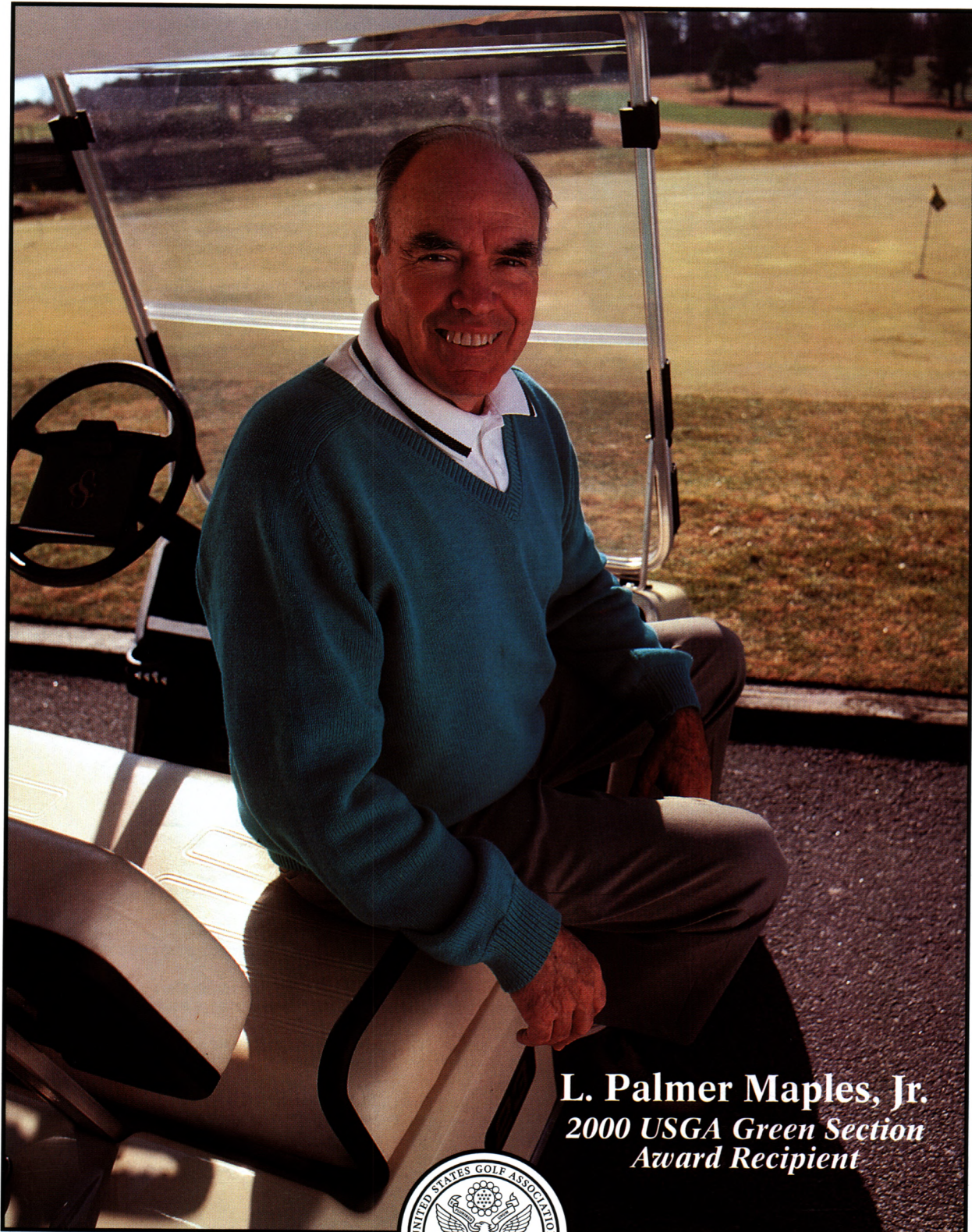


USGA® GREEN SECTION

Record

Volume 38, Number 3

May/June 2000



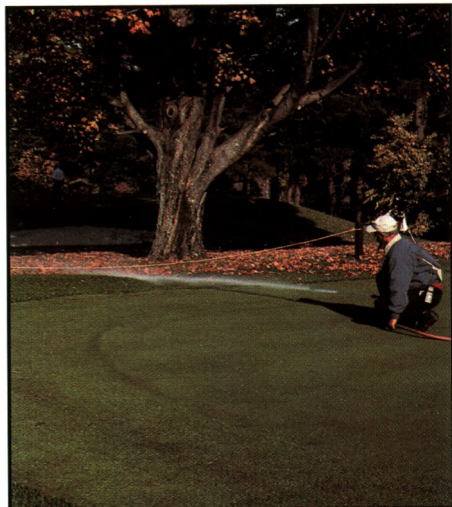
L. Palmer Maples, Jr.
*2000 USGA Green Section
Award Recipient*



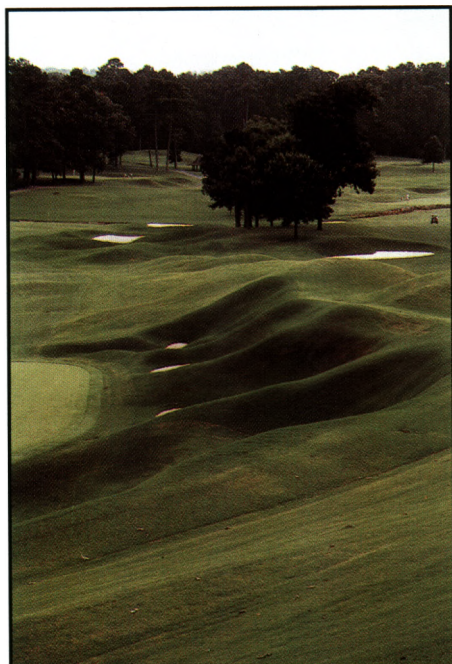
A PUBLICATION ON TURFGRASS MANAGEMENT

BY THE UNITED STATES GOLF ASSOCIATION®

Cover Photo:
L. Palmer Maples, Jr., is the
2000 USGA Green Section
Award recipient.



A simple, inexpensive hose system can be used to quickly remove pine needles and other debris from green surfaces. See page 23.



Gentle mounding adds character to every course. However, when the mounding becomes so severe that hand mowing is required, the cost of maintenance skyrockets. See page 25.

USGA® GREEN SECTION Record

1

2000 USGA Green Section Award Recipient — L. Palmer Maples, Jr.

2

The New Millennium — Making Wise Decisions

3

Rotaries in the Rough

A growing trend in the management of hybrid bermudagrass roughs. By John Foy

4

Successful Recruiting

Building your crew around student interns. By R. A. (Bob) Brame

5

The Best Bookmark to Access

Using the USGA Green Section website as an information resource. By Kimberly S. Erusha, Ph.D.

6

Cardio Crisis on the Course

Emergency equipment for dealing with heart-attack victims on the golf course. By Brian Maloy

7

Give Me Your Poor, Your Tired, Your Dead Bentgrass Greens

Golf courses are reaping the rewards with new bermudagrass varieties. By Chris Hartwiger

8

What You Don't Know *Can* Hurt You: How to Use the Law to Protect Yourself

A top trial lawyer discusses common legal issues facing course officials and superintendents. By J. Michael Veron

11

Using Compost to Improve Poor Soils

There is more to growing better grass than applying extra fertilizer and water. By Stanley Zontek

12

Curb Those Curves

Golfers seem incapable of keeping all four tires of a cart on a winding path for any length of time, but well-placed cobblestone curbing can be a turf-saver. By Robert Vavrek

13

Spikeless Golf Shoes — Avoiding A Slip-Up

Ideas for improving the traction of spikeless golf shoes. By Patrick Gross

15

Burning the Candle at Both Ends

High temperatures and low cutting heights lead to a dead end!

By Bingru Huang, Ph.D.; Xiaozhong Liu; Jack Fry, Ph.D.; and Michael P. Kenna, Ph.D.

17

Purchasing New Products and Technologies: An Ethical and Common-Sense Approach

Advice for superintendents to determine if new products and technologies are for your golf course. By Robert N. Carrow

21

Sometimes Drainage Can Be Boring

A technique new to golf courses that can help keep water moving. By Paul Vermeulen

22

Is It Or Isn't It?

Using a quick method to identify pink snow mold. By Keith Happ

23

Putting Out The Fire

A hose system used to get water out fast. By Jim Skorulski

24

"Once You Get 'Em, You Gotta Keep 'Em"

Obtaining and then keeping labor to the end of the season can be challenging. By David A. Oatis

25

Making Golf More Affordable

Addressing issues that need to be considered by architects, builders, and golf course superintendents. By James F. Moore

29

Putting the Horse in Front of the Cart

Using rubber horse stall mats as a durable, low-bounce cart path surface. By Matt Nelson

30

Giving New Bunkers An Old Look

A shortcut stacked-sod technique can provide a mature appearance for new bunkers. By Darin S. Bevard

32

Don't Fire Until You See the Whites of Their Eyes

Using a map saves money and time in the battle against mole crickets. By Patrick M. O'Brien

33

Two Tips for the Price of One

A simple way to eliminate visual aids on your golf course. By Larry Gilhuly

34

News Notes

38

Turf Twisters

2000 USGA GREEN SECTION AWARD RECIPIENT

PALMER MAPLES HONORED

"I've always been proud to be a golf course superintendent."

WITH THOSE simple words, L. Palmer Maples, Jr., CGCS, retired golf course superintendent from the Summit Chase Country Club in Snellville, Georgia, accepted the 2000 Green Section Award presented to him by John O'Neill of the USGA Executive Committee. Granted by a distinguished panel of experts in the turfgrass field, this annual award recognizes persons for distinguished contributions to golf through work with turfgrass. It was presented to Maples on February 19, 2000, at the Golf Course Superintendents Association of America Annual Conference and Show in New Orleans, Louisiana.

The Maples family tree includes multiple generations involved in all aspects of the game of golf: golf course superintendents, golf professionals, and golf course architects. Palmer Maples' ancestors can be traced back to working with such legends as Old Tom Morris and Donald Ross. In accepting the award, Palmer said, "It is a great honor to have my name added to the list of people receiving this award. I hope I've made the Maples family proud."

Palmer started working on the golf course at the age of 12, and by the time he was 14 he knew his goal in life was to become a golf course superintendent. His first job was to put used

motor oil on sand greens and make them smooth. From there, he began to mow fairways and roughs, rake bunkers, and spread fertilizers.

He earned an associate degree in turfgrass management from Abraham Baldwin Agricultural College in Tifton, Georgia. While attending school, he interned at Sea Island Golf Club (St. Simons Island, Georgia) and helped conduct field experiments with Tifgreen bermudagrass under the direction of renowned turfgrass scientist Dr. Glenn Burton. After serving two years in the Army he continued his education at the University of Georgia, earning a bachelor of science degree in agronomy.

His first job after completing his degree was to join the staff at Charlotte Country Club as assistant golf course superintendent, later being named the superintendent in 1959. Maples was one of the first superintendents in the South to convert bermudagrass greens to bentgrass. His career of over 38 years as a golf course superintendent also took him to The Standard Club (Atlanta, Georgia) from 1970 to 1976 and to Summit Chase Country Club from 1981 to 1997.

Palmer not only excelled at his career, but he also shared his wealth of knowledge and experience with legions of other golf course superintendents.

From 1967 to 1969 he was president of the Carolina Golf Course Superintendents Association. In 1975, he volunteered his time to lead the activities of the Golf Course Superintendents Association of America (GCSAA) as its president.

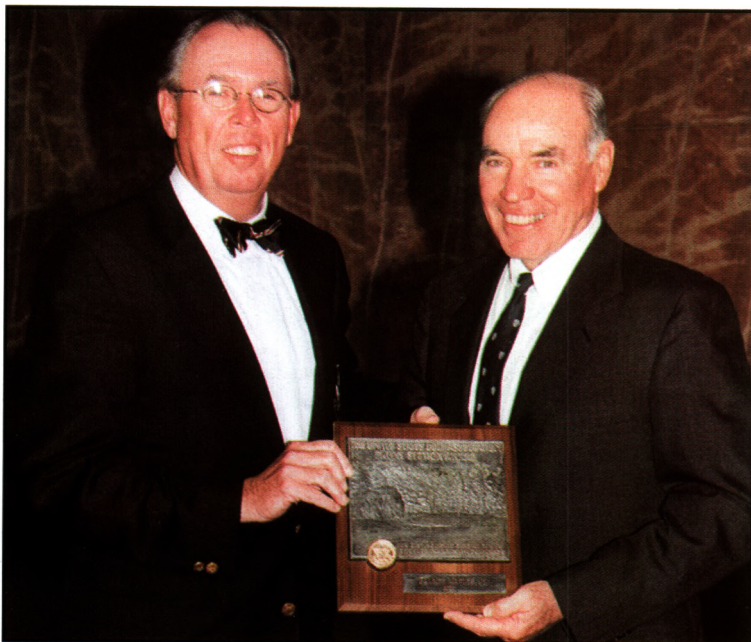
After his GCSAA presidency, he left The Standard Club to accept a GCSAA staff position as director of education, a position he held until 1980. He directly interacted with thousands of golf course superintendents as he developed conference educational programs and served as technical advisor to the GCSAA publication, *Golf Course Management* magazine. Palmer also served an instrumental role in developing the GCSAA's library of educational materials.

His love of the outdoors and agronomic challenges brought him back to his golf course superintendent role when he joined the Summit Chase Country Club in 1981. Until his retirement from the club in 1997, he remained active in both the GCSAA and the Georgia GCSA.

Throughout his career, Palmer shared his talents with many others as well as his employer. For many years, he volunteered his time to serve on the USGA Green Section Committee and the USGA Green Section Award Committee, and today he still actively serves on the GCSAA Historical Committee. He also is a member of the Donald Ross Society.

Palmer believes that golf course superintendents' willingness to share information is what has allowed them to progress so far in their careers. In retirement, he continues to share his wealth of knowledge and zest for the profession by teaching at Gwinnett Technical Institute, consulting with other golf courses, and speaking at meetings. One supporter wrote, "Your enthusiasm spreads like fire, and the students are not only academically trained, but also motivated."

When all things are added up, his lifetime contributions, particularly his dedication, service, and commitment to excellence, certainly demonstrate that Palmer Maples is a great example of someone who lives what he believes.



John O'Neill (left) presents Palmer Maples with the 2000 USGA Green Section Award.

The New Millennium — Making Wise Decisions

February 19, 2000, New Orleans, Louisiana

FOR THE 19TH CONSECUTIVE YEAR the annual Green Section Education Conference was held in conjunction with the Golf Course Superintendents Association of America International Turfgrass Conference and Show.

This year more than 800 people attended the Green Section's program on Saturday, February 10, at the Morial Convention Center. James T. Snow, National Director of the USGA Green Section, served as moderator for the afternoon's program of 20 speakers who addressed this year's theme, "The New Millennium — Making Wise Decisions."

THE BEST TURF TIPS OF 1999

One of the most popular annual features of the Education Conference is the Best Turf Tips. This year, 18 Green Section staff members reported on some of the helpful ideas and ingenious innovations they came across while visiting golf course superintendents in every part of the country during 1999. The Turf Tips appear throughout this issue.



Rotaries in the Rough

A growing trend in the management of hybrid bermudagrass roughs.

by JOHN FOY

USING rotary equipment to cut cool-season turfgrass roughs has been a standard practice for many years. However, in Florida and across the Sunbelt where fine-textured hybrid bermudagrass is the dominant turf cover through rough areas, the use of rotary mowers has not been a common practice because the rotary mowers did not provide an acceptable quality of cut. It has been commonly felt that large five- or seven-gang reel units were needed to keep up with regular mowing of bermudagrass roughs during the summer. At most Florida golf courses, rotary mowers have been used primarily for trimming and cleanup work around trees where the larger gang units could not operate.

In the past few years, however, there has been a growing trend of using rotary mowers for maintaining hybrid bermudagrass roughs. Some of the reasons for this trend are:

- Equipment improvements such as faster blade RPMs, multi-blade setups, and the mulching deck designs that provide an improved quality of cut.
- Reduced mowing time because of faster operating speeds and greater maneuverability of the rotary mowers relative to pull-behind gang units.
- Rotary mowers can continue to operate in wet conditions and with excessive turfgrass growth, which bogs down and even stops both ground and hydraulically driven reels.
- The "vacuuming" effect of the mulching decks helps produce and maintain a more upright shoot growth character and smoother surface condition.
- During the fall, winter, and spring months, this "vacuuming" effect also can help minimize rough deterioration and loss of definition from cart traffic.
- With the increased trend of winter overseeding of bermuda roughs, using rotary mowers on a year-round basis avoids the need for extra equipment.
- Some of the new rotary mowers are less expensive to purchase and operate relative to five- and seven-gang self-contained reel mowers.

At some facilities in Florida, rotary mowers are now used exclusively, while at others a combination of rotary and reel mowing is practiced. When a combination of rotary and reel mowers is used, typically the rotaries are used first and then the reel mowers are used for a cleanup cut.

Regular sharpening and/or replacement of the rotary mower blades is needed to maintain a good clean cut with bermudagrass roughs. During the growing season, blade maintenance needs to be performed at least every two weeks, and preferably on a weekly basis. Yet, compared to maintenance of reel units, blade maintenance can

be accomplished relatively quickly and is less expensive. Furthermore, the mulching decks still need to have some type of clipping discharge, and mowing speeds must be slowed down in order to achieve an acceptable quality of cut when mowing wet and thick bermudagrass roughs.

Wise decisions are always important, and in this new millennium, rotary mowing is a viable and growing trend in the management of bermudagrass roughs.

JOHN FOY, *Director of the Green Section's Florida Region*, has been "roughing it" for Florida golf courses for 15 years.



Over the past few years, the use of rotary mowers to maintain hybrid bermudagrass roughs has been a growing trend. To maintain a good quality cut, the blades must be sharpened on a regular basis.

