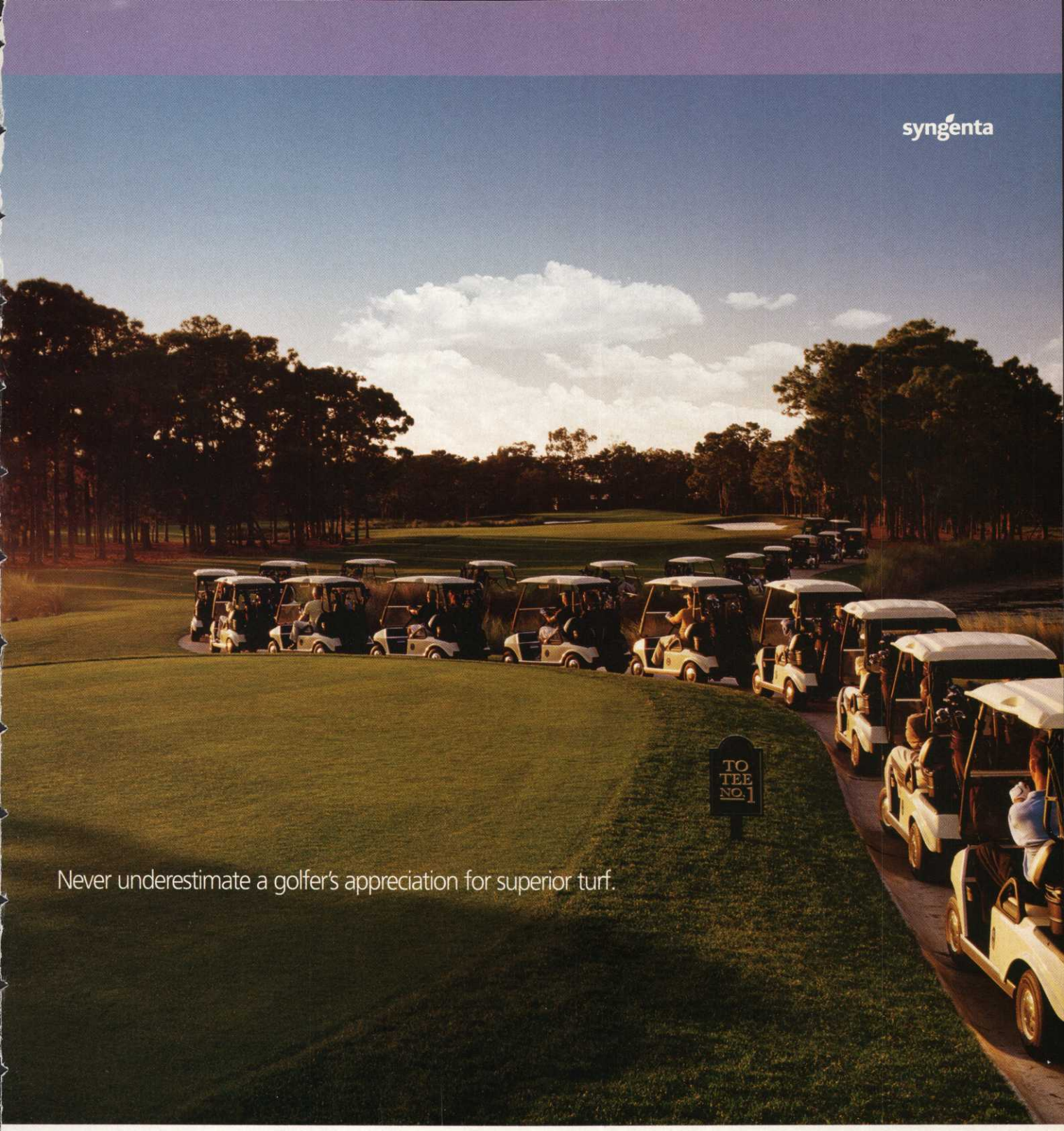

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"A lot of times it's just kind of a nuisance disease . . . but in some cases . . . it can be disruptive to the putting green."

