PROJECT EverGreen
Because Green Matters™

Our mission is to preserve and enhance green spaces in our communities for today and future generations.

BECAUSE GREEN MATTERS.

A national non-profit service organization, Project EverGreen works to help spread the good word to consumers about well-maintained lawns and landscapes, sports fields, parks—anywhere that green exists. The more people believe in the environmental, economic and lifestyle benefits of green spaces, the better off we'll all be.



WORKING TOWARD A SUSTAINABLE FUTURE.

Together with key industry partners, Project EverGreen has established the following programs to help make a greater impact, sooner:

GreenCare for Troops
SnowCare for Troops

- Project EverGreen connects military families with lawn and landscape companies, as well as snow removal companies to receive free services while their loved one is serving overseas.
- More than 3,500 contractor volunteers and 11,000 military families have signed up for GCFT, while 800 contractor volunteers and 700 military families signed up for SCFT.
- These popular programs have garnered attention on TV and in newspapers across the nation including Mike Rowe's *Dirty Jobs* and NBC's *Nightly News*.

GreenCare for Communities

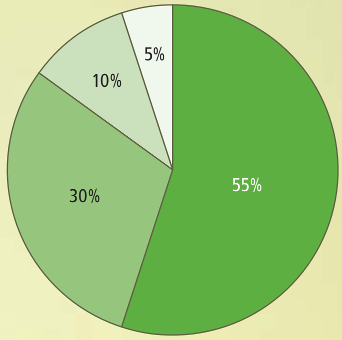
- Creating a focused effort on select communities across the United States, this program brings industry professionals, consumers and anyone who's passionate about healthy green spaces together to improve their city and surrounding areas.
- Over the last four years, our message has made a positive impact in: Akron, Ohio; Milwaukee, Wisconsin; and from the corridor spanning from Greensboro to Raleigh, North Carolina.
- In 2011, Project EverGreen will bring our message to Ft. Myers, Florida.

GreenCare for Youth

- By reaching out to children of all ages, we can create a greener tomorrow.
- The Art of Green Spaces Competition, sponsored by Birds and Blooms, encourages students to use all forms of art to share how they feel about the green spaces in their lives.
- Golf bag tags, featuring messages on the benefits of green spaces, are given to participants of the GCBAA Sticks for Kids program.
- Youth sports field renovations make playing surfaces better and safer.

YOUR SUPPORT HELPS US SPREAD THE GOOD WORD.

- Company contributions (55%)
- Service contractor contributions (30%)
- Associations/Media/Agencies (10%)
- Individual contributions (5%)



HOW YOUR CONTRIBUTIONS ARE UTILIZED.

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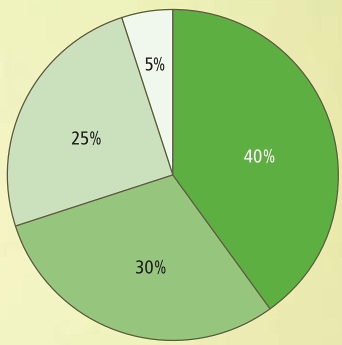
- National marketing/communications (30%)
- Administration (25%)
- Fundraising (5%)



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Golfdom's PRACTICAL RESEARCH DIGEST FOR TURF MANAGERS

TURFGRASS TRENDS

SHADE TOLERANCE

N Rate and Primo Maxx Effects on Shade Tolerance

By Ben Pease

Management of shaded creeping bentgrass (*Agrostis stolonifera*) requires extensive inputs to maintain acceptable quality. Current pressure to reduce inputs associated with golf course turf comes from many angles. Velvet bentgrass (*Agrostis canina*) is a possible alternative to creeping bentgrass (CBG) in shaded putting green situations.

Velvet bentgrass (VBG) was widely used in research through the 1970s and more widely used on golf courses in the first half of the 20th century, but the introduction of CBG seed in the mid-1950s initiated a shift in management practices that favored CBG over VBG, resulting in the near abandonment of VBG. VBG is anecdotally the most shade tolerant bentgrass, but that's never been quantified and management practices have never been evaluated in shaded conditions.

The purposes of our trial were to compare the shade tolerance of CBG and VBG and to begin investigating cultural management of shaded VBG. Our objectives were to determine how N rate and trinexapac-ethyl (TE) application affect the agronomic characteristics of both species subjected to 80% shade. We hypothesized that VBG would maintain higher quality than CBG under 80% shade and that lower N rates would favor VBG over CBG. We also hypothesized that both bentgrass species would react similarly to TE.

