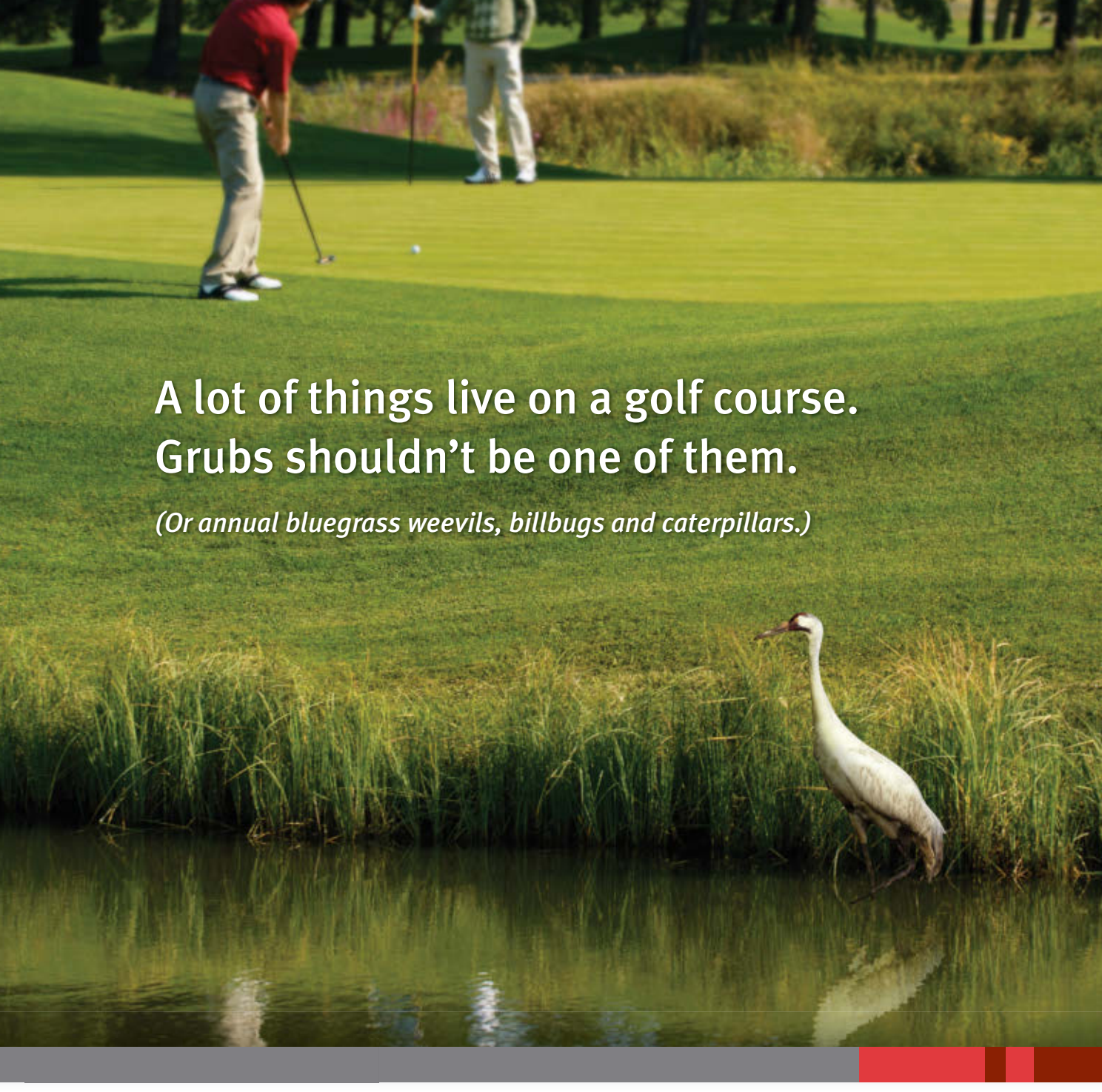

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Accumulating Stress Periods

BY KARL DANNEBERGER

Finally, the summer of 2011 is over. If you thought it was a particularly hot one, you'd be right.

