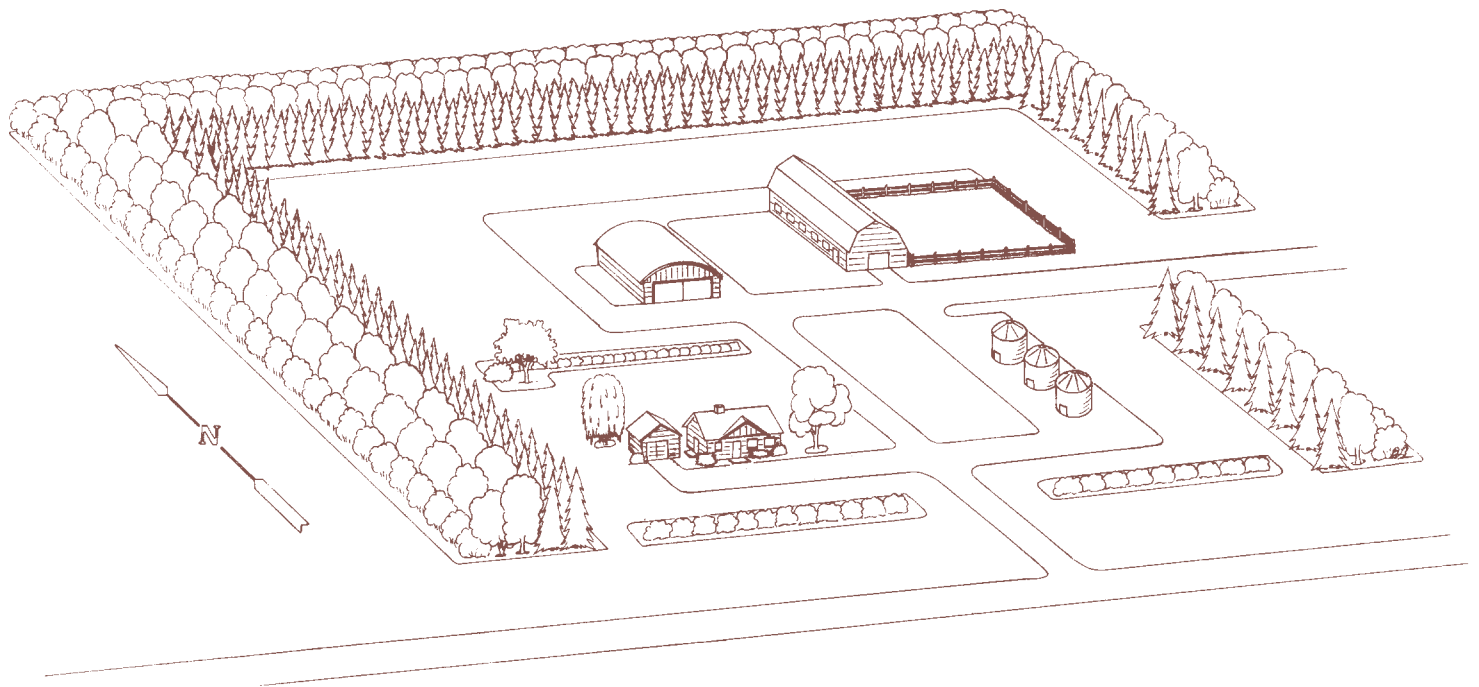




Planning Farm Shelterbelts



Introduction

Properly planned shelterbelts provide many benefits to farm families. They reduce wind, control blowing snow, protect livestock, buildings and gardens, and trap snow for dugouts. Shelterbelts also provide habitat for wildlife, decrease energy consumption and beautify the farmyard.

