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Players at this year's PGA Championship should appreciate the new Champion ultradwarf bermudagrass greens. The greens will play fast and firm as opposed to stiff and wet, Rees Jones says.

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"It's your communication skills, purchasing, writing... those are the classes that can make you a success," he says. "Yet we all gravitate to turf classes. It's more important than ever to be well-rounded in this business."

Play the game

There are superintendents who play golf, and those who don't.

Put Mangum in the former category. He plays, and he plays well. He shot a 76 when he played Augusta National. He currently holds a 7-handicap, the highest it's been in a few

years, which is understandable with the 2011 PGA Championship looming. He jokes that he wants his handicap to get high enough that he can play with Tommy Witt and be competitive in the senior division at the GCSAA tournament.

He believes that being able to play the game is not only important to keeping his job, but that it also helped him get his job in the first place.

"One round of golf can change your life," Mangum says with a dead-serious look on his face. "This has happened to me a couple of times."

Mangum recalls a job interview over two decades ago he had with a fertilizer company that was looking to get into the golf market. His interview took place over a round of golf at... Atlanta Athletic Club.

"I had a great day, shot a 76, didn't throw any clubs, made a good impression," Mangum says. "I was offered the job over dinner, but I turned it down because I wanted to stay in the superintendent business."

"Two years later, the same guy was in charge of the search committee to hire the new superintendent at Atlanta Athletic Club," Mangum says. "I actually got this job two years before I interviewed for it, when I showed I knew my way around a golf course."

Mangum remembers playing a Nassau on his first day as the superintendent at AAC. He shot a 33 for nine holes, and took \$35 off a member.

"Word spread quickly that I could play, and that gave me credibility," Mangum says. "The members knew I could view the course from a player's perspective."

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Golfdom at the PGA Championship

Be sure to stop by the Golfdom Daily during the PGA Championship, beginning Monday, August 8th. *Golfdom* editor in chief Seth Jones will be at the course posting regular updates on all things interesting to *Golfdom* readers at www.golfdom.blogspot.com.



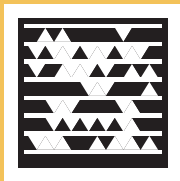
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Champion Bermuda, Relocated Bunkers Await PGA

Though the PGA Championship was played there 10 years ago, players will see a much different course than what they saw when David Toms won in 2001.

In that time, the course has undergone a greens renovation, changing out its Crenshaw bentgrass greens for Champion ultradwarf bermudagrass greens. It's also moved bunkers — in 2001, fairway bunkers were located between 240 and 270 yards off the tee. In 2011, they'll be 280 to 340 yards off the tee. The bunkers have also been made deeper, with steeper faces, and the fairways are even tighter than they were in 2001, thanks to a renovation by golf course architect Rees Jones.

"The best decision the club ever made was going from bentgrass — which does not provide great summer greens in the Southeast, in my opinion — to a grass that I can give my members top playing conditions on a daily basis," says Kasey Kauff, head superintendent of the Highlands course at AAC. "The bent was always on life support. We all know how hot it gets in Atlanta in the summer. With Champion, I consistently can provide greens rolling over 12 with the firmness members desire."

Architect Rees Jones, whose father, Robert Trent Jones Sr., designed nine holes of the Highlands Course in 1967 (the other nine holes designed by Joe Finger), says that the course will still play somewhat similarly to how it played in 2001 because of the way technology has added length to the professional's game.

