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Spring is the time for turf renewal and rejuvenation. *Poa annua* is part of that spring ritual — often appearing surprisingly out of nowhere and in full bloom. *Poa annua* is the most seductive of all the plants with which we deal. How can you better explain spending one's entire professional life obsessed with either trying to kill it or maintain it — and then endure scorn for your efforts.

Studying *Poa annua* is an engrossing and consuming endeavor, but like spring keeps one scientifically young. There is always something new to be learned and written from studying *Poa annua*. For example, I have always been curious of how a putting green in the fall that is uniformly dense and comprised entirely of creeping bentgrass can appear pockmarked in late winter because of *Poa annua*.

A common explanation is that *Poa annua* germinates in the fall when soil temperatures drop below 70 degrees Fahrenheit — or as more recently reported that the optimum temperature for germination of *Poa annua* is 19 degrees Celsius daytime (66 degrees F) and 10 C (50 degrees F) nighttime (McElroy, et al., 2004) — with the plants not becoming apparent until mid to late winter because of environmental or management disturbances.

What bothers me about the above scenario — given that *Poa annua* is considered a pioneer (one that initially establishes itself in a barren area) or opportunistic weed that requires a disturbance to germinate and colonize an area — is no apparent disturbance has occurred to some of these greens. Disturbance is important because opportunistic weeds do not like competition from other plants. Additionally, weeds that produce small-sized seeds like crabgrass and *Poa annua* need a disturbance so light can penetrate the canopy and trigger germination.

Given conventional thought, the above green must have had a disturbance (ball marks, wear, excessive grooming or management practices) that provided openings for *Poa annua* seeds to receive light-triggering germination. How much disturbance is needed? The answer is rather complex but apparently not much.

Spring (and *Poa Annua*) Is in the Air

BY KARL DANNEBERGER



APPARENTLY,
POA ANNUA
DOESN'T NEED
LIGHT TO GERMINATE

Researchers at Auburn University (McElroy, et al., 2004), besides looking at the optimum temperatures for *Poa annua* germination, investigated the impact of photoperiod. When analyzed across temperature treatments, they reported that *Poa annua* could germinate in complete darkness at a level relatively close to germinations observed under light.

Although most weeds that produce small seed need light to germinate, *Poa annua* apparently does not. While disturbance is still important for *Poa annua* to occur, the ability for it to germinate under a dense turf canopy provides it a competitive advantage.

To continue along the pioneering abilities of *Poa annua*, one of the all-time classic turf lines was coined by Dr. Joseph Vargas who said, "When creeping bentgrass dies, *Poa annua* fills in. And when *Poa annua* dies, what fills in? *Poa annua*." Given that quote, I wonder why another weed or a native turfgrass species does not establish itself.

In a series of field studies, ecologist Joy Bergelson (1990) suggested that the presence of litter produced by *Poa annua* during colonization reduced both the germination and survival of native grasses. When it dies, *Poa annua* "remains" might provide its offspring the opportunity and advantage to germinate and establish with minimal interference from other species.

If we ever get to the point where we think we know everything there is to know about turfgrass management, ecologist will always remind us, "Not quite yet."

Karl Danneberger, Ph.D., *Golfdom's* science editor and a turfgrass professor from The Ohio State University, can be reached at danneberger.1@osu.edu.



Right On Line

Sometimes green speed and consistency
are easier to *feel* than measure

BY DAVID FRABOTTA, SENIOR EDITOR

THEY MIGHT NOT NEED TO BE FAST, BUT THEY HAD BETTER BE CONSISTENT.

WHETHER YOU MANAGE A PAR-3, DAILY-FEE TRACK OR A POSSIBLE U.S. OPEN

VENUE, GOLFERS EXPECT GREENS TO BE IN HARMONY WITH EACH OTHER.

Of course, you'll hear gripes about speed, but they pale in comparison to the complaints you'll get if greens play differently around the golf course on any given day.

Cultural practices help create uniform conditions by replicating maintenance and fertility processes. That's the science part of it. But managing microclimates, weather and the lay of the land often render some greens on a golf course different from the others, requiring a bit of art to keep them in line.

Some superintendents Stimp. Others rely on their own sleight of hand.

"I don't play a lot of golf, but I putt my greens every day," says Chad Mark, superintendent of the Kirtland Country Club near Cleveland. "For me, it's a better gauge of consistency because I don't have a lot of areas to get accurate Stimpmeter readings. It's to the point where I know where they are, and I can go from green to green and putt and know that I was getting a consistent speed."

Many of Kirtland's 1921 push-up greens, compliments of C.S. Alison, are "severely sloping" back to front, which makes Stimping a difficult proposition, especially when Mark keeps them running pretty slick to meet member expectations. On the few spots flat enough to get an accurate reading, they run about 11 feet, and he pushes 13 for tournaments.

