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 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 feet, marking locations of existing trees, sloughs, buildings, farm access roads and power lines. Next, draw in the prevailing wind directions 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. Mark this distance around the perimeter of the yard plan to indicate the proposed locations of the shelterbelts (Figure 1).

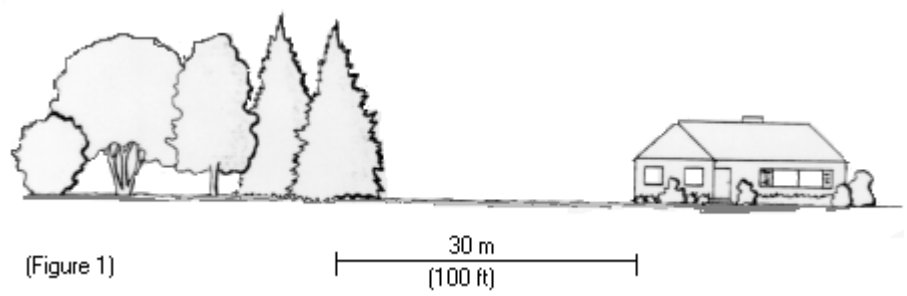

Figure 1: The minimum distance from buildings

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 comers to allow summer air flow through the yard.

The farmstead shelterbelt should be tall, fast-growing, long-lived and dense in both summer and winter. Accomplish this by using a variety of species, each possessing at least one of the desired characteristics. Refer to Trees and shrubs for Shelterbelts for a description of trees and shrubs used for shelterbelts.

The outside row of a shelterbelt acts as a snow trap and should be a dense shrub such as caragana, villosa lilac, or choke cherry. 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).

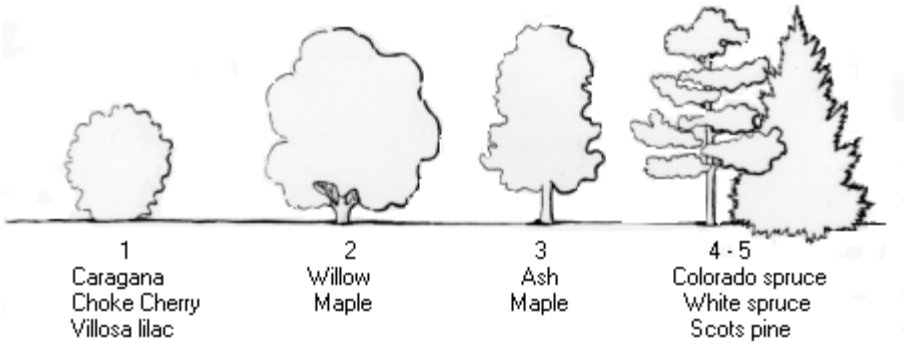

Figure 2: The side view of a 5-row shelterbelt

Poplar and Siberian elm are fast-growing but short-lived on the prairies. If they are used in the shelterbelt, plant them outside the shrub row to provide early protection for the slower growing species and 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 . If you are limited to two rows, plant one row of dense shrubs such as caragana, villosa lilac, or choke cherry, and one row of dense trees such as spruce. Also you may wish to combine a shrub with a green ash to increase the shelter by the outer row.

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Species Selection

Selection of appropriate tree and shrub species is very important. Each species has its own characteristic height, width, density, longevity, growth rate and resistance to insects and diseases (Table 1).

Table 1: Species recommended for shelterbelts

Species	Mature Size (Height)	Life Span	Moisture Requirement	Growth Rate	Salt Tolerance	Comments
Caragena	4.5 m 15 ft	80	Low	Moderate	Medium	Avoid planting on poorly drained sites
Villosa lilac	4.0 m	60	Medium	Moderate	Medium	Non-suckering,