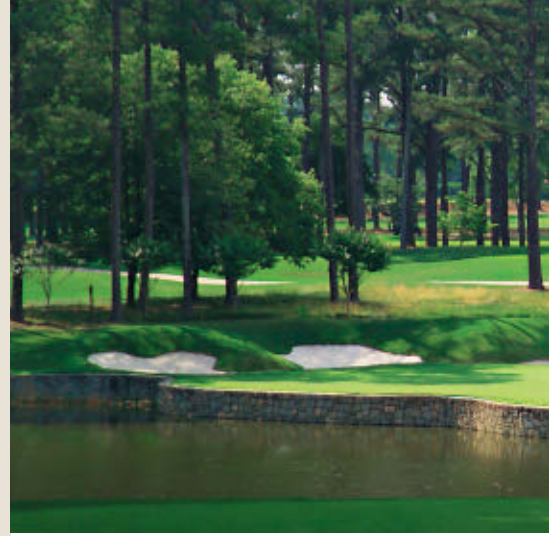
"We've added length, dropped some tees, on No. 6 we added a pond, we've set up a par 5 to be a drivable par 4, which is the latest thing in championship golf," Jones says. "One thing we didn't change was the contour of the greens. We changed the turf, so now the contours will be noticeable because the greens won't be stiff and wet, they'll be fast and firm, so the ball will break more."

Mangum says that the addition of Champion bermudagrass has eased his mind in the weeks leading up to the tournament.

"You look at having an event in August in the South... that's the last month you'd pick to have a major event on bentgrass greens," he says. "In 2001 we were in a situation (with bentgrass greens) where as the rounds went up, the conditions went down. Now, with Champion, as rounds go up, conditions go up."

Mangum uses an interesting statistic to drive home his point: In 2001, the course experienced 8 hours of temperatures above 90 degrees from June 15th to August 15th. In 2010, during the same time period? A whopping 760 hours above 90.

And of course the players will see a longer Atlanta Athletic Club than they did in 2001. For the 2011 PGA Championship, the Highlands Course will play to 7,467 yards and a par of 70. In 2001 the course played at 7,194 yards and a par of 70. — S.J.



Continued from page 22

Family first

Mangum's three kids are adults now, but he recalls a scene from when two were in second grade like it was yesterday.

The event was called "Donuts for Dads." All the fathers were invited to come in and have donuts with the kids in the class. It was doubly important for Mangum to be there, as he had his two youngest, Trey (now 31) and Hayley (now 29), both in that same class.

Mangum sat there in a chair too small for him, with Trey on one side, Hayley on the other, munching away on glazed donuts. Another little boy sat at their table, nervously watching the door.

After about 30 minutes passed, some dads were getting up to leave.

"I'll never forget this," Mangum says some 20 years later. "This little boy looked at me and said, 'Well... I guess he's not coming.'"

The memory can make Mangum glassy-eyed to this day.

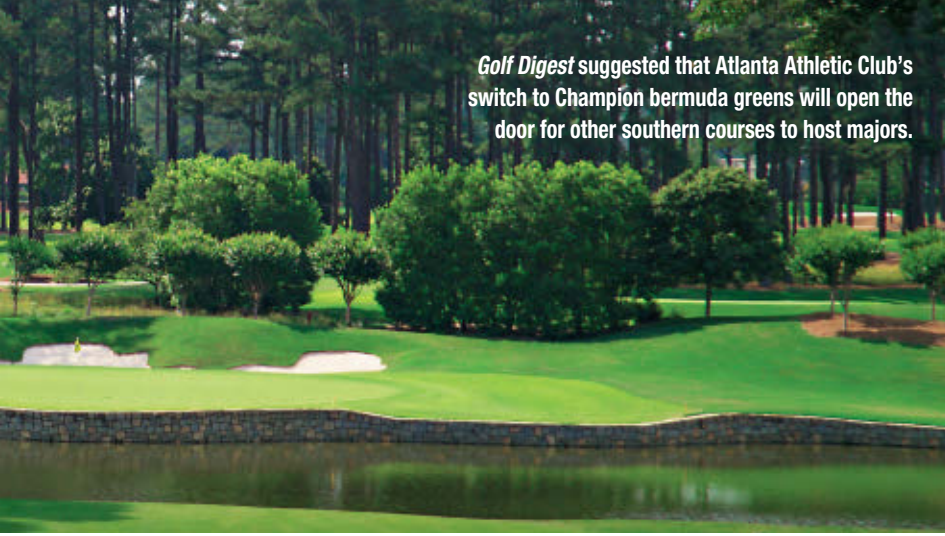
"It broke my heart, but at the same time I'm glad I saw it, because it made me be there for as many of the kids' events as possible after that," he says.