PAT GROSS
USGA GREEN SECTION

Continued from page 50

director of the Southwest region of the USGA Green Section, recalls several Las Vegas courses that lost grass, especially bentgrass greens, throughout the summer.

"A lot of times it's just kind of a nuisance disease … but in some cases, especially on greens, if there's a severe infestation, it can be disruptive to the putting green," Gross says.

"I've seen it so severe that it kills the grass," adds S. Bruce Martin Jr., a Clemson University professor of plant pathology and physiology. "It's more than a nuisance then, and that's on bentgrass or bermudagrass."

The presence of fairy ring is tough to predict, which hinders attempts at preventive treatment. Some years the disease shows up, others it doesn't. And even when it appears, a superintendent might not immediately realize it. "Trying to guess whether you're going to have fairy ring or not is probably a waste of money," Martin says.

The first signs often appear in late spring or early summer, when heat stress begins to increase. Rings of grass experience intensified growth and color, although the circles might be inconspicuous if the rest of the grass is growing commensurately.

"Most of the time you'll see the stimulation of the grass. Or that might not even be visible at all," Martin says. "We're getting plenty of rain in the Southeast, and that generally tends to mask the symptoms. But as soon as things start to dry out and warm up a bit, that's when [the rings] start to show up."

Eventually, if the dry conditions — exacerbated by mower traffic — persist into July and August, the diseased turf begins to die. "The bad cases become severely hydrophobic, and then you get a dead ring," Frey says. "That's what we want to avoid."

And how does one do that? The best preventive treatment for fairy ring, according to Farrar, is adequate thatch management. Fungi begin growing in the center of what becomes a ring and grow outward via the thatch.

"They're digesting the thatch, not the plant itself," Farrar says. "If you don't allow a lot of thatch buildup, then you reduce the amount of food that fungus can get to."

Beyond thatch management, the preventive game can be guesswork. Frey and his crew have experienced success the last two years with spring applications of fungicides, such as azoxystrobin, pyraclostrobin and flutolanil. "We've seen fairy rings literally cut in half where we applied the pesticide and where we didn't," he says.

But the weather has more than cooperated those two years. Courses in the Northeast have not experienced drought conditions, and Frey still isn't sure if similar spring applications will work as well leading up to a dry, hot summer.

"The biggest kicker is we haven't had a real good drought situation to look at it preventively," he says. "So on a full-scale preventive basis, I don't know if it's feasible or not. The last two years have been fairly wet, and (fairy ring) has not reared its ugly head."

In some cases the problem runs deeper than thatch. Soil-dwelling fairy rings are more difficult to control, Martin says, and can lead to a chronic condition.

"A lot of the time the fairy rings are living off the roots of the trees that are on the edge of the fairway, or they're decomposing the stump that's been buried in the fairway. So their food source is never-ending," he says.

