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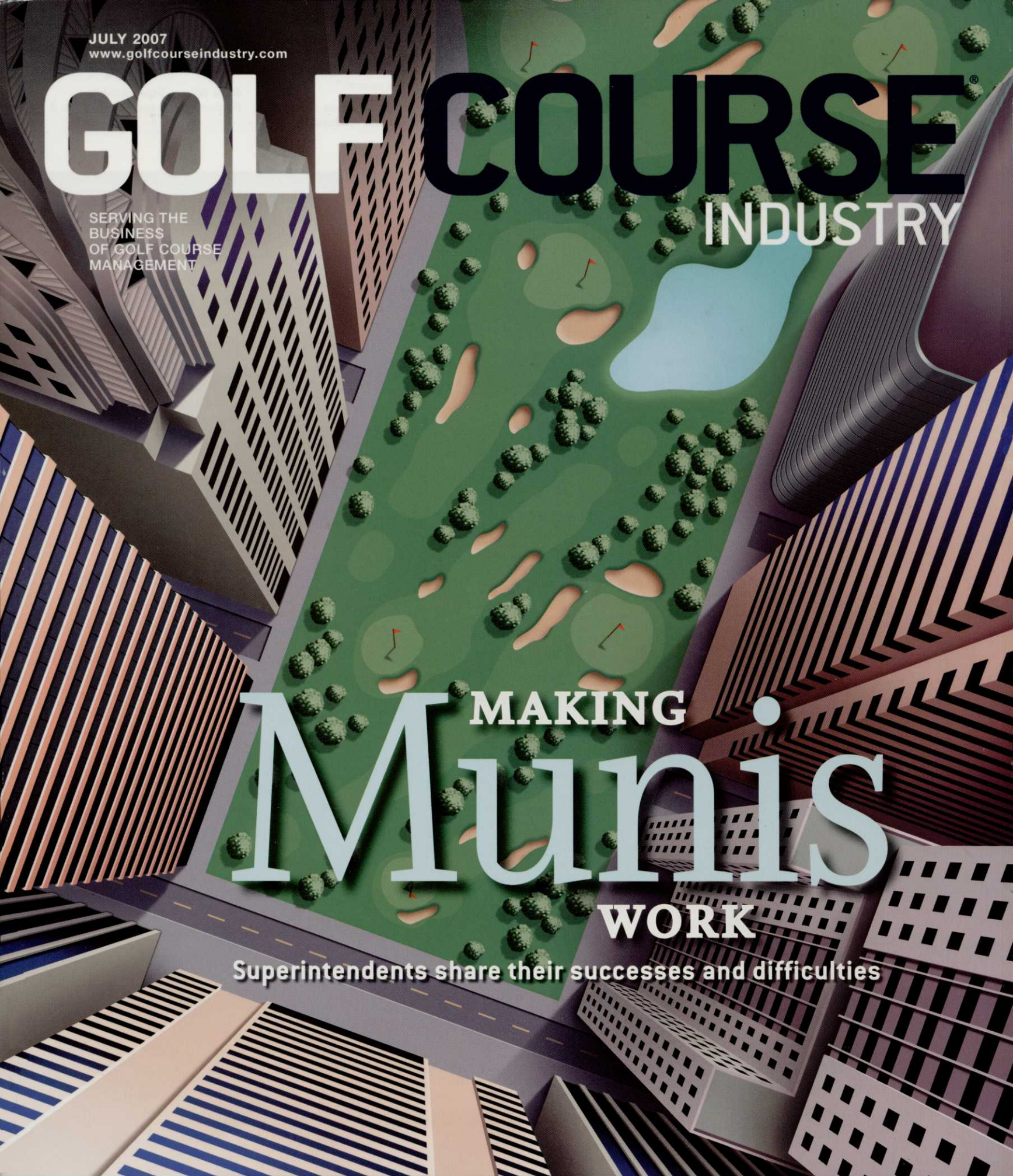

