



Iowa's Cooperative Snow Fence Program



Iowa Department
of Transportation

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While we can't keep it from blowing, there are ways to influence the wind that carries tons of blowing and drifting snow. Periodically, severe winter storms will create large snow drifts that close roads and driveways, isolate farmsteads and increase snowplowing. Many of these drifting problems happen in the same place year after year.

Although there are no foolproof methods of wind and snow control, properly designed and maintained snow fences can reduce or eliminate these problem areas. This publication discusses the benefits of snow fence, then examines the types used by the Iowa Department of Transportation. Finally, it provides information about how you can get involved in the DOT's Cooperative Snow Fence Program.

“National research has found that it costs 100 times more to plow snow than to trap it with a snow fence.”

Source: Strategic Highway Research Program.

Public benefits of snow fence

- Reduces blowing and drifting snow on roadways
- Stores snow at low cost
- Reduces the accident rate during snowy, windy conditions
- Creates safer travel conditions
- Decreases freezing and thawing effects on the roadway
- Lowers snow removal cost
- Increases visibility

Benefits to landowners

- Improves access to farmsteads and rural areas
- Helps reduce soil erosion
- Provides a service to your community
- Conserves wildlife
- Can increase yield by retaining moisture and reducing drying effects of the wind

Purpose of a snow fence

The purpose of a snow fence is to keep as much snow off the roadway as possible for safety and cost efficiency. Drifts that would normally fall on the roadway now form at the location of the snow fence.



How does a snow fence work?

Snow fence forces the wind to go around and through the fence, causing the wind to lose energy and speed. The snow particles suspended in the fast-moving air come to rest as the speed slows. This forms a drift behind or in front of the snow fence. The height of the fence, and amount of snowfall common to the area, determines how much snow a fence can trap.

Characteristics of snow fence

To be effective, snow fences must be properly designed and located with respect to the highway in need of protection. Not all roadways will benefit from snow fence. Snow fence is used by the DOT at critical locations where it can effectively trap and control blowing and drifting snow.

A fence placed in the wrong location may not do an adequate job of protecting the road, and may even cause snow to accumulate on the roadway.

Height

Any standard size fence will help stop drifting snow. However, the taller the fence - the more snow will be trapped. One row of eight-foot fence is recommended for maximum efficiency. Multiple rows of shorter fence can also be used. One eight-foot fence can trap as much snow as five rows of four-foot fence. Height should be sufficient to store blowing snow during an average to above average snowfall year. The average snowfall for Iowa is 32 inches; the range is 21.9 to 42.4 inches.

Length

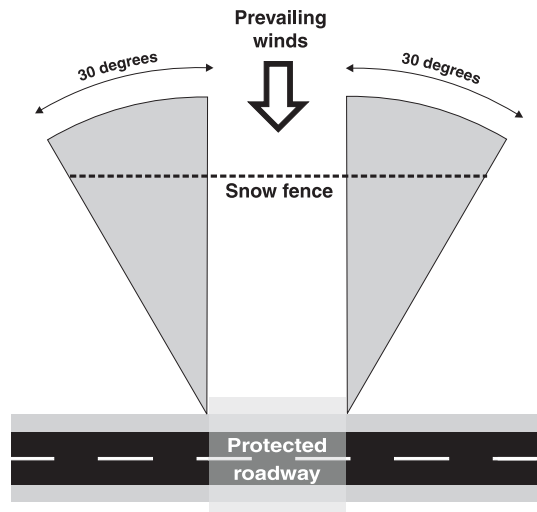
Snow fence length determines the maximum amount of area that can be protected from blowing and drifting snow. Snow storage at the ends of a barrier is significantly less than near the center. It is recommended that the ends of the fence extend approximately 30 degrees beyond the desired protection limits to allow for wind variability.

Set back distance

Fences should be set back from the edge of the roadway a distance of 35 times the height of the fence. For instance, if the snow fence is eight feet tall, it should be placed 280 feet back from the edge of the roadway. (8' high x 35 = 280-foot set back.) Living snowfence should be set back from the edge of the roadway a distance of 15 times the expected height of the mature fence.

Placement

The fence should be placed as parallel to the road and perpendicular to the prevailing wind direction as possible.



It is recommended that the ends of the fence extend 30 degrees beyond the desired protection limits.