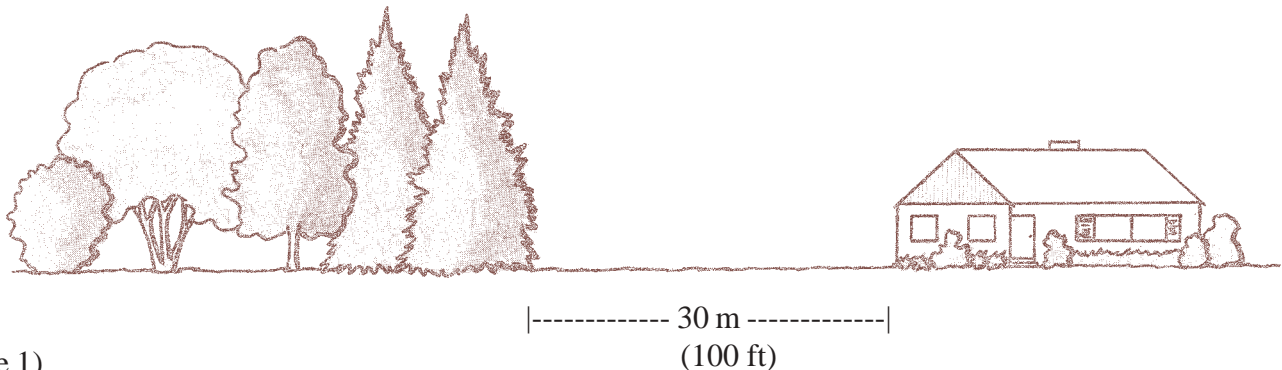
Planning Your Shelterbelt

Proper planning of a shelterbelt involves reviewing your present requirements, assessing your future needs, estimating the quality of existing shelterbelts and planning new shelterbelts for unprotected areas of the farm.

Begin by mapping out your farm using a scale of 2.5 centimetres = 30 metres or 1 inch = 100 ft., marking locations of existing trees, sloughs, buildings, farm access roads and power lines. Next, draw in the prevailing wind direction and note areas where excessive snow accumulation can cause problems.

To eliminate problems with snow buildup, keep all trees at least 30 metres (100 ft) from main buildings and driveways (Figure 1). Mark this distance around the perimeter of the yard to indicate the proposed locations of the shelterbelts.

Minimum Distance From Buildings



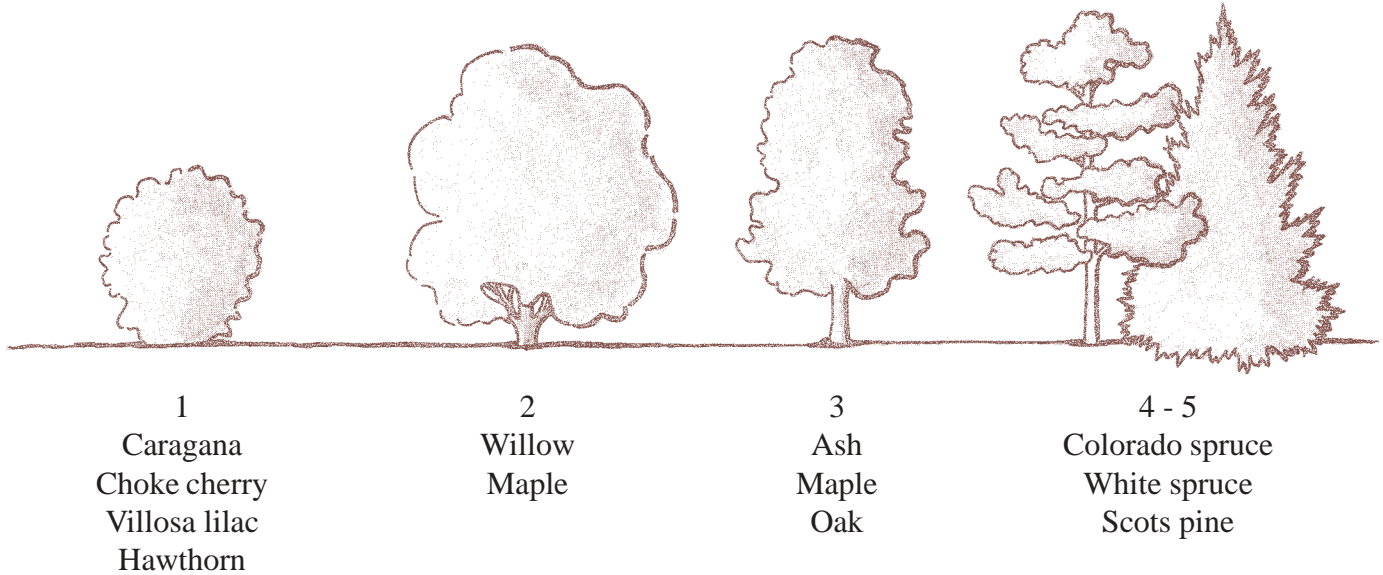
(Figure 1)

