



# Grazier

► by Kindra Gordon

## Tips for trees

*Whether trees are providing shelter from the cold wind or offering shade from the heat, their protection is always appreciated. And protection from the elements can help increase livestock performance and avoid weight losses. But trees can take years to grow to a useful height. Thus, establishing trees for livestock protection requires foresight.*

### Getting started

Even the act of planting a windbreak requires advance planning — with the first consideration being the selection of an appropriate location. In choosing a windbreak site, determine which direction the wind comes from during the time of year you want protection, says Rich Straight, with the U.S. Department of Agriculture (USDA) National Agroforestry Center in Lincoln, Neb.

For instance, if you are planting a windbreak to protect livestock in the winter, determine which direction winds typically blow from in the winter months. “We recommend your windbreak be placed perpendicular to the troublesome wind,” Straight says. In the Northern climates, this would typically be to the north or west of the area to be protected.

“Windbreaks need to be planted upwind from the area you want to protect,” Straight adds. So when selecting the windbreak site, he also suggests considering the locations of buildings, feeding facilities, roads, driveways, property boundaries and utility lines.

### Should you plant during drought?

Dry conditions can greatly reduce the survivability of tree seedlings. Therefore, a primary consideration when deciding to plant trees is the availability of soil moisture.

If your region has been in a drought for a few years, soil moisture is likely minimal, and you may want to delay planting until a wetter spring.

If you decide to plant during or following a dry year, supplemental watering may be necessary, says Rich Straight with the National Agroforestry Center. Including a fabric or mulch around the plantings can help hold moisture in the soil, Straight says.

“If windbreaks are planted too close to roads or driveways in snowy climates, they can actually cause snow to drift into those areas,” Straight says. Or, they can affect visibility if planted too near a road intersection.

Even the topography of the land can influence where a windbreak is best-suited. “A hill or rise that’s just upwind can influence wind flow and where a windbreak should be placed,” Straight says.

If you are establishing a new feedlot or calving facility, he adds, “Plan ahead where windbreaks will go before establishing the infrastructure.” This should allow adequate room for the windbreak and maximum protection from the wind.

### Space considerations

Length, height and width of tree plantings are factors that will also influence the effectiveness of a windbreak, Straight says.

Length of a windbreak determines the amount of total area receiving protection. As a rule of thumb, windbreak experts recommend that the length needs to be 10 times the height of the windbreak, or a minimum of 50-100 feet (ft.) longer than the area being protected.

“Length is important because a windbreak needs to be longer than the width of the area being protected,” says Straight. He explains that this is necessary because as the wind goes around the end of a windbreak it is pulled in toward the center. Straight adds that designing an L-shaped windbreak can create a larger area of protection and allows for shifts in wind direction.

Height of a windbreak determines the extent of the area protected downwind. Height is determined from the row of tallest trees and increases as the windbreak matures. On the leeward side (the side away from the wind), the effective distance of windbreak protection can be increased to as

much as 30 times the height of the trees. A figure of 10 times the height is often used to describe the area of greatest wind reduction. For example, a 40-ft.-tall windbreak would provide protection for 400 ft. Wind speed reductions are also created for a distance of two to five times the height of the windbreak on the windward side.

The width, or number of rows in a windbreak, restricts the amount of wind and snow that passes through. The more solid, or dense, a planting, the less wind is allowed through.

Density of a windbreak depends on the landowner’s goals, Straight says. “If a short, deep drift of snow is wanted, a dense planting is needed. To distribute snow across a field for moisture, a planting with less density — such as a single row of broadleaf trees — may be adequate,” he says.

He also offers this example: Feedlots in the Northern Plains may need a dense windbreak on the north or west side to stop snow. Then, on the south side, a single row of broadleaf trees can allow for cooling summer breezes to pass through.

Density and width of a windbreak are also key factors for wildlife habitat. “A wider windbreak provides more benefits for wildlife nesting, loafing, travel corridors and protection from predators,” Straight says.

As a rule, Straight says a minimum three-row shelterbelt is suggested to provide livestock protection in the winter. However, windbreaks with five or six rows and up to 10 rows may be most effective, depending on the landowner’s goals.

### The planting process

After a site is selected, planting preparations can begin. While the spring planting season is the best time to plant tree seedlings, the site should be tilled the fall prior to planting, Straight says. “Working the site in the fall helps reduce competing vegetation and prepares the soil so the tree seedling roots will have good soil contact,” he adds.

In preparing for tree plantings, landowners also need to be aware of what herbicides may have previously been applied to the site. “Some broadleaf herbicides can have a negative impact on trees,” Straight says. If you are uncertain about the history of the site, he suggests conducting a soil test.

Soil types will also influence what species of trees and shrubs are suitable to the growing conditions. “Soil type and local climate — including average rainfall and winter and summer temperatures — are the first considerations when selecting species,” Straight says.

The purpose of the windbreak is another factor to keep in mind when selecting

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species. "If you have a large area to protect, you'll likely select the tallest trees suited to the site. To stop snow, rows of conifers and shrubs may be necessary," Straight says.

He adds, "Shrubs are an important component of a windbreak. They help reduce ground-level blowing wind. Their dense branching and seeds and fruits also provide good habitat for wildlife."

A final decision before planting will be spacing between rows and within rows. For

the first five years after planting, you'll need to have access to cultivate or mow between the rows. Width between rows should be determined based on your equipment size.

Within the rows, consider the mature width of the tree or shrub. "The closer you plant trees together, the sooner the branches grow into each other and provide closure and protection," Straight says. Whereas planting far apart (35 ft., for example) can mean waiting 35 years until the trees provide a closed windbreak.

He reports that most trees are planted to get some closure at five years. As a guide, large trees are typically planted 12-18 ft.

apart; smaller trees are planted 8-12 ft. apart; and shrubs are planted 3-8 ft. apart.

However, Straight says if this guideline is used, after a windbreak has been established for about 15-20 years, some trees may need to be thinned out to maintain the health and vigor of the stand and to reduce competition among the trees for water and nutrients.

### **Management, care**

Poor site preparation and lack of weed control are the two most common reasons windbreaks don't survive, Straight says. Here are some management tips to increase the odds of getting trees to grow:

- ▶ Keep tree seedlings moist prior to planting.
- ▶ Livestock should be fenced out of tree plantings at all times.
- ▶ Control weeds and grasses around trees for a minimum of five years after a windbreak is first established. "Weeds and grasses compete for water and root space with the new seedlings. This competing vegetation can also shade out young seedlings when they are first getting established," Straight says. Reducing the vegetation around trees can also help eliminate rodents from

taking shelter among the trees and damaging the bark.

- ▶ If a water conservation fabric or mulch is put down with the planting, consider cutting larger openings in the fabric as the trees and shrubs grow. "We're seeing good results with these fabrics in reducing weed competition and storing moisture," Straight says. However, he reports, they are finding that as trees mature the small openings made in the fabric at the time of planting can girdle the trees or reduce sprouting from shrubs. "Due to shading from the trees,

the fabric is lasting up to 15 years, when it should be breaking down after five to seven years." Thus, Straight recommends landowners cut wider openings in the fabric for trees and shrubs after about five years.

For assistance in designing, installing or selecting species for a windbreak, contact your local conservation office. More information about windbreaks can also be found on the National Agroforestry Web site at [www.unl.edu/nac/](http://www.unl.edu/nac/).