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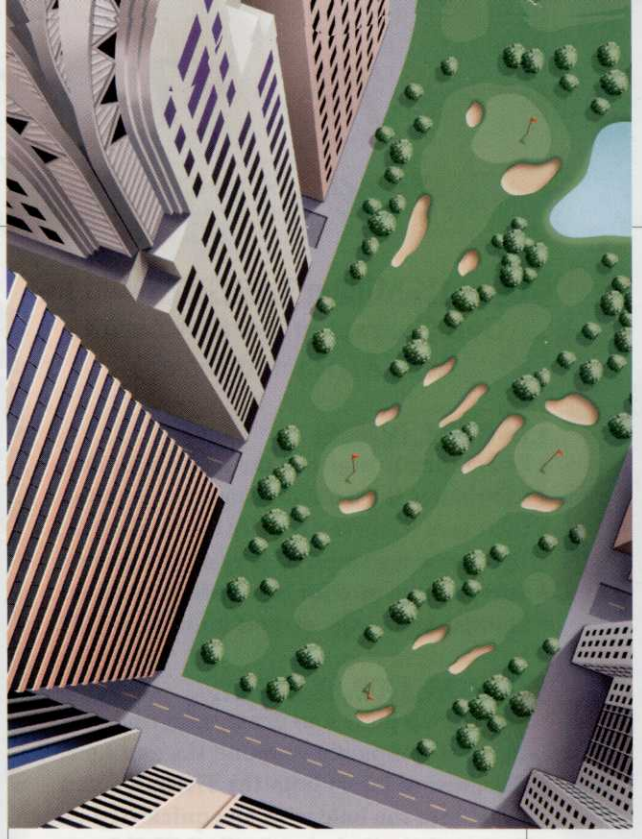
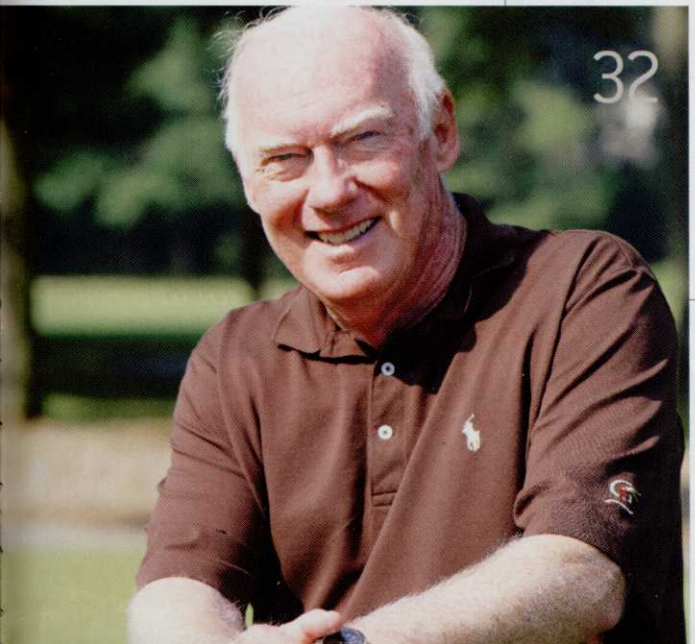
pictured from left to right:
Bob Farren, CGCS, Golf Course and Grounds Manager
Paul Jett, CGCS, Superintendent Pinehurst No. 2

