

can be so devastating to golf course turf if not treated with respect. Also, I was curious as to why there can be frost on the grass when the temperature has risen above freezing.

Interestingly enough, "surface temperature" or "ambient temperature" is an official measurement that is taken between 4.1 and 6.6 feet off the ground. Since cold air is more dense, it will settle below what is the measured surface temperature and keep the air at true ground level below freezing after the thermometer rises above it. This would also explain why frost is more prevalent in the valleys and hollows of the golf course.

And, contrary to popular belief, frost is not frozen dew. According to "The Weather Doctor," (www.islandnet.com/~see/weather/whys/frost.htm), "frost is a covering of ice crystals on the surface produced by the depositing of water vapor to a surface cooler than 0 degrees Celsius (32 degrees Fahrenheit)." Since the water vapor changes directly from a gas to ice, dew technically isn't a factor in the equation.

The USGA's Bevard also had this to add to the scientific equation: "The level of plant hardening is a major component. I believe a hardened, frosted plant will sustain less damage than one that has not completely hardened because there is more water inside the cells in the actively growing plant."

Superintendent knows best

Every superintendent knows his course's microclimate best and what it can handle as far as the frost goes. Sometimes it's a matter of science and nature, but other times common sense kicks in.

Paul Masimore, certified superintendent of Marlton Golf Club in Upper Marlboro, Md., offers a logical and common-sense approach.

"Have you ever tried to putt or even wanted to putt on a frosted green? It is not a good, quality playing surface," he says. "My feelings are, if I can't send my staff out to mow, roll or blow off the surface, then it is not

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The Facts on Frost

"The only visual damage I've seen are footprints," one superintendent says.

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playable. I like to see two-thirds of my first green frost-free before I send my staff out for maintenance. After we have cleared the third green, I let play out. If I am only blowing the surface clean and no other maintenance, I let play out as soon as I clear the first green.

"The only visible damage I've seen are footprints. I've never gotten down with a scope to look at the turf with footprint damage to see how extensive the damage might be. And just imagine what you would hear from some golfers about having to putt through a very obvious footprint.

THE DAMAGE
POTENTIAL TO
THE TURFGRASS
CLEARLY
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THE NEED TO
"LET THEM GO."

"I was taught not to let anyone on frosted turf, and I have not varied from that policy during my career," Masimore adds. "If one considers how frost is formed, then it's obvious that damage can be serious. Letting play out for usually a small number of golfers just does not justify the risk for potential damage. If the course was booked solid for play

during that time of year, then maybe I would look at other options for getting play out faster."

So you can see, the damage potential to the turfgrass clearly outweighs the need to "let them go" because they're pressuring you. The fact that caring for a golf course is a year-round task gets lost on the golfer who has called in sick for the opportunity to tee it up.

A golfer will never know that because he damaged the turf that day by walking on a frost-covered green, the turf will have a harder time coming out of dormancy two months down the road and it will be the first grass to succumb to disease when the conditions are right for it. ■

Jim Black is a turf professional and contributing editor for Golfdom.

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IT'S A European

Golf course managers across the big pond eradicate *Poa annua* by starving it of fertilizer and water. Could this turf management technique work in America?

By Larry Aylward EDITOR IN CHIEF

The greens are hungry at Essener Golf Club in Essen, Germany. In fact, they're starving.

But Seve Schmitz, the golf course manager at Essener, has the bentgrass/*Poa annua* greens on a rigid diet for a reason. He's trying to rid them of the dreaded *Poa annua*. Schmitz despises annual bluegrass like many American superintendents do.

Maybe more.

When Schmitz does feed the greens, he uses a type of fertilizer the *Poa* doesn't like.

Yes, it's kind of like feeding brussel sprouts to a 5-year-old. The kid will stare at them and dally at them with his fork, but he won't eat them.

Schmitz is also keeping his course's greens parched, as part of his *Poa*-riddance program. The *Poa*, which doesn't have long roots to draw deep into the soil profile for water, doesn't like this procedure either.

So Schmitz is here to tell American golf course superintendents that he *can* make *Poa* go poof on his course's greens by cutting back sharply on fertilization and irrigation. "It's a common practice in the United Kingdom," Schmitz says.