In fact, according to the National Oceanic and Atmospheric Administration, the summer of 2011 was the second warmest summer on record. (The warmest summer on record for the United States occurred in 1936 — giving those of you 75 and older another thing to brag about.) Excessive heat in 2011 resulted in the warmest August for six states, including Arizona, Colorado, New Mexico, Texas, Oklahoma and Louisiana. Dallas set a record for the number of days (70) above 100 degrees F and recorded the second most consecutive days (40) above 100 degrees F for 2011.

In conjunction with the high temperatures were the extremes in moisture. Dry conditions occurred throughout the Midwest, West and the South, while above normal precipitation occurred in the Northeast. Record rainfall was set in a number of states in the Northeast.

Unfortunately, the summer of 2011 was preceded by the fourth warmest summer on record — the summer of 2010 — and eight of the warmest years recorded since 1880 have occurred since 2001 (*Golfdom*, May 2011, page 18). I think the accumulative effect of one record warm summer after another may help explain why the summer of 2011 was so tough on turf.

As background, one of the basic ecological axioms in managing turf is that practices accumulate. In other words, the benefits from good management practices increase over time. For example, multiple studies report that crabgrass population decreases over time with moisture, higher (proper) mowing heights and adequate fertilization. From a competitive standpoint, a dense, healthy turf reduces the penetration of light to germinating crabgrass, resulting in a less competitive weed. Over time, less and less crabgrass germinates under these conditions.

Conversely, poor management practices also accumulate over time, leading to a worsening problem. Reversing the cultural practices mentioned above can shift the turf to a less competitive advantage, increasing the severity of crabgrass over time.

I THINK THE ACCUMULATIVE EFFECT OF ONE RECORD WARM SUMMER AFTER ANOTHER MAY HELP EXPLAIN WHY THE SUMMER OF 2011 WAS SO TOUGH ON TURF.

The consecutive hot summers have clearly stressed turf. For example, managing creeping bentgrass has become more difficult under stressful conditions. One sign is the appearance of bacterial disease of creeping bentgrass. Over the last few years we have seen a dramatic increase in verified reports from the western United States through the Mid-Atlantic region. Most of the cases occurred where creeping bentgrass was under extreme stress.

Another sign of stressed turf is the increase in "wet wilt." Out East, where high temperatures met precipitation from frequent thunderstorms, anaerobic soil conditions resulted in rapid turf decline. Although most often associated with *Poa annua* under putting green conditions, this year creeping bentgrass greens suffered injury caused by anaerobic soil conditions.

Dealing with the cumulative effect of summer stress conditions is challenging. In areas like Atlanta and eastern Texas, where creeping bentgrass is grown on the border of warm-season turfgrass adaptation, golf courses are replacing creeping bentgrass with ultradwarf bermudagrass. How the ultradwarfs perform over time remains to be seen, but initial reports are promising.

In areas where the turfgrass is adapted, the use of heat-tolerant cultivars will be encouraged. From a management perspective, good management practices will not only have to be implemented during the predicted stress period, they'll have to be expanded for the entire growing season. Because "normal" summer conditions appear to be gone for now.

