



Green Section

BEST MANAGEMENT PRACTICES CASE STUDY



Cup-cutter-sized holes above drain lines and deeper holes created with a 4-inch auger can help eliminate standing water on putting surfaces and reduce the risk of winter injury.

IMPROVING SURFACE DRAINAGE TO REDUCE THE RISK OF WINTER INJURY

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Gino Marchetti, superintendent

ISSUE

The putting greens at Glen Oak Country Club consist primarily of *Poa annua*, a grass that is highly susceptible to crown hydration – one of the most common forms of winter injury in the northern United States. Crown hydration injury occurs when turf plants imbibe water as ice and snow melts, and are then subjected to a rapid temperature drop that causes cells to rupture, killing the plant. Following sequential years of winterkill on *Poa annua* putting greens, Superintendent Gino Marchetti implemented several management programs to reduce the risk of winter injury.

ACTION

One method to minimize the risk of crown hydration is to improve surface drainage so melting ice and snow do not cause water to accumulate on the putting surface. To help move water off the putting surfaces at Glen Oak, cup-cutter-sized holes are cut above subsurface drain lines to provide a direct route for water to reach the pipes. This method prevents water from sitting on the surface and allows it to quickly exit the putting green cavity through the drainage system.

In low-lying areas where subsurface drains are not present, or in consistent problem areas, a 4-inch auger is used to cut deep holes through the frost layer to improve water movement away from the surface. By digging deeply with the auger, the risk of the holes filling with water and freezing is reduced.

An 8-inch-wide sod cutter is also used to create shallow trenches that allow water to flow easily off the putting greens during freeze and thaw cycles. The sod that is removed from the trenches can be placed in surrounding bunkers to preserve it until it is replaced the following spring. Encasing the edges of the sod strips with bunker sand helps prevent desiccation.

RESULTS

Since the harsh winter and subsequent turf damage that occurred in 2014, these management programs have proven to be successful at reducing the risk of winter injury. Cup-cutter-sized holes were installed before the winter of 2014, but the holes froze over and were unable to function as intended. Since the addition of the 4-inch auger holes in poorly drained areas, no winter injury has been experienced. However, there has not been a winter as harsh or conducive to winter injury as the winter of 2014. Marchetti feels that by improving surface drainage in these ways he has reduced the risk for winter injury on the putting greens at Glen Oak.