Under Cover

The Use of Winter Turf Covers is More Personal than Universal

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Snow is a near-perfect insulator, ideal for protecting cultivated grass. But in this age of climatic changes and possible global warming, snow is fast becoming a vanishing resource. Not so long ago, the arrival and departure of winter snow and ice was a predictable phenomenon. Today golf course superintendents from Helena, Mont., to Helsinki, Finland, can no longer depend on Old Man Winter to dump a natural turf cover on their greens. These days one must rely on technology and ingenuity to do what nature apparently can no longer do with regularity.

Artificial turf covers provide a rational alternative to snow and ice. Covers are increasingly deployed on golf course greens the world over, but no single insulator will work for every winter scenario. Microclimate is everything, the experts say, and what works in Helena may fall flat in Helsinki.

"The first thing to consider is where you are," says Julie Dionne of Laval University in Quebec City, Canada. "No one cover will work in all situations. Quebec City gets lots of snow, much more than Montreal. What you use and how you use it will differ accordingly to each situation."

A Telling Test

In the early 1990s, Laval University conducted a series of experiments to gauge the effectiveness of different turf covers in limiting winter damage to *Poa annua* golf greens. The two sites were Montreal Country Club in St. Lambert and a testing facility at the university. One unprotected control plot was tested against seven covered with the following materials: a permeable Evergreen cover, an impermeable Evergreen cover, a mat composed of curled wood shavings covered with an impermeable Evergreen cover; a permeable Evergreen overlaid with 15 centimeters of hay and a top layer of impermeable Evergreen, a wooden shelter shrouded with a layer of impermeable Evergreen to allow for a 5-centimeter air space, a light felt material overlaid with impermeable polyethylene and a thick felt overlaid with impermeable polyethylene.

The covers were in place by the winter of 1993-94 and removed in April 1994. The results of the test were conclusive. First of all, the notion that local weather conditions determine the use and effectiveness of winter turf covers was confirmed in spades. The snowfall in Quebec City was far greater than in Montreal. The snow insulated the Laval test sites and stabilized temperatures throughout the season. But winter damage occurred nevertheless. Snow molds were present on the plants because of the warming conditions created by the covers and augmented by the heavy snow.

Conclusion: Under certain conditions, covers may actually open the door to turf disease, illustrating the need for fungicidal treatment before they are installed.

Montreal, meanwhile, experienced very different winter conditions during the testing period. Harsh winds buffeted the course, and a light accumulation of snow was washed away by heavy rains. The covers were all that stood between the test greens and the destructive effects of the season, and, because of this, each one could be evaluated separately.

For instance, the curled wood mat proved to be the most effective insulator, and the *Poa* green underneath it emerged virually unscathed. The felt covers, both thin and thick, did not fare as well as the curled mat, while the turfgrass covered with only a thin layer of permeable and impermeable material with no insulating layers did the poorest of all. Turf damage due to freezing put the Montreal greens out of commission until May 1995.

But stand-alone permeable and impermeable covers can prove essential to winter turf health. While they provide little by way of insulation, they do fend off dessication and frost damage. Impermeable covers, when used in combination with other materials, protect against ice and prevent seepage into the other insulators layered beneath them, such as hay and wood mat.

The study uncovered additional data as well. Monitoring the microclimate under the protective covers helped determine the proper time to remove them. This was accomplished by installing thermocouple wires under the covers and periodically recording the results.

Knowing when to install and remove covers is vital. Early implementation can retard the hardening of the soil. Taking the cover off too late may weaken the plants' ability to repair themselves. Once the cover is off, it will be necessary to wean the grass from the microclimate it has become accustomed to. Permeable covers should be used after the winter cover has been removed. This light covering will shield the green from lingering winter effects.

(Continued on Page 23)

Under Cover—

(Continued from Page 21)

Turf Covers in the Real World

While winter turf covers may be a practical alternative to snow in some parts of the country, many superintendents don't endorse their use. Installation is labor-intensive, some say, and removing the cover prematurely can actually damage a green. Also, seeded grass can grow into a tarp and come out of the ground in clumps when the cover is removed.

"I've actually seen that happen," says Joe Adams, assistant superintendent at Omaha Country Club in Omaha, Neb., and a member of GCSAA the last eight years. "There are lots of problems with covers, another being the problem you sometimes get with ice storms. When ice accumulates on the covers, it seals off the green. You may have to break it off several times in a single season to oxygenate the grass. The combination of ice and tarp can kill a green."

There are other hazards to turf covers besides premature or incorrect removal. Covers may also create their own greenhouse effect, subjecting the grass to disease pressure even as they protect it for winter dessication.

"You can't take a cover off quickly without risking the health of the grass," says 21-year veteran John Hoofnagle, CGCS at Valley Country Club in Aurora, Colo. "Removal requires a weaning period. Spring in Colorado can mean warm days, cold nights and frost on the ground the following morning. You can either recover the grass at night, which workwise is no picnic, or you leave the cover on through the spring, creating a microenvironment that may encourage the growth of snow molds and other diseases. Then you have the problem of winter play. We get a lot of that here, and for the players covered greens are unacceptable."

For Adams, Hoofnagle and many others, the best way to protect a green from the ravages of winter is to allow the season to run its course. Mother Nature has her stormy side, but she also takes care of her own. When it's available, snow and ice, with intermittent winter watering, provides more than adequate protection and does so without subjecting the grass to unnatural stress.

Other superintendents augment nature with nature, employing the materials provided by Mother Earth to protect carefully cultivated greens.

Four-year GCSAA member John DeCora, superintendent at Court House & Jail Rock Golf Course in Bridgeport, Neb., covers his greens in the winter with sand.

"The sand is applied in a light coat over the crown. After that, the key is moisture," DeCora says. "Artificial covers really don't work as well as natural ones, and they're also relatively expensive. This is a pretty small course. Four thousand square feet of turf cover is more than adequate to protect it. But the covers would cost us about $400 to $500 per green and maybe $5,000 to cover them all. Another problem: They don't last very long. Inside of four or five years, they're shot and you have to buy more of them."

But for every opponent of winter covers, there are other superintendents who rely on them religiously. Mike Cohrs, the assistant at Buffalo Run Golf Club in Buffalo, Minn., describes artificial winter insulators as "a definite help," and points to the unusually wet winter of 1996 in Minnesota as a prime example.

"There was between ½ to 2 inches of ice on the ground statewide. Lots of places around here had no covers and had plenty of damage as a result," Cohrs recalls. "We routinely cover all of our 19 greens with something called HPI covering. It's made out of synthetic strands all weaved together. We put it down like a very thin carpet and because it's so thin, it allows for oxygen and sunlight penetration.

"We also use Excelsior matting, a plastic matting about ½-inch thick with wooden fibers mixed into it. The wood chips create air pockets that allow the plants to breath. On problem greens, we use Excelsior in combination with HPI. We have depressions in some areas of the course which, uncovered, would fill up with water and promote freeze damage. Covered or not, problem greens remain problem greens. But the insulators help keep the problems under control."