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Division of Resource Conservation & Forestry

Windbreak management

Windbreaks require management to remain healthy and effective. Implementing good windbreak management strategies addresses these three objectives:

- to promote vigor and growth of individual trees and shrubs.
- to develop the windbreak structure for maximum effectiveness.
- to lengthen the effective life span of the windbreak.

Maintenance

- Weed control
 - Mechanical
 - Fabric
 - Chemical
- Pruning
- Thinning and release
- Other maintenance
 - Insect
 - Disease
 - Fire
 - Livestock

Renovation is a drastic form of maintenance.

Evaluation needs to be done on-site to determine needed maintenance.

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This brochure was funded in part by a grant from USDA Forest Service Forest Stewardship Program.

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January 2007

Windbreak Maintenance or Renovation



South Dakota
Department of Agriculture
Division of Resource Conservation
and Forestry

Windbreaks are integral parts of many farming and ranching operations. They protect man, animals, crops and buildings from cold winter wind, hot summer wind, and deep snow. Windbreaks prevent wind erosion and provide wildlife habitat.

Windbreaks require management to remain healthy and effective.

Windbreak trees are planted close together to provide a wind barrier as quickly as possible. However, as tree and shrubs mature they begin to crowd one another. This crowding must be relieved to maintain vigor and sufficient foliage to form an effective wind barrier. Symptoms of overcrowding include premature foliage loss, poor foliage color, dead branches, increased incidence of disease and insects, and reduced growth.

Maintenance or Renovation ?

Maintenance is done throughout the life of a windbreak to keep it healthy and growing. It is especially important early in the life of the windbreak. Maintenance includes any post-planting care such as weed control, pruning, and thinning. Fertilization and watering may be considered, although watering is rarely done after the first few years after planting, and fertilization normally is not required.

Weed Control - Grasses and weeds compete with trees and shrubs of all ages for moisture, light, and nutrients. This is especially important with smooth brome. Competing vegetation must be eliminated for successful establishment of new plantings. Competing vegetation needs to be controlled in older windbreaks to maintain a healthy stand of trees.

Grasses and weeds between rows can be controlled by cultivation, mowing or herbicides. If cultivation is used, avoid turning the soil deeper than three inches to prevent damage to tree roots.

Fabric – In regions of low rainfall, woven, black plastic weed barriers are effective in reducing weed competition and soil moisture loss in new plantings. Although they reduce the workload associated with weed control, they are not maintenance free. Weeds still occur between the rows and along the edge of the fabric. Care must be taken to avoid damage to the fabric when mowing or cultivating.

As the trees grow, they will encounter the fabric. Whenever the tree encounters the fabric, the holes within the fabric must be enlarged to allow the tree room to grow. If the holes are not enlarged, tree growth will envelope the fabric eventually causing tree mortality.

Pruning – When young, multi-stemmed trees are pruned, a faster growing, single-stemmed tree develops. Forked or multi-stemmed trees are prone to wind damage. They also tend to put on less height growth. Select a dominant trunk and prune out forks and extra stems before they become two inches in diameter. Do not prune branches on older trees because it reduces the density and effectiveness of the windbreak.

Thinning and releasing - If a windbreak shows signs of crowding remove some of the trees — either individual trees within a row or entire rows. Candidates for removal include diseased, dying, and low-vigor trees.

Other Maintenance – Fences should be maintained throughout the life of a windbreak if livestock are present. Young trees can be damaged by browsing and trampling. Older windbreaks can have their effectiveness greatly reduced by browsing of lower branches and soil compaction.

Renovation can be considered a more drastic form of maintenance. It becomes necessary to renovate as a windbreak ages or deteriorates due to poor maintenance or design. If possible, renovation should start early enough to allow any new planting to become effective before windbreak protection declines.

Evaluating a windbreak needs to be done on-site to determine needed maintenance. The following is a guide to help landowners decide whether windbreak renovation is necessary. The guide uses characteristics such as age, health and vigor, species diversity, density, and intended use to determine if renovation is needed. If a windbreak does not need renovation, normal maintenance will still be necessary.

Windbreak renovation guide.

1. Is windbreak over thirty years of age?
 - a. Yes go to 2
 - b. No go to 3.
2. Do the tree crowns appear healthy, vigorous, full, and straight; few or no dead branches; tips of branches in crown not significantly touching, overlapping, or interlaced with adjacent trees; no insect /disease problems?
 - a. Yes ... go to 6.

- b. No ... (within row) remove individual suppressed trees or trees with poor form; (between row) if tree row is overtopped or shaded, remove complete row; go to 3.
3. Is windbreak composed of only one species of tree, for example all Siberian Elm or all cedar?
 - a. Yes ... need to increase tree diversity; go to 4.
 - b. No ... go to 5.
 4. Are there more or less than four rows of trees in the windbreak (if not a farmstead windbreak, go to 5)?
 - a. Four rows or less ... add rows of trees. If all deciduous, add minimum of two rows conifer, for example cedar, to windward side of windbreak. If all conifer, add minimum of two rows deciduous trees or shrubs, for example honeylocust or plum, on leeward side of windbreak. Go to 5.
 - b. Five or more rows ... if all deciduous, either add a row of conifer (cedar or juniper) to windward side of windbreak or remove first and second windward rows and plant new rows of conifer. If all conifer, add one or two rows deciduous trees or shrubs on leeward side, or remove last leeward row or two and plant deciduous trees, for example honeylocust. Go to 5.
 5. What is spacing distance between trees within row and between tree rows?
 - a. Less than 10 feet (trees in one row overtop adjacent trees, either within row or between row) ... remove either individual trees or entire rows to reduce crowding.
 - b. Greater than 10 feet ... go to 6.
 6. Does snow drift in protected area, like livestock feeding/ calving area, work area, or living area?
 - a. Yes ... add tree rows to windward side of existing windbreak or extend length of existing windbreak. Optimum is to have open area of 40-80 feet between existing windbreak and newly planted windbreak.
 - b. No ... go to 7.
 7. Does windbreak attract a variety of wildlife?
 - a. Yes ... go to 8.
 - b. No ... add one to two mixed shrub rows to leeward or windward side of existing windbreak. Use millet or milo as cover crop and weed control.
 8. Windbreak does not need renovation. Continue maintenance.