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G89-923 Windbreak Maintenance and Renovation

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G89-923-A

NebGuide

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Windbreak Maintenance and Renovation

What are you doing to maintain your windbreak? Is renovation necessary? This NebGuide can help you decide.

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- Maintenance or Renovation?
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Windbreaks are integral parts of many Nebraska farming and ranching operations. They protect man, animals, crops and buildings from cold winter winds, hot summer winds, and deep snows. Windbreaks prevent wind erosion and provide wildlife habitat.

All windbreaks, even well-designed ones, need regular maintenance. Some windbreaks, especially those that are older or neglected, may need more drastic treatment or renovation.

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 planting.

Maintenance includes any post-planting care such as weed control and pruning. Fertilization and watering also may be considered maintenance, although watering is rarely done after the first few years after planting, and fertilization normally is not needed.

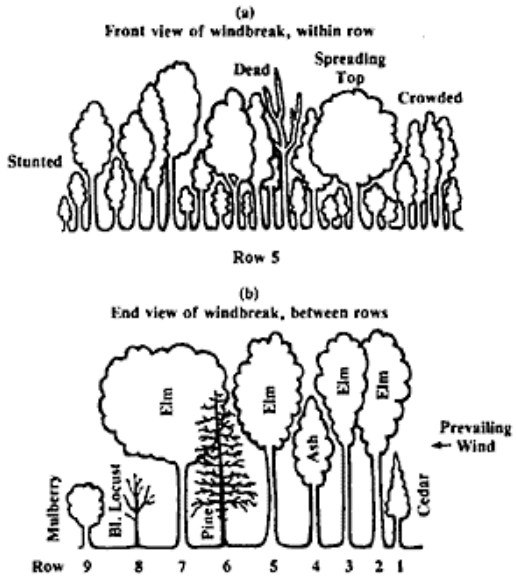

Figure 1. Typical Nebraska windbreak before renovation.

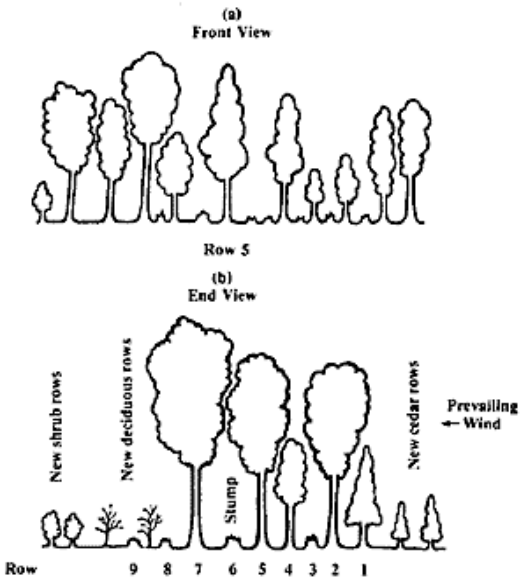

Figure 2. Typical Nebraska windbreak after renovation.

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 plantings to become effective before windbreak protection declines.

Renovation includes techniques such as adding or removing tree or shrub rows, thinning within rows, and managing natural reproduction and coppice sprouts. Pruning also may be part of renovation. *Figures 1 and 2* show typical windbreak profiles before and after renovation.

Many windbreaks in Nebraska and throughout the Great Plains are old, and some are poorly designed. Species diversity often is lacking, with Siberian elm (commonly called Chinese elm) dominating many windbreaks. Siberian elm can get quite large and will overtop and out-compete more desirable species. It tends to be short-lived.

Evaluating a Windbreak

Windbreaks differ in design and growth characteristics. An on-site evaluation is necessary to determine maintenance and renovation needs.

Table I presents 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 indicate a windbreak's need for renovation.

If a windbreak does not need renovation, normal maintenance still will be necessary. Follow the routine maintenance guidelines presented in this NebGuide.

Windbreak Maintenance

Weed Control -- Grasses and weeds compete with trees and shrubs of all ages for moisture, light, and nutrients. This is important in central and western Nebraska and is especially important with smooth brome. Competing vegetation must be eliminated to successfully establish new plantings. Competing

vegetation also can be controlled in an older windbreak to maintain a healthy stand of trees.

