

# Living Snow Fences: Functions and Benefits

Living snow fences (LSF) are living plants such as trees, shrubs and native grasses, planted to manage blowing and drifting snow and protect roadways, farmsteads, livestock facilities, and communities. These fences form a wind barrier that slows the wind, causing the snow to drop in and downwind of the planting, thus protecting the road or property downwind. Snow fences in crop fields can also help manage soil moisture for the next growing season. Living snow fences offer multiple benefits including: travel time savings, cost-effectiveness, reduced annual maintenance, snow and dust containment, wildlife and pollinator food and habitat.



Living snow fence planting using shrubs and conifers

Blowing and drifting snow on roadways are major transportation safety and mobility concerns, causing accidents and requiring expensive winter roadway maintenance. These issues can be especially problematic near farmlands, where snow can drift onto roadways from harvested fields. To address these problems, the Minnesota Department of Transportation (MnDOT) operates a program that pays landowners in identified problem areas to plant living snow fences consisting of trees and/or shrubs or leave standing corn rows to reduce the volume of snow blowing or drifting onto roadways. Standing corn rows can also act as a windbreak. LSFs improve driver visibility, road surface conditions and have the potential to reduce accidents, snow removal costs and equipment emissions while increasing motorist mobility. MnDOT traffic safety data suggest that using LSFs can reduce snow and ice-related accidents. A MnDOT traffic safety study found LSFs that protect curves in roadways can reduce crash severity by 40 percent.

## Design

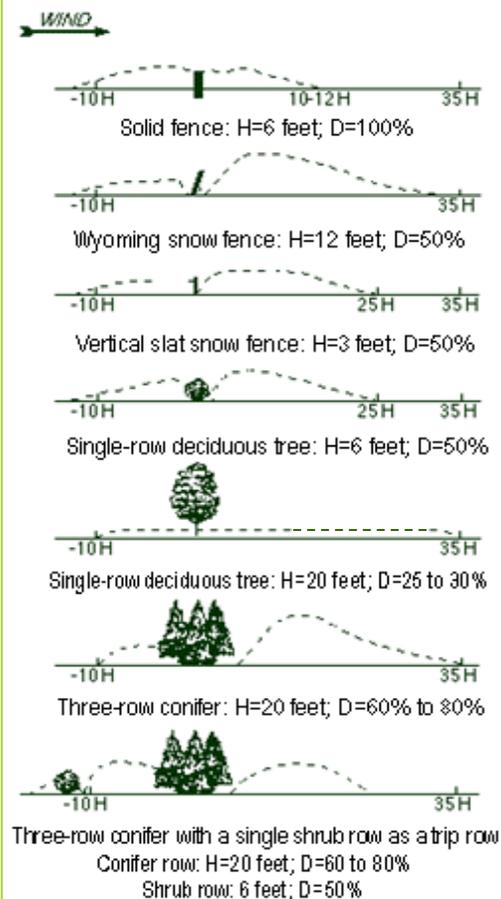
- Select plants that can grow to a mature height of 6 to 12 feet tall and plant multiple rows (typically 2 rows is sufficient) to achieve 25 to 50% vegetation porosity
- Extend planting length of the LSF 30 degrees further out from both ends of the planting beyond the area to be protected (to mitigate drifting problems at the ends of the LSF)
- Determine the proper width and number of rows to be planted
- Use a proper set back based on the winter climate data for the potential snow transport to the site that can be determined at [http://climate.umn.edu/snow\\_fence/Components/Design/introduction.htm](http://climate.umn.edu/snow_fence/Components/Design/introduction.htm)
- A setback range of 75 to 250 feet from the highway right of way is common.

## Planting and Maintenance

- Control competing vegetation in the fall before planting
- Proper soil preparation is important if planting by hand or with a tree planter
- Control weeds the first 3–5 years
- Consider a fabric weed barrier or mulch for weed control and water conservation
- Water plants regularly the first 3 years (2–5 gallons per plant every 2–3 weeks if dry)
- Protect plants from deer and rabbit damage by using plant tubes, guards or fencing if needed
- Monitor site every other month in the summer for weeds, plant health, insects or disease
- Check LSF sites after storms for broken limbs and severely damaged trees
- Prune trees or shrubs for long term growth, form and health
- Replace dead plants



Segments of roads with LSFs (right) have better driver visibility and road surface conditions than those without (left), leading to lower road maintenance costs and fewer accidents. LSFs can also benefit the atmosphere by storing carbon dioxide and reducing emissions from snow removal operations.



Different designs for living snow fences  
(H=height of snow fence, D=density)  
Adapted from *Windbreaks for Snow Management*  
(EC 96-1770)  
University of Nebraska Cooperative Extension

### Tree and Shrub Selection:

Proper plant selection for a living snow fence is extremely important to insure an effective, long lasting planting. Plants need to be winter hardy and should be suitable for the climate, site and soils. If multiple rows are planted, each row should be a different species. Many plants can offer potential income or food benefits such as energy biomass, edible berries and nuts, decorative florals and materials, craft and medicinal products, and specialty woods. If appropriate, consider using native plants. Landowners should consult with county Soil and Water Conservation District, National Resources Conservation Service, Department of Natural Resources and Extension staff to get a recommended list of plants suitable for the area. <http://z.umn.edu/rectrees> or <http://z.umn.edu/windbreaks>

### Financial Assistance Programs:

There are opportunities for cost share and annual land rental payments for planting and maintaining living snow fences. The USDA Conservation Reserve Program (CRP) offers cost-share, annual and incentive payments. Environmental Quality Incentives Program (EQIP) may also offer LSF funds. Contact your county Farm Service Agency (FSA) office for more details. If the living snow fence will be protecting a designated MnDOT snow problem highway, state MnDOT funds may be available in addition to CRP and EQIP payments. There are also MnDOT funds available for leaving standing corn rows adjacent to designated highways. Look on the [MnDOT website](#) or contact your district office for more information. Cities and counties may also have LSF programs contact your County Highway Engineer for details.

MnDOT web site: <http://www.dot.state.mn.us/environment/>

### References and Web Links:

Analysis of Snow Climatology website: [http://climate.umn.edu/snow\\_fence/Components/Design/introduction.htm](http://climate.umn.edu/snow_fence/Components/Design/introduction.htm)

Living Snow Fences: <http://www.extension.umn.edu/distribution/naturalresources/DD7277.html>

Living Snow Fence Cost Benefit Tool:  
<http://www.dot.state.mn.us/environment/livingsnowfence/cost-benefit.html>

Producing Marketable Products from Living Snow Fences:  
<http://www.extension.umn.edu/distribution/naturalresources/components/DD7646.pdf>

UM Climatology: <http://climate.umn.edu/>

UM Snow Climatology: [http://www.climate.umn.edu/snow\\_fence/index.html](http://www.climate.umn.edu/snow_fence/index.html)  
[http://www.climate.umn.edu/snow\\_fence/intro.html](http://www.climate.umn.edu/snow_fence/intro.html)

USDA National Agroforestry Center: <http://nac.unl.edu/workingtrees/livingsnowfenceforweb.pdf>

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