may be needed during the renovation process.
- E. Wildlife and pollinator needs should be considered when selecting tree or shrub species to add or remove.
- F. Species diversity, including use of native species, should be considered.
- G. Increasing species diversity could reduce impacts from existing and new diseases and pests.
- H. Refer to Wisconsin NRCS FOTG, Practice Standard 612, Tree and Shrub Establishment; and Wisconsin Forestry Technical Note 4, Tree and Shrub Species for Windbreaks, for further guidance on planting trees and shrubs.

VII. Plans and Specifications

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

- Landowner and renovation objectives will be documented in the conservation plan.
- A thorough inventory of the windbreak will be completed and documented.
- Identify the treatment(s) to be applied.

VIII. Operation and Maintenance

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance):

- Additional thinning, pruning or coppice management may be needed in the future to maintain function.
- Periodic applications of nutrients may be needed to maintain plant vigor.

IX. References

USDA, NRCS Wisconsin Field Office Technical Guide (FOTG), Section IV, Practice Standards and Specifications.

Bentrup, G. 2008. Conservation buffers: design guidelines for buffers, corridors, and greenways. Gen. Tech. Rep. SRS-109. Asheville, NC: Department of Agriculture, Forest Service, Southern Research Station.

Brandle, J.R. et al. 1988. Windbreak Technology. Agric. Ecosyst. Environ. Vol. 22-23. Elsevier Pub..

Stange, C., et al. 1998. Windbreak Renovation. University of Nebraska Cooperative Extension EC 98-1777-X.