SUCCESSFUL RECRUITING

Building your crew around student interns.

by R. A. (BOB) BRAME

FEW WOULD ARGUE that successful recruiting is not critical to having a winning team in college sports. Some coaches and assistant coaches are better at recruiting than others and thus gain a distinct competitive edge. Successful recruiting principles apply to golf course maintenance as well. Most courses in an area are in competition with each other for golfers. The maintenance staff plays a huge role in quality conditioning/playability, the team/staff is anchored by career commitment, and those superintendents who invest in recruiting gain an edge.

Although we all know that the conditioning of a golf course is dependent upon a number of factors often not controllable by the superintendent, this does not change the fact that golfers cross compare. Clearly, it is important to inform golfers of the differences in course conditioning (i.e., weather, budget, play volume, design, etc.) and why these variables impact playability from location to location. Nevertheless, comparisons between both public and private courses will be made. You can communicate and educate, but cross comparing and thus competition for golfers is a reality for most facilities.

There is a direct relationship between the conditioning of a golf course and the quality of the staff and equipment. These two components are frequently discussed on Green Section visits. Without question, the operating and capital expenditure budgets directly impact staff size and quality, as well as the equipment inventory. Considering



The Country Club (Cleveland, Ohio) successfully uses a professionally produced videocassette and brochure to enhance efforts in recruiting student interns to work on the golf course.

specifically the maintenance staff, it has become increasingly difficult over the last few years to find and keep good help — a pressing issue in our industry.

A number of strategies have been and are being used to secure quality employees. The use of student interns has become one of the better methods for establishing a high quality, hard-working staff/team. Student interns are normally highly motivated and committed to golf course maintenance. These facts allow a core group of interns to develop into an excellent anchor for the quality conditioning of the golf course.

Recognizing the value of student interns and the fact that there are a limited number available for hire, recruiting is very important. Like communicating and public relations, some superintendents are better at recruiting than others. Those who invest in recruiting will get the best interns and have a superior staff core, which yields a better final product. The competitive edge goes to those who invest in and are good at recruiting.

interns and their current positions; (5) job benefits and compensation; and (6) a personalized appeal from the superintendent to join the team.

Matt secured the services of a local film company to produce the video. The cost was \$5,000 for 30 tapes, which included customized cases for the tapes. Future updates to the original tape will likely be possible at a lower rate. Considering the convenience and positive communication of information, the price seems nominal.

As you contemplate how to gain a competitive edge, consider the value of a professionally produced videocassette to recruit student interns.

Matt Shaffer, golf course superintendent at The Country Club in Cleveland, Ohio, has used a number of techniques over the years to attract student interns. Most recently, Matt has used video-cassettes. A videotape, along with a brochure, is sent to prospective interns and/or their college professors. The tape includes: (1) information about The Country Club; (2) a student intern job description; (3) a pledge of commitment to the intern's education, growth, and career; (4) a listing of former

BOB BRAME is the Director of the North-Central Region. A 10-year employee of the USGA, Bob has 36 years of experience in the golf course management industry, which includes 18 years as a golf course superintendent.

The Best Bookmark To Access

Using the USGA Green Section website as an information resource.

by **KIMBERLY S. ERUSHA, Ph.D.**

IN TODAY'S SOCIETY, communication is the name of the game. We hear about how large company mergers between internet service providers and traditional news organizations bring us the latest information, in faster formats, and using new technologies that continue to change daily.

To the golf course superintendent, this new technology offers many benefits, but it also challenges you to keep up with ever-increasing volumes of information added to an already overloaded schedule. The computer has made this job much easier, both for the educator and the recipient. Fortunately, the computer has become more commonplace in our daily lives as we use it to scan prices at the grocery store, monitor bank accounts, pay bills, and order merchandise.

The advent of the internet has provided a tool for businesses to make information more readily available to their customers. Not only can it be used to provide basic information about a company, but it can be continually changed and updated on specialized topics so that consumers have the latest information available at their fingertips.

With the USGA website averaging more than 1 million hits per month and swelling to more than 8 million hits during the week of the U.S. Open, the Green Section realized a tremendous educational opportunity. A considerable amount of time and effort has been spent in the last two years to update the Green Section portion of the USGA website. Now visitors can find more information about the Green Section programs and be kept up to date about current events taking place

within the department. Our goal is to provide information about our programs and activities in an easy-to-use format.

Variety abounds, with Green Section activities encompassing the Turf Advisory Service, Construction Education Program, Turfgrass and Environmental Research, and Environmental Education Programs. On the website, a basic explanation of each of the Green Section's major programs can be found, outlining the goals, objectives, and current projects. For example, the Turfgrass and Environmental Research Program provides a history of the program and outlines current projects receiving funding. In 2000, more than 89 projects will receive a research grant from the USGA Turfgrass and Environmental Research Program. The website is an easy way to monitor the research taking place in your region of the country. All new research call-for-proposals are outlined on the site to supplement mailings made to turfgrass researchers.

The Construction Education Program has grown considerably since its inception in 1995. The website is a great starting point to find the current specifications for the USGA Method of Putting Green Construction and the list of soil testing laboratories accredited by the American Association for Laboratory Accreditation (A2LA). Information is available on new research taking place to further define the laboratory methods used to formulate putting green rootzone mixtures. Helpful articles are available for review and downloading on green, tee, and bunker construction methods, including pertinent case studies.

The Turf Advisory Service (TAS) is the heart of the Green Section's activities. Each member of the Green Section staff travels and speaks with superintendents and green committee members at hundreds of golf courses each year. Their activities provide a unique perspective that is available through no one else in the industry. One new feature of the TAS portion of the website is the addition of Regional Updates. Every two to three weeks each regional office writes a short synopsis of activities and problems taking place in their region. The topics range from the latest disease outbreaks and environmental impacts on turf conditions to educational opportunities in the region.

These updates are available through the website to help people keep informed of the latest happenings in the region and to provide helpful hints for recovering from unexpected troubles. For example, the Southeast Region agronomists were able to provide timely information to a large number of superintendents who had to endure unexpected flooding conditions. This information got into the hands of many more superintendents much more quickly than the agronomists would have been able to reach responding to individual phone calls.

Create your bookmark today to the USGA Green Section website, and visit often to access the most up-to-date information resource available.

KIMBERLY S. ERUSHA is Director of Education for the USGA Green Section and has been on staff since 1990. She is based at Golf House in Far Hills, N.J.

www.usga.org/green

CARDIO CRISIS ON THE COURSE

Emergency equipment for dealing with heart-attack victims on the golf course.

by BRIAN MALOY

DURING THE 1999 MOTOROLA Western Open, Garland Dempsey experienced a heart attack while caddying for John Maginnes. Fortunately, the caregivers at the scene acted quickly by using CPR and a portable heart defibrillator to save his life. Garland was lucky that day because he was only minutes away from becoming another national statistic.

Heart failure is rated as the number-one killer in America. The American Heart Association (AHA) reports that each year 1.1 million Americans experience a heart attack, and 350,000 of those people become fatalities. Usually, a heart attack is caused by a clot in one of the vessels that supplies blood to the heart, and it may or may not be accompanied by unconsciousness. In extreme cases, the victim can die suddenly without warning.

The first ten minutes of a cardiac arrest are critical. If proper help doesn't arrive during this time period, the outlook is grim. In large cities where emergency medical service (EMS) response time is often delayed because of traffic congestion, the chance of survival is only one to two percent.

According to an American Heart Association study, golf courses are among the most common places for heart attacks to occur. The likelihood of surviving heart failure on the golf course is less than five percent (lower than the national average). Due to the remote location, paramedics are often slow to respond because of the limited accessibility to many golf courses. Consequently, a golf course is one of the worst places to be when your heart stops, or at least it was until now.

Brook Hollow Golf Club in Dallas, Texas, is a proactive golf course in the Mid-Continent Region. With the combined efforts of member Dr. Bill Weaver, general manager Dale Miller, and superintendent Ken Small, the club is now better prepared to handle an emergency situation. The club purchased three automatic external defibrillators (AEDs) and has placed them in key locations around the facility. Likewise, two solar-powered emergency



The care given to a heart attack victim is most critical during the first ten minutes. Automatic external defibrillators are used to help save lives at remote locations like golf courses.



Brook Hollow Golf Club (Dallas, Texas) has strategically located two solar-powered emergency call stations on the course. In an emergency event, they can be reached quickly to summon help.

call stations are strategically positioned so that they can be reached quickly in the event of an emergency. One AED is approximately \$3,800, and the emergency call station costs \$4,900 — a bargain if only one life is saved.

Operating the portable defibrillators is easier than one might expect. In the past, portable defibrillators were heavy and cumbersome, but they have become more manageable and weigh less than 10 pounds. Once the electrode contacts are applied to the victim, the AED leads the caregiver with both voice and visual prompts through a three-step rescue procedure. The American Heart Association offers one-day training in CPR and the use of the AEDs for a nominal fee.

Perhaps once our culture embraces the necessity of this type of life-saving equipment there will be fewer casualties lost to this number-one killer. Maybe someday every police officer, restaurant owner, hotel manager, and golf course superintendent will be equipped with his or her own AED. What about your golf course? This small investment is worth serious consideration to potentially save a life.

For more information, visit the American Heart Association website at: www.americanheart.org. To acquire an AED, contact: www.avantech-heart-safe.com or www.compliant.com.

BRIAN MALOY tries to avert all crises on the golf course as an agronomist in the Mid-Continent Region.

Give Me Your Poor, Your Tired, Your Dead Bentgrass Greens

Golf courses are reaping the rewards with new bermudagrass varieties.

by CHRIS HARTWIGER

LIFE IN THE transition zone may have its advantages, but it is not the land of opportunity for bentgrass greens. Whether it is winter injury to warm-season turfgrass or summer heat stress to cool-season turfgrass, the transition zone is never dull. The summer of 1999 was no exception. Bentgrass greens throughout this region suffered greatly under extreme temperatures. This regional trend offers a glimpse at what golf courses in this region are doing to break this cycle of summertime disaster on bentgrass greens.

The decision of whether to plant bentgrass or bermudagrass on putting greens has never been easy in the southern portion of the transition zone. Improved cultivars, better maintenance techniques, and player demands have made bentgrass the most popular choice for the past ten years. In fact, the bentgrass/bermudagrass line was pushed farther south during this period.

Has bentgrass been a success in the South? The reviews have been mixed, but when armed with the right tools, good management, and reasonable weather, bentgrass greens have been a success at many courses. However, in extreme summer conditions such as those in 1995 and 1999, bentgrass greens struggled and even failed in some instances. The general consensus

has been that even though bentgrass may become weak in the summer, there are still more days of good putting conditions during the year with bentgrass than with bermudagrass greens.

The introduction of new ultradwarf bermudagrass varieties has given golf courses another option and may even change the conventional wisdom in the bentgrass-versus-bermudagrass debate. While there is disagreement on the exact definition of an ultradwarf, this article considers an ultradwarf to be any variety that tolerates regular mowing at $\frac{1}{8}$ " or less.

After 30 years of Tifdwarf, turf managers in the Southeast are breathing a collective sigh of relief and can be heard shouting, "Finally, a bermudagrass that can compete with bentgrass." And compete they do! In fact, many of the ultradwarfs provide faster, firmer playing conditions during the summer than bentgrass varieties.

It has not taken long for news of the success with ultradwarfs to spread. Many bentgrass courses have converted to an ultradwarf bermudagrass or are considering it. The decision has been driven by several factors:

- The high-play and high-stress periods occur at the same time.
- The ultradwarfs are superior compared to Tifdwarf.
- Maintenance costs are lower with bermudagrass.

- Golf courses are having difficulty finding skilled labor.

- Water quality is degraded or is poor in many areas. The ultradwarfs have better tolerance to marginal water quality than bentgrass in the southern climate.

Although the ultradwarfs have been successful, there are areas of potential concern with these varieties. For example, the best method to overseed or transition the overseeding in the spring is not completely understood. Best management practices are evolving through a combination of trial and error and university research. Winter hardiness and tolerance to pests still need further investigation, too.

If your golf course is interested in a conversion, ask the following questions before proceeding.

- What is the most important playing season? Bermudagrass is much more tolerant of high temperatures and humidity in the summer.

- What are the growing conditions like? Factors such as shade, water quality, rootzone quality, green size, and traffic patterns all will influence the performance of the turf and should be evaluated.

- Does your golf course have the staff and expertise to successfully manage bentgrass?

- Is your budget adequate to properly maintain bentgrass?

Is an ultradwarf variety the answer for your course? Maybe it is or maybe it is not. Remember that the transition zone is a tough area in which to grow any turfgrass. Today, we can confidently say that there are better options on the bermudagrass side of the equation. Whatever your choice is, the player is the real winner.

CHRIS HARTWIGER considers his land of opportunity to be on the golf course. When not playing, Chris can be found at home in Birmingham, Alabama, or visiting one of the courses in the Southeast or Florida Regions.



Maintaining high quality bentgrass turf during the summer temperature extremes in the Southeast can be a difficult challenge for the golf course superintendent.



Wooden surfaces are under closer scrutiny these days due to the potential to slip with non-metal spiked shoes.

What You Don't Know *Can* Hurt You: How to Use the Law to Protect Yourself

A top trial lawyer discusses common legal issues facing course officials and superintendents.

by J. MICHAEL VERON

THERE ARE MANY who claim that America has become an overregulated society. If recent trends in the world of golf are any indication, it is difficult to argue with that assessment. In virtually every aspect of golf course operations, the law has become increasingly intrusive. And while ignorance may be bliss to some, it's downright dangerous if it means being unaware of legal requirements for hiring and firing employees, sexual harassment on the job, liability for injuries to golfers, and many other issues that are commanding our attention these days, whether we want them to or not.

It is impossible, of course, in the space of one article to discuss any of these issues in any meaningful detail. My goal is less ambitious. The intent here is to acquaint you with the law governing certain key areas of golf course management so that you will be sensitive to potentially troublesome issues if they arise. After all, identifying problems is the first step to solving them!

Hiring and Firing

Unless an employee has a written contract, he or she is generally considered to be an "at will" employee. This means that the employee serves at

the will of the employer and can be terminated at any time.

You generally can hire and fire employees for whatever reason you wish — or for no reason at all. You just can't refuse to hire someone or fire him or her for the wrong reason. The "wrong" reasons can be summarized as follows:

- You cannot make an employment decision (hire, fire, promote, or demote) based on an individual's race, gender, religion, age, or national origin, unless that status is somehow related to a bona fide occupational qualification. Both federal and state laws prohibit that kind of discrimination.

- You cannot refuse to hire someone because of a disability unless it prevents the employee from performing an essential part of the work. This is prohibited by the Americans with Disabilities Act, which requires you to make reasonable accommodations for an employee's disability.

- You cannot fire someone in retaliation for filing a worker's compensation claim. This is usually prohibited by state law.

- You cannot fire someone for reporting an environmental violation to regulatory authorities. This is known as "whistleblower" protection and is a provision in many environmental laws.

When making any employment decision, it is very important to document why you acted as you did. If you are dismissing an employee for poor work performance, having a written record of specific instances in which the employee failed to report for work, failed to do assigned work, violated work rules or safe practices, or engaged in other unacceptable conduct will protect you against an unfounded claim that the termination was based on an illegal motive.

How to Protect Yourself

You can negotiate your own arrangement with your employer in the form of an employment contract. Instead of being employed at the will of your employer, your contract can provide for a set term, such as one or two years. It also can provide for other terms of your employment, such as your compensation and the conditions under which you can be terminated (*i.e.*, for "cause"). If you are terminated before the end of the contract without cause,

you are usually entitled to be paid for the remainder of the term of your agreement.

The typical provisions in an employment contract include:

- **Compensation:** Salary, including bonus for exceptional performance.

- **Performance Standards:** The measure or criteria by which you will be evaluated.

- **Term:** Length of your employment.

- **Cause for Termination:** Conditions that would justify your dismissal before the end of your term of employment.

- **Fringe Benefits:** Health insurance, retirement benefits, work vehicle, continuing education opportunities, expense account, etc.

This list is by no means exhaustive. Your work contract can contain virtually anything to which you and your employer agree. You should, of course, retain an attorney to make sure everything in the agreement is worded properly so that it is enforceable in the state where you work.

Sexual Harassment

Federal law (specifically Title VII of the Civil Rights Act of 1964) makes it "an unlawful employment practice for an employer . . . to discriminate against any individual with respect to his . . . conditions . . . of employment because of [his] sex" The Supreme Court of the United States has determined that this law is violated when the workplace is "permeated" with "discriminatory intimidation, ridicule, and insult" that is "sufficiently severe or pervasive to alter the conditions of the victim's employment and create an abusive working environment."



Drainage projects should be clearly marked to alert golfers of a potentially hazardous area.

The trick, of course, is to identify when that occurs. It is not a simple question. In fact, our courts have wrestled with a variety of situations in which an employee complained of sexual harassment, and the results were not always clear. Ultimately, the only generalization that can be made about this is that there is no distinct line separating right from wrong conduct.

According to the Supreme Court, the "mere utterance of an . . . epithet which engenders offensive feelings in an employee" does not violate the law. In the words of the Court: "Conduct that is not severe or pervasive enough to create an objectively hostile or abusive work environment," or "an environment that a reasonable person would find hostile or abusive — is beyond [the law's] purview." Moreover, "if the victim does not subjectively perceive the environment to be abusive, the conduct has not actually altered the conditions of the victim's employment, and there is no . . . violation."

In plain English, this much is clear from the Supreme Court's language: Isolated instances of offensive remarks or jokes in poor taste do not constitute unlawful conduct. At a minimum, the supposedly offensive conduct must occur frequently. Moreover, it must be something that the offended employee cannot reasonably avoid. In addition, it must be severe enough to offend a person of normal sensibilities to such a degree that he or she cannot perform work without unwarranted stress. The courts do not require that the employee prove psychological injury. In other words, they need not have a nervous breakdown in order to have a claim.

