



Windbreak Management

Windbreaks require management to remain healthy and effective. Just as a forest can be managed to yield more benefits, a windbreak can be managed to maintain an effective wind barrier. 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.

Management versus Renovation

Windbreak trees are planted close together to provide a wind barrier as quickly as possible. However, as the trees 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 diseases and insects, and reduced annual growth.

Properly managed windbreaks require little renovation. Management should begin after trees are well established and before crowding starts. This is usually between the 10th and 15th year, depending on tree species, rate of growth, and spacing. Periodic removal of individual trees to relieve overcrowding can eliminate the need for major renovation. Care must be taken in removing trees in a windbreak to avoid reducing its effectiveness.

Methods of Renovation

Managing a windbreak from the start will reduce or eliminate costly renovation measures. However, if no management has occurred in a windbreak for 20 years or more, renovation may be necessary to restore its long-term wind-control potential. Following are practices for renovating a 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. Long-lived species such as green ash, hackberry, bur oak, or honeylocust should be favored for retention over short-lived species such as Siberian elm and cottonwood.

In many older windbreaks, pine and redcedar rows have become overtopped and crowded by fast-growing deciduous trees (trees that lose their leaves in the fall). Since evergreen trees provide needed density for wind reduction, they should be favored by removing adjacent rows of overtopping deciduous trees. Research has shown an increase in diameter growth and foliage density in both ponderosa pine and redcedar after removing competing rows of trees.

Deciduous trees also respond to release treatments. Released deciduous trees will grow faster in diameter and height, and develop longer, wider, and denser crowns than overcrowded trees.

Before starting a thinning treatment, consider its effect on the windbreak. Removing enough trees to end all crowding may make the windbreak

too open to be effective. Removing too many trees can allow undesirable vegetation to encroach into the windbreak. Crowded inner rows may not have sufficient lower foliage to provide wind protection if the outside rows are removed.

It is best to implement management practices one step at a time instead of all at once. This method allows the windbreak to function while the renovation is being completed. For example, if several rows need to be removed, it may be advisable to remove only enough rows to establish a new row. As the new row develops and starts to provide wind protection, additional rows can be removed. In thinning operations, two light thinnings done a year or two apart may be better than one heavy thinning.

Coppicing. Cutting trees and shrubs a few inches above ground level and managing the resulting sprouts is called “coppicing.” It is an effective method to increase the low-level density of large overgrown shrubs. Most deciduous tree and shrub species used in windbreaks will sprout when cut back to ground level during the winter. Deciduous tree sprouts may be short-lived in a windbreak. Therefore, coppicing is more applicable to renovating outside shrub rows. Evergreen trees, such as pines and redcedar, will not sprout from a cut stump.

Pruning. Some landowners prune lower branches of windbreak trees, especially evergreen trees, to improve their appearance and to allow debris to blow through the windbreak. This

practice reduces the effectiveness of windbreak plantings. If the windbreak is open enough for debris to blow through, it is too open to control erosion and snowdrifts. Since the primary purpose of a windbreak is to use foliage density to control wind movement, removing lower limbs is generally not recommended.

However, some pruning may be advantageous. Branches damaged by wind, snow, ice, insects or disease may need to be removed to improve the health of individual trees.

Controlling Grasses. Cool-season perennial grasses, such as tall fescue or smooth brome, are detrimental to windbreaks because they compete with trees for available water and nutrients. Removing competing cool-season grasses can result in increased vigor; diameter and height growth; and crown density in windbreak trees.

If cool-season perennial grasses are growing adjacent to a windbreak, they must not be allowed to spread into the windbreak. Mechanical cultivation or use of a contact herbicide will aid in hindering the spread of grasses into the windbreak.

If a cool-season perennial grass has invaded the windbreak, it should be destroyed by applying an approved herbicide. Mechanical cultivation within a windbreak is usually not recommended due to the potential of tree and root injury.

Planting Additional Trees and Shrubs. Planting additional rows of trees or shrubs adjacent to a windbreak can improve its effectiveness and longevity. When a windbreak reaches 25 years old or more, it is a good practice to plant one or two rows of evergreen trees adjacent to the windbreak. This will help ensure continued

wind protection as the trees in the older windbreak reach maturity and start to decline. When the older trees need to be removed, the additional rows will be established and provide protection.

In some situations, there is not enough room to plant additional rows of trees on the outside of an existing windbreak. New tree rows can be planted within the existing windbreak after old tree rows or trees in poor condition are removed. Plant only one row for every two rows removed. This will provide additional space for new trees and easier access for maintenance of the new planting.

When planting additional rows, try to add diversity to the windbreak. Whenever possible, plant a tree or shrub species that is not in the existing windbreak. Diversity will improve wildlife habitat and reduce the risk of potential insect and disease problems.

A key point to remember before removing and replacing tree rows is to determine what wind control level needs replacing. Evergreen trees provide excellent year-round low- to mid-level wind control. Tall deciduous trees provide upper-level wind control. Shrubs are good for low-level wind protection and also provide good wildlife cover and food.

Root pruning may be necessary to reduce competition from the existing trees. Roots need only be pruned to a depth of 2 feet. Repeat the operation in 3 to 5 years. Tractor-mounted root pruners are available on loan from

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Kansas Department of Wildlife and Parks and some county Conservation Districts. No adverse effects have been observed as long as the root pruning is made near the ends of the branches (drip line) and only one side is pruned in one year. However, roots of some tree species, such as honeylocust, black locust, and osage-orange, will produce sprouts at the point of pruning.

Managing Natural Reproduction. Well-established windbreaks that are protected from livestock and fire often have an abundance of natural seedlings. These may be used to fill in gaps in the original planting or to increase the density of lower level foliage. One way to manage seedling reproduction is to cut all young trees except those in a narrow band where a new row is desired. Another way is to select the best individual trees, spaced 6 to 10 feet apart, and remove all remaining trees.

Before beginning renovation in your windbreak, seek professional assistance. Technical assistance in windbreak renovation is available from your county K-State Research and Extension office, Natural Resources Conservation Service, or the Kansas Forest Service.

Related Publications

- *Tree Planting Guide*, C-596
- *Windbreaks for Wildlife*, MF-805
- *Windbreaks for Kansas*, MF-2120
- *Chemical Weed Control in Tree Plantings*, MF-656
- *Conservation Tree Planting Schedule*, L-871



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