FEATURES





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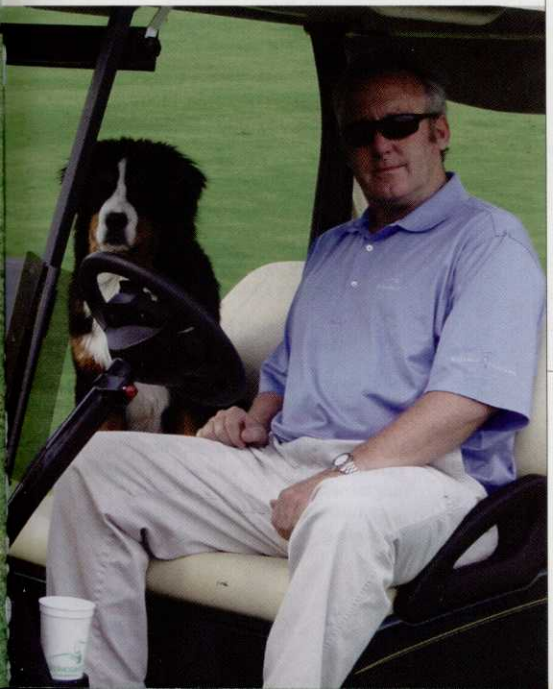

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EDITORIAL MISSION STATEMENT:
Golf Course Industry reports on and analyzes the business of maintaining golf courses, as well as the broader business of golf course management. This includes three main areas: agronomy, business management and career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

John Walsh
Editor

THE NEXT GENERATION

In politics, issues are framed frequently in terms of what life is going to be like for our grandchildren and their children. What condition are we going to leave the earth in? How much debt will the country have generations from now? Politicians use the feel-good image of children to push policies they want to implement now. Genuine or not, politicians say they're concerned about future generations.

What's more genuine is the golf course maintenance industry's concern for its future. Turfgrass professors, superintendents and manufacturers invest a lot of time, effort and money to educate turfgrass students and young assistants about the business of golf course management. The goal is simple: continue to elevate the profession and industry and see them thrive in the future.

Two examples of support for the industry's future come to mind: Jacobsen's Future Turf Managers Seminar and Bayer Environmental Science's and John Deere's Green Start Academy. These companies understand the value of investing in young people because students and assistants will be their customers and leaders of tomorrow.

It's remarkable to see the enthusiasm and determination of these students and assistants who seem to have clear career paths mapped out in their heads. They thirst for knowledge and soak up every bit of information superintendents, suppliers and professors impart. It's marvelous to see them dissecting the information presented to them and forming opinions and theories.

One consistent message superintendents convey to students and assistants at these events is success in the industry doesn't come quickly or easily. It requires personal sacrifice and takes more time than it did a generation ago. At first, this message might seem depressing, but the best and brightest among the attendees seem to understand and accept the challenges laid before them. They don't balk at the difficult path they face because they're intelligent, hard-working people who are determined to succeed.

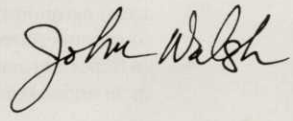
Events such as these might be just as important to a young person's future as any course of study or internship. Students and assistants network with peers and mentors alike to build relationships that will help them advance their careers. Armed with information, advice and relationships, students and assistants can weave a path of success more easily than those without these experiences.

As superintendents, it's part of your job to be mentors to students and assistants so they'll be prepared to lead the industry when the time comes. Hopefully, you have an active internship program in which you're influencing the lives and careers of future superintendents. Think about your career and the decisions you've made, about the things you would've done differently. Share these experiences with students and assistants. Contribute to their education outside the classroom. Make them the best they can be by imparting your wisdom.

If you're a manufacturer who isn't involved with a program for mentoring and educating students and assistants, think about starting one. There are plenty of quality students and assistants who are worth the investment.

Professors and universities should be marketing to and encouraging graduates to think about continuing their education to become the next generation of professors. Someone has to teach future turfgrass students once this generation of professors retires. Besides, not every turfgrass graduate will become a superintendent.

The industry does an estimable job of investing in its future and should be proud of its efforts. Even with taut budgets, it should continue to do so. **GCI**



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Environment spotlight

Thanks for the recent article "On the greener side" in *Golf Course Industry* (March, page 42). I know it means a great deal to our members to be highlighted for their dedication and hard work. Pat Blum at Colonial Acres, Tim Powers at Crystal Springs, Dave Phipps at Stone Creek, and Drew Cummins at Red Tail Golf Club deserve to be in the limelight. Thanks for keeping the good work of environmental stewards at the forefront of your readers.