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

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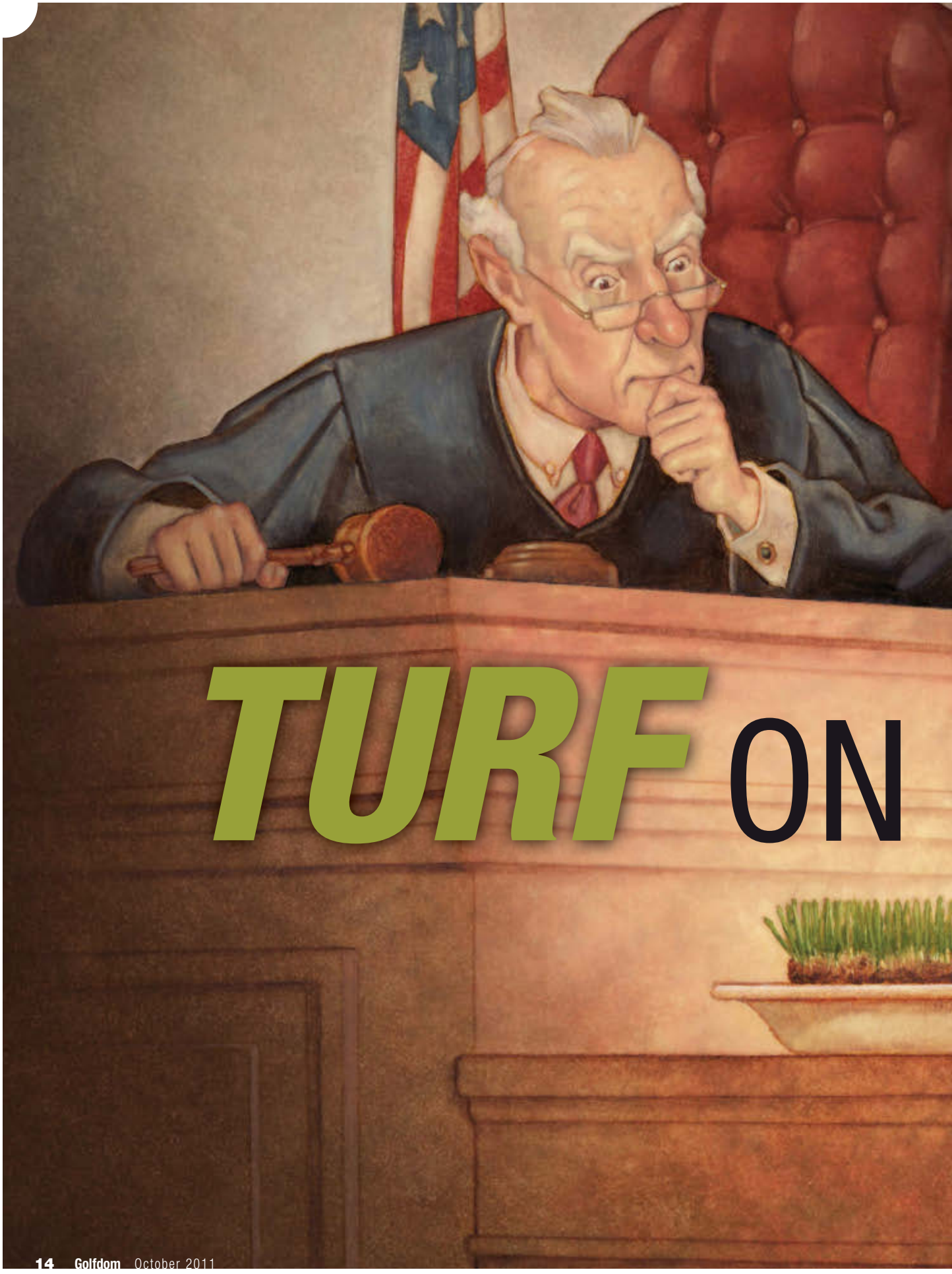
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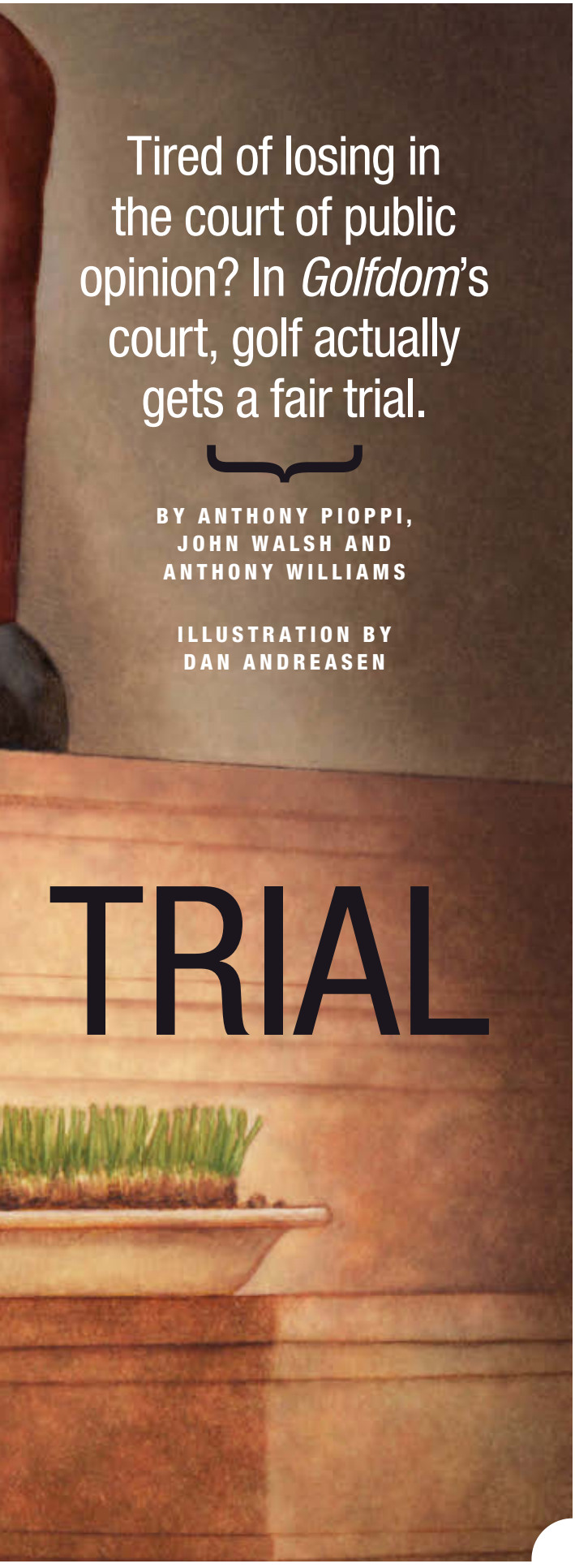