Mark does more than just putt around his greens to see how they feel. The practice is a crucial routine that helps him make agronomic decisions depending on how they roll.

He's not alone. Many superintendents can be found putting around on their greens to make sure they are consistent from day to day and from green to green.

Russ Myers, certified superintendent of Southern Hills Country Club in Tulsa, Okla., putts every green every day. His 11 handicap is nothing to sneeze at, but you don't need to be able to break 80 to acquire useful data from putting your greens. He says his daily routine

allows him to gauge more than speed; it tells him how the ball rolls on the undulating Perry Maxwell greens.

"The same height of cut every day doesn't play the same every day," Myers says. "I can get a feel for how smooth they're rolling when I putt. But most importantly, my putter is in my hands to tell me how little mechanical stress I can get away with."

GOLFDOM'S ANNUAL GUIDE ON GREEN MAINTENANCE

The putting routine was imperative for Myers last summer, when the 35-year-old hosted his first Major tournament, the PGA Championship. Unfortunately for Myers, he had to walk a very fine line between mechanical stress and disease because of an unusually wet summer.

Southern Hills was so wet that the rough was too soft and fragile for even the lightest of commercial mowers, forcing Myers to buy 20 rotary push mowers from Home Depot so his crew (and a bunch of guys from the caddy shack) could get through the long stuff.

He reduced mowing on the greens to a few times a week — which wasn't too unpopular because few members braved the elements to play golf. Putting his greens every day allowed him to keep the mowers in the shop more often.

"They might seem fast, regardless of what the speed actually is, so that might be one less mow that I put on them," Myers says. "It's not about a number here. It's about feel, especially on greens that have a lot of undulations like ours do."

Other days, Myers says putting his greens tells him absolutely nothing. "It's not my Zen," he says. It's just one method to gauge how maintenance regimens are affecting ball roll and green-speed consistency. Stimping

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6:40 AM...

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Right On Line

Kirtland Country Club's native greens (C.S. Alison, 1921) require a rigorous solid-tine aerification program on the *Poa annua*/bentgrass surface, says superintendent Chad Mark.



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and dropping balls from a waist-high position might be others.

At Butler National Golf Club in Oak Brook, Ill., superintendent Michael Sauls puts about half of his greens every day to get information about ball roll and green speed, and his assistant superintendent Stimps every day as well. Putting helps him judge ball roll, and Stimping allows him to keep greens around 11 feet to meet member expectations.

"Monitoring is the key," Sauls says. "My assistant does the Stimpmeter reading for me, and I'm on the golf course with a putter in my hand every day. It's really just a matter of taking that information between myself being out there and the actual data from my assistant in order to make a decision about what you are going to do the next day."

The data Sauls compiles tells him whether to double-cut greens or roll on a given day, both of which he does about twice a week when he needs a little more speed to keep members happy.

Cultural practice makes perfect

Of course, measuring green speed and consistency, regardless of the method, is just a way to measure the efficacy of cultural practices that propagate healthy turfgrass and a smooth putting surface.

One of the most important programs is fertility and growth regulation. While fertility products vary from slow-release

granules to foliar-feeding liquids, the result is the same: steady, controlled growth.

"If you keep the rates light and adjust frequency based on growth, then you're going to have the most consistency day to day and throughout the season," Myers says. "In theory, if you could spray every day and adjust the rates based on the growth you got every day, then it would be just like adjusting the thermostat in your house."

While everyday feeding might be extreme from a labor perspective, managing growth flushes is imperative to consistency, which is one of the reasons plant growth regulators (PGR) have been adopted so widely at many clubs.

Mark uses PGRs on Kirtland's *Poa annua*/bentgrass greens every week from April through October.

"When plants come out of regulation, we have surges and goofy metabolic processes that can cause you to lose control of nutrition," Mark says. "I think it helps with consistency, and it helps heal faster after aerification."

Subsurface airflow is another crucial component to keeping healthy turfgrass, Mark says. In addition to two five-eighths-inch core aerifications every spring and fall, the crew uses a needle tine or star tine every month to get some gas exchange in the rootzone, keeping the classic course's greens healthy through August.

"An aerification program has to be

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Counter Culture: Raise the Height of Cut by Rolling

The United States Golf Association has spent \$27 million on grants for turfgrass research since 1983. As a major partner with academic researchers, the association is a pre-eminent force in helping to identify emerging maintenance trends and how they influence plant health.

In addition to academic data, the association's Green Section agronomists and its Turf Advisory Services are the most widely consulted third-party advisers to superintendents in the country. That means they see more golf courses collectively and can identify more trends than any bunch of turfgrass guys around.

Naturally, they spend most of their time talking about maintaining golf greens for playability and plant health. Surprisingly, the primary advice USGA gives superintendents is to raise their height of cut.