Just as an innocent remark is clearly not sufficient to create a hostile work



Potential liability situations should be evaluated throughout the golf course. This situation, with golfers exiting the cart path to reach the tee, is an accident waiting to happen.



Fungal growth indicates structural decay in this tree. Regular inspection of golf course trees is important to identify potential hazards.

environment under the laws prohibiting sexual harassment, there are certain kinds of conduct at the other extreme that clearly are not allowed. An employer who requires an employee to submit to sexual advances as a condition of employment clearly violates the law. On the other hand, it is obviously permissible for an employer to date an employee. Much depends on the nature of the relationship and the extent to which the employee consents to the arrangement. Each case is decided by its own facts.

This is, of course, different from sex, or gender, discrimination, which consists of making employment decisions based upon the sex or gender of the employee. That kind of problem is covered in the first section of this article.

Golf Course Liability for Injuries to Others

Litigation involving golf courses is a growth industry. In this day of political correctness, golf courses are an inviting target to those who see golf as a game played only by the rich and privileged in our society. Leaving aside the factual inaccuracy of that view (the most crowded golf courses are daily-fee courses), the fact remains that we have become a litigious society. Prudent golf course managers must plan accordingly to minimize their liability.

Of course, the most common causes of injury or damage are from slips and falls on the premises, golf cart collisions, and errant golf shots. In each instance, the liability of the golf course

usually turns on whether it has caused an accident because it did something wrong. Put in more legal terms, a golf course will usually be held responsible for the damages arising from an accident if a court determines it has breached its duty of care to the injured party. That duty of care is usually described as the duty to act reasonably under the circumstances.

In the case of a slip and fall, the issue is whether the accident was caused by a defective condition, such as a slippery surface. If so, the next question is whether the golf course created the condition. In some jurisdictions, the course will still not be liable unless it had notice that the condition existed and failed within a reasonable time to correct it. If the condition could not be corrected, then the course ordinarily has a duty to warn those encountering the condition of the danger it poses.

Classic examples of potentially dangerous areas would be newly sodded areas, low-strung ropes, holes or construction areas that are not open and obvious, and any other condition where it is foreseeable that a person could be injured. Any such condition should be marked in a conspicuous manner until it can be eliminated or made safe.

Golf cart accidents are a growing source of litigation. Although the primary responsibility for collisions lies with the operator of the cart, some cases also have placed blame on the course for over-serving the cart driver with alcoholic beverages or for dangerous conditions on the course, usually the design or construction of cart paths. In that respect, the issue is whether an unusually sharp turn or steep cart path caused or contributed to the accident. As with other dangerous conditions, the first objective should be to identify and eliminate them. If a danger cannot be eliminated, cart operators should be warned about them and instructed with a conspicuous sign what to do to avoid the danger (e.g., "Caution: Steep grade — drive slowly").

Obviously, no golfer is perfect. Since even the world's greatest players hit errant shots on occasion despite their best efforts, doing so is not considered to be a negligent act. Accordingly, a golfer who accidentally injures another with a poorly struck shot is ordinarily not liable to the injured victim.

However, the courts have imposed liability if it is determined that the golfer — or the golf course — was guilty of some other negligent act that caused

or contributed to the injury. For instance, a golfer who injured a young boy while playing through was held liable for the boy's injuries because he failed to warn the boy he was in a zone of danger before he played his shot. For the same reason, it can be argued that a golf course that places people in a zone of danger because of poor course routing could share responsibility for resulting injuries.

These cases all come down to their own facts. A court faced with this kind of claim has to determine from the facts of the situation whether the course failed to act reasonably.

This is equally true where a course is sued because of injuries from lightning or other severe weather. Obviously, a golf course cannot eliminate the danger of lightning or other severe weather. The question is whether it has taken reasonable steps to protect golfers from the danger, such as by posters that educate them about the dangers, sirens and storm tracking equipment, and lightning shelters.

Conclusion

Knowing the rules is like knowing the line of a putt: It doesn't guarantee success, but it certainly improves your chances. Understanding the way in which courts evaluate the kinds of claims that may arise from your golf course operations certainly improves your chances of eliminating problems before they occur.



*J. MICHAEL VERON, a trial lawyer and a member of the USGA Sectional Affairs Committee, lives in Lake Charles, Louisiana. Michael has been a frequent speaker at USGA conferences on legal issues pertaining to golf. His first golf novel, *The Greatest Player Who Never Lived*, was published earlier this year.*

USING COMPOST TO IMPROVE POOR SOILS

There is more to growing better grass than applying extra fertilizer and water.

by STANLEY ZONTEK



Compost materials are an excellent resource to help improve physical structure of soil and increase its organic matter content.

MOST GOLF COURSES do not enjoy a uniform depth of good soil in all areas. There are always places where the soil is poor and grass does not grow well. You know the spots. They are the first ones to dry out, the first ones to wilt, the hardest underfoot, and recurring eyesores where, in spite of your best efforts, you have trouble growing a good stand of grass. What to do?

The first question to be asked is why the soil is bad in the first place. Assuming you are not dealing with an insect or disease problem, an area of dense shade, extensive tree root competition, or a gap in irrigation coverage, the problem probably is related to soil structure. Specifically, the turf probably is trying to grow in subsoil rather than topsoil. Again, what to do?

If old soil textbooks can be believed, it takes nature something like 500 years to "create" an inch of topsoil. If you have time to wait, fine. If not, read on.

A faster method of improving the tilth or the physical structure of soil is to increase its organic matter content. In this case, it can be done by incorporating a generous layer of compost into the soil. How much to apply? One-quarter inch seems to work well. Lesser

amounts provide fewer benefits, although any amount should help the soil. Core aeration is the most used incorporation technique. This is the essence of this year's turf tip. It is inspired by several different golf course superintendents who are using compost to improve areas of poor soil on their golf courses.

The first is John Haley, superintendent at Chartwell C.C., in Annapolis, Maryland. John needed to improve the stand of grass in his roughs. His course is located near the Chesapeake Bay. The majority of soils on his course are comprised of a fine sandy clay loam lacking in organic matter. Spreading a ¼-inch of a locally available compost, composed of sewage sludge and wood chips, worked wonders. Areas where it was difficult to grow grass now have a better stand of grass on them. This may be due to the improved soil structure along with better nutrient and moisture retention enhanced by the compost applications.

Mark Silva, CGCS, Country Club of Virginia, Richmond, Virginia, is using the same technique to improve fairway turf on his Tuckahoe Creek and James River courses. As a result of renovation projects on both courses, areas of poor

soil in fairway cuts have been a frustration to the staff. Even bermudagrass, which normally responds well to extra water and fertilizers applied to these areas, never really thrived until composts were used. In the case of the Country Club of Virginia, the composts are homemade. They are comprised of leaves, clippings, sand bunker edging debris, and other golf course litter.

Our last two examples are both new golf courses. As with most new course construction, soils become compacted and intermixed, and even though there may be an attempt to save and replace topsoil, there are always areas of poor soil. Almost without exception, these areas are lacking in organic matter. Thus, in the case of new golf courses, using composts in areas of poor soil can be even more important. Again, the pictures tell the story. Better grass is growing where the organic matter content of the soil has been enhanced by the use of composts.

What is the bottom line? First, most golf courses do not enjoy good soils everywhere. To improve poor soils and to accelerate the accumulation of organic matter, composts of almost any type, if applied in the proper amounts and when incorporated into the soil in conjunction with core aeration, should help the stand of grass.

Is this a technique to be used on the entire golf course? Probably not. However, if you have a handful of problem areas with hard, poor soil, try using composts. This may be a useful technique to improve your problem soils and develop a quality stand of grass on these perennial problem spots.

STANLEY ZONTEK is Director of the USGA Green Section Mid-Atlantic Region. Contributors: JOHN HALEY, superintendent at Chartwell C.C., Annapolis, Maryland; MARCUS HOLMES, superintendent at Pleasant Valley G.C., Chantilly, Virginia; MARK SILVA, CGCS at the C.C. of Virginia, Richmond, Virginia; RAY VIERA, superintendent at Four Streams G.C., Beallsville, Maryland.

CURB THOSE CURVES

Golfers seem incapable of keeping all four tires of a cart on a winding path for any length of time, but well-placed cobblestone curbing can be a turf-saver.

by ROBERT VAVREK

A CART is a different kind of four-letter word to most superintendents. Yet it is not uncommon to find 50 or more rental carts at private and public courses across the North-Central Region. Turf wear and compaction from concentrated cart traffic often has a detrimental effect on course appearance and playability. Unfortunately, the damage is often concentrated in highly visible areas near greens or tees.

Motorized carts, however, are an important source of revenue for both private and public golf courses. Furthermore, the availability of power carts makes the golf course and the game accessible to golfers with a wider range of physical ability as compared to courses that require walking. In fact, it is virtually impossible to walk a round of golf at an increasing number of high-end resort courses that are being designed and routed for mandatory cart use.

The presence of a well-designed network of paved cart paths is a step in the right direction toward addressing the concerns associated with cart traffic. Golfers, though, just can't seem to keep all four tires on a meandering path — even a generous 8-foot-wide surface. Maybe it's the habit of never stopping on a highway, but instead

pulling off to the right and onto the berm. Maybe it's the fact that we know the shortest distance between two points is a straight line. In any event, the turf adjacent to paved cart paths takes a beating near greens, immediately adjacent to tees, and along the inside perimeters of any sharp turn in the path.

Well-placed curbing can reduce turf damage next to paths near greens and tees. Other options near greens and tees are to install a series of short wooden blocks or ropes/stakes to deter the "one tire off the path" pattern of damage that plagues most courses. Curbing an entire cart path, though, is not practical. An effective substitute for traditional curbing along a sharp curve in a path is cobblestone.

A number of superintendents have fine-tuned techniques for installing a slightly raised cobblestone-type berm immediately adjacent to a path using various sizes of fieldstone or paving bricks. A common denominator among these techniques is to excavate the worn compacted area near the path and then install a base of sand or crushed limestone to a depth of approximately 1 inch to support the stones. The tricky, tedious phase of the procedure is the handwork of filling in the narrow spaces between the stones

using sand, soil, or crushed limestone. Limestone and soil are more difficult to work with than dry sand, but the finished product is more stable. The crushed limestone sets up well and practically cements the stones together. The advantage of using soil is that the spaces between the stones can support grass growth and further blend the curbing into the surrounding terrain.

Cobblestone curbing has enjoyed the most success at high-end resort courses, where appearance is just as important as playability. These courses typically depend on cart revenue as an important source of income. Consequently, most of these courses possess a continuous paved path to ensure cart revenues during wet weather.

Make no mistake about it; the process of installing cobblestone curbing is a time-consuming, labor-intensive operation. Similar to building a stone wall, laying out just the right mosaic of stone is more of an art than a science. If the curbing is installed with care the first time, it will last many years and provide an effective barrier to carts without impeding mowing equipment.

BOB VAVREK has tried to straighten out the curves of golf course maintenance at courses across the North-Central Region for 10 years.



Turf immediately adjacent to a paved path oftentimes suffers from cart damage. A cobblestone berm is an effective alternative to standard curbing along areas of a paved surface where golfers cause damage when pulling their carts off of the path.

Spikeless Golf Shoes — Avoiding A Slip-Up

Ideas for improving the traction of spikeless golf shoes.

by PATRICK GROSS

SPIKE MARKS on greens? It has been a long time since golfers moaned about spike marks now that spikeless golf shoes are commonplace at many golf courses. The move to spikeless golf shoes was one of the most beneficial and controversial changes for golf courses during the 1990s. This move away from steel spikes has improved golf in many ways, including:

- Smoother greens.
- Less wear on clubhouse carpets and golf cart flooring.
- Improved golfer comfort.
- Better traction and safety on concrete surfaces.

As with any new concept, it often takes a few years to understand the lasting benefits and get a better handle on the negatives. For spikeless golf shoes, some of the major concerns include:

- Grass accumulation on the bottom of the shoes, which contributes to slipping.
- Slipping on wood surfaces.
- Less traction on steep, wet slopes.
- For a small percentage of golf courses, the spikeless shoes leave indentations that detract from putting quality and surface smoothness.

No matter what kind of golf shoes you wear, there is the potential to slip and fall. At this time, no shoe companies are willing to give a 100% guarantee that you will not slip anywhere on the golf course because there is such a wide variety of terrain and conditions. To avoid liability, superintendents and course officials must take a close look at their golf course and



Approximately 5% to 10% of golf courses experience damage or pronounced indentations as a result of spikeless shoes. Since there are dozens of different types of spikeless shoes, it is unfair to assume that all models are automatically better for the turf.





Spike brushes mounted on a ball washer stand or placed directly on the ground next to tee markers is a popular idea to allow golfers to remove accumulated grass clippings for better traction.



One drawback of spikeless golf shoes is the lack of traction on wood surfaces such as railroad tie steps and bridges. Various types of coverings can be used, such as rubber mats, to improve traction.

implement appropriate safety precautions to avoid slip-and-fall accidents. Here are a few good ideas to avoid slip-ups with spikeless golf shoes:

Brushes: Spike brushes are very popular, especially on tees, to remove grass from the bottom of shoes. The spike brushes can be placed on ball washer stands or directly on the ground next to the movable tee markers.

Rubber Mats: Various styles of rubber mats can be placed on top of concrete or wood surfaces to improve traction. The main concern is railroad tie steps or paths next to tees and greens. Some superintendents have had success contacting local manufacturing plants and purchasing used conveyor belts that can be cut up and used on top of railroad tie steps or wood bridges. There also are composite rubber paving squares and many other styles of rubber mats that can be used effectively.

Alternate Paving Materials: A number of different materials can be used for walkways or paths where traction is a concern, including crushed rock, decomposed granite, or other locally available road base materials.

Compressed-Air Cleaning Stations: An air compressor with a retractable

hose and pressure nozzle is another popular idea to clean shoes, especially near the clubhouse and at the entrance to the locker rooms. Be sure to adjust the air pressure so that grass clippings do not rebound and hit someone in the face.

Finally, there are some negatives about spikeless shoes regarding playing quality. Approximately 5% to 10% of golf courses experience damage or pronounced indentations on greens as a result of spikeless shoes. The damage seems to be worse on wet, thatchy greens, but much of the problem stems from the fact that there are dozens of different types of spikeless shoes. It is not fair to assume that all spikeless shoes are automatically better for turf. Research on this topic is just beginning, and hopefully there will be more to come. In the meantime, superintendents and course officials should take a careful look at their golf courses and implement some of these tips or some of their own creative solutions to avoid any slip-ups with spikeless golf shoes.

PAT GROSS helps golf course superintendents avoid slipping as the Director of the USGA Green Section Southwest Region.

Burning the Candle At Both Ends

High temperatures and low cutting heights lead to a dead end!

by BINGRU HUANG, Ph.D; XIAOZHONG LIU; JACK FRY, Ph.D.; and MICHAEL P. KENNA, Ph.D.

CREEPING BENTGRASS grows vigorously when air and soil temperatures are within its preferred range. During July and August, when temperatures increase to 90°F or higher, new root production slows, many roots die, and the turf canopy may thin and turn brown. This decline in quality is a primary concern of golf course superintendents in the southern and transition zone states.

The researchers at Kansas State University have conducted a series of experiments over two years that have documented the effect of temperature and cutting height on the physiology of Penncross creeping bentgrass.

Temperature

Figure 1 describes the relationship between temperature and carbon dioxide (either fixed by photosynthesis or consumed by respiration). Photosynthesis is the measure of the amount of energy, or food, that the bentgrass plant produces from sunlight. At low temperatures, the bentgrass plant is capable of producing an adequate amount of energy or food. However, as the temperature increases, photosynthesis declines, and the amount of energy available for vital life functions continues to decrease.

The surprising result from the Kansas State University research is that the respiration rate, or the amount of energy consumed by the plant, increases as soil temperature increases. This leads to the dilemma of “burning the candle at both ends” because the leaves produce less energy while the plant demands even higher amounts. Ultimately, this can lead to a total collapse of the biological processes in the bentgrass plant.

