

# Shelterbelts

Shelterbelts refer to a linear planting of trees and/or shrubs in single or multiple rows that can be incorporated into an agriculture production system, known as agroforestry. Shelterbelts have multiple benefits, they act as a barrier to reduce wind speed, modify air, and ground temperatures, boost soil moisture, contribute to soil and water conservation, and prevent erosion. Establishing shelterbelts throughout the farm property can increase storage of carbon or reduce the loss of stored carbon, known as carbon sequestration. This agriculture practice is one method to help mitigate climate change.

## Shelterbelts Used in Agriculture

### Crop Production

Shelterbelts can have a positive impact on crop production by reducing the wind speed, forcing the wind to go up and over the shelterbelt protecting the plants from physical damage. This decrease in wind speed can also trap snow providing more moisture for early season crop growth and reducing evaporation during drought periods to improve crop production. The trapped snow can also protect overwinter crops, such as wild blueberries.



Figure 1: Established shelterbelt at edge of crop field.

### Livestock Production

Shelterbelts have multiple benefits to livestock producers by reducing noise and odors (thus reducing nuisance complaints), providing shelter, and reducing wind-chill during winter conditions and shade in summer, which reduces stress and improves animal performance. Shelterbelts that are planted near barns can reduce the amount of energy necessary to heat or cool the building depending on the season.

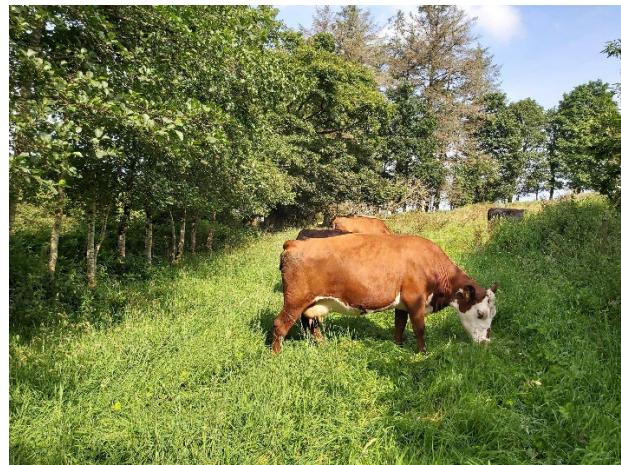


Figure 2: Shelterbelt used in livestock production.

### Environmental Conservation

Shelterbelts can increase biodiversity on the farm and better support the connection of habitats for wildlife and endangered species. By enhancing existing vegetation areas on the farm or planting a shelterbelt, not only does it support the conservation of native plants and animals, it can help boost mental health and wellbeing of those living and working on the land.

Shelterbelts provide ecosystem services, e.g. habitat for native pollinators and natural pest control. These perennial systems can also increase carbon storage in the soil which plays a significant role in climate change mitigation.

## Planning for Shelterbelts

Before planting, determine the main purpose or function of your shelterbelt. Are you seeking shade and cover for your livestock, or a windbreak for soil erosion control and crop protection? Are you interested in enhancing biodiversity and developing habitat connectivity for native wildlife as a primary focus or as a secondary benefit? Below are a few points to consider in planning an effective shelterbelt:

- **Inspect:** review your farm property to identify existing vegetation and natural shelterbelts. Identify any areas that are vulnerable to wind exposure or erosion or need more shade.
- **Height:** the height of the shelterbelt determines the protection capacity for the areas downwind.
- **Density & Length:** the length of a shelterbelt should be greater than the height of the belt by at least 10:1. Higher density (multiple-row vs. single-row) will discourage wind from passing through the shelterbelt. Two-row shelterbelts usually consist of a row of shrubs and a row of taller trees. Five meters should be left between the rows. It is better to plant a multi-row shelterbelt using a variety of trees or shrubs rather than planting two or more rows of the same, lowering the risk of losing the entire shelterbelt to storm events or disease. Table 1 shows the density of common shelterbelt species.

Table 1. Density of shelterbelt tree species.  
Adapted from AAFC.

Density	Species
Low	oak, poplar, trembling aspen
Medium	ash, larch, pincherry, pine, Siberian crab
Medium-High	red-osier dogwood, red elder, sea buckthorn, snowberry, lilac, willow
High	spruce

- **Spacing:** trees will be healthier later in life if they have adequate space to grow but this extra space will provide an opportunity for wind tunnels until the stand matures. Staggering trees in adjacent rows often provides the best opportunity for wind protection while the stand is being established. It is common to see a spacing of 5 m (16 ft) between the rows.
- **Orientation:** the direction affects the effectiveness of the shelterbelt. Trees planted at right angles to the wind are best. However, to intersect winds, multiple shelterbelts are often required.
- **Plant Selection:** use native plant species whenever possible as they can provide better habitat for wildlife and can survive local conditions which may include drought and fire. Match the characteristics of the site (geology, soils, climate, aspect, and elevation). Plant a variety of species, coniferous and deciduous trees, and shrubs as well as herbaceous vegetation. Consult your local landscape group for helpful tips.
- **Cost:** the cost will depend on the objectives, type, and plant species involved. Consider the cost in three categories: 1) planning and site preparation; 2) planting and/or establishment; and 3) on-going maintenance.

Information on shelterbelt funding and program opportunities, visit Nova Scotia Department of Agriculture link below:

[Sustainable Canadian Agricultural Partnership, Resilient Agriculture landscape Program Guidelines](#)

**Additional information and resources click on links below:**

Contact EFP team at (902) 893-2293  
[www.nsfa-fane.ca/efp/](http://www.nsfa-fane.ca/efp/)

[Shelterbelts Design Guidelines](#)  
[Climate Change Adaptation Program: Shelterbelts](#)