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Turf grooming

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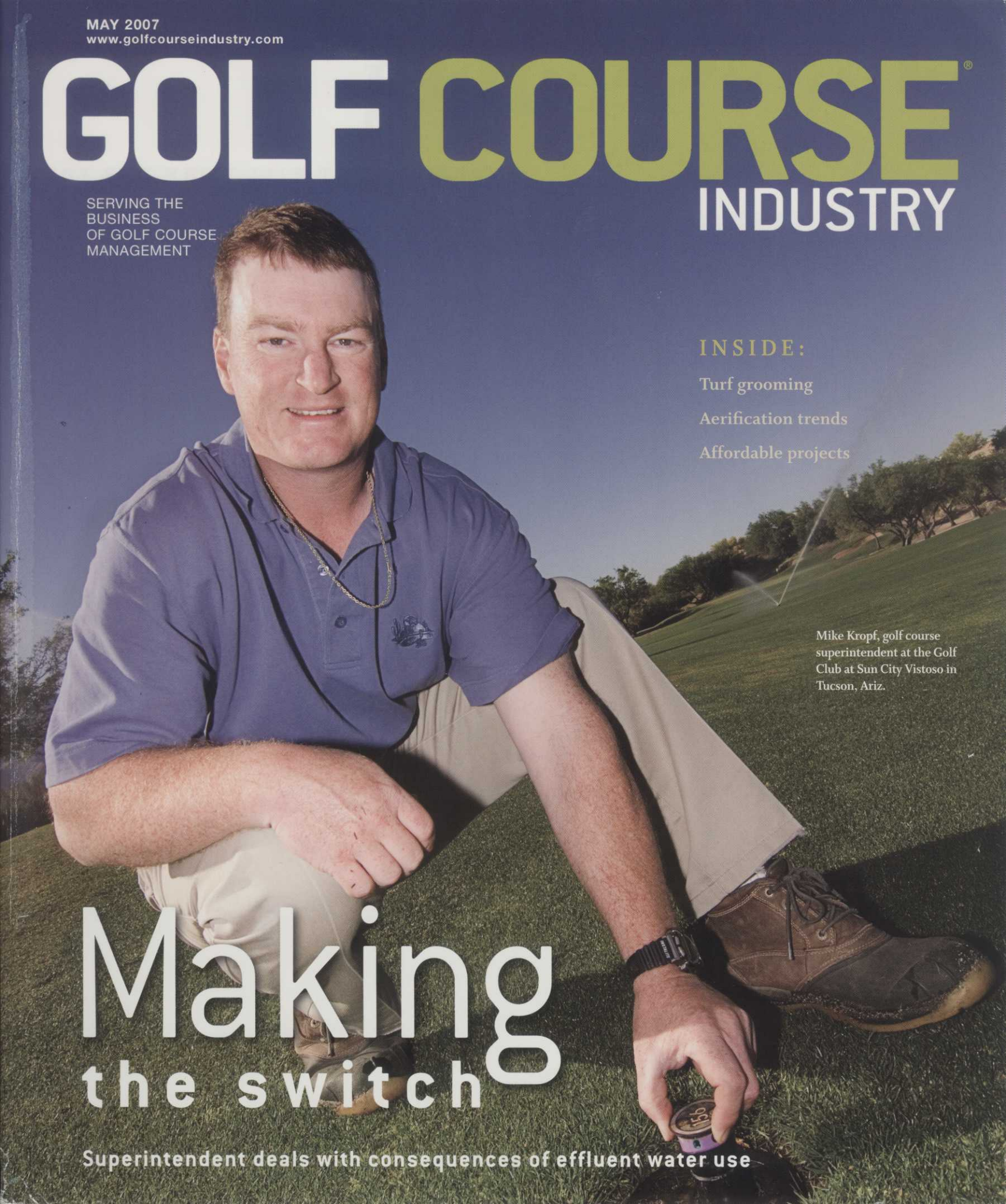

Mike Kropf, golf course superintendent at the Golf Club at Sun City Vistoso in Tucson, Ariz.

Making the switch

Superintendent deals with consequences of effluent water use

TEE 2 GREEN

"Interseeding works for us"

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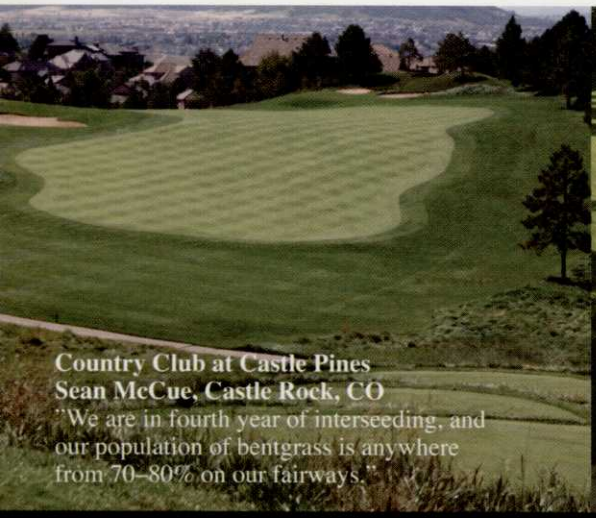
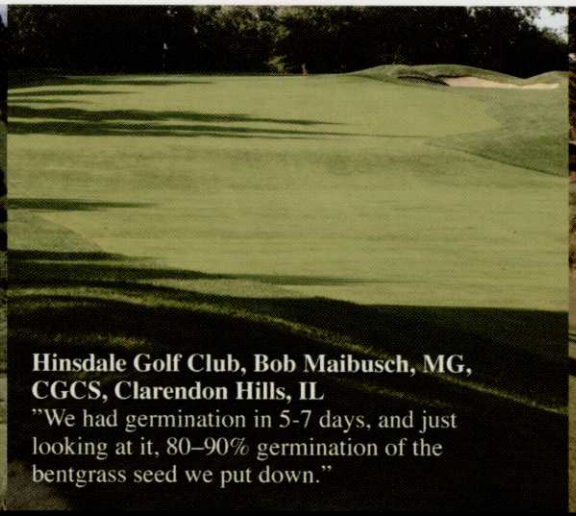
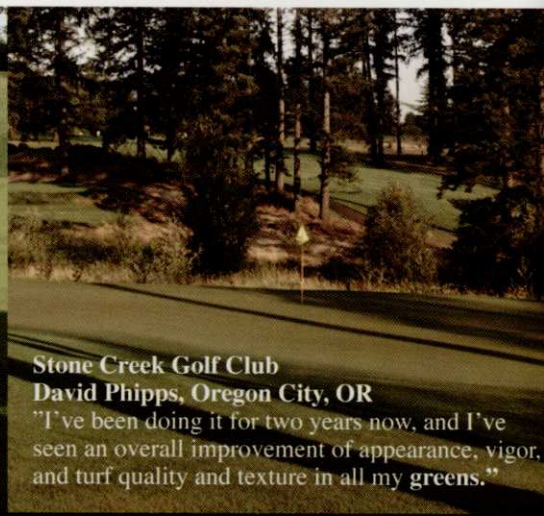


Country Club at Castle Pines
Sean McCue, Castle Rock, CO
"We are in fourth year of interseeding, and our population of bentgrass is anywhere from 70–80% on our fairways."



Hinsdale Golf Club, Bob Maibusch, MG, CGCS, Clarendon Hills, IL
"We had germination in 5-7 days, and just looking at it, 80–90% germination of the bentgrass seed we put down."



Stone Creek Golf Club
David Phipps, Oregon City, OR
"I've been doing it for two years now, and I've seen an overall improvement of appearance, vigor, and turf quality and texture in all my greens."

"I WILL CONTINUE TO INTERSEED TO KEEP GETTING ADDITIONAL POPULATIONS OF BENTGRASS OUT THERE AND TO HELP ME COMPETE AGAINST THE *POA ANNUA* POPULATIONS IN OUR FAIRWAYS"
Sean McCue, Country Club at Castle Pines, Castle Rock, CO

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"I'VE SEEN AN OVERALL IMPROVEMENT OF APPEARANCE"
David Phipps, Stone Creek Golf Club, Oregon City, OR

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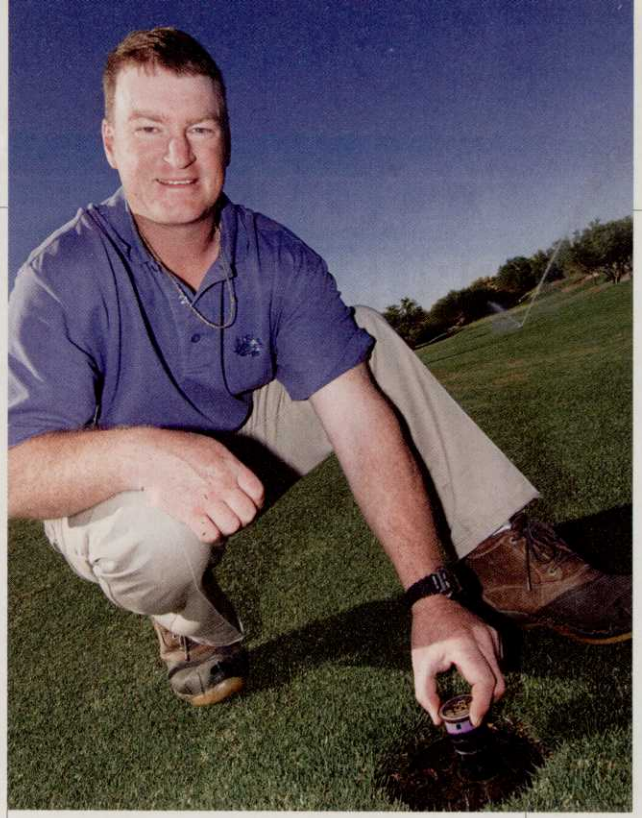

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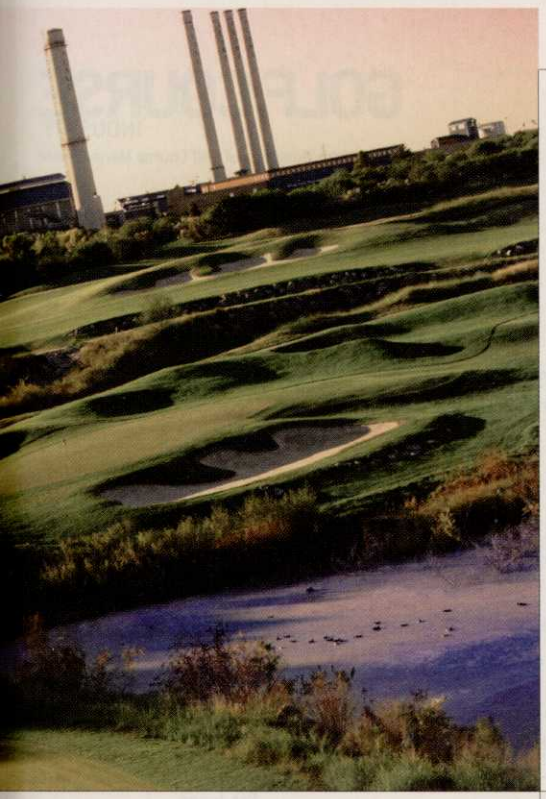

DEPARTMENTS

COLUMNISTS

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RESEARCH

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DRIVEN TO CHANGE
Less than desirable conditions led to an upgrade that lets members at Northmoor Country Club in Illinois make the most of the course's practice facility.

MORE THAN ONE WAY
There are numerous ways to maintain bunkers, but factors such as budgets, green committees and memberships determine how superintendents maintain them.

ONLINE POLL: TOPDRESSING FAIRWAYS
As a golf course superintendent, do you topdress your fairways? Visit the GCI home page to vote in this online poll.

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EDITORIAL MISSION STATEMENT:
Golf Course Industry reports on and analyzes the business of maintaining golf courses, as well as the broader business of golf course management. This includes three main areas: agronomy, business management and career development as it relates to golf course superintendents and those managers responsible for maintaining a golf course as an important asset. Golf Course Industry shows superintendents what's possible, helps them understand why it's important and tells them how to take the next step.

John Walsh
Editor

TIME ON THE BEACH

Whining about bunker quality is a time-honored tradition. Many golf course superintendents say they deal with more complaints about bunkers than anything else, including putting greens. That's because bunkers are hazards, and golfers don't like to be in areas where they don't have control of what happens next.

The real bunker issue isn't pleasing all golfers, which can't be done anyway; instead, it's determining how hazardous bunkers should be. Money, equipment, weather and golfers' skills effect bunkers' degree of difficulty. Superintendents should take the lead on the issue by sitting down with owners and green chairmen to establish bunker standards. Setting standards can reduce complaints and keep more golfers happy. Check out the list of eight bunker questions on page 30, and use them as a guide to help determine bunker standards at your facility.

We would like to hear from you. Please post any comments you have about this column on our message board, which is at www.golfcourseindustry.com/messageboard.

Golfers need to realize the financial limitations of bunkers, and superintendents should explain this to them. Money usually can solve any bunker-maintenance issue, but for most, there's not enough of it to be the answer. Understanding various bunker designs and purposes, and golfers themselves, are the keys to eliminating confusion about bunker maintenance. All those involved should know bunker-maintenance intensity and cost increase proportionally as a bunker shot's degree of difficulty decreases.

Superintendents should educate club members about bunkers and explain that they can't take all the hazardous elements out of bunkers, but they don't have to go to the extreme of telling them not to hit balls in the bunkers in the first place.

One can't discuss bunkers without talking about consistency. It's the goal of well-maintained bunkers. There are many bunker elements superintendents should check to improve consistency: packing and smoothing methods, raking and grooming methods, edging, drainage, liners, sand depth, moisture content and furrows or lack thereof. For example, once a month, superintendents can make sure depth is consistent, which usually involves hand-raking. Also, they can experiment with different rake attachments to meet golfers' needs, but let golfers know that no rake attachment will produce the same pattern because of different moisture levels in the bunkers and the natural elements that prevent bunkers from being the same.

Some superintendents recommend sampling and testing sand every two years to stay ahead of any developing problems such as silt. Sand should be checked for infiltration rate, calcareousness, color (which isn't important agronomically), particle size and penetrometer value. Everything considered, playing quality is paramount.

Skill level also perpetuates the perception of bunker inconsistency. Low-handicap golfers are driving bunkers' smooth conditions because they tend to see a tight lie and consistency, and high-handicap players tend to fear a tight lie because they think they're going to screw up the shot. High-handicap players usually don't care about bunker conditions because they tend to fear the shot no matter what.

The bottom line is that golf isn't fair. Donald Ross once said there's no such thing as a misplaced bunker and it's the job of the golfer not to hit it there. That's not quite the message superintendents want to give golfers – even though many of them would like to – but the more superintendents spearhead the bunker discussion, the better off they'll be.

John Walsh

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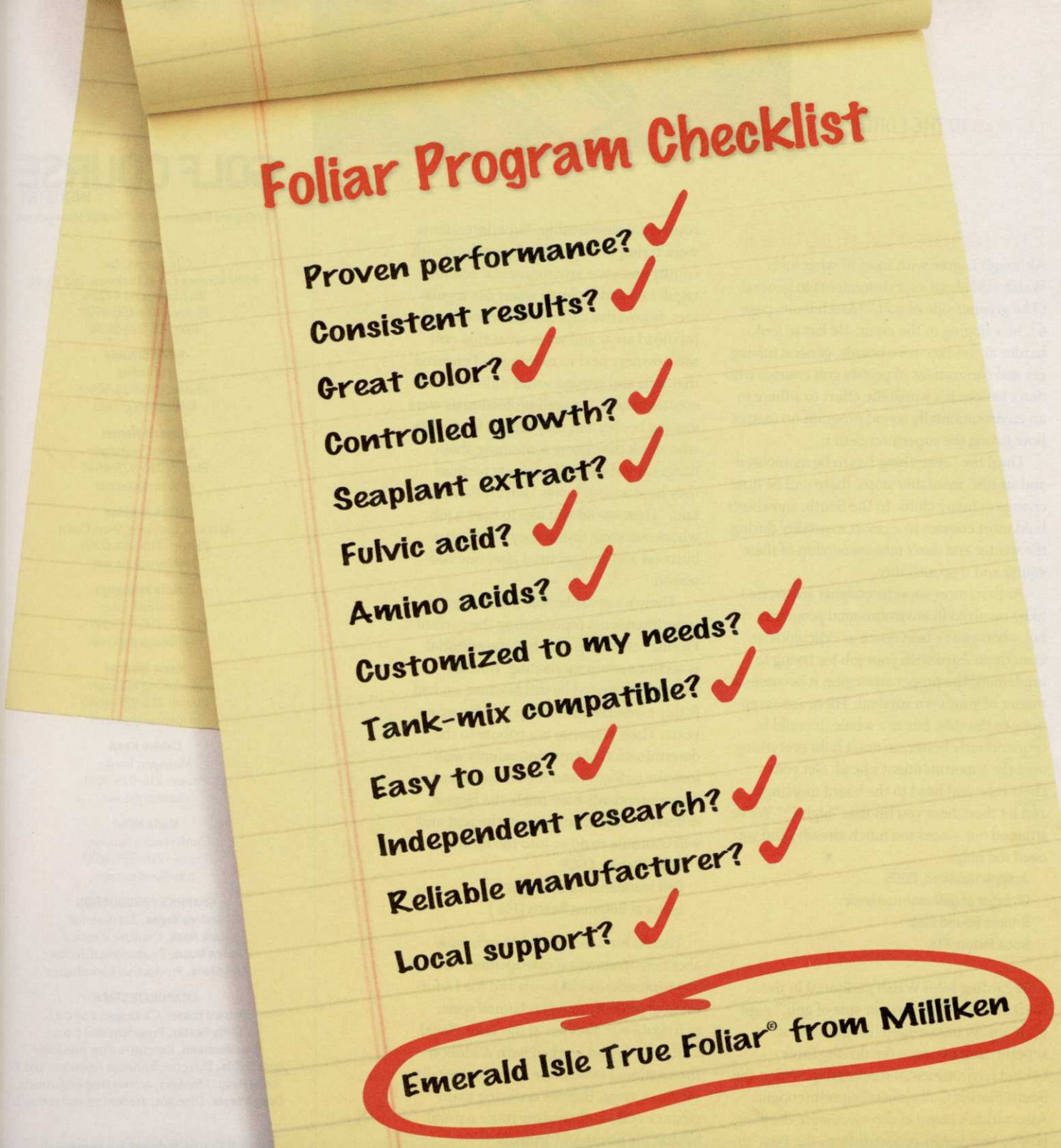

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Environmental practices

Although I agree with most of what John Walsh said about superintendents in general (The greener side of golf," March issue, page 6), he's singing to the choir. He has to look harder at the executive boards, general managers and committees of private golf courses who don't believe it's worth the effort to adhere to an environmentally sound program no matter how strong the superintendent is.

Until the "everything has to be manicured and sterile" mentality stops, there will be little change at many clubs. In the South, snowbirds hold most courses to a resort mentality during the winter and don't take ownership of their equity and responsibility.

At first, most superintendents are excited to be involved in environmental programs, but when you're beat down as ridiculous or even threatened with your job for trying to implement the proper strategies, it becomes a matter of your own survival. There are exceptions to the rule, but as a whole, it could be tremendously better, so don't hold everything over the superintendent's head. Get your choir robe and head to the board meetings and let them hear you hit that "high C." We've strained our voices too much already, and we need the help.

Joseph Hubbard, CGCS
Director of golf maintenance
Broken Sound Club
Boca Raton, Fla.

Regarding John Walsh's editorial in the March issue ("The greener side of golf," page 6), it always has seemed like golf course superintendents were the driving force behind environmental stewardship. When the South Florida Golf Course Superintendents Association's board of directors were deciding how to best use its proceeds from the First South Florida Turfgrass Exposition 20 years ago, they unanimously decided to concentrate on environmental research. This decision was firmly endorsed by the membership, the Florida Turfgrass Association and the University of Florida.

I've visited more than 400 golf courses while I was a sales manager for an equipment company, and I didn't see one example of superintendents who simply didn't care or were too lazy to concern themselves with environmental stewardship. Superintendents were trying to establish relationships with county and state environmental resource regulators and regional water use regulators. Innovative superintendents devised mix/load areas and wash areas that cost their owners next to nothing and ensured that soils and ground water didn't become contaminated. Devoted professionals were unsung heroes and easy targets for people who think they know something about turfgrass and the golf business because they have a yard. It was Don Shula who said, "How would you like to have a job where everyone thinks they know your business and you get fired after one bad season."

There's a considerable percentage of superintendents representing the current Florida leadership who feel the editorial is accurate, even motivating. Initially, I was dumbfounded by this because we had firmly taken the leadership role for many years. Their response is a tribute to the determination of superintendents who love the outdoors and the environment. Superintendents have made the biggest difference at golf facilities in the past and will continue to do so into the future.

Scott Wahlin, CGCS
Golf maintenance manager
Links at Boynton Beach (Fla.)

Thanks for a thoughtful March issue about environmental management. Our superintendents Cal Lewis and Joe Deforest take pride in using reclaimed water to irrigate our 45 holes at the Lake Placid Club. We've also worked with Audubon International to increase environmentally sensitive areas, thereby reducing maintenance costs and creating more natural habitat for plants and animals.

Furthermore, to ensure eternal protection of the tees, greens, fairways and rough of our two championship courses, we entered into a conservation easement with Audubon International whereby the designated areas might never be developed for anything more than a golf course or cross-country skiing trails.

Arthur Lussi
Director of golf
Lake Placid (N.Y.) Club

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SALES
GIE Media, Inc.
4020 Kinross Lakes Parkway, 2nd Floor
Richfield, OH 44286
Phone: 800-456-0707
Fax: 216-925-5038

Kevin Gilbride
Publisher
Phone: 216-925-5090
kgilbride@gie.net

Russell Warner
Account manager
Phone: 216-925-4647
rwarner@gie.net

Amee Robbins
Account manager, West Coast
Phone: 310-546-6060
arobbins@gie.net

Bonnie Velikonya
Classified sales
Phone: 216-925-5075
bvelikonya@gie.net

Marie Spencer
Marketing manager
Phone: 216-925-4640
mspencer@gie.net

Debbie Kean
Manager, books
Phone: 216-925-5011
dkean@gie.net

Maria Miller
Conferences manager
Phone: 216-925-4657
mmiller@gie.net

GRAPHICS / PRODUCTION
Andrea Vagas, Art director
Mark Rook, Creative director
Helen Duerr, Production director
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10 tips for a successful job interview

Bruce Williams, director of courses and grounds at The Los Angeles Country Club, has plenty of experience on both sides of the interview table. During the past 20 years, most of his time in job interviews has been spent on the interviewer side of the table. After conducting hundreds of interviews for prospective golf course superintendents, Williams has a few ideas about what candidates can say to get a job.

Interviewees will sit before a panel of people involved with golf course operations. They could range from the general manager or director of golf of a facility to a private club's green committee or park district's selection committee.

Based on his experience sitting on some of these committees, Williams offers 10 points to follow to win over the multiple types of interviewers when applying for a position. These tips can be applied to jobs at any golf course in the United States, he says.

1. There's no need to cram for the interview exam; you either know things or you don't. If you don't know facts about the club before you go in, you're not going to soak up that knowledge two days ahead of time.

"These things don't happen quickly," Williams says. "You can't just look stuff up on the Internet. Surely there are a couple of weeks to prepare from the time you apply for the job until the interview."

Prospects should prepare until they feel comfortable with the golf course's history and current information. Learn what makes the course unique, and find out if there are any projects in process. Is there any construction planned for the course?

Mock interviews help to increase the comfort level as well.

2. Have an agronomic plan in mind for the property. Prospects need to be able to communicate their vision for the future and how they would accomplish it.

3. Know the history of the facility, including the architect and the former superintendents who worked there. Also, know the financial information about the club and department. Know if the club has a waiting list, if it's profitable, etc.

4. Ask for a collection of soil tests, water tests, USGA reports or other consulting reports prior to the interview. Interviewees should review this information before the interview so they can speak intelligently about it.

"In addition to getting the job, I would want to know if I can be successful with resources that are currently there and if I can make improvements with those resources," Williams says.

Whatever the condition of the course, don't make the mistake of insulting the current owners.

"People tend to be proud of their facility, so you have to walk a fine line," Williams says. "Go for constructive criticism rather than drawing negatives."

5. Analyze your staffing and budgetary needs before the interview and make appropriate recommendations. If the potential employer asks the interviewee what he or she thinks about the budget, the prospective hire should be able to respond with an intelligent answer rather than asking the interviewer what the budget is. To keep up with or exceed the competition, acquire that information before the interview.

6. Bring copies of your accomplishments and work at previous positions. Show before

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and after work pictures. This is another way to get a leg up on the competition.

"When I would go into the interview, I would make sure every person has a portfolio with my resume and a business card attached," Williams says.

7. Be relaxed and be yourself. Let your personality glow and show. Don't let your nerves lose the job for you. Being relaxed comes with adequate preparation and practice. Being relaxed also can help the interviewee feel more like himself or herself.

"Sometimes people make the mistake of trying to be somebody they're not," Williams says, adding there's a fine line between confidence and overconfidence. "If somebody says, 'You're going to make a big mistake if you don't hire me,' that's too much."

Fitting in appearancewise also helps the interviewee to feel more comfortable.

"If you think everyone in there is going to wear a coat and tie, why would you go in with golf attire?" Williams asks. "If you don't know, it's OK to ask. Some people go out and golf afterward."

A general rule of thumb is to wear a sport coat and tie or suit. Don't overdo it.

"A tuxedo isn't necessary," he says.

8. Reflect on the business acumen side of things and show future employers how savvy you are on the business side of things. Terms such as return on investment and net profits should not be foreign to applicants.

"People worry about which agronomic questions are going to be asked," he says. "Usually less than 20 percent of the interview questions are agronomic."

Job seekers should focus on other topics of conversation, including business aspects.

9. Show examples of team building, development of training programs, motivational techniques, etc.

"Businessmen understand these things much more than plant pathology and soil science," he says.

Applicants should use portfolios to highlight this.

10. Tell the interviewer you want the job and why you are the best fit. Sell yourself. Some candidates go through the interview without ever mentioning they want the job, which is a mistake.

"Tell them when you go in that you want the job," he says. "Then, during the course of the discussion and when you close the interview, tell them again you want the job," he says. "Don't be redundant. Tell them you're excited and you'd be a good fit."
– *Heather Wood*

The GCSAA Career Services Center also offers help for job seekers. Visit www.gcsaa.org/career for more information.

The international way

A BLECovater cuts channels to a 10-inch depth on 10-inch centers. Photo: Quent Baria

Quent Baria, CGCS, at the Towson Golf & Country Club near Baltimore, took the road less traveled with his putting greens: the international route. Rather than California, push-up or USGA-spec greens, Baria tried a less-often-used method – the international green method – which he says brought greater benefits than conventional methods.

Baria took the superintendent position at the Geoffrey Cornish-designed, 35-year-old course in 2002. A year later, heavy rain – 32 inches in 58 days – spelled trouble for the greens, which had no drainage system.

"Eight greens were dead before Memorial Day," Baria says, adding that putting surfaces at other holes seemed to be doomed as well.

Baria knew a change had to be made, but the club didn't have the estimated $1 million to rebuild the greens completely. Instead, Baria built on top of the existing greens, which cost about $250,000.

The course closed in June 2003, and the project began. With help from Columbia, Md.-based Ed Beidel, a member of the ASGCA, and with the input from club committee members, design alterations in the greens were addressed. Green configurations were adjusted to make existing bunkers more relative to play.

Surface contours were softened so the greens remained fair, yet challenging. This was necessary preparation for the faster green speeds achieved with the new generation bentgrasses, Baria says.

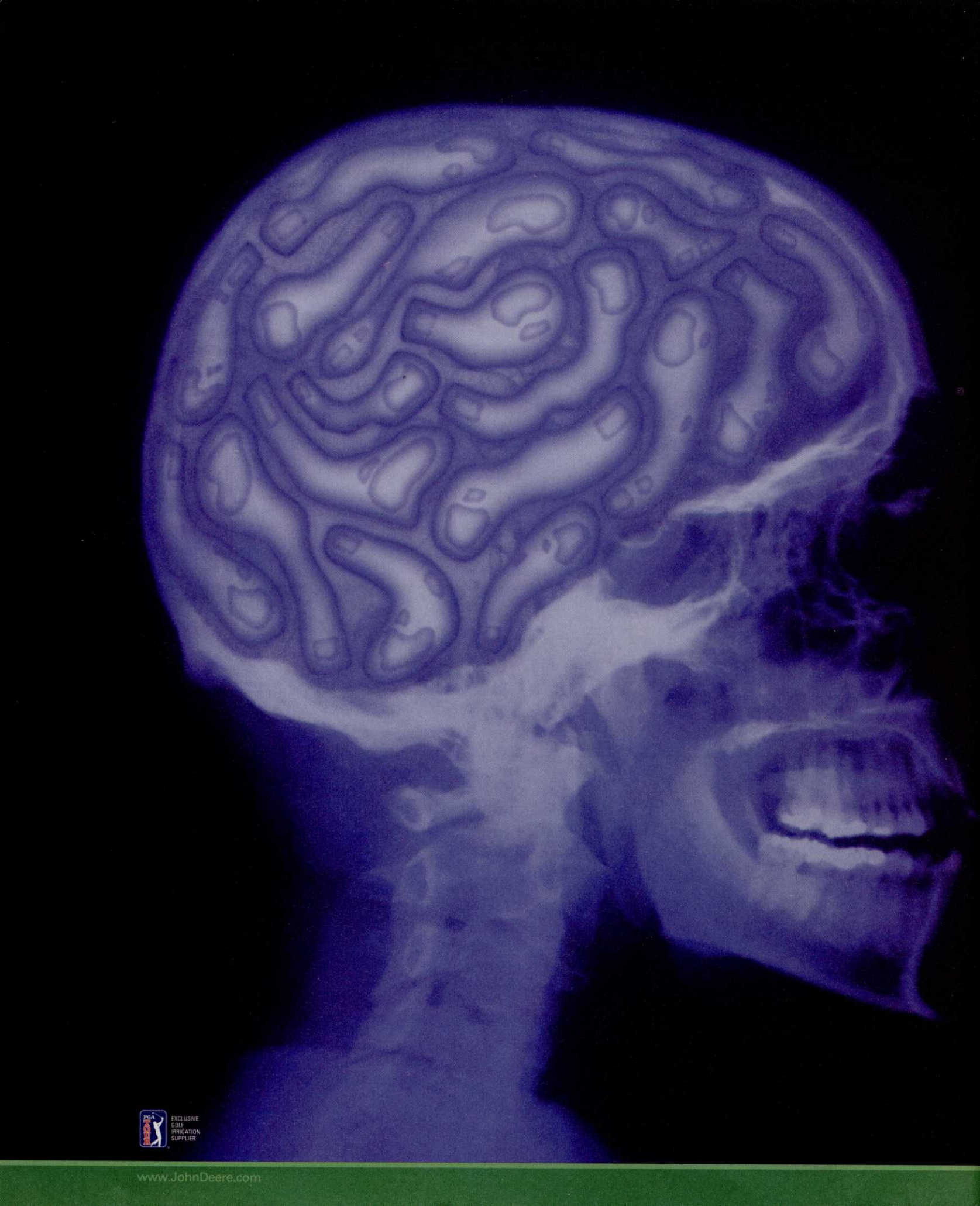
The first step of building on the greens was spreading sand over them. Harmon Turf Services of Hillsville, Va., then performed the on-site soil blending. Baria has heard many in the industry say on-site blending can't produce quality, homogenous results, but that wasn't the case.

"A uniform, six-inch cultivation depth was achieved," he says.

The next step is what gives the international green method its name. The crew used a BLECovater, which, coupled with the method of using it, is from the U.K. The machine cuts channels to a 10-inch depth on 10-inch centers at width of about three-quarters of an inch. The channels can be filled with rice-size gravel.

"This creates negative hydraulic conductivity to move water into the profile," Baria says.

The greens were then covered for methyl bromide gassing. This cost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Three different organic fertilizers were used to rapidly rebuild the essential microbial population for plant growth. An inorganic starter and gypsum also were applied.

Penn A-1 bentgrass sod, obtained at $1 per foot, was installed. When the process was complete, Towson had functional greens for about $2 per square foot. The course opened for play Aug. 26, less than three months after the project began.

Four years after the greens reopened, Baria continues to experience desired performance from his greens. The channels pull in and hold water, which means Baria doesn't see as many instances of localized dry spot as he did with the old greens. They also seem to recover quickly from other afflictions.

"After a freeze, our greens are ready three to five days before the others in the area," Baria says.

The greens stand up well to the stress that comes with 23,000 to 24,000 rounds per year, he adds. The second year after the greens were installed, there were only six to 10 days where they needed to be hand-watered. They continue to require few days of hand-watering and less maintenance than courses with more conventional greens-building methods, Baria says. – *HW*

Quent Baria, CGCS, renovated the putting greens at Towson Golf & Country Club using the international method, which cost about $2 per square foot. Photo: Heather Wood


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TURF HERBICIDE

The staff at Broken Sound Club is used to hurricane preparation. Photo: Joe Hubbard

Never too early

For Joe Hubbard, the name Wilma will always provoke a certain dread. Hubbard, golf course superintendent at Broken Sound Club in Boca Raton, Fla., has put the golf course back together after a few violent storms during his time there, though none have caused as much havoc as Hurricane Wilma.

Hubbard and his crew had just cleaned up after the damage Hurricane Francis caused in 2004 when Wilma hit the area in October 2005 with 140-mile-per-hour winds and caused more than $1 million worth of damage. It took more than a year to clean up, Hubbard says, adding that trees were wiped out, changing the layout of the course.

"Nothing will ever be exactly as it was before the hurricane," he says. "You can't replace the trees; the landscape was devastated."

Other named storms, including Jeanne, Frances and Katrina tore through the course and left a mess, though none were as devastating as Wilma.

This year, the chances of Hubbard and his crew getting a break look grim. Weather expert William Gray recently released his prediction that there will be 17 named storms this year, five of them major hurricanes. Gray, who heads the Tropical Meteorology Project at Colorado State University, says the probability of a major storm reaching land on the U.S. coast this year is 74 percent, compared with the average of 52 percent throughout the past century.

While hurricane season is still a few months away, golf course superintendents who've been affected by storms say it's not too early to form an emergency plan.

Hubbard was the first of his team to get to the course after Hurricane Wilma, allowing the crew to put their families' safety first. He spent many hot, humid nights on a cot in his office as he and the crew worked seven days a week to get the course back into shape. The power was out for several days, which made the high temperatures more unbearable.

The crew cleaned up the downed oak and Ficus trees, replaced the damaged sod and refilled the bunkers. Bunker sand had blown probably 50 miles away, Hubbard says. He brought in heavy equipment, including

front-end loaders, as needed, but says some courses spent the money to have them on hand.

Hubbard hired contractors and temporary workers to share some of the workload with his crew. The blow Wilma dealt, just after cleanup from Jeanne was wrapping up, helped boost low morale among the workers, Hubbard says.

"I increased the crew's hours for a couple of months and put more money into my people's pockets," he says. "They had more money to help their families."

In the wake of such disasters, Hubbard would like to see more collaboration. Golf courses with less damage should put politics aside and help neighboring courses who aren't as lucky.

Terry Wood, golf course superintendent at Naples National Golf Club, says the last time a major hurricane hit that part of Florida was Donna in 1960. But even storms considered minor can cause damage. After Wilma blew through in 2005, the course was left with $1.5 million worth of damage.

The course was just starting its season and had been open for two or three weeks when news of a storm came through. The course was closed the day before it was supposed to hit that area. This gave the staff time to move their families to a safe place. The storm dumped more than five inches of rain on the golf course – not bad compared to other locations and other storms that year, Wood says. But the winds that accompanied it were enough to cause considerable damage.

