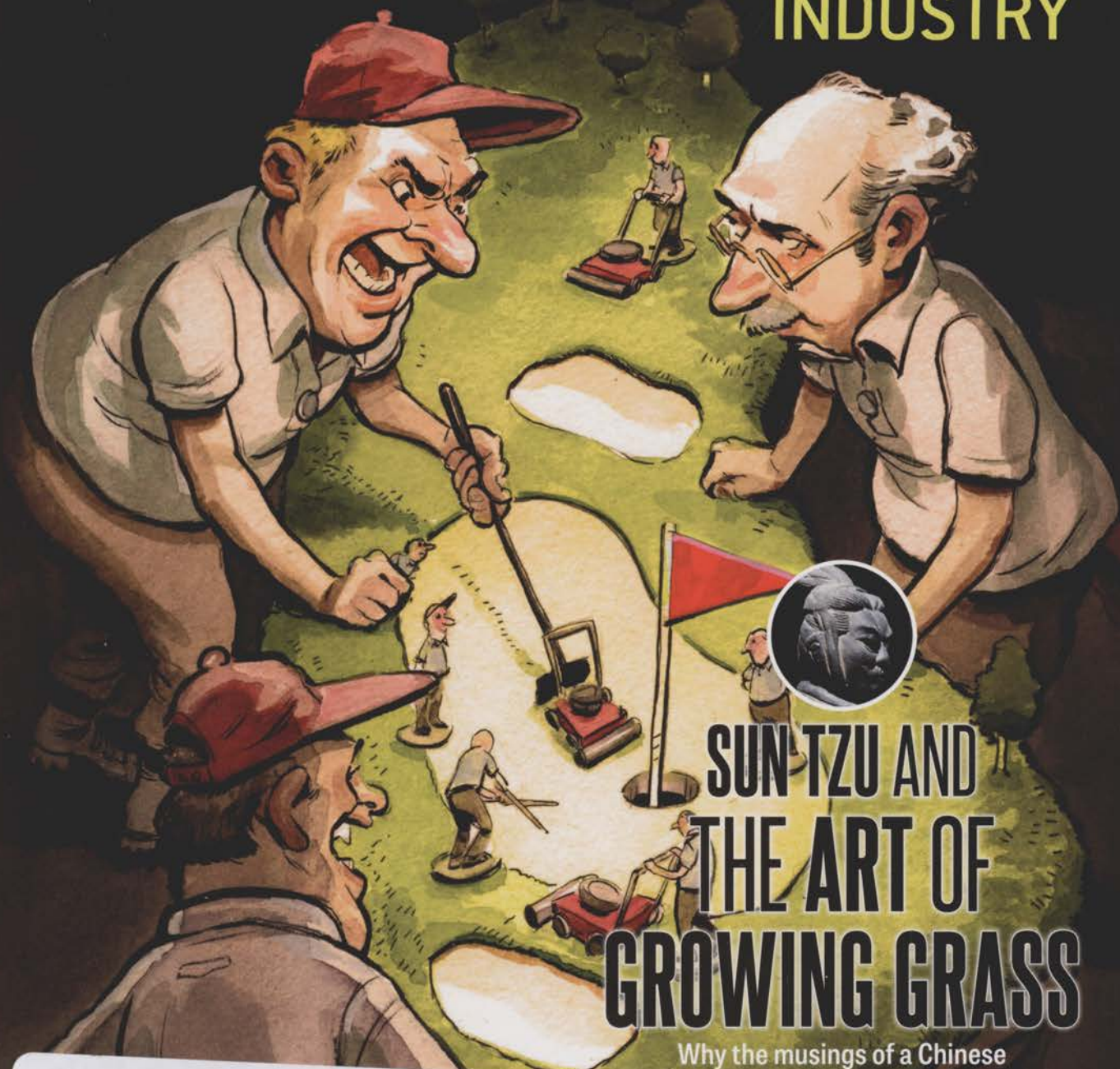


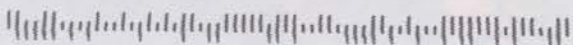
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## SUN TZU AND THE ART OF GROWING GRASS

Why the musings of a Chinese philosopher relate to maintaining a golf course and how they can help you manage the demands of the job.



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## THE BATTLEFIELD

**B**y no means did we intend to make light the horrors of war with this month's cover story. I just feel I need to put that out there before going on. Instead, our intent is to draw a parallel between the preparedness necessary to do battle, whether on the field or the fairway.

We asked our good friend and frequent contributor Anthony Williams (CGCS, and the director of golf course maintenance and landscaping at the Four Seasons Resort Club Dallas at Las Colinas in Irving, Texas) to take some artistic liberties with Sun Tzu's Art of War – the 2,000-year-old Chinese military treatise on warfare – and his reinterpretation as applied to turf management and what's needed to be a successful golf course superintendent. On a more personal level, Anthony has often used parts of Sun Tzu's master work in his seminars covering both martial arts and turfgrass topics with equal reflection for over 30 years.

In this month's cover story, Anthony identifies seven Sun Tzu quotes that correlate the art of growing grass (or growing people who grow high-quality turfgrass, for that matter). He began balancing a martial arts career with his turf career in the early 1980s. Thirty-five years later he's still earning a living through the martial arts and the cultivation of high-quality turfgrass.

“Sun Tzu was not a micromanager. Instead, he reminds us that we cannot be expected to do everything ourselves, and that we will ultimately depend on our army (staff) to direct tactics and programs and accomplish the physical tasks required in a proper way to ensure success.”

be expected to do everything ourselves, and that we will ultimately depend on our army (staff) to direct tactics and programs and accomplish the physical tasks required in a proper way to ensure success.

Whether from the back of a Jeep or the front seat of a Cushman, a good leader makes sure his people are prepared to not only do a job, but to achieve success. And while this may not feel the same as directing troops into battle, it has the same level of gravitas. Think about it. **GCI**



**Mike Zawacki**  
Editor

I, myself, read The Art of War nearly a quarter-century ago, primarily because it was on a summer reading list. However, one of my favorite excerpts that Anthony chose to highlight dealt with training as a critical component for success. Anthony, channeling Sun Tzu, says high-quality turfgrass is dependent on the proper training of senior staff such as assistant superintendents, as well as the foot soldiers – the entry-level greenkeepers. Sun Tzu was not a micromanager. Instead, he reminds us that we cannot

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Vol. 29 No. 9

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Scott Traphagen, John DiMascio, Larry Napora and Renee Geyer lead the golf course maintenance operations at Firestone Country Club in Akron, Ohio. The club has hosted a professional golf tournament every year since 1954.

## It's their game

**How pride and efficiency allow the Firestone Country Club crew to simultaneously balance a World Golf Championship event with regular play.**

By Guy Cipriano

**THE HAPPENINGS SOUTH** of the Firestone Country Club golf course maintenance facility suggest an atypical occurrence.

Forty-nine of the world's best 50 golfers compete before thousands of spectators as a worldwide television audience follows their shots. Banners, billboards, scoreboards, bleachers and concession stands create a festive atmosphere on the edges of a venerable course.

Inside the maintenance facility, superintendents discuss the land to the north and west. The presence of the World Golf Championship Bridgestone Invitational means



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another week of juggling maintenance on four courses.

The 600-acre Akron, Ohio, facility includes 63 holes. While the world knows the South course, which has hosted a professional tournament every year since 1954, the crew also maintains the private North and West courses and a nine-hole public course. The entire facility is open during WGC Bridgestone Invitational week, with morning shotgun starts on the North and West courses and a packed tee sheet on the Raymond J. Firestone Public 9.

So, how many volunteers does Firestone recruit to provide support? The answer will surprise almost anybody who has worked on a PGA Tour event.

"My first year we did a written vote: Who would like to have volunteers?" says director of golf course operations Larry Napora, who arrived in 2008. "I think at the time we had 65 employees, and 63 said no. They wrote: It's our course all year. We don't need anybody to help us." The maintenance team has swelled to 72 employees. Dozens of positions are filled by prideful veterans. One employee has mowed greens on the South course for 43 years, yet he's still 14 years behind the longest-tenured crew member. A few area teachers spend summers on mowers at Firestone instead of on beach chairs.

Course superintendents John DiMascio (South), Scott Traphagen (North), Renee Geyer (West) and Derek Messina (Raymond J. Firestone Public 9) rely on their experienced employees to introduce Firestone's philosophies and practices to newcomers. Maintaining the private courses also requires positions to handle the practice range and clubhouse grounds, an irrigation technician, and assistant superintendent who helps DiMascio, Traphagen and Geyer. Four mechanics with more than 100 years of combined experience produce year-round efficiencies.



Top: The par-5 16th hole on the Firestone Country Club South course; Right: The par-3 15th hole.

The crew works split shifts during the WGC Bridgestone Invitational, and DiMascio says every employee will spend time on the South course, which is mowed twice daily when weather cooperates. The North and West courses are also mowed daily during tournament week. The week represents an extension of the year, as DiMascio, Traphagen and Geyer communicate frequently and openly about where to direct personnel.

"After we got the South done for the first round of play, we start talking, 'We're trying to get these collars and approaches mowed over here. We need to get this done. How are your bunkers doing?'" DiMascio says. "We are always thinking because you're not just done with your course. Your course might be shut down for the season, but the North is still open. You're always thinking about it. It's a constant thing."

The agronomic programs on the



private courses are similar, although slight tweaks are executed as the WGC Bridgestone Invitational approaches. The South course receives an "extra kick" of fertilizer in the rough and an additional preventative fungicide application before the event, DiMascio says. The courses share equipment and heights of cut are identical for most of the year. The period leading into WGC Bridgestone Invitational week is the most important maintenance stretch of the season. "We start prepping a month in advance," DiMascio says. "If you don't have it done by the time advance week is here, you're not going to get it done." Firestone's high-level conditions are a PGA Tour staple. Chuck Green, the



PGA Tour agronomist assigned to the WGC Bridgestone Invitational, says former PGA Tour player and current rules official Dillard Pruitt tells people, "If you don't like Firestone, then you don't like pro golf." The South course opened in 1929 and was originally designed by Bert Way. Robert Trent Jones Sr. redesigned the course in the 1960s. Narrowing fairways and tweaking bunker placement are among the changes in the last 15 years. An operating steel irrigation mainline installed in 1929 still exists below the surface.

The staff notices things every year that can be enhanced. But nobody is ready to overhaul a successful template. "When you have a tournament every year, you're not reinventing the wheel," Napora says. "You're tweaking it." GCI

## Tartan Talks No. 14

Prompted by the late Bob Cupp, John Sanford decided to increase involvement in the American Society of Golf Course Architects. His involvement peaked earlier this year when he became president of the society.

Part of Sanford's presidential duties included recording a Tartan Talk episode at the Golf Course Builders Association of America summer meeting in Charlotte. The episode featured a little late summer baseball chatter – Sanford's father, John, pitched parts of 12 major-league seasons – and plenty of golf course architecture discussion. Sanford is based in Jupiter, Fla., and he has numerous ideas about designing strategic golf courses. Enter <http://goo.gl/yjXfe> into your web browser to hear the episode.



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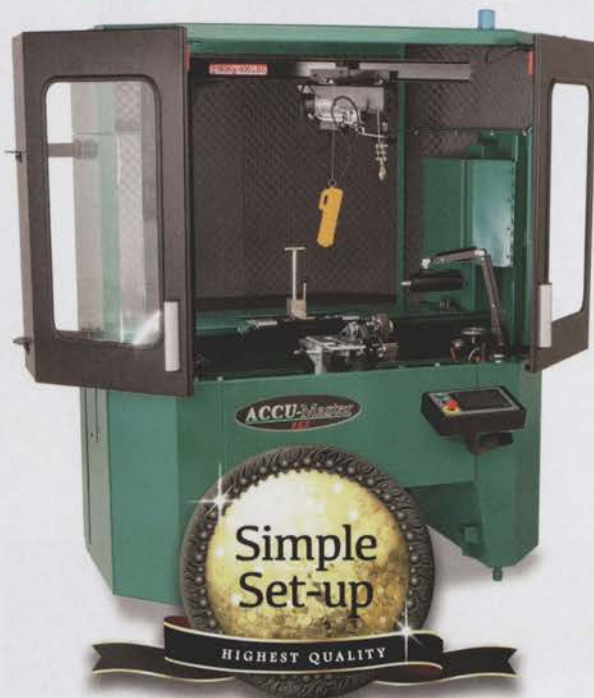
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## NOTEBOOK

### Want to be a nationally published turfhead?

GCI is giving you a chance for a second straight year.

After debuting to industrywide praise in 2016, Turfheads Take Over will return this December. Contributing to the 2017 issue is a painless process: write around 750 words about any industry-related topic, lesson or experience. Submissions along with applicable photos can be emailed to associate editor Guy Cipriano at [gcipriano@gie.net](mailto:gcipriano@gie.net). The deadline to submit an article is Oct. 31, 2017. GCI publisher Pat Jones recommends submitting first-person essays.

Pinehurst Resort's Bob Farren, Cypress Point's Jeff Markow, Saucon Valley's Jim Roney, Des Moines Golf and Country Club's Rick Tegtmeier, head National Mall turf manager Michael Stachowicz, and Cleveland Metroparks CEO Brian Zimmerman were among the industry leaders who contributed articles to the 2016 Turfheads Take Over. The issue culminated with 2017 Old Tom Morris Award recipient Paul R. Latshaw writing the "Parting Shots" column.




### Carolinas pride reigns at PGA Championship

Quail Hollow Club became the first Charlotte, N.C., course to host a major championship last month. Enter <http://goo.gl/UxFc3R> into your web browser to learn more about the club's talented agronomic team. In other news involving Quail Hollow, John Deere and club officials announced the formation of the Quail Institute, a program offering one-year fellowships in agronomy, golf operations and club management.



