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Shelterbelts and Windbreaks: Plugging Up the Holes

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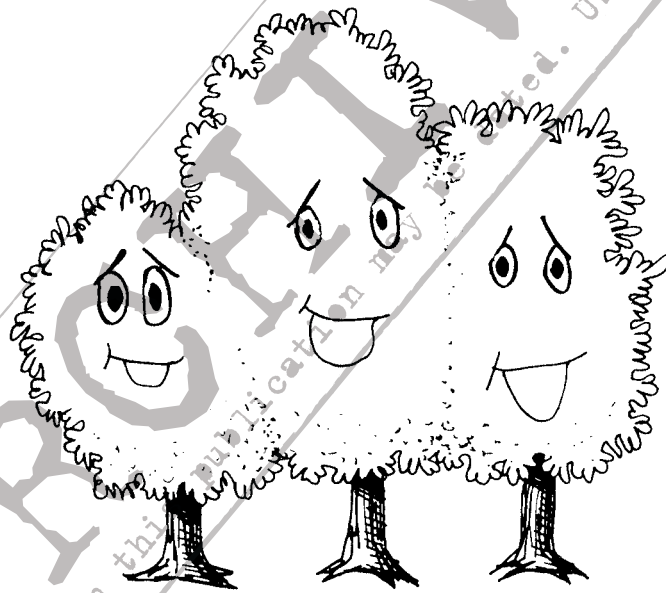
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Shelterbelts and windbreaks:

Plugging up the holes



Cooperative Extension Service
South Dakota State University
U.S. Department of Agriculture

Some signs your shelterbelt/windbreak has passed its prime are

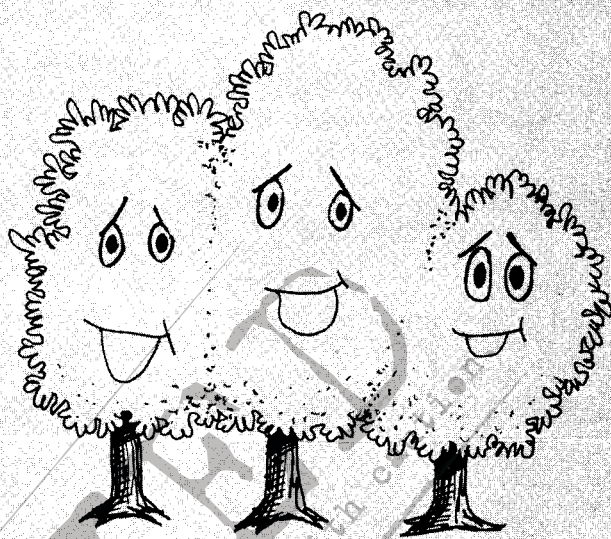
- grass growing in the planting
- a poor or nonexistent shrub row
- trees in poor vigor
- livestock in the planting
- holes or gaps in the rows.

FS 749

Problem:

The S/W with dead, missing, or weak trees

Plugging up the holes



Larry Helwig
Extension forester

General procedures for renovating a shelterbelt/windbreak

(for details, also see fact sheets 746, 750, 751)

1. Know what a good planting should look like. If your planting is in trouble, correct it.
2. Determine (a) which species is under stress, (b) its age, (c) the cause of the problem, and (d) how to correct the cause before starting any work.
3. If the planting is worth renovating and competing ground vegetation is the problem, remove the excess vegetation. The response can be dramatic.
4. If the planting is weak in spots, control the weeds and replant with recommended species.
5. If there are large expanses of weak and missing trees, it may be better to start a new planting leeward, windward, or somewhere within. (See tree list in fact sheet 750).
6. If there isn't room to establish a new belt on either side, it may be necessary to remove all or part of the existing trees. Kill the ground vegetation with a chemical, work up, and replant.

There's such a long wait between planting and benefits that too often we choose to live with an existing shelterbelt/windbreak (S/W) that isn't doing its job. After all, it's better than nothing.

"Nothing" is what we will end up with.

Then winter storms will raise heating bills and make life uncomfortable for us and miserable for the livestock.

Renovating the tree rows in the S/W is the hardest phase in S/W repair. But many South Dakota S/Ws are reaching the age where work must be done now, while there's still some benefit to be gotten from existing trees while the new ones grow.