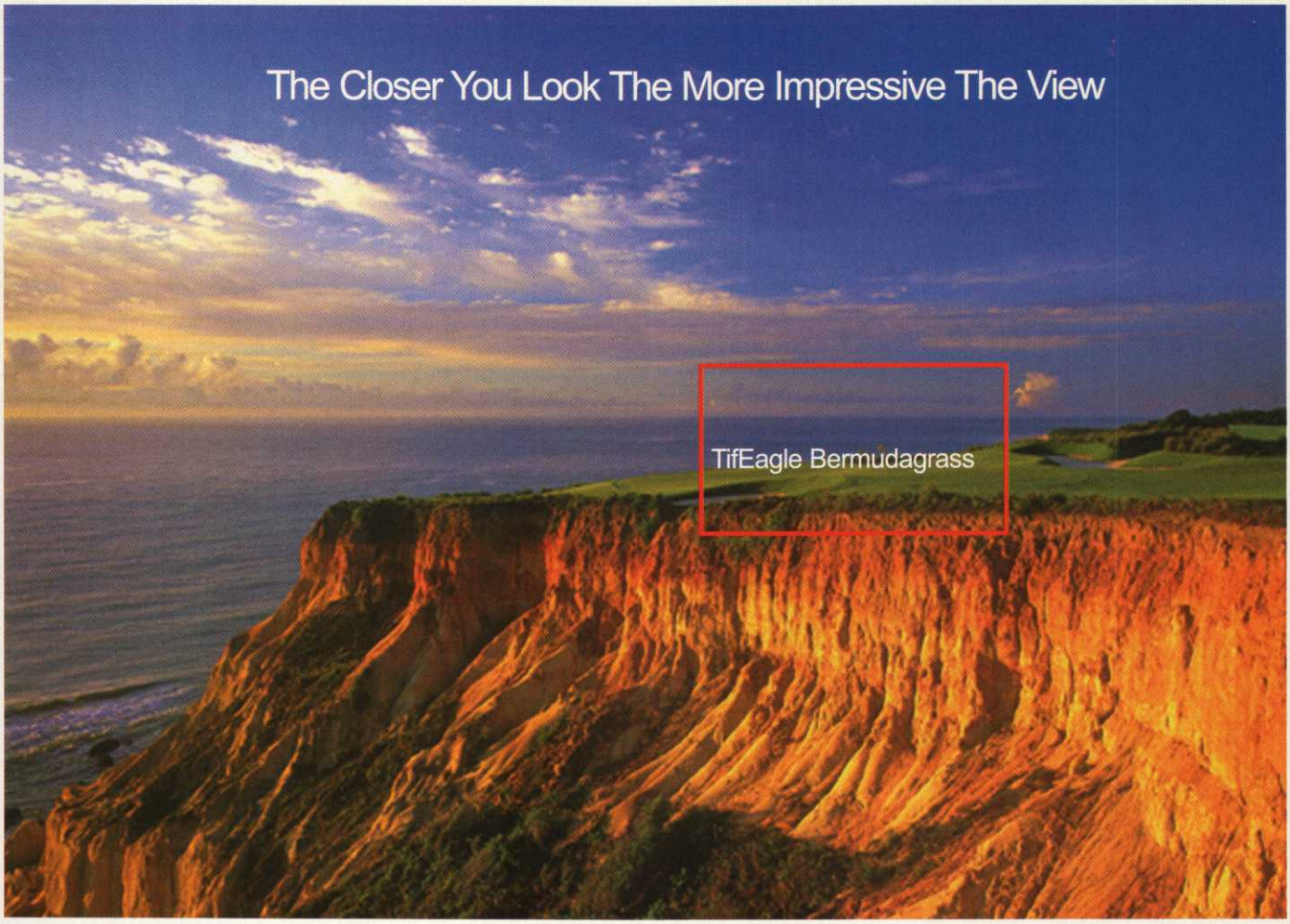
And lest one thinks complete soil recovery is the answer, think again, Frey says. "I've heard of people digging the soil out of the ground, and they still come back," he says.

If fairy ring does appear, it's time to turn to fungicides as a curative treatment. "We've done a good job with curative control with some of the fungicides and wetting agents, so that would be a smarter approach from the standpoint of money and control," Martin says.

The market is also seeing new surfactants that treat hydrophobic soil and manage water in sand-based greens. The question, Martin says, is whether these materials will work in conjunction with the fungicides. "That's something we need more information on," he says. "But I think that's where you're going to see the research kind of go now with fairy ring."

If the condition hasn't been remedied by the time drought conditions arrive, the situation can turn grim, Gross says. "That edge of the ring gets hydrophobic, and in a drought situation, when your resources are limited, it's tough to put on that extra water to keep that ring moist and keep it from fading out," he says.