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**To do list:**  
Renovate course.  
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A photograph of two men on a golf course. One man, Keith Wood, is crouching down, looking at something on the grass. The other man, Shane Omann, is standing next to him with his hands on his hips, looking down at the same spot. They are both wearing dark jackets and khaki pants. The background shows a well-maintained golf course with trees and a stone wall.

*Keith Wood, Superintendent,  
and Shane Omann,  
Assistant Superintendent,  
Quail Hollow Club,  
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# END BUDGET PROCRASTINATION



**Henry DeLozier** is a principal in the Global Golf Advisors consultancy. DeLozier joined Global Golf Advisors in 2008 after nine years as the vice president of golf for Pulte Homes. He is a past president of the National Golf Course Owners Association's board of directors and serves on the PGA of America's Employers Advisory Council.

**T**o the list of things we love to procrastinate on (exercising, dieting, organizing the garage and learning to speak a foreign language), we should add budgeting.

Experts on such matters tell us that we're all guilty of procrastination. But we delay, defer and prolong for a number of different reasons. Maybe the biggest is that we see an important task as a daunting project, one that intimidates and practically immobilizes us. Another reason – although we don't like to admit it – is that we worry that we might fail. Whatever the reason, budgeting brings out the best (and worst) in our fellow procrastinators.

Let's dive into some strategies and tactics that can help break the budgeting process into manageable chunks and reduce the accompanying fear.

## STANDARDS OF EXCELLENCE

Standards-setting must precede budgeting to ensure that club leaders and management are aligned in communicating expectations. At the highest levels, the standards should be affirmative, simply stated and realistic. These statements serve as Magnetic North to give departmental managers a clear-cut understanding of the desired destinations.

Superintendents use an agronomic plan to describe their intentions and methods. These descriptions identify

the manpower required and the costs attached to that labor. Care and upkeep standards correlate to the activities required by the golf course staff to achieve the standards and frequencies required. Routine task planning, such as mowing, irrigation and fertility management, combine with special project needs to detail the number of hours and materials that will be consumed and the associated costs.

Superintendents know that most budget initiatives die because of a lack of understanding, not because the request is flatly rejected. That's why those experienced in the budgeting process are among the most accurate and detailed in their descriptions, summarizing assumptions and providing calculations that underlie each line item. They make sure that decision-makers understand what is needed, why it is needed, and what the results and benefits will be if the costs are approved.

## STRATEGIC GOALS AND OBJECTIVES

Most successful courses and clubs operate with clearly stated goals and objectives, which are detailed in their strategic plan. Management is charged with executing the plan and achieving the goals. Their budget is a key element of their plan, forecasting revenues and costs that provide the financial roadmap to the intended destination. There are three guideposts along the way:

1. Confirm that you accurately understand what is expected. If there is any ambiguity, it will show up in the budget.

2. Explain what is necessary in order to achieve the established goals and objectives. Show that you fully understand the fit-and-finish requirements of each goal and objective.

3. Describe a path to completion that includes checkpoints so everyone involved stays updated on progress. Describe progress in terms of percentage complete, budget status and timeline. If progress is poor, say so. And describe corrective steps being taken to get back on schedule.

## COMMUNICATION

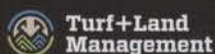
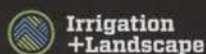
Open and honest communication is a key for successful budget planning and execution. That's especially important to remember when preparing complex and potentially confusing course maintenance budgets. Here are three communications techniques to make your budget easier to understand and approve:

1. Educate your audience. Most committee and board members are not agronomic experts. Therefore, superintendents and managers should educate them and club members in the art and science of proper course care so the budget reflects adequate funding to achieve agreed upon standards of excellence.

2. Conduct field-day demonstrations. A part of the education process is taking decision-makers onto the course to show them what is working, lacking and needed. Show what is required to achieve the standards of excellence on which all have agreed.

3. Provide monthly updates that show how the budget is being managed, monitored and achieved. Managers and members develop increased trust in superintendents who hold themselves accountable for the desired results. Provide visual updates to management, board and members so everyone feels invested in the outcome. **GCI**

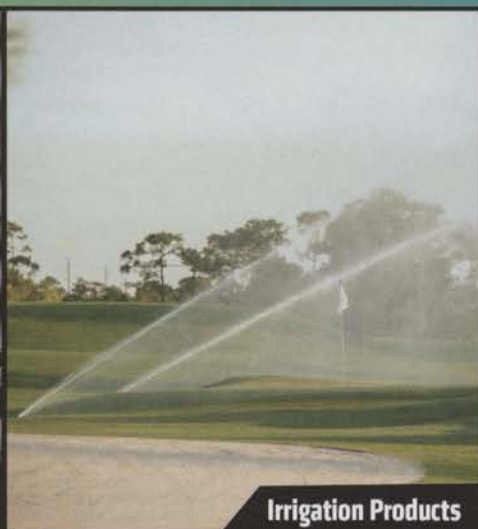




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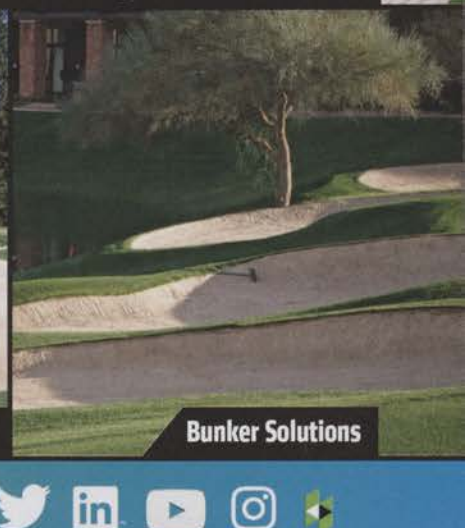
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# SUN TZU AND THE ART OF GROWING GRASS

Why the musings of a Chinese philosopher relate to maintaining a golf course and how they can help you manage the demands of the job.

By **Shihan Anthony L. Williams, CGCS**

Illustration By Britt Spencer

**T**he Art of War, the masterwork written by Sun Tzu (BC 544 – BC 496) in the mid-fifth century BC, has stood the test of time as a collection of strategies that when applied to various situations have proven to be successful over and over. Military and business leaders alike have used the wisdom in The Art of War to inspire and achieve personal and group goals. Personally, I have often used parts of Sun Tzu's master work in my seminars covering both martial arts and turfgrass topics with equal reflection for over 30 years. The purpose of this article is to examine seven quotes from Sun Tzu that have direct correlation to the art of growing grass (or growing the people who grow the grass), especially high-quality golf turf. I began balancing my martial arts career with my turf career in the early 1980s when I was teaching martial arts classes at night for Abraham Baldwin Agricultural College and attending turf classes under ABAC's Dr. Eddie Seagle by day. Thirty-five years later I am still earning a living through the martial arts and the cultivation of high-quality turf grass. I hope these insights will help you improve your level of artistry and success within all of your endeavors.



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## TRAINING IS CRITICAL TO SUCCESS

*"Victory usually goes to the army who has the better trained officers and men." — Sun Tzu*

What does this really mean for the modern superintendent? It means that success in the management of high-quality turfgrass is often dependent on the proper training of your senior staff such as assistant superintendents and supervisors as well as the foot soldiers of our industry, the entry-level greenkeepers. Sun Tzu is quietly reminding us that we cannot do everything ourselves that we will ultimately depend on our army (staff) to direct tactics and programs and actually accomplish the physical tasks required in a proper way to ensure success. For example, in the properly trained world, there should never be a scalped collar or a diesel mower filled with gasoline. This is perhaps the most direct of the quotes that we will examine today, but I believe that it is by design. This is the cornerstone that most of the other precepts are built. You must develop quality training and evaluation programs for each level of your staff in order to be successful in the golf industry. Think about some of the legendary turf managers of our time. They are all famous for training and producing high-quality per-

sonnel on an ongoing basis. Start with training the basics at the entry-level and then move onward through your tasks and tactics (agronomic plans) providing practice and noting performance. Remember that in this area practice does not make perfect but perfect practice leads to a deep level of mastery that, in time, leads to sustainable success. Knowing how is the beginning. Knowing why is the secret of success.



## MANY VOICES, ONE SONG

*"He will win whose army is animated (driven) by the same spirit throughout its ranks." — Sun Tzu*

It is an easy thing to say that we are single minded as to our purpose, but it's hard to live that truth on a daily basis. Scores of mission statements and vision statements whirl through the halls of business. But how many stick? How many golf operations understand from top to bottom why we are all here and what we need to accomplish through thousands of separate activities that will achieve the ultimate goal of a truly sustainable and profitable business? Sun Tzu is pointing toward a transparency and a clarity that is deep and yet simple in a connected family/work environment. I once visited a plant where they produced



chewing gum. The combined vision and mission statement was, "We Make Great Gum," and every employee knew how their job impacted the gum being great, right down to the sales team who found it easier to sell great gum over average gum. They owned the message because they lived it unforced and naturally every day. They were a family, an economic army working for a shared goal and fueled by the energy of even the newest member. We must make this a reality within the turf management operation as well. Great training fails when the staff is not motivated, so creating a shared sense why we need to

be successful and what every one's role is will create a synergy that is obvious to all who see it or hear of it.



### PICK YOUR BATTLES

*"He who knows when he can fight and when he cannot will be victorious." — Sun Tzu*

When it comes to superintendents and egos, everyone knows that you need a healthy dose of confidence with an

equal dose of gratitude to do this job well. However, Sun Tzu reminds us it is wise to pick your battles and be prepared to engage or not engage at all. In fact, he also recommends that if you cannot win, then do not engage but rather gain better understanding and continue to train for other objectives. Have you ever heard of a superintendent in the middle of a situation such as overseeding (to do it or not), converting greens to a new type of turf or some other controversial property issue that was about to choose to fight or not to fight? Sun Tzu is simply reminding us that every dog has his day and the

best way to win is to be sure that it is a fight worth engaging and you have all of the intellectual and physical resources to guarantee success. Beware the temptation to overestimate your worth because you have been very successful. My mentor Palmer Maples Jr. once told me that you can get so gifted at solving problems that you eventually become the biggest problem because you fail to see priorities through the eyes of others. There are many facets to the processes and battles presented daily in the management of high-quality turfgrass, so be sure to pick your battles wisely and success and long tenure will be your reward.



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### A SENSE OF TIMING IS CRITICAL IN LIFE, CAREER AND BUSINESS

*"Quickness is the essence of war."*

— Sun Tzu

Have you ever had regrets about the road not taken? Perhaps it was a job or relationship that seemed like it would be around forever, but suddenly the door closed and the opportunity was lost. Here Sun Tzu is giving us all the ultimate reminder that life, business and war move really fast, and you have to make decisions quickly to take advantage of opportunities and procrastination leads to ruin or at the very least deep regret. I write this article from Dallas, Texas, about 800 miles from my hometown of Indian Creek, Ga. I am only a few months removed from using this advice in my own career. I was offered my dream job as director of golf operations for TPC Four Seasons Golf and Sports Club Dallas at Las Colinas. It was an amazing opportunity, but I had to act. I packed what I would need through the AT&T Byron Nelson Classic, and I accepted the job, moved to Texas and lived a very different lifestyle while we secured the family and other details later. The experience has been the highlight of my career. Never wait too long to make things happen. Great opportunities by their very nature are rare so being aware of your goals and plans and up to date on

your capabilities are all things that can help you know when to take that leap of faith for a chance to live your dreams. The technology of today with smart phones, apps and real-time reporting have made the windows (pardon the pun) of opportunity even smaller. See your vision clearly, plan your steps, define the actions required and act without hesitation nor regret. One of my favorite Sun Tzu quotes is the perfect way to close out this section: "Let your plans be as impenetrable as the night and when you move, fall like a thunderbolt."



### SYNERGY DEFINED IS 1+1=3

*"Opportunities multiply as they are seized."* — Sun Tzu

Sun Tzu is pointing out a long-known axiom that some people are seemingly blessed with success or born under a lucky star may not be true. The truth is simpler and deeper. Sun Tzu is speaking to the synergy created when strong positive habits are formed and practiced over and over. The idea is touched on by hundreds of positive thinking gurus and programs. For our purpose, it should be clear that the more you work toward the items you identify as critical and make the reality of your circumstances bend to your will, the better you will get at it. Getting amazing results and identifying more opportunities or even bigger

*"Never wait too long to make things happen. Great opportunities by their very nature are rare so being aware of your goals and plans and up to date on your capabilities are all things that can help you know when to take that leap of faith for a chance to live your dreams."*

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"dream"

accomplishments is largely the result of personal action that is divinely guided. You will begin to see opportunities that others bypass unknowingly. This synergy has been documented over and over. Most people get lost between strategy and tactics, and never seem to take the right action at the right time or some simply get tired of the fight and give up. You see we cannot change what we are willing to tolerate. So, by the very laws of nature, you must turn the art of seizing opportunities into a daily habit not a rare life event. If you do make the commitment, I promise the opportunities multiply just as Sun Tzu said. My office is covered with the irrefutable evidence that this is a timeless truth.



### ALWAYS STRIVE TO BE THE WISE GENERAL

*"The reason that the wise general conquers the enemy whenever they move and that their achievements surpass ordinary men is foreknowledge."* — Sun Tzu

Now you may be wondering what is foreknowledge and why is it so important. First, let's define foreknowledge as the combined accumulative knowledge from the beginning of a thing up to the present moment in time and its integration with other items of note that lead to unerring intuition. That can be a lot of information. The point is to be



complete in your assessment of things so that mistakes or miscalculations are not possible. A basic example of foreknowledge would be a trusted recipe that has been handed down for generations. Each generation proving and guarding ingredients and methods to reach the desired results. Sun Tzu warns us to value firsthand experience above hearsay and ghosts, but gather the whole of the information and then prove its worth. This is the same logic we apply to the total aeration process for greens or other high-value turf. Our foreknowledge and research allow us to build a plan of action that is the result of our expanded search for truth about the situation presented to us. Before making an incorrect move, we test the action against proven foreknowledge to ensure success. It is also important to note that as your achievements surpass ordinary men, some people will stop clapping when you win or do something of note. Hold the course and take the high road trying to be aware, humble and stay prepared to justify your actions at all times. We are always being tested to see how well we have learned the lessons of our craft. The art of greenkeeping is a true blend of science and art. Because it requires a large number of people to share a vision or foreknowledge, it will always be a moving target that while difficult to hit, has many rewards for those who persevere and hit the target each day.



