



Narrow drainage trenches with heating cables in the bottom can help prevent winter injury on putting greens with poor surface drainage.

PREVENTING WINTER INJURY

Cutten Fields Golf Club | Guelph, Ontario

Bill Green, superintendent

ISSUE

The soil-based putting greens at Cutten Fields Golf Club have poor surface drainage in numerous areas and relatively high populations of *Poa annua*. Cultivation efforts have improved internal drainage, but even well-drained soils do not drain when they are frozen. In areas where surface drainage is poor, freeze and thaw cycles have damaged the putting greens during 10 out of the last 15 winters. The combination of poor surface drainage, winter shade and high *Poa annua* populations is a recipe for consistent winter injury on the putting greens.

Revenue losses and repair costs from the winter injury that occurred in 2014 exceeded \$240,000 and the putting greens were not opened for play until July. This was an extreme event, but revenue is lost and repair costs are incurred any time that damage occurs on the putting greens. Taking steps to make the putting greens less susceptible to winter injury would greatly improve spring and early summer playing conditions while reducing repair costs and revenue losses.

ACTION

Tree work was performed around the putting greens to maximize sunlight throughout the year. This would promote overall turf health and hopefully boost creeping bentgrass populations, a turfgrass that is less vulnerable to winter injury. Special efforts were made to increase sunlight penetration during the winter to accelerate the melting process and reduce the potential for ice accumulation. Rebuilding the putting greens to improve surface drainage was not financially feasible, so the following technique was developed to help protect the five putting greens that are most susceptible to winter injury:

- Narrow drainage trenches are cut in the putting greens in late fall to provide surface drainage. The trenches are approximately 2.25 inches wide and 2 inches deep. They are located in low areas and aligned to capture water and prevent it from accumulating on the putting surface.
- The removed putting green sod is placed in greenside bunkers and sand is pushed up around the sod edges to prevent desiccation.
- Heating cables, like those used to melt ice on rooftops, are laid in the trenches to ensure they remain functional regardless of temperature and snow and ice accumulation.
- Initially, animals damaged several cables during the winter, so now they are wrapped around copper pipe for protection. Caution is taken not to cross the cables, thereby avoiding a possible short circuit.
- The cable plugs are attached to a temporary piece of PVC pipe installed vertically in the ground so they can be located quickly regardless of snow accumulation.
- When ice accumulates in low areas the cables are activated using two portable generators. The cables melt the ice, often restoring surface drainage in less than an hour.

RESULTS

Given the extreme weather experienced during the winter of 2014, it is doubtful that this technique would have prevented all of the damage. However, this system has been utilized for the past two winters and no winter injury was experienced. It is important to note that recent winter weather has not been extreme; the real test will come when more severe winter weather is experienced.

The cable system has proven to be a relatively inexpensive way to reduce the risk of winter injury. Annual installation and removal requires 48 staff hours in the fall and 32 staff hours in the spring. The cables themselves cost \$500. Superintendent Bill Green says that having a third generator would improve the system because timing is critical and an extra generator would speed up the melting process. Given the economic impact winter injury has had on Cutten Fields in the past, this low-cost program is well worth the investment.