**NATURAL RESOURCES CONSERVATION SERVICE**

**CONSTRUCTION SPECIFICATIONS**

# WINDBREAK/SHELTERBELT RENOVATION

## 1. Scope

The work consists of replacing, releasing, and/or removing selected trees and shrubs or rows within an existing windbreak or shelterbelt, adding tree/shrub rows, or removing selected tree/shrub branches. This specification (including references made within Conservation Practice Standards, Specifications, and Technical Notes) and the Form KS-ECS-5, Tree/Shrub Planting, shall be used to design the practice. Practice application will be documented on Form KS-ECS-5 and narrative statements in the conservation plan.

## 2. Renovation Practices

### Under Planting

- Plant eastern redcedar or Rocky Mountain juniper [1/] approximately midway between the rows of the existing windbreak where any 1 of the following conditions exists:
    - Where trees and shrubs in 2 or more adjacent rows are removed or are scattered with a majority dead or are in poor condition.
    - Where the windward rows are inadequate for significantly reducing low-level winds or controlling drifting snow.
    - Where the leeward rows need to be improved for wildlife purposes.

For establishment recommendations see Kansas Forestry Technical Note No. 9, Tree/Shrub Establishment and Maintenance Guidelines.

- For within-row spacing, refer to Conservation Practice 380, Windbreak/Shelterbelt Establishment.
- Where natural regeneration of eastern redcedar is present, thinning as described below may be needed. Where natural regeneration is spotty, new plantings should be used to supplement regeneration.

### Supplemental or Enlargement Plantings.

- Cultivated plantings will be made in accordance with Conservation Practice 380, Windbreak/Shelterbelt Establishment.
- Supplemental or enlargement plantings will not be made closer than 30 feet from large spreading trees such as Siberian elm, eastern cottonwood, honey locust, or a spreading, suckering-type shrub.
- Supplemental or enlargement plantings with small and medium-sized trees or shrubs including eastern redcedar and Rocky Mountain juniper [1/] will not be closer than 5 to 10 feet from the drip line of adjacent rows of shrubs or small and medium-sized trees.
- Eastern redcedar or Rocky Mountain juniper [1/] are the preferred species for use in supplemental plantings on the north and west sides of existing windbreaks where soils are suitable. New plantings on the south and east sides of existing windbreaks can be of any adapted tree or shrub (See electronic Field Office Technical Guide [eFOTG], Section II).

- Scalp plantings will be made in accordance with Kansas Forestry Technical Note No. 9 and Conservation Practice 380, Windbreak/Shelterbelt Establishment, with the following exceptions (assuming original belt was scalp-planted and contains all conifers):
    - Plantings will not be made closer than 15 feet from existing plantings if eastern redcedar or Rocky Mountain juniper [1/] is used. Eastern redcedar or Rocky Mountain juniper [1/] are the preferred species for use in supplemental plantings on the north or west of existing windbreaks where soil permits.
    - Plantings of pine species will not be made closer than 20 feet from existing plantings and/or 5 to 10 feet from the drip line of adjacent rows of trees or shrubs.

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

- Designate the perimeter of the area to be cleared or killed by marking paint or flagging.
- All trees, shrubs, or other debris from a cleared area which interfere with cultivation operations or planting will be removed from the site or disposed of within the site (such as creating brush piles for wildlife) prior to planting.
- Prepare a site by acceptable methods according to Kansas Forestry Technical Note No. 9. Refer to Conservation Practice 490, Tree/Shrub Site Preparation.
- Following tree/shrub removal during windbreak renovation work, conifers are best suited for replanting these areas. Refer to Kansas Forestry Technical Note No. 10, Conservation Tree/Shrub Plantings Suitability Groups, Windbreak Suitability Groups, and Plantings for Kansas, for conservation tree/shrub plantings and attribute information.
- Where only a portion of the interior of a windbreak is removed, replant the area with 1 row less than the number of rows removed.
- 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.
- The removal of trees by severing at the base may cause sprouting. To control sprouting where it is not wanted, apply an appropriate herbicide. Care should be taken to avoid flashback (passive loss of an herbicide from the roots of treated trees), or excess herbicide contacting the soil.[2/]

**Release of Sod-Bound Trees**.

- This is applicable where at least 70% stand exists and where heavy sod has curtailed growth.
- Herbicides may be the most effective method to control competing grasses. All herbicides must be applied according to label information. [2/]
- If practical, cultivation may also be used. Plow shallow or cultivate no deeper than 3 inches between the rows. Do not plow or cultivate closer than 1 foot from the base of the trees. The optimum time is midsummer or early fall.

