Excess Organic Matter is No Laughing Matter at The Straits

When you strive to provide 100% customer satisfaction, it can be a challenge to incorporate important but disruptive maintenance operations into the turf management program.

BY DAVE SWIFT

he Straits and Irish Courses at Whistling Straits, along with the Meadow Valley and River Courses at Blackwolf Run, make up the 72-hole golf resort designed by Pete Dye known as Destination Kohler in Kohler, Wisconsin. The Straits hosted the 1999 PGA Club Professional Championship and the 2004 PGA Championship, and it is scheduled to hold the 2007 USGA Senior Open.

The Straits is a rugged, links-type layout with extensive dunes and more than 1,000 bunkers located along two miles of Lake Michigan coastline that can play more than 7,600 yards from the back tees. This unique public facility is a *walking only* course that averages 30,000 rounds of golf annually.

THE CONCERN

Construction of the Straits started in 1995, and the course opened in July of 1998. The greens were built to USGA recommendations and seeded with Providence creeping bentgrass. During construction and grow-in, important cultural practices for new greens, such as topdressing, were sometimes placed on the back burner in an effort to complete the project in a timely manner.

Extended periods of cool, humid weather during spring and fall are standard fare along Lake Michigan. A healthy stand of bentgrass naturally recycles organic matter into the upper soil profile of greens when roots,



Core cultivation with a unit capable of close spacing is the key to success for removing excess organic matter from greens. Filling the holes with sand is accomplished easily when using dry sand and blowers.



Cleaning up the cores is the most labor-intensive stage of the aeration operation.



Buffalo turbine blowers are used to move dry sand into the holes. Keeping brushes and dragmats off the turf causes minimal injury to the putting surface.

shoots, stolons, and other plant parts are replaced throughout the season. The natural soil microbial processes responsible for organic matter decay are temperature dependent. Consequently, the cool microclimate along the lake produced ideal conditions for thatch accumulation.

After hosting the Club Professionals Championship in 1999, we started to address the concerns associated with excessive organic matter accumulation that had developed in the upper inch or so of the greens. Problems with scalping and *Poa annua*/moss encroachment increased as mowing heights were lowered to increase green speed, especially across severe undulations.

THE SOLUTION

During the next three years a maintenance plan was developed and finetuned to prepare the greens for the 2004 PGA Championship. Our goals were:

• Reduce organic matter accumulation in the upper rootzone to provide golfers smoother and firmer greens.

• Eliminate moss and reduce *Poa annua* encroachment.

• Achieve these goals while causing minimal inconvenience to golfers.

From 1999 to 2002, various management practices were assessed to manage thatch. We would lightly topdress greens more frequently throughout the season to prevent further thatch accumulation, but we needed a way to remove the excess organic matter that had already created a layer in the soil profile. Ideally, we needed to develop an aggressive aeration program without closing the golf course or reducing green fees.

By trial and error we found that when nine or more greens were cultivated at one time, we received an unacceptable number of complaints and requests for reduced green fees. With this in mind, we implemented a schedule of cultivating only six greens at a time using quarter-inch hollow tines. When the first six greens would heal completely, six more were cultivated, and then the last six greens were treated. Furthermore, the sequence of cultivation was staggered so that only a few consecutive holes were affected at any one time. Complaints practically disappeared.

The program was started during the spring of 2000. The goal of significantly reducing organic matter was not being achieved despite two to three aeration operations per season. More aggressive cultivation with the Graden vertical mower was employed twice during the fall of 2001 to modify the upper soil profile. The unit removed considerably more material from greens than the A backpack blower is used to eliminate the buildup of sand that occurs at the interface between the collar and the rough.



quarter-inch aeration, but the increased number of complaints from guests was unacceptable.

Using the *Green Section Record* article "Core Aeration by the Numbers," found in the July/August 2001 issue as a guide, the decision was made to use larger tines in a closely spaced pattern to affect a greater percentage of the greens per cultivation. The goal was to impact 30% to 40% of the green's surface area during 2002 and 2003 in preparation for the 2004 PGA Championship.

