

Selecting Trees and Shrubs in Windbreaks

Windbreaks are plantings of single or multiple rows of trees or shrubs that are established for one or more environmental purposes. Purposes of windbreaks include: wind protection, controlling blowing and drifting snow, wildlife habitat establishment, energy saving, living screens, odor abatement and more. The effectiveness of a windbreak depends on suitable tree and shrub selection as well as planting density and spacing. This fact sheet offers information on tree and shrub species to consider in Minnesota windbreak plantings and a list of resources for technical and financial assistance.

Tree and Shrub Selection:

Windbreak tree and shrub selection is extremely important to insure an effective, long lasting planting. Plants need to be winter hardy and should have a positive history of plantings in the area suitable for the site and soils. Select multiple species of trees and shrubs, so if there is a failure in a row the windbreak is still effective for the purposes. A mix of deciduous and coniferous plants is recommended and should be based on the purpose of the planting. Many plants can offer potential income benefits such as edible, decorative, crafts, medicinal and specialty woods. As appropriate, first consider using native plants. Landowners should consult with area or County Soil and Water Conservation Districts/National Resources Conservation Service, Department of Natural Resource and Extension staff to get a recommended list of plants suitable for the area.

Density:

How dense the planting and the number of rows depends on the purpose of the windbreak.

Density	25-50% density	50-65% density	65+% density
Protection	Crop, Soil Snow Distribution	Air Snow Accumulation	Farmstead, Livestock, Noise Wildlife (10 rows)
Planting	<ul style="list-style-type: none"> • 1 row-deciduous shrub • 2 row-deciduous tree and deciduous shrub 	<ul style="list-style-type: none"> • Twin row-deciduous shrub • 1 row-evergreen tree • 2 row-evergreen tree and deciduous tree • 3 row-combination of deciduous trees/shrub 	<ul style="list-style-type: none"> • Twin row-evergreen tree • 3 or more row-combination of evergreen trees, deciduous trees/shrubs

Plant Spacing:

Tree and shrub plant spacing affects active growth. Trees planted too close together may be stunted due to crowding; while too far apart from each other may cause gaps which reduces the effectiveness of the windbreak. Spacing recommendations are found on the species list page.

Financial Assistance Programs:

There are opportunities for cost share and even annual land payments for the land planted to trees as windbreaks, wildlife plantings, shelterbelts and living snow fences. The USDA Conservation Reserve Program (CRP), continuous sign up offers cost-share, annual payments and incentive payments. Contact your county Farm Service Agency (FSA) office for more details.

References and Web Links:

National Agroforestry Center, USDA/NRCS, www.unl.edu/nac
 UM Agroforestry Extension, www.extension.umn.edu/agroforestry
 Recommended Trees for Minnesota, <http://z.umn.edu/rectrees>
 Mn/DOT Plant Selector, <http://dotapp7.dot.state.mn.us/plant/>
 Minnesota Natural Resources Conservation Service (NRCS), www.mn.nrcs.usda.gov/
 Minnesota Board of Water and Soil Resources (BWSR), www.bwsr.state.mn.us/
 Minnesota Farm Service Agency (FSA), www.fsa.usda.gov/FSA/

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Trees and Shrubs for Windbreak Plantings

(Partial List)