"We lost more than 635 trees, many of them pine trees," he says.

Wood's 24-man crew was on the course the day after the storm helping to make it playable again. Contractors helped grind the trees and haul the stumps away. With the exception of a roof, most damage was contained to the debris scattered around the course, Wood says. The power outage lasted for a few days.

Hubbard and Wood say people in general are more prepared for hurricanes now than they were two years ago. More businesses are ready with backup generators. Golf courses in storms' paths have better ideas about how to prepare for a natural disaster.

Hubbard and Wood already have started to prepare for the storm season. Items on their checklists include:

- Create hurricane preparedness kits that include flashlights, medical supplies, contact sheets with information for emergency generators and a bottled water supplier;
- Meet with the other department heads and create or review an emergency plan;
- Keep a list of emergency contact information for all employees;
- Have the name of a reliable tree contractor lined up;
- Avoid as much tree damage as possible by trimming trees before the hurricane season starts; and
- Keep an adequate fuel supply. Be sure gas pumps are manual, not electric, in case power is lost.

Storm seasons don't always turn out how they're predicted. For example, Gray forecast 17 named storms for 2006 including nine hurricanes, five of them major ones. Instead, there were 10 named storms and five hurricanes, two of them major hurricanes.

But Hubbard doesn't focus on the numbers.

"Whether they say there will be two or 30 storms, we always try to stay prepared," he says. "That's what a true Floridian does." – *HW*

From nine to five

What started out as a nine-hole addition at Hinckley (Ohio) Hills Golf Course ended up as a five-hole course aimed to attract beginners, youngsters or those who simply don't have time to play nine or 18 holes.

The project began eight years ago, according to golf course superintendent Jean Esposito. Her family, who owns the 18-hole, Harold Pack, Sr.-designed course, wanted to add nine holes but encountered problems securing land necessary for that size addition. Three years later, after five new holes were completed (three on the back side, then two more on the front side), they were integrated into the existing course and a cluster of five par-4 holes were made into The Buzzard's Nest, named after the bird who vists the course yearly.

"The Buzzard's Nest is good for the mother and son who like to play, but think nine holes is too much," Esposito says. "We thought five would be just enough."

Esposito hopes that attracting a more diverse group of golfers will help improve business. Yearly rounds at Hinckley Hills are below 20,000, not nearly what they used to be, she says, citing the economy, gas prices and competing outlets for people's disposable income as some of the causes for the decline.

When the Buzzard's Nest opened, it included holes four, five, six, 12, 13 and 14 from the existing course. The newly built holes took their places, moving from the inside of the course to the outer edges. The holes from the existing course that were taken out of play for the five-hole course sat out of commission before the Buzzard's Nest opened to give the stressed turf a break.

The original 18 holes opened in 1964. Until a few years ago, the layout hasn't been changed. The only exception was 10 years after it opened when the front nine became the back nine and vice versa.

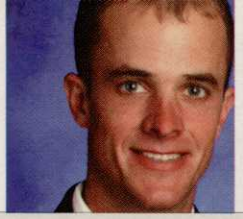
In the beginning, Esposito's family was one of three owners. Each of the three families, including the children, labored to build the course. Much of the work was done in-house.

The original golf course superintendent (and Esposito's father) Donald Krush, 89, continues to keep her up to date on industry practices. He was involved heavily in the design and construction of the course, including the addition eight years ago.

"My dad was on a bulldozer during the construction," Esposito says.

The new holes were built consistently with the old ones. Penncross bentgrass (with some *Poa annua*) are on the greens, and a bluegrass/ryegrass/fescue mix is on the fairways. Esposito, along with her husband, Mark, nephews and a handful of other part- and full-time help, manage the grounds. Her sister, Sue Smith and nephew, Mike Smith, manage the concessions and pro shop, respectively.

Operating the course is a seven-day-a-week job for some of the family, which means holiday dinners during the golf season are spent in the clubhouse's back room. Esposito doesn't mind that because she enjoys the industry and aims to foster a greater enjoyment of the game among golfers, five holes at a time. -*HW*



Michael Heustis, the assistant superintendent at Chicago Golf Club in Wheaton, Ill., is an active member of the Midwest Association of Golf Course Superintendents. He can be reached at michael_heustis@hotmail.com or 630-668-3588.

UP FOR THE CHALLENGE?

As I left the maintenance facility to go home one day, my dog and a member's dog that I was watching for two weeks ran toward a nearby road. The dogs never looked back when I called their names because they were in pursuit of a squirrel. I wasn't as worried about them getting into harm's way as I was disgruntled because they ignored me. As I approached the dogs, I noticed a concerned man who loaded the dogs into his van. I was unable to get his attention before he drove off with them. I quickly caught up with him a few blocks away. Ironically, he was an employee of the member and already had paged him to inform him of his "lost dog." After a quick phone call back to the now-stressed member, I reassured him his dog and mine were fine and in good hands. I felt foolish, but there wasn't much I could do. I could have tied up the dogs, but they had never run off before, so that didn't seem necessary.

I tell this story because it's a close analogy of the different challenges assistant superintendents face throughout their early years in the profession. The challenge isn't well-trained dogs not listening to commands, but career challenges you've trained yourself well for yet your hands are tied still.

A unique challenge many assistants face is the abundant career advice they receive. Knowing exactly how to filter and customize this advice to fit your situation while providing the best potential outcome can be difficult. Being able to implement all the career advice you ever received undoubtedly would put you at the top of any search committee's list of candidates. However, cost and time constraints often eliminate important issues. Realistically, the more feasible advice will be put into action by many, but it's the advice requiring more money, time and effort that will set others apart.

For example, it's been recommended for many years to create a personal/professional Web site to enhance your accomplishments. This would allow a search committee to understand your achievements and dedication to work in greater detail. It's an expansion of a resume and a great opportunity to cover areas not discussed in an interview.

Of course nothing is free. If you balk at the price of creating a Web site, as many do, chances are you need to shop more. If price still is a concern after significant shopping, refrain from buying a new television, for example. We all love toys, but chances are the Web site will pay for itself before the television does, or convince yourself the advice requiring more effort and less money is worth accomplishing when ample funds aren't available. This might include networking at local association meetings, writing a thank you note or volunteering. Once you're comfortable with that, advice requiring some money might be the next step. Keep in mind this is a small investment with high potential for long-term gains.

Realistically, the more feasible advice will be put into action by many, but it's the advice requiring more money, time and effort that will set others apart.

In addition to being overwhelmed by career advice, all assistants with any career goals seem to face one more big challenge. Patience is the challenge of being late in your career as an assistant and having to wait for the job (a) you've always wanted and/or (b) the job you've prepared yourself for for years. In your mind, the stage is set. You have an idea of what style and caliber golf course at which you want to begin your career as a superintendent. You've used all the career advice previously mentioned to the best of your ability and have recaptured your many accomplishments on your resume. These might include items such as the courses at which you've been employed, being an active part of your local association, preparing a course for a tournament, continuing education and, most of all, maintaining the desire and drive to be a great superintendent.

However, one thing lacks – the market for superintendent positions is at its tightest when you're looking for a change. You quickly realize the drag of the job market after a month or two, or even a year of having local and national Web sites burned onto your computer screen while searching for jobs. Perhaps the first few interviews are for practice. Those interviews will only make you better. We've all heard the words of wisdom "great things come to those who wait," but perhaps this is only a phrase of comfort as we do our best to maintain our patience.

Implementing others' advice and being patient with your career are only two challenges among a number of others assistants face throughout their careers. Although challenges might range from experience levels to family matters, the two challenges previously mentioned are common ones every assistant experiences. Taking on any number of challenges that cross your path will only make you a better person. You never know, it might be just what the search committee is looking for. Good luck! GCI

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Jeffrey D. Brauer is a licensed golf course architect and president of GolfScapes, a golf course design firm in Arlington, Texas. Brauer, a past president of the American Society of Golf Course Architects, can be reached at jeff@jeffreydbrauer.com.

YOUR ROLE IN CONSTRUCTION

A golf course superintendent recently suggested that, while he has enjoyed my columns about the practical aspects of course renovation, I could help him more directly by writing about how he might be involved in an upcoming renovation project.

It's a great suggestion because a superintendent usually becomes an owner's representative based on the theory that he knows most about the golf course components that are installed. While this is true, superintendents rarely have much training in construction management, and in general, the golf construction industry is less sophisticated about contract administration than other fields, where full-time administrators are the rule, and it's often a separate profession from designers.

Of course there are seminars, books and even college majors about construction administration. Federal, state, county and city agencies often have their own contract administration manuals and protocols. It's a big subject, so let's look at the big picture of construction evaluation.

A superintendent's role in construction can be stated simply as watching all construction as if he's going to live with the results, which is exactly what happens. After construction, a superintendent's job will be affected by how the contractor handled the details. Every poorly tied-in, green seed-bed edge; bad irrigation thrust block; missed drainage area; or uneven piece of sod a superintendent can prevent by directing a contractor to install them correctly means there will be one less problem for him to fix after construction. Even if the contractor fixes the problem under warranty, it's one less hassle and one less deterrent to maintaining the course. So, it's likely a superintendent will push for the best detail work possible.

In theory, a superintendent should see everything put in the ground to assure the best possible installation. Construction evaluation is a full-time job if done right. In practice, a superintendent – given his other responsibilities, which ought to be reduced by being out of play or through delegation – should ride throughout the course as often as possible, visiting each construction operation as frequently as possible, often unannounced, to let work forces know he's watching regularly. The more a superintendent sees, the more mistakes he's likely to catch or prevent.

A superintendent's role in construction can be stated simply as watching all construction as if he's going to live with the results.

Contractually, it's not as simple. Normally, a superintendent is protecting an owner's interests by having his crew do a quality job under a prescribed budget and a services contract, if any. A superintendent's work as an owner's representative means he'll be working within parameters set in a golf course design agreement and a multimillion dollar construction agreement to get what an owner paid for under those agreements. Those agreements can be daunting, but a superintendent can't avoid them, and his first order of business is to become familiar with their basic outlines and most important details.

Responsibilities can vary, but generally, a golf course architect is responsible for designing and specifying the improvements, usually with an owner's and superintendent's input and approval. During construction, an architect probably is contracted to visit the site about once a week. Under those limitations, he can't see every construction operation or detail, especially if buried after installation, so a designer and club will rely on a superintendent to monitor construction quality daily. Depending on a superintendent's exact role, he'll report any problems to a golf course architect or have the authority to direct a contractor to correct mistakes.

A contractor is responsible for building the project to a golf course architect's specifications. The best ones follow the letter of the specs closely and even try to provide a bit more while still trying to make a reasonable profit.

Human nature and the dynamics of the three-party contract suggest that, no matter how professionally everyone approaches the project, there will be at least some minor conflicts of opinion, if for no other reason than a contract is set up to encourage that for the best resolution dispute.

That type of contract puts a superintendent right in the middle of things. He'll find, like all things, it's really a people business. A superintendent's first responsibilities include maintaining a professional presence and attitude on behalf of an owner, working within the parameters of a construction contract between an owner and contractor, receiving what might be reasonably inferred in the construction contract from the contractor, and working within a construction contract and budget.

Next month, we'll cover specifics. **GCI**

Jim McLoughlin is the founder of TMG Golf (www.TMGgolfcounsel.com), a golf course development and consulting firm, and is a former executive director of the GCSAA. He can be reached at golfguide@adelphia.net or 760-804-7339. His previous columns can be found on www.golfcourseindustry.com.

WEB SITES MAKE A DIFFERENCE

Can there be a greater difference between night and day? I thought not until I noticed the difference between when a superintendent applies for a job with the support of a personal Web site and when a superintendent applies for a job without one. The availability of a quality, personal Web site transforms the job application process from an arduous, uphill climb to coasting down hill on a well-oiled bike. If you doubt me, read on.

STANDARD JOB APPLICATION PROCESS

The traditional job application process unfolds in the following, always-challenging manner:

1. From the start, trouble begins when candidates submit a cover letter with a resume because candidates have a bad habit of overloading their resumes with too many words, pages and supporting photographs that make it difficult for a search committee to evaluate their applications.

2. Once received at the club/course, the game of resume Russian roulette begins – applications are put into an ever-growing pile that frequently caps out at more than 100 resumes per job opening.

3. The glaring weakness with the search process is that search committees generally don't know how to identify the approximate six best candidates they want to interview. Consequently, search committees resort to what's tantamount to a lottery process to identify who will be interviewed and who won't, leaving most of the better applicants without an interview opportunity.

4. While the problem is over for those not interviewed, it's just beginning for those selected for an interview because now they face the daunting task of hard selling themselves cold-turkey to an uninformed search committee in a very few minutes. This results in candidates invariably committing interview suicide because (a) they generally wait to submit their plans of action until walking into the interview room, which guarantees a bland interview; and (b) to overcome the handicaps of ill-defined resumes and late action plans, they talk more about their past jobs than where they would take the target maintenance program specifically if hired.

In summary, is it any wonder that the vast majority of superintendents and assistants applying for jobs not only get discouraged but also begin to doubt themselves seriously?

DEFINING A QUALITY WEB SITE

Before looking closely at the Web-site-supported job application process, it's important to identify what defines a quality Web site because weak Web sites will not get the job done. The simple logic that applies here is that quality Web sites require a quality inventory of links to the home page. For example, the following summary profiles should be linked when applicable:

> For the next several years, submitting an application with a quality Web-site address virtually will gaurantee an interview.

education history, assistant jobs, superintendent jobs, in-house construction projects, career summary, a consolidated resume, published articles, references and a possible wild card link to address unique situations. (See a model Web site at *www.stevenrenzetti.com*.)

The majority of the dozen or so Web-site drafts sent to me each month for my review are sub par. Therefore, anticipate it will take working through several drafts before a candidate will be able to finalize an effective Web site. (For further commentary about this subject, read my March 2004 *Golf Course Industry* column.)

WEB-SITE APPLICATION PROCESS

The Web-site-supported application process is evolving in the following manner where applicants:

1. Prepare a more aggressive cover letter that will present the applicant's Web-site address together with a request for access to specific course data/information that will facilitate the preparation of a more definitive action plan.

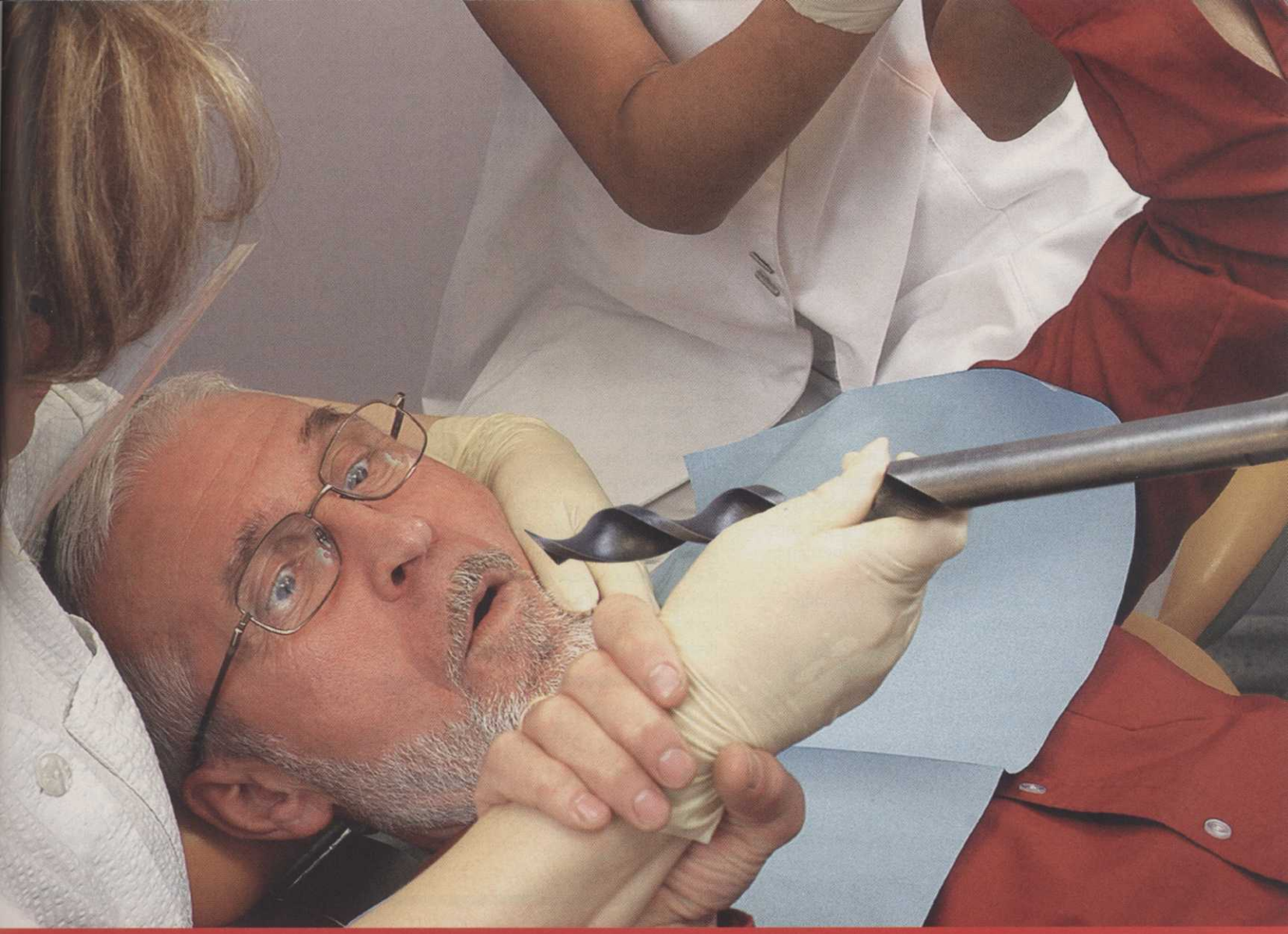
2. Forward the cover letter with Web-site address via e-mail to the search committee chairman who will distribute the application upon receipt to the entire search committee electronically. Two strategic benefits quickly gain are that the candidate's submittal won't be put in the stored pile of more than 100 hard-copy resumes received and the search committee gains immediate access and time to preliminarily review the applicant's credentials comfortably.

For the next several years, submitting an application with a quality Web-site address virtually will guarantee an interview. Soon thereafter, applications received without Web-site support generally won't be considered seriously.

3. Prepare an appropriate action plan of comfortable length (less is more) that will summarize a candidate's approach to the vacant job should he or she be hired, and submit it electronically to the search committee 10 days prior to the interview. This will allow the search committee to become completely familiar with a candidate's action plan well *before* interviewing.

This benefits the candidate significantly because it eliminates the need to hard sell and precipitates a solid interactive question-and-answer session with the search committee that allows candidates to present themselves comfortably and effectively in their best professional light. This is how jobs are won.

Not only are quality Web sites the golden key to effective career advancement, they're also the key to elevating an entire profession, given the opportunity. **GCI**



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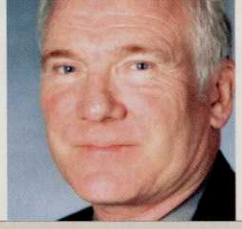


Robert A. Milligan, Ph.D., is professor emeritus from Cornell University and senior consultant with Madison, Wis.-based Dairy Strategies. He can be reached at 651-647-0495 or rmilligan@trsmith.com.

MOTIVATIONAL WORK ENVIRONMENT

"What can I do to motivate (insert employee name)?"

Undoubtedly, this is the most common personnel management question I receive. It's a great question but also difficult and complex. It's easily the most researched and written-about question in organizational behavior.

Let's discuss the question by making three key observations:

1. In a technical sense, the answer to the question is "you can't." Technically, all motivation is self-motivation. For example, I'm the only one who can motivate myself. Don't be alarmed. Although true, this reality doesn't stop you from influencing your employees' motivation levels. But remember, your task is to provide an environment in which your employee will choose to be motivated. Think about the analogy of sports coaches. They can't play the game, but they can teach skills and develop strategies and tactics to enable players to succeed when playing a game. Similarly, superintendents can provide the goals, rewards and culture in which your employees will choose to be motivated.

2. Decades of motivation research haven't given us an exact recipe for the ideal motivational environment for employees. However, there are principles – often differing from common practice – that provide excellent guidance. There's more about this research below.

3. Within the general guidelines of the research, each employee is unique when it comes to providing a motivational environment. Some are self-motivated and seemingly (but not correctly) need little attention from their supervisors. Others retain motivation with constant encouragement and compliments. Still, others require stiff consequences to motivate them to refrain from unacceptable behavior (such as tardiness) and remain focused on excellent work.

Author Marcus Buckingham says great managers discover what's unique about each person and capitalize on it. What you must do to motivate employees can be analogous to putting greens. Each green has a uniqueness that must be recognized and responded to before a course will exceed golfer expectations consistently. Similarly, there are motivation principles that must be supplemented with knowledge about each individual's uniqueness to achieve a motivated golf course maintenance staff.

> Remember your task is to provide an environment in which your employees will choose to be motivated.

Perhaps the most frequently referenced motivation theory is psychologist Frederick Herzberg's two-factor theory. The first set of factors, called maintenance or hygiene factors, is crucial to employees because a lack of these items causes dissatisfaction among employees. These factors include:

- Economic factors;
- Security needs;
- Social needs;
- Working conditions; and
- Status.

All managers recognize the importance of these factors. However, most believe that providing fair levels of these factors will provide an environment that motivates most employees. Herzberg's theory maintains that fair levels of these factors will eradicate dissatisfaction largely, but these factors don't create a motivational work environment.

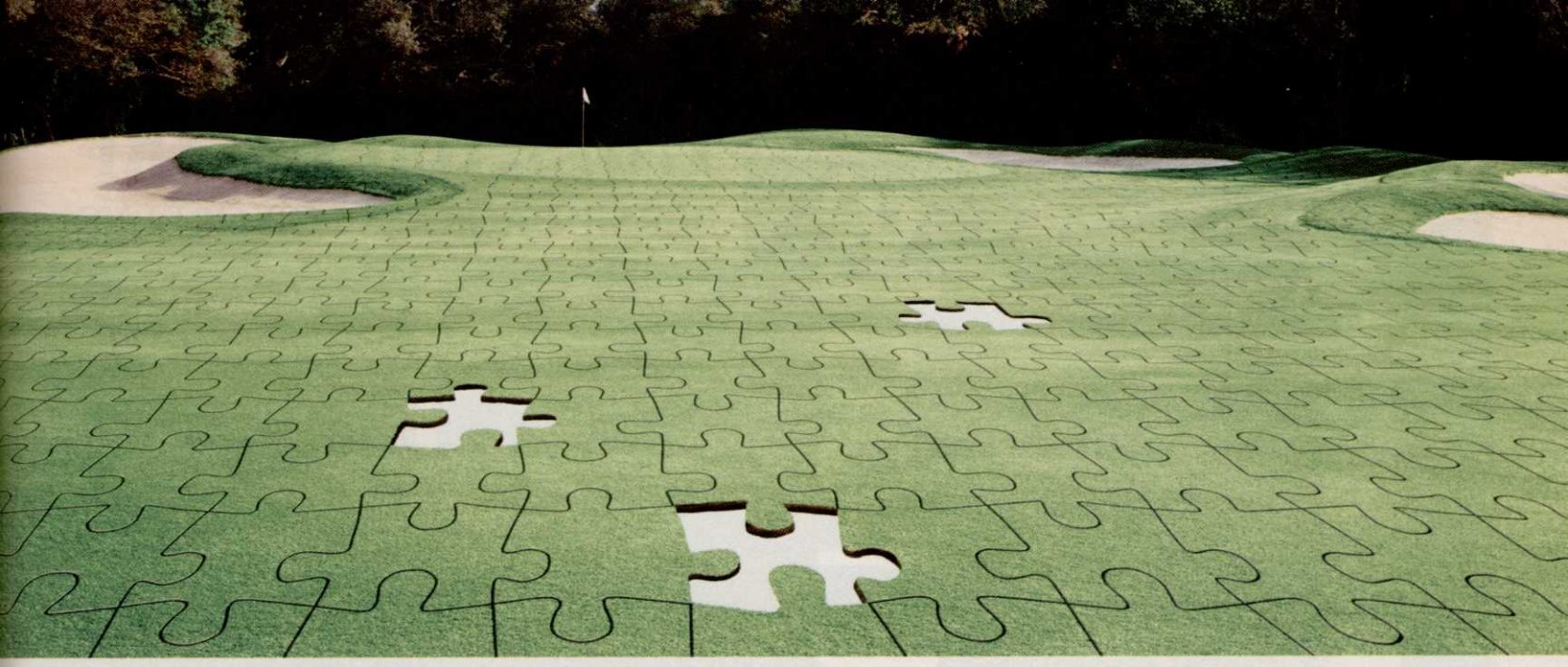
A different set of factors provides the environment to motivate employees. Herzberg's motivators augmented with suggestions for applying them to a golf course maintenance staff are:

- **Feelings of personal accomplishment.** Just as motivation is personal, so is accomplishment. This is where setting goals or assisting employees to set them becomes crucial. The feeling of personal accomplishment occurs when set goals are met and exceeded, or even come close to amid difficult circumstances. Without goals, it's difficult for employees to feel satisfied. For example, satisfaction can be felt from something as simple as checking off completed items on a to-do list.
- **Recognition for achievement.** Recognition through positive feedback, compliments and reward programs is motivating and reinforces successful behavior. Few managers capitalize sufficiently on this motivator. We are trained to identify problems and, in fact, turf responsibilities require that we excel at identifying problems. For most of us, however, explicitly looking for positives seems unnatural. That, however, is a key part of your supervisory role and is instrumental to building a motivational environment.
- **A sense of importance to the business.** When talking to employees, I've often been amazed at the magnitude of their positive response when they receive a hat, shirt or jacket bearing the name of the course or organization at which they work. It isn't the hat, shirt or jacket that's important, it's the message it sends. However, this is where dissatisfiers (pay, working conditions, treatment) can come into play. If major dissatisfiers are present, they won't be motivational because employees don't feel they're important to the organization.

Other Herzberg motivators include challenging work, achieving increased responsibility, access to information and involvement in decision-making.

Here are three comments about motivating employees to think about:

- Only your employees can decide their level of motivation.
- Only you can establish the environment that will shape that decision.
- Great managers discover what's unique about each person and capitalize on it. **GCI**



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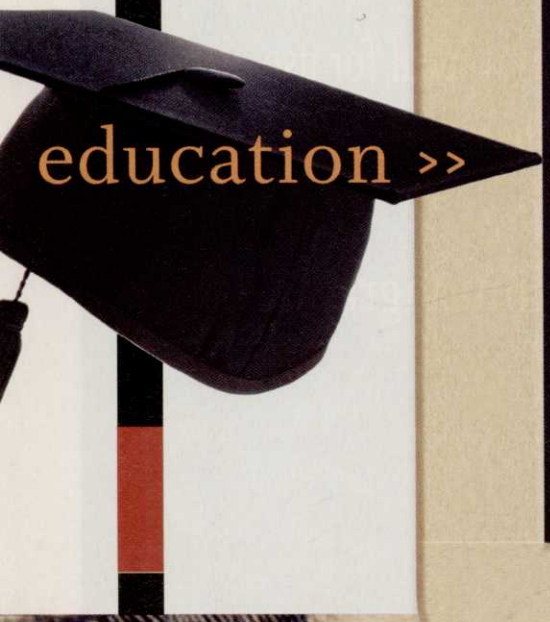
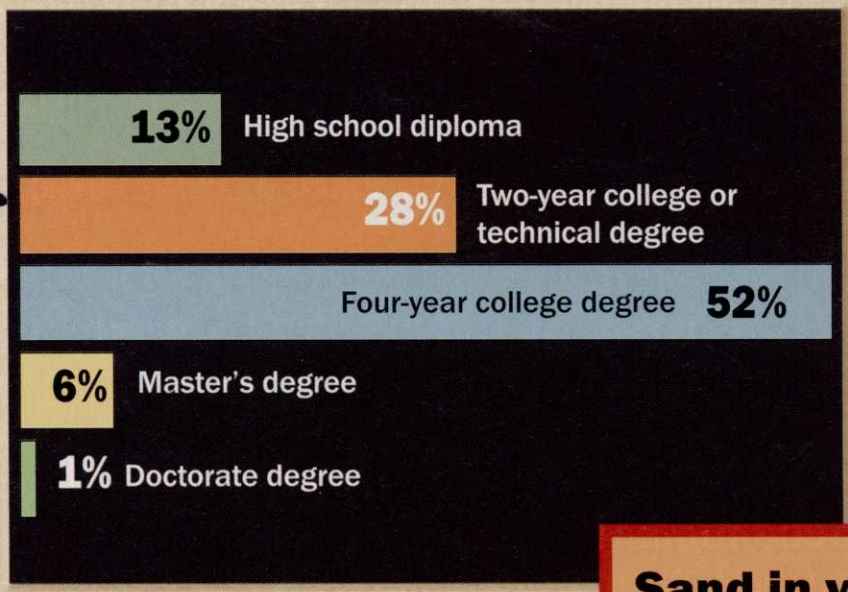


education >>

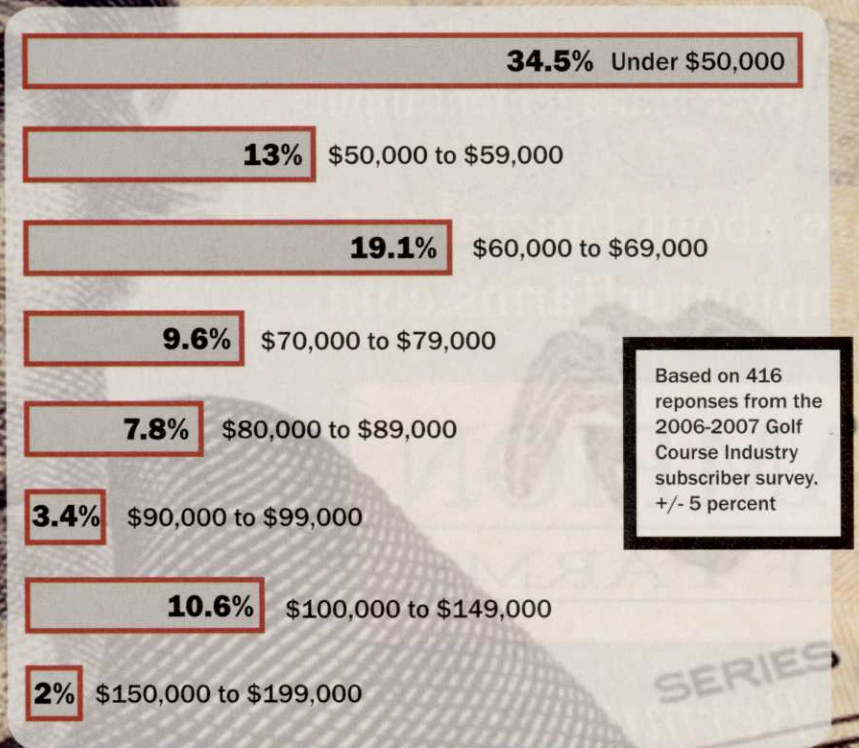
About 7 percent of golf course superintendents have an education higher than a four-year college degree.



based on 158 responses from an online poll, +/- 8 percent

What do you earn?

Less than 15 percent of golf course superintendents make more than $100,000.



Based on 416 reponses from the 2006-2007 Golf Course Industry subscriber survey. +/- 5 percent

Sand in your shorts?

At some golf clubs, bunkers are more of a problem with golfers than greens. Consistency and fairness seem to be the main issues. Most likely, bunkers are a sore spot for many golf course superintendents because golfers complain about them. The following discussion questions – courtesy of Bob Randquist, CGCS, director of grounds at Boca Rio Golf Club in Boca Raton, Fla. – can help superintendents and golfers determine what perceptions and expectations of bunker conditions should be for their golf course.

1. Should a golfer ever have a buried lie in a bunker?
2. Should a golf ball always roll back to the flat portion of the bunker and not come to rest on a slope?
3. On average, what percentage of the time should a golfer be able to get the ball out of a greenside bunker and into the hole in two shots?
4. On average, what percentage of the time should a golfer be able to hit a shot from a fairway bunker onto a green?
5. Should a golfer ever have to play a shot from underneath or against the lip of a bunker?
6. Should the surface of the sand be smooth or furrowed?
7. Does the playing condition of the bunker provide equal hazard to the low- and high-handicap players?
8. Can you determine and define the difference between a fair and unfair bunker?

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BY PAT JONES

NOT-SO-AVERAGE Joe

PGA HEAD TOUTS GAME'S ECONOMIC IMPACT

Last February, I spotted a man strolling quietly through a hotel lobby in Anaheim, Calif., during the Golf Industry Show. To most conference attendees, he isn't an immediately recognizable figure like his predecessor or some of the others who run major golf associations. I caught up to him and made a smart-ass remark about not even saying hello to old friends. As always, he's impeccably dressed, gracious and funny, yet he's not the kind of person who everyone instantly notices. To a casual observer, he's just an average Joe.

In truth, he's anything but. He's Joe Steranka, the c.e.o. of the PGA of America and one of a handful of the most powerful people in the business.

Steranka has been a sports guy from day one. After graduating from West Virginia University in 1979, he worked in the public relations department for the Washington Bullets (the old, politically incorrect name for today's Wizards). Proving that white men can jump in the NBA, he leaped over to the Cleveland Cavaliers organization as their director of communications for two years. The Cavs, 20 years before LeBron James, weren't exactly great.

"It was a different era," Steranka says. "One season, we had more players on our roster than wins."

Next came a five-year a stint with a big-time sports marketing firm in D.C. where he worked with clients including Michael Jordan and Jimmy Connors. Then, in 1988, he headed to Florida to join the staff of the PGA of America and never left.

Under the tutelage of long-time c.e.o Jim Awtrey, Steranka became the association's rainmaker by developing and managing huge contracts with TV networks for the PGA Championship, Ryder Cup and other events.

"There was a time when a lot of golfers thought the Ryder Cup was a Tour stop sponsored by the truck rental company," he says.

Not anymore, as viewership and revenues from both events have grown exponentially.

When Awtrey retired 18 months ago, the PGA looked internally and found Steranka – a man who'd helped grow the organization's annual revenue to $160 million – as the logical candidate to replace him.

Steranka has kept a relatively low profile during the first year and a half of his tenure, but that's starting to change as he hits the road to meet with PGA sections throughout the country and visit national and local legislators to preach the gospel of golf's economic impact.

WHAT'S YOUR PERSPECTIVE ABOUT HOW THE INDUSTRY HAS CHANGED IN 20 YEARS?

The biggest change in the golf business is that we've become a huge industry. We generate $62 billion a year for the U.S. economy. That's bigger than the motion picture industry, the amusement and gaming industry, the furniture industry and a bunch of others that would surprise most people. We employ 500,000 people. We drive real estate development and charitable fund-raising. That makes us unique. There's a much higher recognition that golf is more than just a game. We have a huge business impact. It was considered kind of a boutique business in the '80s. Now we're a mainstream industry.

Photo: Courtesy of the PGA of America

The best run golf facilities in America will employ a GCSAA superintendent and PGA professional, says Joe Steranka. Photo: Courtesy of the PGA of America

In operations, the biggest change has been the convergence of supply and demand. Golf became a big driver of other businesses, particularly real estate and travel, and courses were built for other reasons besides just golf. That changed the whole equation. As a result, it changed the focus of the professional team at every facility. It became less of an order-taking job and more of a marketing, database management and share-of-wallet job.

HOW HAS THAT CHANGED THE ROLE OF THE GOLF PROFESSIONAL?

For the past five or six years, we've reached out to employers (through the PGA's council of major owners), and they're telling us that it's still important for the golf professional to maintain the spirit of golf at the nation's courses, help people play better, etc. But they also want them focused on customer retention and revenue generation. It's a much more complicated world out there than 20 years ago.