Shelterbelt Design

Once you have determined the location, decide on the number of shelterbelt rows required to properly protect the farm. Up to five rows of trees are recommended on the north and west sides to provide protection from prevailing prairie winds. Two or three rows are usually adequate on the east and south side. Field access roads should be located in the east or south corners to allow summer air flow through the yard.

The farmstead shelterbelt should consist of a combination of tall, fast-growing, long-lived and dense trees and shrubs. Accomplish this by using a variety of species, each possessing at least one of the desired characteristics.

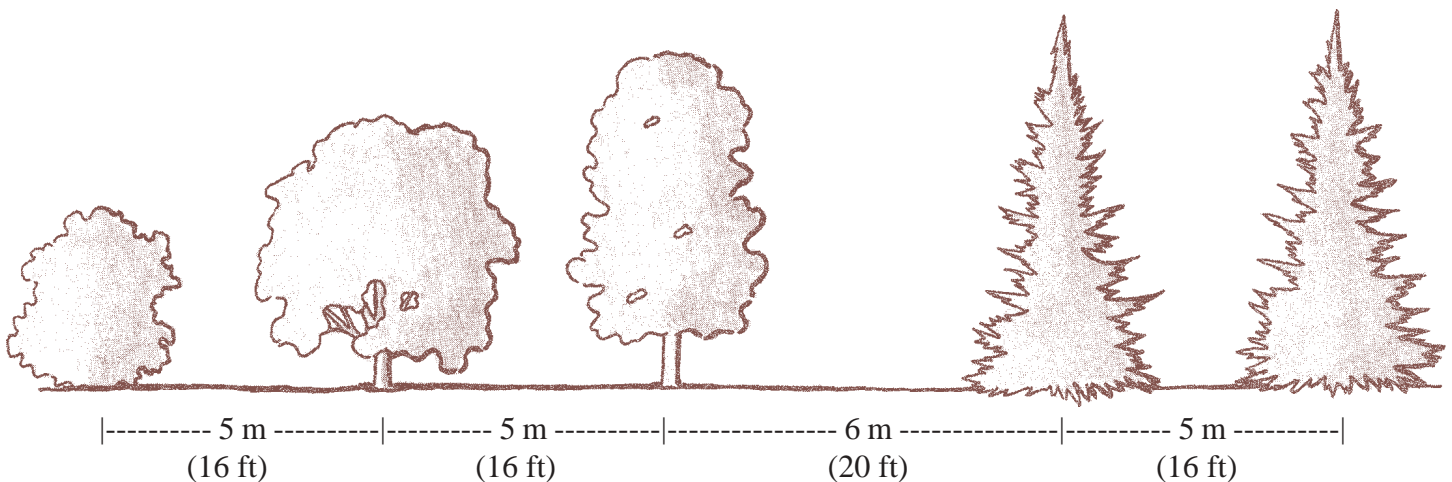
The outside row of a shelterbelt acts as a snow trap and should be a dense shrub such as caragana, villosa lilac, choke cherry or hawthorn. The second row should be a fast-growing species such as acute willow or Manitoba maple. Long-lived species such as green ash, bur oak or Manitoba maple should be planted in the third row. The fourth and fifth rows, which are closest to the yard, should be tall, dense and long-lived. Conifers such as Colorado spruce, white spruce and Scots pine are suitable here. In addition, they benefit from the early protection provided by the outer rows (Figure 2).



