An under-appreciated tool

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While it'll help manage disease, topdressing also produces a better root zone, which will lead to healthier turf and better playing conditions.

Old Tom Morris would be smiling if he knew his wheelbarrow accident centuries ago at Prestwick is now a cultural practice to combat diseases and maintain greens in top playing condition.

“Ever since Morris’s time, greenkeepers have used topdressing to various degrees as an important cultural practice,” says Adam Moeller, agronomist, Northeast Region, USGA, who did his master’s thesis a few years back on topdressing programs for greens.

“Over the past two decades its importance has increased as the height of cut has gotten lower and lower really as a way to seal the surface and protect it against scalping,” Moeller says. “Its primary function is to dilute the organic matter that accumulates at the top and modify the root zones over time.”

Topdressing is beneficial for both native Poa greens and for sand-based greens. “You are using a better surface on top of a poorly drained surface,” Moeller says.

“With sand-based greens you are protecting that investment through diluting that organic matter – trying to provide better drainage and better soil oxygen and compaction resistance in the top, Moeller says. “From a playability standpoint, you get firmer, smoother greens that are really focused more on protecting the plant, but also burying the plant crowns, which is the growing part of the plant.

“Essentially, if you continue to apply topdressing you are protecting those crowns from traffic, mowing injuries and anthracnose disease, which is one of the biggest diseases superintendents have to battle these days with annual bluegrass turf,” he adds.

Topdressing and Anthracnose

Conventional wisdom used to be that topdressing would invite disease; but, research conducted by Dr. Bruce Clarke from Rutgers University over the past decade has shown topdressing is actually more of a cure when it is complemented by a fungicide program.

Clarke, along with fellow academics John Inguagiato from the University of Connecticut and Jim Murphy from Rutgers have collected data that shows topdressing reduces the severity of anthracnose. But, Clarke cautions, the trio have never looked at the impact of topdressing on fungicide efficacy.

“Since topdressing reduces anthracnose one would assume that fungicides would work better perhaps at lower rates or for longer intervals, but to my knowledge nobody has conducted the research to prove or disprove that hypothesis yet,” Clarke says.

This past July, the three researchers submitted a proposal to the USGA to examine just this topic and the playing quality of turf.

“This would utilize the results from our anthracnose research on cultural factors and pull it all together with fungicide use,” Clarke says. “Essentially taking the beneficial impacts that we have documented in previous research such as probable BMP factors that we would test could include N fertility, topdressing, and mowing height and combining them with fungicide factors such as application interval and rate.”

Clarke says this research is planned for 2012-2013 after they conclude some ongoing studies examining the impact of nitrogen, topdressing and cultivation on anthracnose.

Fungicides still needed

“You still need fungicides regularly because the disease pressure is so high under current expectations,” Moeller says. “You add topdressing to the program and that is just another cultural practice that reduces the severity of it. You still use fungicides, but by topdressing as well, you should minimize outbreaks – assuming other common cultural practices are in place.”

Just ask Todd Raisch, superintendent at Ridgewood CC in Paramus, N.J. In 2001, the private club had a major anthracnose outbreak.

“Our greens basically died across the board,” Raisch says. “We looked at every one of our practices and how it affected anthracnose and at the time there wasn’t a whole lot people who knew about anthracnose.”

Clarke started his research in 2002; Ridgewood participated in the initial trials. Raisch says Clarke took over one-third of their practice putting green, which measures approximately 20,000 square-feet.

“We learned all kinds of data such as chemicals that did not work at Ridgewood, and ones that did and combinations we had not thought of,” Raisch explains.

In 2003, the second year of the study, Raisch says Clarke started to put nitrogen into the mix and showed that nitrogen made a huge difference in keeping anthracnose out.

“Previously, we had low nitrogen rates – only one pound to one pound and a half on our greens per 1,000 sq. ft.,” Raisch says. “We started to put more nitrogen down and the more nitrogen we put down, the more organic material we created and that led to a need to topdress more. Conventional wisdom at the time was that the more you topdress, the more likely you are going to end up with anthracnose because you are wounding the plant by giving opportunities for infection to develop.”

But, Raisch says Clarke’s research over the last few years has proven the opposite.

“We started to topdress a lot more to match our organic growth, but at the same time I was cautious in the summer months because it’s hot and the turf is stressed, so we don’t need to be adding sand out there,” Raisch says. “Clarke proved that topdressing on a weekly or bi-weekly basis is actually good for keeping anthracnose away.
“What he showed was that if you topdress regularly you can artificially raise the height of cut by protecting the crowns of the plant from wounds,” he says. “You could raise the height of cut, but effectively it’s a lower height because the sand acts as a buffer between that and the crown of the plant. You basically have about the same green speed because you have the firmness because more exposed leaf tissue but same amount as lower height.
Just raising the height of cut by 10, 1/1,000 makes an enormous difference in the health of a plant.”

Today, thanks to Clarke’s research, Raisch uses a lot more nitrogen; this has helped keep anthracnose away from Ridgewood for 10 years now.

“It was really a combination of getting our chemistry right and a lot of the research by Dr. Clarke and his colleagues,” he says. “Topdressing, nitrogen, growing environments right and we took down about 1,300 trees … it was a whole package.”

For his part, Moeller recommends regular, light applications of between one to three weeks. That said, at the end of the day, it comes down to budget because sand is costly and so is the labor. Play volume is another challenge.

“If the golf course is always jam-packed, it is difficult to put this in operation,” he says. “It only takes about three hours to topdress all 18 greens, but that’s still difficult to fit in on a busy course. It can be done in morning but if the canopy is moist, it will impact how that sand will work into the canopy. You don’t want it to be really wet because when you drag it you are not going to get it all in the canopy.”

So, possible solutions are to use either dry sand or keep the sand in storage bins that will protect it from moisture. While sand silos are costly, Moeller says they are certainly worth the investment over a few years of an aggressive top dressing program.

Application rates are key

Many people use a light brush attachment or vibratory roller to coax the sand into the surface. But Moeller believes this is a mistake.

“Oftentimes, superintendents apply topdressing too lightly and it won’t accomplish what they want because it’s not applied heavy enough,” he says. “The application rates I see that work the best are approximately 1 cubic foot/1,000 square feet… that’s where I’ve seen the most success and that’s been documented through research on anthracnose disease and also through organic matter dilution.”

So, why don’t more superintendents topdress more deeply? Moeller says the technology is so good superintendents will err from that standpoint because they don’t have to do any incorporation strategies such as brushing or using rollers.

“In some instances, if the sand is completely dry and the canopy is really dry, you might not need brushing at all, just a light irrigation, but for the most part, if you don’t need any brushing you are on the light end of the spectrum and that topdressing might not accomplish anything,” Moeller says.

No matter how frequently you topdress, or at what rate, Moeller says the most important thing is that superintendents make this a regular part of their turf maintenance program.

“It is one of the most important cultural practices to managing organic matter, which directly relates to firmness and the reliability of the root zone,” he says. “If you have too much organic matter, it’s going to be difficult to have a high-quality surface. Too much organic matter can also compromise the root development, affect drainage and pesticide efficacy.

“This is just another tool to help manage disease. It doesn’t eliminate the use of fungicides, but at the end of the day, it is going to produce a better root zone, which will lead to healthier turf and better playing conditions.”

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