WHAT'S A TYPICAL DAY LIKE FOR YOU?

I travel between 150 and 190 days a year, depending on whether it's a Ryder Cup year. I've done that for years. I'm also working my way around the country meeting with all 41 sections and districts. I spend some time on Capitol Hill and various state capitols talking with legislators about the economic impact of golf on the state and national level. I also spend quite a bit of time on initiatives with the other allied associations such as the GCSAA, USGA, PGA Tour, LPGA, etc. There's greater effort being put into cooperation between allies than ever before.

WHAT ARE YOU LOBBYING FOR AT THE LEGISLATIVE MEETINGS?

We need to communicate the economic impact of golf. About 80 percent of Americans don't play golf, so many people in influential positions might not have a clue about what we do. It's important they realize half a million people rely

on the game to put food on the table for their families. We're also the world's leading golf destination, and people come from all over the globe to play here. Finally, we provide a platform that raises $3 billion a year for every charity under the sun. That's a pretty compelling message.

The study done of the economic impact of the industry in Virginia was particularly telling. The sport generates $3.1 billion in economic impact in the state. The revenue generated per acre of golf turf is much higher than any other crop or usage. That speaks volumes about how important we are to Virginia and every other state.

WHAT'S THE DESIRED OUTCOME?

This new focus on communicating the economic value of golf is designed to ensure we get the regulatory support golf deserves on every level. That doesn't mean we aren't still focused on building the game, but it's more critical than ever to tell our economic story.

GIVE US A TOP-LEVEL VIEW OF THE FINANCIAL SIDE OF THE ASSOCIATION?

We're budgeted for $160 million in total revenue this year. The gross dollars that go into programs are about $60 million. Everything we spend still follows the mission that we established in 1916: Establish and constantly elevate the standing of the golf professional, make PGA membership a standard for the industry and increase interest in the game.

HOW BIG IS YOUR STAFF?

We have about 200 headquarters staff people, but there are another 200-plus folks who work at our sections throughout the country. We're trying to blur the lines between headquarters and sectional staffs to ensure everyone has the same mindset – we all work for 28,000 PGA professionals.

IT'S BEEN ABOUT A DECADE SINCE PGA SOLD ITS TRADE SHOWS TO A PRIVATE COMPANY. LOOKING BACK, JUST HOW GOOD A DECISION WAS THAT?

It was perhaps the greatest business decision we've ever made because it assured the association's financial future and diversified our revenue stream. The PGA Merchandise Show is the largest gathering annually in this $62 billion industry. Reed Elsevier, the trade show's owner, has helped us do that. It's a great meeting place for our members and the entire golf industry.

At the time of the sale, we also looked at the trade show business as something that was changing and becoming complex. To be able to partner with a company that was the largest owner and operator of trade shows in the world was particularly appealing. They have tremendous leverage that allows them to do what they do best, and it also allowed us to do what we do best. The show still carries our name and the number of professionals attending still increases – and will increase even more next year when we move our annual meeting to the show. Plus we have a increasing international presence at the show.

WHAT DID YOU THINK ABOUT THE COMBINED FORMAT OF THE GOLF INDUSTRY SHOW?

It's positive. Any time you can bring allied groups together, it builds team spirit at every level. The joint session was good, and there was a lot of informal networking. It was the best of both worlds.

WHAT FORMAL WORKING RELATIONSHIPS EXIST NOW BETWEEN THE GCSAA AND PGA?

A facility that employs a GCSAA superintendent and a PGA professional are going to be among the best-run facilities in the country. We also had a situation in which both of our respective presidents, Sean Hoolehan and Brian Whitcomb, were from Oregon. That led to some new ideas.

One example of cooperation is that we are on the board of the Environmental Institute for Golf. It's given us a great firsthand look at what it does. It's impressive. That data – environmental, economic, etc. – is mightily important when setting our long-term direction as an industry. Our executive committees also have a joint meeting at the Masters every year in which we review our respective businesses. Steve Mona and I also recently reached out to Jim Singerling from the CMAA to do a "State of the Golf Industry" letter that we send out to owners of courses that employ members of all three groups. We try to highlight the success stories where team management is working.

WHAT MORE COULD BE DONE TOGETHER?

We're looking at conducting joint operational research about rounds and revenue to eliminate some of the redundancy. We're also working together on a pace-of-play study.

MANY SUPERINTENDENTS SAY THERE'S TENSION IN THEIR RELATIONSHIPS WITH PROFESSIONALS. DO YOU THINK THAT'S AN ISSUE?

I don't think there's tension. The more we can demonstrate at the local facility level that the GCSAA superintendent and the PGA professional are working together as a management team, the better off we'll be as an industry. By and large, there's a great deal of respect and mutual admiration. We've said for the last few years that where the professional, superintendent or CMAA club manager are all being considered for promotion, the best person should get the role. None of our organizations should try to exert influence over that decision. If the facility performs well everyone benefits.

WHY HAS THE PGA BEEN MORE AGGRESSIVE THAN THE GCSAA WHEN PUSHING FOR ITS MEMBERS TO BE CONSIDERED FOR G.M. POSITIONS AT FACILITIES.

We're responding to the PGA Employers Council who've said they'd like to see more professionals who have great relationships within the facility and who focus on customer retention and revenue. We're just trying to meet the market's demand for more professional managers.

WHAT'S YOUR TAKE ON THE GCSAA CHARACTERIZING SUPERINTENDENTS AS THE KEY MANAGER AT FACILITIES?

I don't think it's appropriate for me to respond to what other organizations say.

WHAT DO YOU DO FOR FUN?

I like just puttering around the backyard, pulling weeds and stuff. I have a great family that I can't spend enough time with. Every once in a while, I'll get my 17-year-old son to go out and play. Anytime you get a teenager alone for four hours, it's a good thing. I also just ran in a 5K race with about 40 other PGA employees. That was a nice break.

ANY FINAL THOUGHTS?

Never forget how special our game is. We're part of the American landscape. We all need to puff out our chests a little more about the remarkable impact we have in our communities in terms of economics, charitable support and environmental benefits. Every manager needs to know his associations are committed to golf's advancement. **GCI**

Joe Steranka can be reached at steranka@pgahq.com or 561-624-8440.

BY JOHN WALSH

Making the switch

Arizona superintendent deals with consequences of effluent water use

Get ready because it's coming. Reclaimed water, that is. Well, at least for some. And it won't necessarily be cheaper than irrigating turfgrass with potable water.

With the increasing concern about fresh water supply, water use on golf courses is being scrutinized now more than ever. The results of this scrutiny can be categorized into two groups: those who use less potable water via restrictions and those who switch to reclaimed water. Many more golf courses will be joining the second group in the near future. Although, for some, the timing depends on where they're located. One state where it's happening sooner than later is Arizona.

When it comes to irrigating turfgrass with reclaimed water, golf course superintendents – in Arizona and elsewhere – can learn from Mike Kropf, golf course superintendent at the private, 18-hole Golf Club at Sun City Vistoso in Tucson. Kropf, who's been at Sun City Vistoso for a little more than a year, is dealing with the consequences of switching from potable water to reclaimed, or effluent, water.

But such a decision to switch wasn't made by club management – it was made by the town.

"There was no decision-making process to switch from potable water to effluent because the town told the golf courses in the area they would be using reclaimed water by a certain date," Kropf says. "The decision to switch wasn't by choice. Oro Valley law states that if there's reclaimed water available, golf courses will use it."

The town gave Sun City Vistoso about a year's notice.

There are five courses in the vicinity of Sun City Vistoso that use reclaimed water for ir-

Mike Kropf had experience managing turfgrass irrigated by effluent water before coming to the Golf Club at Sun City Vistoso. Photos: Jacob Chinn

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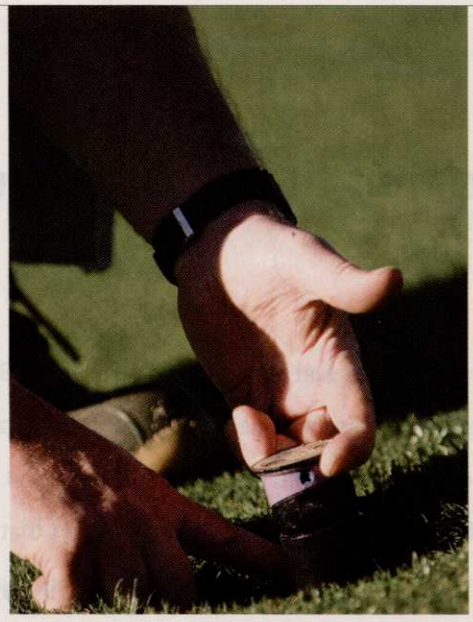
rigation, and two more that will open during the next couple years also will use reclaimed water, Kropf says.

The switch from potable to effluent water happened just before Kropf started working at Sun City Vistoso. One of the reasons Kropf was hired at Sun City Vistoso is his previous work with reclaimed water. Kropf was an assistant golf course superintendent at Heritage Highlands Golf and Country Club eight miles away. The previous superintendent at Sun City Vistoso, Greg Hrycyk, left to take a job in California.

Sun City Vistoso, which opened in 1986, generates between 33,000 and 35,000 rounds annually and has about 300 annual members. The fairways and rough consist of 419 Bermudagrass, the tees are 328 Bermudagrass, and the greens are Tifdwarf Bermudagrass. The turf on the fairways, rough and greens existed before the water switch was made, but the turf on the tees was replaced when the course switched to using reclaimed water, so it's about a year and a half old.



As a result of using reclaimed water, ciliated protozoa grow in the irrigation lines and can clog nozzles. Photo: Jacob Chinn

GO WITH BERMUDA

When irrigating with reclaimed water, it's better to have Bermudagrass greens rather than bentgrass greens, Kropf says. Other courses in the Tucson area currently have or had bentgrass greens, including Heritage, but some have switched to Bermudagrass because it's easier to manage when using reclaimed water. Reclaimed water has high levels of nitrates, and because of that and hot temperatures, bentgrass becomes "puffy," Kropf says.

"It grows faster than you can cut it, and you scalp the grass," he says. "You need to adjust for it. You get a huge surge of growth and disease pressures, especially in July and August during monsoon season. You can't mow the greens

> "Oro Valley law states that if there's reclaimed water available, golf courses will use it." - MIKE KROPF

fast enough. If you're at a high-dollar course and can afford large amounts of fungicides and maintenance inputs you can manage it. It's very high maintenance. If not, you succumb to it. It's like thatch but different.

"The bentgrass greens slowed down a bit at my last course, so management just bit the bullet and took out the bentgrass and replaced it with Bermudagrass," Kropf adds. "I'm a big fan of Bermudagrass greens. I don't have the manpower or the money to deal with bentgrass. But if you have bentgrass greens, then you also have Bermudagrass that encroaches on the bentgrass greens."

When overseeding Bermudagrass greens, they eventually will roll similar to bentgrass greens, Kropf says.

"I overseed the last week of September, and by Thanksgiving, you're really dropping the mowing heights," he says. "I was cutting them at 0.125 by January. I had them down to 0.115 by March and then down to 0.110 in April because of the tournaments we host. When I scalped for overseeding preparation, I had the mower down to .100. Tifdwarf Bermudagrass can tolerate that. MiniVerde, a new dwarf-type Bermudagrass, can handle it even more."

Last month, the ryegrass and *Poa trivialis* were kicking out of the greens, and Bermudagrass was coming through. Kopf says it takes a month to six weeks to get through the transition.

WATER DELIVERY

One would think using reclaimed water to irrigate a golf course would be cheaper than using potable water because the quality isn't as good. But that's not the case at Sun City Vistoso. Kopf pays $830 per acre-foot. Compare that to $5 an acre-foot other area courses pay for well water because they were grandfathered in using that water, to which they have rights.

To deliver the reclaimed water to Sun City Vistoso and other area courses, the city had to route a pipe, which is T-ed off at a nearby main road. Heritage Highlands pays less for reclaimed water than Sun City Vistoso because it already had a reclaimed water line routed directly to it.

"My water is routed through the local municipality," Kropf says. "I have to call Oro Valley (the nearest community supplier) every morning and tell them what I watered and what I need. Once it gets all orders, it calls Tucson Water and has it sent. I pay $2.55 for 1,000 gallons. At Heritage Highlands, they pay about $2.05 because they don't have to go through the local municipality. They get their reclaimed water directly from Tucson Water."

The golf courses using reclaimed water didn't have to pay for the pipe that was installed – the municipality paid for it up front.

"When all is said and done, I pay more for reclaimed water than potable water," he says. "Technically, you're not supposed to pay more for reclaimed water, but it's not a savings because I have to overwater to leach out the salts and increase the application of soil buffers and calcium applications to compensate for the high salts in the reclaimed water. I haven't seen a larger increase in the budget for water, I'm just adjusting my program."

A NEW SYSTEM

Sun City Vistoso's new irrigation system came on line November 2005. Hrycyk was involved with the irrigation renovation, so the system was new to Kropf when he arrived. However, he learned much about water management during the six years he spent at Heritage Highlands when he was the irrigation manager.

"Everything was new except for the pump station, which I'm repairing now," Kropf says.

The pump station was replaced in 1999, and club management didn't replace it when the irrigation system was renovated because the system was costly ($2.5 million) and management wanted to get the full life out of it, Kropf says.

"I'm running on one pump now," he says. "The reclaimed water ate away at the rubber bushings and seals on the pump shafts causing the pumps to seize."

The two pumps and the installation will cost about $40,000, Kropf says.

The new irrigation system has four or five

heads on each lateral line, and Kropf has individual control on each head.

"It's nice because the soils aren't great," he says. "The course was built on rock. I think I'm overwatering. I water every day. I can't go every three days like others because the soils don't have a good profile and dry out quickly. If I don't keep water on the turf, you can see the salts coming up, especially in the rough. The sodium levels are so high that water is being pulled out of the plant by the sodium in the soil instead of the plant pulling the water out of the soil. The grass turns gray. Once you see the gray and wilty look of the grass, it takes a while to get the green color back."

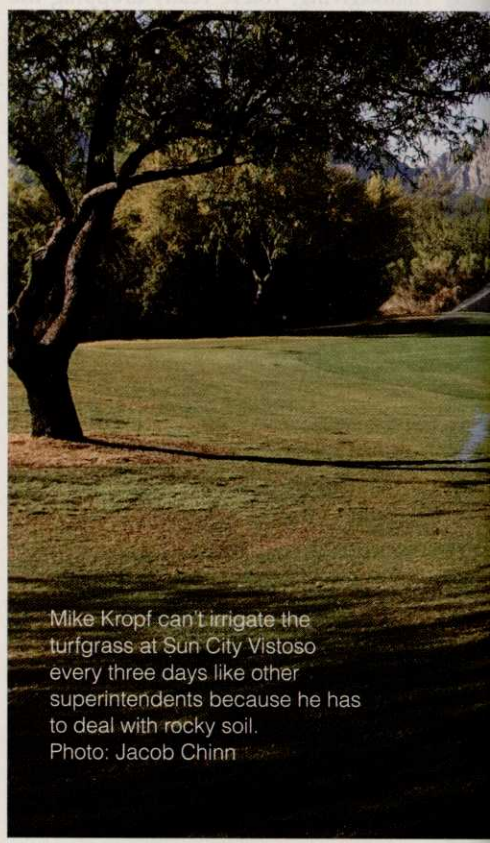
Kropf's maintenance budget is $1.2 million, and $390,000 is budgeted for water. As of April, Kropf was $60,000 underbudget for water. He didn't use as much water as planned because there was a good monsoon season. Kropf believes the new irrigation system is highly efficient.

"I'm not watering as much as they did before with the old irrigation system, but the reclaimed water cost is more than if I had potable water," he says.

The reclaimed irrigation water arrives at the course and sits in two holding ponds that are next to the clubhouse. Algae grows in the ponds, and it smells at times.

"I've tried different algaecides and nothing worked, so we had to get guys out there and skim the algae off the pond," Kropf says.

Another problem with reclaimed water is



Mike Kropf can't irrigate the turfgrass at Sun City Vistoso every three days like other superintendents because he has to deal with rocky soil. Photo: Jacob Chinn

ciliated protozoa, which grow in the irrigation lines. Protozoa grow once they get in the irrigation lines because they don't like oxygen or light. Filters don't work because the organisms grow on the filters, Kropf says.

"It's a snot-like material that clogs the nozzles to the point where it looks like silly string when the heads turn on," he says. "So I'm adding a citric acid and other chemicals to clean them out. You need to stay on top of that or else the sprinklers won't work because they're so clogged."

Irrigating with reclaimed water tends to wear equipment out more quickly. Kropf says the crew at Heritage Highlands replaced nozzles more often because the plastic wore out.

"Metal parts also corrode badly," he says.

CULTURAL PRACTICE CHANGES

Irrigating with reclaimed water doesn't just affect one's watering practices. It impacts cultural practices as well. In many cases, being more aggressive is necessary. Because of reclaimed water use, Kropf is aerifying the rough more often.

"Members who have been here for 20 years asked what I'm doing, and they say no one has done that before," he says.

Kropf slices the fairways during the winter and aerifies with solid tines (not pulling cores) on the greens because he can't core aerify as often as he would like. He also has been dethatching because of buildup.

Kropf also backs off on his fertility program. He tests the soil three times a year and the water once a month.

"I base my fertilizer programs off of that," he says. "I'm using high levels of potassium because Bermudagrass responds to it in a lateral growth pattern. I'm also going to more organic slow-release fertilizers instead of the synthetics because I don't need salt. I feed as I go and try to time it with the overseeding. I want the turf to peak in March and April because of tournaments we host."

According to the soil tests, the sodium level is now three times higher than optimum range because of the high levels of sodium in the reclaimed water. The turfgrass doesn't always look gray because of overwatering keeps the salts

below the roots, the nonstop aerifying and slicing, and the application of calcium and humic acid products.

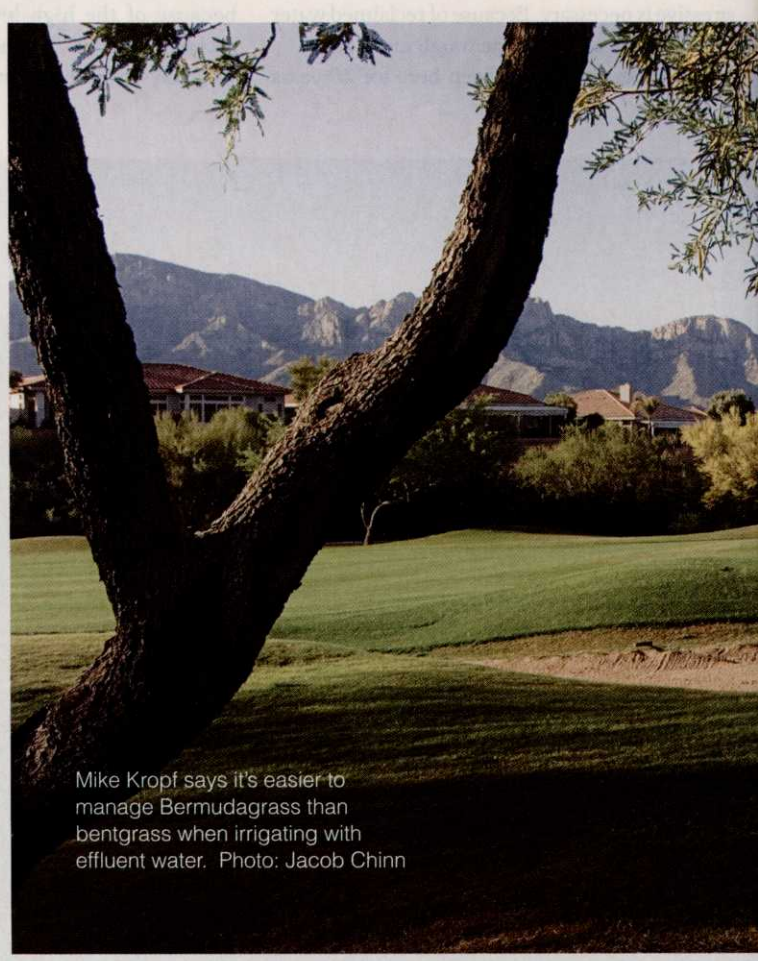
The biggest change is the pH level in the water, which was 9.1 on Kropf's last water test, and that correlates with the higher pH of the soil tests. Tees had pH levels at 8.3 and 8.4. Greens had better pH levels at 7.8 and 7.9. The high soil pH locks up micronutrients, so Kropf has been adding micronutrients and a lot of calcium, which displaces sodium in the soil and moves the sodium down past the roots with the flushing process of applying excess water.

When Kropf arrived at Sun City Vistoso and started mowing the push-up greens, the buckets were juicy – full of water – so he didn't put a lick of fertilizer on them for a month until he got them down to more manageable conditions. He wanted to make them stronger and less susceptible to disease or insect problems.

Kropf also is putting down higher levels of Primo than he normally would because of the reclaimed water use. During July, August and September, he says he can't mow the roughs fast enough.

Despite the changes in his fertility program, Kropf's fertility budget hasn't changed drastically.

One area that Kropf doesn't worry much about is turf disease, mainly



Mike Kropf says it's easier to manage Bermudagrass than bentgrass when irrigating with effluent water. Photo: Jacob Chinn

because of the characteristics of Bermudagrass and the arid climate. In April, it's so dry salts will increase from the heavy use of reclaimed water causing plant stress and increased disease pressures. Kropf applies a fungicide for fairy ring, which is really the only disease the turf gets, unlike with bentgrass.

"Bermudagrass has more tolerance to salt than bentgrass," he says.

RECLAIMED WATER'S IMPACT

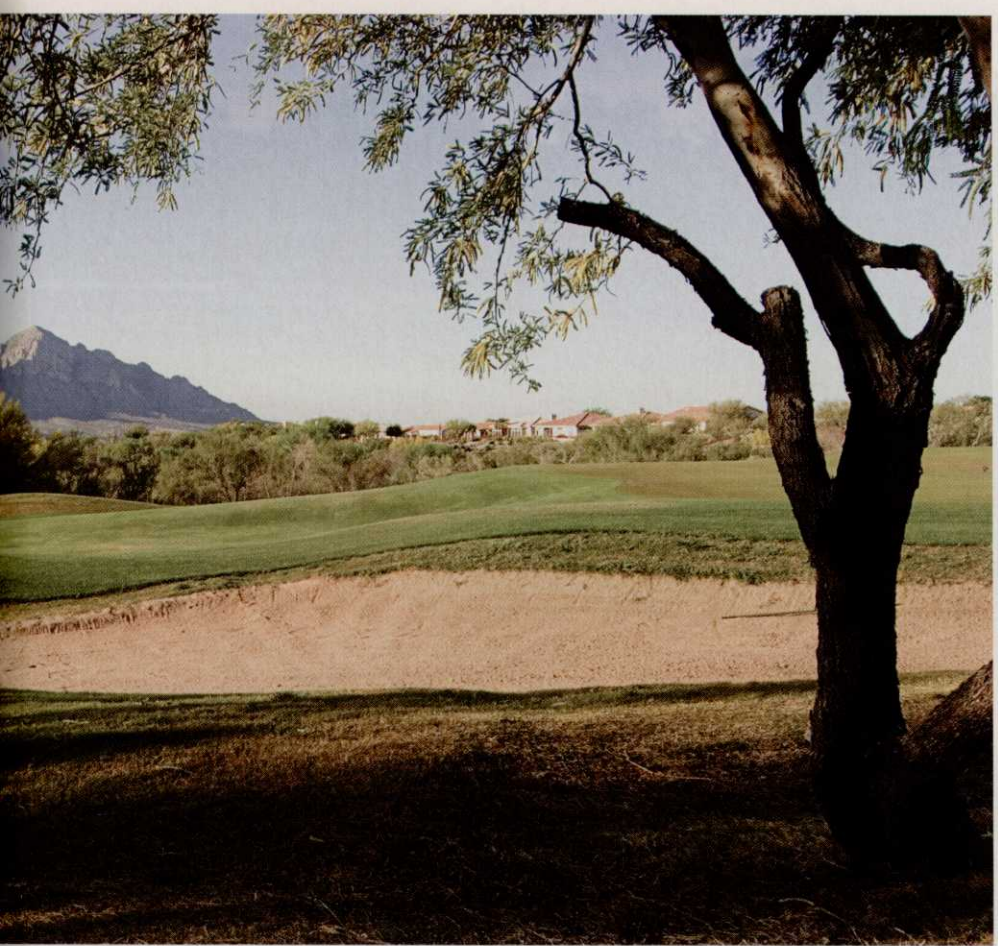
In the future, it's inevitable more golf courses will switch from potable water to reclaimed water.

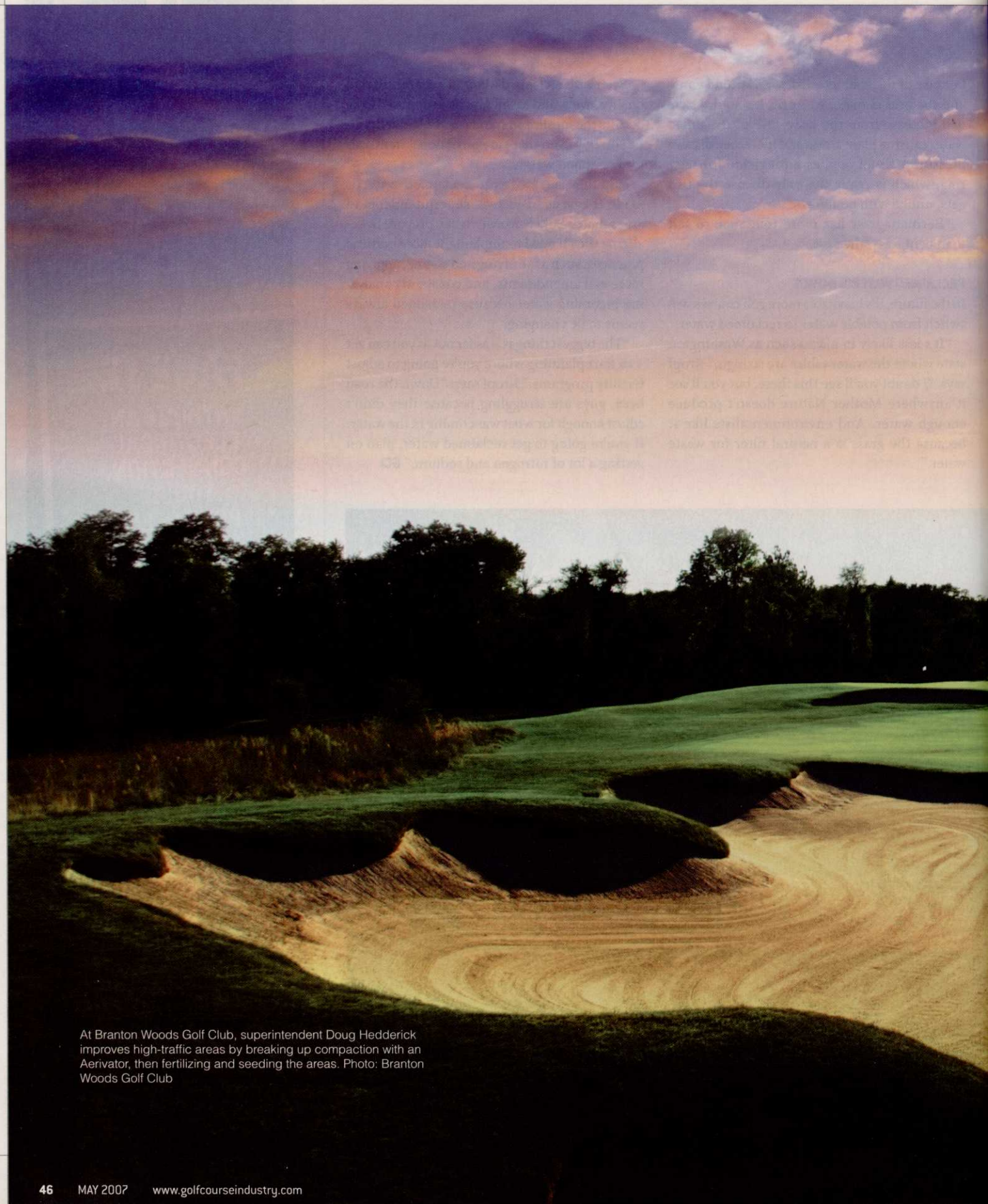
"It's less likely in places such as Washington state where the water tables are so high," Kropf says. "I doubt you'll see this there, but you'll see it anywhere Mother Nature doesn't produce enough water. And environmentalists like it because the grass is a natural filter for waste water."

Even with reclaimed water, there are different quality levels, and Kropf says he's supposed to be getting the minimum standard of "A" quality effluent; however, there are no national standards for reclaimed water.

Whether the switch to reclaimed water is made this year or in five, superintendents in areas that are likely to switch can prepare by realizing they'll need to implement more cultural practices, such as aerifying and slicing, applying more soil amendments, and constantly analyzing incoming water because reclaimed always seems to be changing.

"The biggest thing is – as far out as you can get – to start planning where you're going to adjust fertility programs," Kropf says. "Down the road here, guys are struggling because they didn't adjust enough for what was coming in the water. If you're going to get reclaimed water, plan on getting a lot of nitrogen and sodium." **GCI**



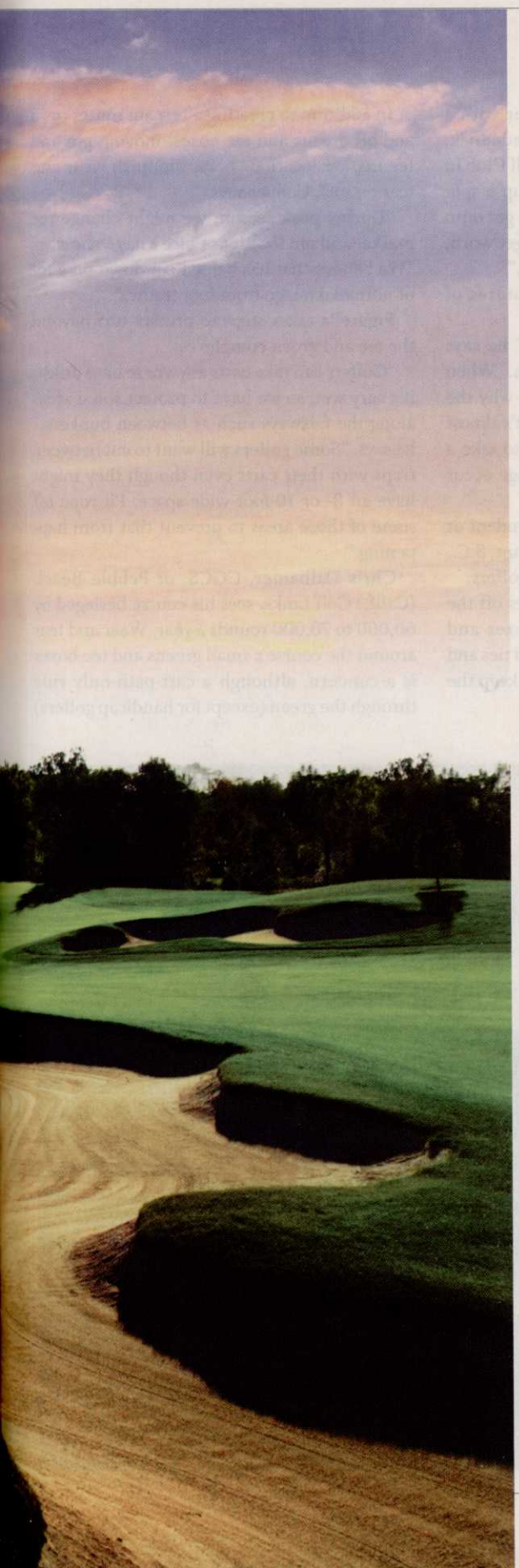


At Branton Woods Golf Club, superintendent Doug Hedderick improves high-traffic areas by breaking up compaction with an Aerivator, then fertilizing and seeding the areas. Photo: Branton Woods Golf Club

BY JOHN TORSIELLO

TURF WARS

Superintendents try to minimize wear and tear in high-traffic areas through cultural practices and altering golfers' behaviors



Sometimes Monica Cooper, CGCS, feels like she's fighting a losing battle.

"I guess I'm a sucker for punishment," says the superintendent of Smyrna Municipal Golf Course in Bell Buckle, Tenn. "I try to keep golfers off the fairways when the grass is dormant during the transition time between winter and spring. They don't understand why they can't go off the cart paths. It's because that's a time when grass is most susceptible to damage from wear and tear.

"But I love what I do, and I keep trying to make the playing surface as good as I can for them," she adds. "We tell them what they need to do out on the course to help, but golfers at a municipal facility have about a five-minute memory span."

Kim Wood, golf course superintendent at the Tournament Players Club at The Canyons in Las Vegas, sympathizes with Cooper.

"I just don't think there's an awareness among most golfers about how much damage carts can do to turf," he says. "We've tried to initiate a 90-degree rule onto and off fairways, but nobody adheres to it. Human beings are like cattle. It's always the shortest possible route to where they're going. It's the same with the maintenance staff. You have to constantly remind them to watch where they access bunkers and not follow the same paths. It's quite a challenge."

Most golf course superintendents probably feel the same as Cooper and Wood as they struggle to prevent turf damage in high-traffic areas, such as entries and exits to and from tee boxes and greens, and on putting surfaces and tee areas themselves.

"You can't start accusing people of going where they shouldn't go and damaging turf," says Joe Figurella, golf course superintendent at The Links at Madison Green in Royal Palm Beach, Fla. "So we try and prevent damage in a number of ways."

TRAFFIC CONTROL

One of the most successful and least labor-intensive means of preventing damage in high-traffic areas is controlling the flow of golfers. This can be accomplished by cordoning areas leading to and from greens and tee boxes and directing golfers to their destinations on each hole with signage. It's wise to alter the exit routes daily to minimize wear to one particular area, superintendents say.

"We try to control the traffic flow by putting posts into the ground joined together with a plastic, two-inch chain," says Doug Hedderick, superintendent at Branton Woods Golf Club in Hopewell Junction, N.Y. "We open up a spot along the cart path where people can get onto the fairway. When one area starts to get worn, we close it off and create another one."

Hedderick agrees golfers are creatures of habit.

"It's the path of least resistance," he says about golf course foot and cart patterns. "When one goes everyone will follow. That's why the ropes and directional signs work well. It's almost like herding sheep. It's much better to take a proactive stance rather than let damage occur and then try to fix it."

Rob Mackie, golf course superintendent at Dunes West Golf Club in Mount Pleasant, S.C., battles "lazy head syndrome" among golfers.

"Often, they like to park two inches off the cart path, especially around tee boxes and greens," he says. "So we placed railroad ties and roping in high-volume traffic areas to keep the carts on the paths."

In addition to creating alternate routes onto and off greens and tee boxes, moving pin and tee marker locations helps diminish wear and tear on turf, Cooper says.

"During peak season, we might change tee marker and pin locations twice a day," she says. "We believe that has helped cut down on a lot of normal damage from foot traffic."

Figurella takes steps to protect turf beyond the tee and green complexes.

"Golfers can take carts anywhere here unless it's very wet, so we have to protect some areas along the fairways such as between bunkers," he says. "Some golfers will want to cut between traps with their carts even though they might have an 8- or 10-foot wide space. I'll rope off some of those areas to prevent that from happening."