Tired of losing in the court of public opinion? In *Golfdom*'s court, golf actually gets a fair trial.

BY ANTHONY PIOPPI, JOHN WALSH AND ANTHONY WILLIAMS

ILLUSTRATION BY DAN ANDREASEN

TRIAL

IT HAPPENED AGAIN just last month.

In an article about golf courses in *Fast Company*, the editors couldn't resist the easy target, describing golf as "water-guzzling" and "pesticide-laden" in a headline. The irony is, if readers got past the headline, they would have discovered that the article was mostly about the positive things that courses are doing for the environment these days.

It's almost comical how golf is unfairly chastised. It's like the old professional wrestling shtick: As soon as the referee turns his back, that's when the good guy gets hit with the folding chair.

But in our world, it's not the wrestler who's getting smacked with the chair; it's us.

This month, *Golfdom* challenges the court of public opinion with our best defense — professionally trained golf course experts. We asked superintendents to respond to some of the industry's most common accusations. We might not have access to a slick lawyer, but our experts — *Golfdom*'s readers — know a thing or two about defending themselves.

▶▶▶

OPENING ARGUMENT

Your honor, making the opening argument on behalf of the turf industry is the president of the Georgia GCSA as well as the 2011 Environmental Communicator of the Year, **Anthony L. Williams**, Certified Golf Course Superintendent, Certified Grounds Manager, and the director of grounds at the Stone Mountain (Ga.) Golf Club.

ENVIRONMENTAL stewardship is the oldest tradition in golf.

The first superintendent, Old Tom Morris, was famous for his golf course designs and maintenance practices that allowed for the game of golf to be played in concert with the natural lay of the land. Those organic beginnings in Scotland have sustained a deep and ongoing environmental heritage that is embraced by the modern golf course manager now more than ever.

Despite golf's roots in stewardship, some people still cling to a stereotype that emerged several decades ago. Some golf properties were seen as wasters of water and liberal applicators of all types of chemicals. The general perception was one bad apple does spoil the whole bunch, forever.

