ABSTRACT

Blowing snow can cause significant problems for mobility and safety during winter weather in three distinct ways. It may drift onto the road, thus requiring almost continuous plowing while the wind is blowing (which may occur when a given winter storm is over). Snow may drift onto wet pavement (perhaps caused by ice control chemicals) and dilute out the chemicals on the road, creating ice on the road. And sufficient blowing snow can cause a major deterioration in visibility on the road, a factor which has been shown to be significant in winter crashes.

The problem of blowing snow can be very effectively addressed by creating a snow storage device upwind of the road that requires protection from snow drifting. Typically, these storage devices are fences. Extensive design guidance exists for the required height and placement of such fences for a given annual snowfall and given local topography. However, the design information on the placement of living snow fences is less complete. The purpose of this report is to present the results of three seasons of study on using standing corn as snow fences. In addition, the experience of using switch grass as a snow storage medium is also presented. On the basis of these experimental data, a design guide has been developed that makes use of the somewhat unique snow storage characteristics of standing corn snow fences.

The results of the field tests on using standing corn showed that multiple rows of standing corn store snow rather differently than a traditional wooden snow fence. Specifically, while a traditional fence stores most of the snow downwind from the fence (and thus must be placed a significant distance upwind of the road to be protected, specifically at least 35 times the snow fence height) rows of standing corn store the majority of the snow within the rows. Results from the three winters of testing show that the standing corn snow fences can store as much snow within the rows of standing corn as a traditional fence of typical height for operation in Iowa (4 to 6 feet) can store. This finding is significant because it means that the snow fences can be placed at the edge of the farmer’s field closest to the road, and still be effective. This is typically much more convenient for the farmer and thus may mean that more farmers would be willing to participate in a program that uses standing corn than in traditional programs.

On the basis of the experimental data, design guidance for the use of standing corn as a snow storage device in Iowa is given in the report. Specifically, it is recommended that if the fetch in a location to be protected is less than 5,000 feet, then 16 rows of standing corn should be used, at the edge of the field adjacent to the right of way. If the fetch is greater than 5,000 feet, then 24 rows of standing corn should be used. This is based on a row spacing of 22 inches. Further, it should be noted that these design recommendations are ONLY for the State of Iowa. Other states of course have different winter weather and without extensive further study, it cannot be said that these guidelines would be effective in other locations with other winter conditions.