Schmitz, who implemented the program at his course about two years ago, is sold on its success. Generally, he says a superintendent can reduce the *Poa* on his course's greens by 80 percent to 90 percent in up to five years.

Now, for the \$65 million question: Could Schmitz's program work on U.S. golf course greens to eradicate *Poa*?

Schmitz says it would, but he notes that the United States Golf Association (USGA) Green Section doesn't advise American superintendents to take such an approach to kill *Poa*.

"They're worried the bentgrass will suffer," Schmitz says of USGA agronomists.

But he quickly adds, "I can assure you the first grass to suffer will be the *Poa*."

Stanley Zontek, director of the USGA Green Section's Mid-Atlantic Region, is familiar with Schmitz's agronomic process to control *Poa*.

"We categorize it as the acid theory," Zontek says, noting the old practice that aims to create acidic conditions that favor certain turf varieties. "It goes back almost 100 years."

Zontek classifies Schmitz's program to rid *Poa* as a variation on the acid theory. While Zontek doubts the program would be a good fit for *Poa* control in the United States, he doesn't dismiss it completely.

"We won't say it won't work," Zontek says. "It just produces a quality of putting green

GREEN MAINTENANCE GUIDE

Thing

that we're not sure the American golfer is ready to accept."

Jim Snow, national director of the USGA Green Section, says Schmitz's program wouldn't work at most American courses for a variety of reasons. Many U.S. golf courses are subject to much more heat and humidity, closer mowing heights and heavier golfer traffic than European courses, Snow says. Under such conditions, he says disease problems would be exacerbated if the turf was starved of nutrients and water. Hence, significant turf loss could occur.

Snow says the method might work "here and there" along the cool New England coast on turf that doesn't receive much play, or at courses where golfers don't mind the appearance of their greens. "But most courses in the United States don't have that luxury," he adds.

Golfers have accepted the method at Schmitz's course, however. Schmitz, who has been in the business for 35 years, has spent the last 17 years of his career at Essener, a 55-year-old private club. The parkland-style course, with many trees and a clay-based soil, is one of the oldest in Germany.

The course's greens are comprised of Heriot and Bardot varieties of colonial bentgrass. And of course, there's the unwanted *Poa*. Schmitz and the members at Essener dislike *Poa* because it disrupts green speed. Ahh, green speed — it's an issue in Germany like it is in America.

Not surprisingly, Schmitz says

Essener's members travel to the United States, mostly Florida and California, to play golf on courses which have fast greens. Then they return to Essener and ask Schmitz to speed up the greens there.

Schmitz says he's been able to convince members that green speed can be increased — not by mowing the greens shorter but by making the greens more consistent from a playability standpoint by converting them to almost one turf variety exclusively.

"Our standard height of cut is 4 millimeters (0.16 inches)," Schmitz says. "We're not

going down to the 2.5-millimeter height of cut (like courses in the United States)."

Problem is, the *Poa* on the greens, when mowed at 4 millimeters, prevents consistency of the greens. "But if we have a high population of bentgrass in the greens, then we have a very consistent roll," Schmitz stresses.

When they're fertilized, Essener's greens are fed nitrogen almost exclusively. Phosphates and potassium are used on occasion. Schmitz also uses highly acidic ammonium and iron sulfates, which the *Poa* doesn't prefer. The bentgrass does, however.

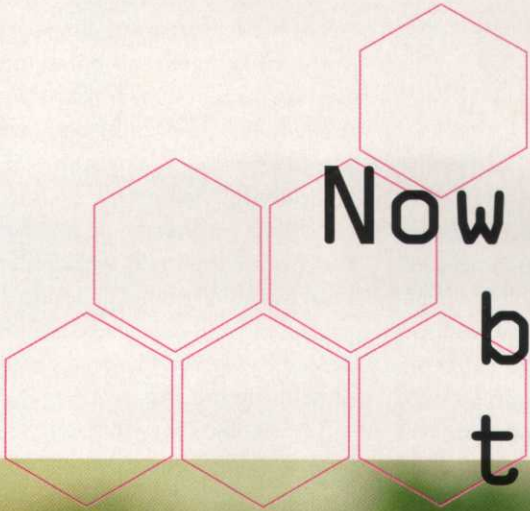
Schmitz fertilizes the greens when the *Poa* appears especially weak and thin. Then the hungry but still healthy bentgrass reacts swiftly to the feed, but the exhausted *Poa* doesn't. Hence, the bentgrass outperforms the *Poa*.