Of course, for guys like Frey, a bad case of fairy ring might at least provide a bumper crop of mushrooms. ■



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Reverse osmosis hasn't taken the golf industry by storm, but that doesn't mean some golf courses haven't had success with the irrigation technology

By Larry Aylward, Editor in Chief

Worth Its Salt?

PHOTO BY: MIKE KLEMME

The last time we spoke to Rob Kloska, superintendent of the Jupiter Island Club in Hobe Sound, Fla., he was singing superlatives about his golf course's reverse osmosis system.

That was nearly three years ago, and Kloska still lauds the system. In fact, Kloska, who has been at Jupiter Island for 10 years, says the course plans to upgrade the system so it can make more water to satisfy the course's needs and keep it from spending about $3.30 per 1,000 gallons for potable water.

Reverse osmosis, or desalinization, is the process of extracting salt and other minerals from brackish salt water and converting it to irrigation-quality water. Kloska says Jupiter Island decided to build the $1 million reverse osmosis plant because of soaring potable water costs and water restrictions imposed by the city's utility company. Kloska figured if the course manufactured its own water, it wouldn't be at the mercy of the utility company during droughts and wouldn't be affected by soaring water prices.

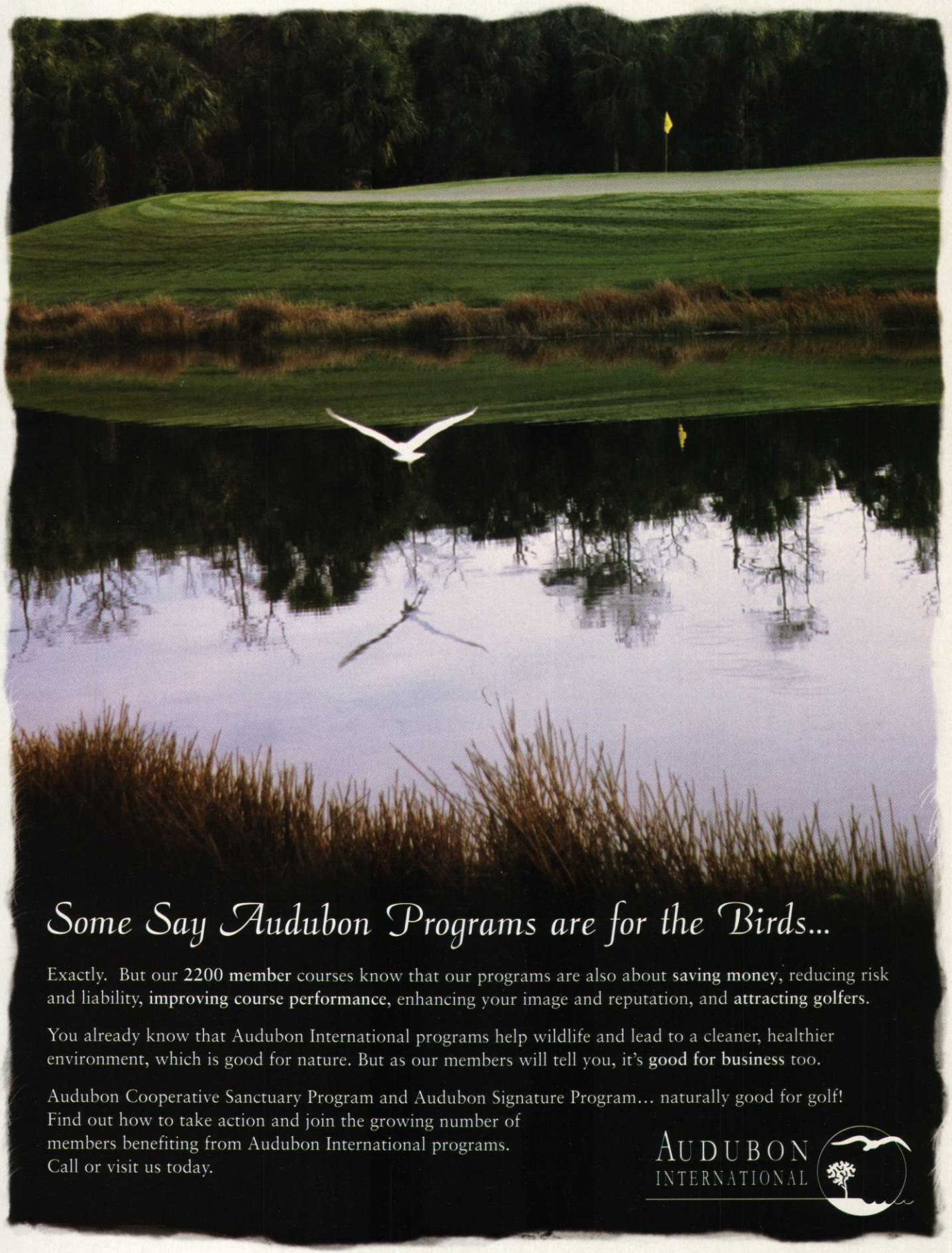
Other golf courses in Florida have experienced success with reverse osmosis, but the technology hasn't taken off in other regions of the country.