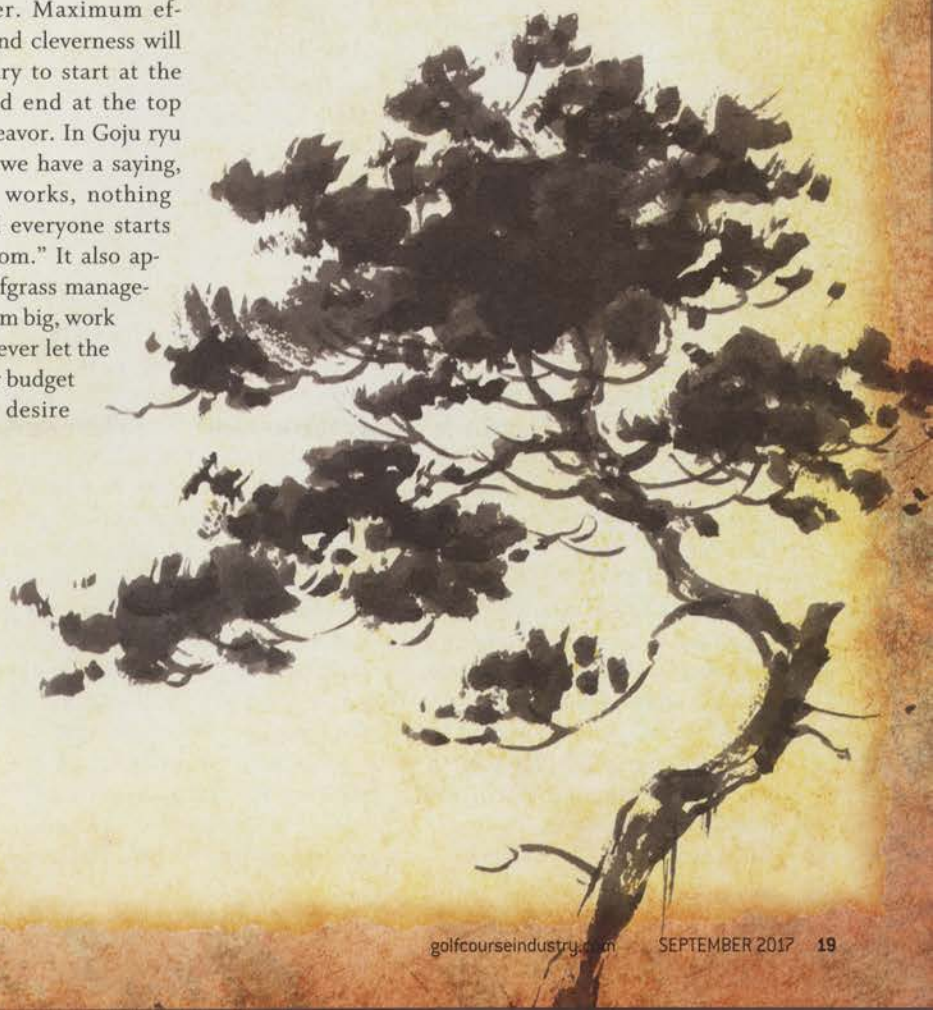
**DO NOT LET THE SIZE OF YOUR  
CURRENT RESOURCES LIMIT YOUR  
ASPIRATIONS**

*"Great results can be achieved  
through small forces." — Sun Tzu*

I saved this one for the last so it might resonate. It is often an advantage to prove your resourcefulness and skills with few resources in order to earn your way to bigger and better opportunities. Remember it is not where you start that matters when it comes to career. You must know where you are going to reach the ultimate success within the legacy of your career. Maximum effort, will and cleverness will be necessary to start at the bottom and end at the top of any endeavor. In Goju ryu Karate Do we have a saying, "everyone works, nothing is free and everyone starts at the bottom." It also applies to turfgrass management. Dream big, work hard and never let the size of your budget limit your desire to achieve.

It has been a journey full of inspiration and simple answers to complex questions as we revealed some of Sun Tzu's deepest wisdom as it relates to the art of growing turfgrass. The true depth of this wisdom is that everyone will take away a slightly different understanding of the text depending upon their level of experience or their need for understanding. I would encourage you reread the article after a few days, take a few side notes and pick one or two areas to put into your daily action plans. Do this for a few months and see if you notice the impact the strategies are having. Consider this exercise an investment in your future. May the tools you find help build the career that you have always wanted. **GCI**

Anthony Williams, CGCS, is the director of golf course maintenance and landscaping at the Four Seasons Resort Club Dallas at Las Colinas in Irving, Texas. He's a frequent GCI contributor.





# 'BRAIN-BUCKET' SYNDROME



**Tim Moraghan**, principal, ASPIRE Golf ([tmoraghan@aspire-golf.com](mailto:tmoraghan@aspire-golf.com)). Follow Tim's blog, Golf Course Confidential at [www.aspire-golf.com/buzz.html](http://www.aspire-golf.com/buzz.html) or on Twitter @TimMoraghan

**A**s superintendents, we hear, and are asked, some pretty crazy things. But I just was recently told a story that takes the cake when it comes to selfishness. It's the end of summer, so I guess it's the heat or the solar eclipse.

Here goes:

Seems a member of a well-known club, and a very good player, qualified for a national championship. So, he asked the superintendent at his club if the greens could be made to run faster, allowing him to more realistically practice for the big event. He didn't care about the club's other 300 members — he needed to get his game ready.

Now, I don't know for a fact that this player is young and it's obvious he's not new to the game. But I've been hearing from a lot of you about a new breed of golfers, a generation that has been raised to expect instant gratification and to have the whole world instantly accessible at their fingertips.

On the one hand, I'm glad to hear newer, younger golfers are coming to golf and joining clubs. However, these same golfers all seem to think that when they ask for something it should be done yesterday and because they can find anything they want on the Internet, they are always right. In truth, this generation is no smarter (and definitely no nicer and more

“Is anyone else struck by the irony that we need crews of 150 or more to assist in getting courses ready for the very few and very privileged? And this is something to aspire to? Really?”

rude) than the legions of selfish, small-minded members who came before them and who treated superintendents and their crews like “the help.” But by staring endlessly at their phones, iPods and television instead of looking you in the eye, they're just ruder.

In many ways, these new golfers are repeating the same complaints made by past generations. And most of them start with television. They point to what they see on Tour each week and wonder why they can't have those conditions at their clubs. They listen to the overhyping of the perfect maintenance during the majors, conditions that our own industry praises, as well.

Is anyone else struck by the irony that we need crews of 150 or more to assist in getting courses ready for the very few and very privileged? And this is something to aspire to? Really?

Once again, we're dealing with an audience that neither understands nor appreciates how hard we work. But they have no problem sitting by

and speculating what needs to be done without ever having done it. Oh, right, they have a lawn (assuming they just don't write a check to someone else to maintain it). But when they get tired or bored tending their gardens or managing their lawns, they can go inside, grab a cold one and plunk themselves down in front of that week's golf broadcast and think, “if only our guy could do that.”

You know what? We can do that — if you give us the time, people, equipment and money, and then get out of the way. In fact, we'd love to do it.

I'm also hearing from a lot of you whose work ethic is being challenged by people — young, old and most privileged, doesn't matter — who have no idea what the superintendent's job is. You've put in a few years or more, busted your hump keeping the course in good shape, but suddenly someone is saying how you've “lost your edge,” or they're sending around an article they found online (where everything is true!) that says your course, any course, can be better and for less money. Just another example of golfers who might be really smart and successful in real life forgetting everything they know about business, human resources, economics and management when it comes to their club or course. It's the “brain-bucket” syndrome. When they arrive on course, they drop their brains in the large bucket by the clubhouse door.

What can we do? Start by remembering that we chose this line of work knowing that, in many ways, we're at the bottom of the totem pole when it comes to being respected. If you enjoy what you do and what you get to accomplish, then you just have to live with the self-knowledge that you're doing a good job.

If you're lucky, and many of us are, you are respected and well-treated by the people you work for and with. If that's you, give yourself a pat on the back because you're not only doing a (MORAGHAN continues on page 57)





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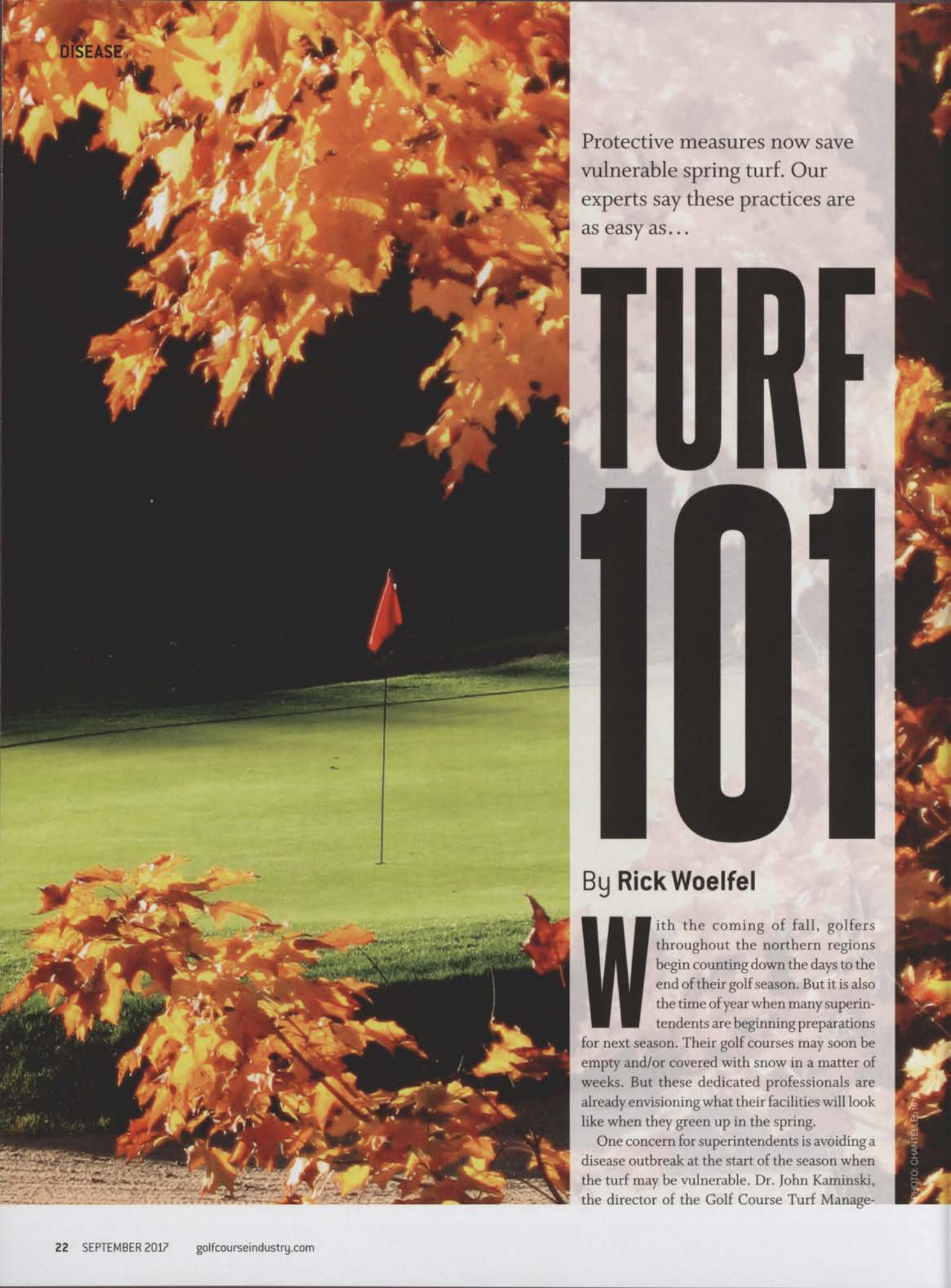


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# TURF 101

By Rick Woelfel

**W**ith the coming of fall, golfers throughout the northern regions begin counting down the days to the end of their golf season. But it is also the time of year when many superintendents are beginning preparations for next season. Their golf courses may soon be empty and/or covered with snow in a matter of weeks. But these dedicated professionals are already envisioning what their facilities will look like when they green up in the spring.

One concern for superintendents is avoiding a disease outbreak at the start of the season when the turf may be vulnerable. Dr. John Kaminski, the director of the Golf Course Turf Manage-



ment Program at Penn State University, maintains that the most effective way of warding off disease in the spring is to nurture healthy turf through the fall and into the winter.

"I think of it as fundamental Turf 101," he says. "I think the stronger you are going into winter, the more likely you are to avoid some avoid some (disease issues) that you may come across."

Dr. Jim Kerns, associate professor and extension specialist of turfgrass pathology at NC State, agrees. "Turf that struggles through the winter months is predisposed to disease in the spring," he says. "Pathogens are opportunistic, therefore having weak plants at any time can allow for disease development."

When it comes to heading off early season disease problems, Kaminski says superintendents working in northern sections of the United States and Canada are at a disadvantage. "The northern guys have the challenge of having annual bluegrass," he says. "You can have perfect turf and still have a bad winter and get turf loss, but the adage of having healthy turf going into the winter is definitely going to be important."