"Most of us as a staff today are trying to get clubs, even modestly budgeted clubs, to take advantage of the speed roller because

we're finding that guys are able to raise their cutting heights slightly, which makes for better turf health on a year-round basis, and yet not sacrifice speed to meet players' demands," says Bud White, director of the USGA Green Section Mid-continent Region.

Superintendents have been pushing the green-speed envelope for so long that many have insufficient fertility, rendering too much stress on their bentgrass, White says. Low fertility and extremely low mowing heights translates into more disease, inconsistent growth and unhealthy turfgrass that teeters on the brink of failure. Raising the height of cut and increasing rolling can create the same conditions without the added stress.

"Research shows that you can roll a reasonably built green three times a week without damage to the turf or soil compaction, so when it's done at the right times, there has been good success," White says. "Another thing that superintendents are doing a lot is going to a solid front roller

on the greens more in the summertime on bentgrass instead of the groomed roller because there is a lot less stress with that smooth, solid front roller."

At Crystal Downs Country Club in Frankford, Mich., certified superintendent Michael Morris has developed a system that not only raises height of cut, but he actually maintains expected green speeds by rolling his greens in lieu of mowing some days, which creates less mechanical stress, saves equipment wear and frees up valuable labor.

"It's a paradigm shift from the way you've normally done things," he told attendees at a Golf Industry Show session. "Rolling every day and skipping mowing (every other day) gave us the same result."

Incidentally, Morris Stimps his greens every day to ensure his cultural regimen is in line with member expectations. Every person in the maintenance department uses the number to determine his or her duties. ■

— David Frabotta

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built to develop a root system that's going to take the beating that we give these grasses today by pushing green speeds in the 11 to 12 range all the time," he says.

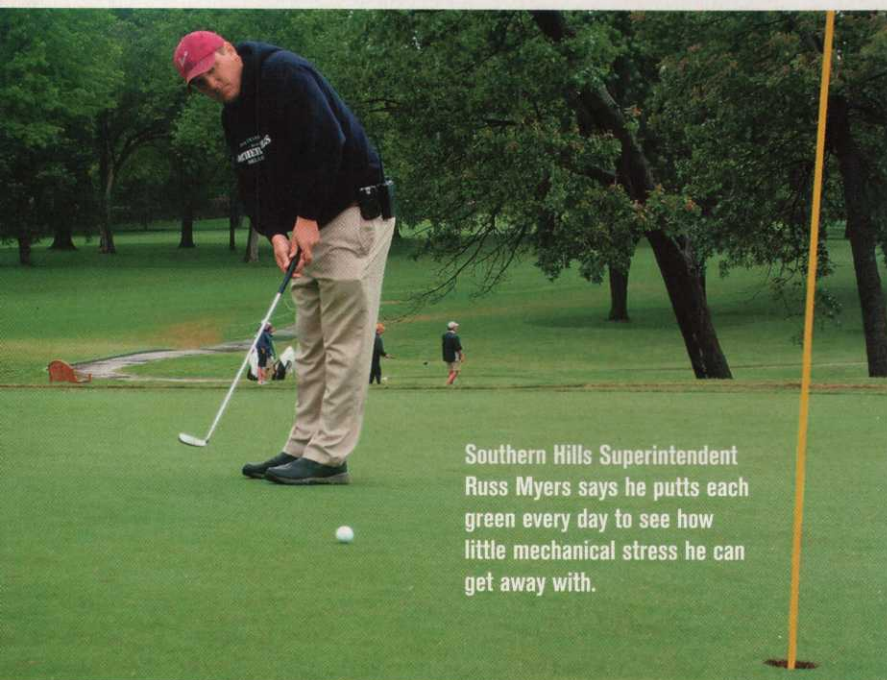
Of course, probably the No. 1 path to

consistency is mowing practices and uniformity. It's important that operators are trained to know how to spot mower mishaps or putting surface irregularities, and it's often the job of assistant superintendents to check each green to make sure mowers are operating properly.

Sauls says the operators on his greens routes have about 10 years experience. "A first or second-year guy is not going to get a greens route," Sauls says.

Mark concurs, and at times takes it one step further by taking it upon himself to cut the cleanup route if his premier operators have the day off. He also runs an 18-inch reel on a 22-inch mower to disperse mower weight and cut down on the likelihood of scalping or wearing out edges.

"We have our best mowers cutting the cleanups every day so that we keep a good edge," Mark says. "When that guy goes on vacation, then I'll do it myself, or my assistants can still check greens mowers and tag along with the trailer and cut cleanup as they're checking mowers. We take that job pretty seriously because it's an area that really gets beat to hell, and people notice it." ■



Southern Hills Superintendent Russ Myers says he puts each green every day to see how little mechanical stress he can get away with.