That dated and biased view of golf has left an impression that even the latest science and hard facts have a hard time changing. It is all too common to hear the generalization "Golf courses use chemicals, and superintendents don't care about the environment."

But something I've learned: Those same people are willing to visit a golf course or watch a presentation to learn more about the facts. When presented with the facts, they often respond, "I never knew that golf course superintendents were so well trained and produced such amazing environmental programs."

Superintendents are breaking new ground in areas such as water quality and conservation, habitat management, integrated pest/plant management, advocacy and sustainability, communicating that information to a diverse group of stakeholders. Exact information on water and chemical use at the local course is now as common as the presence of tees and greens.

The best evidence of superintendents' commitment to keeping Mother Nature happy can be found in their active membership and influence in many environmental organizations. Audubon International has helped improve and certify environmental stewardship on golf courses for over 20 years. Through the Audubon Cooperative Sanctuary Program for Golf Courses, hundreds of member clubs have developed long-term sustainable environmental practices and embarked on a variety of environmental case studies aimed at proving the value of their environmental programs.

The GCSAA has no problem proving and showcasing the great environmental work done by its more than 19,000 members. It sponsors the latest in continuing education aimed at environmental stewardship. The GCSAA's Environmental Management Program offers six specializations

An ongoing case study at Stone Mountain Golf Club is an effort to recover the yellow daisy with "no-spray" zones.

PHOTO COURTESY: ANTHONY L. WILLIAMS, CGCS, CGM

in different aspects of stewardship.

The Environmental Institute for Golf (EIFG) is the philanthropic sister organization of the GCSAA. It's committed to making golf more compatible with nature. One of the most valuable services supported by the EIFG is the Edge, an online archive of some of the best environmental case studies relating to golf courses (www.eifg.org).

DESPITE GOLF'S ROOTS IN STEWARDSHIP, SOME PEOPLE STILL CLING TO A STEREOTYPE THAT EMERGED SEVERAL DECADES AGO.

When it comes to environmental stewardship, modern superintendents are part student, part seasoned professional. Their education comes from some of the latest university research and a comprehensive curriculum in studies ranging from agronomy, economics and of course, stewardship. Superintendents see a bigger ecosystem that is inter-connected through millions of smaller parts, and they know that each action impacts the whole system. They see daily how their courses clean air and water, trap carbon, provide habitat, create jobs, conduct research and, yes, even allow the game of golf to be played.

Superintendents view their profession as a calling, not just a job. They remember the past, work for today and plan for the future. That's why, when people are willing to listen, they learn that superintendents are advocates not only for the game of golf, but also for the precious land on which it is played. ■

Turn to page 18 for ACCUSATION #1 ▶

ACCUSATION #1

Local wildlife hates the golf course.

THE DEFENSE CALLS TO THE STAND

Stan George, CGCS, Prairie Dunes Country Club, Hutchinson, Kan.

REBUTTAL

WHEN A PERSON claims that wildlife hates a golf course, there's a good chance that person has never set foot on a tee, green or fairway.

In fact, it would be impossible to find a golf course where wildlife not only survives, but also thrives, sometimes to the chagrin of the superintendent and members. How many tens of thousands of dollars have been spent attempting to get a flock of Canada Geese to move to a location other than the middle of a fairway?

In urban areas, golf courses often provide the only habitat for various creatures that crawl, walk, fly and swim. It would be hard to disprove, for instance, that there is more wildlife at the 36-hole Pelham/Split Rock Golf Courses than in the rest of New York City's Bronx, which is dominated by pavement and cement.

The real questions might be, however, how much does wildlife like golf courses, and is there a way to measure that? In one instance, both questions were answered.

A golf course versus a state park

In the early 1990s, two graduate biology students from Tabor College in Hillsboro, Kan., performed one such study at Prairie Dunes Country Club. They measured the number of species and amount found on the 400-acre Prairie Dunes property located in Hutchinson, Kan., as compared to the nearby 1,100-acre Sand Hills State Park.

"It was very, very similar," said longtime Prairie Dunes superintendent Stan George of the conclusions. "The numbers and species were the same as the 1,100 acres of pristine prairie."