The *Poa* also can't withstand the infrequent waterings, Schmitz points out. "The

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Seve Schmitz, a golf course manager in Germany, stands by his method to control *Poa annua* on greens.





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It's a European Thing

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shallow rooting grass will die three times faster than a grass that can reach down with its roots and pull more moisture," he says.

Schmitz and his crew overseed the greens monthly with Browntop bentgrass. They verticut the greens in two directions prior to overseeding. They topdress the greens after overseeding, and brush it in.

Schmitz notes the greens can't be groomed heavily for at least two weeks after overseeding.

Yes, the greens don't look healthy at times. The bentgrass is able to retain its blue-green color, but the yellow *Poa* looks like it's ailing. "Your membership must be aware that the greens will look a bit sick at times," Schmitz says.

Schmitz has been preaching "consistent playability of greens" to members as the way of making them roll quicker. "If we have decent fine grass and not a bunch of spongy *Poa annua* biotypes, then the greens will putt better," he says.

Some U.S. superintendents have tried facets of Schmitz's *Poa* control program, says Zontek, who adds he recently spoke to a Virginia superintendent who placed his course's greens on a modified acid theory. The course had new greens, and the superintendent planned to fertilize them with ammonium sulfate to drop the pH level and suppress disease.

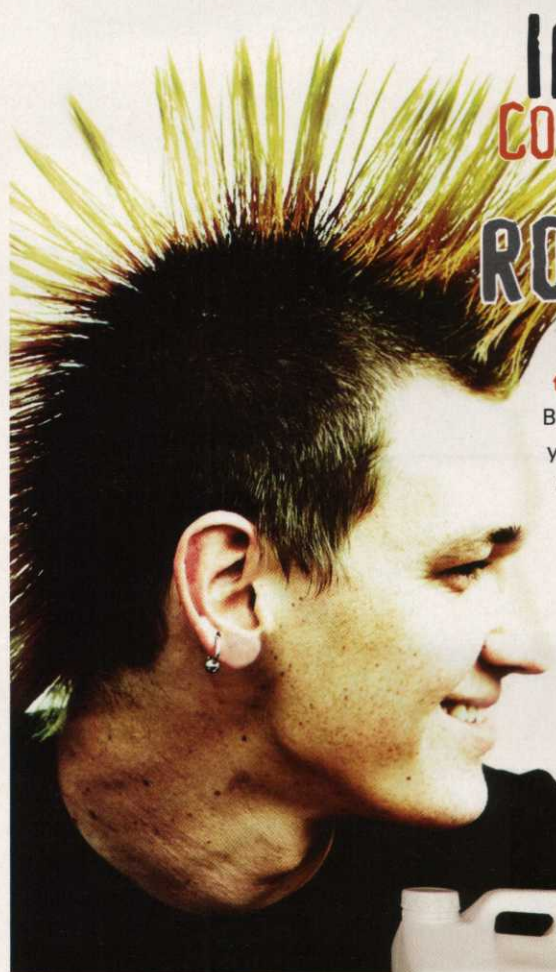
ON THE VERGE OF

It's been a long time coming, but its arrival date may be on the horizon. If all goes well on the regulatory end, Roundup Ready creeping bentgrass, a joint project between The Scotts Co. and Monsanto Co. that has been in development for several years, might be available for sale next year, Mark Schwartz, senior vice president of seed operations for Scotts, recently told *Golfdom*.

Roundup Ready creeping bentgrass is a genetically modified turf. Scotts and Monsanto inserted a gene to modify the plant's DNA to make it resistant to Monsanto's nonselective herbicide Roundup to make it easier for superintendents to control turf weeds, especially *Poa annua*.

In January, Schwartz said he hoped the government would deregulate the product in the next six to nine months. He said the U.S. Department of Agriculture indicated it would publish an Environmental Impact Statement (EIS) on the product between now and mid-June. "Effectively, the EIS will point out any environmental risks or lack thereof, and should have a recommended course of action," Schwartz said, noting the Environmental Protection Agency must also sign off on the product before it can be sold.

Roundup Ready creeping bentgrass has sparked controversy the past few years. Bill Rose, chairman of Turf-Seed,



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"But it's a resort golf course and costs more than \$100 to play," Zontek says. "So [the golfers] like the greens mowed at one-eighth of an inch."

