

PANEL DISCUSSION ON MOSS CONTROL

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MY THEORIES

Moss is a relatively new phenomenon on golf greens. Awareness in the turf industry has occurred only in the 90's though it certainly has existed on golf courses for decades. Why has it suddenly become a topic at most of our educational conferences across the country?

Moss is a product of the "need for speed" mentality that has swept the U.S. recently. When I started in the industry in 1977, an average cutting height on putting greens was 1/4"; we would be proud to skin the surfaces to 3/16," and 5/32" was foolish and risky. At that time, moss stayed between the bricks at the clubhouse. There simply was not enough voids in the surface to allow a foreign invasion of moss.

Today an average cutting height is 5/32", though we dare admit to such shaggy conditions. A cut of 1/8" seems more the norm than the exception, and some on the newer series of bents maintain a daily speed of 7/64" down to 3/32". On top of this we are using less fertilizer in an attempt to reduce the blade size to prevent even the least resistance. The moss between the bricks that has forever been mechanically transported via golf shoes to the green, and helped along by mowing practices now has a chance to survive.

Why does moss survive between bricks? There is a built in moisture retention in the depressions between bricks that is paramount to its survival. Notice next time you walk on brick surfaces that anywhere there is shade on the bricks, or areas not under cover, more moss is present. Covered areas with little exposure to moisture have no moss. On a golf green we create the perfect environment for moss survival, whether heavy soil or USGA spec greens. Because of low cutting heights we feel the need to water with both quantity and frequency. Moisture retention in my opinion is more critical to moss survival than lack of sunlight, soil types, and infiltration rates.

MY EXPERIENCE

We opened our course at New Albany Country Club in Columbus, Ohio in May, 1992. In September of 1992, we hosted the first Wendy's Three Tour Challenge, an event televised through all 18 holes. The need for consistency and speed was elevated by this fact. I was a proponent of "lean and mean" and produced daily stimpmeter readings of 10-11 feet. For the event we were at 12-13 feet. Unfortunately, this speed standard had been set too high at the beginning, and had become the norm. By the Fall of 1994, I began to notice the moss but because of its green color, I don't believe I took it as seriously as if it had been brown. We went into the winter with moss as we covered our greens with woven plastic covers, a practice we adapted during grow-in.

In the spring of 1995, we uncovered the greens and discovered a tremendous spore population that we created with the warm, wet environment. We were literally collecting more spores than grass in some mowings. I began to research the problem and found there to be little recommendations in those days.

EXPERIMENTATION

At that time the recognized practice was to in some way burn the moss out. In 1995 and 1996 we tried several forms of ferrous sulfate, ammonium sulfate and hydrated lime. Lime was eliminated almost immediately due to application difficulty, fear of burn of our Penncross bent, and the fact that we already had soil pH's of 7.5 to 8.0. We tried various rates of ferrous and ammonium sulfate. We were able to turn the moss black, but never kill it entirely.

Dr. Karl Danneberger of Ohio State University initiated his own testing on one of our putting greens, setting up a series of products from iron sources to Ronstar to a product called DeMoss at varying rates. His results were similar, with some blackening but no significant results.

The Scotts Company and Dr. Milt Kagayama set up a series of tests on another putting green using similar products and some experimental ideas identified only by research numbers. They had some success in killing moss but with corresponding unacceptable kill to the bentgrass.

Based on all of the results and some experimentation by Todd Voss of Double Eagle Club near Columbus, and Frank Dobie of the Sharon Club near Akron, we began to experiment more with the De Moss product in 1997. Mr. Dobie had organized a group of some 25 superintendents and researchers into a database and coined us "The Moss Men." He would periodically send out a questionnaire and ask probing questions about our grass types, height of cut, fertilization practices, severity of moss, and our experimental results. He would then compile the data and print the results for all of the participants. It was an outstanding effort on his part, and gave all of us some confidence to continue testing.

Participants were trying everything from rubbing alcohol to Desenex foot powder in an effort to find a dessicant with some efficacy. I spent most of my effort on the De Moss product. By early summer 1997 I had come up with a spray bottle method that was turning the moss brown. Dr. Danneberger's observation early on was that turning the moss black only damaged it; turning it a bronze/brown color permanently killed it, and he was right. The De Moss was turning the moss brown and killing it, mixed with very high rates of surfactant. However, I soon discovered that an application on an 80 F day wiped out the surrounding bentgrass. So we were back to the drawing board.

THE ANSWER

Mike Hambach, then a superintendent in Virginia, had stumbled upon using Ultra Dawn dishwashing detergent and killed the moss in a matter of hours. This was reported to Mr. Dobie in his questionnaire, and he immediately tried it at the Sharon Club with great success. In a matter of days, Todd and I were experimenting as well with application methods and rates. The significant fact in the use of Dawn is the absence of serious damage to desirable turf. We tried to produce kill in bentgrass by applying on 95 degree days in full sun with low humidity and were unsuccessful, much to our delight. Slight discoloration was all we could manage under the most oppressive conditions.

My current mixture is five ounces of Ultra Dawn to two gallons of water with no additional surfactant. Please note that Mr. Hambach's results show the use of "Ultra" Dawn and not regular Dawn. There seems to be an additive in the Ultra product that aids in the dessication of the moss. We apply the mixture in a backpack or hand held sprayer and "dribble" the material on the plant at low pressure. It comes out of the nozzle as a sudsy ball; do not discourage the sudsing as we feel there may be something to the material "melting" on the leaf blades that may provide better coverage and sticking. There may be other concentrations that work as well; this is what works for me. You should see brown moss on the same day if it is a warm, sunny condition.

There is some question as to the legality of using this material in this application. After much discussion, my sense is that it is perfectly legal in that Dawn is a residential product. Had it been a commercial product with no label for this use, we certainly would have an issue as to it's intended use.

CULTURAL PRACTICES

You must remember that it was my cultural practices that initiated the problem. I have since increased my fertilization, reduced my sprinkler irrigation, increased my hand hose irrigation, raised the height on a daily basis, and virtually eliminated the use of grooved rollers. I have added the use of a season-long wetting agent, one of the new technology products, which allows me to "dry down" the greens more evenly.

To offset the certain reduction in speed and smoothness, I use brushes in front of my walking greens mowers as needed, sometimes as many as 3-4 times per week. I topdress every three weeks lightly, and the brushing action from that task further reduces "bladyness." I use sidewinder lightweight rollers 1-2 times per week only if needed to attain my green speed goal.

My goal is now nine feet on the stimpmeter. I start out the season at nine feet and keep it there except for our member-guest and a few other key events. Our members are very happy at that speed, and particularly with the smoothness from the rollers.

CONCLUSION

The whole process took over three years, but I never gave up. Putting together a network of fellow superintendents and industry experts was both fruitful and enjoyable. Utilize key staff members or interns to maintain the experimentation process. By yourself, you will not be able to stay consistent with your testing. The process was very satisfying, knowing that together we solved a growing problem through a grass roots effort.