Native soil push-up greens were constructed at the O.J. Noer Turfgrass Research and Education Facility near Madison, Wis., in spring 2008. Support structures for the shade cloth were then installed and the field plots were seeded on July 3, 2008. Cultivars used were Vesper VBG and Tyee CBG, both seeded at 1.2 pounds per 1,000 square feet. Prior to seeding, the study area was fertilized with 0.5 pounds P per 1,000 square feet (15-11-7 NPK) to aid establishment. Plots were irrigated for two minutes, five times daily until turf germination appeared complete. Beginning Aug. 1, 2008, irrigation was reduced to once-daily 75% ET replacement.

Grow-in

The study area was fertilized with 0.5 pounds N per 1,000 square feet on seven dates between July 20 and Nov. 7, 2008 to aid establishment (34-0-11 NPK). Beginning July 17, 2008, turf was mowed at 0.5-inch height of cut with clippings returned

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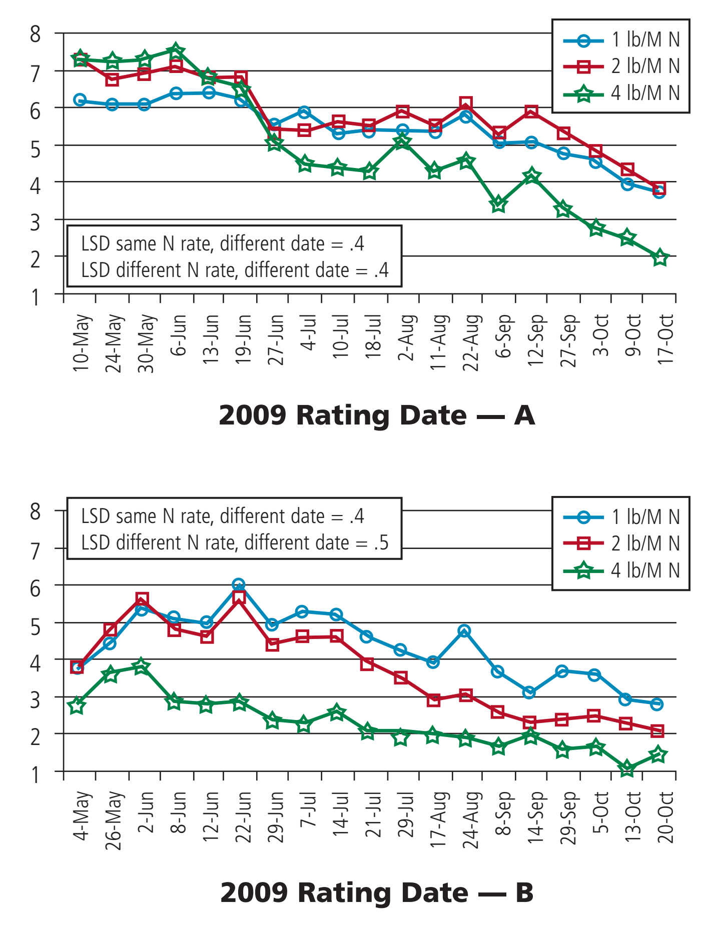
FIGURE 1: TURFGRASS QUALITY (1-9)



Quality of shaded bentgrass putting green turf in (A) 2009 and (B) 2010 as affected by N rate and rating date. Fertilizer treatments were applied at 14-day intervals beginning May 1, 2009 and May 3, 2010. Quality was rated on a 1-9 scale, with 1 = completely necrotic turf; 5 = minimal acceptable putting green turf; and 9 (not shown) = optimal density, uniformity and color.

Continued from page 43

using a walk-behind reel mower. The cutting height was reduced to 0.165-inch by Sept. 24, 2008. This height was maintained for the remainder of 2008.

Treatments were arranged in a randomized, complete block, split-split plot design with four replications. Main plots were bentgrass species (CBG or VBG). Each main plot was split to receive three annual N rates (1, 2, and 4 pounds per 1,000 square feet) and two annual TE (Primo Maxx) rates (0.0 and 0.875 ounces per 1,000 square feet). Nitrogen was applied every 14 days using TeeJet XR8002VS nozzles in water equivalent to 1.0 gallon per 1,000 square feet, beginning May 1, 2009 and May 3, 2010. Fourteen equal applications were made each year. Trinexapac-ethyl was applied every 28 days using the same equipment and water rate as the N treatments, beginning May 15, 2009 and May 3, 2010. Seven applications were made each year.