The basics

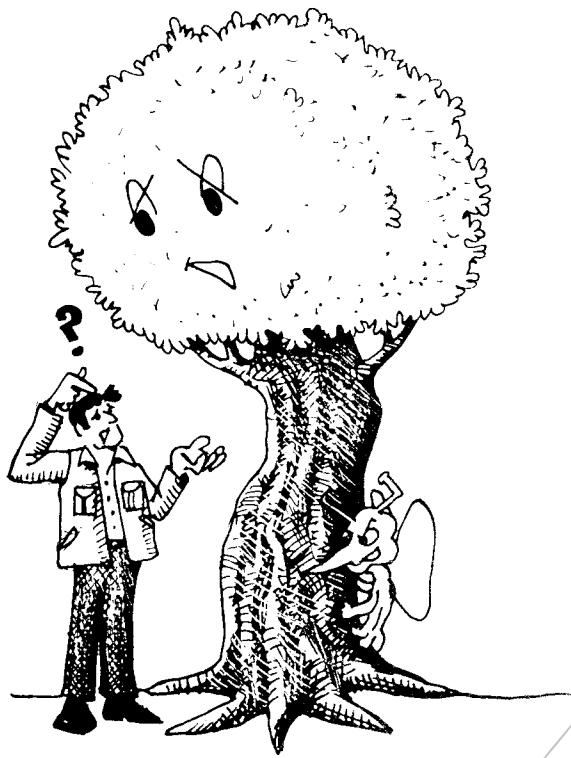
The ideal S/W is tall, dense, and continuous. The height determines the amount of area protected, and the density determines the degree of protection. When you look at the planting during growing season from upwind, it should appear like a continuous wall or barrier.

This wind barrier makes outside work more comfortable, reduces animal feed intake, minimizes snow removal costs, and reduces home and farm building heating costs.

A clean floor in the S/W in summer usually indicates that the tree and shrub crowns are thick and healthy. Broadleaved weeds, even in spots, show that crown density is decreasing and the S/W is going through some kind of stress. Grass means that the planting has been under stress for several years and needs attention.

When planning S/W renovation, consider where you want the most wind and snow protection—center of the farm yard? feeding area?

The windward shrub row should be 200 to 250 feet north and west of this Principal Area of Protection (PAP). The rest of the planting falls between this row and the PAP.



Use an orderly procedure when deciding if money should be spent on renovation. (1) Determine the species (it won't pay to renovate an American elm planting). (2) Determine age (a planting 50 years old will not readily respond to extra care). (3) Determine cause for decline (a planting suffering from a boring insect will not respond). (4) Correct problems if possible. (5) Proceed with the best method of renovation.

Function of trees and shrubs

Tall trees are the wind protectors for the PAP. The guideline for determining the area of influence is 10 times the matured height of the tall trees. This is the distance wind will be decreased to the downwind of the planting.

Shrubs are ground-wind barriers to stop windblown snow before it reaches the PAP. A planting which has a windward shrub row closer than 200 feet to the PAP will provide more comfort from wind, but increase problems from drifting snow. The reverse is true when the shrub row is beyond the 250-foot distance.

Medium height trees fill the crown gap between the shrub row and tall tree rows.

Actions cause reactions

The unthriftiness of your present S/W is a reaction to a stress of some kind. You can expect the S/W to react to your attempts to repair it too. Some actions will have an adverse effect but sometimes this can't be avoided.

Reducing or eliminating the competing vegetation within or adjacent to an existing planting will cause the nearby trees to put on extra foliage, thus decreasing the light for underplanted trees.

Planting to the windward of an existing S/W will reduce the amount of snow in the old planting and

possibly put it under greater water stress. And when the new planting matures, it may not have as much effect on the wind in the PAP as you'd want, since it could be located too far beyond the 250-foot distance.

Planting new rows to the leeward of an old planting will deprive the new planting of snow if the old S/W is functioning at all. On the other hand, if the old planting is open at ground level, snow may pile up on newly planted evergreens. If the new planting is closer to the PAP than the recommended 200 feet, drifts may settle in your work area.

Deciding what to do

Make your decisions on renovation in an orderly sequence:

1. Visualize what a highly functional planting should look like. What is missing from your planting?
2. What was the cause for this deterioration? There is **always** a cause, even though it may not be apparent. Make plans to correct the situation before replanting.
3. Determine if the present S/W is within the recommended 200- to 250-foot zone. If not, is there room for a new planting either to the lee or windward side? Don't discount the possibility of rearranging your work area to fall into the new PAP. Minor adjustments of drives, fences, or doorways are well worth the cost for wintertime comfort and economy.
4. Will it be a new planting or can you bring the old S/W back into prime?