The result surprised many, including George, especially considering Sand Hills State Park is almost three times the size of the golf course. Also, with a golf course, a swimming pool, tennis courts and dining options, Prairie Dunes is a hub of activity.

"You would have thought there was too much traffic, but it had little effect," George said.

He was pleased with what the researchers unearthed.

"It was gratifying and interesting, as well," George said.

Maintaining the prairie

Prairie Dunes and Sand Hills both have an abundance of raccoons, skunks, deer, voles and birds. And although bobcats are rarely seen there, their tracks are frequently spotted.

Part of the success in keeping wildlife on the Prairie Dunes property can be attributed to the fact that the golf holes are routed around a large central area of grass-covered dunes.

"We have a corridor within the golf course where wildlife doesn't just pass through, but stays," George said.

He added that open space does not necessarily mean wildlife finds it a suitable place to reside. George's home, not too far from Prairie Dunes, abuts 80 acres of untouched land, yet he does not see nearly the amount of wildlife in his "back yard" as what he sees living on the course.

Since 1958, the club has been the

THEY MEASURED THE NUMBER OF SPECIES AND AMOUNT FOUND ON THE 400-ACRE PRAIRIE DUNES PROPERTY LOCATED IN HUTCHINSON, KAN., AS COMPARED TO THE NEARBY 1,100-ACRE SAND HILLS STATE PARK. "IT WAS VERY, VERY SIMILAR," GEORGE SAYS.

Since 1958, Prairie Dunes has been the site of a U.S. Women's Open, three U.S. Women's Amateurs and a U.S. Senior Open, among many other tournaments.

Part of the success in keeping wildlife on the Prairie Dunes property can be attributed to the fact that the golf holes are routed around a large central area of grass-covered dunes.

PHOTOS COURTESY: STAN GEORGE, CGCS

site of a U.S. Women's Open, three U.S. Women's Amateurs, a Curtis Cup, a U.S. Mid-Amateur, a U.S. Men's Senior Amateur, a U.S. Senior Open and five Trans-Miss Men's Amateurs. It also has hosted the Big 12 Conference Championship nine times, most recently this year.

One reason, if not *the* reason, Prairie Dunes is a favorite locale for wildlife is the battle against invasive woody species that George has been waging there since arriving at the course nearly 20 years ago. Cedar, dogwoods and cottonwoods are three of his most aggressive and threatening foes. Ornamentals, such as Virginia Creepers, have made their way from homes in the area onto the golf course.

George said that once man settled on the prairie and established population centers, prairie fires were extinguished and no longer burned unfettered, resulting in an altered landscape. The elimination of the fires led, in part, to much of the prairie changing from grass to trees, not just on the golf course but throughout the region.

"You take away fire and the woodys win," George said.

Through a pattern of mowing, spraying and burning, George has converted much of the dunes area back into grasslands. With controlled fire, George said, trees such as immature dogwoods are damaged, if not killed. Also, fire "gets rid of the heavy mat of old growth and undergrowth," he added, pointing out that the charcoal and ash act as fertilizer for the grasses.

One surprising outcome of the removal of the heavy, low-lying living and dead vegetation was the arrival of more birds, especially predators like hawks that could more easily prey on food sources such as voles and mice.

Longtime Prairie Dunes assistant Jim Campbell is the one responsible, George says, for devising the plan that, if followed, will, "tip the scale to grasses."

According to George, one full season of mowing, burning and spraying will be enough for the grasses to establish dominance.

Asked to respond to the accusation that wildlife doesn't like golf courses in light of the research at Prairie Dunes, George had a succinct response.

"It wouldn't hold up in court," he said.

—Anthony Pioppi

Turn to page 20 for ACCUSATION #2 ▶

ACCUSATION #2

Golf courses are careless with water use.

THE DEFENSE CALLS TO THE STAND

Jim Brown, CGCS, Newport Dunes Golf Club on Mustang Island in Port Aransas, Texas

REBUTTAL

EVERYTHING'S BIGGER in Texas, including droughts.