Irrigation was applied four days per week at 60% ET replacement beginning May 2009. By August 2009, ET replacement was reduced to 40% because the dense shade cover greatly decreased the water needs of the turf system. Plots were mowed each morning six days each week, with clippings removed. Height of cut was 0.125 inch for both growing seasons. Light topdressing occurred monthly during both growing seasons using USGA sand root zone mix.

Shade cloth was installed on hoop houses arching over the plot area from May 10 to Oct. 25, 2009 and from May 13 to Oct. 18, 2010 to reduce photosynthetic active radiation by approximately 80%. The installment and removal dates corresponded with local spring tree leaf development and fall tree leaf senescence.

Turfgrass quality was rated on a 1-9 scale, with 1 = dead turf; 5 = minimal acceptable putting green turf; and 9 = optimal density and uniformity. Relative chlorophyll index, clipping yield and ball roll distance data were measured/collected but will not be addressed here. Data were subjected to ANOVA using repeated measures analysis to determine significant treatment and year effects. Because year by treatment interactions occurred, data were analyzed separated by year. Treatment means were separated with Fisher's least significance (LSD) test at the 0.05 probability level when *F* tests indicated significant treatment effects.

Turf quality results

Rating date was significant in both years, along with its interaction with N rate, TE application, and bentgrass species. In 2009, all N rates provided acceptable quality through June 26 (Fig. 1A); 4 pounds per 1,000 square feet N was below acceptable quality for the remainder of 2009 except on August 1. Turf fertilized at 2 pounds per 1,000 square feet N maintained acceptable quality through September 26 while the 1 pound per 1,000 square feet N rate resulted in unacceptable quality beginning September 11. Prior to June 26, the 2 and 4 pounds per 1,000 square feet N rates usually produced similar turf quality.

After June 26, turf fertilized with the 1 and 2 pounds per 1,000 square feet N rates usually had similar quality. In 2010, the 4 pounds per 1,000 square feet N rate produced unacceptable turf quality on all rating dates and had lower quality than the other N rates on all dates except September 13 (Fig. 1B). The 1 and 2 pounds per 1,000 square feet N rates also began the year at unacceptable quality but recovered to acceptable quality by June 1, although the 2 pounds per 1,000 square feet N rate returned to unacceptable quality for the remainder of the year except on June 21.

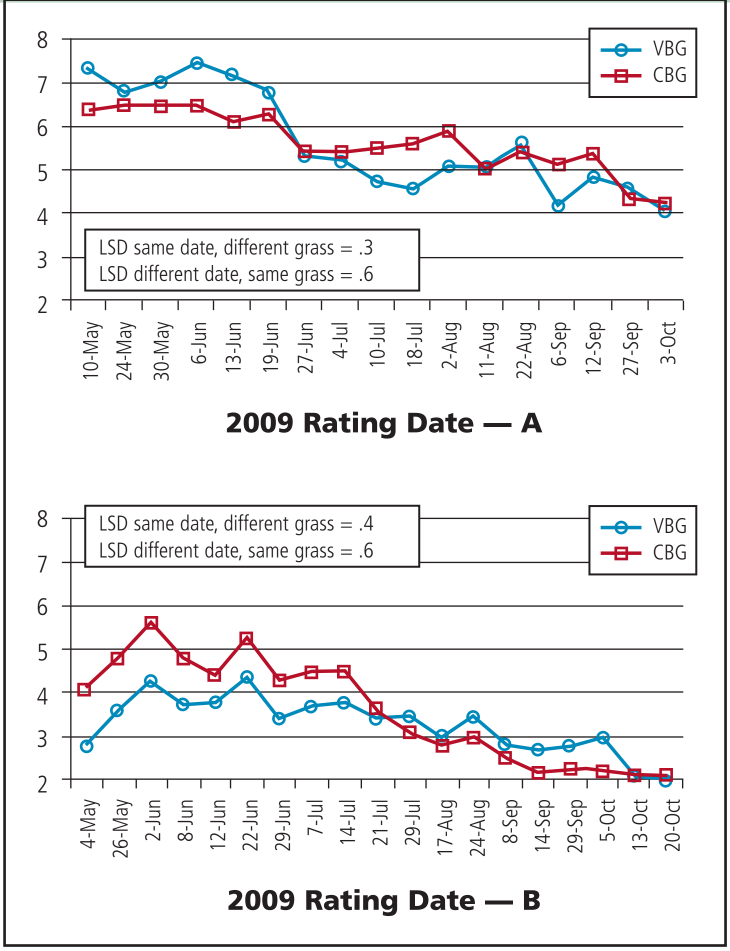
The 1 pound per 1,000 square feet N rate maintained acceptable quality only through June 21 and July 6 through July 13. Beginning on July 6, 1 pound per 1,000 square feet N always had significantly higher quality than 2 pounds per 1,000 square feet N.