(Figure 2 - Side view of a 5-row shelterbelt)

Poplars are fast-growing but short-lived on the prairies. If removal is a concern in the shelterbelt then plant poplar outside the shrub row to provide early protection for the slower growing species and also to facilitate removal of dead trees.

Although five tree rows are recommended for effective shelter, not all sites have sufficient room for this many rows. For confined sites, reduce the number of rows rather than planting too close to buildings or reducing the recommended spacing between the rows (Figure 3). If you are limited to two rows, plant one row of dense shrubs such as caragana, villosa lilac, choke cherry or hawthorn, and one row of dense trees such as spruce. Also, in situations where space is limited, you may wish to combine a shrub with green ash to increase the shelter provided by the outer row.



(Figure 3)

Species Selection

Selection of appropriate tree and shrub species is very important. Each species has its own characteristic height, width, density, longevity, growth, invasiveness and resistance of insects and disease (Table 1). Refer to the brochure entitled “Trees and Shrubs for Prairie Shelterbelts” for more information on species characteristics.

Shelterbelt Spacing

The spacing recommendations within and between rows is very important (Table 2). Seedlings will eventually develop into mature trees, reaching heights up to 18 metres (60 ft) and widths up to 12 metres (40 ft). Leave sufficient space between shelterbelt rows to permit the passage of maintenance equipment. Follow recommended spacings so that adequate light, moisture and nutrients will be available for maximum growth and survival.

Table 2
Recommended Minimum Spacings Within Rows

DECIDUOUS SHRUBS	SPACINGS		DECIDUOUS TREES	SPACINGS		CONIFEROUS TREES	SPACINGS	
	m	ft		m	ft		m	ft
Buffaloberry	1.0	3	Bur Oak	2.5	8	Colorado spruce	3.5	12
Caragana	0.3	1	Green Ash	2.5	8	Scots pine	3.5	12
Choke cherry	1.0	3	Manitoba maple	2.5	8	White spruce	3.5	12
Hawthorn	1.0	3	Poplar	2.5	8	Siberian larch	2.5	8
Sea Buckthorn	1.0	3	Willow	2.5	8			
Villosa lilac	1.0	3						

Recommended Minimum Spacing Between Rows (*Figure 3*)

5 m (16 ft) between adjacent deciduous rows

6 m (20 ft) between adjacent deciduous and coniferous rows

5 m (16 ft) between adjacent coniferous rows

When you have selected appropriate tree species and determined the number of rows, draw them on your farmyard plan. Attach a copy of the plan with your application for trees. The Shelterbelt Centre accepts applications from eligible applicants on a first come, first served basis starting **JUNE 1 FOR DELIVERY THE FOLLOWING SPRING.**

** The root systems of some species, including willow, maple, spruce and poplar, are very fibrous and competitive. These species should not be planted close to gardens, orchards or underground water and sewage systems. **