"This is the biggest drought Texas has ever seen," says Jim Brown, CGCS, of Newport Dunes Golf Club on Mustang Island in Port Aransas. "Water is keen on the public's mind."

It's also keen on Brown's mind, and with a 5-year-old irrigation system, he's able to water the Arnold Palmer signature course, which is managed by KemperSports, precisely. The precision has helped lower Brown's water bill from $150,000 annually during grow-in to $115,000 (the electrical portion of that is between $42,000 and $48,000).

"The golf course industry is so far ahead of residential and commercial providers and users when it comes to efficient water use, yet they're picking on their biggest supporters," he says.

At the source

Newport Dunes, which is Audubon certified, has three irrigation sources that feed into an 800,000-gallon concrete reservoir. The first is an effluent supply from a wastewater plant that provides between 350,000 and 800,000 gallons per day. The second is a freshwater lake that can provide as much as 500,000 gallons a day.

The third is a horizontal reclamation system providing between 50,000 and 150,000 gallons a day. The system captures water that moves past the root zone into a series of pipes located throughout the property and then mechanically transports it back to the reservoir tank.

The system, new to the golf industry, came out of Florida, where people were using it to feed wells. Newport Dunes, which doesn't sit near an aquifer, has a water table between its clay and sand levels. The pipes, set 40 feet apart, are set at the top of where the water table is. Drainage from the greens also feeds into the pipes, collecting in the reservoir.

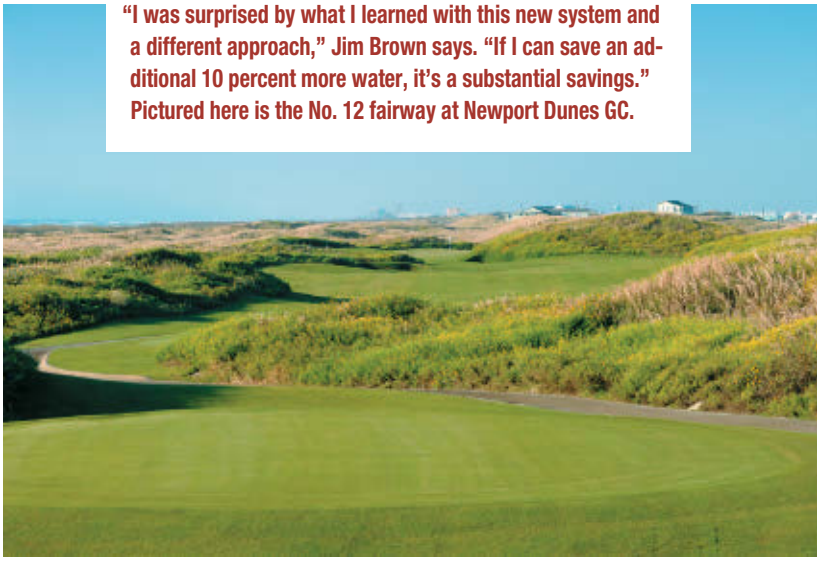
"We're putting back 150,000 gallons a day," Brown says.

Precision irrigation

Working toward greater efficiency, Brown set standard daily irrigation practices 20 percent below daily evapotranspiration (ET). He started at 5 percent and worked his way toward 25 percent. But he saw desiccation of the plant, so he is settling at 20. For example, if the weather station records daily ET of 0.25, Brown will apply 0.20 inches of water per station on that given day's irrigation cycle.

Because certain areas of the course have features, soil conditions or exposure to excessive wind and solar radiation, the standard had to be adjusted to provide adequate soil moisture for the plant. Brown's crew adjusts station percentages to achieve consistent moisture content, which is different throughout the course:

greens – daily average of 10 percent volume of water content (v/wc);
tees – daily average of 18 percent v/wc; and



"I was surprised by what I learned with this new system and a different approach," Jim Brown says. "If I can save an additional 10 percent more water, it's a substantial savings." Pictured here is the No. 12 fairway at Newport Dunes GC.

PHOTO COURTESY: JIM BROWN, CGCS