In 2009, both TE treatments were similar in quality on most dates prior to June 18 (≥6.5). Beginning June 18, TE-treated turf had significantly higher quality than non-TE-treated turf through October 8. TE-treated turf maintained acceptable quality through September 11 while non-TE-treated turf maintained acceptable quality only through June 18 (data not shown). In 2010, TE-treated turf had significantly higher quality than non-TE-treated turf on 7 of 19 rating dates.

Only TE-treated turf had acceptable quality on two dates (June 1 and 11), although on June 1 TE- and non-TE-treated turf were of similar quality (≥4.8).

In 2009, VBG maintained acceptable quality through July 3 and from August 1 to August 21, while CBG maintained acceptable quality through September 11 (Fig. 2A). Prior to June 26, VBG had significantly higher quality than CBG on most rating dates. After July 3, CBG had significantly higher quality than VBG or the two species were of similar quality. In 2010, CBG was the only species to achieve acceptable quality, although only on June 1 and 21 (Fig. 2B).

FIGURE 2: TURFGRASS QUALITY (1-9)



Quality of shaded bentgrass putting green turf in (A) 2009 and (B) 2010 as affected by bentgrass species and rating date. TE treatments were applied at 28-day intervals beginning May 15, 2009 and May 3, 2010. Quality was rated on a 1-9 scale, with 1 = completely necrotic turf; 5 = minimal acceptable putting green turf; and 9 (not shown) = optimal density, uniformity and color.

Conclusions

Sometimes CBG had better quality than VBG, refuting our hypothesis that VBG would maintain higher quality than CBG under shaded conditions. This may be a cultivar effect.

Both bentgrass species reacted similarly to N rate and both benefitted from lower N rates while under shaded conditions. Agreeing with our hypothesis, both bentgrass species benefitted from the application of TE.

Ben Pease is a graduate student in the Department of Horticulture at the University of Wisconsin-Madison. He can be reached at bwpease@wisc.edu.

St. Augustinegrass: Shade Tolerant, But How Much?

By Phil Busey

In warm climates, St. Augustinegrass is generally the best choice for shady landscapes, but it's not without problems.

There are shade-tolerant varieties of St. Augustinegrass, such as Seville and Palmetto, however the variety Floratam grows poorly in shade (see Table 1).

The bigger problem is whether any St. Augustinegrasses can survive "this much shade," which will require answering the even more difficult question, "How shady is it?" St. Augustinegrasses can grow in 25% relative light, where 100% represents an open area. Dwarf varieties can sometimes survive in 12% relative light, but not much less. Floratam thins out even at 20% relative light, its leaves grow tall, and are scalped by mowing.

Measuring shade the hard way

Shade, the reduction of light, is difficult to measure. Tree shade moves throughout the day with changing sun angle (see illustration on page 47). Light meter readings can be made at multiple points around a tree, and mapped, to show the area impacted by shade at the instant of measurement. (Technically it is photosynthetic photon flux density, and not visible light, that affects plants the most. But to get even a rough approximation of shade measurement, I must simplify.)

Repeated measurements throughout the day, recorded and summed for each point, can be superimposed to show a map of concentric circular areas of different levels of cumulative light. Compared with adjacent nonshadowed areas, with 100% of available sunlight, as we walk toward the trunk, there is a circular area with only about 12-20% relative daily light. That's where grass stops growing and there is only bare soil. This method is accurate and time-consuming.

It is simpler to visually estimate relative light. For example, when asked to describe shadiness, some people say, "The lawn receives three hours of sunlight." Although a rough estimate, it has value. Assuming a 12-hour day with uniform light, three hours of sunlight is approximately 25% relative light. But the guesstimate of shade level does not factor in how tree shade varies by tree species. Trees with open canopies, such as slash pine, cast lighter shade compared with dense canopy trees such as live oak, which are generally too dark to allow any grass survival.