Mangum says his employer — he had just started at Atlanta Athletic Club at the time — understood the importance of being there for family.

"It was the same guy who hired me, a guy by the name of Gaylord Coan," Mangum says. "He told me, 'This is a big job, and a busy job. But you'll get in more trouble with me if you neglect your family than if you neglect your job.'"



Golf Digest suggested that Atlanta Athletic Club's switch to Champion bermuda greens will open the door for other southern courses to host majors.



Mangum smiles when he thinks about all the fun things the family did together when the kids were young. His oldest, Miranda, is now 33, with two children of her own.

"We didn't get the kids many toys for Christmas when they were little," Mangum says. "Instead we took them on trips, some amazing places, like the Grand Canyon, Niagara Falls and South Africa. We've got great memories from those days, and I wouldn't trade them for anything."

Get away from the golf course

All the hours spent on a golf course, all the hours spent worrying about weather, disease pressure, equipment failures... it weighs on every superintendent.

That's why Mangum suggests to his colleagues that they find an outlet away from the golf course.

For him, he's found hobbies in both fly fishing and gardening.

"For a lot of guys it's fishing, but if it's biking or climbing or whatever, you

need that outlet away from the course, something you can do that can clear your mind," he says.

Although Mangum admits, his fly fishing trips are also taken with a group of friends who are superintendents and turf cognoscenti.

"You're still around golf, yet you're away from it. Trust me, there's something about being waist-deep in 50-degree water that just relaxes you."

So, there you have it. From being involved in your association to fly fishing, Ken Mangum hopes his advice can help some of this new generation of superintendents.

After all, he was the young guy a few years ago. ■

Seth Jones (sjones@questex.com) is editor in chief of Golfdom.



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→ Seaplant Extract and Humates for Summer Stress

Erik Ervin is a professor of turfgrass science at Virginia Tech. Ervin and his colleagues have been studying compounds that can be used to reduce the harmful effects of summer stress on creeping bentgrass greens. Below are some of the highlights of their research.

Q What compounds have you been focusing on in your research? We have spent most of our time investigating the effects of seaplant extract and humates, alone and in combination, during drought and heat stress. In our experiments we include controls that contain the same amount of fertilizer as the seaplant extract and humates. We also include synthetic cytokinin and synthetic auxin as controls to help us determine the means by which seaplant extract and humates improve creeping bentgrass performance.

Q What is in seaplant extract that is beneficial to creeping bentgrass experiencing summer stress? Cytokinin. Cytokinin is produced in root tips and stimulates the production of antioxidants. Antioxidants protect plants from reactive oxygen species (ROS). ROS cause the breakdown of cell membranes and the disruption of certain physiological processes. When soil temperatures reach 80° F or higher, root tip production declines, along with the plant protective benefits that cytokinins offer.

We are also beginning to learn about other beneficial compounds in seaplant extract such as auxin, proline and betaine. Proline and betaine help turfgrass plants avoid dehydration.

“Seaplant extract and humates are both effective in improving creeping bentgrass health when applied alone.”

Q What is in humates that is beneficial to creeping bentgrass experiencing summer stress? The primary compound we have studied is auxin. Auxin is a hormone that promotes root growth among other benefits. Auxin is produced in leaf tips and as temperatures increase, leaf development slows and so does auxin production. Our research comparing auxin from humates and synthetic auxin has shown similar turfgrass responses. Humates are also an excellent chelating agent. Research with other plants has shown improved micronutrient availability following an application of humates.