Chris Dalhamer, CGCS, of Pebble Beach (Calif.) Golf Links, sees his course besieged by 60,000 to 70,000 rounds a year. Wear and tear around the course's small greens and tee boxes is a concern, although a cart-path-only rule through the green (except for handicap golfers)

At The Links at Madison Green, superintendent Joe Figurella takes steps to protect turf in high-traffic areas beyond tee and green complexes, such as between bunkers. Photo: The Links at Madison Green

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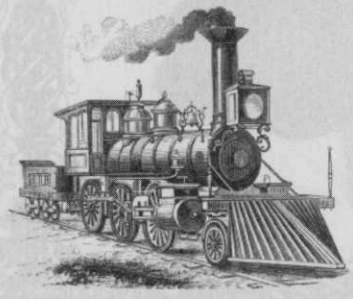

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Each spring, superintendent Matt Strader and his staff reseed and resod high-traffic areas because of turf damage. Photo: Penn National Golf Club

alleviates much of the potential turf damage.

"We have some signage with ropes attached to stakes to alternate patterns onto and off of tee boxes and greens," he says. "Even though many golfers walk with caddies, because of the huge number of rounds we generate and the small size of our greens, we could have turf damage if we aren't careful."

PLAN OF ATTACK

Despite the best intentions of superintendents and their staffs, turf damage still occurs in high-traffic areas. But that damage can be lessened, and perhaps prevented in some instances, with an aggressive turf management plan for those areas most at risk.

"I don't think anyone wants to get into a curative mode with turf damage," Dalhamer says. "You don't want to be trying to revive damaged or worn turf year in and year out."

Dalhamer advises superintendents establish a turf management program for areas around and on greens and tees.

"You should monitor wear and tear and do as much as you can culturally to keep the turf healthy," he says. "We do a lot to stimulate the growth of grass through a fertility program, and we have an aggressive aerification program for our greens where we aerify six times a year."

That might present challenges for a superintendent whose paying customers expect pure putting surfaces when they visit.

"We use a slicer that creates an air pocket one to three inches below the surface and lets the green breathe," Dalhamer says. "All you can see at the top is a surgical-like incision. We'll do that an hour before we send the guys out to mow and roll in the morning. It's almost impossible to detect by golfers. We also verticut and topdress with sand to improve drainage."

WAYS TO IMPROVE TURF HEALTH IN HIGH-TRAFFIC AREAS

- **Stimulate growth through a fertility program**
- **Aerify aggressively**
- **Verticut and topdress**
- **Move pin and tee locations**
- **Redirect golfer traffic with ropes and signs**
- **Hand-water when hot**
- **Resod or reseed**

Matt Strader, golf course superintendent of the two courses at Penn National Golf Club in Fayetteville, Pa., sees a lot of wear and tear at the ends of cart paths, so each spring he and his staff will resod and reseed key areas.

"The big thing is keeping the fertility up in high-traffic areas so the grass can withstand the pressure better," he says.

Keeping turf in high-traffic areas as porous as possible can prevent serious damage.

"I've been using an Aerivator that shakes up the ground and breaks up any compaction in areas around greens and tee boxes," Hedderick says. "We'll put fertilizer and grass seed down in those areas, and the grass will come up in the hole that's made. The new blades of grass are protected until they're strong enough to withstand being walked on again."

Island green complexes, which have a small slit of land where golfers walk on and off of the putting surface, can be a headache because there's only one or two points where people can walk.

"That's where you have to be especially aggressive aerifying to break up compaction of the soil caused by golfers walking on the turf," Wood says.

Figurella says he and his crew always work extra hard to relieve compaction in high-traffic areas. They'll fertilize and seed the area and then rope it off.

Mackie believes healthy turf is one of the biggest weapons a superintendent has in his or her battle against wear and tear on grass.

"Keeping your turf healthy and not allowing it to get lean helps prevent damage," he says. "We're always fertilizing and topdressing to prevent damage and to keep the turf strong."

SEASONS GREETINGS

The severity of damage to turf around greens and tee boxes can be seasonal. During periods of heavy rain, it's vital to keep motorized carts off fairways and rough.

"Once it gets really hot in the summer, you see stress magnified," Wood says. "So wear and tear in high-traffic areas is going to be magnified."

Usually, some of the worst turf damage occurs during a drought when the grass is stressed and can't take a pounding, Strader says.

About three years ago, Mackie and his staff started allowing carts in fairways only during the winter so golfers would stay out of the rough where the grass is susceptible to damage.

"Golfers kind of look at you weirdly, but the plan has worked well and protected the rough areas," he says.

Spring is one of the most difficult times of the year for Cooper.

"We can go from dormancy to green and then back to dormancy in a few weeks in the spring," she says. "That's when it becomes difficult to make golfers aware of the damage they can do to dormant grass, especially after they've been allowed on the fairways a few days earlier."

Once it gets hot, one can see turf stress increase, especially in wear areas.

"We have a combination of ryegrass and bermudagrass, and there's a window of time when the rye starts to go and the bermudagrass is starting to bloom that we'll see areas suffer thinning," Wood says. "Extreme heat just complicates the problem."

Hand-watering high-traffic areas during hot spells can help prevent turf stress.

TIME TO REPAIR

Despite the best-laid plans, some turf damage simply can't be remedied.

"We've had a rare case of having to resod a par-3 tee box because it had gotten so beat up during the summer," Dalhamer says. "We're lucky because we have an endless supply of turf and the resources to resod an entire tee."

But most golf course superintendents aren't so fortunate.

"Most damage to fairways will go away eventually," Figurella says. "Mother Nature has a way of cleansing itself. But if it's serious enough damage, we'll have to go and repair the damage by hand." **GCI**

John Torsiello is a freelance writer based in Torrington, Conn. He can be reached at jtorsiello@sbcglobal.net.

Usually, some of the worst turf damage at Penn National Golf Club occurs during a drought when the grass is stressed and can't take a pounding, says superintendent Matt Strader. Photo: Penn National Golf Club

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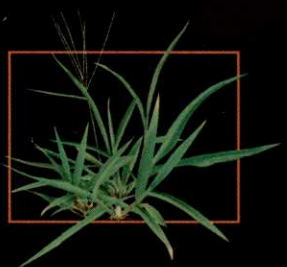

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aeration options

SUPERINTENDENTS IMPLEMENT VARIOUS PRACTICES TO MEET TURF NEEDS

BY STEVE AND SUZ TRUSTY

To golfers, aeration is a paradox – they don't like it done, but they like the results eventually. It's a good thing aeration options have opened the door for golf course superintendents to mix and match methods to develop the most effective strategy for the needs of the courses they manage. While typical core and spike aerification remain part of turfgrass management programs, other procedures are used, too, as the following four examples depict.

In the spring, superintendent Mark Krick and his crew aerate wall to wall, using five-eighths-inch coring tines on the greens and three-quarter-inch coring tines everywhere else. Photo: The Homestead Golf Course

One trend Bob Vavrek of the USGA Green Section sees is close-space aeration, as superintendents try to pull out twice as many cores for twice as much benefit. Photo: Steve Trusty

A 'PLAIN JANE' PROGRAM

Frank Pizzuto, Jr. is owner and superintendent of two 18-hole courses in New York: The Elms Golf Club in Sandy Creek and The Pines in Pulaski. The Elms has been a family-owned course since it opened in 1960, and The Pines was purchased in 1983. Both are in small towns near Lake Ontario and attract golfers who are tourists and army personnel stationed at Fort Drum in nearby Watertown. Budgets are tight and have been affected by a decline of play because of troop deployment.

Both courses have sandy soil – The Pines location was sand dunes before the course was developed – and feature Penncross bentgrass greens. Traditionally, the season runs from Memorial Day to Labor Day.

For the past 15 years, Pizzuto has aerated the greens and tees in the spring and fall with five-eighths-inch hollow tines at about a 2-inch spacing to a 4-inch depth.

"The soil is so sandy our winds quickly dry the cores," he says. "Then we drag mat them back in. The remaining debris is just small tufts of grass that we sweep off. The core material generally fills the holes pretty well. If necessary, we'll topdress lightly with sand matching our profile."

The spring aeration is planned for the first week in May and the fall aeration for the last week in August, but weather is the deciding factor. Though aerating later in the fall would affect play less, it's more important for long-term course conditions that holes heal before the onset of winter. Because aeration equipment is shared between the two courses, Pizzuto alternates the timing based on location convenience. The last to be aerated in the fall is the first to be aerated in the spring.

Fairways, which are aerated in the fall only, are perennial ryegrass and *Poa annua* with some bluegrass mixed in. Pizzuto uses a tow-behind Ryan aerator with open-spoon tines.

"We won't start on the fairways until after we've finished the greens and tees," he says. "We can change out our tines for solid-core aerification. Typically, we'll do that with our Toro unit and hit the greens and tees as needed for stress relief and better water penetration. With our native sandy soils, compaction is less of an issue so this 'plain Jane' program has worked very well for us."

WELL WORTH IT

The Homestead Golf Club in Lakewood, Colo., is an 18-hole public course that opened in 2002. The links-style course has heavy-clay native soil. The greens are 90 percent USGA spec sand and 10 percent Dakota peat topped with bentgrass. Originally, the tees and fairways were seeded with a mix of low-grow Kentucky bluegrasses and 10 percent perennial ryegrass. Since then, the tees have been overseeded with ryegrass.

"Heavy clay soils and excessive traffic/compaction are

Superintendent Judd Pittler at Hannastown Golf Club uses one-quarter-inch quad tines on the bentgrass greens in the spring and fall. He also has added an 8- to 10-inch-deep, solid-tine aeration in the fall. Photo: Barry Reeger

the overriding factors in our aeration program," says Mark Krick, CGCS. "In the spring, we aerate wall to wall. We use five-eighths-inch coring tines on greens and three-quarter-inch coring tines everywhere else. We tackle nine holes at a time, closing down that half of the course for a day. We collect the cores using a standard Cushman core harvester on all greens and most tees. Manual harvesting is required for those tees with extreme contours."

Krick works in conjunction with Bruce Nelson, CGCS, of Fox Hollow at Lakewood to supply their cores to a local composting company, which combines them with sand and humus to produce a ground compost material suitable for topdressing. It's provided to the two courses at a discounted price.

After harvesting, Krick uses a triplex unit with the Thatch-Away Supa System Verti-Cutter head, which can get down to one-sixteenth of an inch on a verticut reel to clean up any remaining debris.

"We'll topdress the greens with the 90:10 mix of sand to peat that matches the soil profile," he says. "The tees are topdressed with a sand and compost mix. Occasionally, we have topdressed our shorter stretches of fairway, but the results didn't justify the cost and time involved. We follow up with an application of fertilizer and soil amendments – usually gypsum – on the entire course. Amendments and respective rates are based on soil test results."

Krick aerates the greens, tees and roughs in the fall, generally starting near the end of September and depending on current weather conditions and long-range predictions.

"If we wait too late in the season, we'll have too little healing to avoid desiccation around the hole entry," he says.

Krick augmented his coring program with vertidraining, in which solid tines are used. He's followed the reports about using needle tines, but sees them as a better fit for those with sandy soils.

"The coring process is very labor intensive, but going into our fifth year, the results have proved to me that it's worth it," he says.

SANDY SOIL'S BENEFITS

Wild Horse Golf Club, a 9-year-old, 18-hole public course in Gothenburg, Neb., has native soil that's primarily a fine sand with little silt or clay. The greens are bentgrass; the green surrounds are a fine fescue with some creeping bentgrass mixed in; and the tees and fairways are a bluegrass/perennial ryegrass mix.

Josh Mahar, CGCS, generally aerifies the fairways, greens surrounds and tees in April and then again starting in late August and going into September, depending on the weather. He uses a Toro ProCore 880 with one-half or five-eighths-inch, side-eject hollow tines. Usually, he uses the five-eighths-inch tines.

"We allow the cores to dry down and then drag them with the metal keystone drag," he says. "After that, we'll go over the area using our deck mower set as low as it can go. By then, the area is pretty clean. Our sand breaks apart so easily that by a couple mowings it's hard to tell we've core aerated. Our golfers might notice it while we're in the process of aerating, but surface disruption is minimal, and it doesn't have much effect on play."

Mahar times fertilization shortly after aeration, basing the formula and application rate on soil test results. But he takes a different approach with the native-soil greens.

"For the past eight years, we've been managing them primarily with consistent topdressing, pulling matching material from one of the hillsides," he says. "We use a light application, ranging from one-sixteenth to one-eighth of an inch, every two weeks. We topdress, brush in the material with a cocoa mat drag and mow again

to clean up anything that's been pulled to the surface by the drag."

Mahar started using needle tines on the greens about four years ago. Before that, he used only the five-eighths- and one-half-inch tines.

"We install the needle tines on our Ryan Greensaire 24 and use them once or twice a year, but only as needed on the dry spots, not the entire green," he says. "It increases water penetration, and there's virtually no surface disruption."

APPRECIATIVE MEMBERS

Judd Pittler became superintendent of Hannastown Golf Club in Greensburg, Pa., in February of 2006. The original nine-hole course has 10 push-up *Poa annua* greens (one practice). The tees are predominantly *Poa*. A second nine holes were added about 10 years ago and include USGA greens that are primarily bentgrass with some *Poa* encroachment and modified-soil bentgrass tees. All fairways are clay-loam native soil with a mix of *Poa* and bentgrass. There's more *Poa* on the original course and more bentgrass on the new nine.

"For some reason, the new greens weren't aerified during the first three or four years, so there's a large organic matter buildup in the top 2 inches," Pittler says. "The two previous superintendents attacked that aggressively with aeration and used verticutting to reduce the thatch. I've adopted similar strategies, using one-quarter-inch quad tines in the spring and fall. We collect the cores using a core harvester attachment on a Cushman. The actual mix for the new greens used a sand particle size that's a little large. To avoid choking them off with too much finer sand, our topdressing is straight silica sand with an 80:20 ratio of large to small particles."

Pittler is incorporating sand into the older soil greens to bring the two nines closer agronomically. Along with the spring and fall quad-tine aerification and topdressing, he has used sand injection with the DryJect at least once the past two years.

"We've also added an eight- to 10-inch-deep, solid-tine aeration in the fall," he says. "We've used needle tines on all the greens in July to alleviate compaction and increase oxygen and gas exchange in the root zone."

During Pittler's first season, the greens showed some disease activity when they emerged from winter.

"We wanted to reduce abrasion on the tender turf, so instead of using brushes or brooms following topdressing, we used a push blower to blow the sand down into the holes," he says. "We didn't get any bruising, and it cleaned up well. It only took two people, rather than the eight to 10 for the other methods – a great advantage with our limited budget and crew size. Obviously, we've continued that procedure."

Pittler is using standard half-inch coring tines on the tees along with aggressive verticutting and slicing on the newer nine for thatch removal. Cores are collected on both sides.

"Our season usually runs from March to early November," he says. "Last year, mild weather extended play into January, so we weren't able to topdress the tees as planned."

Fairways are an issue at Hannastown, however, because they haven't been core aerified for more than 10 years.

"Fairway work has alternated between the Aerivator at a 4- to 5-inch depth and the AerWay slicer," he says. "We'd need to contract out for core aerification, but we're trying to work it into the budget."

Pittler found the multiple options for aeration are a great asset to his turfgrass management program.

"With the quad tines, we're getting coring benefits, but with less surface disruption and faster healing," he says. "With the deeper needle tines, there's essentially no surface disruption. These tools allow us to aerate more frequently and accomplish our goals with minimal inconvenience for the golfers. Our members really appreciate that." **GCI**

Steve and Suz Trusty are freelance writers based in Council Bluffs, Iowa. They can be reached at suz@trusty.bz.

Comparing tools for customized cultivation

> During his golf course visits, Robert C. Vavrek, Jr., senior agronomist for the USGA Green Section north-central region, sees many maintenance trends. One of them is more customized cultivation for a particular problem or goal. There are many new options available with tine types, penetration depths and spacing, and other cultivation methods that superintendents can consider.

"While superintendents generally use hollow tines for organic matter management, they might attack compaction with water or sand injection, or deep-tine treatment," Vavrek says. "With the new options, one of the trends is more close-space aeration, trying to pull out twice as many cores for twice as much benefit without spending more time on the operation."

One factor that always seems to affect aeration is golfers' rising expectation levels.

"They're less willing to accept playing surface disruption, especially on the greens," Vavrek says. "In response, we see superintendents substituting one type of cultivation for another, seeking less disruption, but increasing the number of cultivations within a season hoping for the same results."

With so many variables throughout the regions of the country in weather issues, seasons of play, and soil and turf types, it becomes increasingly important for superintendents to analyze cultivation options to determine what each can realistically accomplish in terms of their courses' specific needs, Vavrek says.

Editor's note: As well as direct consultation with the USGA Green Section staff, resources addressing cultivation issues can be found in the archives of the Green Section Record including: "Customized Cultivation," by Bob Vavrek, September/October 2006; "Aeration and Topdressing for the 21st Century," by Pat O'Brien and Chris Hartwiger, March/April 2003; and "Core Aeration by the Numbers," by Chris Hartwiger and Pat O'Brien, July/August 2001.

Rx FOR HEALTHIER TURF

GROOMING PROMOTES VERTICAL GROWTH

STORY AND PHOTOS BY DAVID WOLFF

Simply put, turf grooming is a means of managing turf's growth habit to provide a quality, healthy plant. The process uses narrow vertical blades (thin kerf) to clip the advancing growing point of turfgrass periodically.

Grooming is the easiest, most stress-free way to promote vertical growth in golf course turf, says M.C. Engelke, Ph.D., a professor and faculty fellow at the Texas Agricultural Experiment Station in Dallas, which is an agency of the Texas A&M University System. Groomer use helps eliminate grain, smooths irregularities and makes individual blades stand erect for consistency and better play. Regular groomer use will foster thicker plants and healthier, more robust turf.

"It's important to distinguish grooming from vertical mowing," says Engelke, who's also a consultant to Jacobsen specializing in the identification, production and maintenance of turfgrass. "Both processes

use vertical blades, but from a biological standpoint, this is where the similarities end. Verticutters use rotating vertical blades, which penetrate deep into the crown area of the plant, and possibly below, severing stolons and stems. This generally provides an effective means of reducing or removing thatch."

Groomers are lightweight versions of verticutters, and they help reduce grain and lift turf for a cleaner cut. This is accomplished by setting the blades at or slightly above the height of cut (bedknife setting).

"From a biological standpoint, however, adjusting the blades to just below the height of cut (initially not to exceed 10 percent below the bedknife) provides stimulus to the plant to initiate new growing points," Engelke says. "The rotating vertical blades sever the expanding culm (stem), remove the plant apex (growing point) and force the crown to generate a new bud."

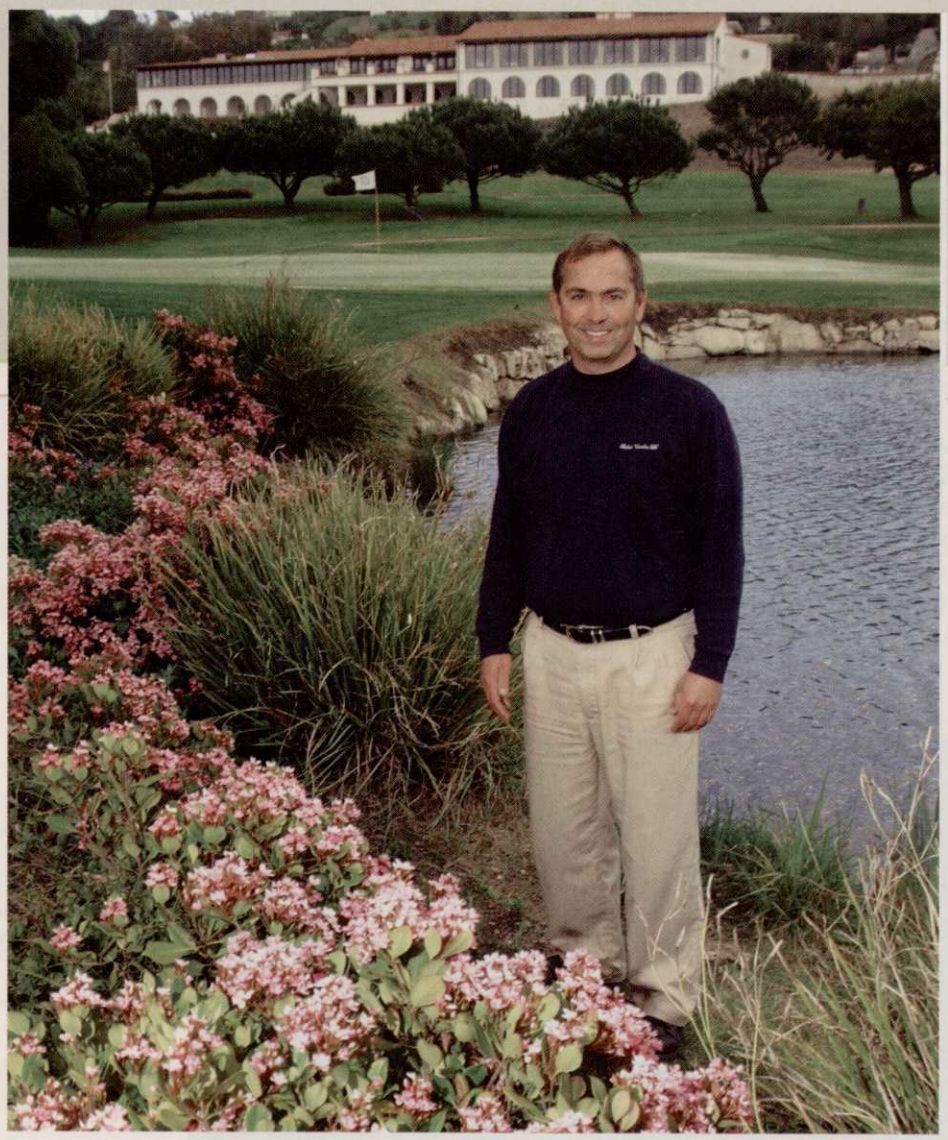
LIGHT SCALPING

Turf grooming can be compared to light scalping but on a much-reduced scale. Using one-half-inch spacing between vertical blades that are one-eighth-inch thick results in about 3 to 5 percent of the culms being clipped during each mowing. Each grooming "scalps" a fraction of the turf, which is staged in a timed recovery response.

"By repeatedly using groomers, the entire turf community is eventually forced to be in a rejuvenated state with new growth from the crown of the plant," Engelke says.

Grain occurs when the culm or stem is allowed to elongate and lean a particular direction with the growing point at the cut end of the stem. If the stem is removed periodically and new growth is initiated from the base of the plant (crown), the subsequent growth is forced to be more vertical and less prone to developing a grain and less prone to scalping.

At Red Hill Country Club, superintendent Craig Kimmel uses turf groomers on his walk mowers for greens and collars, and on three fairway mowers.



At Palos Verdes Golf Club, Pat Gradoville, CGCS, cuts kikuyugrass fairways three to four times a week and uses turf groomers every other mowing.

Besides altering the way the plant grows, the position of the growing point is changed also.

"With the extending stem being severed (scalped), the plant will initiate new growing points at the crown," Engelke says. "Repeated mowing with turf groomers encourages and conditions the plant and turf to grow tighter to the soil, making for a firmer, more open canopy. This open canopy aids in escape of excess moisture and provides a healthier, more resilient turf."

OVERSEEDING REQUIRES GROOMING

Turf grooming can be critical especially prior to overseeding. When ambient air and soil temperatures decline during the fall, the plant begins to store carbohydrates in the roots, rhizomes and stolons. This helps with winter survival and spring green-up and transition.

With the acceptance of overseeding warm-season grasses with a cool-season grass such as *Poa trivialis* or perennial ryegrass, it has been a standard practice to verticut heavily and even scalp the turf. Scalping is accomplished via a verticutter, flail mower or reel mower set low enough to remove excess plant material.

"Not only is this a laborious task, but it also disrupts the course, creates considerable debris that must be removed and, more importantly, reduces the plant's ability to store additional carbohydrates for winter survival," Engelke says. "In many cases, it also will force the plant to use much of its stored carbohydrates just to finish out the fall growing season."

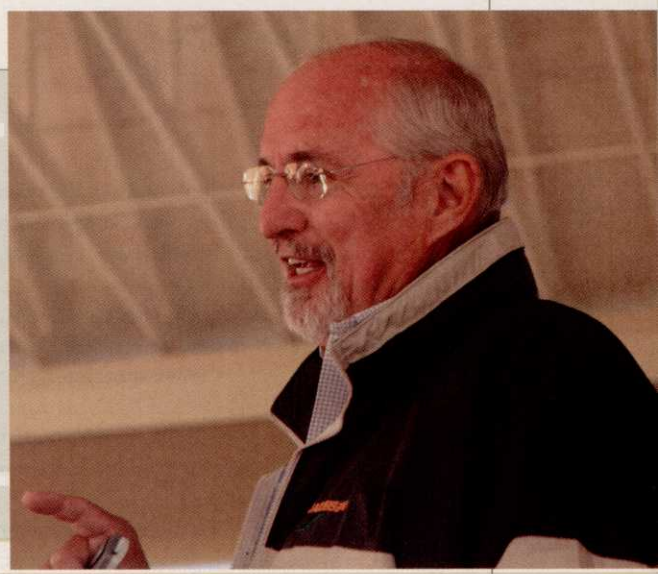
A three-year grooming study conducted by Engelke resulted in improved turf health, fall color retention and spring green-up. The need for extensive fall preparation for overseeding was reduced, providing a superior turf during the fall and spring transition with improved winter survival.

"Grooming is a proactive cultural practice that supports maximum turf health and performance throughout the year when done routinely," he says. "All stoloniferous and rhizomatous turfs have been demonstrated to benefit from routine grooming regardless of the height of cut."

TAMING KIKUYUGRASS

Several golf course superintendents have had success since they started grooming their turf. Pat Gradoville, CGCS, grows kikuyugrass in the fairways at Palos Verdes Golf Club in California and says the species is a good thatch builder.

"It's important to distinguish grooming from vertical mowing. Both processes use vertical blades, but from a biological standpoint, this is where the similarities end."
-MILT ENGELKE, Ph.D.



"If we don't stay on top of kikuyugrass, it can get out of hand real quickly," he says. "When I came here, I was afraid to fertilize."

Gradoville cuts fairways three to four times a week and uses turf groomers every other mowing.

"The groomers eat into the thatch and take out some of the puffiness," he says. "We've actually increased the percentage of kikuyugrass in the fairways by feeding it more and using a growth regulator. The growth regulator reduces clippings and makes the plant more compact. We have the benefit of adding nutrients without getting a flush of growth."

However, grooming isn't a substitute for verticutting for Gradoville. Grooming can be aggressive and will thin turf if the blades are set too deep, or if groomers are used too much. Healthy turf producing thatch will tolerate much more grooming than hungry turf with no thatch.

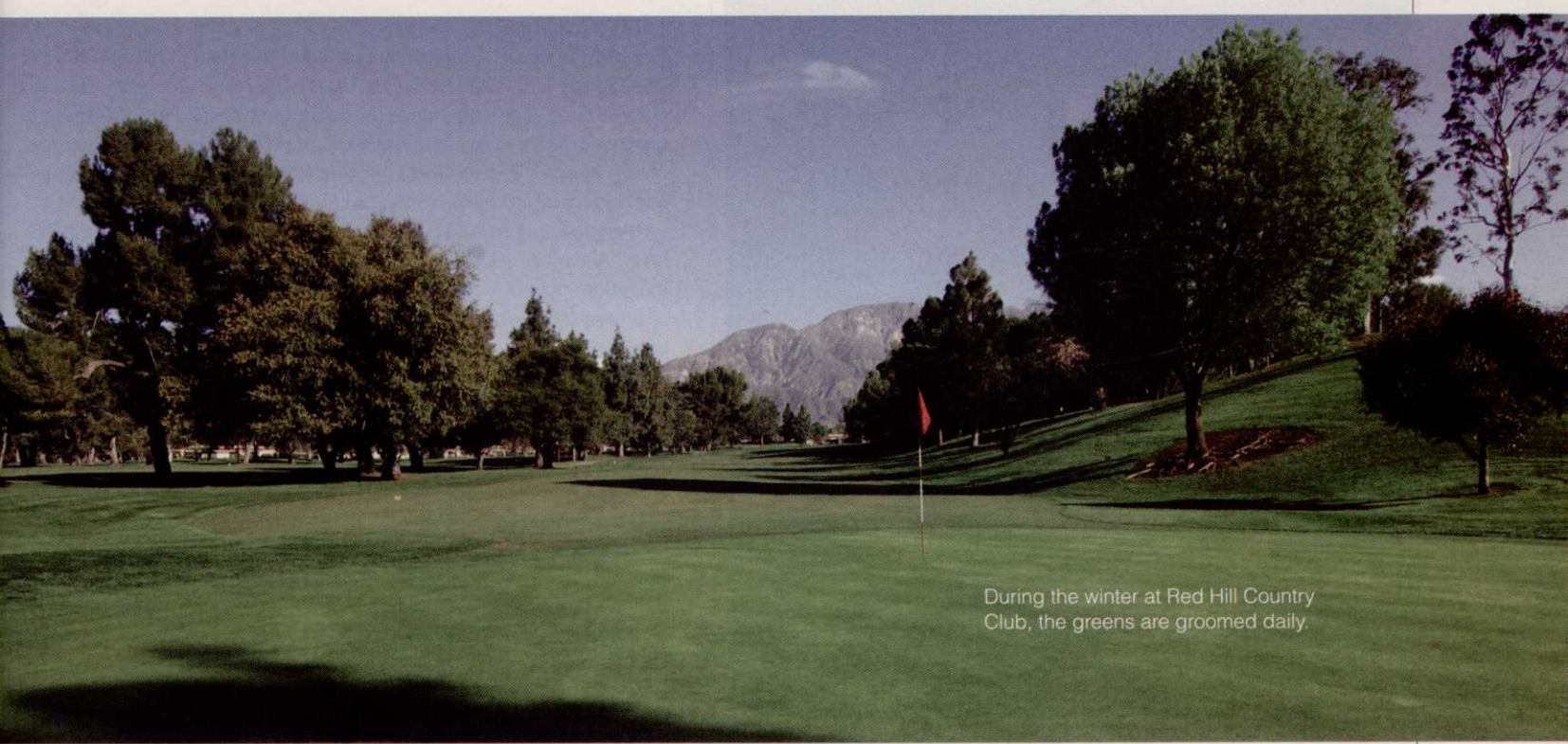
"We use it more like a hard tickle," he says. "With this practice, we've reduced the need to verticut as frequently. The kikuyugrass seems to thrive with turf grooming, but you need to watch you don't overdo it."

The *Poa annua* greens at Palos Verdes are groomed twice a week, while the bentgrass tees are groomed every other week.

"The golf course continues to improve, as the members tell me how much better playing conditions are today," Gradoville says. "I attribute part of that to technology."

FAIRWAY RENOVATION

Red Hill Country Club in Rancho Cucamonga, Calif., has a reputation for being one of the hid-

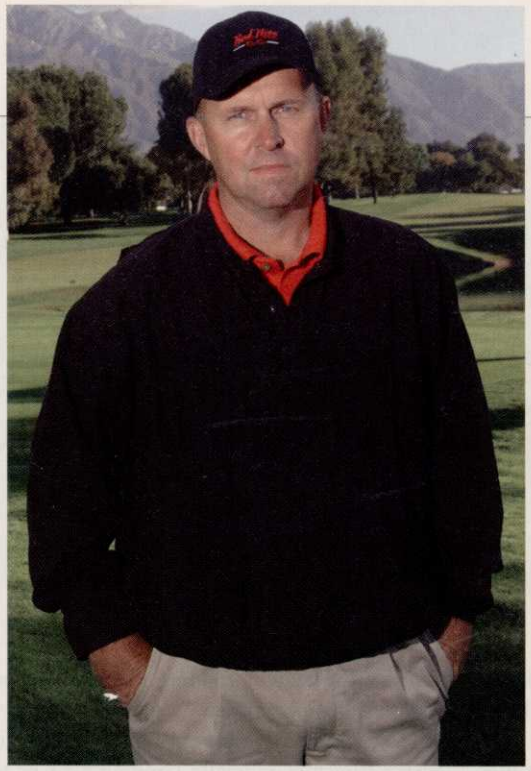


During the winter at Red Hill Country Club, the greens are groomed daily.

den gems of the Inland Empire. Built in 1921 and measuring 6,611 yards from the championship tees, the course sits on a bed of heavy, clay soil, and has small, push-up greens.

However, in today's golfing environment, players and members expect current standards of course conditioning. So, when superintendent Craig Kimmel arrived in March of 2000, his direction was simple: bring the course up to date. His first challenge was the fairways, which had been overseeded for many years.

"This created a lot of problems in summer with the *Poa annua* and ryegrass," Kimmel says. "They just died out in the heat. In 2002, we renovated two fairways as a test plot with hybrid bermudagrass, and it has stood the test of time. Now we've changed all the fairways to Tifway II, and they perform excellent in the summer. We aerify a couple times a year and sand topdress; we don't overseed. We want a drier, more consistent golf course with better ball roll during the summer and winter. When the turf is semidormant, we don't have to water. Then during the summer, we don't have to put as much water on hybrid bermudagrass as we would with a cool-season grass. The quality of the fairways has risen exponentially."



Superintendent Craig Kimmel and his staff try to stand up the grass for a better quality cut and more consistent surfaces.

The maintenance staff verticuts a lot from the spring to the beginning of summer to knock down *Poa annua* seed heads and take care of thatch. Then they light topdress for a smooth ball roll.

Kimmel uses turf groomers on his walk mowers for greens and collars and on the club's three fairway mowers.

"During the winter, greens are groomed every day," Kimmel says. "From March through November, fairways are groomed whenever they're cut, five to six days a week. Turf grooming isn't verticutting. We're trying to stand up the grass for a better quality of cut and more consistent surfaces. Groomers were something I asked for in our last equipment package. From demonstrations, I liked what I saw and am pleased with the results. We're reaping the benefits of turf grooming."

A SPECIAL SETTING

Few golfing experiences are more memorable than playing a round at The Quarry Golf Club in San Antonio. The front nine plays through native rolling grasslands, while the back nine is nestled in a 100-year-old quarry pit. More than 1.5 million yards of topsoil were brought in to create the course's 8-inch base. Golf course superintendent Bruce Burger has been involved in the project from nearly the beginning in 1993.

"People living around the quarry's rim used to look into a dump," he says. "Now they see a beautiful golf course. When we first fired up the irrigation, people were on their patios clapping."