Helpful fence hints

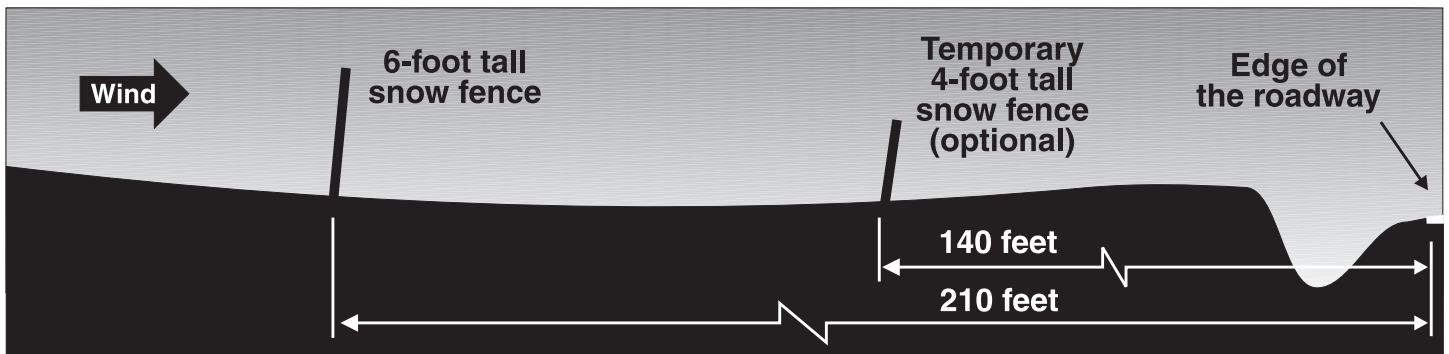
- Fences should contain 40 to 50 percent open space to be most effective.
- Horizontal gaps are the preferred design.
- A gap of six to eight inches is needed between the ground and the fence to reduce the tendency of fences to become buried in drifts, which reduces storage capacity.

Types of snow control

- Structural, either permanent or temporary
- Standing corn
- Living, using either trees, shrubs, tall grass, or combination of types

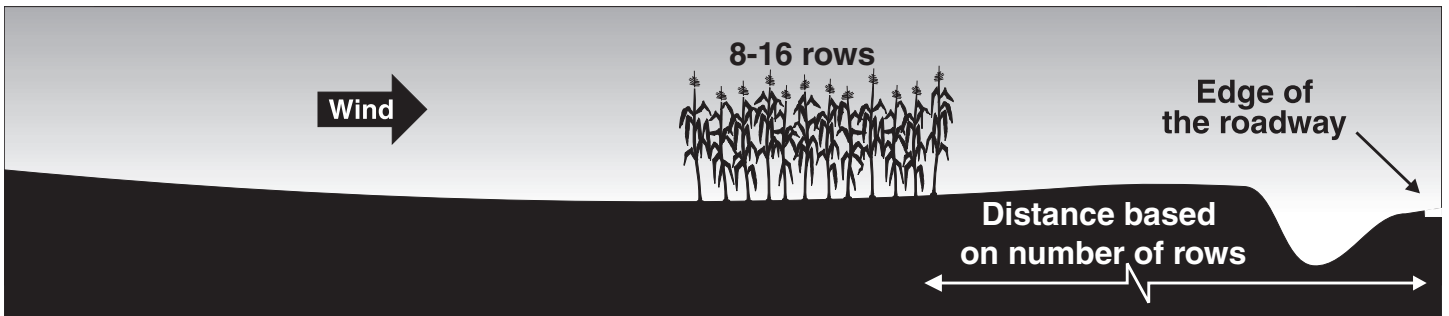
Type	Description	Advantages	Agreement length
Structural, permanent	Six- to eight-foot tall fence consisting of two wooden posts, lightweight plastic fence and 2" x 4" supports.	Very low maintenance. Takes up as little as one-foot width of land.	10 year minimum.
Structural, temporary	Four-foot tall portable plastic fence or wooden fence.	Installed after harvest and removed before planting.	Fall to Spring.
Standing corn	One section of eight to 16 rows of corn.	Can reduce soil erosion. Public service organizations benefit from picking by hand. Wildlife habitat.	Fall to Spring.
Living trees, shrubs or native grasses	Two or more rows of trees or shrubs, or a combination of both.	Wildlife habitat. Reduces soil erosion. Hunting ground.	10 year minimum.
CRP living snowfence	Two or more rows of trees or shrubs, or a combination of both with 75-100 foot native grass buffer.	Wildlife habitat. Reduces soil erosion. Hunting ground.	10-15 years per CRP program guidelines.

Structural snow fence



The conventional slatted, four-foot high snow fence and the six-foot high board fence have been used in Iowa in the past. The preferred height for a single row fence is six feet. The height of snow fence required depends on the annual snowfall. Most places in Iowa will receive great benefits from a four- to six-foot high fence.