Shrubs		(space 3-6 ft within the row; 6-10 ft between rows)	Height	Width
American Cranberry bush	<i>(Viburnum trilobum)</i>		10	12
Common Ninebark	<i>(Physocarpus opulifolius)</i>		10	10
Dogwoods	<i>(Comus sericea)</i> <i>(Comus racemosa)</i> <i>(Comus alternifolia)</i> <i>(Comus amomum)</i>	Redosier Gray Pagoda Silky	10 10 30 10	12 10 20 10
Elderberry	<i>(Sanbucus canadensis)</i>		20	10
Hazelnut, American	<i>(Corylus americana)</i>		8 - 10	6 - 8
Lilac, Common	<i>(Syringa vulgaris)</i>	(suckers)	15	12
Nannyberry	<i>(Viburnum lentago)</i>		20 - 25	6 - 10
Sandbar Willow	<i>(Salix interior)</i>	(suckers)	5 - 10	5 - 10
Sand Cherry	<i>(Prunus cistena)</i>		8	8
Serviceberry	<i>(Amelanchier alnifolia)</i>		10 - 30	10 - 20
Silver Buffaloberry	<i>(Shepherdia argentea)</i>	(for sandy soils)	8	10
Silverberry	<i>(Elaeagnua commutate)</i>	(suckers)	5 - 9	3 - 6
Small Trees		(space 10-15 ft within the row; 20 ft between rows)	Height	Width
American Plum	<i>(Prunus americana)</i>	(can spread/suckers)	20	15 - 25
Black Chokeberry	<i>(Aronia melanocarpa)</i>	(can spread; suckers)	10	6 - 8
Chokecherry	<i>(Prunus virginiana)</i>	(can spread/suckers)	20	15 - 35
Crabapples	<i>(Malus sp.)</i>	(there are apple scab resistant and susceptible cultivars)	20 - 30	20 - 30
* Hawthorn, Arnold	<i>(Crataegus arnoldiana)</i>		15 - 20	15 - 20
Nanking Cherry	<i>(Prunus tomentosa)</i>		15	15 - 35
Pin Cherry	<i>(Prunus pennsylvanica)</i>		15	15 - 20
Deciduous Trees		(space 12-20 ft within the row; 20 ft between rows)	Height	Width
Birch, River	<i>(Betula papyrifera)</i>		40 - 60	40 - 60
Buckeye, Ohio	<i>(Aesculus glabra)</i>	Autumn splendor (seeds toxic)	20 - 40	20 - 45
Catalpa, Northern	<i>(Catalpa speciosa)</i>		50 - 80	20 - 40
Cottonwood, Eastern	<i>(Populus deltoides)</i>	(male tree does not release cotton)	50 - 100	40 - 75
Elm, American 'Princeton'	<i>(Ulmus Americana 'Princeton')</i>	(plant elms resistant to Dutch Elm Disease (DED))	45 - 65	30 - 50
Hackberry	<i>(Celtis Occidentalis)</i>	(Bare root trees need to break bud before planting)	40 - 60	25 - 45
Hickory, Shagbark	<i>(Carya ovata)</i>		75 - 100	40
Honeylocust, Common	<i>(Gleditsia triacanthos)</i>		30 - 50	30 - 40
Kentucky Coffeetree	<i>(Gymnocladus dioica)</i>		50 - 70	45
Linden, American	<i>(Tilia Americana)</i>		50 - 75	30 - 50
Linden, Little Leaf	<i>(Tilia cor data)</i>		30 - 45	20 - 30
Maple, Autumn Blaze	<i>(Acer x freemanii)</i>		40 - 70	
Maple, Silver	<i>(Acer saccharinum)</i>		40 - 70	30 - 50
Oak, Bur	<i>(Quercus macrocarpa)</i>		50 - 80	35 - 60
Oak, Red (Northern)	<i>(Quercus rubra)</i>		60 - 70	45
Oak, Swamp White	<i>(Quercus bicolor)</i>		50 - 60	
Oak, White	<i>(Quercus alba)</i>		50 - 70	
Walnut, Black	<i>(Juglans nigra)</i>		50 - 70	60
Conifer Trees		(space 12-20 ft within the row; 20 ft between rows)	Height	Width
* Eastern Red Cedar	<i>(Juniperus virginiana)</i>	(use native species/can be aggressive)	50	10 - 20
** Eastern White Pine	<i>(Pinus strobus)</i>		100	50 - 80
** Ponderosa Pine	<i>(Pinus ponderosa)</i>		100	25 - 60
** Red Pine	<i>(Pinus resinosa)</i>		80	20 - 40
White Cedar	<i>(Thuja occidentalis)</i>	(protect from deer)	50	10 - 20
White Spruce (Black Hills)	<i>(Picea glauca 'densata')</i>		50	20 - 30
** White Spruce	<i>(Picea glauca (moerch) voss)</i>		100	20 - 30

*Note: Apple and hawthorn trees should not be planted near red cedar trees due to disease problems (cedar-apple rust). Plant spacing requirements depend on species and desired density. Red cedar can be aggressive and needs to be managed. White spruce and white cedar are native but not the cultivars, black hills or techny (white cedar), however, these are excellent cultivars for SW MN.

**Large pines which are tall and sparsely branched (white, ponderosa and red) may not be recommended for your eco-region or landscape. Native plants should always be considered first, however, there are also approved non-native cultivars that may add superior habitat for specific sites. Review habitat plans with local specialists.