Q How are seaplant extract and humates best used in a management program to minimize the impact of

summer stress on creeping bentgrass greens? Seaplant extract and humates are both effective in improving creeping bentgrass health when applied alone compared to a fertilizer-only control. However, when applied together, there is an additive effect from the combination of seaplant extract and humates.

We recommend that a superintendent make one or two applications of seaplant extract plus humates two weeks apart prior to soil temperatures reaching 80° F. These applications during good growing conditions help prepare the plant for summer stress. Applications of seaplant extract plus humates should be made every two weeks throughout the period of high temperatures and/or drought.

Seaplant extracts and humates are not silver bullets. They will help improve creeping bentgrass performance during summer stress only in conjunction with sound cultural practices designed to promote plant health.

Q What has been the feedback from superintendents using seaplant extract and humates to help manage summer stress of creeping bentgrass? At first, superintendents are a little uncertain of the idea, but after explaining the science behind the response seen in our research, superintendents are open to trying the seaplant extract and humate combination. Those superintendents who try it are mostly positive about the results and feel it helped the creeping bentgrass cope with summer stress. ■

Clark Throssell, Ph.D., loves to talk turf. He can be reached at clarkthrossell@bresnan.net.



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TURFGRASS TRENDS

FERTILIZING FAIRWAYS

Reducing N Inputs with a Soil Test

Soil testing can help in adjusting fertilizer rates.

By Brian Horgan, David Gardner and Kevin Frank

Fertilization practices are highly scrutinized on golf courses across the United States due to environmental concerns. The majority of research indicates that turfgrass nitrogen fertilization poses little risk to the environment. However, recent research has identified nitrate leaching as a greater risk than previously thought on mature turfgrass stands (Frank et al., 2006). Other studies have identified that soils are capable of storing large amounts of N as organic fractions but suggest that this capacity is not infinite (Qian and Follett, 2002).

What these researchers are suggesting is that as turf ages and soils mature, mineralization of organic N will exceed immobilization, thus creating a greater supply than plants need for growth and development.

Nitrogen Cycle Definitions:

Nitrate leaching. Nitrate is an anion (negatively charged) and is free to move with water through the soil profile. When nitrate leaches beyond the rootzone, the nitrogen is considered lost.

Immobilization. The conversion of ammonium (NH_4) to organic nitrogen. Organic N is not taken up by plant roots or tissue.

Mineralization. The conversion of organic nitrogen to NH_4 . Plants take up NH_4 or NO_3 , which are inorganic ions.

For example, in the North Central region of the United States, a golf course may fertilize fairways with 3 pounds N per 1,000 square feet per year. So if we go back to the initial establishment of that fairway, immobilization (NH_4 to organic N) of fertilizer N will dominate the soil N cycle. Turfgrass may only have access to two pounds of that N fertilizer with one pound getting stored in the soil organic matter. This starts the soil N storage process and the clock on the amount of organic N the soil can store.

As time passes and prescribed fertilization programs are followed, the soil will immobilize more and more fertilizer N to a point when it can store no more. That may take 10 or 30 years, depending on soil type and rate of soil organic matter accumulation. Regardless of the number of years, when this point is reached, the soil starts producing NH_4 through mineralization at a rate greater than immobilization.

Don't consider just the color response from fertilizer but also the turfgrass's function and playability.