Table 1
Species Recommended for Shelterbelts

Species	Mature Size		Life Span ¹ (years)	Moisture Requirements ²	Growth Rate ³	Salt Tolerance ⁴	Potential spread by seed or suckers ⁵	COMMENTS
	Height	Width						
	m/ft	m/ft						
Arnold hawthorn	4/13	3/10	Moderate	L	M	L	M	Large thorns, susceptible to cedar apple rust and pear slug infestations
Silver buffaloberry	4.5/15	3.5/12	Moderate	L	M	H	H	Silvery foliage, edible red fruit, spines, suckers
Ross caragana	5/16	3/10	Long	L	M	M	M	Avoid planting on poorly drained sites
Choke cherry	7/23	3.5/12	Moderate	M	M	M-L	M	Shade intolerant, suckers
Indian-summer sea buckthorn	5/16	3.5/12	Moderate	L	M	H	H	Silvery foliage, edible orange fruit, spines, suckers
Villosa lilac	4/13	2.5/8	Long	M	M	M	M	Non-suckering, performs poorly on sandy soils, shade intolerant
Bur oak	20/65	6/20	Long	L	S	L	L	Difficult to transplant
Plains green ash	15/50	6/20	Long	M	M	M	L	Slow growth under dry conditions and susceptible to 2,4-D damage
Manitoba maple	14/45	12/40	Moderate	M	F	M	M	Susceptible to aphids and 2,4-D damage
Assiniboine poplar	25/80	3.5/12	Short	H	VF	L	L	Male clone, resistant to insects & disease. Susceptible to melampsora leaf rust
Canam poplar	25/80	5/15	Short	H	VF	L	L	Female clone, superior drought tolerance
Manitou poplar	20/65	6/20	Short	H	VF	L	L	Male clone, resistant to insects & disease, susceptible to melampsora rust
Walker poplar	25/80	3/10	Short	H	VF	L	L	Female clone
Acute willow	15/50	15/50	Moderate	H	F	L	L	Long, narrow foliage
Silver-leaf willow	15/50	15/50	Moderate	H	F	L	L	Foliage is a silver color
Colorado spruce	18/60	6/20	Long	M	S	M-L	L	Requires protection during establishment
White spruce	18/60	6/20	Long	H	S	L	L	Requires protection during establishment
Prairie green Scots pine	18/60	6/20	Long	M	M	L	L	Faster growth rate than spruce, requires protection during establishment
Lindquist Siberian larch	18/60	6/20	Long	H	M	M	L	Deciduous conifer losing its needles in the fall. Difficult to establish on dry sites

¹ Life Span: short = 20-30 years, Moderate = 30-50 years, Long > 50 years.

² Moisture Requirements: Low = < 300 mm, Medium = 300-400 mm, High = > 400 mm.

³ Growth rate: S - Slow, M - Moderate, F - Fast, VF - Very fast.

⁴ Salt Tolerance: L - Low, M-L - Medium-Low, M - Medium, H - High.

⁵ Potential Spread by Seed or Suckers: L - Low, M - Medium, H - High.

NOTE: Some species have the potential to spread and become invasive beyond the planting site. For more detailed descriptions of tree species, refer to the brochure "Trees and Shrubs for Prairie Shelterbelts".

Shelterbelt Planning Around Dugouts

A shelterbelt can be designed to trap snow to help replenish water supplies and reduce the hot, dry winds that increase evaporation from dugouts. Trees should be planted at least 20 - 50 metres (65 - 165ft) from dugouts, depending on drainage. If the land slopes away from the dugout, then plant the shelterbelt closer to allow the trapped melting snow to drain into the dugout. Do not plant any closer than 15 metres (50 ft) to prevent the shelterbelt from using stored water and contaminating the water with foliage. If trees are planted too close to the dugout, aeration may be required to prevent water stagnation.

Multiple rows of shrubs such as caragana, lilac, choke cherry, buffaloberry, hawthorn and sea buckthorn, provide a dense effective snow trap. Conifers like Colorado spruce, white spruce and Scots pine can be used for greater wind protection. Follow shelterbelt spacing recommendations as previously mentioned. For more information, refer to the brochure "Shelterbelts for Dugouts".

Points to Consider in Planning

1. Keep all trees at least 100 feet from roads, buildings, etc. to prevent snow problems. Check with your Rural Municipality regarding tree planting regulations next to road allowances.
2. Plant only as many trees as you can care for. More trees are killed by weeds and grass than by any other cause. Refer to the brochure "Weed Control in Shelterbelts."
3. Avoid any openings or access roads in the shelterbelt which will allow the prevailing winds to blow into the yard site.
4. Protect shelterbelts from livestock; fence off the planting if necessary.
5. Include fruit-bearing shrubs such as choke cherry, buffaloberry, hawthorn and sea buckthorn in the outer row to benefit wildlife.
6. Ensure dead trees are replaced as soon as possible.

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