Standing corn



This type of snow barrier affords the landowner more control over the materials used on their property since they plant their own fields. (However, advance planning is required because the rows of corn need to be planted parallel to the roadway.) In the past, landowners have arranged to have service organizations pick the corn by hand and sell it to benefit their organizations. Events such as this may be tax deductible and also offers a community service for the area.

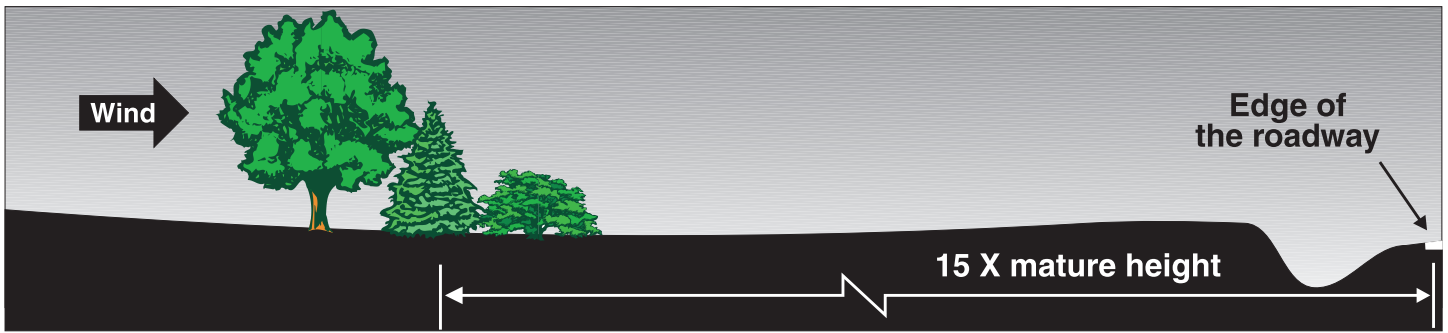
Living snow fence

Living snow fence is pleasing in appearance and requires little maintenance. Living snow fences work the same as those already mentioned. They too need to be placed back from the roadway a distance of 15 times the mature height of the plant.

Species are selected and placed to create the space needed for a snow fence when the plants reach maturity. The goal is to establish a living fence that not only survives and grows fast, but also remains effective over a long period.

Deciduous trees, shrubs and native grasses

Windbreaks made of trees, shrubs and native grasses have been used for years. Not only do trees, shrubs and native grasses provide wind protection, but they add beauty to the roadway and create a habitat for wildlife.



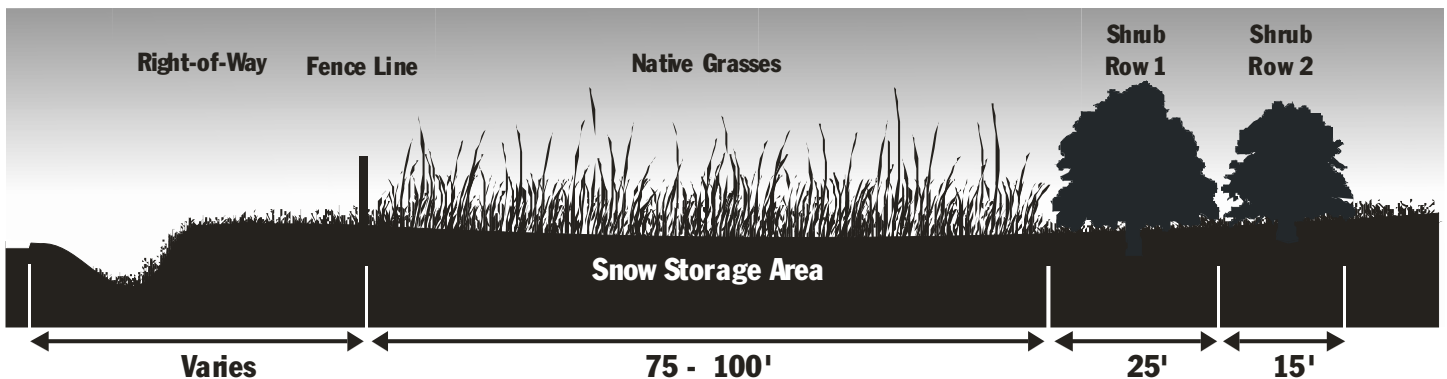
Trees and shrubs should be planted in rows running parallel to the roadway. Two rows or more provide the most effective wind protection. Native grasses should be at least 100 feet deep running parallel to the roadway.

Species selection is determined by the soil type and fertility, as well as the surrounding vegetation. Because soil types vary around the state, each living snow fence may be custom designed to suit that area.