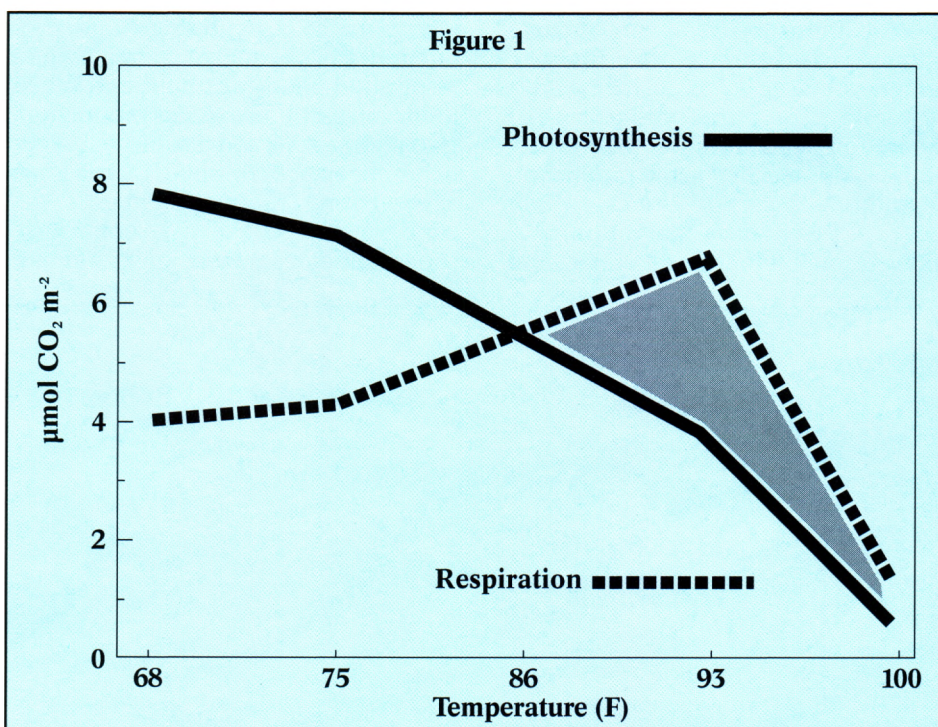
Effect of Summer Temperature

To illustrate what happens during the summer, photosynthesis and respiration are graphed in Figure 2. Photosynthesis in the leaves is the amount of energy, or carbon dioxide, that the plant fixes into food for respiration. In June, everything is going along smoothly when temperatures are below 90°F. However, in July, the temperature begins to warm and photosynthesis

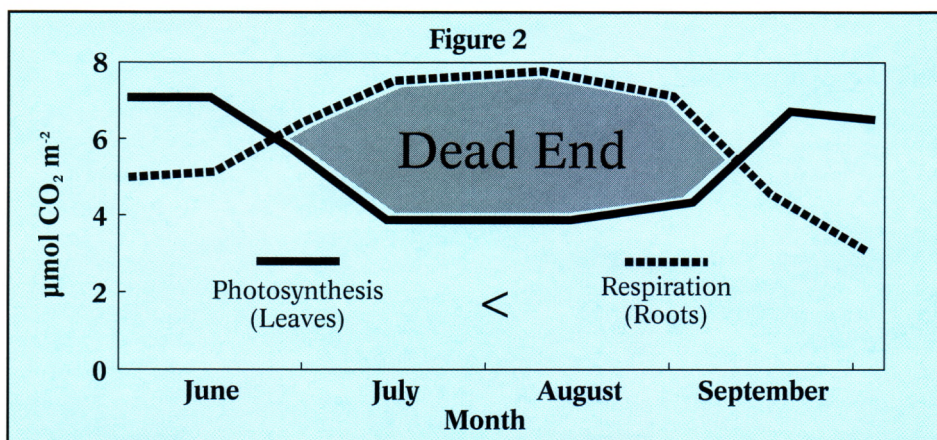
starts to decrease. This lower rate of photosynthesis continues throughout the hotter months of July and August. Finally, in September, photosynthesis increases in response to lower temperatures.

In Figure 2, respiration, or energy consumption, is illustrated. In June, respiration is less than photosynthesis.

However, as temperature increases, respiration increases to a level higher than the amount of energy produced by photosynthesis. This continues throughout the summer months. Again, when temperatures cool in the fall, respiration returns to a level below photosynthesis. Unfortunately, there is a two-month period when the bent-



Food production (photosynthesis) decreases as temperature increases. However, food consumption (respiration) in the bentgrass roots increases as temperature increases. When food consumption exceeds food production, starvation results and bentgrass decline is inevitable.



There is a period during the summer months when food consumption (respiration) exceeds food production (photosynthesis). It is during this time that putting greens are most susceptible to other climatic stresses and disease.

grass plant uses more energy than it can produce. During this time putting greens are most susceptible to the other climatic stresses or disease.

Cutting Height

The cutting height of the putting green has a significant effect on bentgrass physiology during the summer. Figure 3 compares different cutting heights over the 1997 and 1998 summers. Regardless of cutting height, bentgrass photosynthesis declined to the lowest levels in July and August. However, turf cut at $\frac{1}{8}$ of an inch was more adversely affected than that cut at $\frac{5}{32}$ of an inch.

A $\frac{1}{8}$ of an inch cutting height reduced photosynthesis by removing a large amount of leaf surface area. In 1998, bentgrass cut at $\frac{5}{32}$ of an inch had a higher rate of photosynthesis than respiration, even during the hottest periods. This resulted in the production of additional carbohydrates, which prevented bentgrass starvation and allowed maintenance of shoot and

root growth. The results indicate that food consumption is much more likely to exceed food production during the summer months if the cutting height is less than $\frac{5}{32}$ of an inch.

Others have suggested that additional leaf tissue, under higher cutting heights, imposes additional stress on roots that supply the leaves with water and nutrients. However, the results presented in this article demonstrate that raising the cutting height by only $\frac{1}{32}$ inch during the summer had a significant positive effect on bentgrass physiology.

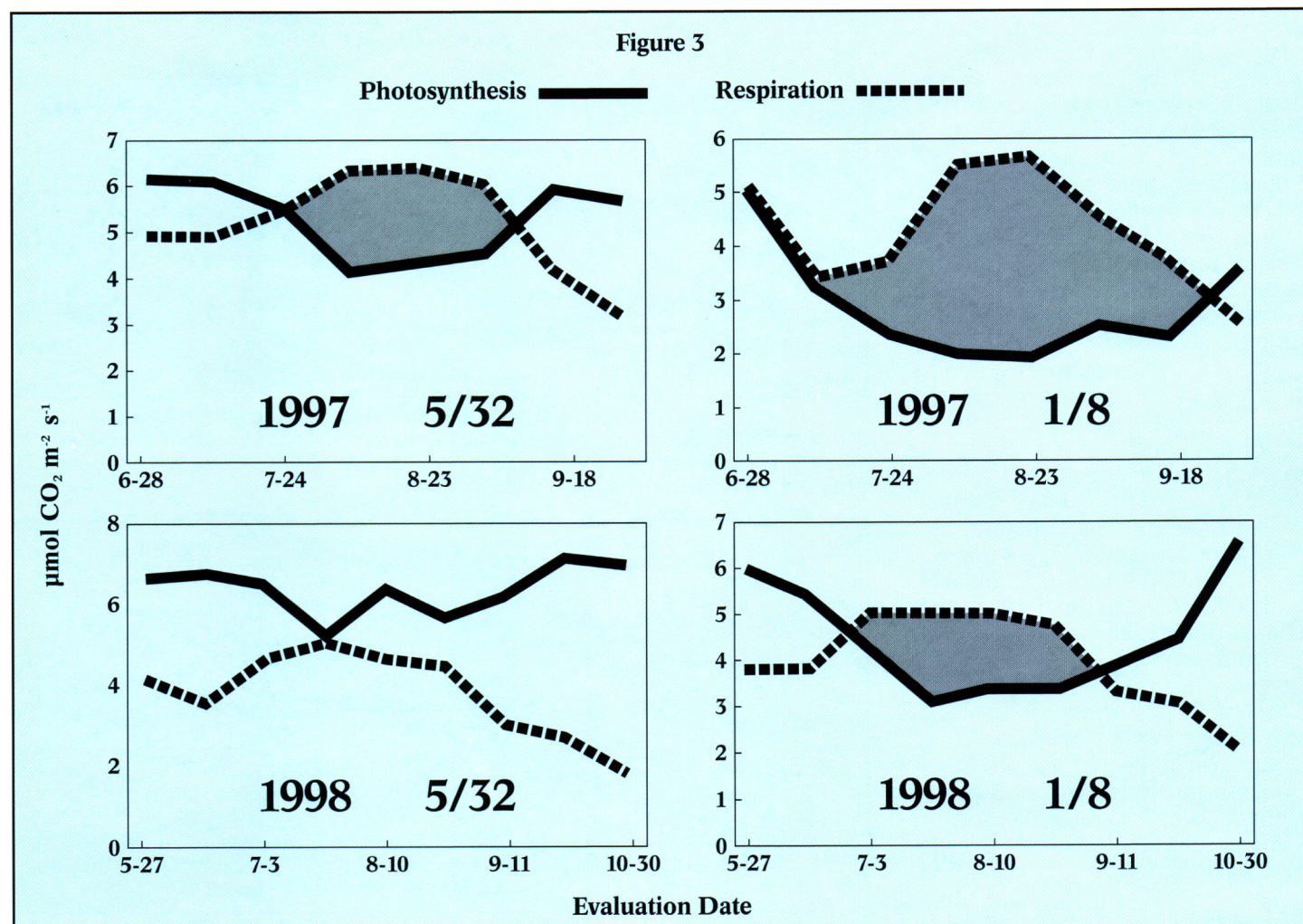
Conclusion

It is essential that all plants maintain a level of photosynthesis (food production) that is equal to or greater than respiration (food consumption). When food consumption exceeds production, starvation results and decline will occur if this imbalance continues for too long.

Preventing summer bentgrass decline remains a challenge to golf course superintendents where high summer

temperatures are common. Mowing at the highest acceptable height in mid-summer will allow bentgrass plants to maintain the needed balance between food production and consumption. If you are not doing so now, monitor soil surface temperature throughout the summer. Discuss with your golfers the need to increase food production (photosynthesis) by increasing cutting height when the soil surface temperature is greater than 90°F. Use this information to help explain that high temperature and low cutting height can lead to a dead end because the bentgrass plant is *burning the candle at both ends*.

BINGRU HUANG, Ph.D., is assistant professor of turfgrass stress physiology, XIAOZHONG LIU is a graduate research assistant, and JACK FRY, Ph.D., is associate professor of turfgrass science in the Department of Horticulture, Forestry, and Recreation Resources at Kansas State University. MICHAEL P. KENNA, Ph.D., is research director for the USGA Green Section.



The results indicate that food consumption (respiration) is more likely to exceed food production (photosynthesis) during the summer months if the cutting height is less than $\frac{5}{32}$ of an inch.



Maintenance budgets are a significant contributor to the high cost of green fees. An example of an ethical issue, as well as prudent integrated pest management practices, is the overall wise and efficient use of budget resources. Using spot treatments versus overall blanket treatments makes more efficient use of maintenance budgets and reduces pesticide loading.

Purchasing New Products and Technologies: An Ethical and Common-Sense Approach

Advice for superintendents to determine if new products and technologies are for your golf course.

by **ROBERT N. CARROW**

STAYING on the cutting edge in the golf course superintendent's profession requires integrating new products and technologies into a sound turfgrass and golf course management program. The question is, "Which products and technologies are truly beneficial and cost-effective?"

In answering this question, golf course superintendents are confronted with two difficulties: (a) The turfgrass industry has attracted many companies and consultants offering new products, technologies, and services. A casual walk through the Golf Course Superintendents Association of America's (GCSAA) Trade Show reveals the immense scope of these offerings, and (b) many new products and technologies have very limited field/lab testing to validate their claims.

In this presentation, practical, step-wise guidelines are discussed concerning making wise decisions about purchasing new products/technologies for superintendents desiring to stay on the cutting edge of advancements in their profession. *Three ingredients for wise*

and successful decision making are: ethical decisions and actions, information, and common sense.

Ethical Decisions and Actions

What is "ethics"? "Ethics" is the discipline dealing with what is good or bad and with moral duty and obligation. It involves the moral principles or values that determine the conduct of an individual or a group. A code of ethics attempts to define an acceptable standard of conduct which is enforced by peer pressure, voluntary compliance, or law. Values can, therefore, direct a person's decision making and actions either by internal (character or inherent discipline to do right) or external (codes or laws with enforcement means or peer pressure) means. A profession, or society as a whole, functions best when the moral principles or values are understood and when individuals exercise the character or internal discipline to live moral lives.

Where does ethics impact my profession? Ethics enters into all relation-

ships, decisions, and actions arising from decisions. Consider, for example, the relationships common to golf course superintendents:

- Person-to-person relationships.
- Person to course officials and the course as a facility.
- Person to profession (professional conduct).
- Person to society, such as in the areas of environmental stewardship of water, wetlands, endangered species of plants or animals, water, and soil; the immediate golf course neighbors and community.
- Person to God (spiritual aspects).

As interaction occurs in these relationships, they can be governed by honesty, truth, and integrity or the opposite. In a recent request for education proposals for seminars, the GCSAA specifically addressed the need for more emphasis on ethics and values in the workplace. The "desired outcomes" of the course reveal the breadth and depth that ethics impacts the profession. Quoting from the GCSAA (2000):

“Take any commonplace remedy, give it a mysterious origin, advertise it with extravagant claims, and it will be purchased by the credulous. At present, the crop of grass-growing nostrums appears to be above normal!” — Drs. Piper and Oakley, *The Green Section Bulletin*, 1922

1. *Identify and integrate* personal and professional *values and ethics* into daily activities.

2. *Create ethical guidelines and values* for the golf facility.

3. *Communicate golf facility ethics and values* and help others understand them.

4. *Demonstrate ethical problem-solving abilities* by tying decisions to the values and goals of the golf facility.

5. *Ensure that appropriate legal and ethical interests* are considered in all decisions.

6. *Review the decisions and activities of your staff* to ensure they are parallel to the values and ethics of the golf facility.

7. *Demonstrate acceptance* of diverse opinions and values.

8. *Act in a fair and ethical manner.*

Ethics and purchasing new products/technologies. As noted earlier, specific science-based information is often limited or lacking for many new products/technologies. Substituted for testing and evaluation may be manufacturer claims, testimonials, and pseudoscience (claiming a product can theoretically provide a response while knowing that the magnitude is very small, or providing “selected” data to

support a claim while withholding data that proves otherwise). The issue of how to obtain useful information is dealt with in the next section. The ethical point is that golf club officials *assume* that the golf course superintendent is making *science-based decisions* on new products/technologies when spending their money. Even when a superintendent is basing the justification for purchasing a new product/technology solely on a manufacturer’s claims, club financial officials assume that the superintendent, as the resident expert, agrees with the claims because of a science-based expertise.

If a new product seems to have potential to address a problem but adequate information is lacking, it is very acceptable for a golf course superintendent to purchase some product at a reasonable cost for a trial. However, some products or technologies can cost \$10,000 to \$50,000 just to “try out” due to the hardware expenses. A good example is water treatment technology. There are specific reasons supported by science to treat irrigation water — if the reason/problem exists (Carrow et al., 1999). However, it is not unusual to find different types of water treatment apparatus present on a golf course

where the water quality is such that treatment is not needed. Also, new water treatment techniques seem to appear each year without data to support their usefulness in golf course irrigation situations. Thus, expending large amounts of club funds for testing a new technology is an ethical issue when the decision is based on “I hope” rather than “I know” and the club bears the total cost if the technology fails to perform according to prior claims. Another example of an ethical issue is the overall wise and efficient use of budget resources. Golf course maintenance budgets can often be made more efficient while not sacrificing quality. Maintenance budgets are a significant contributor to the high cost of green fees.

Information — True and Unbiased

To ensure high ethical standards, golf course superintendents can take three actions: (1) demand high ethical standards from themselves, (2) insist on a high ethical standards of conduct by the staff under their direction, and (3) require product/technology/consultant providers to adhere to an acceptable ethical standard. This latter aspect requires that providers respect the golf course superintendent’s need for *truth-based information*. It is not a question of whether good, science-based information can be provided (unless the product does not do what is claimed), but a question of whether it is demanded. If a product or technology is able to significantly prevent or correct a specific turfgrass management problem, then this is a scientifically testable claim. Thus, it is not unreasonable for a purchaser to request valid, unbiased data to be provided. To insure that “good information” is provided, golf course superintendents are encouraged to ask themselves seven questions (Table 1).

1. Is this product needed in my situation? The turfgrass plant is exposed to many stresses (climate, soil physical/chemical/biological, pests, traffic). All cultural practices except mowing are done to prevent or correct a particular stress. Thus, a new product or technology should help address a specific



Improving cultural practices and drainage is a good first step to solving black layer, a common symptom of a serious soil physical problem.

problem on the turfgrass site or it is not needed.

Sometimes a product is not necessary because it is already present in the soil or plant. For example, humic acid or humate products most consistently cause positive responses (from micro-nutrients, growth stimulants/hormones) when applied to sites with very little organic matter (O.M.) such as during grow-in of greens or in hot climates that decompose much of the inherent O.M. However, on areas with even 1% or 2% O.M. by weight, responses are often non-existent or limited because 35% to 40% of the existing O.M. is classified as humic acids. Similar situations often exist when microorganism (M.O.) inoculations are used to enhance M.O. populations. The high O.M. production, nutrient-rich, well-irrigated environment of many turf areas already supports large M.O. populations. If soil or climate conditions are unfavorable to sustain inherent populations, added M.O. cannot be sustained, either.

It is also questionable whether a product is needed if the manufacturer will not list the active ingredient on the label. Proprietary materials can be protected by patents, which are public documents. Sometimes the term proprietary is used to justify not listing what a material is because it is a material that others could easily market — possibly at a more competitive price. It is always amazing to read detailed product literature claiming many benefits, but the material is never identified or else identified in general terms.

2. Are there better “alternatives”?

Two examples will suffice to illustrate this question. When alkaline soil conditions are present (i.e., pH>7.0), a pH reduction program could be initiated using S compounds to acidify the soil. Even if free CaCO₃ is not present in the soil and, therefore, acidification is possible, it is often less expensive to simply apply somewhat more Fe, Mn, or P, since high pH causes few problems except these nutrient deficiencies. Or, in the case of acidifying irrigation water (which requires considerable hardware expense), to prevent the “potential” for calcite sealing of sand greens over time, it is unreasonable to treat water over the whole course for a problem restricted to the greens. Also, routine cultivation and granular S materials can effectively alleviate this physical problem at much less expense (Carrow et al, 1999).

3. Is the positive response due to the “active ingredient” or to an added

material? It is not unusual for N, Fe, or colorants to be added to various soil amendments, or even some fungicides, to provide a “greening” effect that implies a growth response from the product. One could wonder why these are needed if the product does what is claimed. Certainly a turf manager would not want to pay a high cost for a product whose only response came from small quantities of relatively inexpensive N, Fe, or colorants rather than the advertised “active ingredient.”

These are situations where Fe or N is added intentionally to enhance product performance. Foliar Fe products often provide a greater degree of greening when applied in conjunction with a small quantity of water-soluble N. Also, cytokinin materials often benefit from added Fe, which causes a greater greening response, while the cytokinin gives a longer-term effect. In these



High salinity and sodium levels can contribute to soil physical problems. Your USGA agronomist can assist with decisions regarding the latest science-based information involving soil amendments and water treatment options.