A concern with reverse osmosis is how to dispose of the salty brine extracted during the conversion process. But what effect the brine, which resembles water, has on an environmental area depends a lot on geographic location. Brine disposal doesn't present a problem at Jupiter Island, Kloska says. The brine is simply dumped in a gravel swale, where it percolates into the ground. The salinity of the brine is similar in parts per million to the water in the Intercoastal Waterway, which is only 200 yards from the swale, so it makes for safe disposal.

The key, Kloska stresses, is that the disposal area for the brine is not a foreign area to the substance. No matter where the dumping area is located, it's vital that the brine is a good match for it in terms of salinity and salt concentration.

"Being on the coast, there are natural salt water environments that offer a good match [for disposal]," Kloska says. "The water company that services Hope Sound recently started up a reverse osmosis plant. It makes a lot more water than our system does. [The plant] has a pipe that goes under the Intercoastal and into the ocean. That's where it dumps

Continued on page 56



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Continued from page 54

the brine. But the salt concentrate that it's dumping in the ocean is less than the salt concentration already in the ocean."

Despite some environmentalists' fears of brine disposal in Florida, Kloska says the substance is nothing to fear.

"Let's break down the chemistry," he says. "It's just salty water. It's not loaded with radioactivity, and there are no concentrations of lead."

Thankfully, Kloska says, brine disposal for the most part has been a non-issue in Florida. But that's not true in other areas of the country.

Brian Vinchesi, proprietor of Irrigation Consulting in Pepperell, Mass., believes reverse osmosis is a ways off for golf courses in the Northeast. At issue is what to do with the brine. "It's a big concern because you just can't [dispose of] it anywhere," Vinchesi says.

Several New England states are still not allowed to use reclaimed and effluent water for irrigation. When the time comes, however, Vinchesi believes regulators will allow the use of reclaimed and effluent water before allowing reverse osmosis.

Irrigation consultant Dave Davis, president of Lake Arrowhead, Calif.-based David D. Davis & Associates, says reverse osmosis is being experimented with in areas on the West Coast, such as Southern California, to see if it can create usable irrigation water and be cost-effective. "But I don't think it's there yet," he adds.

Brine disposal is a big issue in California, as well. Coastal residents want it disposed as far out to the sea as possible.

Cost is also a big issue, probably more so in California than in Florida. It rains more often in Florida, so golf courses there can use rain for irrigation more than courses in California.

"If you're using [reverse osmosis] as your main source of water, the volume used would be substantially greater, and I suspect the size of the reverse osmosis treatment plant would have to be considerably larger," Davis says. "Therefore the investment required would be substantially greater."