Is there any method for shade measurement that is more accurate than guesstimation of shade hours? And less time consuming than making measurements all day? Yes.

Performance of St. Augustinegrass varieties in shade, 17% relative illumination under trees

TABLE 1: ST. AUGUSTINEGRASS IN SHADE

VARIETY	TURFGRASS QUALITY (10 = best, 7 = acceptable)	GROWTH HABIT
Delmar	6.8	Dwarf
Seville	6.0	Dwarf
Jade	5.3	Dwarf
Bitterblue	4.3	Non-dwarf
Raleigh	4.0	Non-dwarf
Floralawn	2.8	Non-dwarf
Floratam	2.3	Non-dwarf

The overcast sky method

To easily and accurately measure shade, you need nothing more than a good camera, a piece of cardboard, and an overcast sky.

Under an overcast sky there are no shadows and no problems from sun angle. The overcast sky emits dullish light from all angles throughout the day, proportional to percent sky exposure. An open area with no trees has 100% exposure to the overcast sky. If there is 50% sky exposure under the tree, the light under the tree is 50% as much as in the open area. This method accounts for canopy filtering (e.g., slash pines vs. live oaks), beats guessing, and beats making measurements all day. (For scientific proof of the accuracy of light measurements under an overcast sky, see Campbell and Marini, 1992.)

A large surface of medium color such as a piece of cardboard is a reference target. The cardboard is placed on the ground under the tree and a camera reading is taken, then the cardboard is moved to the open area away from the tree, and a second reading taken.

Although most of us use a camera on fully automatic setting, a good camera has a manual setting which provides a readout of the aperture or exposure time or deviation (in F-stops) from ideal exposure. Since F-stops measure light in powers of 2 x (or 0.5 x), an area under a tree with 1 F-stop difference from full sun has 50% relative light, while 2 F-stops represents 25% relative light. If the readout is in exposure steps (e.g., 1/15 or 1/30 seconds) or in aperture stops (e.g., 4.0, 5.6) these are also powers of 2.

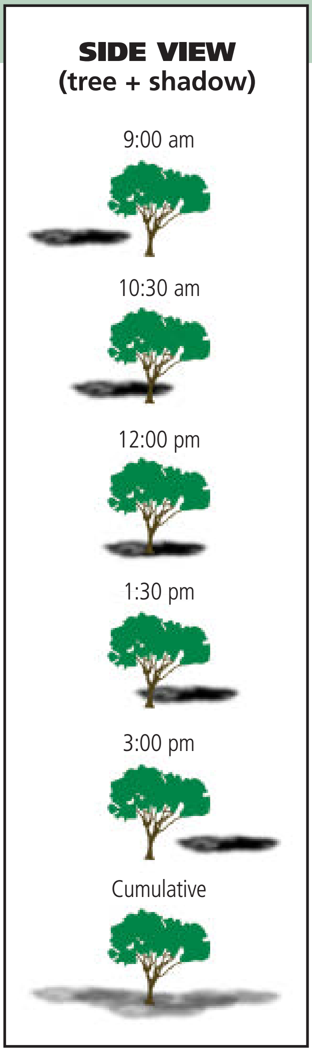


ILLUSTRATION COURTESY: PHILIP BUSEY

Testing in the shade

Scientists standardize shade level, under fabrics of known percentage transmission, to compare turfgrasses growing side-by-side in shade.

Neutral fabrics, such as black shade cloth, filter sunlight uniformly across the entire sky, without the problems of sun flecks or sun angle. Neutral shade is not perfect in representing the quality of light, the proportion of photosynthetic photon flux density largely in the red wavelengths, but it provides a reasonably accurate way of forcing relative shade levels of known percentages.

Few shade tolerance studies have been done of St. Augustinegrass varieties, and they generally use more light than is the problem.

To detect differences in shade tolerance among St. Augustinegrass varieties, shade tolerance studies should be conducted in the range of 10-20% light, not 25-45%, as has been the case.

Getting shade grass

The last problem in the use of shade tolerant St. Augustinegrasses is where to obtain them. If they are not readily available, contact information for sod producers who grow shade tolerant St. Augustingrass varieties can be obtained from statewide listings such as www.floridasodgrowers.com. You can then call the grower and ask for the names of landscapers and installers they deal with.