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

A preemergent herbicide, such as Princep, will control germinating weeds and grasses. This is especially important in the tree row where cultivation is difficult. Preemergents should be applied to bare soil soon after planting. On established or perennial grasses and weeds it may be necessary to use a contact or translocating herbicide such as Roundup.

Princep can be used in conjunction with contact herbicides, or can be applied in the late fall or early spring to control the vegetation. A preemergent herbicide also can be applied after mechanical weed control. Always follow the instructions on the label when using any chemical.

Pruning -- When young, multi-stemmed trees are pruned, a faster growing, single-stemmed tree develops. Forked or multi-stemmed trees are prone to wind breakage. 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. Trees can close small pruning cuts more quickly than large ones. Do not prune branches on older trees because it reduces the density and effectiveness of the windbreak. See Extension Circular EC82-1224, *Pruning Shade Trees*, for more details on pruning.

Other Maintenance -- As mentioned previously, fertilization rarely is needed in tree plantings. Watering generally is needed only for a few years after planting to help establish the windbreak.

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.

Windbreak Renovation

Follow the procedure outlined in *Table I* to determine renovation needs. Besides the techniques mentioned in *Table I*, several other important points should be considered.

1. Windbreaks dominated by Siberian elm should have a root plow pulled between existing tree rows and any newly planted rows. Siberian elms are extremely competitive and will stagnate new tree plantings. Planting individual or single trees inside Siberian elm windbreaks is not recommended.
2. Renovated windbreaks should have windward rows of conifers and leeward rows of deciduous trees, and each row of trees should be a different species. The windbreak should be composed of two age classes of trees--this is called an uneven-aged windbreak. In an uneven-aged windbreak, young trees will be in place to grow and replace older trees as they die.
3. Sunlight, along with moisture, is critical for good tree growth. Removal of complete tree rows or groups of trees, followed by planting in the resulting open area, generally will produce better tree survival and growth than individual tree removal and planting.
4. Stumps of recently cut deciduous trees are likely to sprout. Stumps can be treated with a mixture of the herbicide 2,4-D and diesel or with Crossbow, Tordon, or Velpar to eliminate sprouting. ***There is a possibility that herbicide could be translocated to standing, live trees of the same species through rootgrafts, causing severe damage or even death of the remaining trees.***
5. Trees can be removed with a chain saw or larger power equipment. Manual labor generally is less expensive and less damaging to the site than large equipment. Trees can be girdled and left

standing for wildlife. Girdle a tree by cutting into the wood all the way around the trunk near the base.

6. Sprouts from cut stumps of certain deciduous tree and shrub species are called coppice sprouts. Coppice sprouts can grow fast and increase the windbreak's low-level density. To stimulate the growth of sprouts on shrubs, leave a six to 12 inch stump.

Managing Natural Reproduction

With sufficient moisture, many tree and shrub species naturally reproduce themselves when protected from livestock and fire. This natural reproduction occurs under older trees and in open areas created by deteriorating rows. These young trees and shrubs improve the low-level density and catch more snow.

Natural reproduction in a healthy, effective windbreak can be left alone, as it will stagnate in a few years. It will remain alive for several years, but eventually will need to be released or it will die. If, however, older trees are beginning to deteriorate, the natural reproduction should be released.

Natural reproduction is released by removing some of the older trees and thinning the young trees. There are two ways to thin the reproduction. One is row thinning, which involves cutting or killing all reproduction except that in the original row or a new row. Another is selective thinning, which is the selection of the best trees at appropriate spacing, and the cutting or killing of all other reproduction. The appropriate spacing varies with each species and generally should be the recommended planting spacing for that species.

Additional Information and Assistance

Most county ASCS offices have windbreak renovation as an approved cost-share practice. Help in assessing windbreak condition and determining needed maintenance or renovation practices is available from your Nebraska Forest Service District Forester, Soil Conservation Service office, Natural Resources District, or County Extension Educator.

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Table I. Windbreak renovation guide. Refer to NebGuide text for details.

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?

   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.

   a. 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.

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