Jean Mackay
Director of education and communications
Audubon International
Selkirk, N.Y.

Good pay

After reading Jim McLoughlin's "Club management options" column (March, page 26), I'm not sure I agree entirely with his premise that contract management doesn't attract the better superintendents or pay well.

I've been working with the top agronomic officers from the nation's largest multicourse companies for several years. I haven't met many brighter, better paid, more confident superintendent leaders in other golf circles. These guys/gals aren't visible in GCSAA activities or outside their companies because they're too busy, but they're terrific agronomically and as business people. They have a good handle on the return on investment of everything they're doing on the golf course. They're not just spenders but recognize they and their teammates have to have ownership of the bottom line of club operations. The superintendents of these companies are learning it doesn't always make sense to improve maintenance conditions beyond what's economically sensible. I'm not sure that's easily learned.

So, perhaps at the lowest level of these corporations, superintendents aren't necessarily the highest earners, but most of the multicourse company c.e.o.s will let you know superintendents are their most valuable commodity, and they're paying them well. Most importantly, one can move up the ladder if he/she is good and wishes to move up without the trauma of having to find a new employer.

The happy medium between the committee system, general manager system and contract maintenance is golf course maintenance contracting managed by a strong general manager. This brings all parties back into the game, yet lends expertise to an area not well understood by most g.m.s or club committees.

Ted Horton, CGCS, CIA
Ted Horton Consulting
Canyon Lake, Calif.

Association politics

Jim McLoughlin's column ("A two-year presidency," April, page 24) makes too much sense. For years, I've asked why GCSAA members are funding travel expenses for the board. Superintendents fight for every penny and justify their spending down to the dwindling dollar. Steve Mona is the figurehead of the association and has done an amazing job in his tenure. However, he's a paid employee of the GCSAA and should attend those functions as our c.e.o. and lobbyist in the field. The trips for the board, and sometimes their spouses, seem fiscally extreme. This is one of several reasons why some superintendents won't join the association. They might have a valid point. This isn't a completely outrageous perk considering the amount of time board members spend away from their jobs and families. Unfortunately, in this day and age, perception is reality.

Also, look at the committees. The GCSAA tells the "no name" superintendents, in the interest of having better representation, they can be on a committee only every other year at the most. That's fair, and I, as many, have accepted that. What isn't consistent is when a high-profile superintendent is allowed to stay on a committee year after year with no rotation off unless he asks not to be added. I make a logical plea to the GCSAA management team that the high-profile superintendent is no better than the superintendent at a nine-hole course in Anytown, USA, who works his ass to the bone on a small budget and has to be creative and imaginative on his own. Because this type of superintendent is using his head and instincts for survival not publicity, he might have better ideas for the middle-of-the-road guys that aren't in same monetary league as the big clubs. Every superintendent deserves any accolades he/she gets because of all the monsters, real or imaginative, they face daily.

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

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A job well done

The clubhouse at Oakmont (Pa.) Country Club. Photo: John Walsh

All the prep work has long been finished and the media spotlight no longer shines on Oakmont (Pa.) Country Club. After hosting the U.S. Open for the eighth time, the course is healing and members are back to playing on their 104-year-old course.

John Zimmers, the club's grounds superintendent, is back to his staff of about 40. During the week of the U.S. Open, he had about 160 volunteers help him and his staff prepare and maintain the course. Volunteers included golf course superintendents, assistant superintendents (including all of Zimmers' former assistants), friends of Zimmers and vendors.

Zimmers, who has been at the club eight years, plotted the work for everyone on a spreadsheet to determine how many people he needed to work on the course. For example, Zimmers figured he needed 20 people on bunker detail on both the front and back nine because there are 210 bunkers on the course.