The primary disease issue confronting northern-based superintendents each spring is snow mold, whether it be pink, gray or speckled. "The type depends on snow cover and conditions in the spring or before snow falls in the winter," Kerns says. "In order to get gray or speckled snow mold, at least 60 days of snow cover are required. Pink snow mold, or *Microdochium* patch, does not require snow cover and can be severe when temperatures reach 65 degrees Fahrenheit



Turf that struggles through the winter months is more susceptible to disease in the spring. "Pathogens are opportunistic, therefore having weak plants at any time can allow for disease development," NC State's Dr. Jim Kerns says.

or below with periods of high humidity."

Beware of snow mold even before colder weather sets in, Kaminski says. "Pink snow mold can start up in October and become active," he says. "So, you're going to have to be on the lookout for that. Gray snow mold... everybody's putting out preventative applications for that sometime around Thanksgiving or Christmas depending on how far north you are."

Another concern for superintendents tending to bentgrass greens is take-all patch. "The disease won't show up until the following summer," Kaminski says, "but the best time

to apply fungicide is when the pathogen is active. And that's going to be in the fall, October and November."

As an alternative, the fungicide can be applied in the spring but in any case, soil temperatures should be between 55 and 65 degrees, Kerns says.

Other disease issues a superintendent might have to face come spring include, depending on the variety of turfgrass, spring dead spot, large patch, fairy ring or take-all root rot.

In addition to applying fungicide, Kaminski recommends maintaining an ongoing fertility program through the fall as well. "I think what (superinten-

dents) want to do is continue fertilizer programs at a moderate level," he says, "and as the turf starts growing more as we get into the fall they can bump that up a little bit."

"They key to me is getting a good fertilizer down where the plant is going to store that and not use it all. So, you're basically going to want to continue to fertilize it as normal and then right before the grass pretty much shuts down but is still able to take up those nutrients. Then it will store (the nutrients) over the winter and give it a better chance of surviving some of the pressures over the winter."

Fertilizers can be beneficial. Kerns notes potassium's effectiveness against spring dead spot, but he says fertilizers are not a substitute for fungicides. He says when dealing with issues such as large patch, spring dead spot and take-all root rot, the applications must be scheduled to coincide with a period when the soil reaches a temperature of 70 degrees at a 2-inch depth for a minimum of four or five consecutive days. He says that in these instances the calendar should be set aside. "Pathogens respond to temperature and moisture," he says, "not the season."

The weather is the wild card in all this. "The weather has been odd," Kaminski says. "Everyone says it's getting so warm but in 2013-14 and 2014-15 we had some of the worst winters that we've had. You can't predict that. And so you have to do the basic things to protect your turf; with fertility and fungicides, and hope that things turn out in the spring."

Superintendents must be alert to the prospect of having to deal with issues they haven't



faced before. Both Kaminski and Kerns are seeing issues that, while not new, are becoming more common farther north than in years past.

"We're seeing some odd-ball diseases," Kaminski says. "We're seeing an unusual Pythium that's hitting *Poa*. Not in the winter, it's a seasonal thing. Thatch collapse is a new disease that we've seen. There's really no good control for that; we just try to tell people to treat it like fairy ring."

Some diseases that in years past were more problematic in the Transition Zone are now advancing northward, Kerns says. "We've diagnosed Pythium root dysfunction

and Pythium root rot in more northern areas than we have in the past," he says. "Another disease that seems to be more problematic is summer patch. It also seems like nematodes are more problematic in more northern climates.

"I do not want superintendents reading this and freaking out. These diseases are by no means occurring as frequently as we see them in North Carolina, but the incidences seem to be increasing. (But) this is just an observation and we do not have data to support that claim."

In the end, Kaminski says disease control comes down to adhering to the basic principles

of turf management. "I think the thing is just try and stick to the fundamentals," he says, "and don't get so far removed from doing normal things that you know are going to result in a healthy plant."

It's important to not subject the turf to unnecessary stress and increase its susceptibility to disease. "A lot of times we see people whose expectations are so high and are just pushing their turf so hard for such a long period of time that it that makes it a little tough," Kaminski says.

Some facilities will remain open throughout the winter. Others will close, allowing not only their turf but also their

superintendents to reenergize. Winter provides a window for superintendents to attend turfgrass conferences or take other steps to expand their knowledge base, Kaminski says.

"When the winter season hits, it's conference season," he says. "There are always new things that are coming out and are important. It would be good for superintendents to go and continue to update themselves on the latest information that's out there because things are changing fast.

"This new disease with Pythium ... a few years ago it was thatch collapse for us. There are a lot of new things that are coming out and there are also

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Attending winter conferences can help superintendents expand their knowledge about diseases such as Pythium.

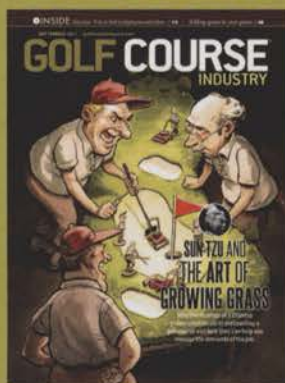
new management options like the new nematocides that are out on the market. Kind of educating themselves about it and knowing what to look for. I think it's a good time, as you get into winter and put the grass to bed, to really focus on revitalizing yourself and that includes continuing education." **GCI**

*Rick Woelfel is a Philadelphia-based writer and frequent GCI contributor.*



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# Understanding Nematodes is Critical Before Attempting Control

By Derek Settle, Ph.D.

*Green Solutions Specialist, Bayer*



Derek Settle is a technical specialist on the Bayer Green Solutions Team, which delivers best-in-class, solutions-based programs and tools to assist Bayer customers where they live, work and play. E-mail him with your comments at [Derek.Settle@Bayer.com](mailto:Derek.Settle@Bayer.com).

**N**ematodes that feed on the roots of turfgrass can negatively impact a golf course superintendent's ability to maintain healthy greens. Approximately a dozen nematodes are frequently associated with turfgrass roots and these include awl, cyst, dagger, lance, lesion, needle, ring, root knot, sheath, spiral, sting and stubby root. Nematode genera also feed on foliage (*Anguina* and *Subanguina*) and are detrimental to *Poa* greens in cool regions of coastal California and Washington. Initially, nematode damage results in off-color patches of turf in a range of patterns and shapes, which are easily confused with other common problems such as localized dry spot and nutrient deficiency.

Nematodes are currently a hot topic at educational meetings since there are now new solutions for their control. Three nematicides entered the market during an 11-month period starting April, 2016. Though these products are effective and much easier to use than the previous generation of nematicides, a basic knowledge of nematodes and each active ingredient will help to create a long-term nematode management strategy (see table below).

Plant parasitic nematodes that damage turfgrass share an important characteristic: all have a needle-like mouth part or stylet and will be most injurious when other stressors are present. Severe nematode damage in both

cool- and warm-season turf is most likely to occur when high populations collide with temperatures that are unfavorable for root growth. At these times, additional biotic stressors are also thought to play a part in the damage to roots such as take-all root rot, *Pythium* root rot, and other root-related diseases. Though nematodes are often "the straw that breaks a [golf green's] back", managing the other stressors will help limit the progression of symptoms and can improve recovery if nematicides are used.

**Sampling for nematodes is critical before using a nematicide.** Nematode populations fluctuate month to month, often in response to root growth since more roots can support greater numbers. The best time to sample is from late spring to early summer and then again in fall. A recent Talking Turf post from the Bayer Green Solutions team has more information at [backedbybayer.com/ControlNematodes](http://backedbybayer.com/ControlNematodes).

Diagnostic lab results will show nematode populations per unit of soil. For each nematode in turf, established population thresholds are used to help predict nematode damage and assist in determining if intervention is needed. Each nematode species in turf differs in their ability to cause damage. For example, sting nematodes are considered high risk and root knot nematodes rate as moderate-to-high risk.

**The decision process to address nematodes can now begin.** The nematology lab report is then used by the superintendent in conjunction with the long-term weather, turf-type, location, expectations, budget, etc. to determine if a nematicide is needed and which one is most applicable. The interaction between all these variables makes the decision to apply a nematicide highly specific to each course and there are many university and industry resources available to help. It is now possible to create long-term management strategies to limit future nematode damage in turf.

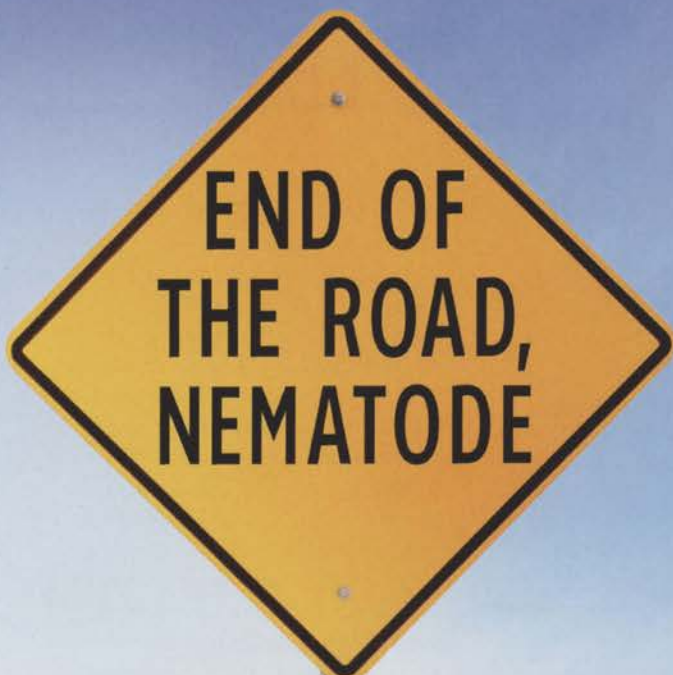
## New nematicides for commercial turfgrass use

Product	Manufacturer	Active Ingredient	Formulation	Signal Word	Half life <sup>1</sup> in soil (days)	KOC <sup>2</sup> Average	Launch Date
Nimitz <sup>®</sup>	ADAMA USA	Fluensulfone	G	Caution	≤17	187	April, 2016
Indemnify <sup>®</sup>	Bayer	Fluopyram	SC	Caution	>162	363	August, 2016
Divanem <sup>®</sup>	Syngenta <sup>®</sup>	Abamectin	SC	Warning	≤30	6,773	March, 2017

<sup>1</sup> Half Life provides an estimate of the duration of the active ingredient in the soil.

<sup>2</sup> Larger KOC number indicates stronger absorption of the chemical to soil.





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# NEW TECHNOLOGIES AND CHANGE



**Brian Vinchesi**, the 2015 Irrigation Association Industry Achievement Award winner, is President of Irrigation Consulting, Inc., a golf course irrigation design and consulting firm with offices in Pepperell, Massachusetts and Huntersville, North Carolina that designs golf course irrigation systems throughout the world. He can be reached at [bvinchesi@irrigationconsulting.com](mailto:bvinchesi@irrigationconsulting.com) or 978-433-8972 or followed on twitter @bvinchesi.

It may not seem like it from the outside, but the typical golf course irrigation system is rapidly changing. It's no surprise these changes are being driven by technology. Now some may think that change is not a good idea, but others love state of the art – even if it doesn't quite work right out of the box. Because it is technology, you would think these changes are most prevalent on the control side and that is true, but the technical advances available on the control side have also spilled over into sprinklers and pump stations.

On the control side, we have the now age-old battle of 2-wire vs. satellites. Although satellites are winning a few battles, 2-wire is winning the war, which is not surprising considering most research and development efforts are on the 2-wire side. Manufacturers always continue to improve software, but they're pretty much the same for either type control system. The future looks like 2-wire and for good reason. Conventional satellite systems send signals down a single wire; 2-wire basically sends data down a two-wire cable. A data wire can handle more information, more sophisticated signals and anything it is attached to can provide information. There's also more feedback because the cable can interact with everything on it.

2-wire systems are good at troubleshooting themselves. If you have an electrical issue, they can pretty much

take you to a few feet from the specific place where the problem is occurring. They can also do trending and provide baseline values so you can tell when equipment may be deteriorating or about to fail. This is done on some systems by looking at the voltage and amperage at the individual sprinkler. This is all great, but the most intriguing thing about 2-wire is what it may/ will be able to do in the future. Which takes us to the sprinkler.

Because the control system has gotten more technical, the sprinkler has gotten smarter to deal with it. What you're seeing on the 2-wire side is a larger case to house additional equipment, a smart module or both. The equipment/module varies in their approach, but each allows the manufacturer to provide more information at the sprinkler or to obtain more data that can show up on the central control system software. Again, what might this allow in the future: pressure readings, arc adjustment or flow at the individual sprinkler?

With irrigation and pump system controls, we are seeing various apps that are available to program, troubleshoot, and monitor irrigation and pump systems accessible through any number of smart devices. On pump systems using the app is like standing in front of the control panel and you can pretty much do anything on the app that you can do at the control panel. Remember that the app does

not see or hear, so it is still a good idea to visit your pump house every once in a while to make sure there are no odd noises or spraying water.

Pump stations have also changed due to technology. Most of this is seen in better and smaller components, but also includes flow meters, user interfaces and interacting with the irrigation system controls. Sensing and monitoring options are also more readily available.

Today's pump station uses magnetic flow meters as standard as opposed to paddle wheel. Filtration controls are integrated into the pump control panel as opposed to stand alone. User interfaces are touch screens or full-blown computers as opposed to switches and key pads. Monitoring of power use, electrical conductivity (salt) and turbidity are also available. The irrigation/golf industry is also close to having most pump stations being able to interface with the three major manufacturers of golf irrigation equipment although not all to the same degree. This interaction allows the irrigation system schedule to react to actual pump station flows and pressures and to have the pump system operate as efficiently as possible.

There is the ongoing HDPE vs. PVC debate, and there is change occurring there as better fittings and valves become available for both, but especially HDPE. All PVC systems are becoming rare, but there are many hybrid systems being installed with PVC mainlines and HDPE laterals as well as all HDPE.