Table 1

Questions to Ask About a New Product/Technology

1. Is the product *needed*?
2. Are there better *alternatives*?
3. Is the positive response from the product or an *added material*?
4. What about *magnitude, duration, and consistency of response*?
5. Are valid, unbiased *test results* available?
6. Should I try this on a *trial area or basis*?
7. Do the *benefits* justify the *costs*?

situations, scientific data exist to support a synergetic response.

4. How important is the response?

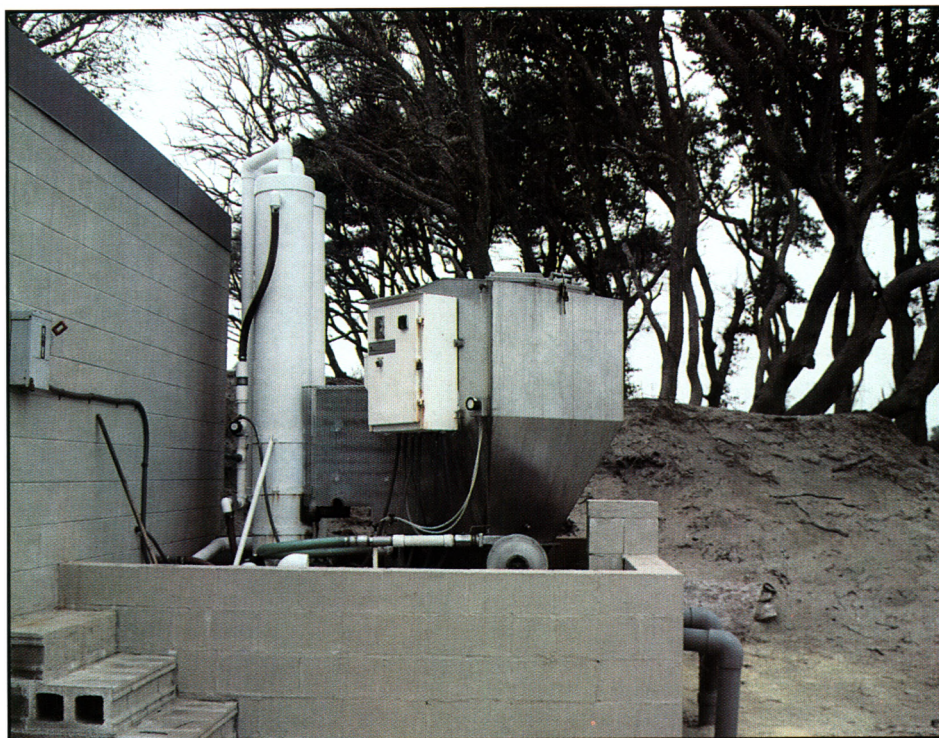
Every soil amendment has the “potential” to influence all soil properties — physical, chemical, or biotic. Altering one factor has a “ripple effect” on all others. Thus, soil amendments (whether physical, chemical, or biotic) are sometimes advertised to improve a wide variety of properties — improve soil structure, increase soil aeration, enhance soil M.O. activity, etc. These statements are “theoretically” true, but even with careful scientific measurements the practical importance of the claimed responses is often very small or not measurable.

To illustrate this point, one could add some water or N to a turfgrass system. The water can “stimulate M.O. activity,” “improve soil physical properties (i.e., water in the soil is a soil physical characteristic), and “increase nutrient availability.” Added N could stimulate M.O. activity, thereby enhancing structure development while improving soil chemical properties. Thus, one could sell bottled water or NH₄NO₃ fertilizer as a “soil amendment” and make a wide variety of general claims about improving soil physical, chemical, and biological properties.

The important question is not whether a “theoretical” response can occur, but instead is the *magnitude, duration, and consistency of the response* of practical importance to justify the expense.

- **Magnitude:** Is the response great enough to be important, or so small that it does not justify the expense and time?

- **Duration:** Does the response last long enough to be important?



Water treatment technology, such as the sulfur generator, has been used successfully in agriculture for decades. A thorough evaluation of the problem should be conducted before investing the considerable amount of money needed for this technology.

• **Consistency:** Do I get the same response all the time or only once in a while?

5. Are valid, unbiased “test results” available? If only unsubstantiated manufacturer claims and testimonials are available to support a product, then it becomes a “buyer beware” situation. Sometimes testing is conducted but the results are mixed. It is important to see the full set of unbiased results and not just the positive data for a fair evaluation. Scientific results from universities, unbiased private laboratories, or unbiased consultants are the best protection from false claims, but individuals testing products must be careful to be ethical in reporting results. The reporting of full results is often difficult for university researchers since there aren’t many publication outlets for negative or no-response data. They may provide a company with the full data set, but a company may misrepresent the data by selecting only positive data. This can be countered by honest verbal presentations by researchers at conferences or written reports in local (in-state) publications.

A good technique to use, especially for high-dollar items, is to ask, “Will you put in writing exactly what this product will do in my situation and why that response occurs? Then, please supply me with independent

data and its source to support the claims.”

6. Should I try this item on a trial area or basis? Many times a small expenditure will obtain sufficient product to test on a trial area, and this is a good means of evaluating the material. However, as noted previously, expenditures of relatively high-dollar amounts to “test” a product or technology are inappropriate unless club members are fully aware that they are the testing facility and funding source for testing. When conducting a trial, be sure to include proper scientific technique.

- Have a control (check).
- Have replications.
- Randomize.
- Determine ahead of time what you specifically expect based on product claims. Do these occur?

7. Do the “benefits” justify the costs? The “bottom line” is whether benefits to a golf facility justify the cost. A sobering question that will reveal true feelings is to ask yourself, “Would I purchase this product or technology with money from my personal bank account if I were the owner?”

Common Sense

In addition to basing purchasing decisions on an ethical and information basis, plain common sense is

important. A few common-sense statements illustrate this point.

- The foundation of all excellent golf facilities is solid, basic turfgrass management. This starts with priority attention given to the basics — good fertilization, irrigation, mowing, pest control, and cultivation programs. The “extra 5% or 10%” enhancement in quality from incorporation of new products or technologies cannot compensate for the missing 90% from good “basics.”

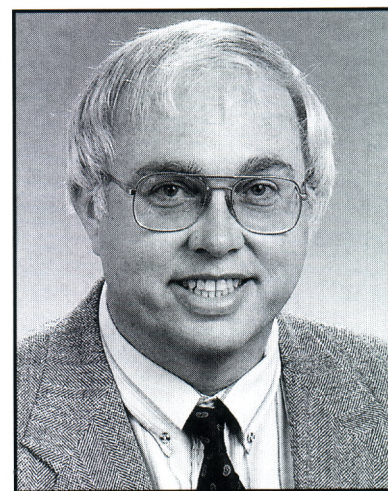
- There is no “silver bullet” product or technology that will come along and solve all or most of your problems. Thus, do not respond to “silver bullet” claims or testimonials. The nearest to a silver bullet in the turfgrass system is a good golf course superintendent. The nearest to silver-bullet products are water and N.

- If it sounds too good to be true, then most likely it is not true.

In summary, all of our decisions and actions are, in reality, based on ethics. Ethical decisions and actions are made on a foundation of truth and right. This requires a high level of good information and a common-sense approach. The results of these ingredients are wise decision-making and more affordable golf.

Reference

Carrow, R. N., R. R. Duncan, and M. Huck. 1999. Treating the cause, not the symptoms — irrigation water treatment for better infiltration. USGA Green Section Record 37(6):11-15.



DR. ROBERT N. CARROW, turfgrass research scientist/professor at the University of Georgia - Griffin Station, is also a Fellow of the American Society of Agronomy and Vice-President of the International Turfgrass Society. His peers hold him in high esteem for his ethical standards.

Sometimes Drainage Can Be Boring

A technique new to golf courses that can help keep water moving.

by PAUL VERMEULEN

NOT ALL PUTTING greens have been created equal. Some were built using exacting specifications to ensure excellent drainage and optimum turf performance, while others were built with heavy soils and consequently have problems. The most common problem with soil greens is poor drainage that jeopardizes the survival of the turf during periods of heavy rainfall.

When faced with the challenge of greens that drain poorly, most superintendents would prefer to discuss complete reconstruction. Due to overriding circumstances, however, there are many cases where this option is not immediately available. For example, a green may have beloved architectural characteristics that the golfers fear will somehow be lost if reconstructed, or a green would otherwise be fine if it were not for stagnant water standing in the cup following a downpour.

For the small number of greens that drain poorly and are questionable candidates for complete reconstruction, specialized drainpipe can be installed by using horizontal boring technology. This technology has a wide range of applications and is somewhat familiar to many because it is used to install utilities under existing roadways. The clear advantage to using horizontal boring technology to install drainpipe underneath soil greens is that it involves absolutely no putting surface disruption whatsoever.

Daniel Dinelli, superintendent of North Shore Country Club, in Glenview, Illinois, was the first to take advantage of horizontal boring technology for installing putting green drainpipe. After being denied membership approval to rebuild the older greens that had developed chronic drainage problems, he knew that he had to look elsewhere for a meaningful solution to his situation. If he could not improve the drainage characteristics of



After several lateral drain pipes have been pulled underneath the ground by a boring machine, they must be connected to a mainline that allows excess moisture to escape from the green. Connecting the drain pipe to a main line requires digging a narrow trench off to the side of the green, where the disruption will have little impact on play.

the old greens, it was certain that the turf would forever suffer during the summer months.

The first option investigated by Mr. Dinelli was to dig trenches in the old greens and install standard perforated drainpipe. This option has gained great popularity across the country due in large part to the successes at many well-known courses. In fact, there are even several golf course construction contractors who have special expertise in this method of drainpipe installation and are capable of completing the work on putting greens with minimal scarring.

With the looming prospect of digging trenches in the older greens, though, Dan turned his attention to the second option of using horizontal boring technology. The only unsettling aspects of this second option were that it would require working with a contractor with no golf course experience and adapting specialized pipe used to pump air up through soils contaminated with petroleum or other hazardous materials. Basically, the entire operation would require boring 2"-diameter circular passageways 18"

below the surface of the green and then pulling the PVC pipe with small slits cut into the sidewalls back through the openings. The operation was deemed a success upon completion with only a small hole dug approximately 20 feet in front of the green where the four PVC drainpipes could be connected to a mainline running off to the side of the fairway.

To maximize the efficacy of the specialized drainpipe, Dan also worked with David Potts, president of Soil Air Technology. By attaching a vacuum pump to the main line, most of the excess moisture trapped in the heavy soil used to build the green now can be evacuated in one to two hours after a rainstorm. In essence, the vacuum has increased the saturated hydraulic conductivity reading for the green from 1.5" per hour to 3.5" per hour.

An additional possible benefit realized from the use of a vacuum on the main line is that the CO₂ level in the soil can be lowered throughout the profile of the green. This finding may well prove to be relevant at some later date, assuming that overall turf vigor is related to the concentration of various gases in the root zone. At the very least, the alteration of the CO₂ level illustrates that the vacuum has an effect several feet outward from each of the drainpipes.

For additional information on the use of horizontal boring technology, contact Daniel Dinelli or David Potts. As of the writing of this Turf Tip, a patent for the process of installing the specialized pipe underneath a putting green for the sake of improving sub-surface drainage was being pursued.

PAUL VERMEULEN focuses his efforts in Arkansas, Illinois, Iowa, Kansas, Missouri, and Nebraska as the Director of the great Mid-Continent Region.

Is It Or Isn't It?

Using a quick method to identify pink snow mold.

by KEITH HAPP



In some cases disease samples don't need to be shipped to a diagnostic laboratory for identification. The University of Massachusetts Diagnostic Laboratory has observed that under the proper conditions many pink snow mold samples can be easily diagnosed by golf course superintendents themselves.

IT HAS LONG been taught that managing turfgrass disease revolves around accurate and timely diagnosis so that preventative or curative measures can be implemented. Although many turf managers utilize preventative disease control strategies, a great many employ an integrated approach to disease management. In either case, field diagnosis remains essential so that control measures are effective and efficient.

Imagine walking onto the course after a long winter and seeing unfamiliar discoloration on the greens. All precautionary measures were implemented prior to winter weather, so it is even more puzzling as to what could be attacking the turf. The discoloration is exhibited in all sizes and shapes and appears to be moving toward low-lying areas of the greens. The color of the infected turf ranges from chlorotic yellow to greasy brown/orange. To further compound the issue, there are no visible signs that would help identify the pest problem. To address the problem, a diagnosis must be made rapidly so that further damage can be minimized.

Managing golf course turf involves managing problems proactively before visual signs of damage or decline become evident. Arguably, a major component of course preparation is pest control, particularly disease control. Organisms that can wreak havoc must be controlled in order to provide healthy turf that offers the best playing conditions.

Each spring an easily misdiagnosed disease attacks putting green turf throughout much of the northern United States. Pink snow mold (*Microdochium nivale*, also known as fusarium patch) has become a problem primarily due to the fact that it is commonly misdiagnosed as cool-season phythium. The symptoms and signs of a disease help distinguish it from others, but unfortunately signs are not always visible and symptoms can be confusing. This is particularly true for pink snow mold in its early stages of development. Not all superintendents own or have access to a microscope to examine the signs an organism expresses, so when problems do arise, samples often are sent to a university or independent diagnostic lab for identification. Although a definitive diagnosis can be achieved, there is an element of time involved before results can be returned.

Dr. Gail L. Schumann directs the activities of the disease diagnostic laboratory at the University of Massachusetts. She receives samples in all shapes and sizes. During the spring, samples from Massachusetts and adjoining states roll in and one of the most common samples submitted is pink snow mold. During cloudy, cool, wet spring weather, this disease can proliferate rapidly and can be streaked onto unaffected areas by mowing or other traffic, similar to the destructive way hot weather phythium blight can be experienced. This is due primarily to the fact that the residual effects of the

fungicide applied the previous fall have been exhausted. In many northern areas of the United States, weather conditions can allow pink snow mold to remain active well into the month of June. In fact, pink snow mold activity has been diagnosed by university laboratories during 11 months of a calendar year.

Dr. Schumann observed that by the time pink snow mold samples arrived at the laboratory they would often exhibit clear signs of the disease. During the time it took to package and ship the sample to the lab, mycelium would grow. The signs of the disease are expressed when a cool and damp environment is provided. This observation led to Dr. Schumann's turf tip for rapid diagnosis of the problem. She suggests the following:

- First, sample the infected sites so as to obtain a continuum of disease symptoms.

- Second, wrap the sample in a moist paper towel or lightly sprinkle a little water on the turf surface. This will simulate an extended period of leaf wetness similar to prolonged periods of dew.

- Finally, insert the sample into a plastic bag and place it in a cool, shaded area of the maintenance facility. An interior corner of the maintenance building will work well. The plastic bag should be closed securely, but a 1" to 2" air space should be maintained.

In as little as 24 hours, signs of the disease will be expressed. Initially, mycelium growth will be white. This is due to the lack of sunlight exposure. However, with sunlight exposure mycelium growth will develop a pinkish color, thus offering more classic features for diagnosis. Most importantly, the mycelia will distinguish the problem from cool-season phythium, a root rot disease that does not produce such surface growth. A certain diagnosis requires observation of the spores of the fungus with a microscope.

Naturally, not all turf diseases can be diagnosed this way. However, this method provides a means to further support an initial diagnosis of pink snow mold, leading to effective control of the problem. If you're confused about this disease and would like to confirm a suspicion, give this strategy a try.

KEITH HAPP uses all kinds of methods to identify and treat all kinds of turf problems as an agronomist in the Green Section's Mid-Atlantic Region.

PUTTING OUT THE FIRE

A hose system used to get water out fast.

by JIM SKORULSKI

NEEED A WAY to apply water quickly? Sick of lugging 50 feet of hose behind a golf cart? Tired of golfer complaints, scorn, and ridicule? Worried about having enough bodies around on the weekend, or maybe your automatic irrigation system just doesn't cut the mustard? Well, have we got a deal for you!

Actually, the deal is a simple, manual means of syringing the golf course quickly and with minimal disruption to play — guerrilla warfare, if you will, in the battle against wilt. Joe Charbonneau, CGCS, Gleneagles Golf Club in Manchester Village, Vermont, introduced the concept to me. Mr. Charbonneau credits the original idea to Dave Clement, CGCS, who recently retired from Framingham Country Club in Framingham, Massachusetts. It is a simple, inexpensive hose system that can be fabricated from materials that are already available in your shop or a short trip away at your local plumbing supply store.

Mr. Clement's short hose system consists of a 5' to 6' length of $\frac{3}{4}$ " hose attached to a quick coupler, a 6" piece of threaded $\frac{3}{4}$ "-diameter galvanized pipe, a $\frac{3}{4}$ " galvanized reducing coupler, and a nylon insert fitting. The reducer fittings range in size from $\frac{3}{8}$ " to $\frac{1}{2}$ " in diameter. The nozzle is constructed by clamping the 6" piece of pipe to the hose. The nylon fitting is screwed into the reducing coupler, which then screws onto the $\frac{3}{4}$ " pipe. Tighten the nylon insert and coupler with a crescent wrench and you're in business.

The nylon inserts are easily interchangeable in the field, depending on the application desired. Another nozzle option is a $\frac{3}{4}$ " PVC insert reducing coupler attached directly to the hose. Mr. Charbonneau uses a 1"-diameter hose of the same length. A $\frac{3}{4}$ "-diameter aerification tine serves as the nozzle, attached directly to the hose with a clamp. Both short hoses will throw water 60 to 70 feet.

The short hose is light and non-cumbersome. There are no long hoses to drag or transport, speeding up the process and making it easier to move

amongst play. Simply pull up next to the snap valve, connect the hose system, hold on tight, and you're ready to go. An average-sized green can be syringed in a minute or less, often from a single snap valve.