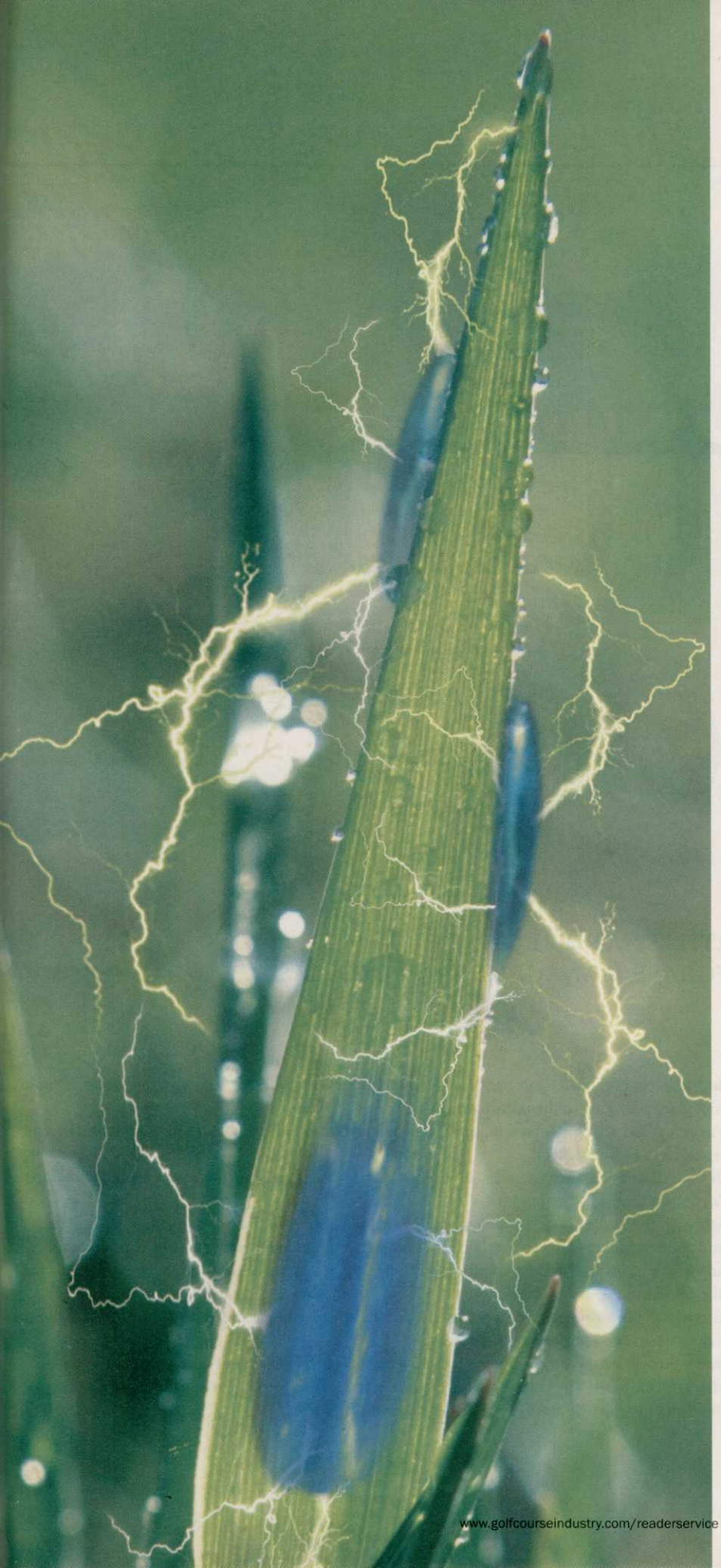
Burger cuts putting greens with triplex mowers equipped with turf groomers.

"When we started using groomers, we cut the greens at one-eighth of an inch (0.125) with the triplexes and groomers, and I got rave reviews," he says. "Everyone remarks about their consistency."

With the Tifdwarf bermudagrass, Burger is able to maintain the greens at that height without any undue stress on the turf.

"The groomers help reduce the number of times we need to verticut," he says. "The leaf blades stand straight up, and the bedknife and reel come behind and clip them vertically instead of just rolling over the top. We don't have much thatch buildup because the groomers stand up the leaf blades to give us a better cut." **GCI**

David Wolff is a freelance writer based in Watertown, Wis. He can be reached at dgwolff@charter.net.



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BY BOB SELIGMAN

getting started

THE ENVIRONMENT, SOIL, FERTILITY AND PRODUCTS IMPACT THE ESTABLISHMENT OF TURFGRASS MANAGEMENT PROGRAMS

Setting up a comprehensive turfgrass management program at a new golf course might seem simple at first glance, at least to the uninitiated eye.

Put down soil, toss grass seed on top, let a good sprinkler system do its thing, and voila! Instant fairways, rough and putting greens.

If only it were that easy. Putting together a turfgrass management program requires a list full of requirements. It's comprehensive.

One deals with the desires of golf course owners and architects; issues involving soil, fertilizer, water, mowing and aerification; not to mention budgets. Superintendents must prepare for environmental conditions and variations, as well as determining what kinds of grasses are best suited for the course during play and the off-season.

And that's just the beginning. Once a program is in place, superintendents have to be able to plan for and make short-term and long-term adjustments.

"You cannot grow grass on cement like many people think they can," says Joe Voss, owner and president of Marco Island, Fla.-based Joe Voss Consulting and Design. "You need to get your soils up to meet the specifications and to grow the grass you're trying to grow."

At 3 Creek Ranch (above), the turfgrass management program is influenced by the Teton Range, a nearby fly-fishing area and a housing community. Photo: Dan Tolson

At The Club at Flying Horse (opposite page), superintendent Dan Hawkins found out what products were and weren't needed during the grow-in. Photo: The Club at Flying Horse

FERTILIZATION'S IMPORTANCE

But before the first blade ever rises out of the soil, one has to consider the important issue of initiating a turfgrass management program during the design phase of building a new course or during grow-in – but there doesn't seem to be a clear consensus about when to start.

"You usually do it during the design period because you want input from the architect and the owner about what they want for grass," says Voss, the former golf course manager for Liberty National Golf Club in Jersey City, N.J. "There's so many different varieties of bentgrass. First, you have to find out what they want and what their budget is going to be, which is key. How much will they spend on construction? How much drainage you have? What's your water quality? That determines your turf program from the actual construction and the preplant through the grow-in and the maintenance."

Fertilization is key for a grow-in to start well, Voss says.

"You might have limited water or limited quality water, but you need to be up to speed on what you're going to use for your preplan and your grow-in," he says.

ENVIRONMENTAL CONSIDERATIONS

Mike Etchemendy, director of facilities operations at 3 Creek Ranch in Jackson Hole, Wyo., also started his program during the design phase. The emphasis was on the environment, which includes the nearby Teton Range and a private fly-fishing area within the adjacent private housing community. Etchemendy started out with an

When establishing the turfgrass management program at 3 Creek Ranch, director of facilities operations Mike Etchemendy used an environmental consultant who developed a natural resource management plan, which models fertilizer and pesticide use after weather conditions. Photo: Dan Tolson

environmental consultant who developed a natural resource management plan.

"It basically models fertilizer use, chemical use and pesticide use with weather conditions in this area," he says. "We have three spring creeks where the runoff water could enter during a storm. We modeled all chemicals that could be used here against thunderstorms and rain events that have happened here during the past 30 years. This model told us what kind of potential pollutants we could have entering our spring creeks from the golf course and the residential community. We eliminated anything that could potentially harm or pollute the spring creeks. That told us what kind of fertilizers we could use, what nitrogen sources could pollute the spring creeks and any fungicides that could enter the spring creeks. We worked backwards from there."

TESTING THE SOIL

But not everyone favors putting the pieces of the puzzle of a comprehensive turfgrass management program together during the design phase. At The Club at Flying Horse in Colorado Springs, Colo., golf course superintendent Dan Hawkins says by testing the soil during the grow-in, he knew what additional amendments were needed such as gypsum and potassium. As a result, management was able to move the money set aside for preplant fertilization and use a portion of it for additional amendments such as gypsum and potassium. This was done before the grow-in, during the construction time frame.

"Those products would have been amended by the construction company on the golf course prior to seeding," Hawkins says. "Once we take over the hole from the construction company, then we begin growing in whatever hole it is."

During grow-in, Hawkins found what products were and weren't needed, which also saved money.

"At the time, we were doing this particular job, and I hadn't decided what we were going to use for our greens program," Hawkins says. "The fertigation system allowed us to get some nitrogen out during the watering of the greens, as well as the rest of the golf course, so we were

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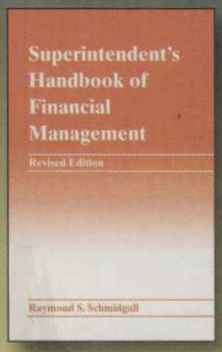

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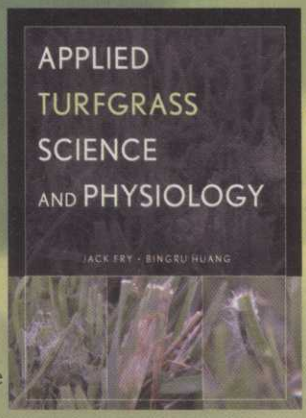

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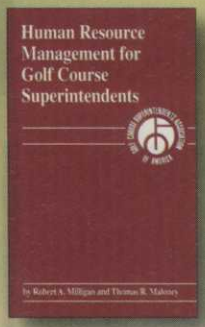

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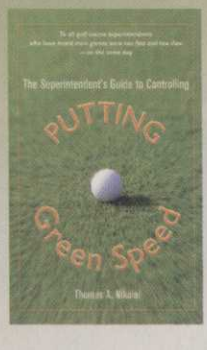

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getting a nitrogen component that allowed us to see what kind of growth we were getting. We could dial back on our foliar program rather than saying ahead of time that we knew exactly how the bentgrass was going to grow. We could see what the grass was looking like on the greens, and instead of using one product, we were going ahead with a different product because we were getting better growth than we thought."

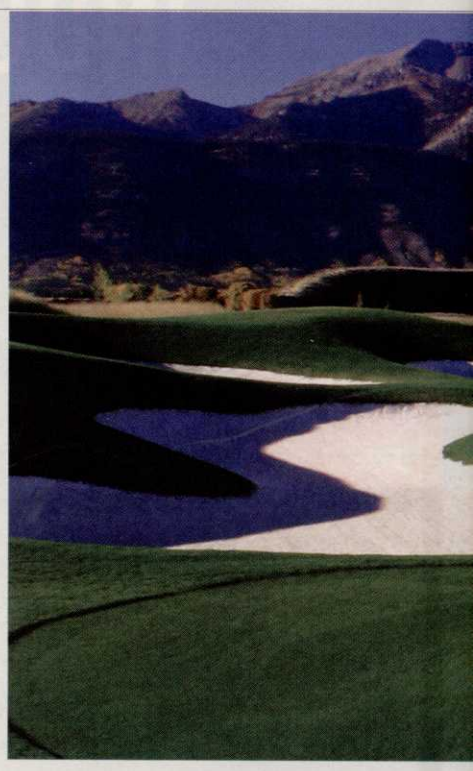
MAKING ADJUSTMENTS

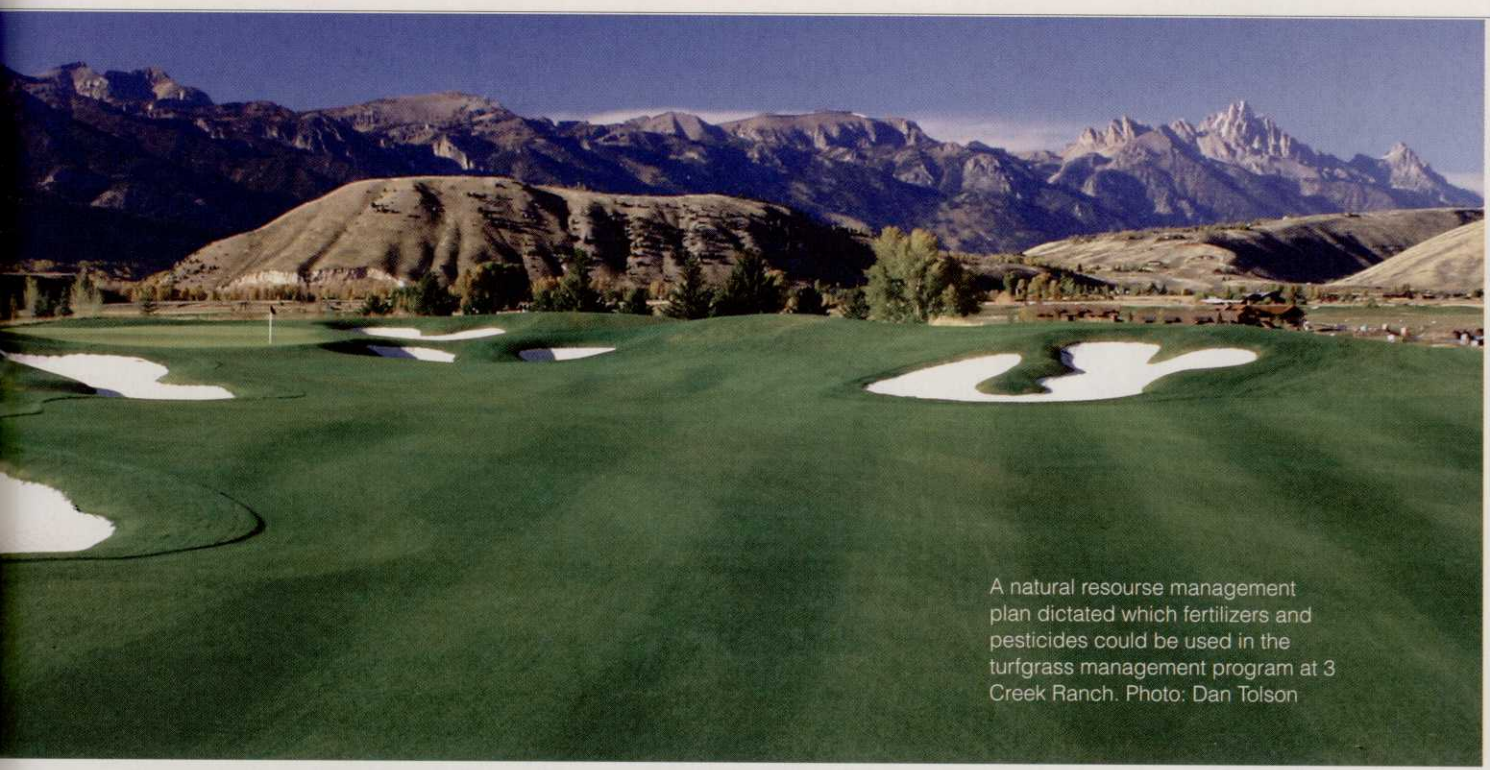
Being flexible is part of developing a successful turfgrass management program. As Hawkins admits, there's much adjusting on the fly depending on what's happening. At Liberty National, for example, capping material had an extremely high salt index, so an intensive program was needed to regulate the pH level and add nutrients while eliminating the salts. The importing of high salt soil was halted eventually.

Even with making adjustments, not every aspect of a successful program is initiated at the beginning. Some take place several years later. One potential change is with products. New ones are made better and cheaper than their predecessors. As a result, Hawkins says he'll probably use his fertigation system more extensively because there are more better-blended products available.

"The golf industry – the turf side of it – is a changing science," Voss says. "Things get bigger, better, faster, stronger. That's inevitable. We've gotten into all this new gene research. You might change what you're doing halfway through the construction." **GCI**

Bob Seligman is a freelance writer based in Suffren, N.Y. He can be reached at bhseligman@aol.com.





A natural resourse management plan dictated which fertilizers and pesticides could be used in the turfgrass management program at 3 Creek Ranch. Photo: Dan Tolson

ARCHITECTS, DEVELOPERS TARGET NONTRADITIONAL COURSE NICHES

shorter loops

By T.R. Massey

Golf course development is in a holding pattern. The need for new, 18-hole championship courses isn't as great as it was a decade ago, and new-builds have slowed during the last few years. The cyclical pattern happens as the sport's popularity waxes and wanes.

But it's not as if there's nothing going on. Many golf course architects say they're working on renovating older courses. There are still active areas of new development in the South and West. But in urban areas of the country reaching a saturation point for traditional golf courses, some see a new niche developing that includes nontraditional, inexpensive projects.

"I think it's a trend," says Michael Hurdzan, a principle of Columbus, Ohio-based Hurdzan/Fry Golf Course Design and author of the book, "Building a Practical Golf Facility." "If we don't recognize that people are living a faster pace of life, then we're making a huge mistake," he says.

That's why when local developer Bill McCorkle called Hurdzan last year to ask for advice about what to do with 17 acres of green space, Hurdzan had plenty of ideas.

"Our gut feeling was that there was a market for a nontraditional facility," Hurdzan says. "He only had so much acreage, so there was a leap of faith on his part that we were right."

McCorkle had purchased 85 acres of land adjacent to Polaris, one of the biggest retail areas in Columbus, and intended to build 93 single-family homes and 54 condos there.

"The township designated 20 percent had to be open space and recreational-use applied,"

Developer Bill McCorkle believed there was a need for a public golf course instead of soccer fields and baseball diamonds on the 17 acres of land he owns that was set aside for green space. Photo: Little Bear Golf Course

It cost $3.5 million to build the nine-hole Falcon Valley Golf Club in Lenexa, Kan. Photo: Falcon Valley Golf Club

McCorkle says. "Rather than 17 acres of soccer fields or baseball diamonds, I felt there was a need for a public course that was good for recreational players."

Between them, Hurdzan and McCorkle had enough knowledge to move forward without a market study.

"I went from my own personal experiences and talked to friends and colleagues and clients," McCorkle says. "It was informal, but the local market is saturated with 18-hole courses. There are so many first-rate country clubs and championship courses, I didn't feel like I was competing with them. My price point was lower and more accessible."

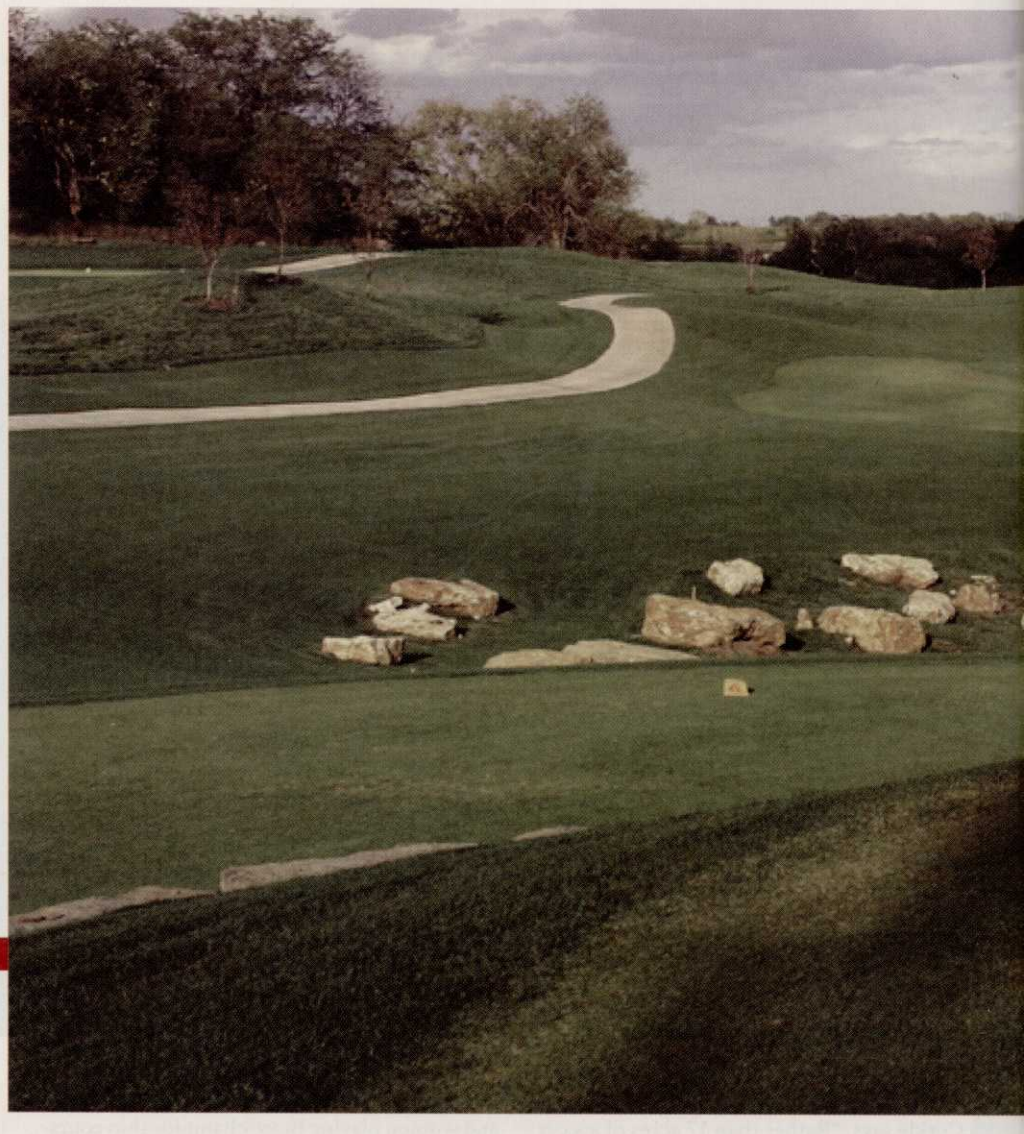
McCorkle saw an opportunity on which he hopes to capitalize when he opens Little Bear Golf Course, his 10-hole (two loops of five) par-3 facility this season.

"There aren't that many juniors and seniors and women playing those championship courses," he says. "I felt like there was a large, untapped market of people who enjoy golf – those who want to learn aren't going to Muirfield Village Golf Club to learn to play. I felt like my course would be a feeder system for the country clubs. They learn here and get a membership somewhere else."

In addition to being an alternative-type golf facility, Little Bear also has artificial turf on the tees and greens, so maintenance costs will be almost nothing, and those areas won't damage as easily as natural-turf greens.

"I was the guy talking him into the artificial turf greens," Hurdzan says. "It made perfect sense. He doesn't have to have a pesticide applicator on staff, no fertilizers – all the traditional things you worry about with housing development deals."

After testing several varieties of man-made



The nine-hole Falcon Valley Golf Club is projected to generate 30,000 rounds this year. The club's owner says the local market is saturated with 18-hole courses. Photo: Falcon Valley Golf Club

turf, McCorkle was convinced.

McCorkle arranged to have the golf course construction be part of the overall development loan. He further strengthened his financial operation by tying in the storm water management program from the subdivision to a series of lakes on the course so it can be used for irrigation.

The small development is inside a larger cluster of about 2,000 homes, all of which are within walking distance of Little Bear. The course also is close to a high-density business area.

"I thought there might be some corporate outings," McCorkle says. "People do business while they golf, but it doesn't have to take five hours. You can play this course in 90 minutes and still close a deal."

Additionally, McCorkle built a 14,000-square-foot clubhouse that's geared for parties, receptions, banquets and corporate meetings.

"That was needed to supplement the golf," he says. "In the dead of winter, you need extra income."

COME AND LEARN

Identifying places for newcomers to learn is what drove the city of Fargo, N.D., to build the 12-hole Osgood Golf Course three years ago. A local developer gave the city 100 acres of land on the newly developing southwest side of town. It also helped that the city's parks and recreation district commissioners were forward-thinking golfers.

Colorado-based architect Rick Phelps had worked for the city before, and this time, officials told him they wanted something different.

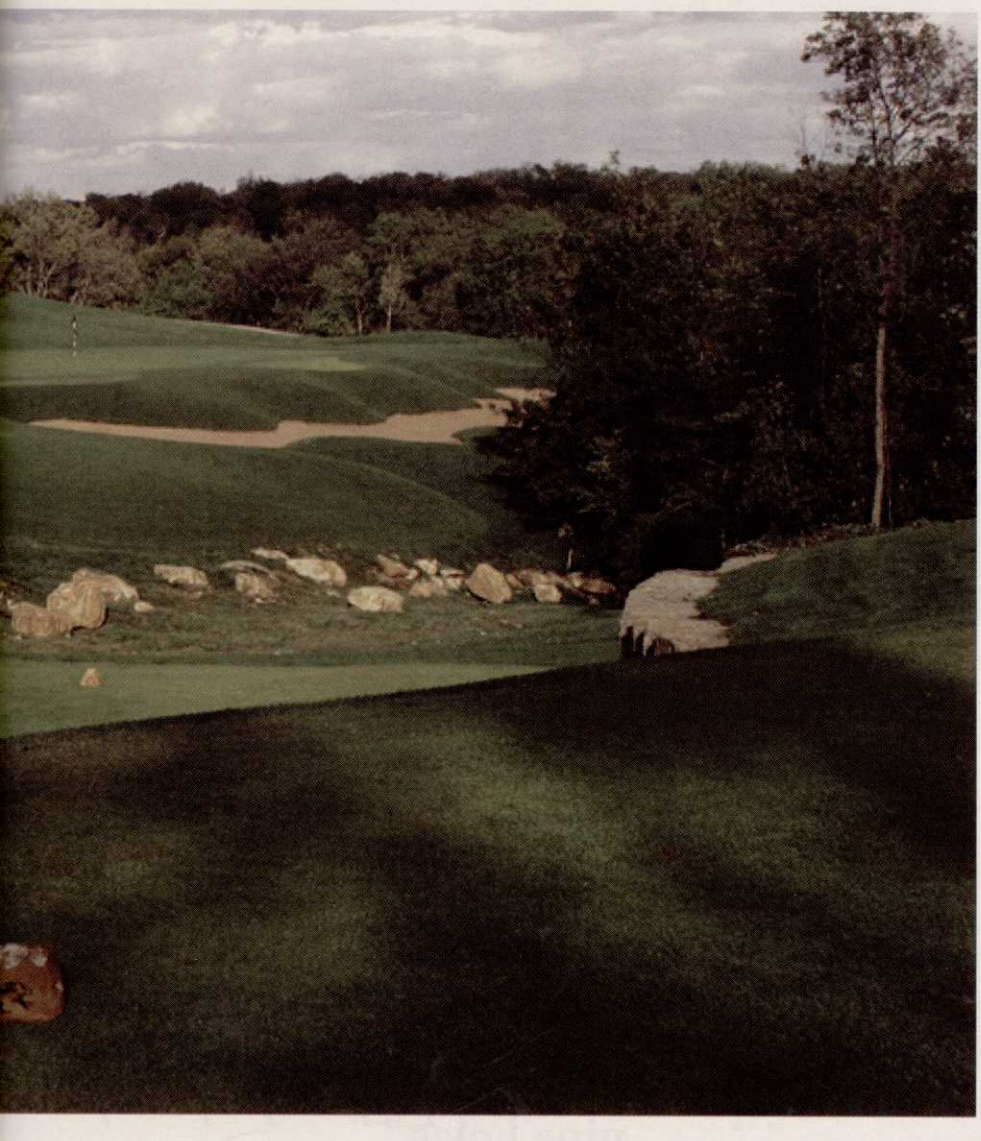
"Both our 18-hole courses are similar, and our two nine-hole courses are packed," says Roger Gress, executive director of the Fargo Park District.

With the feeling a market study was superfluous, the city had Phelps build a 12-hole course of three four-hole loops. There are 1,000 kids in the Fargo summer golf program, and the unique setup allows Osgood to be conformed in a variety of ways, including a nine-hole course with three holes set aside for teaching or maintenance purposes.

"We have college kids teaching, and the driving range is big, so it will be a money-maker," Gress says. "If we do our job maintaining it, it's going to be popular."

Phelps, whose associate Kevin Atkinson was the main designer for Osgood, sees the same successful future for the facility.

"We're trying to do what we can to bring in



new people," Phelps says. "The research I've read indicates there's a tremendous number of people thinking about taking up the game but are intimidated by cost, time constraints or just the thought of playing 18 holes. We have to get rid of that stigma."

Osgood is a short course but has three par-5s. Its popularity grew from 9,100 nine-hole rounds in its first year of operation to 21,000 last year.

"If you go 10 or 20 years and looked back, I'd like to think by year five or six revenues are paying for expenses, not debt service," Gress says. "Once it's paid off, it's an incredible amenity and should take care of itself."

The city paid $2.8 million for the course's construction (the maintenance facility was $350,000 of that) and is charging $15 green fees for nine-hole rounds.

"We had enough money in our budget, and there haven't been any problems so far," Gress says. "We wanted to push youth golf and teaching. We think we hit a home run with it."

Phelps sees the need for more courses like Osgood. He and Atkinson are working on a course in Colorado that will be a companion to nearby Antler Creek Golf Course, which is the state's longest course at 8,113 yards. The sister course is 6,700 yards with four- and six-hole loops that return to the clubhouse.

"You don't have to play 18," Phelps says. "The way the routing is set up, you can play four, six or nine holes if you want. Not everyone wants to play 8,100 yards at a tournament venue. You can't bring the kids out there. It's too much for them."

FINDING A NICHE

Near Kansas City in Lenexa, Kan., Dean Ralston and a partner recently bought the 3,400-yard, nine-hole Falcon Valley Golf Club, a Craig Schreiner-designed layout that opened in 2002. Ralston sees an advantage in a nine-hole layout – great quality golf for those who don't have the time to play 18-holes.

Originally, the course was supposed to be paired with nearby Falcon Ridge Golf Club, but deals fell through and there wasn't room for 18 additional holes.

The 12-hole Osgood Golf Course in Fargo, N.D., was built on 100 acres of land. Its popularity increased from 9,100 nine-hole rounds in its first year of operation to 21,000 last year. Photo: Osgood Golf Course

"There can be quality in less than 18 holes," Ralston says. "Seventy percent of our players play only nine holes."

Financed through a local bank and benefiting from market studies, the facility was built for about $3.5 million on 120 acres of land and includes a 4,500-square-foot clubhouse.

"People are so busy with work, activities and kids, we offer a good quality course at a value and alleviate the time constraint," Ralston says.

The area is saturated with 18-hole facilities, and with Falcon Valley's location and quality, it's in a great niche, Ralston says.

Ralston projects 30,000 nine-hole rounds this year, with greens fees at $27 including cart on weekends and holidays. Surrounded by high-end housing, Ralston sees a growing group of people who will take advantage of high-quality golf without the pressure of 18 holes.

SMALLER CAN BE BETTER

John McDonald, one of the owners of golf course builder John McDonald & Sons in Jessup, Md., believes there's an uptapped reserve of golfers who want such nontraditional layouts.

"There are people who don't want to spend the money or the time who will come out for the right place," he says. "Those who want to spend an hour and a half will love 10-hole courses, or places with multiple holes for the same green. If you built the right features on the right piece of land, you could tap a part of the market that doesn't even golf right now."

That's what's needed to get the next generation into the game, McDonald says.

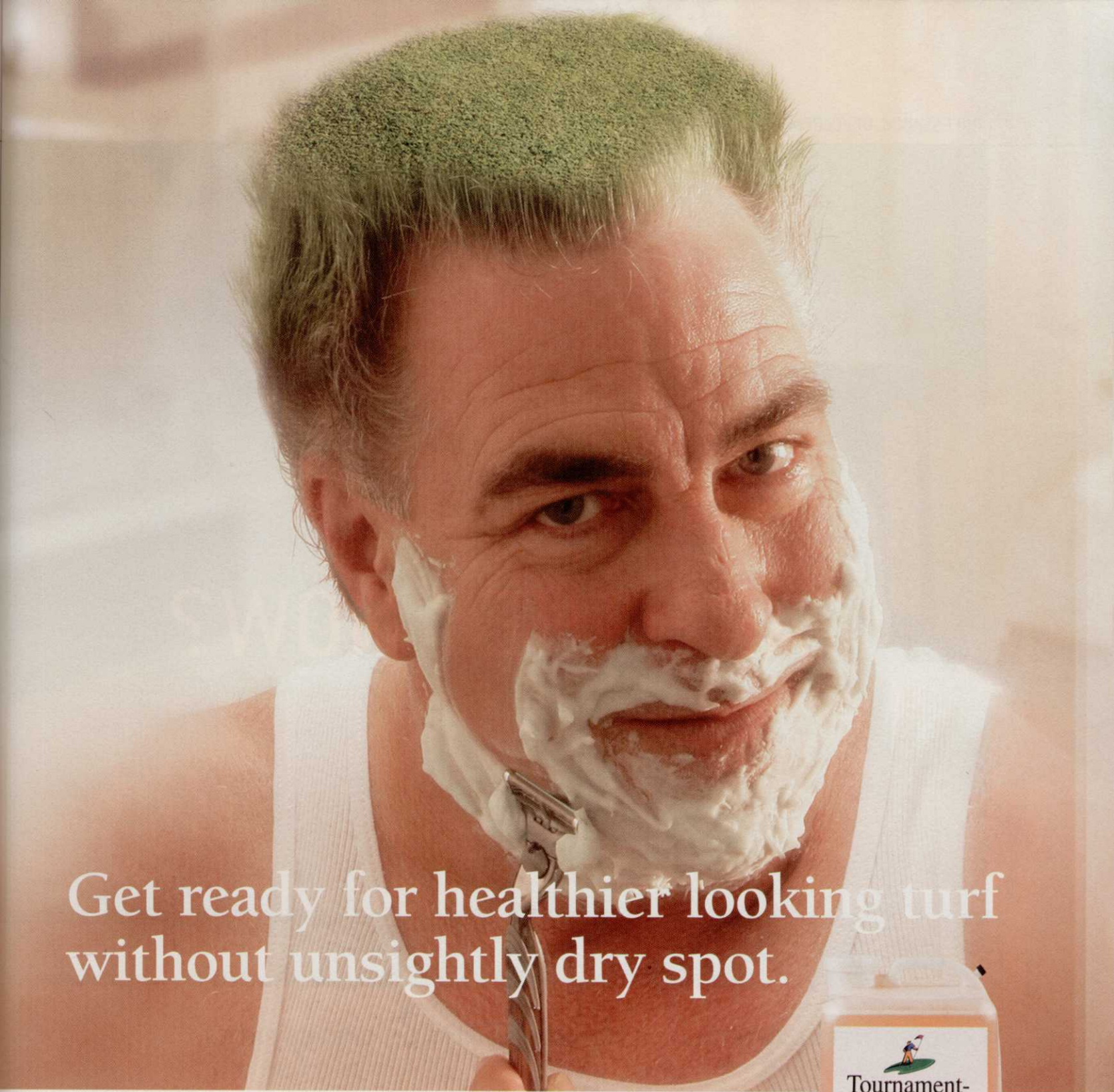
"Ultimately you need to get people on a smaller property to get them into golf," he says. "That perpetuates the next group of people who will play golf on the next group of 18-hole golf courses that will need to be built in the next decade or so."

McDonald is on the same page with Hurdzan when talking about nontraditional golf. Hurdzan believes small facilities can be built that dictate a reduced-distance golf ball. He also sees room for modifying existing golf courses.

"In a couple of places, we're suggesting we take the last three holes of the course and design extra tees and greens and break them off from the rest of the course," he says. "You could play them in the morning before anyone ever gets out there. You're appealing to a different market. You could take a big golf course and make it a smaller one. That way, people who only want to enjoy the course for an hour in the morning can do it." **GCI**

"There can be quality in less than 18 holes. Seventy percent of our players play only nine holes."
- DEAN RALSTON

T.R. Massey is a freelance writer based in Columbus, Ohio. He can be reached at trm@columbus.rr.com.



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EX-SUPERINTENDENTS TAKE ALTERNATE ROUTES ON CAREER PATHS

BY JOHN WALSH

Thousands of golf course superintendents love the profession so much they'd never leave or wouldn't think of doing anything else professionally. But sometimes there are factors in a superintendent's life that cause him or her to leave the profession. And although aspects of the job are missed, the decision isn't regrettable in most cases. Oscar Peterson, Bill Roberts and Bill Lanthier are cases in point.

DIDN'T SEE THE LIGHT

Oscar Peterson, CGCS, was a golf course superintendent for seven years and was in the industry for 18 years dating back to when he was in high school.

"What lured me into the business was the phenomenon – at the time – that you could get to a course early in your career and retire there," he says.

Peterson graduated with a bachelor of science degree from the University of Wisconsin at Madison in 1995 and then worked as the assistant superintendent at Blackhawk Country Club in the same city.

"I didn't do the second assistant or spray technician thing because I was lucky enough to get a true assistant's position right out of school," he says.

After four years as an assistant at Blackhawk, Peterson went to Freeport (Ill.) Country Club as superintendent. He stayed there from 1999 to 2004. Then he went to Watertown (Wis.) Country Club as superintendent. After two years at Watertown, Peterson became disillusioned with the job market and left the industry to start his own commercial and residential outdoor lighting business.

"I was enticed by the ideal career path," he says. "I signed up to be an assistant for two years and then get a head superintendent's job; but for others, that's not likely anymore. I was the last of the guys to make it to a superintendent's position early in one's career. I was a superintendent at age 24. Now, there aren't many superintendents under the age of 30.

"I was lucky to get my first superintendent's job, but the town and club went through tough times, and I left to go to Watertown," he says. "At the time, I started a family and was close to other family members. I thought Watertown was more stable. Eventually, I wanted do to less physical labor and work with a bigger budget, but with the economy and shrinking budgets, that didn't happen. I worked 60 hours a week and did a lot of physical labor. I wanted to go to a club with more of a staff."