What if the potable water crisis comes to a head in the Northeast and in the West and golf courses are looking for alternative irrigation methods? Could reverse osmosis be made to work despite its red flags? "I don't see why it wouldn't work," Kloska says.

But he stresses that two issues must be met. First, the source of the water to be desalinized must remain the same. Manufacturers of reverse osmosis systems require a constant quality of water to push through a system's vessels and separate the brine from the clean water.

"If you design a system to clean water that's 2,000 parts per million and you start running 4,000 parts per million into the system, it's not going to function right," Kloska says.

The second issue is safe disposal of the brine. You don't want to introduce salt into an environment that's not used to it, Kloska stresses.

Also, reverse osmosis can pose problems because it can create water that's too clean. A reverse osmosis system can clean water so thoroughly that it takes ions out of the water, which can make the water more corrosive than salt water. The treated water can also disrupt sprinklers and irrigation sensors.

"I've been told by a number of agronomists that if you're going to use water from reverse osmosis, it needs to have some minerals added back to it," Davis says.

Kloska is sold on the technology and remains a satisfied customer. His course's reverse osmosis system has performed well and paid for itself in four years.

Kloska said it before and he'll say it again: The best thing about having a reverse osmosis system is being in control of your irrigation needs.

"If I have to buy water," Kloska says, "that means I'm relying on an entity that's out of my control. If I make my own water, I have total control." ■

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'Heated' Conversation

Superintendents discuss strategies to battle summer stress

Compiled by
Larry Aylward

Hot fun in the summertime? Don't sing that tune to superintendents tending cool-season turf. The "hot" isn't fun in the "summertime" when you're battling Mother Nature's sweltering heat to protect your greens, tees and fairways from stress-related factors. So we asked superintendents: What are the two most important things you do to avoid summer stress on turf?

"One of the biggest tools I use to avoid summer stress on my turf is to apply wetting agents on my 24 acres of annual bluegrass/bentgrass fairways. With a single-row irrigation system, I need to keep my soil hydrated at all times, day in and day out to prevent stress. The best product I have used to keep my soil moist is a wetting agent.

"Another practice we do to relieve stress on the golf course is to remove the buckets on our walking greens mowers before we make our clean-up passes. Even though my staff members were trained to empty the buckets before they made the clean-up passes, not everyone did. So now everyone just removes the bucket (which, with a full load of clippings and dew, can weight up to 16 pounds) before they mow the clean-up pass."

– **Steve Hammon**, Superintendent
Traverse City (Mich.) Golf & Country Club

"The first thing I do, going by results from off-season soil testing, is improve my soils to condition them to grow the best and healthiest turf possible. If my soils are in reasonably good condition, my turf stands the best chance of surviving. Second, and maybe more important, is using the plant growth regulator Primo. I cannot imagine managing turf without it."

– **Charlie Fultz**, Superintendent
Shenvalee Golf Resort
New Market, Va.

"When we run into summer stress times, the two biggest things we focus on are raising mowing heights and using an organic biomix to condition the soil and rootzone. Raising the mowing height is the obvious. I stumbled on the other [tactic] during our integrated pest management (IPM) work.

I knew that 90 percent of the problems were occurring in the soil during those stress months. So I put a mix together of a wetting agent, an amino acid feeder and a biological turf food. Basically, it was like giving turf a vitamin shot to help it fight off a cold before it arrives. While it's not a cure, it has reduced the stress enough where turf is not lost."

– **Patrick Blum**, Superintendent
Colonial Acres Golf Course
Glenmont, N.Y.

"Normandie Golf Club was built in 1901, and the course still has the same push-up greens. The greens also have a thatch layer about 2 inches thick. My plan is to aerify with a walk-behind aerifier with half-inch quadratines in March. I've found this is the fastest way to remove layering. In April I'll change to quarter-inch tines and aerify again in May and possibly June. I'll aerify again with quarter-inch quads in September and then with half-inch quads in October.