**Thinning**.

- Thinning can be the removal or killing of certain trees within the row or removal or killing of entire rows to improve the growth of adjacent rows.
- Trees and/or shrubs thinned within the row generally should not exceed the current recommended maximums for in-the-row spacing by more than 30%. Spacing can be exceeded with documentation considering age, size, soil, and environmental conditions. Target is to release the tree crown on 3 to 4 sides.
- Marking of trees and shrubs or entire rows to be removed must be done prior to any removal operations.

- Removal may be by any means that does not contribute to erosion or that does not damage trees and/or shrubs that will remain. It may be desirable to use the debris for wildlife brush piles. Disposal must be in compliance with county and state regulations.
- An effort will be made to retain those trees, shrubs, or rows that have the most vigor. Removing or killing entire rows of deciduous trees can improve the growth of adjacent rows of evergreens which have been suppressed. Deciduous rows to favor when overtopping or crowding occurs are common hackberry, honey locust, bur oak, and black walnut.
- The removal of trees by severing at the base may cause sprouting. To control sprouting where it is not wanted, apply an appropriate herbicide. Care should be taken to avoid off target herbicide damage through flashback or excess herbicide contacting the soil. [2/]
- When selectively thinning trees/shrubs, linear rows do not need to be maintained. A windbreak density of >50% should be planned for.

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

- Prune branches from adjacent deciduous trees which may interfere with the normal growth of evergreen species.
- Prune deciduous shrub rows which have become leggy (containing sparse or dead branches) and where a dense shrub row is desirable. Cut shrubs back to 4 to 8 inches above ground during the dormant season.
- See Conservation Practice 660, Tree/Shrub Pruning, for pruning assistance.

**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.
- Root plow at the drip line or further from the trees. Cultivation over the root plow furrow is necessary to prevent suckering from the severed roots.
- Root plow to a depth of 18 to 24 inches. This will normally require 2 trips over the furrow, plowing 9 to 12 inches with each pass.
- Repeat root pruning at intervals of 5 to 10 years.
- Root prune when the trees are dormant if possible.
- Locate all buried utilities before starting root pruning.

**Fabric Weed Barrier for Weed Control and Moisture Conservation.**

- Refer to Kansas Forestry Technical Note No. 9.

[1/] Except as limited by law in commercial apple area (both eastern redcedar and Rocky Mountain juniper are hosts of cedar-apple rust). Rocky Mountain juniper is not recommended in MLRAs 75, 76, 84A, 106, 107, and 112.

[2/] CAUTION: If pesticides are used, they should be applied only when needed and handled with care. Follow the directions and heed all precautions on the container label. If pesticides are not handled or applied properly, they may be injurious to humans, animals, fish and wildlife, desirable plants, honey bees and other pollinating insects, and they may contaminate water supplies. Apply only in accordance with federal, state, and/or local laws.

**3. References**

Windbreak Renovation, Craig Strange, USDA, NRCS,
http://www.unl.edu/nac/brochures/ec1777/index.html

Windbreak Renovation, North Dakota State University,
http://www.ag.ndsu.edu/trees/whatnew/windbreak/WBRen3a.htm

Windbreak Maintenance and Renovation, Jon Wilson, Mike Kuhns, Nebraska Extension.

http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1853&context=extensionhist

Windbreak Management, Jim Strine, Kansas Forest Service, KSU MF-815,
http://www.ksre.ksu.edu/library/forst2/mf815.pdf