Like Freeport, Watertown had financial difficulties.

"They cut their budget and asked me to take a pay cut after year two," Peterson says. "There was an exodus of members at clubs in the area. It wasn't just bad decisions made by the board."

Every year Peterson was a superintendent, he looked for another job because his ultimate goal was something else. Every job he interviewed for was because of somebody he knew, not because of his resume, he says.

"Some places had 200 applicants," he says. "That's the way it is nowadays for the top 10 percent of the jobs in the Midwest. If there was a job opening that was better than what I had, I applied for it. In seven years, I applied for about 20 jobs."

Because there are so many applicants for one job, clubs need to narrow the pool. Peterson says assistants are usually thrown out first, then superintendents with less than five years experience, then superintendents with two-year degrees.

"The bad jobs get worse, and the good jobs are few and far between," he says. "I couldn't get to where I wanted to go."

Peterson decided to look outside the industry for gainful employment when he realized the next better job wasn't going to come along.

"I didn't see the light at the end of the tunnel," he says. "For me, the goal was to be at a stable course with at least a $500,000 budget, one good mechanic and one good assistant. All the budgets at the courses I was at were going down. It was tough. I wasn't going to settle only for the Milwaukee Country Club, but I wanted to work somewhere better than where I was. I would have gone to a public or resort course, but the budget had to meet expectations."

One morning while at Watertown, Peterson thought he could work less and make more money doing something else. So he left the club and started his own business.

"I'm working less, and I'm not too far from my field," he says. "I'm outside a lot and not stuck in an office all day.

"You hear of people leaving and turning up as salespeople," he adds. "I know a lot of college friends who left the business, but I wasn't interested in a sales job in golf. I'm working for myself, and I have more control over what happens."

Peterson's former job as a superintendent and the one he has now running his lighting company have similarities – both have technical and financial aspects. Peterson puts the skills he learned while he was a superintendent, such as people management, time management, scheduling and dealing with difficult customers and employees to good use at his lighting job.

Even though Peterson misses being a superintendent every day, he doesn't miss working on weekends and attending late-night committee meetings.

"I'm a better parent and better husband for changing jobs," he says. "I wouldn't go back. I would have to be forced into it. It's a maturing thing. I'm 33, and your priorities change a bit when you're older and have a family."

AFFINITY FOR LAW

Bill Roberts, a former president of the GCSAA, was a golf course superintendent for about 20 years in Wisconsin, Illinois and Michigan. A 1975 graduate of Penn State's turfgrass program, Roberts studied under Joe Duich, Ph.D., then he went to work for Bob Williams at Bob-O-Link Golf Club in the Chicago area, where he was from. Roberts became involved with a local superintendents association and then with the GCSAA's board of directors in 1986, working his way up to president in 1992.

After Bob-O-Link, Roberts became the superintendent at Stevens Point (Wis.) Country Club, then went to Knollwood Club in Lake Forest, Ill., and was there for two years. Then he left for the Lochmoor Club in Gross Point Woods, Mich. Lochmoor was the last club at which he worked as a superintendent. He was there while serving on the GCSAA board and as president. He left the industry in 1994.

Former golf course superintendent Bill Lanthier, right, is now a salesman for Golf Ventures in Florida. Lanthier views his job more as helping friends than selling product. Photo: Bill Lanthier

"When I got into the business, I really wanted to be in it," he says. "I had very good mentors (Duich, Williams and Jim Bertoni, an Illinois superintendent who went to Penn State and who Roberts worked for while he was in college) and those relationships were beneficial. Part of being a superintendent was being involved, and that was my foundation. But I was starting to get a bad attitude even though I didn't hate the people I worked with or the work environment. When I tell people I left working on a golf course to become a lawyer, they look at me like I'm nuts."

Roberts remembers when he decided to leave the golf course superintendent profession.

"One July 4, I was sitting at an irrigation controller," he says. "It was 95 degrees at 4:00 in the afternoon. The golf course was pure *Poa annua*, and I couldn't keep enough water on the grass to keep it alive. Right then and there I decided, as a culmination of things, I didn't want to do this anymore. I'll never forget that."

After leaving Lochmoor, Roberts and Frank Guastella, the former general manager of the club, found a golf course in Marquette, Mich., called Red Fox Run, which is part of a closing air force based. Marquette County was taking over control of the property, including the golf course, and needed someone to run the daily 18-hole facility, so Roberts and Guastella purchased the lease and have been managing the course since.

"It's not Pebble Beach, but it doesn't pretend to be," he says. "I'm not involved day to day anymore."

Roberts didn't consult with colleagues before leaving the profession. He was convinced.

"I was out of the day-to-day stuff when I left golf," he says. "I was working with the PGA education staff and still do. I just did it. I talked it over with my wife but not my colleagues. I wasn't in touch with many of them at that point."

Roberts says he's always wanted to work in the legal field. So, after Lochmoor while managing Red Fox Run, he finished his bachelor's degree at Wayne State in Detroit via its weekend program. Then he attended the Thomas M. Cooley Law School in Lansing.

"They had a weekend program for second career folks," he says. "It took 2.5 years to get my law degree. I went to school for 14 weeks, then had three off, 14 on and three off. I was very determined and focused. I never looked back. Law school was all about persistence."

Roberts took the bar in Michigan in February of 2001 and passed. At that point, he and his wife decided to move back to Chicago to be closer to family. Then he took part of the Illinois bar and passed and went to work for the state attorney's office in DuPage County. He has been there since.

Robert's main client is the county's health department. He deals a lot with confidentiality issues. He's also involved with civil litigation, personal injury, civil rights and criminal cases.

Some of Roberts' habits that he had when he was a golf course superintendent remain.

"I still get up at 4:00 in the morning every day," he says. "I wasn't able to shake that."

Roberts sees similarities between the golf course superintendent and law professions. Mentoring and camaraderie are two.

"This office has a mentoring environment," he says. "There are a million questions to ask, and no one turns me down. It was like that in the golf industry.

"On a personal level, the law profession isn't as adversarial as you might think," he adds. "There's a good level of professional respect."

Looking back, Roberts says he didn't have the affinity for the technical aspect of the superintendent's job.

"I was a history and English guy, not a science guy," he says. "In law, there's a lot of reading, writing, speaking and arguing, and those are my natural affinities. So I thought for a time I was misplaced for 20 years."

But Roberts hasn't lost touch with the industry completely. He sees Steve Cadnelli, CGCS,

(Cape Cod National Golf Club) and Dennis Lyon, CGCS, (city of Aurora's golf division), among a few others, once in a while.

"I didn't want to be miserable doing what I was doing for the rest of my life," he says. "Every job has it headaches, but I'm having a pretty good time. There are many reasons why people don't make a change, but if you're thinking about it, look at it honestly. For me, it was worth it."

HELPING FRIENDS

Although Bill Lanthier isn't a golf course superintendent anymore, he's closer to the industry than Peterson or Roberts. Lanthier is a territory manager for Lakewood, Fla.-based Golf Ventures and has been with the company for nine years. Before that, he spent 16 years as an assistant superintendent and golf course superintendent.

Lanthier started working at Peach Valley Country Club in Spartanburg, S.C. as summer help when he was 15. He worked for then-superintendent Dave McIntosh at the family-owned facility.

"He inspired me to be as good as him," Lanthier says of McIntosh, who's now an international turf consultant.

Lanthier went to school for golf course design, but there were no placements in the industry for him. At the time, he went to work at Mariner Sands Country Club in Stuart, Fla., doing anything he could and worked his way up to assistant superintendent under Kevin Downing, who's now at BallenIsles Country Club in Palm Beach Gardens, Fla. Then, at 25 years of age, he left and got his first superintendent job at North Palm Beach Country Club in Florida helping rebuild the course. After six years at North Palm Beach, he received a call from Mariner Sands and returned to work there for four years. After his second stint at Mariner Sands, he went to work for Golf Ventures, a distributor of chemicals, fertilizer and equipment.

"I wanted to build and design golf courses when I was younger," Lanthier says. "At one point in my career, I got a call to go to South America to build golf courses, but my wife was pregnant at the time."

While at Mariner Sands the second time, Lanthier felt like he was at the top of the profession at 30 years old but realized he needed a different challenge.

"Part of the reason for the change was that I was tired of being told what to do and part of it was that I wanted to be my own boss," he says. "Golf Ventures approached me. I never thought I would be in sales, but in a way, I'm not. I'm helping my friends."

When Lanthier went to Golf Ventures, he says there was no training about how to sell, and in hindsight, it was a tremendous positive for him.

"I couldn't sell a fan in the Amazon," he says. "I was never asked to sell anything, just find out what the superintendents' challenges are. The lack of training allowed me to do it my way. I never looked at sales as an option. I'm not limited to what I can do. The philosophy is to help superintendents do better and the business will take care of itself."

However, the transition to sales wasn't easy.

"I was one of the better paid superintendents at a better club," he says. "Getting paid on sales performance was scary. I'm sure my wife was shocked when I told her about the job change, but she supported it. I love what I do."

When Lanthier was working as a superintendent, he never took a day off, even though no one told him to do that.

"That was my mentality, but I realized I needed to focus on my family," he says. "Even now, I work weekends if needed. I'll do anything in the world to help my friends."

The inflexibility or flexibility with both jobs is self-induced.

"As a superintendent, I could have taken weekends off because the crew wouldn't have missed a beat, but I wanted to be there," Lanthier says.

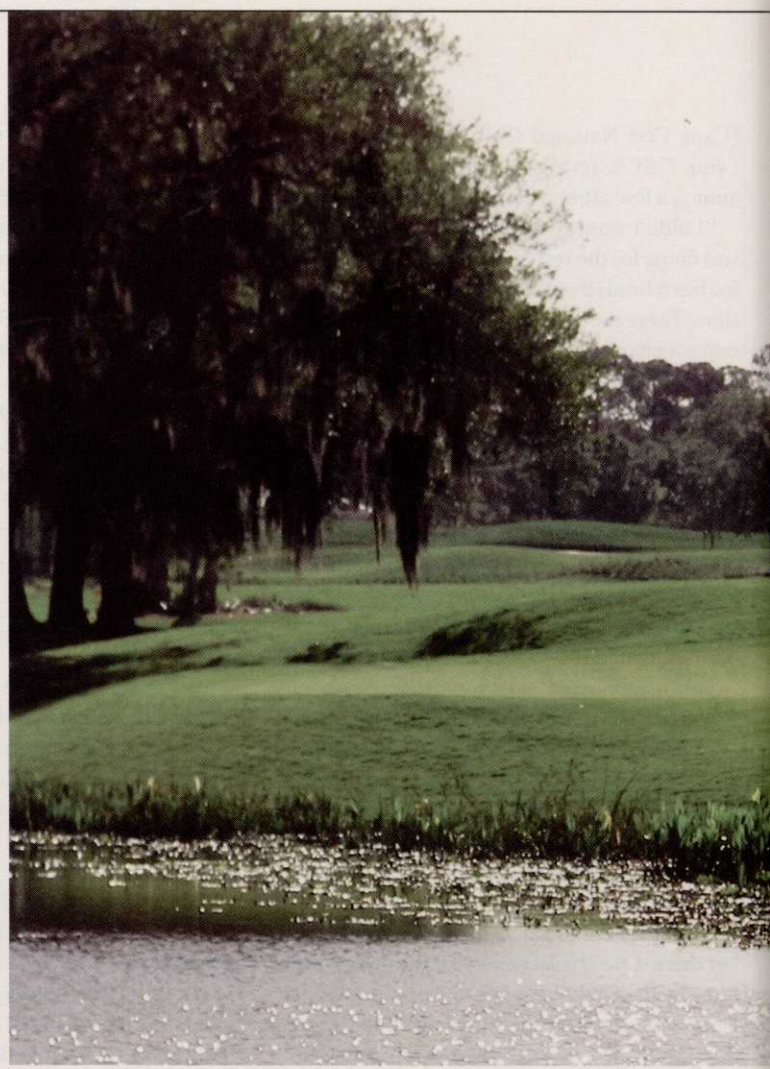
Although in sales, Lanthier is connected to his former crew members.

"Four of my assistants are my customers," he says. I haven't lost touch with them. I miss riding the course in the morning and at the end of the day. But I know of superintendents who like me to be there at sunrise and ride with them."

Overall, it's natural for people to change jobs during their careers.

"Our industry isn't particularly different," Lanthier says. **GCI**

Former superintendent Oscar Peterson now owns an outdoor lighting company and spends more time with his children.



WALL TO WALL

RENOVATION TEAM PLANTS PASPALUM ON ENTIRE COURSE IN FLORIDA

BY PETER BLAIS

One size fits all. The idea worked for adjustable baseball caps on human heads. Now it might be the same for seashore paspalum on Southern golf courses.

The Eagle Course at The Oaks, which was renovated by Arthur Hills recently and opened April 23 in Osprey, Fla., is reportedly the first course in the country planted entirely in SeaIsle Supreme paspalum.

"My understanding is that SeaIsle Supreme is planted in certain areas on some courses, but not wall to wall," says Brian Yoder, the Arthur Hills/Steve Forrest and Associates partner directing The Oaks project. "This should be the first one out of the block, and it will help the club differentiate itself from its competition."

PASPALUM ON THE RISE

Hills/Forrest counts roughly 30 southwest Florida courses to its credit and firmly believes paspalum will supplant bermudagrass as the area's turf of choice in the coming years, Yoder says.

The biggest advantage is paspalum's ability to thrive with a salt-laden water supply. Salt is a major part of effluent and brackish water that many Sunbelt courses are turning to, as potable water becomes increasingly scarce in the rapidly developing South.

SeaIsle Supreme paspalum grows much better with a less-than-perfect water supply, says Earl McMinn. Photo: The Oaks

The turf's proponents claim paspalum requires less water, fewer nutrients and a reduced number of certain pesticides. Compared to bermudagrass, it often has a deeper green color and denser plant structure that allows the ball to sit up higher. It also stripes well when mowed.

Until recently, paspalums have been considered mainly a tee, fairway and rough grass, with ultradwarf bermudagrass still king when it comes to greens. But some recently developed paspalum cultivars, like SeaIsle Supreme and SeaDwarf, have proven to be the equal of ultradwarfs when it comes to quality putting surfaces. That has led certain courses, such as The Oaks, to consider planting paspalum wall to wall.

A COMPLETE OVERHAUL

Earl McMinn, CGCS, came to work at The Oaks – which has two 18-hole layouts, The Eagle and The Heron – as director of golf and grounds maintenance in May 2004. McMinn previously worked at The Landings Club in Savannah, Ga., where he oversaw renovations of the Marshwood and Magnolia courses.

When he arrived, The Oaks' members were debating the extent of needed renovations to The Eagle. The course was in dire need of irrigation and drainage improvements.

"My opinion was that as long as they were tearing up the course and spending $2 million anyway, they could spend another $2 million and do an entire renovation complete with USGA-spec greens and new grass," McMinn says. "We had a lot of off-type bermudas that had gotten into the Tifdwarf 419 bermudagrass, so it wasn't a pure stand of 419 anyway. We also had some common bermudagrass and torpedograss, which is difficult to eradicate."

The members voted overwhelmingly to follow his recommendation. McMinn and Yoder put the project out to bid in 2005 and closed The Eagle in March 2006.

PREPPING FOR PLANTING

McMinn traveled to several golf facilities that had

switched from bermudagrass to paspalum and asked about their eradication programs. Some had used methyl bromide and others preferred Roundup, but McMinn decided to blend the two processes.

He sprayed the entire course with Roundup before overseeding with ryegrass in the fall of 2005. Then he increased the overseeding rates to encourage a thick stand of ryegrass that would smother any of the remaining bermudagrass or torpedograss. Once the course closed the following spring, he applied two more Roundup treatments along with fusilate and Drive. Drive helped further eradicate any remaining torpedograss. Fusilate did the same with the bermudagrass. Once the builder, Landscapes Unlimited, plowed the course under and shaped the main features, McMinn applied methyl bromide to the fairway and tee complexes.

The choice of grass was important. The master plan called for the renovation of all 36 holes. As soon as Hills and McMinn completed The Eagle, McMinn turned his attention to the Pete Dye-designed Heron.

"We wanted to have an excellent playing surface on both courses," says McMinn, who visited numerous Southern Florida courses, as well as The Ocean Course at Kiawah, which was replanted with paspalum.

McMinn's and Yoder's research revealed SeaIsle Supreme ranked at or near the top in most categories on paspalum turf trials. SeaIsle Supreme also seemed to provide the best putting surface.

"I had seen many paspalums that were pretty from tee to green," Yoder says. "But when you got to the putting surface, most paspalums weren't comparable to TifEagle bermudagrass or bentgrass. SeaIsle Supreme seems to provide a better putting surface than anything else. All paspalums have good color, but SeaIsle Supreme gives a better roll and is easier to maintain green speeds. Others seem to be a bit bumpy. Supreme seems a little smoother and easier to maintain desired green speeds."

PLANTING THE TURF

McMinn and Yoder chose Pike Creek Turf as their supplier. Pike Creek is one of five certified growers of SeaIsle Supreme in the country. But this was the first time the Adel, Ga.-based company had worked on a wall-to-wall project with the same turf.

While supplying a single turf type might not sound difficult, there can be complications because tees, roughs, fairways and greens are all sprigged at different rates.

"You can't just pile all the grass together and then spread it," McMinn says. "If you measure the square footage of a green and it requires 100 bushels, you have to make sure there are 100 bushels in the box and it goes to that particular green so you sprig at the right rate. When we got the first load, no one had accounted for that. It was a learning process for both of us."

The Eagle also required about 37 acres of sod because of its numerous vertical features and mounding. The bunkers and green surrounds, in particular, were sodded heavily.

McMinn's previous two renovations at The Landings involved bermudagrass and zoysiagrass. He found SeaIsle Supreme had a better rooting structure.

"That helps when laying sod on slopes and it starts raining," he says. "The quicker it roots down the better."

Two bad storms struck during construction with one dumping 5.5 inches of rain in a 24-hour period. Six holes suffered significant damage, particularly the 15th.

"It basically blew out everything, and we had to do some rebuilding," McMinn says. "That set us back two to three weeks for cleanup and resodding some areas. Otherwise, it was a smooth project."

GROWING IT IN

One of the few drawbacks with paspalum is that it tends to be a bit more prone to disease than bermudagrass, McMinn and Yoder say. During the grow-in, larger amounts of water are needed for turf establishment. Couple that with South Florida's high humidity, and the stage is set for disease problems.

"We used more fungicides than we might have with other grasses during grow-in because of paspalum being disease-prone," McMinn says. "We tried to manage that with water. Once it got cold, we backed off as much as possible on irrigation."

McMinn also fought a daily battle with armyworms, which have a particular affinity for newly planted turf on Southern courses.

GOING FORWARD

One of the advantages of having two courses, particularly during Florida summers, is that McMinn can rotate the two courses for maintenance purposes. One will be available to members for a three-week stretch, while the other is closed for maintenance. That will give the grounds crew the opportunity to make any needed adjustments to the paspalum-sporting Eagle before snowbirds begin returning to southwest Florida in late October.

The Oaks' irrigation water comes from two deep wells with permits to withdraw 500,000 gallons daily. While less salt-laden than effluent, it contains high amounts of bicarbonates, which make the liquid hard and of marginal quality.

The SeaIsle Supreme paspalum grows much better with a less-than-perfect water supply than bermudagrass, McMinn says.

"A fairly good quality water helps the young paspalum plants grow in better," Yoder says. "Once it's established, you can feed it more and more salt. The salt keeps out many of the weeds that would move into bermudagrass. Salt-laden water kills bermudagrass and noxious weeds. Paspalums tolerate effluent much better."

Planting the same cultivar throughout the course also would simplify irrigation management, especially on a layout like The Eagle that expanded the number of irrigation heads

from 750 to 1,200 as part of the renovation, Yoder says.

"With further watering restrictions likely coming down the road and effluent being about the only option, you need to plan ahead," he says. "You need to make sure the irrigation system is set up to handle effluent and use galvanized steel fixtures that can tolerate higher-salt-content water."

In terms of playability, SeaIsle Supreme paspalum grows tighter and denser than bermudagrass. When club members, particularly mid- to high-handicappers, played on other paspalum courses, they loved how high the ball sat on top of the turf, McMinn says. They also liked the way the grass striped when mowed and the dark-green color, much like the Northern courses many play on during the summer.

And because of its waxy leaves, SeaIsle Supreme doesn't hold the early-morning dew like bermudagrass, meaning players should find their shoes, socks and pants much drier, Yoder says.

"Aesthetically, paspalum definitely beats bermudagrass," McMinn says.

Lower-handicap players sometimes take awhile to adjust to the way the thicker paspalum turf grabs the ball compared to bermudagrass. The ball doesn't bump and run as easily as it does on bermudagrass.

"A good player with a variety of shots around the green might have to use more pitch or flop shots around the green," McMinn says.

Those used to having the variety of grasses on their course providing contrast and definition will be surprised how mowing the same grass at different heights, coupled with paspalum's striping ability, will provide equal, if not superior, definition and contrast, McMinn says. He predicts the rough will be cut at roughly 1.5 inches, fairways at less than 0.5 inch and greens as low as 0.1 inch.

Perhaps the biggest advantage of planting the course entirely with SeaIsle Supreme paspalum will be recognized in the future. With Florida under heavy development pressure, many believe it's only a matter of time before potable water will be unavailable for most courses. Effluent might be the only option, and those courses planted in paspalum will be in the best shape to prosper.

"That's a huge consideration in the Southeast, and we want to be ready," McMinn says. "Water will be the biggest driver for courses selecting this turf type during the next 10 to 20 years."

When all is said and done, the bottom line with any renovation is the reaction of those who play it.

"I've taken many members on tours of the new course and have received so many great comments about the layout and design," says general manager Steve Geisler. "Everyone is excited about getting out there once it opens." **GCI**

Peter Blais is a freelance writer based in North Yarmouth, Maine. He can be reached at pblais@maine.rr.com.

Because of its waxy leaves, SeaIsle Supreme doesn't hold morning dew like bermudagrass, says architect Brian Yoder. Photo: The Oaks

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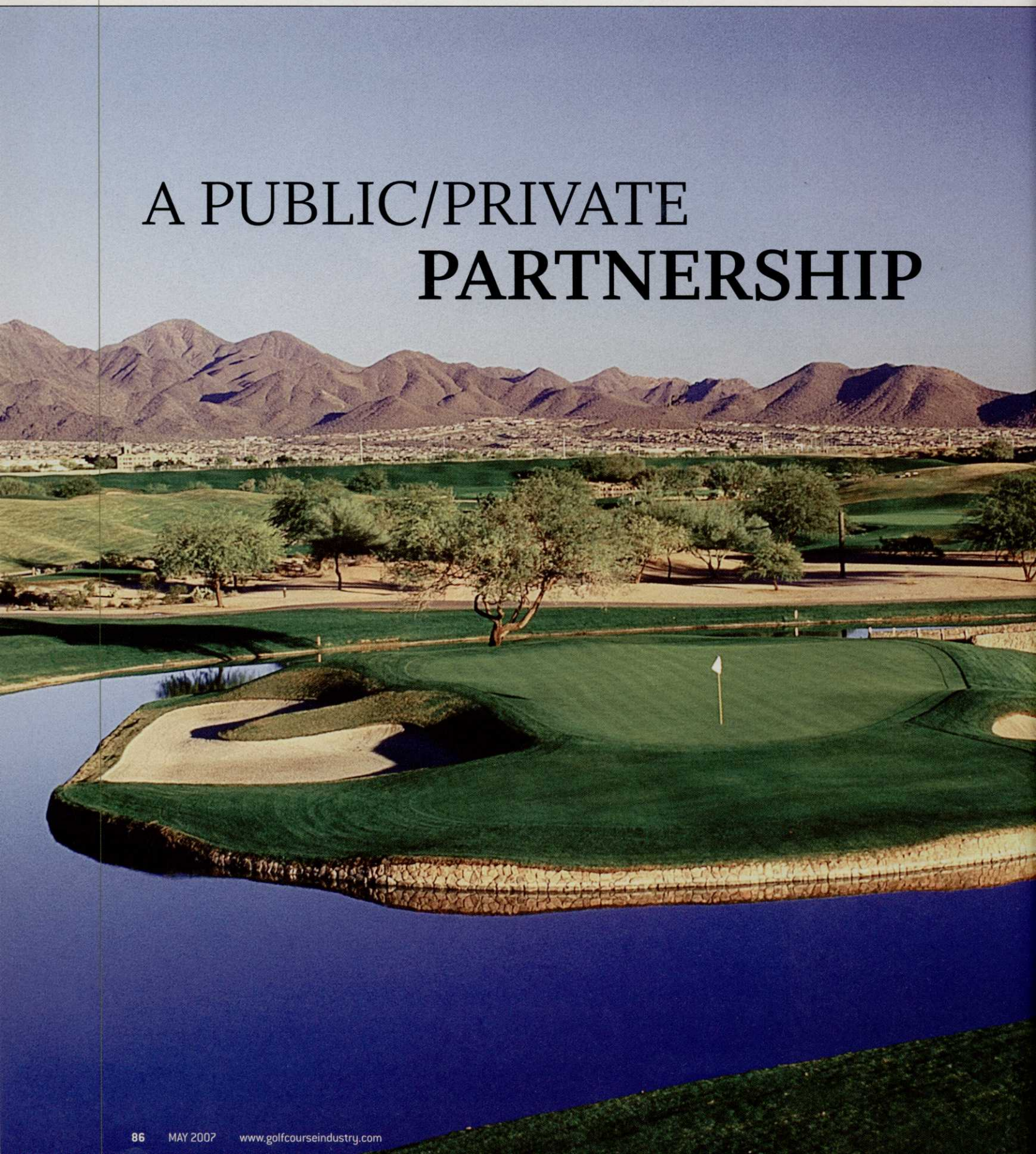


A LOOK BACK AT TPC SCOTTSDALE AS IT CELEBRATES 20 YEARS AND RENOVATES A COURSE

BY PETER BLAIS

When it comes to the book about public/private partnerships, former PGA Tour commissioner Deane Beman, former Scottsdale mayor Herb Drinkwater and Bureau of Reclamation officials co-authored the first chapter.

TPC Scottsdale, which includes the Stadium and Desert courses, recently celebrated its 20th anniversary, a milestone that yields pride and, occasionally, surprise with the likes of Tom Beat. Beat, the city's project manager during construction and now its recreation director, represented the city and controlled the checkbook during the project 20 years ago.

"At the time, we looked around and couldn't find anyone else who had done anything like this," Beat says. "In fact, the BOR now asks me to attend seminars and conferences to put on workshops for gateway cities and towns adjacent to federal lands that might be available for public purposes. We're trying to use this project as a model, telling towns that if they're close enough to federal land, they might be in a position to enter a transaction similar to what was done in Scottsdale. Here's a template, but like everyone else involved at the outset of this project, I learned on the fly."

THE GENESIS

The Phoenix Open, which is now called the FBR Open, originated at the Phoenix Country Club in 1939. The club was a downtown facility where the Phoenix Thunderbirds, a local organization of area businesspeople, raised millions of dollars for charity throughout the years in conjunction with the PGA Tour. The 18-hole course sat on just 125 acres, and by the mid-1980s was too small to host what was the best-attended event on the PGA Tour, according to Vernon Kelly, past president of PGA Tour Golf Course Properties.

The Thunderbirds asked commissioner Beman to help build a stadium-style Tournament Players Club in Phoenix that would be large enough to handle the event. Traditionally, the Tour had structured development transactions that incorporated a real-estate project to provide a source of funds to pay for the golf facility's development. Occasionally, PGA Tour Golf Course Properties encouraged a hotel resort as an option.

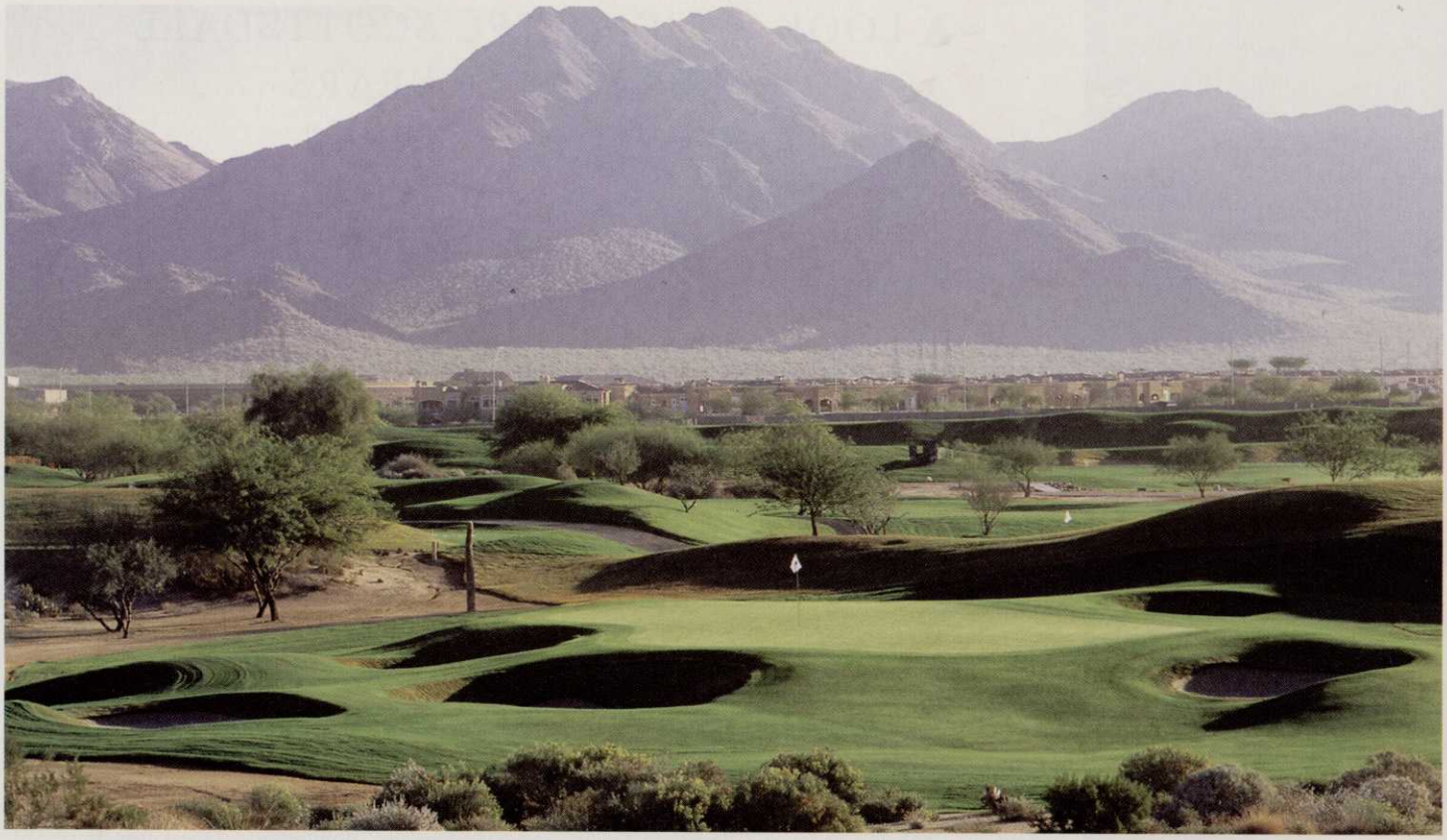
Many of the movers and shakers in the Phoenix/Scottsdale area were Thunderbird members. The Tour asked if any of them were interested in putting together such a project. One member had the idea of building a hotel on his own land and the golf facility on adjacent parkland. At a Phoenix City Council meeting, attended by Beman and Kelly, the proposed TPC project was supposed to be a mere formality. Instead, the city council rejected the plan.

Thinking the Phoenix Open had seen its last days in the Arizona capital, Beman and Kelly were preparing to leave town the next day when Mayor Drinkwater called them with an invitation for the Tour to consider Scottsdale its new home.

"You just tried it in the wrong place," Drinkwater had said, adding he had the perfect location for the facility. "If Phoenix doesn't want you, Scottsdale does."

Beman and Kelly had no idea who Drinkwater was or whether Scottsdale, considered an incon-

Of the two courses at TPC Scottsdale, the Stadium Course is the upscale facility that hosts the FBR Open
Photo: TPC Scottsdale



Money generated from course operations helped the city of Scottsdale pay off a 20-year revenue bond that was part of the development. Photo: TPC Scottsdale

sequential Phoenix suburb at the time, could support such a facility. With a few hours to spare before their flight and intrigued by Drinkwater's aggressiveness, they visited the site.

"Beman told me later that after meeting with this 'big old cowboy' (Drinkwater) the first time, he wasn't sure what he was getting into," Beat says.

Drinkwater believed government does a lot of things well, but competing with private industry wasn't one of them, Kelly says.

"Drinkwater wanted the finest course in Arizona," he says. "But rather than have the city run it, he wanted a first-class operator, like the PGA Tour. He knew if the tournament moved there it would be good for his city."

Scottsdale had a 99-year lease to develop recreational facilities on a 400-acre tract of flood basin owned by the BOR. The agency maintained the tract as a drainage project to capture runoff from several thousand nearby acres. It flooded from time to time, and the water percolated into the ground with no damage to surrounding property. The BOR's regulations forbid the importing of additional fill because the land had to absorb a certain amount of water. However, digging a lake and piling the resulting fill to create fairways and greens was alright because the potential storage area would remain the same.

FINANCING AND CONSTRUCTION

From the city's view, one of the biggest hurdles was developing a way to pay for the courses without tax dollars, which Drinkwater made a condition of the proposal, Beat says. The city planned to float bonds to build two Jay Morrish/Tom Weiskopf-designed courses – the upscale Stadium Course and moderately priced Desert Course. But projected revenues from the golf courses alone wouldn't be enough to pay for the project. Making the numbers work required bringing in another partner, such as an outside developer to build a world-class hotel.

The city and PGA Tour Golf Course Properties ran an ad in the Wall Street Journal and interviewed seven prospective hotel developers before selecting the Princess Hotels to build a five-star resort on adjacent, privately owned property.

The city convinced neighboring land owners to donate sufficient land, which previously had been used as an informal motorcycle racetrack and unofficial dump, to build the hotel and clubhouse. The city leased the land to the operators of the Princess Hotel. The hotel and golf projects created golf course and commercial frontage that added value to the neighbors' properties. The revenue generated for the city from the hotel lease and course operations supplied enough money to pay off the 20-year revenue bonds.

The planned revenue stream was so promising the city was able to develop a pro forma detailing golf facility and hotel revenues in just six months, a task that normally would have taken five years, Beat says. The city eventually paid off the revenue in less than the 20 years stipulated in the original bond issue.

In the meantime, the city built two courses that cost taxpayers nothing and added recreational amenities and a hotel that proved a tremendous boon for the city's tourist industry, paid an enormous amount in taxes and employed many people. The PGA Tour was able to keep the Phoenix Open in its annual rotation, and the BOR guaranteed its land would continue to serve as a floodplain.

"It was truly a win-win-win situation," Kelly says.

TWO DIFFERENT COURSES

As for the courses, Drinkwater wanted two layouts. A dynamic leader with a definite vision of where his community should go, the former mayor wanted one upscale facility that could stage a national event like the Phoenix Open and a quality layout local residents could afford to play.

The challenge was to keep Drinkwater's two-course commitment and have everything ready in time to play the 1987 Phoenix Open, Beat says. Builders broke ground on the two layouts on Aug. 7, 1985. They were grown in a year later. The maintenance crew overseeded the Stadium Course in October and had it ready in time for the 1987 Phoenix Open.

"When we started, there was nothing on the site," Beat says. "We had to bring in all the utilities, build the courses and clubhouse, and be ready with tournament-quality conditions in less than two years. We moved 1.8 million yards of dirt."

