



Hedgerows for Field and Crop

Photo Credit: Ben Russell

Agroforestry fact sheet #2

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Planting and maintaining trees and shrubs on-farm is a wide-ranging endeavor, with many direct and indirect benefits. There are also many factors to consider when implementing or improving agro-forestry projects, as trees are generally long lived and will influence the landscape and operation for decades to come. Hedgerows are purposefully planted rows of woody perennials that not only protect farms from adverse weather, but provide a variety of ecological goods and services, including improved biodiversity, pest mitigation, moisture retention, and potential for additional on farm revenue streams. This fact sheet, as well as the remainder of the agro-forestry series outlines the various benefits and considerations needed to successfully establish trees on your farm.

In Season

Excessive wind can be detrimental to farm productivity by removing topsoil, robbing moisture, and potentially reducing yields. Some crops (like corn, or fruit bearing crops) can lose a significant amount of marketable yield when strong winds blow. Wind, regardless of the time of year, also causes soil erosion, especially when a cover isn't present. As the smaller (and most fertile) soil particles are swept up by gusts, they can be deposited off-farm in watercourses or other environmentally sensitive areas, causing eutrophication and robbing your system of needed fertility. Cover cropping, snow cover, and soil conservation structures can all help mitigate erosion events; however, a physical barrier of trees, shrubs and other perennials can help create a more favorable microclimate for decades at a time. Not only do these structures protect yields and other on-farm investments, they also ensure unwanted airborne concerns off-farm are minimized (e.g. spray drift, odours, noise), as well placed trees in full foliage can reduce pesticide drift by 60-90%, at 3 times the height of the stand. Keeping herbicide and other sprays in the field maintains efficient use of the product while protecting the surrounding environment from spray drift. Although these airborne concerns are not completely avoidable, the additional sheltering from hedgerows can provide protection, natural beauty, and peace of mind to your operation, neighbors, and surrounding environment.



Fig. 1. Environmental benefits of hedgerows (PTES 2024)

Snow fields

Hedgerows can also be used to control snow distribution. Much like when protecting adjacent land from other airborne concerns, keeping fallen snow uniformly distributed in fields helps maintain adequate soil moisture for the next growing season. In these situations, a less dense hedgerow or living snow fence (e.g. single row deciduous) may be preferable to a denser, multi-species hedgerow, which will encourage snow drift accumulation on the windward side of the hedgerow, concentrating runoff and potentially prematurely exposing soil further afield. Snow harvesting through these dense plantings can be helpful near laneways and farmyards but is less practical for field operations. For more info on protecting farmyards and infrastructure from snow drifts see agroforestry fact sheet #3. Less dense hedgerows for uniform snow accumulation presents a tradeoff, however, offering less wind protection to the field and crop during the growing season. Both these factors must be considered as every operation has different goals and challenges. Combining soil conservation practices with considered hedgerow design can help address soil loss and protect from both in season and winter wind.

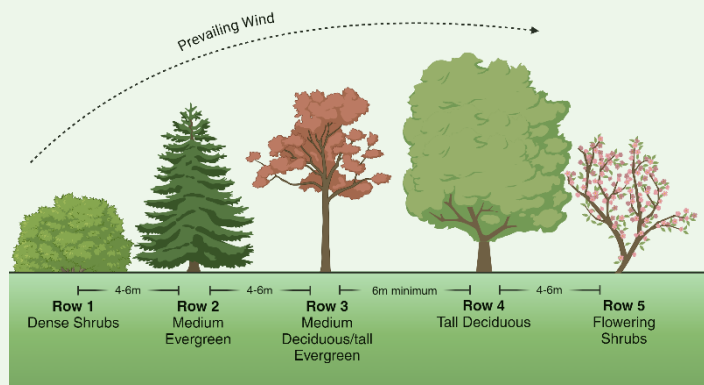


Fig. 2 Example of a full-scale hedgerow design for wind protection and biodiversity (Adapted from Sobba 2006)

How to

When planning to implement or improve hedgerows, it's important to consider the landscape and outline the objectives of the project. Some of the main considerations include the primary objective(s) of the hedgerow (erosion control, spray drift reduction, improved biodiversity, crop protection etc.), state of the soil (wet/dry, pH, weediness/tillage requirements), and surrounding environment, (prevailing winds, thoroughways, buildings, watercourses, communities etc.).

Although single row plantings can provide some protection and are preferable in some instances, planting 3-5 rows of native trees/shrubs increases wind protection, improves habitat/biodiversity, and is typically longer lasting. Fig. 2 (above) shows an example of a multi-row hedgerow, with fast growing trees providing protection for slower maturing species, and flowering/fruit bearing species facing the field/operation. Plant spacing within and between rows varies with species composition, as well as design goals. Larger trees may require several meters of space to mature, with surrounding shrubs providing shelter and filling gaps in the hedgerow. Planting multiple species within the row allows for greater design flexibility while supporting habitat development and local biodiversity.

Table 1. Non-exhaustive list of species well suited for field hedgerow design

Low shrubs	Long lived trees	fast growing trees	High shrubs
Red-osier Dogwood	Red Oak	Poplar	Red Berried/Common Elder
Bayberry	White Birch	White/Black Spruce	Willow
Wild rose	White/Red/Jack Pine	White Ash	Wild Raisin
Sweetfern	Apple	Pin Cherry	Mountain Ash
			Service Berry
			Alder

All operations are unique, and so require an individual approach when selecting location and species composition. See table 1 for a non-exhaustive list of native species for hedgerows, and Agro-Forestry Fact Sheet #1 for more information on site/species selection and tree planting considerations. Funding for the establishment of multi-species stands is available through the Agriculture Stewardship Program with compulsory enrollment in the Alternative Land use Services (ALUS) program. Single row and/or monoculture plantings are not eligible (except for willow plantations in riparian zones).

Snow + Dirt = SNIRT



Once soil has been removed from the field (by wind, water, or between the tread of a boot) it's no longer doing its job as soil and becomes (less) lovingly known as dirt. Particles from wind-borne erosion events can sometimes be seen in the snowy ditches of a PEI winter. Year-long cover, healthy soil structure, soil conservation structures, and well-designed hedgerows can all contribute to keeping the soil where it belongs, combatting SNIRT one field at a time!

The provincial hedgerow planting program can also support the implementation and restoration of hedgerows in farm and residential properties over 1ha. For more information contact the J. Frank Gaudet Tree Nursery at 902-368-6450.

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- Figures created in BioRender.com unless otherwise specified.