The lag in irrigation system sales from 2008-16 didn't curtail product development. But with the current surge in golf course irrigation systems, things will continue to change as even more dollars are invested in upgrades and new products. This will benefit the end user who takes the time to invest in change and learn the new technologies in terms of lower water use, less repair labor and ultimately better turf conditions. **GCI**



# Fashionably *Late*

Most cool-season turfgrass managers stop using soil surfactants in early autumn when the summer stress period is over. However, a late season application of **REVOLUTION** or **DISPATCH** just before you blow out your irrigation system can provide many important turf benefits before the ground freezes in winter and after the ground thaws in early spring.

## BENEFITS INCLUDE:

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- **Spring:** When the rootzone thaws in early spring, Revolution or Dispatch will still be present in the soil, improving soil moisture levels and maximizing photosynthesis and root growth.

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*Follow these recommendations for a properly executed irrigation shutdown that protects the system's components and minimizes the risk of weather-induced damage.*

By Rick Woelfel

# BLOW OUT!

**F**inding success in the turf industry requires having the ability to think ahead. Even as the golf season continues full bore in the northern half of North America, superintendents are preparing for the close of their golf season.

One major step in the season-ending ritual involves shutting down the irrigation system and taking steps to protect it from the weather over the winter. A properly executed shutdown protects the system's components and minimizes the risk of weather-induced damage or other issues over the winter.


Because of the acreage and the topography of a typical golf-course property, shutting down the irrigation system should be a meticulous process. Brian Vinchesi, a design engineer for Irrigation Consulting Inc. in Pepperell, Mass., stresses

it's important not to rush things. "With a golf course, it is important to go slow," he says. "Speed gets you nowhere. (An 18-hole facility) should take two or three days to winterize."

To complete the process efficiently and safely, it's essential to have a written plan in place. Scott Pace is the Eastern regional manager for Rain Bird's Golf Division. He's spent his entire career, more than two decades, dealing with irrigation issues.

"If you don't have a good plan and do things step by step in the winter, you're going to have problems in the spring that could be really, really bad," he says. "You could end up with broken pipes, you could end up with broken sprinklers, you could end up with a pump station with broken pipes. It's very, very important that you have a plan, be systematic about it and not rush in any way."





The plan, according to Rain Bird's Golf Technical Bulletin (11-19-01), should include an accurate drawing or drawings of the irrigation system, highlighting the location of "All 'Zone Shut-Off' or 'Zone Isolation' valves, All 'Drain' valves, all remote control valves, valve-in-head sprinklers, all quick coupling valves, controller locations and areas they control, etc." Mark these locations with flags so you and your team won't have to spend time looking for them during the actual shutdown process.

At the same time, be sure each valve is operating properly. The written shutdown plan should list the areas to be evacuated in sequence, starting with the areas farthest from the compressor and working back toward it from there.

"(Superintendents) should drain the main line if they have drain valves or use quick couplers," Vinchesi says, "and then blow the system out with compressed air. It works best if you can blow it out from the pump system location. The amount of compressed air is what is important, not pressure."

Vinchesi recommends a minimum air volume of 160 cubic feet per minute (CFM) for an 18-hole facility, but the ideal volume will vary from course to course depending on the capacity of the irrigation system and the topography of the property. Most courses will require something in the range of 250-300 CFM range and some larger systems may require as much as 600 CFM.

It's also essential that the air pressure in the system during the blow out not exceed what the system is designed to handle. This should be calculated by determining the maximum

pressure at the weakest part of the system. This figure will be somewhere in the neighborhood of 60 pounds per square inch (PSI). During the blow out, the air pressure should be well below that figure. "Our recommendation is somewhere between 40 and 50 PSI and to not exceed that," Pace says.

Over the course of his career, Pace has seen superintendents exceed their systems' air-pressure specifications with calamitous results. "That's probably one of the biggest mistakes I've seen over the years," he says. "Not adjusting (the air volume) and compensating with pressure. They'll turn the pressure up to 100 PSI and damage the system."

The compressor should be inserted into the irrigation system at the system's highest point. Care must be taken to dissipate the heat generated by the compressed air before it enters the system, because overly hot air will damage the components.

"(Superintendents) will make a connection with their compressor and that air is hot," Pace says "and it heats up as it goes through the fitting. I've seen guys melt pipes right at the connection point so you need to figure out the best place to connect to system without doing damage caused by that heated air coming out of the compressor."

Pace suggests using a 2- or 3-foot piece of galvanized pipe as a heat sink to absorb the heat coming off the compressor and pipe at the connection point. He notes it's important to use a compressor that's compatible with the irrigation system itself. If the air flow or air pressure through the system continues to generate excessive heat, he suggests using a longer piece of

pipe as the heat sink.

Vinchesi says that in some cases it may be preferable to blow out the system from more than one location, depending on the topography of the property. Depending on the layout of the golf course, elevation changes especially, you may have to blow out from several places, he adds.

Pace says when blowing out from multiple sites, it's best to start at the highest point on the property and go from there. "Typically, you would like to go from the high points to the low points on the golf course and if you have multiple high points on the golf course, you would want to connect the compressor at those locations and then work through it systematically from the low point back to the compressor when you're turning on stations or sprinkler heads," he adds.

Frank Tichenor is the superintendent at Forest Hill Field Club in Bloomfield, N.J., where he oversees a staff of 14 that tends to an A.W. Tillinghast design that dates back to 1926 and features an abundance of elevation changes. The club installed a Rain Bird irrigation system roughly a decade ago and Tichenor takes a systematic approach when he shuts it down each year. "I have a checklist," he says. "We've got a few different things that we do when we blow out."

In addition to having a written plan for handling the shutdown, Tichenor will make sure to order a compressor in timely fashion and have a sufficient number of fittings on hand. "It's almost like a countdown to the day we blow the system out," he says.

During the period prior to the actual shutdown, Tichenor



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## IRRIGATION

and his team strive to extract as much moisture from the system as possible. "The key is to get as much water as possible out of (the system) early," he says. "We've got quite a few drains out there where we can drain it in different sections. A couple days in advance, we open up the drains. We have a dedicated (2-inch) fitting for the air compressor that we put in when we put in the system."

Although the golf course remains open through Dec. 31, Tichenor blows his system out around Halloween. "We're not really watering anything in November," he says. "I want to get it done before it gets real cold. It's really kind of a pain in the neck to blow it out when it is freezing out because you get stuck heads and everything. It's not a lot of fun if you get a stuck head and it's 30 degrees."

While the irrigation system may not be operational after the shutdown is completed, its components must still be protected. Like many superintendents, Tichenor keeps a heater running in his pump house during the winter months. "We have a heater in our pump house that we keep at (approximately) 40 degrees," he says. "I just would rather keep the temperature above freezing."

Vinchesi recommends keeping the pump system control panel powered up during the winter months. "If the pump house is not heated, some components, such as a pressure-relief valve will need to be disassembled," he says. "Some other components, such as backflow prevention devices, may need to be heat taped for the winter if water cannot be drained out of them."

Pace recommends leaving all stain valves open during the winter. He also advises running the system through a

$$P_{\text{avg}} \geq 0$$

$$\Delta(f, P_1, V) = ||D|| =$$

$$= P_1 + P_2 + P_3$$

## CALCULATIONS

While irrigation consultant Brian Vincchesi recommends a minimum air volume of approximately 160 cubic feet per minute (CFM) for an 18-hole facility, the ideal volume varies from course to course depending on the capacity of the irrigation system and the topography of the property. Most courses, according to Vincchesi, will require something in the range of 250-300 CFM range and some larger systems may require as much as 600 CFM.

Rain Bird recommends using the following formula to determine the proper volume of air for a particular irrigation system.

Maximum capacity of an irrigation system in gallons per minute (GPM) / 7.5 = the required volume of air in cubic feet per minute (CFM) For example, capacity of irrigation system 900 GPM / 7.5 = a recommended 120 CFM of air during the blow out.

full cycle on a weekly basis with all sprinkler heads activating all valves. "If water settles out to a slow point, you can relieve some of the pressure," he says. Pace also recommends superintendents continue to provide power to their satellite control boxes and weather stations during the winter months.

Vinchesi cautions against waiting too long to perform the shutdown. "Anything with water in it above ground is going to be susceptible to damage during freezing temperatures," he says. "The in-ground equipment can wait until the soil starts to freeze, but if you wait too long, the water in the sprinklers will freeze or damage them and make

your eventual blowout problematic."

Pace emphasizes planning ahead, including ordering the right compressor far in advance and getting the task done as quickly as expeditiously as possible. He notes that some in the industry underestimate the time it takes complete a shutdown properly.

"If you rush it, you have a tendency not to get all the water out," he says. "We recommend you shut the system down and then come back the next day to see what's settled back and to see if there is any more water from those areas."

Pace says that it's literally impossible to eliminate 100 percent of the water from an irrigation system, even if the shutdown is done properly. But in the end, Pace adds that executing a proper shutdown and winterization of the irrigation system, while it may be a time-consuming process, will pay off handsomely.

"My thing is, get it winterized as early as possible that you can do it," he says, "and leave your golf course in good condition and your irrigation system ready for next year." GCI



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# Hunter®



# 19 HOLES WORTH OF REASONS TO RENOVATE ... SOON



**Jeffrey D. Brauer** is a veteran golf course architect responsible for more than 50 new courses and more than 100 renovations. A member and past president of the American Society of Golf Course Architects, he is president of Jeffrey D. Brauer/GolfScapes in Arlington, Texas. Reach him at [jeff@jeffreydbrauer.com](mailto:jeff@jeffreydbrauer.com).

**T**ypically, real estate ads implore you to "Buy Now!" Their reasons are many, and many apply to the question of when to renovate your golf course:

## 1. IT WILL NEVER BE CHEAPER

Over the last two years, prices have jump 15 to 20 percent after holding steady in the wake of the financial meltdown. Prices will continue rising sharply for a while, so sooner surely beats later.

## 2. YOU KNOW YOU WANT TO

Change for changes' sake breathes new life in an old golf course. Playing a new course is exhilarating, and learning its new subtleties takes years.

## 3. STAYING ALIVE & AH, AH, AH, AH, STAYING ALIVE & STAYING ALIVE

Staying in business is good, and a good reason to renovate. Given options, no one chooses a dilapidated golf facility. In the golf course business, the "cost to play" is keeping your facility in good repair.

## 4. AGING COURSE

Except for you and me, everything ages. If your golf course is as old as you are, it probably has some creaking pipes, too, and may be need the golf equivalent of a knee replacement.

**“**Your middle tees might still fit the average male golf game, but your forward two tees are probably too damn long. It's time to let your customers play golf as intended and that requires yardage options not exceeding 4,000, 5,000, and 6,000 yards.”

## 5. AGING GOLFERS

Older golfers hate/won't/can't climb the endless hills we designed decades ago. Physical fitness is in overall decline. Architects are returning to softer designs for artistic, philosophical and practical reasons. Remember the old "Did she or didn't she" hair color commercial? Architects want you to ask that about their earthmoving.

## 6. KEEPING UP WITH THE JONESES

Your competitors have, are or will be building a better mouse trap, even if not using that famous architectural family. Add a golf course cosmetic facelift to your "must do" list.

## 7. FANCY NEW TOYS

Technology advances faster than Dustin Johnson's swing speed. Even decade old courses pre-date

some useful innovations. Irrigation efficiency, soil monitoring, web connectivity and new turfgrasses can pay for themselves quickly in reduced water consumption. These days, renovation doesn't mean replace, it means upgrade.

## 8. GOING IN STYLE - CLUBHOUSES

Fast food, restaurants and hotels have invested billions to freshen their décor. Some \$100 hotels are now nicer than more expensive hotels. Private clubs are modernizing old clubhouses. Can a "Clubhouse Fixer Uppers" show be far behind?

## 9. GOING IN STYLE - GOLF COURSES

Golf course design trends have turned 180 degrees since 2000. Showy is out, and natural is in. For your course to survive, some 1980s era faux mounding must die. You might even make money selling your excess dirt.

## 10. LENGTH MATTERS!

The 7,000-6,600-6,200-5,800-5,400 tee sets of the 1970 and '80s suits nobody. Long hitters prefer 7,200-plus yards. Your middle tees might still fit the average male golf game, but your forward two tees are probably too damn long. It's time to let your customers play golf as intended and that requires yardage options not exceeding 4,000, 5,000, and 6,000 yards.

## 11. LOOKING BACK

Restorations are all the rage. Should the History Channel have a "golf architecture" show? With most Golden Age courses now preserved, focus will shift to preserving Dick Wilson and Robert Trent Jones courses.

## 12. LOOKING FORWARD

Looking at old course documentation for restorations, it's clear those clubs focused on modernizing to their

(BRAUER continues on page 57)



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# Chattahoochee charm

By **Guy Cipriano**

Benchmarking, relationships and stewardship deliver the needs of the environment and golfers at The River Club.





**W**ith rolling Georgia hills and views of the Chattahoochee River, it's easy to forget The River Club's 18 holes traverse a bustling slice of southern suburbia. The course opened in 2005 and quickly established itself as one of Atlanta's most desirable private golf communities. Rob Roy has experienced the entire evolution. He started his job as superintendent in December 2002, making him the club's longest-tenured – and first – employee.

Holding the same job for 15 years yields numerous connections with the land and the people who enjoy it. Roy knows nearly every member by name and understands how wacky weather swings affect the 90-acre golf course.

This year, for example, The River Club received 11 inches of rain in June and close to 10 inches in both July and August. "Besides our grow-in in 2003, it's been one of the wettest summers since I have been here," Roy says. Last year rested on the other side of the weather conundrum: the course received just .2 inches of precipitation during a 72-day stretch beginning in August.

Weather extremities are only part of the challenge facing Roy. The River Club is an upscale facil-

ity in Atlanta's north suburbs, where wealth and private golf options abound. Convenient seclusion defines the club. The gates are 35 miles from downtown Atlanta, yet Roy says the club is "hidden in an area that you wouldn't expect it to be."

The front nine flows through hills; the back nine features river views. Quality land, though, isn't the only requirement for selling homes and memberships in suburban Atlanta. Tremendous course conditions are a necessity.

Roy and his team maintain a course with divergent turfgrass varieties. Bentgrass greens are still prominent in Georgia, and Roy and his team devote significant time and resources to A-1/A-4 bentgrass putting surfaces. A crew boasting multiple employees whose tenures eclipse a decade, agronomic savvy, grit and industry connections make summers tolerable.

Greens are monitored hourly, with Roy using a spreadsheet tactic he calls "benchmarking" to understand and adapt his agronomic program. "We track every hour we spend on the golf course," Roy says. "So, at the end of the year, we can tell how many hours we bent checked, how many hours we mowed greens, how many hours we topdressed and we can make adjustments for the next year."

To further help his team combat the short-term angst of southern bentgrass maintenance, Roy demonstrates long-term thinking. "Our main objective every day is to make the place better than it was the day before," he says. "We just keep our heads down and continue to do what we need to do. But I always I try to find



a long-term solution for whatever obstacles we are facing and fix those issues. It's about making the job easier for the guys, whether it be finding a different mower for a different area or hose reels for bent checking. Whatever it is, try to make the job more enjoyable."

Relationships are another critical component of The River Club's agronomic success. Part of meticulous turfgrass management means seeking help when something seems amiss – and the threat of Pythium always exists in Georgia. Moisture meters, fans and venting are staples of Roy's greens program, but he also understands the value of outside input.

High on his list of contacts is Syngenta territory representative Jason Whitecliffe, who has covered the Atlanta area for 13 years. Whitecliffe works with superintendents who maintain

Bermudagrass and bentgrass greens – he says the split is 60-40 in favor of Bermudagrass in the Atlanta area – and he's forthcoming when assessing the agronomic challenges in the area.

"We're in the Transition Zone," Whitecliffe says. "Warm-season struggles, cool-season struggles. There's no perfect fit for the area. There are years when it's hot and dry, and years when it's cool and wet."

In addition to bentgrass greens, The River Club has TifSport Bermudagrass fairways. Fairy ring, according to Roy, can emerge on both surfaces. Evidence of the trust between Roy and Whitecliffe exists in The River Club's fungicide rotation.

Roy recently added Velist, a broad-spectrum SDHI, to his rotation to provide fairy ring and spring dead spot control on

greens and fairways. Velist was launched in 2015. "Having another tool like Velist has really helped us out," he says. "We saw a lot of positive results from our application that we made last fall and then the applications that we made this year. We are pretty excited about it."

In the summer, Briskway, a broad-spectrum cooling DMI (Demethylation Inhibitors), is added to the rotation. Daconil Action and Heritage Action are also part of the summer program. Both fungicides include multiple active ingredients. "With the summer stress, we try to boost that plant health up," Roy says.



Superintendent Rob Roy arrived at The River Club in suburban Atlanta as its first employee in December 2002.

The combination of proven formulations and a strong relationship with Whitecliffe soothe Roy during perilous periods. The pair's relationship spans a decade.

"It's just like having employees you trust," he says. "You know that you can tell a guy to go out there and perform a certain task, and you don't have to follow-up behind him and do it two or three times. You just have that trust level on these products. You know that you feel good about them and you have used them for years, and if you have a question, you know who you can call. It makes you sleep better at night. It makes your job much easier. It gives you confidence going into summer that you know you have those products that you can rely on and trust. You see those results firsthand and you know that they work."

The River Club's conditions impress Whitecliffe, who calls the private club market "extremely competitive" in Atlanta's north suburbs. "I am proud to support so many



The River Club received Certified Audubon Sanctuary status in 2006, becoming the 12th Georgia course to earn the designation.





Agronomic savvy, grit and quality relationships help The River Club flourish despite a challenging growing environment.

courses that are among the highest maintained golf courses in the country," Whitecliffe adds. "There are a lot of top, elite clubs."

The River Club opened at a tricky time for private clubs with a housing element – three

years before the start of the recession – yet has thrived. Roy, who grew up in Kernersville, N.C., a small town between Winston-Salem and Greensboro, worked at a trio of respected facilities in the Carolinas, Sedgefield Country

Club, The Peninsula Club and Oldfield Club, before arriving in Georgia. Roy, a NC State graduate, obtained grow-in experience at Oldfield. A four-time Carolinas GCSA golf champion, he also sees the course from a golfer's perspective.

"He's a high, high level golfer, and I think that brings something to the table," Whitecliffe says. "He knows what to expect from a championship level golf course and he tries to deliver that every day to his members. As the course matures, it's hard to maintain those levels. Just like there are challenges when we age, there are challenges with a golf course. Knowing the history of the property is certainly a big leg up as opposed to coming in cold and not knowing anything about it."

In the spirit of continual improvement, Roy is eyeing ways to make the course play firmer and faster, thus increasing golfer enjoyment and easing the maintenance burden. Building upon The River Club's strong environmental

pedigree represents another goal. The course received Certified Audubon Sanctuary status in 2006, becoming the 12<sup>th</sup> Georgia course to earn the designation. The club's Chattahoochee River Trail runs along parts of the back nine, giving members an opportunity to study a variety of wildlife, including woodpeckers and blue herons.

"I think all of us in this business want to show that we are good stewards of the land, we are educated and we're using resources to the best of our abilities and that we care about the environment, what's around us and what's down the stream from us," Roy says. "Whenever we sit down and make a plan, we are thinking about all of those aspects. We're trying to find the best solution that not only fits our needs, but the environment's needs and the golfers' needs. I think there are so many better solutions out there nowadays than 10, 15, 20, 30 years ago." **GCI**

*Guy Cipriano is GCI's associate editor.*

## Operation Pollinator

Participating in Syngenta's Operation Pollinator has further helped The River Club superintendent Rob Roy boost golfer enjoyment while enhancing the environment. The program provides golf course managers with information to establish and manage attractive habitats for bees, butterflies and other pollinators.

The River Club established plots near the eighth and 13th tee boxes, and Roy says members "love" the aesthetics of the areas. An overlooked aspect of the program, according to Roy, is how it affects staff morale. "The crew likes to see something that they built turned into something beautiful," he says. Roy has already identified additional areas he wants to turn into pollinator plots and he hopes to find time this winter to prepare the areas for future seeding.

Syngenta offers multiple resources for superintendents interested in Operation Pollinator, including assistance from territory managers. Roy worked with his territory manager, Jason Whitecliffe, when establishing The River Club's pollinator plots.

"I am happy to see so many superintendents and their customers really embrace the program," Whitecliffe says. "It's just really cool. Superintendents are obviously great at growing things, so it's an easy program for them to prepare an area, seed it and give it what it needs."

**Enter [greencastonline.com/operationpollinator](http://greencastonline.com/operationpollinator) into your web browser for more information about Operation Pollinator.**



# STAY STRONG THROUGH THE FALL



What you feed turf now can have a major impact later. Follow these guidelines to implement an effective fall fertilization program.

By **John Torsiello**

**I**t's a long time between the final days of fall and the first sweet kisses of spring sunlight, and we all need lots of

sustenance to get us through the darker days of winter. That goes for turfgrass as well. Fall is the time to feed your turf so that it is ready to burst forth with new and strong growth

during green-up in early spring.

Dr. Gordon Kaufmann, lead turf agronomist for Grigg and Brandt, says that fall fertilization can accelerate green-up and turfgrass vigor in the

spring. In addition, selective nutrient inputs in the fall may also reduce the need for spring fertilization, particularly slow-release nitrogen sources. He advises to apply fertilizer with



moderate amounts (30 to 50 percent) of soluble nitrogen and some slow-release nitrogen, ideally a 1-to-1 nitrogen-to-potassium ratio. "Low doses and frequent applications of soluble potassium will help harden off the plants for winter," Kauffman says. "Fall is also a good time to apply any minor nutrients as determined by soil and tissue testing. Availability of minors takes time and they should be available by spring."

Dr. Eric Miltner, agronomist, turf and ornamentals at Koch Turf and Ornamental, believes the first step for superintendents in planning fall fertilization is to be clear about their objectives. "I think of three possibilities: recovery from summer stress, especially for cool-season turf that has been through a hot summer; maintaining good playability through the fall; and conditioning turf for the upcoming stresses of winter," he says. "You should be addressing all three of these on some level. Depending upon your location, climate, turf species and volume of play, superintendents will emphasize these objectives differently."

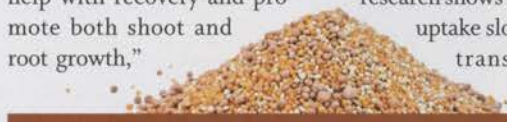
As far as nitrogen application, it depends on a superintendent's objectives and timing. For warm-season grass, some may choose not to apply any, "but if you do, the general rule of thumb is to not apply nitrogen later than one month before the average frost date for your area," Miltner says. Too much nitrogen applied too late can leave the plant overly succulent and susceptible to cold-weather injury. "It is best to rely on low rates of readily available nitrogen for warm-season turf, or sources like polymer coated urea or methylene urea/ureaformal-

dehyde," he adds. Nitrogen release from these products will slow down, and even shut down, as temperatures cool. Remaining nitrogen will carry through the winter and become available again as temperatures warm in the spring.

"For cool-season turf early in the fall, there should be some readily available nitrogen to help with recovery and promote both shoot and root growth,"

ent release is complete before winter dormancy sets in.

"Applications in early fall should contain a mix of slow- and quick-release nitrogen but then move to more quick release as the fall progresses," says Dr. William Kreuser, assistant professor and turfgrass specialists at the University of Nebraska-Lincoln. "Current research shows that nitrogen uptake slows as evapotranspiration is



**“The proper way to fertilize in the fall ultimately depends on what type of product is being used. You want to make sure that the turf is still being fed right up to dormancy setting in. If you’re using a product with slow-release nitrogen that relies on soil microbial activity to break it down, you will need to apply it when the soil temperatures are still warm. But if you’re using a product with quick-release nitrogen, you have more flexibility in ensuring the nitrogen will get taken up by the turf.”**

—Chris Gray, Lebanon Turf

Miltner says. "This could be blended with slow or controlled release nitrogen to provide extended fall nutrition. Polymer coated urea and methylene urea are great choices here. These sources will provide nitrogen early in the fall and release will slow down as temperatures cool and growth slows." Use of polymer coated sulfur coated urea would be similar, except that release does not really shut down, so apply early enough that nutri-

reduced and temperatures cool off. Large applications of nitrogen in very late fall/early winter should be avoided. Uptake is very minimal and the nitrogen either sits in the soil or is leached out during winter precipitation/snow melt." He adds that for highly maintained turf continue spoon-feeding nitrogen throughout the fall until growth begins to cease in late fall. This will maintain uniform color and maximize carbohydrate accumulation without

overstimulating growth rate.

Pat McHugh, corporate agronomist, Southeast, for Floratine Products Group, says that fall fertilization is critical in manufacturing carbohydrate reserves to support the plants survival. The primary time for fall fertilization is when temperatures drop to a point where shoot growth is greatly reduced, but roots are still active.

"The proper way to fertilize in the fall ultimately depends on what type of product is being used," says Chris Gray, golf industry channel manager for Lebanon Turf. "You want to make sure that the turf is still being fed right up to dormancy setting in. If you're using a product with slow-release nitrogen that relies on soil microbial activity to break it down, you will need to apply it when the soil temperatures are still warm. But if you're using a product with quick-release nitrogen, you have more flexibility in ensuring the nitrogen will get taken up by the turf."

Gray says superintendents should test their course's soil to help determine what products will provide the essential nutrients needed for reaching optimum health before entering dormancy. Turf that is fed appropriately entering the winter months almost always come out of dormancy in spring healthier and better prepared to the beginning of the growing season.

Paul Ramina, corporate agronomist, Northeast, for Floratine Products Group, says turf managers need to be aware of all weather and turf conditions and apply the products accordingly. "For example, once hard frosts cause the leaf tissue to go dormant, nitrogen applications are not recommended because



# 98

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## TURF

### Cost control

Experts suggest a few steps for superintendents seeking to trim fertilization costs.

"One can reduce overall expense of late-season fertilization by utilizing controlled-release nutrients and/or focusing nutrient inputs on high-profile areas such as tees and fairways," Harrell's director of agronomy Dr. Raymond Snyder says.

A correct nutrient management program for autumn requires careful planning and execution, and superintendents "should look for other places to cut costs," says Dr. Gordon Kaufmann, lead turf agronomist for Grigg and Brandt. However, Kaufmann adds, rough would be one area of the golf course where superintendents might be able to get away with applying less fertilizer.

Koch Turf and Ornamental agronomist Dr. Eric Miltner says the most logical places on a course to potentially skip fertilization are areas that receive limited traffic. "But before you decide not to fertilize any area, be sure that it is in a state of good nutritional status," he adds. "And be careful about using the same areas every time to save money on your fertilizer budget. That could come back to bite you eventually."



plant uptake is minimal and applied nitrogen is wasted," he adds.

McHugh says that for bentgrass greens in the Transition Zone October – and possibly November – is the time to fall feed with granular fertilizer, usually at a 1-to-1 nitrogen-to-potassium ratio. Nitrogen release should be somewhere 60 to 70 percent slow release. "Going forward from the granular application, go to foliar-based, nutrition supplying needed micros, amino acids and carbohydrates," McHugh says. "Use nitrogen based upon weather conditions/yield. If bentgrass goes into semi-dormancy or dormancy and then comes out of dormancy, reload the plant with minors, amino acids and carbohydrates. Repeat this every time the turf breaks dormancy and begins to metabolize, or when you need to mow."

For ultradwarf greens, McHugh says superintendents should begin "thinking about" a last granular fertilization in August. "The decision is usually weath-

er related and takes place likely in September. Soils are cooling off and sunlight (hours of sunlight) are rapidly shrinking." A 1-to-1 ratio of nitrogen-to-potassium is recommended to build up a maximum amount of carbohydrates. If there is a warm winter and the ultradwarfs break dormancy, it is "very wise" to apply a foliar consisting of minors, amino acids and carbohydrates to replenish the reserves that were spent to break dormancy.

"In the Sun Belt and Florida, winter is the golf season," McHugh says, "and the warm-season grasses do not go dormant unless located in north Florida where frost can occur." Fertilization of warm-season turf is constant year-round. Nitrogen levels are key and should be watched very closely by the superintendent. "Other nutrients are being applied all the time in small amounts through foliar feeding. Granular nitrogen should be applied six to eight weeks, depending upon play, soils and weather. A 1-to-1 ratio of nitrogen-to-potassium



still holds true in the Sun Belt areas."

There are two factors that influence fertilizer efficacy; temperature and moisture, Gray says. "In the fall it can become difficult to accurately predict what Mother Nature provides," Gray adds. "The warmer the temperature, the more active microbes are in the soil, which will directly affect how fast many slow-release fertilizers function." If, for example, methylene urea is applied and the soil temperature drops, the amount of available nitrogen to the plant will be slower than expected. "That's why quick-release fertilizers, like ammonium sulfate, may

be a better product to select when the temperatures quickly drop, which does not require microbial activity to provide available nitrogen."

Dr. Jeff Higgins, vice president of business development for Harrell's, says tissue tests are a "great way" to monitor the success and effectiveness of a fertility program. "There is still a need for the supply of nutrients as building blocks for carbohydrates irrelevant of the tissue concentrations," Higgins says. "It is important to pay attention to potassium levels in the tissues, however, before going into winter cold stress conditions. Ideally, these tissue concentrations should be

greater than 2 percent in the tissues by weight."

There can be some dangers in applying too much fertilizer in the fall. Dr. Raymond Snyder, director of agronomy for Harrell's, says minimization of large soluble inputs that promote late-season succulent growth should be avoided. "Properly chosen controlled-release nutrients sources are ideal for promoting the desired growth habits for turf prior to winter," he says.

Higgins says if soluble fast-release nutrient sources are utilized, "then one needs to be careful on the total amount of nutrient applied per application, as the turfgrass plants can

only absorb a certain amount of nutrient. If excessive amounts of soluble nutrients are applied, then they will be subjected to potential loss."

Stimulating too much growth, Kreuser says, could delay dormancy, increase leaf succulence, and burn carbohydrate reserves going into winter. "Shade is also a concern in fall. The lower sun angle and shorter day length can enhance shade issues. In those situations, reducing nitrogen can be helpful. Use of a plant growth regulator will also help." **GCI**

*John Torsiello is a Torrington, Conn.-based writer and frequent GCI contributor.*

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# SHIFTING to Fall-Focused FERTILITY

The three factors that impact fall nutrition and how enhanced efficiency fertilizer (EEF) products from Koch Turf & Ornamental can be the key to your turf strategy.

**S**ummer can be tough on golf courses. Heat, pests, drought, excessive foot traffic—all these things can stress turf and negatively impact its health and appearance. Now that cooler fall weather has arrived, it's the right time to get your golf course back in shape for next spring, and that includes applying the right fertilizer at the right time. However, with so many fertilizers on the market today, it can be tough to know which option is best for your course.

"Today, the emphasis is more toward the gradual release of nutrients for golf course turf throughout the year, with some northern golf course superintendents experimenting with fall fertilization as their primary fertilizer application," says Chris Derrick, technical agronomist with Koch Turf & Ornamental. "Controlled-release fertilizers are a great choice for fall application, as they can often provide nutrition into the spring season."

Koch Turf & Ornamental produces controlled-release products that optimize nutrient performance and minimize nitrogen loss, basically taking the guesswork out of fall fertilization. These fertilizers support consistent plant growth with fewer applications. Because more nitrogen is available for plant uptake, golf courses can expect optimum results from each fertilizer application.

"In the fall, plants need to prepare for dormancy and get ready for the next year," says Derrick, who holds a Masters of Science in Agronomy from Auburn University. "Turf plants have to gradually shut down to make sure they store adequate amounts of nutrients – in the form of carbohydrates – through the winter. It takes time to shut down in fall and get active again in spring."

Regardless of location, turfgrasses go through transitions throughout the year. While the growing season takes the most attention, plants need to shift from shoot growth to root growth in the fall.

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**DIALING BACK NITROGEN SUPPLY**

"I remember when the push was toward fall root establishment, which meant fall potassium levels were higher than nitrogen levels, generally," says Derrick, who worked as an assistant superintendent in Birmingham, Ala., for six years. "But new research shows it's best not to cut off the nitrogen supply to the plant. It's better to gradually dial it down and let the plant take what it needs."

Because spring weather has been more unpredictable than fall weather in recent years, many superintendents have moved to a fall-focused fertility program.

"It's often difficult to control release of a spring-applied fertilizer treatment," Derrick says. "So, superintendents are putting out larger applications in fall with products that can carryover and still be available in springtime. The application lasts long enough to get the plant growing and green before it runs its course. And it often gets them through until summer months, when they don't typically apply fertility treatments."

**THREE FACTORS AFFECT FALL TURFGRASS NUTRITION:****TIMING**

Derrick doesn't recommend putting out fall nutrition in the late summer transition period when plants are still growing. "It's not the availability of nutrients that makes the plant grow, it's the day-length photo period and temperature," he says. "At that time of year, turf plants aren't actively growing at the

shoot level."

For most parts of the country, September is the best time for a fall fertility application. Conditions and weather patterns may allow a second application in late October or early November. How many fall applications are needed depends on what the superintendent has in the bag. "When using water-soluble sources, such as urea and ammonium nitrate, I'd recommend a split application," Derrick says. "Putting out such readily available nutrients all at once could promote too much growth and not let the plant go into dormancy."

However, if superintendents use controlled or slow-release products, they could get by with just one application. "These products work in unison with plant demands. As plants gradually reduce nutrient needs, less fertility is released," Derrick adds.

**WEATHER**

The unpredictability of weather makes it even more important to choose a controlled or slow-release fertilizer for fall applications. "What happens if you use a conventional source containing all readily available nitrogen, and then you get a warm spell?" Derrick says. "The plant 'wakes up' and reaches the nutrients in the soil. It starts growing at a time you don't want it to grow."

**TECHNOLOGY**

What's in the bag is perhaps

**THREE TYPES of EEF Products**

Chris Derrick, technical agronomist with Koch Turf & Ornamental, outlines the types of EEF products as follows:

**Controlled-Release** – Controlled-release, coated nutrient sources include the products known as polymer-coated fertilizers (PCFs). The manufacturing process involves coating a readily available nutrient such as urea or sulfate of potash with a polymer coating. Examples include POLYON and DURATION CR controlled-release fertilizer.

**Slow-Release** – Also called "slowly available," these products are a part of many turfgrass fertilization programs. They provide greater longevity of available nitrogen (N) than quick-release sources, and are safer to use on turfgrass because of their lower burn potential. This group includes both coated products, like XCU slow-release fertilizer, and reacted products like NITROFORM and NUTRALENE slow-release fertilizer. Natural degradation by moisture or microbial activity releases them over time.

**Stabilized Nitrogen sources** – Stabilized nitrogen fertilizers work by delaying the conversion of nitrogen to forms that can be more readily lost to the environment through leaching, denitrification and volatilization. This delay allows time for rainfall or precipitation to move urea into the soil where it is less prone to volatilization, and retains N in the plant system longer. Examples of these products include UMAXX and UFLEX stabilized nitrogen.

"The important thing is to choose the right product to give an adequate response in the fall before plants go dormant, but still get some carryover in the spring," says Derrick. "A fall EEF application not only gradually puts the turf plant to sleep but provides some additional nutrients for when it wakes up in the spring. That's the best scenario for both turfgrass and superintendent!"

the most important aspect of fall fertilization. The Association of American Plant Food Control Officials coined the term Enhanced Efficiency Fertilizer (EEF) in 2009. It refers to fertilizer products with characteristics that allow increased plant uptake and reduce the potential of nutrient losses to the environment.

Although the EEF term is relatively new, products that fit this classification have been around for more than a half-

century, including methylene urea, sulfur-coated urea and polymer-coated urea products. Fewer applications, less labor and flexible programs are among some of the advantages.

"I define an EEF product as anything that provides extension and availability of fertilizer versus a 100 percent water-soluble source," Derrick says. "Some EEF products release based on temperature, while others release based on moisture availability."



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# Adding **green** to Save **green**

By **John Torsiello**

Colorants and pigments provide the green golfers expect, but they can also reduce your bottom line as long as you know what you are doing and when you should do it.





**T**urf colorants and pigments are keeping customers happy by providing winter color on warm-season grasses and increasingly more cool-season grasses. Aesthetically, they hide blemishes, better define playing surface boundaries and darken the surface for warm-season green-up.

However, there are cost- and labor-saving benefits, as well, says Dr. Grady Miller, professor and extension turf specialist in the crop and soil sciences department at NC State University. For example, they reduce winter turf maintenance with warm-season grasses, which results in savings on water, fertilizer and mowing labor. In addition, they open a herbicide program for winter weed control in warm-season grasses and can be cost effective compared to overseeding, he says.

Colorants and pigments reduce a superintendent's bottom line, especially when it comes to aesthetic turf practices. "There is data available that compares overseeding costs (seed, mowing, labor, fertilization, irrigation, etc.), and

colorants are often much cheaper than overseeding," says Dr. Casey Reynolds, executive director of Turfgrass Producers International and former Texas A&M assistant professor. "Each course is different, though, and superintendents just need to determine the tradeoffs between overseeding and colorants."

Dyes and colorants can reduce light stress on turfgrass plants in the summer, while in winter the benefits include retention of green color on warm-season grasses and more rapid spring green-up for both warm- and cool-season grasses, says Dr. Ed Nangle, Ohio State University assistant professor of turfgrass management. "The combination with fungicidal activity is also of interest, as it seems there is a possible synergy between the pigments and reducing light degradation of some of the active ingredients, therefore

adding efficacy to their use" he says. "Also, it is somewhat situational dependent and budget dependent."

Add HDTV and 4D technology that shows a tournament course's turf flaws to millions of viewers, and colorants become a way to meet high expectations, says Jennifer Seevers, territory manager for Geponics. Colorants, and pigments are used instead of overseeding to reduce water, fertilization and other chemical needs. Colorants are also used in combination with overseeding. "It's almost like insurance," Seevers says. "The results are basically impeccable."

"High-paying members have their expectations met and the colorants assist with transition and consistency in color," she adds. "This is referred to as 'hybrid-overseeding' when combining colorant with overseeding. Very often it's what we're seeing in professional sports on TV when playing on live turfgrass."

Turf experts say there is no "should" with colorant and pigment use. "It's about need and time of year along with what results are a superintendent looking for. If it's to turn something green, urea is a good option also," Nangle says. "However, if it's to potentially

enhance stress tolerance, then that's a different matter and many superintendents are finding benefits with some of these products in this regard."

The optimal use of winter colorant programs on Transition Zone warm-season turfgrass is when the turfgrass has experienced the first frost of the season and begins to go off color, BASF technical specialist Dr. Kathie Kalmowitz says.

"The best timing is to begin your application when the turfgrass still has green tissue so that the colorant can be applied to achieve or bring it back to the most natural color of green for that course," Kalmowitz says. Repeat applications to continue this color can be planned based on weather conditions. "You to want to make the applications prior to the color fading totally because if you wait your program looks poorly executed," she adds.

Colorants can be used in the fall in southern and Transition Zone environments as a replacement to winter overseeding, Reynolds says. This is particularly true of the longer-lasting colorants that provide more color for longer periods. These products typically contain a higher pigment concentration with some type of binder or resin to hold it on the leaf for



longer periods of time. "Colorants that are more in-line with dyes can be used pretty much any time of year when superintendents are just looking to add a little more color, brightness or wow factor for special events," Reynolds says.

In a transitional time, in October to November, if the grass is just a bit off color, Geoponics territory manager Brad Driggers recommends a lighter rate of paint or a pigment to carry it through to dormancy. "Then, when dormant, we use a rate of six or eight gallons of paint per acre," he says. "March or April, we also might use a lighter rate to spruce it up. Then use pigments going into the spring."

Drier, more arid days with low wind and full sun are "great" days to apply colorants, especially ones that are designed to last longer and need the binder/resin to adhere to the leaf. This doesn't seem to work as well on cool, overcast or humid days, Reynolds says.

Superintendents can use colorants and pigments whenever they want to change the turf's color, Miller says. "There are many different considerations on timing," he adds. "Some folks like to keep color consistent, so they may use earlier and regularly, whereas others may want to apply after they have a marked color



## Application

Superintendents have been very creative in application techniques. Initially, it seemed most turf managers used spray wands to apply them to greens, NC State's Dr. Grady Miller says. Then, people started using spray hawks or similar small walking booms. Later, as they started applying to fairways, traditional boom sprayers became more common.

Several superintendents have heavily modified their sprayers to get better coverage with one-pass rather than the more commonly used two-pass application. For greens, you can go with a lot of different types of application equipment.

Commercially available equipment can be employed in the application of colorants and pigments, as well as design-your-own sprayers, Miller says. For larger areas, a boom sprayer used to apply pesticides is most commonly used with the application – either stock or with some modification such as lowering boom, closer spaced nozzles and dual-spray nozzles.

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change to maximize their use.”

The reverse approach could be used on when to not use them. For example, are you willing to re-apply in fall if weather stays warm and continues to grow? Some may see this as a wasted application. You could take a different approach, applying the products when clientele recognizes and demands a certain type of playing surface. Note that using these products on dormant turfgrass does not provide a wearable surface like an actively growing ryegrass overseed. So, the amount of wear may influence using these products, Miller says.