Mr. Clement also uses the hose system, equipped with a $\frac{1}{4}$ " or $\frac{3}{8}$ " nylon insert fitting, to quickly remove pine needles and other debris from the surface of the greens. He does this by holding the hose just off the surface of the green, allowing the water to spray parallel across the surface. The force of the water blows the debris and most of the water off the surface without all

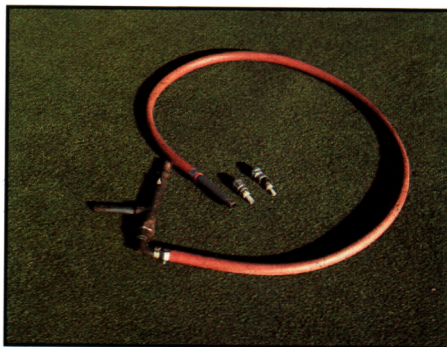
the noise and work associated with traditional blowers.

The short hose is not the answer for more precise hand watering and syringing operations, and it could be misused if placed in the wrong hands. However, if you find yourself up against the wall and need to get a lot of water out fast, then this hose system may just be the weapon for those summer battles.

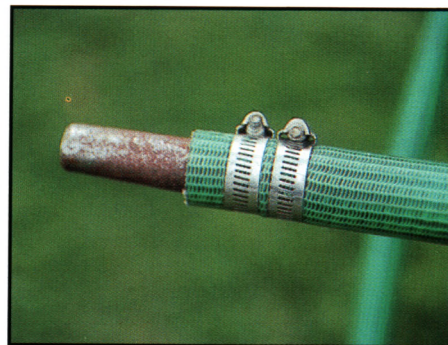
JIM SKORULSKI is an agronomist in the Northeast Region, where he visits golf courses in upstate New York and New England.



Dave Clement uses the short hose system as a simple means of syringing the golf course greens quickly with minimal disruption to play.



Left: The hose system consists of a 6-foot length of $\frac{3}{4}$ - or 1-inch hose attached to a quick coupler. The nozzle can be made with reducing couplers and nylon reducing inserts as shown or with a $\frac{3}{4}$ -inch aerification tine clamped directly to the hose. Right: A $\frac{3}{4}$ -inch hollow tine clamped directly to the hose works well as a nozzle.



"Once You Get 'em, You Gotta Keep 'em"

Obtaining and then keeping labor to the end of the season can be challenging.

by DAVID A. OATIS

FOR THE PAST several years, the economy has been strong and golf has enjoyed a terrific boom. Lots of new courses have been built and many more are on the drawing board. Our existing courses are enjoying increased popularity, too, and money in the form of capital improvement programs is flowing into our courses at an unprecedented pace. Renovation and maintenance budgets have increased across the board, and many courses are finding themselves in the enviable position of being able to tackle expensive improvement projects that once were thought impossible. Life is good in the game of golf, and for those in the business this has been a very interesting period. It would seem that there could be little to complain about during this golf boom.

Despite these obvious positives, I still hear golfers and course superintendents occasionally complain. Golfer complaints don't seem to vary much over the years, and perhaps the same can be said of superintendents. Unquestionably, the single most common complaint in recent years has been

labor, or rather the lack or quality of it. The story is the same at just about every course I visit: no one seems to have enough labor, and everyone is having difficulty keeping good staff. In fact, this problem is also affecting many other industries, and laborers can now afford to pick and choose among various employment opportunities. This year's Turf Tip may help you solve part of that problem.

It comes from Chris Boyle of The Mendham Golf and Tennis Club in Mendham, N.J. Student laborers, mostly from college, have long been a valuable labor source for golf course maintenance programs. Once trained, they can provide reasonably cost-effective labor, which can be utilized to accomplish many of the required daily maintenance chores. But indeed it is a dark day, one dreaded by all superintendents and full-time staff members, when the "college kids" head back to school. The abrupt loss of labor often comes when the turf is weak, the workload heavy, and staff energy levels and morale are at seasonal lows. Perhaps the most difficult aspect of their

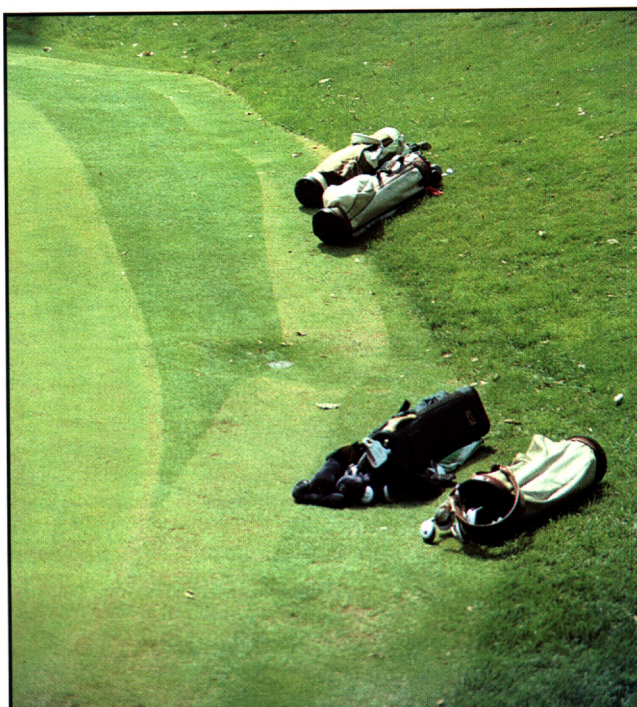
departure is when the college students leave a week or two before their agreed-upon termination dates. This can completely derail vital renovation programs. But who can blame them? After a summer of long hours and hard work, the prospect of going straight back to school without a vacation isn't very appealing. Thus, it is not surprising that many students decide, at the last minute, to leave a week or two early to cram in some carefree fun.

Superintendent Boyle has a simple and cost-effective method of eliminating, or at least greatly diminishing, this early departure problem. In researching this Turf Tip, I actually found it to be a common practice in some areas of the country, while completely unheard of in others. In fact, Mr. Boyle actually brought this idea to Mendham from another course where he was the assistant superintendent under Ed Walsh, CGCS.

In any event, the solution is to offer a bonus system based on the number of hours worked and the agreed-upon departure date. The course banks a small sum of money per hour worked (25-50 cents or perhaps one dollar should be sufficient) that is payable to the employee as a year-end bonus, *if the employee stays and works to the agreed-upon date*. Students leaving early forfeit the bonus. Assuming a 40-hour week and a total of 13 weeks, this amounts to a bonus of \$130 to \$520 paid in a lump sum, a welcome windfall for most students heading off to college. Chris reports it is usually sufficient to entice students to stay on and complete the terms of their employment agreement. So, if you are having trouble keeping your student labor force, give this idea a try. After all, "once you get 'em, you gotta keep 'em!"

DAVID OATIS joined the USGA Green Section in 1988 as an agronomist in the Mid-Atlantic Region and has been Director of the Northeast Region since March of 1990.

In the blink of an eye, even the lowliest person on the maintenance staff can bring the best maintenance program to its knees. Keeping an experienced labor staff until the end of the season will be worth the effort.



Making Golf More Affordable

Addressing issues that need to be considered by architects, builders, and golf course superintendents.

by JAMES F. MOORE



Large, highly maintained bunkers are beautiful — and very expensive to build and maintain. To keep construction and maintenance costs down, such bunkers should be kept to a minimum.

MANY OF US can remember Stanley Kubrick's tale *2001 — A Space Odyssey*. Periodically throughout the movie, a large, dark stone or monolith would appear to mark a critical moment in the history of mankind. While the movie may have dragged at times, those monoliths always got my attention.

It's too bad we don't have some sort of monolith to mark important events in the history of the game of golf — specifically in the history of golf course design, construction, and maintenance. Most of us can think of numerous times the dark, square stones would appear.

One of the first sightings would have occurred when science provided turf managers with effective tools to combat weeds, insects, and disease organisms that beforehand pretty much had their way with golf courses across the country.

The monolith would have reappeared when in-ground irrigation systems made it possible to have good turf in spite of dry spells, especially in parts of the country where dry spells extended for years rather than months. Other monolithic events would include the introduction of mechanically powered construction and mowing equipment

(putting the horse out to pasture), and the development of improved turfgrass varieties. And of course, the advent of formalized educational programs for turf managers would also be highlighted.

The most recent defining moment in the industry occurred when concerns arose over what impact golf courses had on the environment. Just like other major events in both the movie and our industry, there were individuals who were up for the challenges of change and those who were not. The most talented and professional architects, builders, and superintendents saw the



Extraordinarily large greens are obviously much more expensive to build. They are also more expensive to maintain, particularly when hand mowing is practiced. For most courses, greens need not be more than 5,000 square feet in area — assuming most of the area is suitable for hole locations.

environmental issue as an opportunity to display their skills. This was an opportunity to distinguish themselves from their peers. After all, if the job (whether it is design, construction, or maintenance) was always easy, anyone could do it. Such individuals profited greatly as a result of their ability to meet the difficult challenges of the environmental issues.

So what is the next industry-shaping event facing the game and business of golf? What is the next big opportunity for the talented to separate themselves from the pack? In my opinion, the next monolith would signify a return to *affordable golf*.

The growth in golf over the past ten years accompanied a favorable growth in our economy. As a result, many of today's golfers are willing to pay more than ever before to enjoy the game. It is not uncommon for a round of golf to cost more than \$100 on an upscale, daily-fee course. While this might be on the high end, fees on all types of golf courses have increased. These increases are a direct result of the increase in the cost of building and maintaining golf courses — neither of which show any indication of decreasing. While today's golfers apparently are willing to foot the bill, what happens when the economy is not so robust?

In addition, many of golf's newest players are coming from socio-economic groups that simply cannot afford to spend as much to enjoy the game.

Finally, our senior population, traditionally avid golfers, will grow even faster in the future thanks to better health and the impact of the baby boom generation. Although there is a real need for affordable golf now, the need will grow tremendously in the near future. Those professionals in the golf industry who recognize this need have both the opportunity and responsibility to help ensure the future of golf. What can architects, builders, and superintendents do to make golf more affordable?

Architects and Builders

Design features and construction techniques obviously have a tremendous impact on how much it costs to build a new golf course or renovate the existing facility. What often is given too little consideration is their impact on annual maintenance costs thereafter. Here are just a few of the ways architects and builders impact the cost of golf.

- **Site Selection:** A lack of good topsoil, poor quality water, and poor growing conditions as a result of limited light and air movement all result in significantly higher maintenance costs. Selecting a site or a design that requires extraordinary earth moving greatly increases the cost of construction. Moving 500,000 cubic yards of soil during construction was considered excessive only a few years ago. Today it is not uncommon to move more than 1,000,000 cubic yards.

- **Features:** Although bunkers and mounds are important features on any golf course, they are expensive to build and maintain. The costs skyrocket when both the number and severity of these features increase, and they have increased dramatically in modern golf course designs. It is not uncommon to include in excess of 70 bunkers on new courses. Thanks to large earth-moving equipment, many of these same courses sport prolific mounding on virtually every hole. Both types of features are often constructed with such steep slopes that machine maintenance is no longer practical. As a result, constant shoveling of sand is required to replace



Grassy bunkers or hollows require very little labor for proper care. In many cases, they are equally as challenging as sand bunkers.



Golf course superintendents manage increasingly larger numbers of employees and equipment. This, coupled with golfer demands for near perfection in terms of turf quality, results in rapidly increasing maintenance costs.

the sand that washes off the faces of the bunkers, and hand mowing and trimming are required to maintain the turf on the mounding. Increasing the necessity for hand labor is the fastest way to increase the cost of golf course maintenance.

- **Green Construction:** Greens are expensive to build, and every opportunity to reduce costs should be considered when building the affordable golf course. However, poorly built greens are much more expensive to maintain over the long run.

Well-built greens can be kept affordable by using some common sense. For example, very few courses are so heavily played that the greens must be in excess of 5,000 square feet to endure the traffic — assuming the surface contours are kept moderate enough to allow most of the surface to be used for hole locations. There is a trend to build massive greens of 7,000 square feet, and some are much larger. Given the cost of green construction per square foot and the cost of maintenance thereafter, unnecessarily large greens make golf much more expensive.

There also is a trend to incorporate very expensive inorganic amendments into the green rootzone mixture. Although these amendments do have some redeeming qualities, they simply cannot be justified in terms of cost. By selecting sands that meet scientifically proven guidelines, amending those sands (when necessary) with inexpensive organic matter, and utilizing agro-

nomic sound fertilization practices, there is no need for additional costly amendments.

Superintendents

I believe there has never been a time when golf course superintendents have played a more important role in the game of golf. The business of maintaining a golf course has become much more complex, requiring better-educated and more highly skilled turf managers. For the most part, today's superintendents have been up to the task. However, in my opinion, there are far too many superintendents who have lost sight of their primary mission — that being to protect the interests of their employers (ultimately the golfers).

In a recent *Golf Digest* article, Frank Hannigan quoted survey statistics gathered by the Golf Course Superintendents Association of America (GCSAA) regarding the increasing cost of golf course maintenance. These statistics indicated the average budget at 18-hole private clubs is now \$635,930, a 163% increase since 1992, while inflation has been 2% to 3% per year (*Golf Digest*, January 2000).

Such a large increase in the cost of golf course care is due to a combination of factors. First, golfers simply expect more. In the not-too-distant past, golfers were most concerned about the quality of their greens. Today, the most common complaint voiced to the USGA Green Section agronomists as they travel the country is that the

bunkers are inconsistent. Maintaining consistency in a hazard is expensive, particularly when you combine this need with the large numbers of bunkers on today's courses.

Secondly, everything costs more. With fairway mowers costing in excess of \$40,000, computerized spraying equipment as much as \$30,000, and even a walk-behind greens mower running more than \$3,000, it is no secret why maintenance budgets have jumped.

Of course the biggest factor is the cost of labor. Maintenance staffs often include the superintendent, one or more assistants, a chemical technician, an irrigation technician, a mechanic (who also might have an assistant), a horticulturist, and perhaps a secretary. Add to this list 15 to 20 laborers and equipment operators, and it is easy to see why many courses now employ as many as 30 people on the golf course maintenance staff. Labor alone often pushes the maintenance budget above the \$500,000 mark.

Superintendents also have a tremendous impact on the cost of golf by virtue of how they make their purchasing decisions. Like most technically oriented industries, there is no shortage of miracle products being touted to solve almost every problem in golf course maintenance. Invariably, these products have at least four things in common. First, they make fabulous claims which seldom, if ever, can be fully verified through unbiased scientific research. Second, in the absence of



More young people from widely varying backgrounds are being introduced to golf than ever before. They are truly the future of the game — assuming they have a place to play.



Soil moving is often the most expensive aspect of golf course construction. Deep cuts such as this require the movement of tremendous quantities of soil.

science, they rely on testimonials from turfgrass managers who have tried the product under uncontrolled conditions and are convinced it “has made the difference.” Third, the products have great websites, which are usually full of even more fabulous claims and testimonials.

Finally, the products are usually expensive and, in many cases, only marginally effective. Before lending the product their name and often the name of the golf course at which they are employed, professional superintendents should keep in mind that they have a responsibility not only to their employers, but also to other golf course superintendents, to be completely honest in their recommendations of any product. It is worth keeping the following quote in mind: “A wise man may be duped as well as a fool, but the fool publishes the triumph of the deceiver” (Charles Caleb Colton, Lacon 1825).

There are plenty of opportunities for the golf course superintendent to help make golf more affordable, especially if he receives the cooperation and support of the players.

- Concentrate available resources on those areas that most directly impact the play of the game. Almost every golf course has acres of area that seldom come into play on which maintenance can be greatly reduced. Reduce fertilization and irrigation, and before long you will be able to reduce mowing. True, in many cases the area will be less attractive in some people’s eyes, but significant savings can be realized in the process that can be passed on to golfers.

- Reduce costly hand labor as much as possible. The frequent mechanical trimming around lakes, bunkers, cart paths, and trees is tremendously expensive. Allowing buffer areas to grow around lakes not only reduces trimming, but it also helps to prevent runoff of chemical products from turf areas into water features.

- Consider a reduction in both the number of bunkers and the number of times the bunkers are raked. Daily raking is fine for those who can afford it, but for those golf courses anxious to keep green fees down, raking two or three times per week can save dollars. This does not mean the bunkers will be in poor condition — assuming that the golfers remember how to use a rake.

- Steep bunkers with sand flashed high on the faces are unquestionably beautiful — that is, when the sand is in the right place. Unfortunately, the sand moves off the faces in even a modest rain and subsequently must be hand shoveled back into place. It is not uncommon to find courses that spend far more labor hours moving sand around in bunkers than they do caring for greens.

- When making purchases for the course, superintendents should spend money as if it were their own. Many, if not most, of today’s professional superintendents already do this. Unfortunately, there also are those individuals who are willing to experiment with other people’s money. Most products have at least some merit. However, they should be critically evaluated in terms of efficacy and cost-effectiveness. No one in golf course management is in a better position to make

such evaluations than the golf course superintendent.

Conclusion

I am not suggesting that all golf courses should be designed, built, and maintained as outlined above. There will always be courses where money is simply not a limiting factor. Likewise, there will always be golfers who are willing to pay whatever it takes to play a golf course that approaches their idea of perfection as nearly as possible. However, there are many, many more golfers for whom the cost of playing the game may someday be prohibitive, and their numbers are bound to increase in the future. The need for affordable golf represents a tremendous opportunity for architects, builders, and golf course superintendents who are up for the challenge.



JAMES F. MOORE is Director of the USGA Green Section Construction Education Program.

Putting the Horse in Front of the Cart

Using rubber horse stall mats as a durable, low-bounce cart path surface.

by MATT NELSON

ASK MOST golf purists and golf course superintendents alike, and they will tell you that power golf carts are the scourge of the game. Golf carts can be loud, smell, and lead to considerable turfgrass wear or death. Cart paths are expensive to construct, and so is the renovation of worn or killed grass. Hard surface cart paths can negatively affect a golf shot, and carts in general can be argued to detract from the overall golf experience. After all, golf is a walking game, right?