The Desert Course opened about nine months after the Stadium Course.

"It was tees, greens, fairways and dirt," Beat says. "It had state-of-the-art irrigation, grass and construction, but not a single tree. It looked like you were playing on the moon. In fact, we had one tree on both courses."

But creative wheeling and dealing solved the lack-of-foliage issue. At the time, the Phoenix/Scottsdale area was growing quickly with road and construction projects. A state environmental ordinance protected trees, requiring they be boxed and transplanted instead of cut down. With help from the BOR and PGA Tour Golf Course Properties, thousands of trees were relocated and transplanted at the Stadium and Desert courses.

"We even lucked into a bankrupt nursery," Beat says. "That got us a lot of them."

MARKET SHIFTS

Mayor Drinkwater passed away several years ago,

AT A GLANCE
TPC Scottsdale

Location: Scottsdale, Ariz.
Facility: The Desert Course and the Stadium Course
Owner: The city of Scottsdale
Architects: Jay Morrish and Tom Weiskopf
Operator/manager: PGA Tour Golf Course Properties
Builder: Pulice Construction
Superintendents: Was Cal Roth, now at TPC headquarters overseeing all TPC courses; Jeff Plotts is the superintendent now
General manager: Bill Grove
Cost: $20 million (for both courses and clubhouse in 1980s)
Years built: 1985-1987

Increased competition has forced the renovation of the Desert Course. Photo: Nick Bisanz

The renovation of the Desert Course is expected to be completed by November. Photo: Nick Bisanz

and during the 2006 FBR Open, TPC Scottsdale and the city co-hosted a function honoring him and key individuals from the BOR and the city, such as former councilmen Bill Walton and Jim Bruner, who helped make the TPC Scottsdale dream a reality.

"The city understands and appreciates the value of the asset and has reinvested in the asset by taking a share of the profit the facility generates and putting it back into the property," Kelly says.

Because the project sits on federal land, local residents pay the same green fees as nonresidents. The rates are attractive particularly on the Desert Course, which costs between $37 and $65, including a cart. That made it perhaps the most attractive deal in the Valley of the Sun for many years. Rounds peaked at 76,000 in 1998, says general manager Bill Grove.

When it opened in 1986, the TPC Scottsdale complex was just the third major golf project in the city, following two prestigious layouts – Desert Highlands and Troon. For seven to eight years, the Desert Course was the only affordable layout. But the 1990s brought an abundance of new courses that saturated the market. With the downturn in the economy during the late 1990s and particularly following Sept. 11, many of the mid-tier courses started offering off-season and summer rates that were competitive with the Desert Course. Rounds generated on the Desert Course started to decline.

"We couldn't compete because the perception was we were not as good as those more upscale facilities offering discount deals," Beat says. "That was competition we hadn't anticipated."

FACE-LIFT

The par-70, 6,423-yard Desert Course still is in good agronomic condition, but it had lost its position in the marketplace because of so many newer upscale and mid-tier facilities were featuring pars of 72 and lengths exceeding 7,000 yards.

"With those mid-tier properties trying to get their share of play, the Desert Course's rates have become too similar to those mid-tier properties," Grove says. "We need to upgrade our project and improve its market position even though the rates will not change that much."

As part of its original leases with the TPC and Princess Hotel, the city receives 10 percent of the properties' annual revenue that it can then use to retire debt.

"Our agreement is that the money paid to us in rent must be used on the golf facility and not to supplement the city's general-fund budget or any other expenses," Beat says. "It provides us with a unique opportunity to issue debt and use the revenue from the facility to pay it off."

The city will issue a $10-million bond it plans to retire within 20 years to make capital improvements to the Desert Course.

"Planned improvements are designed to provide local residents, guests, Tour players and FBR Open spectators with a memorable golf experience as well as enable us to increase charitable contributions to the community through the Thunderbirds," Grove says. "From significant competitive enhancements and design elements to a new clubhouse, we're confident the renovation will make this already outstanding golf facility an even bigger asset to the city of Scottsdale."

Planned improvements, which will be conducted under the direction of course architect Randy Heckenkamper, will increase the length of the Desert Course to about 7,100 yards. Every hole will be redesigned. The 17th will change from a par 4 to a par 5, returning the course to championship level at a par of 71. It will also benefit from significantly improved drainage and irrigation systems, which will facilitate greater consistency in playing conditions year-round, and greater elevation changes, which will make the course more artistic and challenging. Construction began in January, and the course is scheduled to reopen in November.

The Stadium Course clubhouse also is set to undergo extensive renovations, primarily to the interior. Using artwork and interior decor, the goal is to develop more fan- and user-friendly themes that emphasize the facility's cooperative relationships with such groups as the BOR, city of Scottsdale, Phoenix Thunderbirds, FBR Tournament and 60-plus PGA Tour players who live in the greater Phoenix area and call TPC Scottsdale their home course.

"The idea is to bring the whole story together of how this facility has benefited the Phoenix/Scottsdale area over the last 20 years," Grove says.

Because of Drinkwater's foresight and the BOR, the ability not to use tax dollars to improve the facility remains.

"Our base agreement runs for another 55 years," Beat says. "So we should have the ability to continue upgrading the facility as needed with a built-in revenue source without having to raise taxes or compete for public dollars that are needed elsewhere."

With many different entities involved in the project, it was difficult to make things work, Kelly says.

"They sound good on paper, but invariably one of the parties is unable to deliver its portion of the project and the entire thing collapses," he says. "In this case, everybody did what he or she said they would do and more. It's a tremendous success story." **GCI**

Peter Blais is a freelance writer in North Yarmouth, Maine. He can be reached at pblais@maine.rr.com.

BY JAMES WALWORTH

Soil sampling and analysis

Analytical methods provide quantitative estimates of plant-available nutrients

Soil sampling and analysis are vital for golf course superintendents to help determine effective and efficient turfgrass management programs. Soils are sampled to determine physical conditions, fertility (nutrient) status and chemical properties that affect their suitability as plant growing media.

Through a combination of field and laboratory research, analytical methods have been developed that provide quantitative estimates of plant-available nutrients. Field research determines the optimum soil test levels for various nutrients for specific soil and crop combinations. Optimum fertilizer practices can be determined by knowing the optimum test level of each nutrient for a specific crop and soil, and by knowing how much fertilizer is required to change soil-test values.

Soil testing is comprised of four steps:

- Collection of a representative soil sample;
- Laboratory analyses of the soil sample;
- Interpretation of analytical results; and
- Management recommendations based on interpreted analytical results.

Focusing on the first two steps, one should gain an understanding of the proper methods for collecting soil samples and of the potentials and limitations of soil testing.

SOIL SAMPLING

Soil testing begins with soil sampling. A soil analysis can be only as good as the sample sent to the laboratory. It's important to realize only a tiny portion of a field is analyzed in the laboratory. For example, a one-pound soil sample collected from a five-acre field represents just 1/10,000,000 of the field. Therefore, it's critical a soil sample be representative of the entire field.

The most common and economical method for sampling an area is composite sampling, where subsamples are collected from randomly selected locations in the field, and the subsamples are composited for analysis. The analytical results from composite sampling provide average values for the sampled area. The number of subsamples depends on field size and uniformity. Generally, a larger field or a less uniform field should be sampled more intensively than one that's small and uniform. No less than five subsamples should be taken – 15 to 25 are preferred.

Alternatively, areas can be grid-sampled in a regular pattern. Each sample is analyzed separately so variability of soil properties can be determined. With data provided by grid sampling, maps of soil test values can be constructed from the results. This information can be entered into a geographical information system and combined with additional geospatial data, such as soil texture, crop yields and leaf analyses, and used in precision agriculture systems for variable application of fertilizers and other crop inputs. This is a much more expensive method of soil analysis because of the number of analyses required, although it provides valuable information about geospatial uniformity that can be used in precision agriculture.

Ideally, samples should be collected with a soil probe or auger, to the depth of tillage (usually 6 to 8 inches) or to the effective rooting depth of plants. Deeper samples might e collected for evaluation of subsoil properties,

A soil analysis can be only as good as the sample sent to the laboratory. Photo: David Wolff

such as salt or nitrate accumulation. It's helpful to sample to the same depth each time a soil is sampled so that year-to-year samples can be compared directly to monitor changes throughout time. A small shovel or trowel can be used if a probe isn't available. Each subsample should be equal in size. The subsamples should be placed in a clean, plastic bucket and mixed thoroughly. Then the desired sample amount is removed from the bucket, and the remainder is discarded. Check with your testing laboratory to find out how large a sample it requires.

The area or size of the field sampled depends on management practices. Sample the smallest unit that will be managed separately. For example, if a field has two distinctly different halves, perhaps one half level and the other sloped, then sample the two areas separately, and fertilize each half separately to obtain optimum results. However, if each half of the area won't be fertilized or managed individually, there's no need for separate sampling. A single, representative sample will be less expensive and just as useful. Sample the smallest management unit.

Soil samples should be air-dried or taken to a test laboratory as soon as possible. To dry a soil sample, spread the soil out in a clean, warm, dry area, and let it dry for two to three days. It's best not to heat or dry soil samples in an oven because soil chemical properties might be altered. Bag the sample and send it to a laboratory for analysis. Soil samples can be refrigerated for several days if they can't be dried immediately.

Soil test values change slightly during the year, but the primary consideration for timing of soil sample collection is convenience. Collect samples early enough in the cropping cycle to allow results to be used to adjust management practices.

Soil-sample frequency depends on the specific soil test, environmental conditions and value of the crop. Status of some soil nutrients can change quickly, whereas others don't. For example, phosphorus levels in soil are unlikely to change rapidly and annual testing might be unnecessary. Nitrogen levels, on the other hand, change quickly, and frequent tests are required to obtain accurate determinations of plant-available levels. A new soil analysis might be necessary after heavy rains or after a prolonged period of water-logging if one needs an accurate soil nitrogen level estimate.

When making substantial changes to soil fertility levels, it's a good idea to make the change during a period of two to three years, retesting the soil annually. If a crop doesn't have a high economic value, then occasional soil testing (once every three to four years) might be considered adequate in the absence of any noticeable nutritional problems. In contrast, commercial production of high-value crops might warrant annual testing to ensure maximum yields.

SOIL ANALYSES

After soil samples are received at a laboratory, a number of tests can be performed. A general understanding of soil testing will help you know how the results can be interpreted and appreciate the accuracy of the analytical results.

Soil supplies most of the mineral nutrition for higher plants through the plant's root system. The root system extracts nutrients from the soil throughout a long period of time – two to three months for most annual crops, years for perennial crops. In contrast, a soil test determines the soil's nutrient supplying capacity by mixing soil for only a few minutes with a strong extracting solution (often an acid or a combination of acids). The soil reacts with the extracting solution, releasing some of the nutrients. The solution is filtered and assayed for the concentration of each nutrient. The nutrient concentration then is related to field calibration research that indicates the yield level reached with varying soil nutrient concentrations. This method works well for some nutrients, but is less accurate for others, like those nutrients supplied largely from organic matter decomposition such as nitrogen and sulfur. This is primarily because of the difficulty of estimating or predicting the rate at which organic matter will decompose and release nutrients into plant-available forms.


Soil-sample frequency depends on the specific soil test, evironmental conditions and value of the crop. Photo: David Wolff

Standard or routine soil tests vary from laboratory to laboratory, but generally include soil pH and available phosphorus (P) and potassium (K). They sometimes also include available calcium (Ca) and magnesium (Mg), salinity, and often include an analysis of organic matter content and soil texture. Most laboratories offer nitrogen (N), sulfur (S), and micronutrient analyses for additional cost.

The methods used to test soils vary depending on chemical properties of the soil. For example, tests used for measuring soil P are quite different in the acidic soils common in the southeastern U.S. than those used in the alkaline soils of the southwest. Analysis of southwestern soils with methods tailored for acidic soils will provide erroneous results. Therefore, it's important to be aware of the methods used by test labs, and to select

methods that are regionally appropriate. Local laboratories generally will use methods appropriate for your soils. A listing of local soil test laboratories might be found in the University of Arizona publication, "Laboratories Conducting Soil, Plant, Feed or Water Testing," http://cals.arizona.edu/pubs/garden/az1111.pdf .

SOIL ACIDITY

Soil pH is a measure of the acidity or alkalinity of a soil. The term pH technically only applies to solutions so the analysis must be conducted on a solution. Usually a soil sample is mixed with water, allowed to equilibrate for at least an hour, and the pH measured. Several factors affect pH measurement. Primary among these is the salt concentration of a soil (a salt is any molecule that, when placed in water, separates into positively and negatively charged components or ions). The salt concentration of a soil might vary with the season or with fertilizer application. The salt concentration of a soil generally is greater immediately following fertilizer application than before. The result might be an apparent pH decline as much as one-half a pH unit.

When samples are collected frequently or at various times of the year, it might be noted pH values tend to increase and decrease, seemingly at random. This leads to questions regarding the reliability of soil pH measurements, but the fluctuations might be because of changes in soil salt levels. It doesn't usually present a serious problem in the use of the analysis. Some laboratories measure pH in a dilute salt solution to mask salt-induced variations. This method gives lower pH values and the laboratory should provide interpretation guidelines.

Arizona soils generally are alkaline (high pH), and pH adjustment isn't a common practice. In many other parts of the country, ground limestone is added routinely to soil to raise soil pH. In those parts of the country, lime requirement (amount of lime required to adjust the soil pH to a desired level) is determined. This test isn't needed for alkaline Arizona soils.

ELECTRICAL CONDUCTIVITY

Electrical conductivity of a soil extract is used to estimate the level of soluble salts. The standard method is to saturate the soil sample with water, vacuum filter to separate water from soil and then measure electrical conductivity of the saturated paste extract. The result is referred to as ECe and is expressed in units of deciSiemens per meter (dS/m). Test laboratories might use differing soil-to-water ratios and use a multiplication factor to convert results to an ECe equivalent.

Electrical conductivity is a reliable test for soil salinity, and this is a routine test in the arid southwest. However, in wetter climates, electrical conductivity isn't a standard test so, if soil samples are sent to a laboratory in another part of the country, electrical conductivity might have to be specifically requested.

NITROGEN

Nitrogen analyses aren't difficult to conduct, but interpreting results can be problematic. This is because a considerable portion of soil nitrogen might be contained in the soil organic matter. Plant availability of organic nitrogen is dependent on organic matter breakdown, which is difficult to estimate. Therefore analyses of "total N", a sum of all forms of soil nitrogen or organic nitrogen, aren't routinely conducted. Instead, nitrogen in the nitrate form (NO3-N) is assayed. Nitrate is directly available to plants, so this test provides an indication of short term nitrogen availability. However, NO3-N can be lost quickly from soil, either leached past the rooting zone or lost to the atmosphere in gaseous forms.

The extractant used to remove NO3-N from the soil isn't particularly important. Some laboratories extract NO3-N from soil with a salt solution, such as potassium chloride (KCl). However, other laboratories in the southwestern U.S. measure NO3-N in the same extract used to measure soil P (see below) to reduce analysis costs. Results from these two kinds of extractants are directly comparable.

Nitrate analyses can provide an accurate determination of the nitrogen available to plants at the time of soil sampling, although this might not provide reliable information concerning nitrogen availability later in the growing season. If soil nitrogen analysis is to be used for making fertilizer recommendations, it's important the sampling be done shortly before planting time or during the growing season.

PHOSPHORUS

Most soil phosphorus is tightly bound to soil particles or contained in relatively insoluble complexes. The phosphorus-containing complexes in alkaline soils are different than those in neutral or acidic soils. The amount of phosphorus removed during soil extraction is dependent on the nature of phosphorus complexes and on the specific extractant used, so it's critical phosphorus extractants be matched to soil properties.

The Olsen or bicarbonate extractant, a dilute sodium bicarbonate solution, is used to extract phosphorus from calcareous, alkaline and neutral soils and is appropriate for Arizona

Soil test values change slightly during the year. Photos: David Wolff

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soils. In contrast, most other phosphorus extractants, such as the Mehlich extractants, are suited for acidic soils and aren't acceptable for arid-region soils. If an appropriate extractant is selected, phosphorus analysis is a reliable and useful soil test. On a soil test report, the analysis might be reported as PO4-P.

MAJOR EXCHANGEABLE CATIONS

The four major exchangeable cations in arid-region soils are potassium, calcium, magnesium, and sodium. All except sodium are essential plant nutrients; however, sodium is included because it plays an important role in soil physical properties. Soil sodium level also is needed for calculations of cation exchange capacity and exchangeable sodium percentage.

An ammonium acetate extractant is used to extract only exchangeable potassium, calcium, magnesium, and sodium from arid-region soils but not less plant-available forms. Some difficulty might be encountered in soils containing calcium or magnesium carbonates (calcareous soils) because the ammonium acetate extraction might remove some calcium or magnesium from these minerals along with the exchangeable forms. In these situations, the analytical results might indicate slightly elevated levels of these nutrients. This isn't usually a large problem and potassium, calcium and magnesium tests generally provide excellent estimates of plant available levels of these nutrients.

CATION EXCHANGE CAPACITY

Cation exchange capacity might be estimated as the sum of the major exchangeable cations (potassium, calcium, magnesium, and sodium). Most laboratories don't routinely conduct a separate analysis for cation exchange capacity but use the ammonium acetate extractable levels of these elements (discussed above) for this calculation.

ESP AND SAR

Exchangeable sodium percentage and sodium adsorption ratio are measures of soil sodium content relative to other soil cations. Exchangeable sodium percentage is the concentration of sodium divided by the cation exchange capacity. As described above, the cation exchange capacity often is estimated as the sum of the major exchangeable cations, so exchangeable sodium percentage equals Na/(K+Ca+Mg +Na). Sodium adsorption ratio is roughly comparable to exchangeable sodium percentage but is a ratio of sodium to calcium plus magnesium. For this calculation, concentrations of sodium, calcium and magnesium are measured in a saturated paste extract (see discussion of electrical conductivity above). The equation used for calculation of sodium adsorption ratio is: Na^{+} divided by the square root of Ca^{2+} plus Mg^{2+} where concentrations are in units of mmol/L. Sodium adsorption ratio and exchangeable sodium percentage are useful measures of the influence of sodium on soil properties. The choice between the two is based largely on the type

Sorting through soil testing

BY PAT JONES

The phrase comes out of the mouth of turf consultants, extension personnel, researchers and colleagues all the time: "The first thing to do is get a soil test."

Easy to say … not so easy to define.

For the past few decades, golf course superintendents increasingly have understood that what's underneath the playing surface dictates the health of the turf perhaps more than other factors. Soil tests, done properly, allow superintendents to balance nutrients, manage inputs and withstand stress better.

The problem is that soil testing comes in many shapes and sizes and, more importantly, usually doesn't provide a roadmap for fixing the problems they uncover. A soil test is like a medical diagnosis; it outlines the problem but doesn't necessarily tell you what treatment is needed. That's where superintendents' knowledge or the use of soil consultants and other experts comes in to play.

The cost of soil testing for golf courses can range from "free" (basic tests provided by chemical manufacturers or other vendors) to several thousand dollars a year for an ongoing program with an independent lab.

Owners and clubs need to view soil testing as a necessary investment, not a luxury. To go back to the medical analogy, you can spend a lot of money treating the symptoms of the disease, or you can figure out the real problem and treat it. Soil testing sets a baseline for the entire agronomic program.

Virtually every golf course superintendent has a file or a binder titled "soil tests" on his shelf. It's no different than a corporation that spends a lot of time and money to create a strategic plan. Once all that effort is put into the process, the plan can sit on the shelf and gather dust or be a guide to implementing a program to succeed.

Soils might be too acidic, too alkaline, nutrient-poor or nutrient rich. Or, there might be issues with the quality of the irrigation water on the site. The test is merely a first step in determining what fixes should be attempted to create a medium that supports turf grown at extremely low cutting heights.

It could be necessary to add tons of solid minerals through topdressing or simply employ a different foliar nutrition program. It also might show that the program needs to incorporate more calcium, silica or magnesium in the mix. Every soil is different and every solution for the individual soil problem will be different. That's the value of an ongoing testing program.

Chances are good that two of the largest expenses in any golf course maintenance budget are fungicides and plant nutrition. Quite simply, healthy turf withstands stress better under warm, wet summer conditions and is less likely to need a heavy fungicide program. As a corollary, well-balanced soil provides many of the nutrients golf course turf needs. Instead of a shotgun approach to nutrition, superintendents can use a rifle.

Start your soil testing program now and act on the results, and you and your turf will be less stressed out in the future. **GCI**

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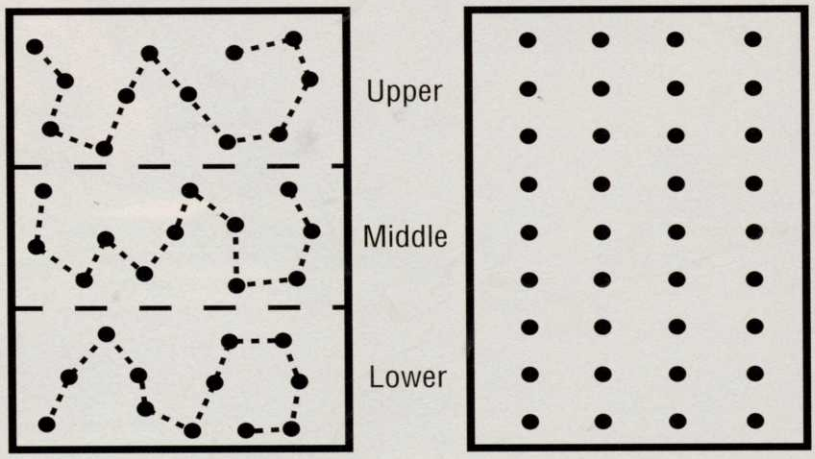
Figure 1. On the left is a dividing and sampling scheme for a sloped field with distinct upper, middle, and lower areas. Circles represent subsample locations that are composited for each of the three areas. On the right is a grid-sampling a field. Each sample is analyzed separately to evaluate field variability.



of extraction used for cation analyses. Sodium adsorption ratio can be used with either soil or water samples, whereas exchangeable sodium percentage is applicable only with soils.

FREE LIME

Free lime is a measure of soil carbonates (salts of CO_3^{2-}). When combined with an acid, carbonates release gaseous carbon dioxide. The test usually performed for soil carbonates is semiquantitative. A weak acid solution is applied to the soil sample, and the degree of fizzing or release of carbon dioxide gas is determined visually and categorized as none, low, medium or high.

SULFUR

Sulfur, like nitrogen, might be contained primarily in the soil organic matter, but plants absorb only the inorganic sulfate (SO_4^{2-}) form. Measuring total soil sulfur doesn't provide a good estimate of sulfur plant availability because rates of release from organic matter can't be accurately predicted. Instead, sulfur in the sulfate form is a more common measure. Sulfate can be extracted from the soil with several extractants, including water or weak salt solutions. Analysis of SO_4^{2-} is relatively easy, but it provides a measure of immediately available sulfur, and not the soil's long-term ability to supply sulfur to a growing plant.

MICRONUTRIENTS

Micronutrient analysis is optional at most laboratories. Most laboratories in the southwest region use a DTPA-TEA (diethylenetriamine pentaacetic acid - triethanolamine) extractant, which uses the chelating agent DTPA that's tailored to extract available iron (Fe), copper (Cu), manganese (Mn), and zinc (Zn) from calcareous soils.

Analyses of these micronutrients probably are less accurate for predicting the likelihood of plant deficiencies or of crop responses to supplemental application of these nutrients than analyses of macronutrients such as potassium, calcium and magnesium because of the influence of dynamic soil conditions. For example, manganese availability can change substantially if the soil drainage status is altered, becoming more available in waterlogged soils and less available in dry soils. Iron availability also is affected by soil moisture and irrigation practices. Furthermore, availability of copper, iron, manganese, and zinc are greatly affected by soil pH, so soils might need to be retested if soil pH is significantly altered. Soil testing can't predict the effects of altering management practices on availability of these nutrients reliably.

The most common method of extracting boron (B) from soils is with hot water. The plant availability and level of extractable boron in a soil might be influenced by soil pH. Boron also might be leached from the rooting zone. Therefore, extractable soil boron provides estimates of plant availability that are less reliable than those of many other nutrients.

Few laboratories conduct soil molybdenum (Mo) analysis. Molybdenum is present at low levels in most soils, much lower than most of the other nutrients, making an accurate determination difficult. Most plants have a low requirement for molybdenum, and slight differences in soil molybdenum levels can impact plant performance. Also, seeds might contain enough molybdenum to supply a crop's entire molybdenum requirement. For these reasons soil tests for molybdenum are of limited use and are seldom conducted.

ORGANIC MATTER

The organic matter level of a soil can be determined by several analytical techniques, all of which are accurate. All measure the amount of soil organic matter, but most don't determine its nature or how it will contribute to soil fertility. Levels of nutrients contained in the soil organic matter can be determined (but usually aren't), and rates of mineralization or nutrient release from organic matter can't be predicted reliably because of the influences of weather and climate. Organic matter content isn't routinely determined in southwestern soils because the levels are relatively low and normally change only slightly.

MAXIMIZING NUTRIENT USE

Soil analyses can provide information that's important for maximizing nutrient use efficiency and agricultural productivity. Furthermore, a historical record of soil properties provided by long-term soil testing is useful for determining the effectiveness of fertilizer management strategies.

Soil sampling is the critical first step in a soil testing program. The second is selection of a laboratory that will use analysis procedures appropriate for regional soils and conditions. Third, an understanding of the accuracy and limitations of individual procedures and of the meaning of soil test results is essential. The last steps, interpreting soil analysis values and developing a fertilizer management program, are crop specific and sometimes dependent on additional soil and climatic properties. **GCI**

James L. Walworth is associate professor and soil specialist at the University of Arizona, College of Agriculture and Life Sciences in Tucson, Ariz.

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- ❑ C-Director of Golf/Head Pro
- ❑ D-Club President
- ❑ E-General Manager
- ❑ F-Golf Course Owner
- ❑ G-Builder/Developer
- ❑ H-Architect/Engineer
- ❑ I-Research Professional
- ❑ K-Assistant Superintendent
- ❑ L-Golf Course Management Company Executive
- ❑ Z-Others (please describe)

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4. Number of Holes: *(check one)*
- ❑ A-9 Holes
- ❑ B-18 Holes
- ❑ C-27 Holes
- ❑ D-36 Holes
- ❑ E-Other

6. Total Annual Maintenance Budget: *(check one)*
- ❑ 1-Less than $50,000
- ❑ 2-$50,000-$99,999
- ❑ 3-$100,000-$249,999
- ❑ 4-$250,000-$499,999
- ❑ 5-$500,000-$749,999
- ❑ 6-$750,000-$1,000,000
- ❑ 7-$1,000,000+

7. Total Course Acreage _____

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- ❑ 1-Full Reconstruction
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- ❑ 3-Greens
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10. What is the Name of the Architect Who Designed the Course?

_____

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1. Resort Chain
2. Golf Course Management Company
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BY MIKE VENTURA

Stunted growth

Plant regulators are a California course's key to tree canopy management

Golf course management can be a complex job because there are so many strategies that need to be implemented for a facility to operate efficiently. Operating the Glendora (Calif.) Municipal Golf Course, a nine-hole, par-3 facility, presents challenges to the city, specifically keeping the course in good playable condition without exceeding the maintenance budget. And trees are part of that challenge.

Trees are an integral component of a golf course and provide value by:

- Lining fairways;
- Protecting other golfers on the course from stray golf balls;
- Showcasing a putting green; and
- Purifying the air.

At Glendora, trees are adjacent to netting, which is used to protect the public and other golfers on the course. In the past, the city would have to prune the branches away from the netting, and it's not uncommon that when a tree is pruned, secondary pests might attack that tree. Woodborers and dry wood termites might attack weak trees. In addition to insect pests, root rot also can attack weak trees.

When tree canopies are overgrown, they require dead-wood or complete-tree removal. In some cases, heavy equipment needed for such a job might pose potential problems for golfers and possible damage to the golf course. Glendora has its own in-house tree pruning staff, but equipment limits how high it can prune. On numerous occasions, the golf course's sprinkler heads have been damaged or broken by heavy tree-pruning equipment, creating additional downtime for repairs. Turf damage and soil compaction also are negative consequences of using heavy pruning equipment.

CHOOSE TO INJECT

The city implemented an integrated pest management program for tree canopies. Before

The city of Glendora used to prune branches away from protective netting, which left trees susceptible to secondary pests. Photo: Mike Ventura

deciding on a product to treat the trees, the city needed to decide the application method for the program. Aerial spraying was considered but not prudent because of the liability of drift and off-target movement of the product.

The city also looked into soil drenching the product, but chose not to because it didn't fit the city's integrated pest management program and it's committed to implementing as many integrated pest management strategies as possible.

The city decided to use a tree growth regulator via tree injection. A certified arborist on staff handles the injections according to manufacturer label rate and recommended timing. But before applying the tree growth regulator, the trees needed to be inspected first. If trees are in a weak growing condition or if they're in decline, they shouldn't be treated. The city first applied the tree growth regulator on Eucalyptus and Shamel Ash trees.

By applying the growth regulator via injection, the city:

- Protects the environment;
- Doesn't place a pesticide in contact with golfers;
- Doesn't have to worry weather conditions negatively affecting the treatment;
- Eliminates pesticides entering the air or soil;
- Eliminates pesticide odor from emanating into the air; and
- Is able to treat all needed trees quickly.

The tree growth regulator (flurprimidol) provides control as long as five years. The tree growth regulator program starts at the time of bud break and continues into May.

However, tree growth regulators aren't for every tree. The city doesn't apply tree growth

IMPACT ON THE BUSINESS

Preconditioning trees pays off

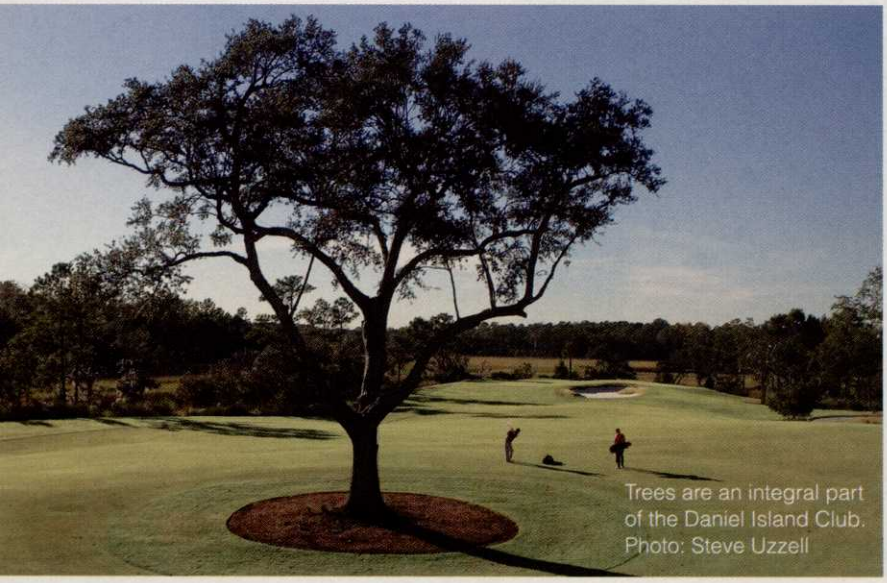
BY CINDY CODE

When it comes to maintaining golf courses, tree care generally isn't what superintendents like to do most – unless quick action is needed to remove trees ravaged by a storm or devastated by insect or disease damage.

While trees are often cited interfering with turf quality and golfer site lines, a proactive tree program and philosophy can add significant beauty and charm to a golf course.

Just ask Mike Fabrizio, CGCS, director of grounds and golf maintenance for Daniel Island Club's Ralston Creek and Beresford Creek courses in Charleston, S.C. Ralston Creek recently was recognized by the National Arbor Day Foundation for its environmental leadership in tree preservation.

Fabrizio has learned much about trees in his eight-plus years at Daniel Island. Before his involvement with the Ralston Creek course, he arrived on the scene four months before construction began on Beresford Creek, which was designed by Tom Fazio. This course, too, received the Arbor Day award in 2003.



Trees are an integral part of the Daniel Island Club. Photo: Steve Uzzell

"It's definitely a tree philosophy around here," Fabrizio says. "Everyone from the developer, who is environmentally conscious, to the architects and everyone throughout the island. Every neighborhood has a park associated with it. Trees definitely give the course a more mature look even when they're brand new. It shows that trees can coexist in a golf environment and enhance it."

Fabrizio's background is turf, but he has surrounded himself with tree experts. He says he's been fortunate to work with Ken Knox of Hendersonville, N.C.-based Tree Doctor. Knox is a consulting arborist who visits courses annually to inspect and diagnoses trees. Fabrizio also has worked with Theo Meade, a local arborist, for about 30 years.

"They both have a passion for trees and help us out tremendously," Fabrizio says. "They catch problems earlier than I ever would."

Fabrizio's maintenance budget for grounds and the two courses is about $2.8 million. Trees alone account for about $60,000 to $65,000 annually, primarily for pruning and fertilization. Additional dollars are allocated for tree maintenance if a large tree dies or is struck by lightening.

Larger trees on the course are deep-drilled and aerified annually and fertilized every three to four years. New or recently transplanted trees are fertilized every year. Aside from fertilization, most treatments are curative rather than preventive. An exception is nursery trees susceptible to spider mites.

Small jobs are done in-house while all major pruning, aeration and fertilization are done by an arborist.

Fabrizio spends about $30,000 to $35,000 in the spring for mechanical and tree health care. The course's oak trees are pruned to remove heavy foliage that makes trees susceptible to wind damage. They'll also reduce tree canopies to protect turf health if they find they're encroaching on the turf.

The developer and golf course architect, Rees Jones, began working two years before construction started

Using plant growth regulators on trees can reduce or eliminate the need for heavy equipment to remove or prune trees. Photo: Mike Ventura

on Ralson Creek to plan a course routing that would impact a minimal number of trees. Preconstruction work included stress conditioning. Root pruning began in the fall of 2003, and the course opened in the spring of 2006.

Arborists removed unnecessary foliage off the top and dead wood from the interior to lighten the trees. Roots on the top 12 inches around trees are pruned. These areas develop small fibrous roots that aid nutrient and water uptake and help trees adapt to new locations.

Fabrizio spent about $100,000 on preconditioning the trees. Even the trees on the course that weren't moved were pretreated to withstand environmental stresses associated with the dirt moving and shifting all around them.

Once construction was under way, crews transplanted 42 oak trees and about 100 pine trees to other areas of the course. Some oaks were at least 60 years old and had trunks as large as 31 inches wide, requiring one of the nation's largest tree spades to help with the transplanting process.

Dallas-based Environmental Designs was hired to relocate the trees. They designed a 144-inch tree spade that had to be put together on-site for the project. Standard tree spades are between 90 to 100 inches.

