NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

WINDBREAK RENOVATION

(Acre)

CODE 650

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.

PURPOSES
Restoring or enhancing the original planned function of existing windbreaks or shelterbelts.

CONDITIONS WHERE PRACTICE APPLIES
In any windbreak or shelterbelt that is no longer functioning properly for the intended purpose.

CRITERIA

1. The following criteria will be used individually or in combination to restore or enhance the performance of a partially functioning or non-functioning windbreak or shelterbelt:

    a. To reduce plant competition or alter the density of the planting, individual trees or shrubs will be identified for thinning.

    b. To remove diseased branches or alter the density of the planting, the trees or shrubs will be pruned or sheared.

    c. To release adjacent rows of trees or shrubs, entire or partial rows of trees or shrubs will be identified and removed.

    d. To improve density and/or vigor of identified rows of trees or shrubs in decline, trees or shrubs with coppicing capability will be cut close to the ground to allow sprouting.

    e. To improve the growth and vigor of trees and shrubs, competing herbaceous vegetation will be mechanically or chemically controlled.

    f. To improve windbreak or shelterbelt density, additional rows of trees or shrubs will be added adjacent to or within an existing windbreak or shelterbelt. 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. (Note: Extending the length of an existing windbreak is handled under Windbreak/ Shelterbelt Establishment Practice 380).

2. The renovation of windbreaks may include several operations, depending on existing conditions. All renovation practices will fall under one or more of the following specifications.

    a. **Site Preparation**. Trees and shrubs may be established in a shallow furrow or a chemically sprayed strip 18 to 36 inches wide where grass and weeds are sparse. For seedlings that are spot-planted by hand, scalp or chemically treat an area in a circle with a minimum diameter of 36 inches. When sod is bromegrass or tall fescue, a four-foot strip or circle must be prepared mechanically or chemically to eliminate competition before planting.

b. **Underplanting.**

(1) Plant adapted tree or shrub species approximately midway between the rows of the existing windbreak or shelterbelt where any one of the following conditions exist:

(a) Where trees and shrubs in two or more adjacent rows are scattered and the majority are dead or are in poor condition.

(b) Where the windward rows are inadequate for significantly reducing low-level winds or controlling drifting snow.

(c) Where the leeward rows need to be improved for wildlife purposes.

(d) Where volunteer vegetation will not produce desirable species.

(2) Plant trees and shrubs in the sections of a field windbreak where they are missing.

(3) Spacing within rows should be in accordance with NRCS Technical Guide Standard and Specifications for Windbreak/Shelterbelt Establishment (380).

c. **Supplemental or Enlargement Plantings**. Plantings will be made in existing windbreaks in accordance with Standard and Specifications for Windbreak/Shelterbelt Establishment (380), with the following exceptions:

(1) Supplemental or enlargement plantings will not be made closer than 30 feet from large spreading trees such as elm, eastern cottonwood, silver maple, or a spreading, suckering-type shrub.

(2) Supplemental or enlargement plantings except shrubs, eastern redcedar, and northern white cedar, will not be closer than 20 feet from adjacent rows of shrubs or small and medium-sized trees.

(3) Supplemental or enlargement plantings with shrubs, eastern redcedar, and northern white-cedar will not be closer than 15 feet from the existing windbreak.

(4) Shrubs, eastern redcedar, or northern white-cedar are the preferred species for use in supplemental plantings on the north and west sides of existing farmstead and feedlot windbreaks where soils are suitable, but other adapted tree and shrub species are allowed. New plantings within a field windbreak or on the south and east sides of existing windbreaks can be of any adapted tree or shrub species.

d. **Removal and Replacement of Dead and Dying Rows**

(1) Designate the perimeter of the area to be cleared or killed with marking paint, flagging, or other methods.

(2) All trees, shrubs, or other debris from a cleared area which interfere with renovation operations or planting will be removed from the site, disposed of within the site, or used to construct brush piles suitable for wildlife cover prior to planting.

(3) If the debris is to be burned, it must be piled far enough away from the planting to prevent damage to the trees. All burning must comply with local burning regulations.

(4) Conifers are best suited for planting to renovate an established windbreak, hardwoods are best suited to renovate a fencerow; however, other tree or shrub species suited to the soil are allowed.

(5) Where only a portion of the interior of a windbreak is removed, replant the area with one row less than the number of rows removed as long as the minimum rows for Specifications for Windbreak/Shelterbelt Establishment (380) are retained.

e. **Renovating Existing Fencerow To Windbreaks**

(1) Species Selection:
Most native species of trees and shrubs are suitable for retention in a fencerow that is being renovated into a windbreak. It is preferable to have only one species of tree in a fencerow windbreak. When making the selection of the trees to keep, favor the most common, desirable species. Open spaces in the fencerow should be planted with seedlings of the predominate species or of another species from the “most desirable” list. Spacing, the condition of the existing trees, and secondary uses should also have a bearing on what trees are eventually retained.

(2) Spacing and Alignment:
As nearly as possible, trees of the preferred species will be left every 10 to 16 feet and in as near a straight line as possible. Open spaces in the fencerow will be planted to tree seedlings on the same alignment and spacing as the trees left in the fencerows.

Trees that are to be managed as part of a windbreak that must be cut back, will be cut off at three to four feet above ground. Trees to be removed will be cut as close to the ground as practical. The trunks of the cut trees may be cut into fuel wood and all unwanted trunks, tops, and limbs may be formed into brush piles for wildlife cover.

(3) Height and Width:
Since the trees retained in a fencerow renovated into a windbreak are alive and growing, they will be changing height and width each year. Most of the native hardwood tress will develop large spreading crowns as they get older. To prevent large crowns and maintain a desirable width of 20 feet and a porosity of 50 percent, the trees need to be cut down as they reach a height of approximately 50 feet.