Ask golf course managers or those profiting from cart revenue, and money talks. There is no question that carts can provide significant revenue at many golf facilities. Carts also allow the handicapped or physically ailing access to the game. Carts save exertion, especially during hot and humid weather. Some people argue that golf carts increase the pace of play, but *cart path only* restrictions and golfers who sit rather than prepare for the next shot sacrifice any perceived increase in the pace of play. Like them or not, golf carts have become an integral part of the American game and are here to stay.

The intent of this article is to address the issue of cart path surfaces and their potential to negatively affect a golf shot. There really is no perfect cart path surface for all situations. Concrete or asphalt are perhaps the best choices, although these surfaces are expensive to install and can cause an unfortunate bounce if too close to play. Gravel, wood chips, or other unstable cart path surfaces are time-consuming and costly to maintain, and may provide poor definition for proper ruling when a player's lie or stance may be affected. Usually there is controversy when a cart path is located in a high-play area. Sometimes there is opportunity to relocate the cart path and solve the problem, and sometimes not.

Amby Mrozak, golf course superintendent at Cameron Park C.C., Cameron Park, California, was faced with this dilemma at the 18th hole of



There is no perfect cart path surface for all situations, but rubber horse stall liners have provided a durable, low-bounce cart path surface at Cameron Park C.C. (Cameron Park, California). Road base was installed on the subgrade of the cart path with a railroad tie embedded along the midpoint. The railroad tie was used as a contact point for the rubber mats and to provide a crown to the surface.

the golf course. The cart path crosses the fairway in front of a hazard on this par-five hole. Relocating the cart path would compromise safety, so the problem was to find a suitable cart path surface that would not cause huge golf ball bounces yet be durable and easy to maintain. Mr. Mrozak found his solution in rubber horse stall mats.

The thick rubber mats are used in horse stalls as durable flooring. The mats are commonly 4' wide by 6' long. The rubber is 1" thick and of medium softness. Mr. Mrozak prepared the subgrade of the cart path crossing the fairway and installed road base. A railroad tie was then installed down the center of the subgrade to provide a contact point for the rubber mats and also a slight crown to the surface for drainage. Lag bolts were used to attach the mats to the railroad ties and the individual mats were spaced approximately $\frac{3}{8}$ " apart to account for shrinking and swelling. Drain tile was installed along both sides of the new cart path as this location is in an area of poor drainage.

To date, Mr. Mrozak claims the rubber mats have worked perfectly without any problems. They have held up very well in the year and a half they have been in place. The project has improved a problem area of the golf course by managing traffic, improving drainage, and eliminating bad bounces. The mats provide a bounce much like firm ground. The members at the club are pleased with the new surface.

Rubber horse stall mats may not be the best solution for reducing cart path interference with play, but they are a novel approach to a common problem that may at least get you thinking of other possibilities. As with much of problem solving, putting the horse in front of the cart is a logical beginning point.

As an agronomist in the USGA Green Section's Northwest Region, MATT NELSON often finds it's the "horse sense" of golf course superintendents that leads to innovative solutions to problems.

GIVING NEW BUNKERS AN OLD LOOK

A shortcut stacked-sod technique can provide a mature appearance for new bunkers.

by DARIN S. BEVARD



Prior to renovation, the bunker edges were deteriorating. The bunkers had also become shallower as new sand was added over the years.



A soil ledge approximately 10 inches in width was created to provide the initial footer to begin stacking sod.



With each layer, soil was added and compacted between the sod and native soil. Tight compaction of the soil behind the sod was imperative to prevent the sod from shifting.

**A Turf Tip from
JOHN GOSSELIN, CGCS,
Rolling Green Golf Club,
Springfield, Pennsylvania**

SAND BUNKERS are an integral part of golf. They are hazards that catch errant shots, but their color and appearance also provide course definition and contrast. However, bunkers require a high input of manpower and resources for proper maintenance.

Today, as demands for improved bunker playability increase, more and more maintenance time and resources are needed to provide these conditions. Maintenance and golf activity impact the physical quality of a bunker. Over time, bunker faces deteriorate, bunker contours change, and bunker drainage fails. Inevitably, the appearance and playability of the bunkers is severely compromised, and renovation may be needed to restore overall bunker quality. Often, the goal of bunker renovation is to restore the original architectural integrity of the bunkers.

At Rolling Green Golf Club, bunker renovations were needed. The membership wanted the bunkers to be restored as closely to their original design as possible. More importantly, they wanted the bunkers to offer the playability and appearance of an aged feature in spite of recent renovation. With those thoughts in mind and armed with aerial photographs of the golf course from the 1920s and '30s, golf course superintendent John Gosselin set out to restore the bunkers to their original size and shape. Drainage problems were also addressed.

The initial phases of renovation were similar to those of any bunker project.

The original contour and placement of the bunkers were estimated from the photographs, the bunkers were renovated, and drainage was installed. Then the regrassing of the bunker faces began. The goal was to provide an "eyebrow" effect on the top edge of the bunkers that could be seen from the teeing ground on par-three holes and from the landing area on par-four and par-five holes. The eyebrow was needed to prevent the appearance of a clean, new edge around the bunker. It was important that the finished product was consistent with the original character of the golf course.

The decision was made to use stacked Kentucky bluegrass sod to create the eyebrow. Rather than using full pieces of sod, the sod was cut into narrow strips about 6" wide. A soil ledge approximately 10" in width was created to provide the initial footer to begin stacking sod. Each strip of sod was positioned as closely to the outside edge of the ledge as possible, one layer at a time. With each layer, soil was added and compacted between the sod and native soil. Tight compaction of the soil behind the sod was imperative to prevent the sod from shifting. Sod layers were added until the desired appearance was achieved. The number of layers varied from bunker to bunker. As few as three up to as many as 20 layers were used, depending upon the characteristics of individual bunkers.

The final step was to position a full piece of sod perpendicular to the stacked sod along the edge of the bunker. The perpendicular sod pieces provided a cap for the stacked sod. The ends of these sod pieces were folded under to provide the finished product and prevent the end of the sod from drying out. As the sod began to grow, the appearance of stacked sod was lost, resulting in the bushy "eyebrow" appearance. The result was nicely finished bunkers that appeared to have been in place for several seasons.

This technique is not for everyone. Its application depends upon the style of bunkering desired. Also, it is not known how quickly the narrow strips of stacked sod will deteriorate and require replacement. Nevertheless, this unusual technique results in newly renovated bunkers that don't look new.

DARIN S. BEVARD *advises on the renovation of bunkers and many other aspects of golf course management as an agronomist in the Mid-Atlantic Region of the USGA Green Section.*



The final step was to position a full piece of sod perpendicular to the stacked sod along the edge of the bunker. The perpendicular sod pieces provided a cap for the stacked sod.



Even prior to sand installation, the results of the bunker renovation provided a striking improvement over the old bunkers.



After renovation, the bunkers were slightly larger and deeper with distinct faces as a result of the stacked sod method employed. More importantly, the finished product fit in with the overall character of the golf course.

Don't Fire Until You See The Whites of Their Eyes

Using a map saves money and time in the battle against mole crickets.

by PATRICK M. O'BRIEN

FROM TEXAS to North Carolina, mole crickets have become the number-one insect pest on golf courses, home lawns, and sod farms across the southern United States over the past 10 years. Two species, the southern and tawny mole crickets, are the most destructive at golf courses. An 18-hole golf course can spend up to \$50,000 annually to control this pest. The conventional philosophy has been to beat these insects into submission with heavy applications of insecticides. Although mole crickets are a challenge to control, a well-planned program can reduce costs without sacrificing control.

Mapping is an effective strategy to reduce costs. In the late 1980s, Dr. Patricia Cobb at Auburn University initiated research on mapping these pests. Research has documented the fact that tawny mole crickets tend to hatch in the early summer in the same locations on the golf course where the overwintered adult tawny mole crickets are active. "If maps are used, the superintendent can save money and time in the battle against mole crickets," says Dr. Cobb.

Mapping involves "recording locations of specific events, conditions, or populations. Mapping also includes action level (threshold) setting," according to Dr. Cobb. In other words, map areas of the course where these insects are causing major turf damage that disrupts the game. Dr. Cobb's research concluded that golf courses could save an average of 68% with maps and proper timing of pesticides.

It generally takes a superintendent six to eight hours to initially map the golf course. Significantly less time will be required in future years since only an update to the map is needed. Pay close attention to sites that mole crickets prefer, such as poor drainage locations, turf adjacent to ponds and streams, low elevation areas, or slopes with southern exposure.

Most superintendents already have course drawings to use for the maps.

Blueprints for the irrigation system are one of the most popular. The elevations included with most irrigation blueprints are a real plus to help predict high activity areas. GPS maps, scorecards, or handmade maps are other possibilities. Mark high activity areas with red ink and marginal areas in orange ink. The red areas are a priority and should be treated initially, while the orange areas are constantly monitored for damage and should be treated only if they reach the threshold level.

Mapped areas can be flagged initially for the spray technician or contract applicator. Apply the products one boom width beyond the flags for best results. Flags save treatment time and take the guesswork out of where to apply the products.

The Red Eagle Golf Course in Eufaula, Alabama, has used mapping with great results. Neil Yarbrough, superintendent, began mapping in 1994. This low-budget golf course had serious mole cricket damage, but it didn't have the resources to treat wall to wall. In the first three years of the mapping program, key play areas, including putting greens, tees, green slopes, and approaches, were treated annually to control damage. Mole cricket breeding areas and other sites above the desired threshold level also

were mapped and treated. Treatments were applied to the mapped areas between the months of June through October when conditions were optimal for good control. Spring treatments for the adults usually were avoided since this was not cost effective at Red Eagle.

Treatments were applied in the late afternoon or at night. Monitoring the hatch of new nymphs helped achieve best results. Red Eagle realized an 81% cost saving the first year using mapping compared to treating the entire 108 acres of the golf course. More importantly, there was no reduction in turf quality. Last season, a 95% cost saving was achieved as the mole cricket threshold areas annually became smaller and smaller. Today, only a few remaining high-threshold areas are treated annually.

Whether you are at a golf course with a large or small budget, spring mapping makes sense to save money and time in the battle against mole crickets. Learn the life cycle and patterns of this destructive enemy. Otherwise, this insect has a remarkable ability to escape pesticide treatment.

As Director of the USGA Green Section Southeast Region, PAT O'BRIEN always keeps his eyes open for good tips.



Mapping is an effective strategy to reduce maintenance costs. Blueprint maps provide a good starting point. High activity and marginal mole cricket areas can be marked in different colors to aid the spray technician in where to apply treatments.

Two Tips for the Price of One

A simple way to eliminate visual aids on your golf course.

by LARRY GILHULY



Small flagsticks in different colors can be used in the fairway to indicate whether the hole location is in the front, middle, or back.

OFF THE TOP of your head, can you name two of the worst visual plagues introduced into golf during the past three decades? No, the way golfers dress is not one of the answers. The prolific and accepted practice of using multicolored flags to indicate hole locations and 150-yard trees or posts do nothing to improve the golf course landscape and, in many cases, can be distracting. So how does one go about making a case to eliminate these eyesores while still providing the advantages they give to the players? Read on and see if you don't slap yourself on the side of the head for not thinking of the simple idea created by John Alexander, superintendent of Waverley Country Club in Portland, Oregon.

Before discussing the simple method to rid your course of multicolored flags and 150-yard trees, the reasons why these visual aids should be eliminated needs to be reviewed. While speed of play is usually used as the general reason why colored flags and 150-yard indicators are used, how about the negatives, including:

- They are not a part of the game. Agree or disagree, but golf requires the ability to think, feel, and observe before going through the physical motions of striking a golf ball. These visual aids

eliminate a portion of the game that is, thankfully, still practiced in Scotland, Ireland, and other countries.

- They require additional maintenance. The time required for trimming around one or two 150-yard trees per hole or around posts is minimal until it is multiplied by 14 or more and must be completed every one to two weeks. Shouldn't this valuable labor be used elsewhere?

- They open the maintenance staff up to unnecessary criticism. How many times have you been criticized for hole locations that border on the sadistic? In some cases, the criticism is justified; however, is it justified when the player blames a poor shot on the color of a flag? I don't think so!

- They can become severe hazards for shots barely off line. Golf is frustrating enough when poor shots end up in the drink or out of bounds. Why add to the misery by placing 150-yard visual aids only a few yards from the edge of a fairway? In the case of trees, there is nothing like the feeling of being stymied behind a tree when you are only two yards off line!

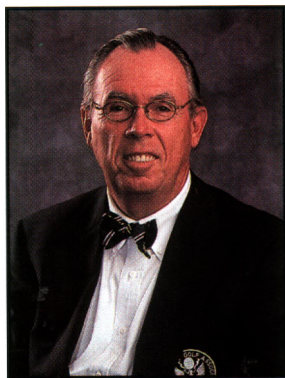
- They do not blend in well with the landscape. Let's face it, some visual aids are very visual and blend into the landscape about as well as a dog at a cat show.

For years, superintendents have used various methods to address these two topics, including whiffle balls, small flags, and other indicators on the flagstick. On the 150-yard indicator side, trees, posts, paint on cart paths, in-ground markers, and posts in the middle of the fairways have been used. The question remains, "Are these really necessary and isn't there a simple way to address these visual aids?" The answer is an emphatic yes, and here is how John Alexander made a seemingly complex problem very easy.

To start with, virtually every golf course uses small flagsticks on the practice green. The top portion that is used to pull the flagstick from the hole can be removed and a three- to four-inch spike added. These tops come in different colors, such as red, white, and blue. Why place a multicolored flag on the green when the hole location can be determined out on the fairway? Better yet, why not place these indicators in the middle of the fairway on the 150-yard indicator? This also eliminates the need for trees, posts, or other obtrusive markers. At Waverley Country Club, all the players need to do is look for the 150-yard marker with the small indicator to determine if the hole is in the front, middle, or back. The fairway mower operators and course setup personnel must move these markers; however, this is a small nuisance when compared to the normal use of multicolored flags and 150-yard trees or posts.

At this time, all indications are that these indicators are very well accepted. Can this idea work at your golf course to finally rid the greens and roughs of visual aids that impact play and maintenance? Give it a try and your players also may see the light of this simple idea!

LARRY GILHULY has been giving aid to golf courses based on visual observations for the past 16 years in the Western and Northwest Regions of the USGA Green Section.



John O'Neill

John O'Neill Named Green Section Chairman

USGA President Trey Holland recently appointed John O'Neill to the position of Chairman of the Green Section Committee. A member of the USGA's Executive Committee since 1998, he replaces Joe England, who stepped down after a four-year stint as Green Section chairman and member of the USGA Executive Committee.

John is no stranger to golf. Before joining the USGA Executive Committee, he actively participated on a number of different boards and committees through all facets of the game. He has volunteered as a board member at Montclair Golf Club (N.J.), served a five-year term on the Metropolitan (N.Y.) Golf Association Executive Committee, and was an original member of the MGA Foundation Executive Committee. John also started a junior golf program that produced two New Jersey state champions. He has served as green chairman at Montclair Golf Club and Westhampton C.C. (N.Y.). Currently, he volunteers as the green and golf chairman at Old Marsh Golf Club in Florida.

In his new position, John will provide guidance to the Green Section's many activities, including its Turf Advisory Service, the Turfgrass and Environmental Research program, and the Green Section's environmental programs. He also will serve the USGA as chairman of the Green Section's Turfgrass and Environmental Research Committee and the Green Section Award Committee.

Sincere thanks and best wishes are extended to Joe England, whose tenure oversaw the expansion of the USGA Turfgrass and Environmental Research Program. Joe has volunteered to continue to serve as a member of the USGA Green Section Committee.

Green Section Internships Awarded for 2000

For the fourth year, the USGA Green Section has awarded internships to outstanding turfgrass management students. During 2000, the Green Section will provide the opportunity for 14 students to travel with the Green Section staff on Turf Advisory Service visits. Each intern will travel for one week with an agronomist in his region between the months of May and August. The goal of the internship program is to provide students with a broader view of the golf course industry and the opportunity to learn about golf course maintenance through the perspective of the Green Section agronomists. More information about each intern can be found on the USGA Green Section website at: www.usga.org/green.

| Intern | Year in School | School | Advisor |
|---------------------|-----------------|----------------------|---------------------|
| Stacy Bonos | Ph.D. Candidate | Rutgers U. | Dr. Jim Murphy |
| Doug Bottamiller | Junior | U. of Maryland | Dr. Mark Carroll |
| Chad Casey | Senior | Mississippi State U. | Dr. Mike Goatley |
| Greg Chevalier | Senior | U. of Florida | Dr. Grady Miller |
| Patrick Christoffer | Senior | Washington State U. | Dr. Bill Johnston |
| David Dudones | M.S. Candidate | Cornell U. | Dr. Frank Rossi |
| James Goodrich | Senior | Kansas State U. | Dr. Jack Fry |
| David Karp | Junior | Cal. Polytech U. | Dr. David Green |
| Brian McDonald | Senior | Oregon State U. | Prof. Tom Cook |
| Gerald Morris | Senior | Michigan State U. | Dr. Jim Crum |
| Chris Stiegler | M.S. Candidate | Oklahoma State U. | Dr. Greg Bell |
| Nicholas Strehle | Senior | Purdue U. | Dr. Clark Throssell |
| Walter Thomas | Junior | N.C. State U. | Dr. Charles Peacock |
| Phillip White | Junior | Del. Valley College | Dr. Doug Linde |

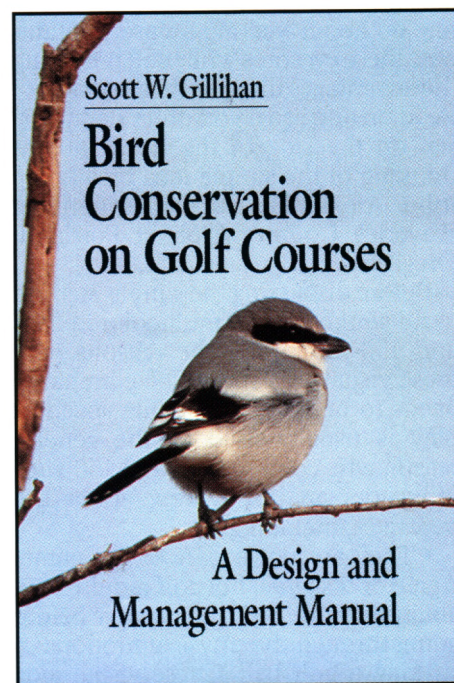
New Book Available Through Wildlife Links Program

Bird Conservation on Golf Courses, by Scott Gillihan of the Colorado Bird Observatory, is now available for purchase.