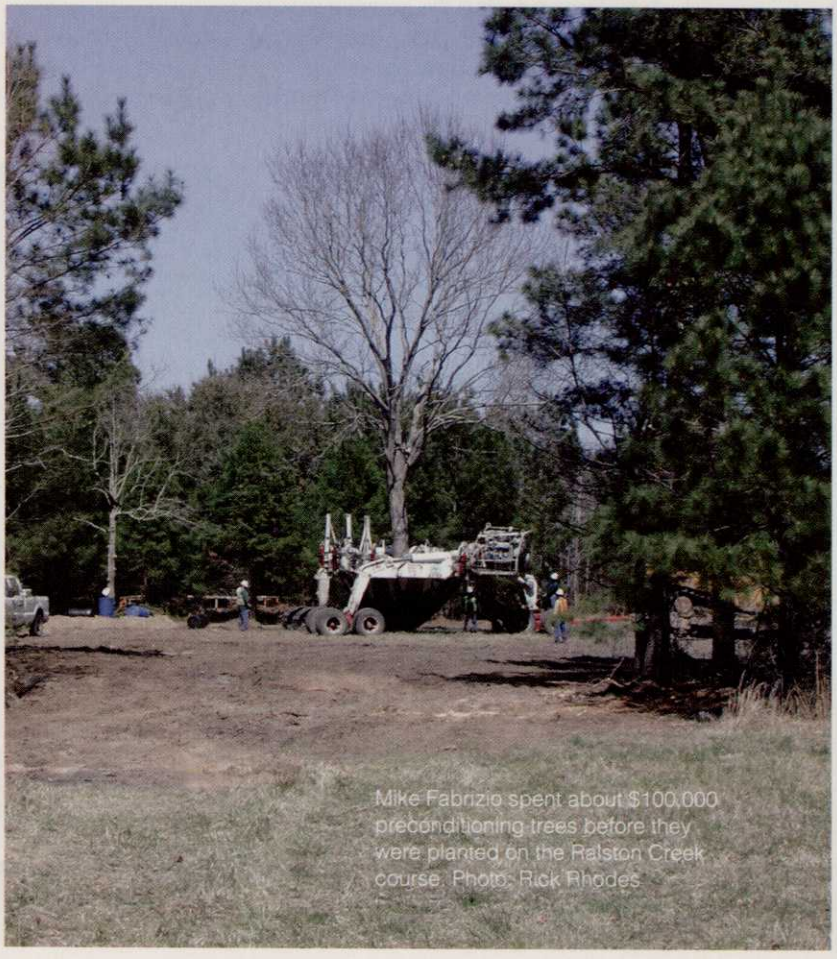
The majority of the trees survived the move, and less than a half dozen died, Fabrizio says.

"I can't stress enough about preconditioning," he says. "It's the third time I've done it, and it's $100,000 well spent."

In addition to saving trees on the golf course, the Daniel Island Co. has planted more than 16,000 trees on the 4,000-acre island since development 10 years ago.

Fabrizio attributes much of the success to the fact that the corridors are 50 feet wider than most and wider corridors allow one to keep trees and still have healthy turf. Traditional 200-foot-wide corridors force trees to be crammed in resulting in too much shade in the play area.

"With our wide corridors, trees aren't a detriment to golfers," he says. "Sometimes I don't think they realize they're there or appreciate them. The course looks like its been there for a long time. They take the trees for granted." GCI



Mike Fabrizio spent about $100,000 preconditioning trees before they were planted on the Ralston Creek course. Photo: Rick Rhodes

regulators on slow-growing trees, only on moderate to fast-growing trees. An understanding of tree physiology is recommended before setting out to inject trees.

Aside from tall trees such as the Shamel Ash and Eucalyptus, the city has numerous smaller trees on the golf course but doesn't treat them because it wants the tree canopies to develop. Once the younger, smaller trees have developed canopies, the trees will be treated.

NO MORE INTERFERENCE

The trees creating the city's greatest challenge are Shamel Ash and Eucalyptus (blue gum) trees. The Eucalyptus is a good fairway tree, providing golfers protection from stray golf balls. Also, protective netting is near many of the tees. The branches and foliage from Eucalyptus trees create a maintenance problem, and replacing the netting is quite expensive.

Since treating the Eucalyptus trees, the city has noticed a decline of new foliage production in the canopy, as well as a darker green foliage, which is desired during the growing season. Without the growth reduction, branches and foliage would be growing into the netting.

Wind damage also can be a problem with the Shamel Ash and Eucalyptus trees. A tree treated with a growth regulator reduces the potential for limb or tree failure caused by wind.

BENEFITS

The city is benefiting the environment by incorporating a tree growth regulator program into its golf course management program. By reducing the need for regular pruning, the city is able to preserve tree canopies and allow trees to clean the air. A stub or topped tree isn't capable of purifying the air. The city believes that by using tree growth regulators it's able to reduce the cost of pruning and the amount of green waste that would normally end up at a landfill.

Another benefit of tree growth regulator applications is labor savings. Because treated trees grow slower, the city is able to reallocate man-hours and can spend more time managing the turf, soil and bunkers on the golf course because turf conditions and managing the playing surface is critical to a successful golf facility operation. **GCI**

Mike Ventura is the landscape maintenance supervisor for the city of Glendora, Calif. He can be reached at mventura@ci.glendora.ca.us or 626-852-4840.

At the Glendora Municipal Golf Course in California, Eucalyptus tree growth needs to be controlled because they're right next to protective netting. Photo: Mike Ventura

BY JOHN WALSH

In due time

Minnesota superintendent tends to irrigation system while he waits for overhaul

Fred Taylor and his crew might not have the best irrigation system in Minnesota, but they've made do repairing and maintaining the 18-year-old system, and will continue to do so, until a new one is installed – which won't be for another eight or nine years.

"Right now, we have more urgent needs, such as a bunker renovation, drainage improvements and a clubhouse renovation that will take three years to complete," says Taylor, certified golf course superintendent at the private, 18-hole Mankato Golf Club. "We're reviewing our master plan right now with architect Garrett Gill."

Mankato opened in 1920 as a nine-hole course designed by golf course architect Tom Bendelow. In 1954, it expanded to an 18-hole facility. Architect William Langford designed the additional nine holes. The club has about 340 golfing members out of a cap of 350. The course features a turfgrass mix. The greens are *Poa annua* and bentgrass, and the fairways are the same mix with the addition of bluegrass.

Taylor, who has been working at the club for 27 years, started there as an intern while attending college. He worked there for five years, left and went back to school, then returned. His maintenance budget is $455,000 sans utilities, which are part of the club's administration budget. Because of that, Taylor says he doesn't have a good idea of what he spends annually on water.

"We don't really pay for water other than $500 for the permit," he says.

Throughout the years, Taylor has allocated a small amount of his budget for repairs and maintenance of the irrigation system. This year, he budgeted $3,650. This line item has increased a bit more recently than in years past. About seven years ago, Taylor was spending about $1,500 for repairs and maintenance to the system.

"We're popping more sprinkler heads," he says. "Over time, the plastic becomes brittle, the pipes become brittle, and the valves leak."

Mankato's irrigation system was installed in 1989, and Taylor says there hasn't been much talk of getting a new irrigation system just yet.

From left, Scott Ness, Allen Starke and Fred Taylor make sure Mankato's irrigation system runs smoothly. Photo: Mankato Golf Club

The maintenance budget at Mankato Golf Club is $455,000.

Mankato's irrigation system can pump 900 gallons a minute.

Fred Taylor budgeted $3,650 this year for irrigation-system repairs.

"However, Bob Vavrek from the USGA looks at our maintenance practices, and he has talked about a new system more seriously than I," Taylor says. "A new irrigation system is eight to nine years out."

The irrigation system is a double-row system from Toro, but one could make the case that it's wall to wall because there are rough lines in most places where the fairway heads don't cover, Taylor says. The system pumps 900 gallons a minute at full go. Taylor doesn't have individual control on the sprinkler heads, but he can run two heads per control station.

"When the system was put in, it was a way to save money," he says.

The system's central control used to be a VT3 video, a first-generation central control that was operated with a light pen. But the flaw of the controller was that the pen wouldn't always work with the monitor. So, Taylor and his staff found a used VT2 mechanical controller and used that for a few years. Then, Scott Ness, one of Taylor's assistants who has a computer and electronics background, made his own central controller from a computer. Using timing software, the staff upgraded to a one-of-a-kind system that has worked great for five years, Taylor says.

"Five years ago, we were quoted between $40,000 and $50,000 to upgrade the control system. Instead, we spent $600."
– FRED TAYLOR

"Five years ago, we were quoted between $40,000 to $50,000 to upgrade the control system," he says. "Instead, we spent about $600."

Taylor usually discovers weaknesses in the system when he winterizes it in late October, a process that takes about eight or nine hours.

"When blowing it out full of air, I've seen a weak head shoot 20 feet in the air," he says.

When pressurizing the system in the spring, Taylor drives around the golf course looking for puddles, which are indications of busted pipes.

"If it's a break associated with freezing and thawing, it's a major deal," he says. "You'll have a lot of water."

When a nozzle base or gear drive assembly needs to be replaced, Taylor says those parts are usually on hand in the maintenance facility. Other parts such as fittings and pipe usually are purchased from a local plumbing house.

"I can get fittings from Toro and Rain Bird, but it's easier to buy pipe from the local plumbing house," he says. "We are blessed with two good distributors. They're a phone call away to help with a problem."

Starting about three years ago, Taylor and his crew have been replacing the old nozzles on all greens and tees with FCI brass nozzles, and they've seen an improvement. Eight years ago, Taylor and his crew added a variable frequency drive and jockey pump to the pump station.

"We couldn't go two weeks without a pipe breaking before that," he says. "That's when it's crucial to have an experienced irrigation guy on staff. Fortunately, Allen Starke, the other assistant at the club, has been with us for about 15 years and knows the system inside and out."

When a complete irrigation system upgrade takes place, most of the pipe will have to be replaced, some of the pipe can be used again, all new heads and controls will need to be replaced, as well as the pump station, but there will be no need to reroute the system.

"It would be nice to duplicate the heads on greens, so one set waters the greens and the other set waters the surrounds," he says. "Having individual head control would be great, too."

Taylor and his crew will make small upgrades to the system – just like they have been doing for years – between now and when they get a new one.

"We'll get by until a major upgrade is done," he says. **GCI**

A new irrigation system at Mankato is about eight or nine years away. Photo: Mankato Golf Club

BY JOHN WALSH

Water delivery

Development team chooses decoder system for irrigation

In the context of building a golf course, an irrigation system is an unglamorous (and unseen, most of the time) part of a project. Yet it's vital to a successful project. Golfers like – and in many cases demand – green grass everywhere, and effective and efficient irrigation helps provide those results. And for some development teams, a decoder system is the control option of choice.

In Wilson, Mich., the 18-hole Sweetgrass Golf Club is being developed for about $5.5 million. Golf course architect Paul Albanese of Plymouth, Mich.-based Albanese & Lutzke designed the course. Construction started in August of 2005, and it's scheduled to be completed in July. The 7,300-yard, public course is scheduled to open in May of 2008.

Dan Grassi, owner and president of Grassi Enterprises, a golf course construction company, is Sweetgrass' project manager who's overseeing the irrigation installation. Grassi first looked at the project in February of 2003 and came on board in June of 2005. Kuhn & Associates, an irrigation design firm, drew the original irrigation plans. Changes were made to those plans, mainly adding to the irrigation system because length was added to the course.

Toro, Rain Bird and John Deere bid the irrigation system, Grassi says.

"We looked at the price, then narrowed it down to service and reliability of the product," he says. "Then we made our decision. John Deere made a package deal, including the maintenance of the golf course after it was grown in, through One Source. Toro also came up with a package. We were looking long term."

The irrigation system is controlled by a decoder system instead of a satellite or hard-wired system. All the heads require fewer wires than heads that are part of a completely hard-wired system, so there's less copper wire and labor required for installation, Grassi says, adding that the price of copper wire has increased considerably recently. With a decoder system, irrigation can be controlled via the Internet, cell phone or hand-held radio.

At press time, Grassi had four holes left to install.

"It's been a much easier and faster instal-

The number of irrigation heads was increased because of the windy site. Photo: EPIC Creative

lation because of the decoder system," he says. "This is the first decoder system John Deere has done in the U.S. I had my doubts, but I've been pleasantly surprised by the performance. For example, the heads feature a flushing system that helps prevent sticking caused by the dirt around them during construction."

When completed, the system will have about 1,200 heads, all with individual control. A double-row system is in place from the tees to landing areas. Near putting greens, there are two sets of heads, one to irrigate the greens and one to irrigate the surrounds. The system cost about $750,000 including the pump station by Watertronics and the control system by Signature Controls. The pump station, which features 60-horsepower motors, pumps 1,500 gallons per minute.

Because Sweetgrass sits on a windy site, trajectory adjustments were made to various nozzles and extra heads were added, mostly on par 5s and tees, and John Deere accommodated that, Grassi says.

"Those extra heads will be taken out because the turf will be in no-mow areas, but enough water is needed to establish them," he says.

Because of the no-mow areas, Grassi says there are fewer heads (about eight per hole) incorporated into the system than if there weren't any no-mow areas.

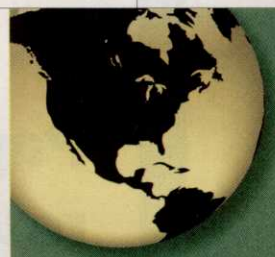
Reclaimed water and rain water will be used to irrigate Sweetgrass, yet nothing in the irrigation system had to be changed because of reclaimed water use, Grassi says.

The fairways and tees are a mix of L-93 bentgrass and Southshore, and the greens are straight L-93. John Hoberton, the golf course superintendent who was brought in when the grass started to grow, is in charge of maintaining the turf.

The irrigation system has a 15-year life span. Throughout time, Grassi expects no problems with the system. The pipes will remain, but he expects some heads might need to be swapped out, which is common with any system. **GCI**

With a decoder system, irrigation can be controlled via the Internet, cell phone or hand-held radio. Photo: EPIC Creative

Terry Buchen, CGCS, MG, is president of Golf Agronomy International. He's a 38-year and AA life member of the GCSAA. He can be reached at terrybuchen@earthlink.net.



Travels With Terry

Globetrotting consulting agronomist Terry Buchen visits many golf courses annually with his digital camera in-hand. He will share helpful ideas relating to maintenance equipment from the golf course superintendents he visits – as well as a few ideas of his own – with timely photos and captions that explore the changing world of golf course management.

Weigh it down

Don W. Taylor, CGCS, director of golf maintenance at Virginia State Golf Association's Independence Golf Club in Midlothian, has a John Deere front-end-loader tractor without a backhoe mounted on it. When his staff uses the fork-lift attachments mounted in place of the front-end-loader bucket to lift pallets of sod or other heavy loads, a large concrete weight is used to keep the rear wheels on the ground for traction in a safe, functional and efficient manner. In the past, implements such as rototillers were mounted on the rear for additional weight.

Former equipment manager Kenneth Price built the large concrete weight that attaches to the three-point hitch. The weight can be taken on and off the tractor easily as desired.

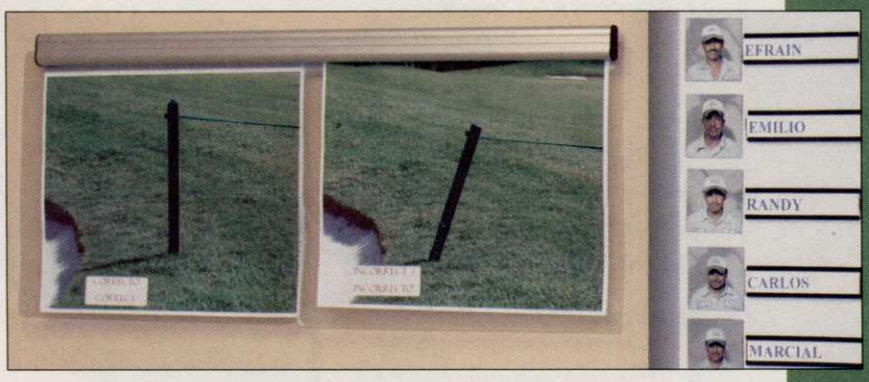
When making the weight, a steel frame was placed inside a concrete form (wooden box) measuring 4 feet by 2 feet by 18 inches. Three, three-quarter-inch-diameter rebars where bent into shape – one at the top and two at the bottom – and welded to the steel frame for additional support. Water was added to Sacrete instant cement and then placed inside the form.

After the concrete dried, it was painted green using specialized concrete paint. The weight weighs more than 500 pounds. The cost of materials used and the mechanic's labor was about $250.

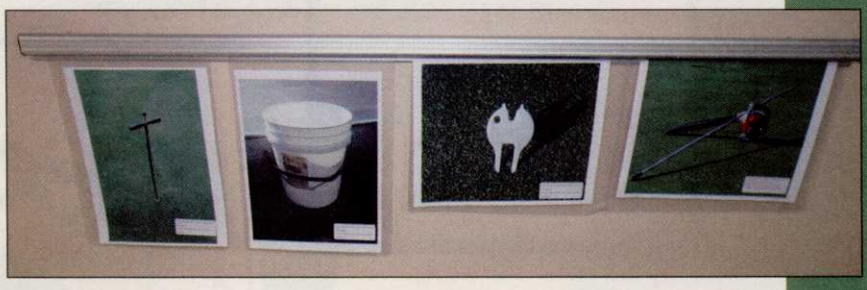
Say it with pictures

Supervisory staffs at golf courses constantly retrain maintenance employees and train new personnel. Darren J. Davis, director of golf course operations at the Olde Florida Golf Club in Naples, Fla., is the epitome of a great communicator, having hosted countless video workshops and written many articles.

The correct and incorrect way of performing specific maintenance procedures is displayed prominently on the employee's lunchroom wall with vivid, digital color photos. The photos are mounted on two Advantus Grip-A-Strip display rails. A roller system organizes the photos on the wall like a bulletin board without tacks. The display rails are available at Office Depot in two size – 24 inches long ($16.99) and 48 inches long ($30.99). After each photo is downloaded to a computer, they're printed on 8.5-inch-by-11-inch, HP glossy photo paper, which can be bought in 100-sheet packs for $29.99.



Then, a caption is written about each photo and translated into Spanish. The captions are printed on Avery 8160 address labels (1 inch by 2 $^{5}/_{8}$ inches), which can be purchased in packs of 750 for $ 11.99, and are affixed to each photo. Because the photos and captions are constantly rotated on display, they're stored in Avery nonstick sheet protectors, which can be bought in packs of 25 for $5.79.



The photos demonstrate tee-marker placement and alignment, repairing divots on tees and fairways, rope and stake placement, ball-mark repairs, etc.

The total cost was less than $100.

Each employee has his individual photos proudly displayed along with his first name on the employee lunchroom wall. **GCI**

Consumer RESEARCH

This year, *Golf Course Industry* is publishing feedback from golfers throughout the United States. We're conducting this research to establish a dialogue between the professional community and golfers. On this page, we'll report trends, likes/dislikes, suggestions and other information we gather through our face-to-face, Web-based and phone research.

Paying for a round of golf

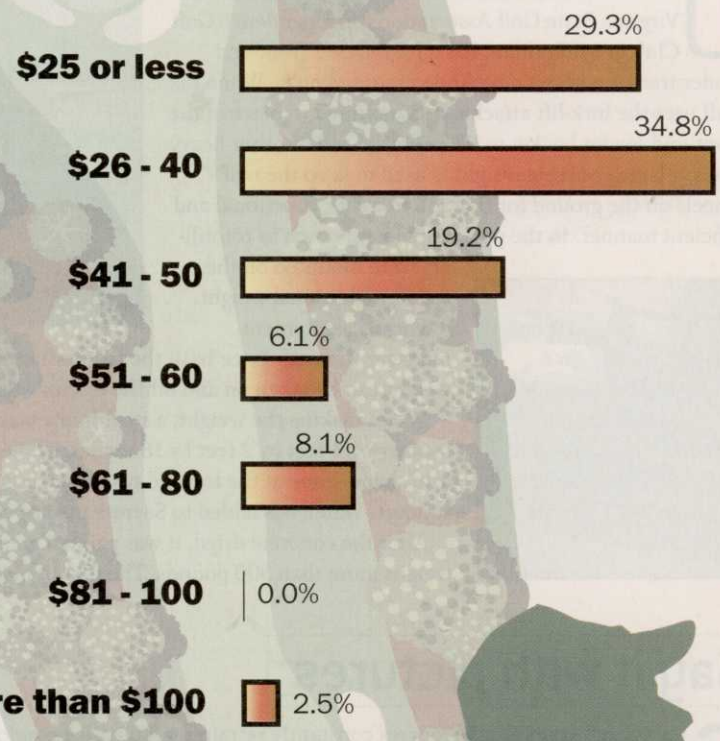
Because of stiff competition and stagnant growth of the number of rounds played nationally, many golf facility operators throughout the country find it difficult to increase or even maintain revenue. Among the many options to boost the bottom line and improve business, green fees is one area of an operation that can move the needle.

Some operators of public facilities have maintained fees, others have lowered them, and still others have increased them as a result of recent course renovations. Which category can your course be grouped?

With so many choices, it's difficult for golf facilities to increase their base of loyal customers. Price is a primary factor for golfers when determining which courses to play. The charts to the left and below offers a glimpse into what Joe Golfer thinks about when paying for a round of golf. Consider this information the next time you're meeting about green fees.

A random sample of golfers throughout the country were surveyed by InsightExpress, a market research company. Golfers surveyed play at least five rounds a year. There were a total of 200 responses, and multiple answers were allowed. Given the sample size and desired confidence levels, the data tolerance is +/- 7 percent.

What do you typically pay for a round of golf (18 holes, cart included)?



What is the maximum amount you are willing to pay for a round of golf (18 holed, cart included)?

Min:	$10
Max:	$500
Average:	$69
Median:	$50

Talstar insecticide

- Controls surface-feeding pests, including all ant species
- Compatible with herbicides, fungicides, other insecticides and liquid fertilizers
- Soil-binding properties allow insecticide to stay where it's placed
- Contains no odorous or plant-damaging solvents
- Water based

FMC Professional Products

golfcourseindustry.com/readerservice # 200

Thompson irrigation nozzle filter

- Prevents sprinkler nozzles and microdrip emitters from clogging
- Available in Type 304 and Type 316 stainless steel
- Features a large conical element with more surface area than traditional y- and basket strainers
- Available in various screen mesh options
- Can be outfitted with optional instrumentation packages

Miller-Leaman

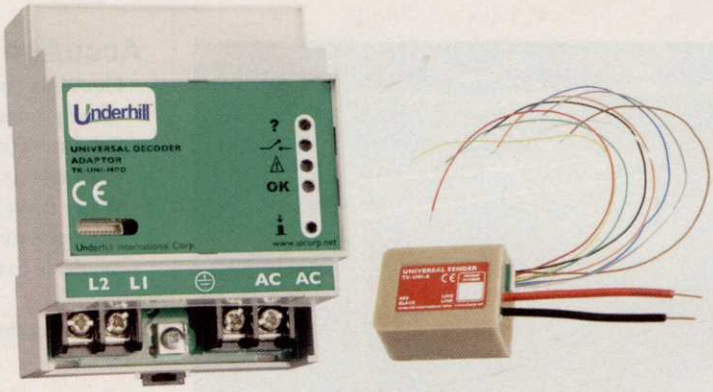
golfcourseindustry.com/readerservice #201

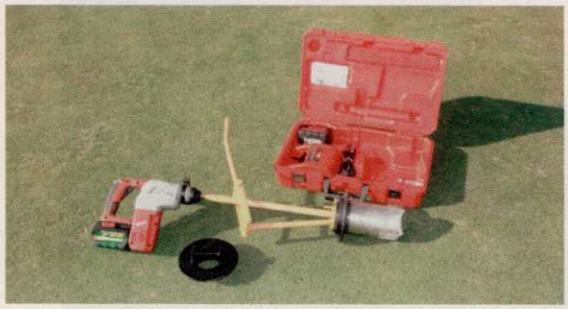
2Wire irrigation decoder system

- Converts any commercial controller to a two-wire operation
- Can operate as many as 63 irrigation stations
- Can be mounted inside an existing controller or in a separate enclosure placed anywhere along the two-wire path as far as 3,000 feet from the controller
- Includes 2Wire Universal Senders, which connect the controller's terminal strips to the two-wire path
- Decoders can be installed at any location along the two-wire path and control one or two valves per station

Underhill

golfcourseindustry.com/readerservice # 202



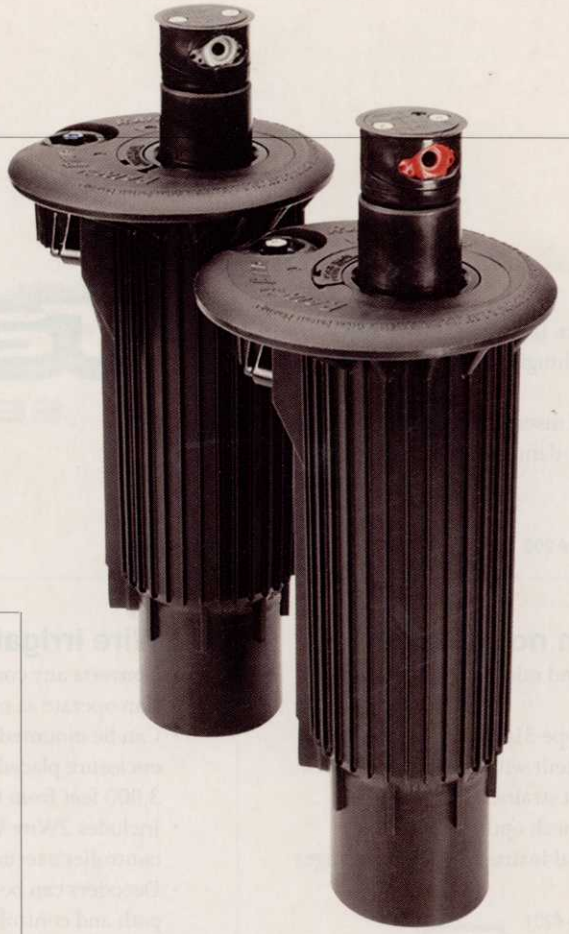


Power cup cutter

- Leaves crisp, sharp edges
- Powered by a Milwaukee hammer drill
- Root system stays intact
- There's no twisting or turning to cause crowning
- Plug removes easily without prying
- One battery cuts 18 holes
- Includes warranties for drill, batteries, charger and cutting unit

JEG Corp.

golfcourseindustry.com/readerservice # 203



Eagle 705/755 rotor

- Delivers water distribution in persistently windy areas
- Prevents a decreased distance of throw
- Features an inverse, wedge-shaped spray pattern
- Delivers a greater water mass up front
- Creates more inertia to contend with the wind
- Produces larger water droplets less likely to cause misting, fogging or drift

Rain Bird

golfcourseindustry.com/readerservice # 204

Turf guard fence

- Protects fragile areas of the course from traffic
- Keeps carts on paths and allows turf to heal
- Provides a clean look
- Ideal in tight spots
- Can be used for hanging directional signs or warnings
- Has a powder-coated finish

Standard Golf Co.

golfcourseindustry.com/readerservice # 205

AccuAire core aerator

- FlexWing design allows aerator to follow the contours of the ground
- Solid steel frame and extrawide racks add weight
- Core spoons rotate on roller ball bearings
- Water tanks for extra weight are optional
- Equipped to use slicer blades or core spoons
- Available in 69- or 93-inch lengths

Broyhill

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Jet Black lake and pond dye

- Blend of environmentally friendly, nontoxic black dyes
- Formulated to reduce sunlight penetration
- Gives water features a natural, black color
- Each EZ SoluPak will treat one acre-foot or 325,000 gallons of water
- Waterproof overpack prevents accidental staining during product handling

Precision Laboratories

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Cooler Pro

- Made of recycled plastic with a realistic wood-grain appearance
- Versions include a 48- or 100-quart Igloo cooler
- Cooler lid attaches to the Cooler Pro and can be detached to use the cooler separately
- Maintenance free

Par Aide

golfcourseindustry.com/readerservice # 208

Weather station product catalog

- 20th anniversary edition
- Includes the company's line of weather stations and data loggers
- Features the Sprayer Station, SpecMaps and the Crop TRAK mini IR thermometer
- AE50 WatchDog weather station information included

Spectrum Technologies

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AD INDEX

* Denotes regional advertisment

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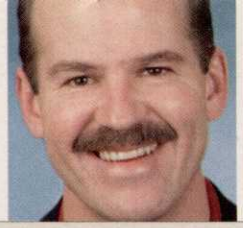

Pat Jones is president of Flagstick LLC, a consulting firm that provides sales and marketing intelligence to green-industry businesses. He can be reached at psjhawk@cox.net or 440-478-4763.

FIVE THINGS I KNOW

It's been 20 years since I stumbled – completely by accident – into this wacky industry. I'm now on my third career in the business but, except for a brief hiatus in the mid-1990s, I've been writing, talking and thinking about the golf course maintenance industry for two solid decades.

And they pay me for that. Go figure.

Much has changed since 1987. The business has gone high-tech. Back then, it wasn't unheard of to try to contact a superintendent only to find he didn't have a phone in the "barn." Now, 80 percent of you use e-mail daily, and I'd be shocked to find one of you who still doesn't have a mobile phone or a Blackberry-type thingy.

The night waterman has gone the way of the dodo. Incredibly sophisticated, multimillion-dollar irrigation systems are run by tiny hand-held computers. The software programs that run these things are more sophisticated than what NASA used to launch the first space shuttle.

Old chemistry went bye-bye and has been replaced by low-dosage, eco-friendly alternatives. Mercury, cadmium, arsenicals, chlordane and other nasties are history. The new stuff is more expensive but more benign and in many cases more effective.

Superintendents – believe it or not – have made dramatic gains in terms of recognition and respect. Years ago, it was cause for celebration every time one of you received any public acknowledgement. It's now almost routine for golf's leaders, Tour players and others in the limelight to state publicly that the superintendent is the key employee at any facility.

Those are the facts of the past two decades, but my message this month is about the truths I think I've uncovered along this long, green path we've traveled together for 20 years. They are:

1. Golf course maintenance is a vast, $9-billion community, yet we act more like Mayberry R.F.D. than Manhattan NYC. This business is essentially a small town where everyone knows everyone else. There are few secrets, and people tend to stick around.

Most of all, despite some erosion the past few years, we largely still share a set of common values based on helping neighbors, treating each other fairly and maintaining an old-fashioned commitment to ethics. In an increasingly cut-throat world, that's something to treasure.

2. Nice guys and gals often do finish first. In other businesses, it seems the further you go up the ladder, the more jerks you'll find clinging to each rung. In golf, it's unusual to meet anyone who's nasty, negative or dishonest at any level, but it's exceedingly rare to find someone at the upper reaches of the business who isn't a pretty good person at heart.

In short, we don't just reward individuals for their ability to grow grass. We also value good people.

> Our ability to evolve, survive and thrive is a direct result of our interconnectedness and our willingness to help others.

3. Superintendents' collective inferiority complex is shrinking slowly. Call it the "Caddyshack Syndrome" or whatever you like, but the notion that superintendents don't get the credit they deserve is beginning to lose credence.

This is something in which the GCSAA should take justifiable pride. I'm not sure any of its public relations campaigns have had that much impact, but by lobbying internally within the larger golf community (the USGA, PGA Tour, PGA of America, etc.), the association has made it a standard to give props to the superintendent. That, for once, is a good kind of political correctness.

4. We evolve quickly and successfully. Despite being old fashioned in other ways, we have a pretty good track record of adapting to change. And I don't just mean technological advances. Cultural practices also have changed rapidly. Just look at how we view soils and aerification now compared the 1980s and you'll know what I mean.

Also consider how quickly we came to grips with environmental issues – real and perceived – and made genuine progress in promoting ourselves as nature friendly.

Our ability to evolve, survive and thrive is a direct result of our interconnectedness and our willingness to help others. It's a nice side benefit of living in that small town I mentioned earlier.

5. This is a genuinely good business. I keep coming back to this idea that our industry reflects our sport. Practice, education, creativity, honesty and fair play are fundamental to success. Gentlemanliness (and "gentlewomanliness," I guess) is the prevailing spirit. We compete, but we also root for each other to succeed.

Lastly, we tend to worry when those values are eroded by ethical questions, business pressures, conflicts of interest, etc. The fact that we fret about these things is a sign that we care deeply about them when other industries simply don't.

Albert Einstein once said, "Whoever undertakes to set himself up as a judge of truth … is shipwrecked by the laughter of the gods." He was a fairly smart guy, so I'll freely admit that I don't have a monopoly on the subject and invite you to send us your truths – good, bad or ugly – about the state of the profession today.

In the meantime, I hope you'll consider yourself as lucky as I do to be living in a cozy little town where the neighbors are involved, concerned, friendly and always willing to help. When you get right down to it, Mayberry is a pretty cool place to be. **GCI**

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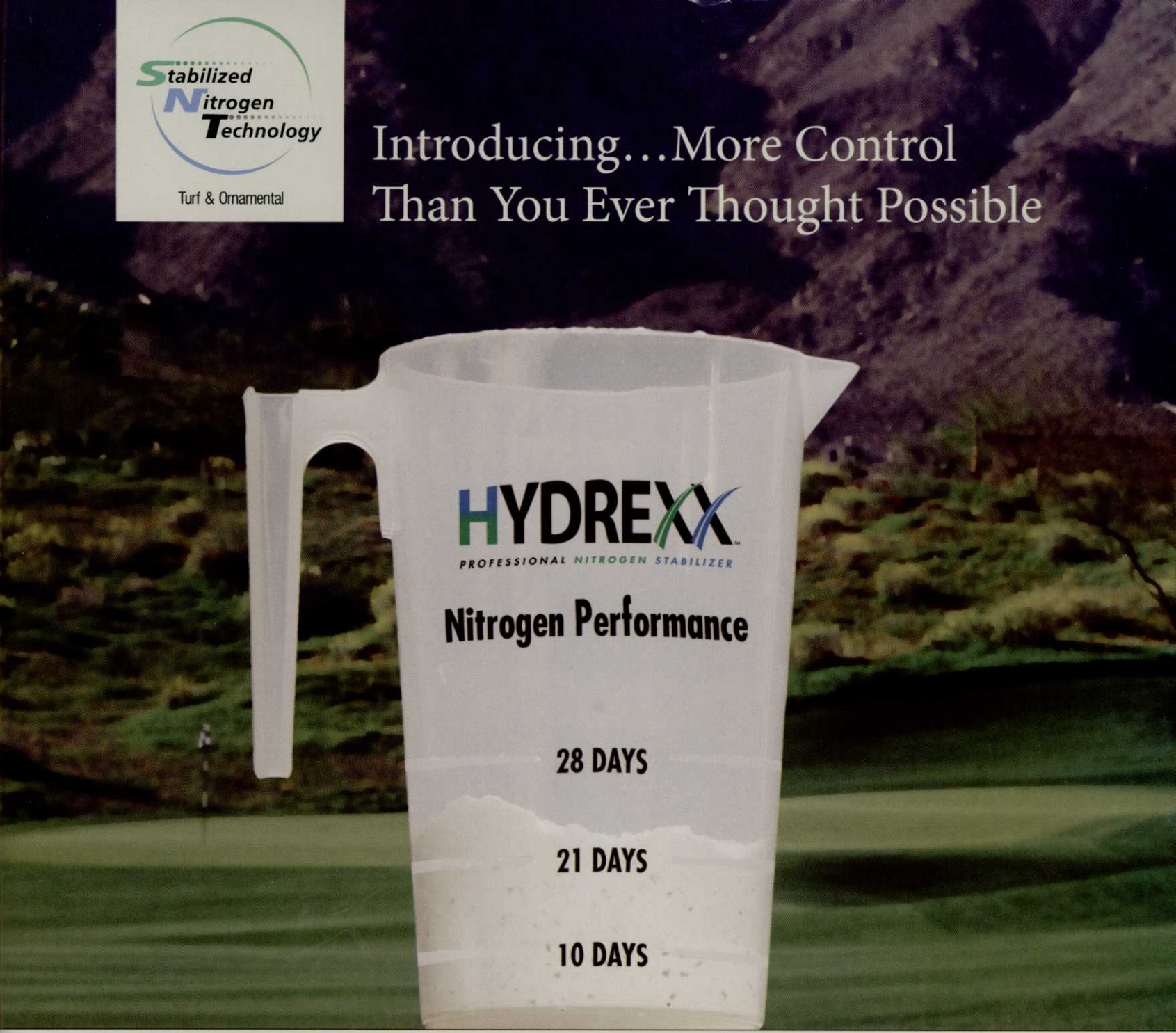

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