(4) Maintenance and Management:
The care of a fencerow renovated into a windbreak involves periodically cutting down each tree in the row as it reaches a height of 50 feet. Most native trees should reach this height at somewhere between 25 and 35 years old.

The cutting necessary to manage the size of the fencerow windbreak can be done by a number of methods ranging from single-tree selection to periodic cuts to all trees being cut at one time (clear cut).

f. **Thinning.** Thinning can be the removal or killing of certain trees within a row or removal or killing of entire rows to improve the growth of adjacent rows.

(1) Trees and/or shrubs may be thinned within the row not to exceed the current recommended maximums for the in the row spacing by more than 30 percent.

(2) Marking of trees and shrubs or entire rows to be removed must be done prior to any removal operations.

(3) Removal may be by any means that does not contribute to erosion or damage trees and/or shrubs that will remain. Disposal must be in compliance with county and state regulations.

(4) An effort will be made to retain those individual trees and shrubs, or entire rows that have the most vigor. Removing or killing entire rows of low vigor trees can improve the growth of adjacent rows that have been suppressed.

(5) The removal of trees by cutting at the base may cause sprouting. To control sprouting where it is not wanted, apply an appropriate herbicide.

g. **Corrective Pruning of Deciduous Trees and Shrubs**

(1) Prune branches from deciduous trees that may interfere with crop production or the normal growth of any evergreen species. Make cuts close to trunk or branch being left. Evergreen trees are not to be pruned.

(2) Prune deciduous shrub rows which have become leggy (containing sparse or dead branches) and where a denser shrub row is desirable. Cut shrubs back to 6 to 12 inches above ground after the winter season. Delay cutting on especially showy species such as forsythia until after flowering.

h. **Root Pruning**. Root pruning may be needed to prevent crop yield reduction adjacent to the windbreak. Root pruning may be used to prevent competition from adjacent trees when supplemental or enlargement plantings are made.

(1) Root plow at the drip line or farther from the trees. Cultivation over the root plow furrow is necessary to prevent suckering from the severed roots.

(2) Root plow to a depth of 18 to 24 inches. This will normally require two trips over the furrow, plowing 9 to 12 inches with each pass.

(3) Repeat root pruning at intervals of 5 to 10 years.

(4) Root prune when the trees are dormant, if possible.

(5) Locate all buried utilities and field tile before starting root pruning.

3. Residual plants will be protected during the renovation. Livestock will be excluded at all times.

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

CONSIDERATIONS

1. Renovation may be accomplished over a period of years.

2. Debris should be removed from the site and disposed properly if the debris will cause insect, disease, fire, or operability problems.

3. Wildlife needs should be considered when selecting tree or shrub species. Species diversity, including use of native species, should be considered.

PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved job sheets, technical notes, narrative statements in the conservation plan, or other acceptable documentation. The minimum documentation required for this practice is outlined on the last page of this standard.

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):

1. Replacement of dead trees or shrubs in new plantings or rows will be continued until the barrier's function is restored.

2. Competitive vegetation will be controlled when it inhibits the renewed growth and vigor of the windbreak or shelterbelt.

3. Supplemental water will be provided as needed.

4. The trees and shrubs will be inspected periodically and protected from adverse impacts including insects, diseases or competing vegetation. The trees or shrubs will also be protected from fire and damage from livestock or wildlife.

5. Additional thinning, pruning, or coppice management may be needed in the future to maintain function.

6. Periodic applications of nutrients may be needed to maintain plant vigor.

REFERENCES

National Standard Windbreak Renovation (650), August 2000
Section IV, FOTG, Appendix B - Tree/Shrub Recommendations
Ohio Standard Windbreak/Shelterbelt (380), June 2002
Windbreak Renovation, University of Nebraska Cooperative Extension, EC 98-1777-X

Practice Documentation For:	*Windbreak Renovation - 650*

The following documentation must be in the case folder or engineering subfolder.

Practice Planning

1. Is the practice part of a conservation plan?
2. Have the purpose(s) for the practice been identified?
3. Is the location of the practice identified on a map or plan drawing?

Practice Design

Have the following design criteria been addressed?

1. Trees or shrubs to be thinned to achieve the planned density.
2. Trees and shrubs that are to be prunned or sheared to achieve the planned density.
3. Trees and shrubs with coppicing capability to be cut close to the ground to allow sprouting.
4. Competing herbaceous vegetation that needs to be mechanically or chemically controlled.
5. Additional rows of trees or shrubs needed and the species, and spacing needed.
6. Residual plants that will be protected during the renovation.
7. Linear feet planned.

Practice Installation / Application

Does the practice meet the minimum criteria for the planned purpose(s)?

Have the following criteria been documented in the assistance notes or practice jobsheet?

1. Types of trees and shrubs thinned or pruned.
2. Density achieved.
3. If applicable, feet of additional windbreak planted.
4. Linear feet renovated.

Practice Deficiencies

If applicable, have the practice deficiencies been communicated with the decisionmaker?

Practice Maintenance

Have the following maintenance actions been communicated to the decisionmaker?

1. Replace dead trees or shrubs in new plantings or rows until the barrier's function is restored.
2. Control competitive vegetation when it inhibits the renewed growth and vigor of the windbreak or shelterbelt.
3. Protect trees and shrubs from adverse impacts of insects, diseases or competing vegetation. The trees or shrubs will also be protected from fire and damage from livestock or wildlife.
4. Additional thinning, pruning, or coppice management may be needed in the future to maintain function.

Other Comments: