



Committee Report

To:	Warden Hicks and Members of Grey County Council
Committee Date:	October 14, 2021
Subject / Report No:	TR-CW-21-21
Title:	Natural Snow Fence Program (Tree and Corn Crop)
Prepared by:	Jim Nicoll, Maintenance Manager
Reviewed by:	Pat Hoy, Director of Transportation Services
Lower Tier(s) Affected:	All Member Municipalities
Status:	Recommendation adopted by Committee as presented per Resolution CW161-21;

Recommendation

- 1. That TR-CW-21-21 be received and that the Natural Snow Fence Policy 12-6 be endorsed; and**
- 2. That staff be directed to develop, in consultation with the Clerks Department, template agreements for the tree fence program and the corn crop use program; and**
- 3. That, the Director of Transportation Services be given approval authority for the natural snow fence agreements and that this delegation be included in the next update to the Delegation of Duties Policy; and**
- 4. That staff be given approval to reach out to potential farmers and landowners to implement the Natural Snow Fence Policy ahead of Council approval in accordance with Section 25.6 (b) of the County's Procedural By-law.**

Executive Summary

Snow fences are utilized to prevent or minimize the drifting of snow on roads, increase driver safety and reduce the need for plowing and salting, therefore reducing salt usage and greenhouse gas emissions. Live natural snow fences, either through the planting of trees or corn crops are an environmentally sustainable option to produce the same results. The use of available corn crops (pending crop rotation) left unharvested

throughout the winter is a proven natural "low cost" and environmentally sustainable snow fence barrier.

Natural snow fences can be a low-cost and environmentally friendly solution to prevent drifting snow and the maintenance related challenges. These barrier locations are strategically chosen and designed to trap snow as it blows across fields before it can reach the road.

Background and Discussion

Winter driving can be dangerous during inclement weather with blowing and drifting snow. This can lead to ice formation and white-out conditions that reduce driver's visibility. The use of snow fences can reduce these factors thereby reducing the risk of accidents.

The Transportation Services Maintenance division works hard to ensure that its network of roads is kept clear of snow and ice during the winter months. This effort can often involve the installation of manufactured snow fences on properties in Grey County near roadways that are subject to blowing snow in accordance with the Municipal Act, 2001.

Snow fences force wind to go over and through the fence, causing the wind to lose energy and velocity. The snow particles suspended in the fast-moving air settle as the speed slows. This forms a drift adjacent the snow fence rather than on the road. The height of the fence determines how much snow a fence can trap, and the distance installed from the road.

Findings

The use of trees as snow hedge and corn crops as a snow fence has been successfully utilized in the following areas:

- Region of Peel
- The City of Ottawa
- County of Dufferin
- County of Simcoe

Furthermore, this alternative has been concluded to be viable in the following publications:

1. Good Practices for Winter Maintenance in Salt Vulnerable Areas, Ontario Good Roads (OGRA) and Conservation Ontario (CO); and
2. Synthesis of Best Practices Road Salt Management, Transportation Association of Canada (TAC), September 2013; and

3. Designing for Environmental Stewardship in Construction and Maintenance, American Association of State Highway and Transportation Officials (AASHTO) Center for Environmental Excellence, 2020.

Snow fence locations are determined by County staff familiar with areas of drifting. These are open areas usually on north south oriented roads. Snow fence is placed on the west side of the road for the prevailing south west winds.

The County is committed to building strong partnerships and fostering community involvement in finding cost-effective solutions that help increase community safety and protect the natural environment in Grey County. Two options are available, a Tree Snow Fence or a Corn Snow Fence.

Tree Snow Fence

Grey County is partnering with landowners to plant trees as snow hedge and windbreaks. There are currently four active agreements that have a 20-year duration. These agreements provided little in compensation to the landowner except the benefits provided by the trees such as reduced loss of topsoil.

Grey County staff recommend identifying areas where a tree snow hedge would be a benefit and approaching landowners to get their interest in participating in this program.

It has been proven that the loss of crop land for the placement of trees is more than compensated for increased yield and conservation of topsoil, however most farmers are reluctant to give up productive land for tree planting.

Farmers wanting to participate in the planting of trees on their property enter into a long-term agreement of 21 years less a day.

Corn Snow Fence

Transportation Services staff has recognized that the use of agricultural crops could be deemed as a win-win scenario where farmers would be remunerated for the cost of the crops being utilized. The benefit to the County is a corn row snow fence at a much lower cost than that of a manufactured variety. Manufactured snow fence is 4 or 6 feet tall while corn plants average 8 feet tall. The additional height translates to additional benefit in mitigating drifting in problem areas.

Farmers are required to enter into an Agreement with the County requiring they leave a minimum of 12 designated rows of corn crop standing throughout the winter season.

The following factors were used in determining an appropriate "fair market value" remuneration:

- Forecasted December corn futures price per bushel;
- Canadian US dollar exchange rate;
- Expected yield in Grey County (bushel/acre) and
- Standard row separation of 30 inches.

Based on these current factors, the overall cost of 12 rows of corn with a yield of 160 bushels per acre, equates to \$2.28 per linear metre. Whereas the cost of the installation and removal of manufactured snow fence is approximately \$5.00 per metre but would require a double row of snow fence to be equivalent to corn snow fence.

The typical farm frontage is 1000 feet or approximately 308 metres which would equal a payment of \$1,000 with a premium like Peel and Dufferin County's. This will be 68% of the cost of installing and removing manufactured snow fence.

Signs similar to adopt-a-highway signs can be installed on the farmers property in recognition of the use of their land.

Proposed Program

Grey County staff are proposing to continue with a permanent Tree Snow Fence program and initiating the corn row snow fence program. Recognizing the value and importance of agriculture and farmers in Grey County with properties adjacent to County roads to allow the County to utilize their land either in corn crop or trees as natural snow fences to increase winter road safety.

Grey County staff are requesting approval to reach out to potential farmers and landowners to implement the Natural Snow Fence Policy ahead of Council approval to start discussions with farmers prior to removal of their corn crops.

Farmers that participate in the program will be providing a public service that may improve driver visibility during "white-out" conditions and improve road surface conditions by minimizing snow drifts and ice. This assists Transportation Services staff in keeping the roads safer for the traveling public and saves money, especially given higher fuel costs associated with operating snowplows.

Participation will be solicited via the use of social media (Twitter, Facebook, County website, etc..), a Media Release, participation in community events, in collaboration with Grey County Economic Development, Grey Agricultural Services Office and the local Conservation Authorities as well as targeted visits to the local farmers to discuss the program further.

Staff is committed to maintaining the required efforts to ensure the program's success. The program will be evaluated to measure its success based on the effectiveness.

Measurable factors would include: the number of standing corn rows to control drifting, along with the communications strategy, and the evaluation of cost savings.

Section 4.2 of the Delegation of Duties By-law provides the Director of Transportation Services with approval authority for live snow fences. Staff are recommending that the next update to the Delegation of Duties extend this authority to crop snow fences.

Legal and Legislated Requirements

None.

Financial and Resource Implications

Financial implications are expected to be minimal based on \$1000 for each farm participating in the program. Initially, the monies will be paid for through the Winter Maintenance budget item. Staff will assess budget allocation based on future levels of farmer participation.

Relevant Consultation

Internal (list)

Economic Development

Climate Change Coordinator

Clerks Department

External (list)

Appendices and Attachments

[Natural Snow Fence Policy](#)

[Corn Snow Fence Calculation](#)

Links

[Wellington County Living Snow Fence Program](#)

[Dufferin County Living Snow Fence Program](#)

[Peel Region Salt Reduction and Living Snow Fence Program](#)

Natural Snow Fence Policy

Approved by:	Policy: 12-6
By-law:	Date Approved:
Replaces: N/A	Last Revision Date:
Section: Transportation Services	Scheduled for Review by: October 2022

Policy Statement

The County is committed to keeping its network of roads clear of snow and ice during the winter season.

Snow fences are utilized to prevent or minimize the drifting of snow on roads, increase driver safety and reduce the need for plowing and salting, therefore reducing salt usage and greenhouse gas emissions. Live natural snow fences, either through the planting of trees or use of existing corn crops are an environmentally sustainable option to produce the same results.

This policy provides landowners and farmers of properties adjacent to Grey County Roads an opportunity to provide a public service that may improve driver visibility during "white-out" conditions and improve road surface conditions minimizing snow drifts and ice.