"Watering these greens shouldn't be too hard this summer even though they contain 70 percent to 80 percent *Poa annua.* I hand-water lightly and frequently in the afternoons daily for about eight to 10 weeks. I won't use a long-term wetting agent but I will use a turf penetrant for flushing and getting the moisture down past any layering that could occur. It's very important to monitor moisture content in the soil profile as well as the weather. I like to keep the greens a little on the dry side. You can always add water but you can't take it away."

– **Kent Critchell**, Superintendent
Normandie Golf Club
St. Louis

"For this season, I plan to continue one tried-and-true turf stress reliever and implement a new plan that I've learned a lot about the past year. Because we are a *Poa annual*/bentgrass golf course with more of the latter than the former, we strive to maintain *Poa annua* and keep it alive through summer stress periods. We have been very pleased with the results we have achieved on fairways and tees with biweekly potassium phosphite fertilizer applications beginning in mid-June and continuing through mid-August.

"Our new stress management plan for our greens is based on the findings of Thomas Nikolai from Michigan State University. We will first establish the ideal speed range for our membership, and then employ a combination of cultural practices, which will allow us to consistently attain that speed without unduly stressing the turf. Instead of relying on simply lowering the mowing height, we plan to increase the frequency of rolling, light sand topdressing, vertical mowing and grooming, double mowing, and plant growth regulator applications (to name a few) to reach our goal."

– **John Gurke**, Certified Superintendent
Aurora (Ill.) Country Club

PHOTO BY: MIKE KLEMME

WHAT A GREAT Concept!

GCSAA could learn something from the functional and fun Idea Fair staged annually by the National Golf Course Owners Association

By Anthony Pioppi, Contributing Editor

When the Golf Course Superintendents Association of America (GCSAA) invited the National Golf Course Owners Association (NGCOA) to become part of its annual conference and show, there was more than one person who wondered: What exactly will the owners bring to the table?

The superintendents already had educational classes, interesting speakers, a golf tournament and the trade show. But at the first Golf Industry Show (GIS) in February, one only needed to wander into the Rosen Plaza Hotel ballroom and the owners' annual Idea Fair for the answer: fun.

While the GCSAA conducts many of its events in a style where a funeral dirge would be the appropriate soundtrack, the owners at the Idea Fair turned in a 90-minute slapstick routine. But here's the best part: The ideas presented were anything but a laughing matter as each one had either made or saved an owner money.

When Jemsek family members, owners of Cog Hill Country Club in Lemont, Ill., told how they converted a few acres of their property into grazing land for sheep and saved $40,000 a year in taxes, you knew people weren't joking.

This wasn't the staid format of the GCSAA's Innovative Superintendent breakfasts, this was yucks and laughs and even a few groans.

NGCOA member Vince Alfonso, who works for the First Tee in Memphis, Tenn., was the master of ceremonies with NGCOA board member Charles Birney acting as his sidekick. For Birney, a general partner of Atlantic Golf, an Annapolis, Md.-based owner, developer and manager of three golf courses, that meant donning an overly snug Superman costume for much of the evening.

Alfonso's rapid-fire delivery of jokes, many of which only he found funny, were interspersed with questions for the 14 contestants and prodding to keep the proceedings on pace. An NGCOA past president, Alfonso has taken part in almost every Idea Fair since it made its debut in 1991. He reveled in his role as ringmaster.

The fun was not just limited to Alfonso and Birney. Speakers had no choice but to be part of the show as they were required to wear a large — very large — light-bulb-shaped hat while making their short presentations.

"It doesn't work if you don't put on the hat," Alfonso told one participant who tried to go without the required uniform.

When Lawren A. Just, president and owner of Persimmon Ridge Golf Club in Louisville, Ky., donned the chapeau, Alfonso

Continued on page 62

Deborah Evans Crawford explains the concept behind Mirada Dollars.

PHOTO COURTESY: NGCOA