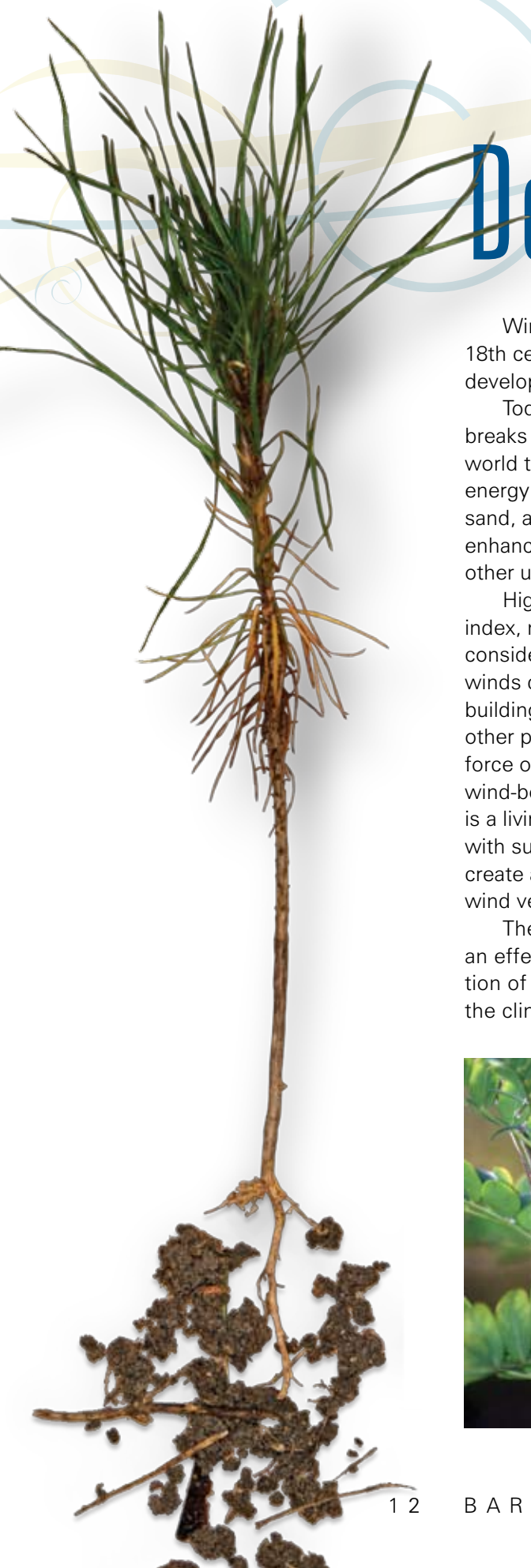

Developing a plan for

Windbreaks were first used by 18th century Scottish farmers in the development of marginal lands.

Today, various types of windbreaks are used throughout the world to reduce wind velocities and energy costs, control drifting snow, sand, and soil, protect livestock, and enhance wildlife habitat, among many other uses.

High winds increase the windchill index, making temperatures seem considerably colder. In addition, winds cause structural damage to buildings, fences, vehicles, and other property from both the physical force of the wind and abrasion from wind-borne particles. A windbreak is a living barrier of trees and shrubs with sufficient height and density to create a "wind shadow" of reduced wind velocities.

The most appreciated benefit of an effective windbreak is the reduction of wind velocity, thus modifying the climate to reduce heat gains in the summer and heat losses in the winter. The correct arrangement of trees and shrubs in a windbreak can reduce wind velocities as much as 75 percent; however, located improperly, a windbreak can actually increase problems for a landowner. Plantings too close to the area requiring protection is common. This can result in snow drifting in and around structures and driving areas making the planting a liability to the landowner.

On the other hand, windbreaks too far away will reduce the benefits. Understanding how wind barriers function, whether structural or living, is important to achieve the desired result.

The effectiveness of any windbreak is determined by three characteristics associated with the planting: height, density, and length.

Height works in tandem with density and will determine the distance downwind the windbreak will be effective. If the planting is about 50 percent dense (open space equals closed space), the planting will reduce wind velocities downwind for approximately 30 times the height of the tallest tree row. An extremely dense windbreak (more than 70 percent) will result in wind velocity reductions on both sides of the planting (leeward and windward) out to a distance of 10-12 times the height of the tallest tree row. The effects of height and density are important to understand as landowners tailor their plantings to address a specific need.

windbreak has future payoff

Length is obviously important. Often, windbreaks are planted to the length of the area in need of protection. Upon establishment of the trees, the landowner soon realizes the planting has actually created more problems than it has solved. Wind becomes compressed as it strikes a barrier, and velocities are actually increased at both ends of the planting and sweep around the barrier and inward at about a 45-degree angle. This phenomenon, termed "end effect," will result in higher wind velocities within the desired protection zone. Thus, plantings must be considerably longer on both ends to account for end effect – 100 feet on each end is generally recommended.

Other factors to consider are how many rows are needed and spacing between rows and between each tree and shrub within the row. The answer to these questions will vary depending upon the intended use of the planting, species involved, and the size of the area that can be dedicated to the planting.

Once design work is done, select the tree and or shrub species that will result in the desired density and survive in the soils and moisture conditions. A soil test is generally recommended. The information provided helps narrow down the species that will work. From there, choices are a matter of personal preference regarding color, form, fruit production, etc. Soil testing is available through the University of Wyoming College of Agriculture's Soil Testing Laboratory. Information is at http://ces.uwyo.edu/Soil_Main.asp, or call the lab at (307) 766-2135.

Windbreaks can certainly be an asset. Properly designed, these plantings result in improved quality of life, resource protection, increased property values, energy savings, etc.; however, like most other endeavors, properly planning a windbreak is the key to success.

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