	13 ft					performs poorly on sandy soils
Choke Cherry	7.0 m 22 ft	40	Medium	Moderate	Medium-Low	Shade intolerant
Buffaloberry	4.5 m 15 ft	40	Low	Moderate	Medium-High	Silvery foliage, edible red fruit, spines, suckers
Sea Buckthorn	4.5 m 15 ft	40	Low	Moderate	Medium-High	Silvery foliage, edible orange fruit, spines, suckers
Acute Willow	15.0 m 50 ft	60	High	Fast	Low	Long, narrow foliage
Siberian elm	12.0 m 40 ft	10-25	Low	Fast	Medium	Heavy seed production
Walker poplar	18.0 m 60 ft	10 to 25	High	Fast	Low	Female clone, produces seed cotton, resistant to insects and disease
Assiniboine poplar	18.0 m 60 ft	10 to 20	High	Fast	Low	Male clone, resistant to insects and disease
Manitou poplar	18.0 m 60 ft	10 to 25	High	Fast	Low	Male clone, resistant to insects and disease
Green ash	15.0 m 50 ft	60	Medium	Moderate	Medium	Slow growth under dry conditions
Manitoba maple	14.0 m 45 ft	45	Medium	Fast	Medium	Susceptible to aphids
Colorado spruce	18.0 m 60 ft	80	Medium	Slow	Medium-Low	Requires protection during establishment
White spruce	18.0 m 60 ft	70	Medium	Slow	Low	Requires protection during establishment
Scots pine	18.0 m 60 ft	70	Medium	Moderate	Low	Faster growth rate than spruce, Requires protection during establishment

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Shelterbelt Spacing

The spacing recommendations within and between rows is very important (Table 2). Remember, you are planting seedlings which 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. Correct spacing between trees and rows allows adequate light, moisture and nutrients for proper growth.

Table 2: Recommended Minimum Spacings Within Rows

Deciduous shrubs	Spacings	
	m	ft
Buffaloberry	1	3
Caragana	0.3	1
Choke Cherry	1	3
Hawthorn	1	3
Sea-buckthorn	1	3
Villosa lilac	1	3
Deciduous Trees	**Spacings**	
	m	**ft**
Bur Oak	2.5	8
Green ash	2.5	8
Manitoba maple	2.5	8
Poplar	2.5	8
Willow	2.5	8
Coniferous Trees	**Spacings**	
	m	**ft**
Colorado spruce	3.5	12
Scots pine	3.5	12
White spruce	3.5	12
Siberian larch	2.5	8

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Recommended minimum spacings between rows

5m (16 ft) between adjacent rows;
6m (20 ft) between adjacent deciduous and conferous rows;
5m (16 ft) between adjacent coniferous rows.

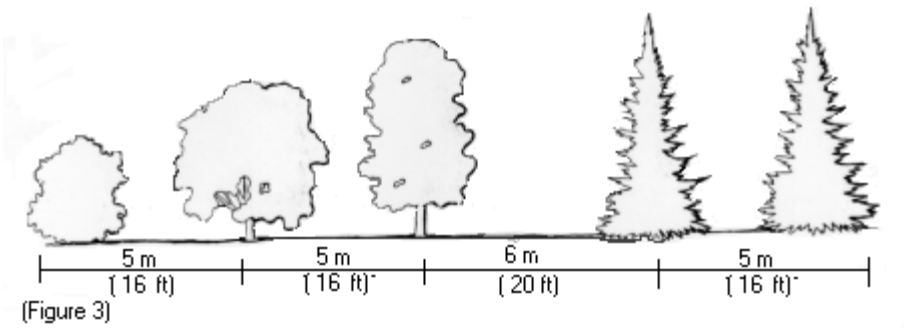

Figure 3: The spacing between rows

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 on a first come, first served basis, starting June 1 for delivery the following spring.

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 15 to 30 metres (50 to 100 ft) from dugouts depending on drainage. If the land slopes away from the dugout, then plant the shelterbelt closer to allow the trapped, melted 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.

Multiple rows of shrubs, such as caragana, lilac and chokecherry, provide a dense effective snow trap. Conifers, like Colorado spruce, white spruce and Scots pine, can be used for greater wind protection.

Points To Consider In Planning

1. Keep all trees at least 100 ft from roads, buildings, etc. 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 Weed Control in Shelterbelts.
3. Avoid any access roads or openings 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 chokecherry, buffaloberry and sea buckthorn,in the outer row to benefit wildlife.
6. Ensure dead trees are replaced as soon as possible.

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