Even with the overcast sky method of shade measurement, remember common sense; trees with touching canopies, or trees with a canopy touching a building are serious problems. So are dense shade species such as live oak, citrus, and Cuban laurel fig under which usually no turfgrass will survive.

As shown in the initial question, appropriate pruning may help temporarily. Deciduous trees such as cypress and gumbo limbo, and trees with filtered shade such as slash pine, may allow turfgrass to survive.

In summary, to deal with the problems of shade, the first step is determining the shade level, then be reasonable and don't expect miracles. Why we have not made more progress with shade tolerant St. Augustinegrasses, besides the difficulty of measuring shade, is the fact that university shade tests are not shady enough.

Philip Busey is an associate professor of environmental horticulture (turf) at the University of Florida, Fort Lauderdale Research and Education Center in Davie. He can be reached at turf@ufl.edu.

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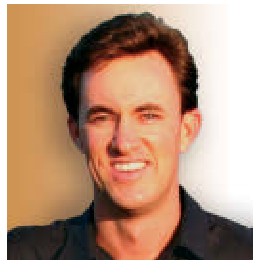
Ad Index

War on Green Speeds

THE PRESSURE TO RAMP UP PUTTING SPEEDS HAS BEEN A RESPONSE TO THE INCREASING EASE OF THE SPORT.

BY GEOFF SHACKELFORD



Longtime readers know that on occasion I share some feelings about technology getting out of control. It's been, what — *two months* — since I last vented about rapid equipment advances causing golf courses to bear unnecessary costs in the form of new tees, new bunkers or other silly add-ons?

Since I started writing columns here and elsewhere about the negative effects of letting pricey equipment overtake the role of skill, the response from the club manufacturer world has always been something like this: "We need new clubs and balls to grow the game and make it more fun." Well, fun has arrived in the last decade in the form of more forgiving clubs and longer flying balls. And where is the American golf industry?

Certainly not thriving thanks to technology breakthroughs.

While the economy deserves most of the blame for our doldrums, you don't hear many prospective players sitting on the sidelines because they were unable to get their hands on another $400 driver with a watermelon-sized driver head. Yet manufacturers, who are free to make anything they want to without USGA rulemaking interference at any time, complain about rules hampering their bottom line.

Meanwhile, playing the game is much simpler for elite players, who reap substantially greater benefits from today's equipment. Combine that with widespread leaps in course maintenance, and the game has never been easier to play. So much so that longtime industry folks hear the "easy" word keep popping up in conversations with better players, to the point that nearly all common sense folks in the game admit the time has come to draw a line in the sand. Especially now that rough and narrow fairways have been shown to be a lame, ineffective and counter productive way to trick up a course in hopes of offsetting juiced equipment.

Which is why it's time to prepare yourself for the war on green speeds.

The pressure to ramp up putting surface speeds for competitions or even daily play has been a response to the increasing ease of the sport. But not until the 2011 U.S. Open at Congressional and July's U.S. Senior Open at Inverness did I realize the pressure the technology chase is placing on putting surfaces. After all, both courses on any given day used to put up a great fight, but strip them of any fear factor in the era of juiced equipment, and super fast, rock firm greens are the only way they can defend themselves.

Both courses were softened by rain with greens already put on the defensive by pre-tournament heat, eliminating the only chance each layout had of making juiced-club-wielding players use their brain or demonstrate something resembling old-fashioned skill. Even more fascinating though is the continued reaction that seems to suggest the course or the people maintaining it are somehow to blame for the game being too "easy."

This is a longwinded, roundabout way to make a scary prediction: the pressure to increase green speed and firmness is only going to increase.

I know, I know. You're saying, "That's not possible." Even though fast greens are the primary culprit for slow play and a huge factor influencing cost, putting surface conditions will get more attention as long as players keep bombing and gouging 340-yard drives.

But there was one hope-inducing twist: the 2011 British Open greens were truly slow by modern major standards, kept that way by a shrewd super who knew any faster could lead to a play stoppage in high winds. The Open surfaces were estimated at around 8.5 on the Stimp by the time the leaders came through. And yet the winning score was six under par. Royal St. George's was not "easy."

Now, if there was just a way to sell paying customers on the idea that today's Hogans and Sneads do not find "slow" greens easy.

You can reach Shack, Golfdom's contributing editor, at geoffshack@me.com. Check out his blog – now a part of the Golf Digest family – at www.geoffshackelford.com.

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