THE CURRENT PROGRAM

The Ryan GA 24 unit equipped with quadratine holders is used because the relatively slow speed of the unit produces a clean, vertical hole. The tine holders are machined to accept halfinch-diameter hollow tines. One pass of the unit affects approximately 9% to 10% of the putting surface. Each green would need to be cultivated three or four times a year to achieve this goal of impacting 30% to 40% of the green's surface.

Greens are cultivated twice during April before the course is opened and once during early September. A few of the problem greens that were contaminated by soil from washouts during construction are aerated three times during spring. Most superintendents would cringe at the thought of the damage and bruising to greens caused by three back-to-back aeration operations during April — a time when turf growth is typically slow due to cool soil temperatures. The key to success is keeping brushes and mats off the putting surface.

Fertilizer and a moderately heavy rate of sand are applied to greens during late fall. This sets the table for aggressive cultivation the following April. The dark topdressing absorbs heat from early spring sunlight and the turf greens up quickly. Early green-up and the availability of nutrients help the holes heal over quickly in spite of the aggressive cultivation. The heavy layer of sand also helps support the aeration and topdressing equipment that could easily rut the soft, wet greens during spring.

After the first cultivation, the cores are blown to the center of the greens with Buffalo Turbine units. This shakes sand loose from the cores and minimizes the wear that would have been caused by scraping cores off greens with snow shovels. Sand from cores and sand from last fall's topdressing begin to fill the holes. The tufts of turf and thatch that remain are removed. A little additional sand is applied to the greens where needed, and it is blown into the partially filled holes. The use of dry sand is an absolute necessity. The green is rolled after the holes are filled and then the process is started all over again.

During early September the process is repeated once, but only six greens are cultivated at a time to minimize the inconvenience to golfers. Cores are removed as soon as they are ejected from the tines. Heavier applications of sand are made to fill the holes, but the turbine blowers are still employed to work sand into the holes. The ability to keep brushes and dragmats off the putting surface greatly reduces turf damage and accelerates the rate of recovery. Again, dry sand is a must.

If we had tried to brush or drag sand into the holes, we would have likely bruised the turf and added several more days to the healing process. Another benefit to using blowers is that any excess surface sand on the greens is sent into the roughs. A clean surface causes less damage to mowers.

Double aeration during spring requires about four days for 20 greens with dry weather. Our weather is pretty chilly in early April and sometimes we have had the plugs freeze to the green. The operation requires two aerifiers, one or two turbine blowers, one topdresser, one roller, and a crew of 15-18



Dry sand is stored in a silo. Moist sand cannot be moved into aeration holes efficiently.

employees. The September operation takes approximately three weeks to complete.

It takes about three weeks for the greens to heal over during spring and a week or two to heal during September. Greens aerated twice in spring take the same amount of time to recover as greens aerated three consecutive times. After all, the holes are all the same size; only the spacing varies.

So far, the only drawback with the turbine blower method has been excess sand accumulation along the outside perimeter of the collar where the short bentgrass collar meets the higher fine fescue rough. The sand buildup due to overaggressive blowing operations resulted in occasional, but significant scalping injury to turf due to the uneven change in grade. Elevated turf needed to be aerated by hand to remove excess sand and was then rolled. Now we spend much more time with backpack blowers along the perimeters to remove excess sand accumulations.

How successful is the program? Complaints are few and far between. The greens are firm and smooth, and they drain rapidly after heavy rainfall events. Root growth is excellent. Want more proof? The noticeable improvement in putting surface quality on the Straits Course has prompted the management team at Destination Kohler to approve these operations for the other three courses at the resort.

DAVID SWIFT, golf course superintendent, arrived at Whistling Straits in 1999, straight from the golf course management program at Penn State University.



Above left: An appropriate amount of topdressing applied to new greens during and after establishment eliminates organic matter layers in the upper soil profile. Above right: Excess organic matter can accumulate quickly in the upper rootzone of new sand-based greens unless an aggressive topdressing program is initiated during the grow-in.