The sticking point is the height of cut. Zontek says U.S. golfers demand fast greens made by a short cut, not just consistent ball roll. He adds that Schmitz's *Poa*-control method allows greens with consistent playability, but they are dense.

Zontek says many European golf course managers and greenkeepers adhere to the process because they believe it's part of traditional greenkeeping — not the modern-greenkeeping methods

that permeate through golf course maintenance in America.

"You mow high, you don't water and you don't fertilize — it's a links-management type philosophy," Zontek says. "It's like Fords and Chevys — people are passionate about one or the other. You've got the traditional greenkeepers, and you've got the modern greenkeepers."

Another reason the program might not work in America has to do with the bentgrass. Although both colonial and creeping bentgrasses can withstand less fertility than *Poa annua*, colonial bent remains more vital against less fertility than creeping bent. And as Bob Brame, director of the USGA Green Section's North-Cen-

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Deregulation?

has voiced his concerns about the glyphosate-resistant turf cross-breeding with non-glyphosate-resistant turf.

In 2004, *The New York Times* reported that a "new study shows that genes from genetically engineered grass can spread much farther than previously known, a finding that raised questions about the straying of other plants altered through biotechnology."

In 2002, Scotts and Monsanto temporarily withdrew their application for the approval of Roundup Ready bentgrass for commercial use in order to answer more questions the American Plant Health Inspection Service (APHIS) had about the turf variety. At the time Scotts said such a delay was common in the regulatory process.

Schwartz said "it's understandable" that it has taken so long to bring Roundup Ready creeping bentgrass to market. Because it's the first perennial turfgrass up for deregulation, it has received more scrutiny, he said.

"This is an important precedent, not just for Scotts, but for any company that may think about having a genetically enhanced turfgrass crop or other perennial such as shrubs or trees," Schwartz added.

— Larry Aylward



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It's a European Thing

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tral Region, points out, colonial bentgrass is the preferred variety on European golf course greens, whereas creeping bentgrass is the preferred variety on American greens.

However, colonial bentgrass can't stand as much player traffic as creeping bentgrass. And Brame stresses the colonial bentgrass, when starved along with the *Poa*, is especially vulnerable to turf damage caused by heavy traffic.

"This variety of bentgrass does not tolerate the heat and humidity of warmer climates nor close mowing," Zontek adds, noting that colonial bentgrass is adapted north of the Mason-Dixon line in the East and in some regions of the north-west United States. "Diseases like brown patch ravage colonial bentgrass."

Brame supports Schmitz's strategy to weaken *Poa* by keeping the greens on the thirsty side. Brame says the strategy is especially effective when used in com-

bination with plant growth regulators.

But Brame stresses that hand watering becomes an absolute if superintendents elect to do this. He brings this up because there are many courses where members restrict superintendents and their crews from hand watering during the day.

"They just don't understand the value of it, and they don't want to see the staff pulling hoses out to do it during the day,"

Brame says. Hence, a superintendent is forced to increase irrigation at night, which defeats the purpose of keeping the greens dry in the first place.

Schmitz admits the program "seems like a crazy way of greenkeeping," but he says it works. "We've had tremendous success with it. We already have greens with 85 percent bentgrass."

Schmitz admits the *Poa* will never be completely eradicated because it has a seed bank in the greens. "But we can live with 80 percent to 90 percent bentgrass," he adds.

While it's a successful way to control *Poa*, Schmitz says there are European greenkeepers who have lost their jobs because they haven't been able to execute the process properly. Timing and patience have everything to do with the program's success.

Zontek calls the program "management on the edge."

Someday, however, American superintendents may be forced to adopt a similar program to maintain greens if they are required by law to cut back on fertilizer, water and chemicals.

"Maybe in 30 years it will be a different story," Zontek says.

But for now, Snow says none of the USGA's 17 agronomists would recommend such an extreme strategy to control *Poa annua*, except in the most benign situations.

"Avoid overwatering and overfertilizing, yes, but grow healthy turf if you want to provide high-quality turf for your golfers and keep your job," Snow adds. ■



At Essener Golf Club in Germany, Seve Schmitz strives toward achieving consistent-rolling greens, not fast greens.

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