This hands-on manual for design and managing golf courses to benefit birds was the first project to receive a grant through the Wildlife Links Research Program. It grew out of a belief that golf courses can and should play a significant role in bird conservation.

The manual is written specifically for golf course superintendents and architects, but the information is applicable to landscape architects, urban planners, and managers of open space areas. The material covers general scientific concepts as well as specific techniques, and provides the basic principles of bird biology, including general habitat requirements, simple guidance for designing environmentally friendly sites, and specific management techniques. Detailed reference materials, including a list of more than 400 birds with their habitat requirements and conservation status provides an excellent reference for targeting management strategies.

The book is available for \$27.95, plus shipping and handling, through the USGA Order Department at: 1-800-336-4446.



Minnesota GCSA Makes Donation to Turfgrass and Environmental Research Program



Bob Vavrek, agronomist for the USGA Green Section North-Central Region, accepts a donation from Rick Fredericksen, CGCS, on behalf of the Minnesota Golf Course Superintendents Association. The money will be used for the Turfgrass and Environmental Research Program. The research program is dedicated to developing turfgrasses for golf courses that substantially reduce water use, pesticide use, and maintenance costs, and to developing turfgrass management practices that protect the environment while providing quality playing surfaces. Rick is the current vice-president of the Minnesota GCSA and golf course superintendent at Woodhill C.C. in Wayzata, Minnesota.

Jim Baird Joins Green Section Staff

The USGA Green Section staff is proud to welcome Dr. Jim Baird as agronomist for the Northeast Region. Jim will work with David Oatis and Jim Skorulski in the region, concentrating his visits in New Jersey and New York.

As an assistant professor in the Crop and Soil Science Department at Michigan State University since 1997, his appointment was split between research, focusing on turfgrass physiology, and teaching both undergraduate and graduate coursework. He also was actively involved as advisor to the Michigan State University Turfgrass Club. Prior to joining the Michigan State faculty, Dr. Baird was an assistant professor for four years at Oklahoma State University.

Jim has hands-on golf course experience to complement his academic achievements, working at five golf courses in Colorado and Pennsylvania during his undergraduate days. His interest in turfgrass maintenance was fostered in high school by his first job on the maintenance crew at the municipal golf course in his hometown of Pueblo, Colorado.



Dr. Jim Baird

Dr. Baird received his Ph.D. and master of science degrees in botany and agronomy, respectively, from Auburn University. He completed his undergraduate degree in landscape horticulture at Colorado State University.

Jim will relocate with his wife, Yunsook, and daughter, Alison, to the Northeast regional office in Easton, Pennsylvania.

Two New Offices

Two new sub-regional offices have been opened to further serve golf courses taking advantage of the USGA Green Section Turf Advisory Service (TAS).

Keith Happ, agronomist for the Mid-Atlantic Region since 1993, has relocated to Pittsburgh, Pennsylvania, to further service clubs taking TAS visits in the Mid-Atlantic Region. Keith will focus his efforts in the western half of the Mid-Atlantic Region. The goal is to have the office operating by mid-May. You can find contact information about this sub-regional office on the USGA Green Section website (www.usga.org/green) and in the staff listing in subsequent issues of the *Green Section Record*.

A sub-regional office also has been opened in the Northwest Region, based in Twin Falls, Idaho. Matt Nelson, formerly an agronomist in the Northeast Region, will assist golf courses in the Northwest and Southwest Regions during the 2000 golf season. In cases of heavy demand for TAS visits, he will be available to help the directors of the other Green Section regions as well. Matt can be reached at 208-732-0280.

USGA Green Section Grant-in-Aid Awards for 2000

| Green Section Region | Principal Investigator & University | Project Title | Grant Request |
|----------------------|---|---|-----------------------|
| Florida | Lawrence E. Datnoff University of Florida — IFAS | Accumulation of Silicon by Bermudagrass to Enhance Disease Suppression | \$ 3,000 |
| Southeast | Beth Guertal Auburn University | Use of Oxygenators in Bentgrass Putting Greens | 3,000 |
| Mid-Atlantic | Peter H. Dernoeden University of Maryland | Safe and Effective Use of Quinclorac (Drive®) on Creeping Bentgrass Fairways | 3,000 |
| Northeast | Frank Rossi Cornell University | Influence of Microbial and Organic-Based Products on Creeping Bentgrass Putting Green Performance | 3,000 |
| North-Central | David Williams University of Kentucky | Renovation of Perennial Ryegrass Fairways with Seeded Bermudagrass | 3,000 |
| Mid-Continent | Randy Kane & Bruce Branham CDGA & University of Illinois | Early Season Suppression of <i>Poa annua</i> Seedhead Development with Growth Retardants and Wetting Agents | 3,000 |
| Mid-Continent | Dennis L. Martin Oklahoma State University | Evaluation of Electrochemical Water Conditioner for Irrigation Water Treatment | 3,000 |
| Northwest | Paul G. Johnson Utah State University | Investigations of Irrigation Amount and Frequency in the Cool-Arid West | 3,000 |
| Northwest | Bill Johnston & J. W. Sitton Washington State University | Evaluating New Fungicides for Their Efficacy to Control Snow Mold in the Intermountain Pacific Northwest | 3,000 |
| Southwest | David Kopec University of Arizona | Evaluation of Seashore Paspalum for Southwest Putting Greens | 3,000 |
| | | | Total \$30,000 |

The USGA Turfgrass and Environmental Research Committee has approved \$30,000 for ten regional research projects (\$3,000 per project). These grant-in-aid projects address issues or problems in the eight Green Section regions of the United States. Some of the projects are receiving additional support from local superintendent chapters, state turf research foundations, national research foundations, and other industry funds.

The projects fall into three general categories. First, some of the funding will provide seed money to begin research on a relatively new idea or concept. Second, some projects will address questions about new commercial products that are untested for golf course situations. The last project area includes traditional turfgrass research to solve a specific problem

within one of the Green Section regions.

Most of the research projects will deal with regional research issues. For example, there is evidence that PNCB-resistant strains of snow mold fungi have developed in the intermountain regions of the Northwest. Washington State University faculty will evaluate several fungicides as potential controls for snow mold fungi. In Florida, scientists will determine if silicon fertilization enhances disease suppression in bermudagrass.

In Chicago, Illinois, researchers will evaluate early seedhead suppression of *Poa annua* with growth retardants and wetting agents. Research at the University of Kentucky, will examine chemical and cultural treatments to convert ryegrass fairways to some of the new cold-tolerant, seeded bermudagrass varieties.

In today's market there are a number of commercially available products untested for golf course situations. Questions have been raised about the reliability of such products. In many cases, much of their marketing is based on testimonial endorsements. Oklahoma State University scientists will evaluate electrochemical conditioning of irrigation water. Auburn University will evaluate the effects of oxygenating products.

The grant-in-aid research will provide answers quickly. Generally, the research will last for just a few months to provide the needed information on a problem. Some of the projects will be repeated a second year to verify results. However, the projects will produce results that golf course superintendents can use to make decisions about the products tested or problem addressed.

Research Publication Available

The American Chemical Society (ACS) recently published symposium proceedings, *Fate and Management of Turfgrass Chemicals*, edited by Drs. J. Marshall Clark and Michael P. Kenna. This 465-page book is a compilation of scientific papers presented at the American Chemical Society symposium held in Boston, Massachusetts, in August 1998.

The book summarizes 26 research papers in four topic areas: an overview of the turfgrass industry and environmental issues, pesticide/nutrient fate, best chemical management practices, and biotechnology and alternative pest management. Much of the research that serves as the basis of the publication was funded through the USGA Turfgrass and Environmental Research Program.

The book is available through the Oxford University Press for \$140, plus shipping and handling. They can be reached at: 1-800-451-7556. Request ACS series number 743. If Oxford University Press is unable to fulfill your order, some copies of the book are available for purchase through the USGA by contacting Mary McConnell at 908-234-2300.



USGA PRESIDENT

Trey Holland

**GREEN SECTION
COMMITTEE CHAIRMAN**

John D. O'Neill
49 Homans Avenue
Quogue, NY 11978

EXECUTIVE DIRECTOR

David B. Fay

EDITOR

James T. Snow

ASSOCIATE EDITOR

Kimberly S. Erusha, Ph.D.

DIRECTOR OF COMMUNICATIONS

Marty Parkes

©2000 by United States Golf Association®

Subscriptions \$18 a year, Canada/Mexico \$21 a year, and international \$33 a year (air mail).

Subscriptions, articles, photographs, and correspondence relevant to published material should be addressed to: United States Golf Association Green Section, Golf House, P.O. Box 708, Far Hills, NJ 07931.

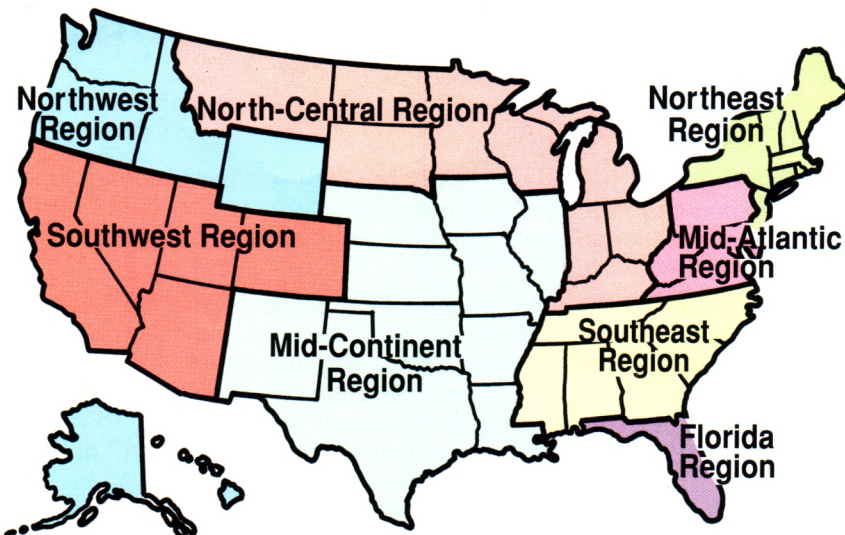
Permission to reproduce articles or material in the USGA GREEN SECTION RECORD is granted to newspapers, periodicals, and educational institutions (unless specifically noted otherwise). Credit must be given to the author, the article's title, USGA GREEN SECTION RECORD, and the issue's date. Copyright protection must be afforded. To reprint material in other media, written permission must be obtained from the USGA. In any case, neither articles nor other material may be copied or used for any advertising, promotion, or commercial purposes.

GREEN SECTION RECORD (ISSN 0041-5502) is published six times a year in January, March, May, July, September, and November by the UNITED STATES GOLF ASSOCIATION®, Golf House, Far Hills, NJ 07931. Postmaster: Address service requested — USGA Green Section Record, P.O. Box 708, Golf House, Far Hills, NJ 07931-0708.

Periodicals postage paid at Far Hills, NJ, and other locations. Office of Publication, Golf House, Far Hills, NJ 07931.

Visit the USGA's Internet site on the World Wide Web. The address is:
<http://www.usga.org>

Turfgrass Information File (TGIF):
<http://www.lib.msu.edu/tgif>
(517) 353-7209



GREEN SECTION NATIONAL OFFICES:

United States Golf Association, Golf House
P.O. Box 708, Far Hills, NJ 07931 • (908) 234-2300 • Fax (908) 781-1736
James T. Snow, *National Director*, jsnow@usga.org
Kimberly S. Erusha, Ph.D., *Director of Education*, kerusha@usga.org

Research:

P.O. Box 2227, Stillwater, OK 74076 • (405) 743-3900 • Fax (405) 743-3910
Michael P. Kenna, Ph.D., *Director*, mkenna@usga.org

Construction Education Program:

720 Wooded Crest, Waco, TX 76712 • (254) 776-0765 • Fax (254) 776-0227
James F. Moore, *Director*, jmoore@usga.org

REGIONAL OFFICES:

Northeast Region:

P.O. Box 4717, Easton, PA 18043 • (610) 515-1660 • Fax (610) 515-1663
David A. Oatis, *Director*, doatis@usga.org • Jim Baird, Ph.D., *Agronomist*, jbaird@usga.org
1500 N. Main Street, Palmer, MA 01069 • (413) 283-2237 • Fax (413) 283-7741
James E. Skorulski, *Agronomist*, j Skorulski@usga.org

Mid-Atlantic Region:

P.O. Box 2105, West Chester, PA 19380-0086 • (610) 696-4747 • Fax (610) 696-4810
Stanley J. Zontek, *Director*, szontek@usga.org
Keith A. Happ, *Agronomist*, khapp@usga.org • Darin S. Bevard, *Agronomist*, dbevard@usga.org

Southeast Region:

P.O. Box 95, Griffin, GA 30224-0095 • (770) 229-8125 • Fax (770) 229-5974
Patrick M. O'Brien, *Director*, patobrien@usga.org
4770 Sandpiper Lane, Birmingham, AL 35244 • (205) 444-5079 • Fax (205) 444-9561
Christopher E. Hartwiger, *Agronomist*, chartwiger@usga.org

Florida Region:

P.O. Box 1087, Hobe Sound, FL 33475-1087 • (561) 546-2620 • Fax (561) 546-4653
John H. Foy, *Director*, jfoy@usga.org

Mid-Continent Region:

P.O. Box 1130, Mahomet, IL 61853 • (217) 586-2490 • Fax (217) 586-2169
Paul H. Vermeulen, *Director*, pvermeulen@usga.org
4232 Arbor Lane, Carrollton, TX 75010 • (972) 492-3663 • Fax (972) 492-1350
Brian M. Maloy, *Agronomist*, bmaloy@usga.org

North-Central Region:

P.O. Box 15249, Covington, KY 41015-0249 • (606) 356-3272 • Fax (606) 356-1847
Robert A. Brame, *Director*, bobbrame@usga.org
P.O. Box 5069, Elm Grove, WI 53122 • (262) 797-8743 • Fax (262) 797-8838
Robert C. Vavrek, Jr., *Agronomist*, rvavrek@usga.org

Northwest Region:

5610 Old Stump Drive N.W., Gig Harbor, WA 98332 • (253) 858-2266 • Fax (253) 857-6698
Larry W. Gilhuly, *Director*, lgilhuly@usga.org
P.O. Box 5844, Twin Falls, ID 83303 • (208) 732-0280 • Fax (208) 732-0282
Matthew C. Nelson, *Agronomist*, mnelson@usga.org

Southwest Region:

505 North Tustin Avenue, Suite 121, Santa Ana, CA 92705 • (714) 542-5766 • Fax (714) 542-5777
Patrick J. Gross, *Director*, pgross@usga.org • Michael T. Huck, *Agronomist*, mhuck@usga.org

TURF TWISTERS

THE TAS PROVIDES

Question: Our Turf Advisory Service (TAS) visit has become a high point of the golfing season. While this is a good point, there are so many people who want to attend the course tour that it has become difficult to address all of our needs and concerns without running short of time. Do you have any suggestions for making the most of our TAS visit? (Ohio)

Answer: First of all, prepare an itinerary prior to the TAS visit. The itinerary need not be extensive, but list the pertinent issues that need attention and discussion during the agronomist's visit. The list helps us focus on those issues during the visit and achieve the most efficient use of the scheduled time. There may be some value in limiting those allowed on the course visit to three or four people. An open session can then be scheduled for the last hour of the meeting to recap and deal with other issues and concerns that individual committee members bring forward. All of the issues will be reviewed and summarized in the written report the golf course receives after the TAS visit is made. For more ideas on making the most of your TAS visit, look at the following article on the Green Section portion of the USGA website: http://www.usga.org/green/tas/tas_visit.html.

A CREDIBLE RESOURCE

Question: During the recent GCSAA Conference and Show several of my fellow superintendents from the Midwest were discussing the possibility of an abnormally hot, dry summer season. Can the USGA point me in the direction of a credible source of long-range forecasting, given the ominous implications of such a weather pattern? (Iowa)

Answer: The National Oceanic and Atmospheric Administration (NOAA) was created in 1970 to, in part, develop a more comprehensive understanding of weather phenomena. They are a multivariied agency of the Commerce Department and are composed of the National Ocean Service, National Weather Service, National Marine Fisheries Service, National Environmental Satellite Data and Information Service, and Office of Oceanic and Atmospheric Research. Based on accurate predictions of the El Niño and La Niña events over the past three years, their long-range forecasting credibility has reached new heights. To assess the probability of a future drought in your location, visit their website at www.noaa.gov.

TO ALLEVIATE DIFFICULTIES

Question: We are having a great deal of difficulty finding open time to spray the course. Play volume is non-stop from morning until night, and the previously blocked Monday mornings have been opened to outings. Do you have any suggestions? (Kentucky)

Answer: When play volume increases to the point where needed maintenance work cannot be done, a red flag goes up. Obviously, if this continues the conditioning of the golf course will suffer and income/revenue will follow. Play volume should be limited to the point where needed maintenance work can be completed. Consider closing half or full day on Monday (or another day), spread tee times further apart, raise rates, or similar such combinations to better balance play volume with maintenance needs. Even the most passionate of bottom-line watchers must acknowledge the importance of guarding a solid foundation for the future. How the golf course is being maintained today is the future foundation.