The availability of funding for living snow fence varies from year to year.

Conservation Reserve Program (CRP) Living Snow Fence

The CRP now includes a living snow fence program that allows landowners to receive annual payments for up to 15 years if they agree to plant two rows of trees or a combination of trees and shrubs along with a 75-100 foot buffer of native grasses. More information about this CRP living snow fence program is available at the local Farm Service Agency, Natural Resource Conservation Service office or local Iowa DOT maintenance garage.



How to get involved

The Iowa Department of Transportation wishes to expand participation in the Cooperative Snow Fence Program. The program establishes agreements with private landowners for the use of snow fence. Landowners have been, and continue to be, the keys to the success of the program.

“It’s amazing to see how well snow fences can help prevent drifting problems and improve visibility. I can really see the benefits of snow fence along the roadway.”

*Walter Phillips
Pocahontas County farmer*

If you would like to learn more about the program and benefits of snow fences, contact your local DOT maintenance office listed on the back page.

The DOT maintenance office nearest you is:

Common Snow Fence Questions and Answers

Q. How could I benefit from installing a snow fence?

- A. If you have a driveway or access road to your property that tends to drift full in the winter, making it difficult for you to travel, then a snow fence may be a solution. Snow fences can reduce or stop drifting all together.

Drifts are formed on roadways because an obstacle, such as a ditch or a building, has forced the wind to move around it, causing the wind speed to slow down. As the wind slows, the snow particles carried in the air have a chance to settle to the ground. Over time, a drift will form around the object.

Snow fences, whether they are structural, made of corn, or living provide the same results. They cause the wind speed to slow so the snow particles in the air have a chance to rest, forming a drift. However, the drift is now located at the snow fence instead of on the roadway or drive.

Q. What height snow fence should I use?

- A. The appropriate height for a fence depends upon three factors: 1) how much snowfall is common for your area; 2) what type of snow fence is available; and 3) how much snow you want to trap. Any standard size fence will help stop snow from drifting. But, the taller the fence, the more snow that will be trapped. One row of eight-foot high fence is recommended for maximum efficiency. However, multiple rows of shorter fence can also be used. For driveways or access roadways, one row of four- to eight-foot tall fence is most commonly used.

Q. Where should a snow fence be placed?

- A. Fences should be set back from the edge of the roadway a distance of 35 times the height of the fence. For example, if the snow fence is eight feet tall, it should be placed 280 feet back from the edge of the roadway. ($8' \text{ high} \times 35 = 280\text{-foot set back}$) The fence should be placed perpendicular to the prevailing winter winds and parallel with the road.

Q. Where can I purchase prefabricated snow fence or find materials to make my own?

- A. Many local farm supply stores or larger hardware/lumber stores carry prefabricated snow fence and fence materials. Snow fence is made of wood, plastic and other materials that withstand the winter elements. For instance, general purpose plastic snow fence made of high density polymers is usually available in 4' x 100' orange-colored rolls.

The best snow fence for collecting snow is one made with horizontal pieces. Wind flow over a horizontal fence will slow quicker than over a vertical fence, causing more snow to deposit on the horizontal fence than the vertical fence. To get the best results, the fence material should have 40-50 percent open space and should be placed six inches above the ground. This allows the wind to pass through the fence while trapping snow particles at the same time.

Types of snow control

Type	Description	Advantages	Agreement length	Compensation (annual)
Structural, permanent	Six- to eight-foot tall fence consisting of two wooden posts, lightweight plastic fence and 2" x 4" supports.	Very low maintenance. Only takes up a one-foot width of land.	Five year minimum.	\$.50 per linear foot.
Structural, temporary	Four-foot tall portable plastic fence or wooden fence.	Installed after harvest and removed before planting.	Fall to Spring.	None.
Standing corn	One to two sections of four to 12 rows of corn, each separated by 160 feet.	Can reduce soil erosion. Public service organizations benefit from picking by hand. Wildlife habitat.	Fall to Spring.	\$.50 above market price.
Corn stalks	Left in the field after harvest. No-till field conditions.	Wildlife habitat. Reduces soil erosion. Hunting ground.	Fall to Spring.	None
Living, trees or shrubs	Three or more rows of trees or shrubs, or a combination of both.	Wildlife habitat. Reduces soil erosion. Hunting ground.	10 years.	Living Roadway Trust Fund. Contact Roadside Development.
Living, switchgrass (testing)	Twelve-foot strips of five-foot tall durable grass.	Wildlife habitat. Hunting ground. Low maintenance.	Six years.	\$.50 above market price/linear foot.