Weather plays a factor in application and results, Geoponics territory manager Phil Martin says. “What we are looking for when applying is a light dew or frost on the ground,” he adds. “If it’s too much, it won’t adhere. It needs to be at least 40 degrees during the day of application. Normally apply in the morning, but if the hottest part of the day hits 40, you’re good. Colorant doesn’t really adhere or dry to the leaf blade if it’s frozen.”

Technology and the technical aspect of color application

## Real ROI

NC State’s Dr. Grady Miller cautions “the first-timer” that playing surfaces are not the same and the cost savings may not be as big as one thinks if you are putting product on warm-season grasses and you have a long dormancy period. “To me, the cost savings is there, but it’s not the primary reason to consider using them at least not in the Transition Zone,” he adds. “I think the ability to finally target problem weeds is one of the biggest tipping points to using them. I’ve even seen golf courses that use them on a rotation just for weed control reasons so they can put their labor and resources to other uses, and then the next year they may go back to overseeding. This can be especially useful at a large complex that has more than 18 holes.”

have been “absolutely pivotal” for Geoponics, Seevers says. “It’s the art. Working with people who are qualified, who know what to do and what not to do really has its plusses. Going rogue is a recipe for disaster. They have one chance to get this right. If a course sprays \$20,000 worth of paint and doesn’t get it right, they blew it. That’s stuff that gets people fired.” GCI



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# GOLF COURSE INDUSTRY



# One LIFE to LIVE



DOA isn't an option for the carts at your golf course. Here are some simple ways to get the most capacity and life from your golf car batteries.

By **Fred Wehmeyer & Zachary Cox**

**F**leet managers hate hearing when one of their golf cars is dead on the fairway. Even though you've been consistent in charging the entire fleet every night, there's always the occasional battery pack that shows it's fully charged but never seems to last long.

Effectively predicting the runtime of a golf car's battery pack starts with understanding the factors that affect its capacity. Manufacturers of deep-cycle lead-acid batteries usually list a battery's capacity as runtime in minutes and amp-hour capacity. Both of these should give you a good estimate as to the amount of time in which a battery can deliver power under a



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specified load. While these ratings provide a good baseline for battery performance, there are other factors that can cause low runtimes that must be taken into account.

#### TIME TO REACH FULL CAPACITY

It is important to know that new deep-cycle batteries do not perform to their rated runtimes immediately. New batteries often take anywhere from 25 to 125 cycles before reaching their full capacity. This is due to the active material on the battery plates not being fully converted until the battery has undergone multiple charge and discharge cycles. New batteries often perform at roughly 75 percent of their rated capacity, so expect performance to increase as the batteries are used.

#### DISCHARGE LOAD

The discharge load of your car is also critical in determining the runtime of your batteries. Most golf cars have 48-volt motors that are supplied energy by 48-volt battery packs. In this configuration, the motor draws roughly 56 amps from the battery pack on average. For 36-volt cars, the motor draws roughly 75 amps on average. This is why most golf car batteries have 56A and 75A ratings listed on the label. When selecting a battery type for your fleet, pay attention to these ratings as they are the most relevant to golf car applications. When testing batteries, use the discharge load applicable to your system and compare the actual runtime to the ratings published on the battery.

#### TEMPERATURE

Deep-cycle battery performance is also affected by tem-

## Get MAXIMUM Capacity



1

Fully charge the batteries before being put into service and after every use.

2

Maintain regular maintenance such as adding water, checking connectors, opportunity charging and a monthly equalization charge.

3

Manage the depth of discharge. If possible, rotate cars to limit the Depth Of Discharge (DOD) to 50 percent or less.

4

Use batteries with a high-rated capacity. Discharge rates often increase as golf car motors get older or if heavier loads are placed on the vehicles. By using batteries with higher runtime ratings, you can ensure your cars will make 36 holes consistently.

5

When in doubt, take a specific gravity reading. This can provide information on the health and state of charge of the battery pack. Consult the battery manufacturer for information on specific gravity readings.



Don't expect batteries to be operating at full capacity immediately. New batteries often perform at roughly 75 percent of their rated capacity.

perature. For every 20 degrees below 80 degrees, the battery loses 10 to 12 percent of its available capacity. Warmer temperatures above 80 have the opposite effect and increase battery performance, but at the cost of shortening battery life. In addition to battery performance, temperature can affect

the charging performance of your fleet. Low temperatures can cause undercharging while high temperatures can cause overcharge conditions.

Knowing these tips and

combining them with regular maintenance can dramatically increase the overall life span of the batteries and save your course money in the end. For more information on battery maintenance, capacity, and runtime ratings, visit [www.usbattery.com](http://www.usbattery.com). **GCI**

*Fred Wehmeyer is senior vice president, engineering and Zachary Cox, is a product and process engineer at U.S. Battery Manufacturing*



**Terry Buchen**, CGCS, MG, is president of Golf Agronomy International. He's a 41-year, life member of the GCSAA. He can be reached at 757-561-7777 or [terrybuchen@earthlink.net](mailto:terrybuchen@earthlink.net).



## Travels with Terry

Globetrotting consulting agronomist Terry Buchen visits many golf courses annually with his digital camera in hand. He shares 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.

## GOATS TO THE RESCUE

**D**avid L. Webner, superintendent at the Westwood Country Club in Rocky River, Ohio, has a very hilly two-acre natural area that was difficult to maintain. Eight goats were rented (\$125/day) and a temporary fence was moved each day after they cleared the vegetation. In four days, they cleared about one-third of the hillside. The owner of the goats estimated that it would take 14 days to clear the entire hillside. They do eat tree leaves and several species of plants they do not eat. And, yes, they do eat poison ivy. The owner feeds them at his farm to assure they have proper nutrition. There was no odor from the goats/feces and there were not any local ordinances prohibiting their use. Each goat has a name and Grady was Webner's favorite. Haulin' Goats of Valley City, Ohio, is the goat rental source ([james@haulin-goats.com](mailto:james@haulin-goats.com)). Webner is talking about purchasing two goats, using tethers in areas he would like cleared and making them permanent members of the grounds crew.



## ELECTRIC SPRAYERS

**T**he bag racks were removed from both 1997 Club Car Golf Carts with gasoline engines and they were then outfitted with 25-gallon sprayers (\$300 each) with 12-volt electric on demand pumps. The pump wiring has an inline on/off switch and there are alligator clips that are attached to the 12-volt golf cart battery. The pump recirculates back into the tank for agitation. One-half-inch diameter hose with spray wands with fan-type nozzles are wrapped-around two ½-inch by 3-inch lbolts that are attached to the bag rack frame during transport. The recycled wooden frame supporting the sprayers are bolted to the rear leaf springs and golf cart body. The sprayers sit on top of ¾-inch thick plywood that is bolted to the wooden frame. The sprayers, operating at 40 PSI, are used to apply chemicals along fence lines, tree wells, satellite boxes, etc. Brandon Crim is the superintendent at the Boise Ranch (Idaho) Golf Course.





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## DESIGN CONCEPTS

(BRAUER continued from page 34)

changing times. Preserving heritage is fine, but change is accelerating. One thing about certain about designing for the past ... there's not much future in it. Millennials won't appreciate golf's traditions like we do. Foregoing tradition is difficult for us, but if we are going to throw in the tradition towel, design can at least help us throw it in the right direction.

### 13. RISING EXPECTATIONS

Modern golfers think they are guaranteed the rights to life, liberty and the routine par. Roughs and bunkers must be as perfect as fairways. Public school curriculums haven't been dumbed down as much. The hazardless hazard trend won't reverse any time soon. It may be worth redoing your sand bunkers just to keep your Yelp reviews positive.

### 14. LOWER BUDGETS

In 1965 (and 1966, '67, '68) my grandmother said, "It's getting

tougher every year, pretty soon no one will survive." We survived, but modern superintendents understand the sentiment. Many have stagnant budgets, and have already exhausted all possible in-house savings. Renovating can help by reducing and "right sizing" bunkers and turf areas to reduce and streamline maintenance.

### 15. PAY SOME BILLS

If your course has vacant land, selling it off for a pocket development in this hot housing market can pay some bills, even if needing to move a few holes around – if it doesn't hurt golf quality. And for some, even if it does.

### 16. ONLY PERFECT PRACTICE MAKES PERFECT

Only recently have great practice facilities been a high priority. The emergence of the upscale driving range has raised practice standards as much as golf standards, first at private clubs, and soon at public courses. The New Age range allows replicating every shot found on the

golf course, and every cocktail found in the bar.

### 17. SAVE THE TURTLES

Whether imposed by regulatory fiat or an in-house initiative, most renovations also foster sustainability, adding with more responsible turf choices, tree management plans, wildlife habitat creation, recycling and energy audits to the main stay focus of water consciousness in turf and landscape.

### 18. FASTER TURTLES

We now better understand how design affects pace of play, and faster play pleases your customers and allows more of them to come out and play.

### 19. THE 19TH HOLE – SAVE THE ULTIMATE ENDANGERED SPECIES – YOUR GOLFERS!

The fun in golf somehow got lost along the way. If form follows function, innovative designs will finally focus on fun for average players. Making a golf course hard is easy, but making one easy is hard. GCI

## OUTSIDE THE ROPES

(MORAGHAN continued from page 20)

good job with your golf course, you're doing a good job as a manager and employee.

No matter which camp you fall in, I do have one piece of advice: Don't get overconfident. If you're not getting the respect you think you deserve, maybe you don't deserve it, maybe you're not doing as good a job as you think and the naysayers have some valid points. If you're well-loved, don't let it go to your head, because as soon as you get cocky, you're in trouble. As one G.O.A.T. football coach told me, "Remember, you're only as good as your last day!"

And, he has several Super Bowls to prove it. So, don't make today your last day.

What I'd really like to do — and think you would, too — is get the following message to everyone who uses your golf course. Maybe you start by talking about this with a sympathetic board member, or posting these points on the locker-room bulletin board:

- Just because you have access to the Internet, doesn't mean you can do the superintendent's job
- Just because you have a lawn, doesn't mean you know how

to get a golf course into shape.

(And when it gets too hot to keep mowing, we don't get to quit for the day and grab a beer.)

- Just because you play golf, doesn't mean you know what the superintendent does for you each and every day
- Just because you think you know how the course should play, most of you wouldn't want and couldn't do this job

If you have some ideas how to get those four points into the heads of everyday golfers of any age, let me know. GCI



# SURVIVORS AND PRETENDERS



**Pat Jones** is editorial director and publisher of *Golf Course Industry*. He can be reached at [pjones@gie.net](mailto:pjones@gie.net) or 216-393-0253.

**L**abor Day has come and gone and the 2017 season begins to wind down. We saw another decent year with experts touting what looks like a slight bump in rounds so far.

Yay, I guess.

Tracking rounds played is a fool's errand. It's more of an indication of temperate weather than industry health. The real metric is revenue and profitability growth. Are the cash registers ringing and are you netting more than last year?

As I look around our industry, it's clear the market's historic core is healthy and growing. Let me give you one piece of evidence: I routinely ask execs from turf industry supply companies if their golf market revenues are growing and every single one of them replied yes.

This despite the fact we're closing 150-plus courses annually, millennials hate us, brick-and-mortar golf retail stores are closing and every two weeks some op/ed writer for *Time* or *Fortune* or *Newsweek* declares golf dead. So what gives?

The fundamental misunderstanding of outsiders looking in at us is that there isn't just one golf market. There are five or six, and none of them have much to do with *Golf Galaxy* failing or *Topgolf* exploding. Some are doing awesome and some are not. Allow me to elucidate.

The top 1,000 private clubs are

icking ass financially. They have the reputation and resources not only to hire great superintendents and invest in their courses, but also to have top-notch sales and marketing folks driving revenues through events and activities. In today's market, an energetic sales director is the second most important person to a club's success behind a strong superintendent.

Conversely, the mid-scale and modestly budgeted clubs are a mixed bag depending on the competitive set in their locale and the quality and creativity of their management. Some exceed expectations and generate robust profits because they actually try new things, measure if they work and adjust accordingly. They also invest as much as feasible. Those who do the same thing year after year and hope for the best are largely screwed in the long run. They won't be able to support the costs and expectations of a private club structure with a mediocre product in the future. "Improve or die" should be their mantra.

Facilities tied directly to real estate developments (particularly those built during the '90s boom) are hurting. In short, these are amenity courses meant to sell homes, not golf. The limitations they face in marketing themselves, inaccessibility to non-residents, and HOA and developer restrictions make it hard to break even. Lots of these facilities end up under MCO umbrellas of some kind

and are managed to control costs, not grow revenues. That is not a long-term formula for success.

Creative, well-managed daily fees are also doing well in areas that aren't hopelessly overbuilt. I love some of the promotions I see these courses doing to attract women, younger players, leagues and outings. The smart ones have avoided some of the pitfalls of handing over a bunch of tee times to *GolfNow* by offering demand-based variable pricing, value-adds and (dare I say it?) FUN.

At the other end of the spectrum are mom-and-pop facilities (and some munis) that just offer cheap, crappy golf. They have commoditized themselves to death by only focusing on price, discounting instead of offering value, and largely ignoring customer service and decent conditions. Many don't even employ a turf pro. They do no marketing. All they do is bitch about how bad the business is. They don't buy much stuff and they don't grow the game. They just exist to suck a little value out of the market the rest of us are building.

Government ops is another category doing fine with talented management. We're fortunate to have an awesome golf division within our *Metroparks* system in Cleveland and I find them in other bigger cities and counties. Yes, many course owners think the government shouldn't compete against private industry, but I've always felt it was meaningful that golf is considered to be an important form of recreation and fitness. In fact, I see munis taking the lead in places to promote the fact that playing golf is actually healthy for you. What a concept, huh?

A sense of ownership is the commonality that will win in the future. When leaders and managers take responsibility for trying new things, borrowing business practices from other segments and focusing on customer service, they will do just fine even in tomorrow's substantially smaller and more demanding golf industry. **GCI**



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