Purpose

The purpose of this policy is to outline criteria for entering into agreements with landowners and farmers of properties adjacent to Grey County Roads for the purpose of planting trees for live snow fences or use of farmers corn crop's as live natural snow fences to prevent or lessen the effect of blowing snow during the winter season.

Scope

This policy applies to all Grey County Roads which the Director of Transportation Services determines to be subject to blowing and drifting snow.

This procedure will cover all approved live natural snow fence plantings on private property or use of farmers corn crops adjacent to Grey County Roads.

1.0 Natural Snow Fence



- 1.1 Natural Snow Fence can improve road surface conditions by minimizing snow drifts and ice. The implementation of a Live Snow Fence Program will assist Transportation Services staff in keeping the roads safer for the traveling public and reduces expenditures.
- 1.2 Natural Snow Fences are strategically placed based on wind patterns and local topography. They are designed to trap snow as it blows across the fields and settle the snow before it can reach roadways. Snow fences force 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 of the snow slows. This forms a drift behind or in front of the live snow fence. The height of the fence and amount of snowfall common in the area determines how much snow a fence can trap.
- 1.3 Natural Snow fences can be an environmentally friendly solution to prevent drifting snow problems and has many benefits, including but not limited to the following:
 - Benefits to Landowners
 - Improve access to farmsteads and rural areas
 - Provides a service to the community
 - Provides environmental stewardship
 - Helps reduced soil erosion
 - Benefits to Community
 - Maintenance Benefits
 - Reduced large snow drifts that may lead to road closures
 - Reduced maintenance costs = reduced tax burden
 - Improves driver visibility to reduced vehicle accidents
 - Environmental / Climate Benefits
 - Lessens impacts on our environment with less salt use, fewer plow truck passes and less fuel consumption (CCC can provide a calculation for this)
 - Moderation of soil and air temperatures
 - Water conservation
 - Provides wildlife habitat
 - Landscape beauty (combine with wildlife habitat?) and agri-tourism
 - Reduces shipping delays for goods and services
 - Carbon sequestration
- 1.4 Transportation Services will arrange for signs to be installed on the lands in recognition of the County's use of the lands to provide natural snow fence.

2.0 Corn Crop Program



- 2.1 Farmers who wish to apply for this program are welcome to contact Grey County Transportation Services at 519-376-7337 ext. 1217 to discuss the program.
- 2.2 Farmers are required to enter into a "Crop Use Agreement" with the County requiring they leave a minimum of 12 designated rows of corn crop standing throughout the winter season.
- 2.3 Remuneration at fair market value of the corn crop will be determined each year based on the following:
 - Forecasted December corn price per bushel;
 - Canadian US dollar exchange rate;
 - Expected yield in Grey County (bushel per acre) and
 - Row separation of 30".

3.0 Tree Snow Fence Program

- 3.1 Grey County Transportation will identify areas of County Roads where a tree snow fence would be a benefit and will approach landowners to gauge their interest in participating in this program.
- 3.2 Landowners are required to enter a "Tree Snow Fence Agreement" with the County for a term of 21 years less a day to allow the County to erect and maintain a snow barrier consisting of two staggered rows of coniferous trees.
- 3.3 The County would be solely responsible for planting and maintaining the trees and replacing any dead trees at the County's sole discretion.
- 3.4 Upon the expiration or termination of the Owner would take full ownership and liability of the Tree Fence.
- 3.5 Remuneration would not be payable to landowners though the permanent tree fence program. It has been proven that the loss of crop land for the placement of trees is more than compensated for increased yield and conservation of topsoil.

4.0 Financial Matters

- 4.1 This program will be funded through the Winter Maintenance budget.

5.0 Roles and Responsibilities

- 5.1 Transportation Department
 - a) Future updates to this Policy in consultation with the Clerks Department.



- b) Staff will conduct efforts to solicit participation include the use of social media (Twitter, Facebook, County website, etc.), a Media Release, participation in community events, in collaboration with Grey County Economic Development, Grey Agricultural Services Office and local Conservation Authorities as well as targeted visits to local farmers to discuss the program further.
- c) Staff will be responsible to evaluate and measure the program's success based on the effectiveness. Measurable factors would include: the number of standing corn rows to control drifting, along with the communications strategy, and the evaluation of cost savings.

Forms and Resources

Corn Row Snow Fence Agreement Template

Tree Snow Fence Agreement Template

Corn Snow Fence Calculation

