

Living Snow Fences

Fact Sheet Series - Fact Sheet #4

Living Snow Fence Species Selection



State University of New York
College of Environmental Science and Forestry

Species Selection

Species selection is an important step in the design of effective and efficient living snow fences. A species matrix can assist in the plant selection for living snow fences by providing a palette of suitable species and a summary of relevant plant traits to compare and contrast species. A species matrix for living snow fences in New York State has been created in conjunction with these fact sheets. An abbreviated one-page version of the species matrix is provided at the end of this fact sheet. The full species matrix is available for download online at www.esf.edu/willow

Twenty-eight species suitable for living snow fences are included in the species matrix. The species suitable for living snow fences in New York State are mainly evergreen trees and deciduous shrubs that create fences with consistently low optical porosity from top to bottom. Species must be tolerant to a variety of roadside conditions across New York State and possess the other traits necessary to achieve adequate snow-trapping function. Every plant species is unique. The species matrix is intended as a selection tool to compare and contrast a variety of plants for living snow fences within the context of design goals and site conditions.

Plant Traits for Living Snow Fences

The morphological traits of height and optical porosity are the two most important factors influencing the function of living snow fences. Mature height should be at least eight feet to achieve adequate snow storage capacity. Porosity should be between 50 percent and zero percent (non-porous) near the base of the vegetation to prevent bottom gaps. Bottom gaps allow wind and snow to pass through, reducing the snow trapping function of the fence. Deciduous shrubs and evergreen trees are most suitable for expressing these traits in the landscape. Most species in this matrix have been proven suitable for living snow fences or windbreaks, but some species remain untested, as indicated on the first page of the full matrix. Additional physiological traits and ecological tolerances relevant to living snow fences have been included in this matrix to assist in plant selection. For example, plants with rapid growth rates are desirable to achieve functional heights and porosities as quickly as possible.



Norway spruce and white spruce living snow fence along Route 167 in Manheim, NY

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Choosing a Species

A variety of factors should be considered when choosing a species for a living snow fence. A thorough analysis of the site conditions should inform the species selection to ensure plants will survive in the environmental conditions of the site. Tolerances to soil conditions and the potential stressors listed in this matrix can greatly affect the vigor and survival of the fence and the number of years until the fence reaches functional maturity. Choosing a species that is well suited to the environmental conditions of the site can greatly influence the success or failure of the fence. Multiple use considerations such as native status, ornamental flowers or value-added products can also be considered when choosing a species. The most widely tested and proven effective evergreen species for living snow fences in New York State are Norway spruce and white spruce. The most widely tested and proven effective shrub species for living snow fences in New York State are hybrid shrub willows.

Shrub-Willow Living Snow Fences

The shrub-willow cultivars included in the matrix possess many of the desirable characteristics for living snow fences such as sufficient height, porosity, and rapid growth rate. Shrub-willow living snow fences can be propagated from dormant stem cuttings with greater ease and at lower costs than using rooted stock of other shrub species. Shrub-willows also tolerate a variety of site conditions and are resistant to most pests and pathogens. Research on shrub-willow living snow fences is on-going. It is recommended that cuttings be purchased from a nursery to ensure quality. Additional information on shrub-willows is available at www.esf.edu/willow



Shrub-willow living snow fence along Route 30 in Grand Gorge, NY

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Northern white cedar living snow fence along Route 86 in Gabriels, NY



Snowdrift formed downwind of a three year old shrub-willow fence on Interstate 81 in Preble, NY

Additional Resources

Gullickson, D., Josiah, S.J., Flynn, P., 1999. *Catching snow with living snow fences*. University of Minnesota.

Tabler, R.D. 2003. *Controlling blowing and drifting snow with snow fences and road design*. Tabler and Associates. Niwot, CO.

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<u>Scientific Name</u>	<u>Common Name</u>	<u>Growth Form</u>	<u>Growth Rate</u>	<u>Mature Height (ft)</u>	<u>Moisture Use</u>	<u>Fertility Requirement</u>
<i>Amelanchier arborea</i>	serviceberry	Multi-stem shrub	Slow	36	Medium	Medium
<i>Caragana arborescens</i>	caragana	Multi-stem shrub	Rapid	12	medium	Low
<i>Cornus amomum</i>	silky dogwood	Multi-stem shrub	Moderate	10	High	Medium
<i>Cornus sericea</i>	red osier dogwood	Multi-stem shrub	Moderate	12	High	Low
<i>Corylus americana</i>	American hazelnut	Multi-stem shrub	Moderate	10	Medium	Medium
<i>Corylus cornuta</i>	beaked hazelnut	Multi-stem shrub	Moderate	15	Medium	Medium
<i>Ligustrum amurense</i>	Amur privet	Multi-stem shrub	Moderate	12	Medium	Medium
<i>Morella pensylvanica</i>	northern bayberry	Multi-stem shrub	Slow	12	Medium	Low
<i>Prunus americana</i>	American plum	Multi-stem shrub	Moderate	24	Medium	Medium
<i>Prunus tomentosa</i>	nanking cherry	Multi-stem shrub	Moderate	8	Medium	Medium
<i>Rhus glabra</i>	smooth sumac	Multi-stem shrub	Moderate	12	Low	Low
<i>Salix caprea</i>	shrub willow 'S365'	Multi-stem shrub	Very Rapid	20	Medium	Medium
<i>Salix eriocephala</i>	shrub willow 'S25'	Multi-stem shrub	Very Rapid	25	Medium	Medium
<i>Salix miyabeana</i>	shrub willow 'SX64'	Multi-stem shrub	Very Rapid	30	Medium	Medium
<i>Salix purpurea</i>	s. willow 'Fishcreek'	Multi-stem shrub	Very Rapid	25	Medium	Medium
<i>Salix sachalinensis</i>	shrub willow 'SX61'	Multi-stem shrub	Very Rapid	25	Medium	Medium
<i>Shepherdia argentea</i>	silver buffaloberry	Multi-stem shrub	Rapid	18	Medium	Low
<i>Syringa vulgaris</i>	common lilac	Multi-stem shrub	Moderate	20	Medium	Medium
<i>Vaccinium corymbosum</i>	highbush blueberry	Multi-stem shrub	Moderate	12	Medium	Medium
<i>Viburnum lentago</i>	nannyberry	Multi-stem shrub	Slow	28	Medium	Medium
<i>Viburnum prunifolium</i>	Blackhaw viburnum	Multi-stem shrub	Slow	16	Medium	Low
<i>Juniperus communis</i>	common juniper	Evergreen shrub	Slow	10	Low	Low
<i>Juniperus virginiana</i>	eastern red cedar	Single-stem tree	Slow	50	Low	Low
<i>Picea abies</i>	Norway spruce	Single-stem tree	Moderate	130	Medium	Medium
<i>Picea glauca</i>	white spruce	Single-stem tree	Slow	100	Medium	High
<i>Picea pungens</i>	blue spruce	Single-stem tree	Slow	100	Medium	Medium
<i>Taxus baccata</i>	English yew	Evergreen shrub	Slow	40	Medium	Medium
<i>Thuja occidentalis</i>	arborvitae	Single-stem tree	Slow	50	Medium	Medium

For complete living snow fence matrix and plant characteristics go to www.esf.edu/willow