Causes of S/W decline

Pinpointing the reason your S/W is no longer functioning may be the most important step you take. It could be species composition or arrangement, age, pests, weather, and/or herbicides.

Species composition

Short-lived species like Siberian elm and cottonwood should not receive the same renovation consideration at 25 years of age that long-lived species like green ash or hackberry would receive at that age.

Age

A number of tree plantings that are sometimes less than 10-15 years old and in poor condition can be renovated simply by removing competing vegetation from the ground surface. Conversely, plantings made up of 30-year-old Siberian elms or 50 to 60-year-old green ash should not be treated. Instead, new trees should be established.

Pests or weather problems

Pests, herbicides, or adverse weather can initiate the decline of young or old plantings. These conditions will reduce the crown density, allow sunlight to filter through, and initiate the growth of competing vegetation. Find the cause and eliminate it before renovating, or compensate by planting more adapted species.



Situation: The planting has trees missing or has small areas of damage.



Remedy: Kill the ground vegetation by mechanical or chemical means and replant 4- to 6-foot trees about 6 feet apart.

Herbicides

If herbicides are used regularly near tree plantings and you find that these chemicals are causing the crowns to thin out, it won't pay to renovate until you change the herbicide application procedures.

Insects

If leaves are chewed or entire branches have been killed or defoliated, suspect insect damage.

Chewing or sucking insects usually cause damage to foliage and are easier to control than boring insects. Before renovating, bring these problems under control. Get professional advice.

Disease

There are no ways to stop the spread of certain tree diseases. The most serious is Dutch elm disease. No

form of renovation other than removal and replacement of American elms should be considered.

Some diseases thin out the crowns, allowing vegetation to become established within the planting. The problem here is both the vegetation and the disease.

Livestock

The S/W damaged by livestock will usually respond to renovation if the plants have not been totally destroyed. The first thing to do is to get the livestock (poultry too) out of the S/W.

Then you may have to replant or prune off shrubs where the animals have rubbed or browsed the lower branches.

Drought and other weather problems

Successive years of low precipitation or plantings that don't distribute winter snows evenly within the rows can cause the decline of plantings. Drought, snow traps, too-wide plantings, and poor shrub rows can all contribute.

Patch or start over?

There is always a need to control vegetation that competes with the trees for moisture. If you have lush grass or weed growth in the S/W, see FS 751, "Getting rid of the grass." On the other hand, if young trees like green ash or eastern redcedar are coming up under the old trees, allow them to become your new tree planting.

Spotty tree survival?

Check the soil. It could be the cause for poor performance.

Open spots without trees will require establishing new ones in sufficient number to give early entire-crown closure. Otherwise, ground vegetation will slowly weaken adjacent trees and eventually make the whole planting ineffective.

Work up the open area or kill the vegetation with herbicides and hand plant 4- to 6-foot trees about 6 feet apart. Consider using the fast growers like Siberian elm on dry spots and poplar or willow on the wetter sites. Keep the area weed free by cultivating and by applying a preemergence herbicide after October 15.

In all situations, site preparation and weed control is important to the success of new trees.

Large expenses of missing trees?

If more than 50% of the trees are gone or dead, it may be best to start a new planting.

If it can be put adjacent to the old planting and not greatly affect the PAP, replant. If new trees would change the PAP to your inconvenience, you might prefer to remove several of the old, most accessible, and least populated rows and replant in place.

Large equipment to remove trees could be expensive, but it may be best in the long run. The old trees can be sold for firewood.

Where to get help

You will want some more viewpoints and professional advice. The county Extension agent, Soil Conservation Office, Soil Conservation District, or district forester can, in most instances, give you help with your S/W problems. The Agricultural Stabilization and Conservation Service will be able to give you information on the availability of governmental financial assistance.

Fact sheets discussing shelterbelt/windbreak problems and renovation procedures are

- FS 746, Stop livestock grazing in shelterbelts
- FS 749, Plugging up the holes (trees)
- FS 750, Fixing shrub rows
- FS 751, Getting rid of the grass

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