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FIGURE 1

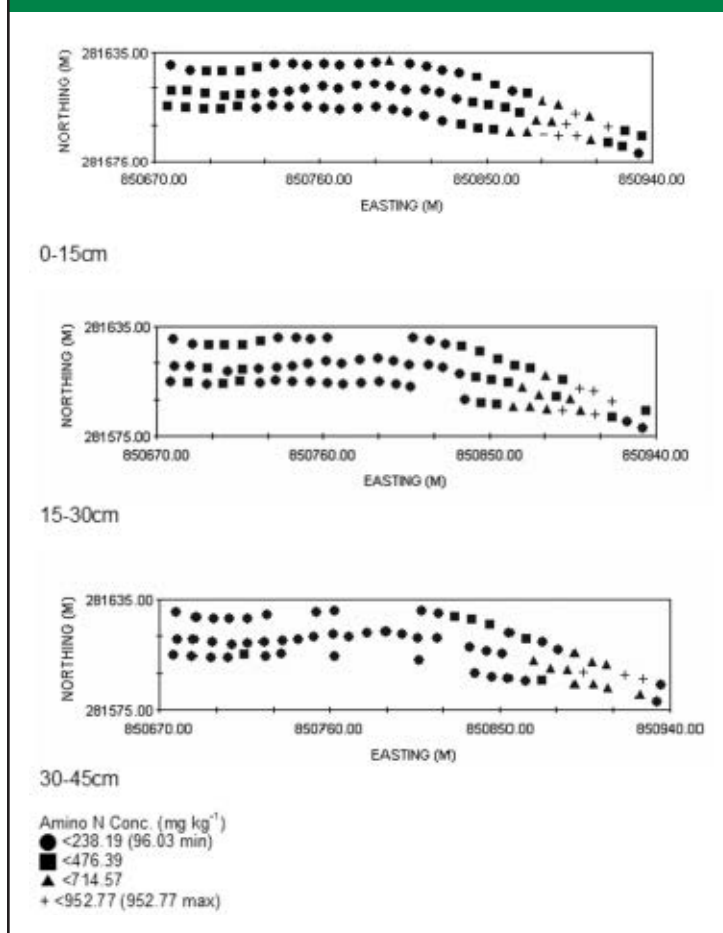


Figure 1. Spatial distribution of soil amino nitrogen (mg kg^{-1}) on Heritage Links fairway #3. Amino N level decreases uniformly over space as depth increases. Different shapes indicate a different amino N content and greater spatial variability.

in the soil is desirable. Furthermore, over-application of N fertilizers may be reduced if estimates of mineralizable N were available. Use of a soil test could also result in more quantitative N fertility recommendations rather than the current practice of applying based on visual appearance.

The Illinois Soil Nitrogen Test (ISNT) has been developed by researchers at the University of Illinois to identify sites in production agriculture that are non-responsive to N fertilizer. The test measures amino sugar N fractions in the soil organic N pool, which supplies the plant with N through mineralization. Amino sugar N is relatively stable compared to NO_3 and NH_4 , thus making it a better predictor of season-long N fertility requirements.

The potential advantages of this test for golf turf managers are that soil N availability could be predicted and the information could be used to adjust fertilizer rates. This would be both environmentally and economically advantageous.

To adopt the ISNT for turfgrass systems, researchers at The Ohio State University, University of Minnesota and Michigan State University have been studying the temporal and spatial variability of the amino sugars in golf course fairways (Gardner et al., 2008); the content of amino sugars in the soil and the resulting turfgrass response; the mineralization rates of soils with varying amino sugar contents; and if amino sugars can be correlated to nitrate leaching potential of a turfgrass system.

Take home messages

We believe this soil test has merit and can provide golf course superintendents with an additional tool to reduce fertilizer N inputs by relying on soil N to some degree. Further study is ongoing.

Amino sugar N content varies over space (Fig. 1), but there is adequate spatial correlation so that standard soil sampling

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If the turf manager continues to fertilize at three pounds N and the soil is now mineralizing at a rate of one pound of N, simple math will tell you that four pounds N are in a form that is available for plant uptake.

But wait! For the past number of years, the plant has been living well on two pounds N. So what happens to the other two pounds N? The N can leach, denitrify or volatilize. In other words, the N is lost from the system and no longer available for plant uptake.

Wouldn't it be great for your budget, the environment and playing conditions if you could predict the amount of mineralizable N that would be available during the growing season?

Given the hypothetical example above, a soil test that could measure organic nitrogen