Paul R. Latshaw, a mentor to Zimmers, was one of the volunteers on hand to help.

"He spent a lot of time here," Zimmers says. "He was there for support and at times would do inspections and give advice if I was tied up. He followed up on things for me. He helped more with the agronomic aspect of things. He asked me what I thought we needed to do to get where we needed to be. Most of the time you know the answer, but it's nice to ask someone who's been through it before."

Ninety-nine percent of the volunteers arrived the Sunday afternoon before the Open, Zimmers says. He and the volunteers reviewed everything to make sure everyone's role was understood. Then, that evening, they went out on the course to practice.

"You try and put people you know in certain spots," he says. "You get people from all over the world who want to come and volunteer, but you can't accommodate everybody. It's important that people know what I expect and accept and how I operate. Volunteers could be very good superintendents elsewhere, yet I might have to ask them to redo something, such as rake a bunker, mow a fairway, fill a divot, straighten a tee, because it wasn't what I wanted. Generally, it's because we see something we can do better. We ask volunteers to do a better job and not take it personally."

Volunteering isn't necessarily a glamorous job. Monday, Tuesday and Wednesday before the Open, some volunteers just pushed rotary mowers all day.

"Volunteers do whatever you ask them to do," Zimmers says. "Volunteering is great exposure for them."

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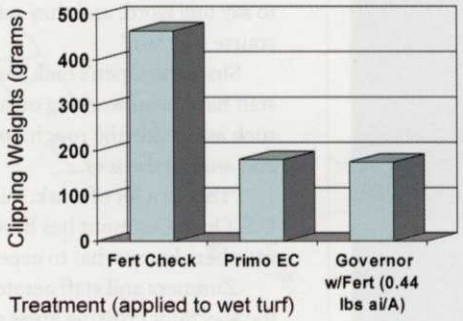

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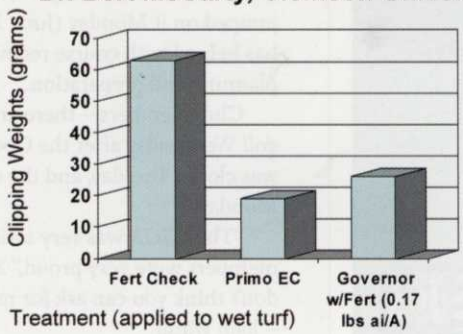
Dr. Bert McCarty, Clemson University



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The mindset of Zimmer's staff is different during the Open compared to the weeks and months leading up to it. And the execution starts with the staff.

"I explain to them the volunteers are here to help, not steal the show," Zimmers says. "I take a staff member and pair him with volunteers."

Days are long during Open week. Some days, Zimmers and his staff start at 3:45 a.m. and don't finish until 10 or 11 p.m. During the Open, there's downtime between 9 a.m. and 2 p.m., although during that time the staff washes everything and gets everything reloaded for later that evening after the golfers finish. During that time, the staff and volunteers look at the grass and look for small details, such as sand that's been blown on greens. The staff and volunteers watch the Open on TV, looking for anything they might need to fix.

There was no crisis during the Open, Zimmers says, although a storm rolled through Wednesday during practice, setting the staff back to start the maintenance later that evening.

There's always a lot to learn when hosting a tournament of this magnitude, Zimmers says.

"There was more media than I thought there would be," he says.

The only surprising comment Zimmers heard from the golfers about course conditions was Phil Mickelson's when he said the rough was a physical hazard.

"The USGA set up the course, and we managed it within the USGA guidelines," he says. "We always want the golf course to hold up, but a lot is dependent on the weather and how the USGA sets up the course. Golfers were saying it was the hardest golf course in the U.S., if not the world. But we wanted them to say one word, and they said it – fair – the course was fair."

Since the Open's end, Zimmers and his staff have been working on areas of the course, such as outside the rough, in the deep rough and around the tees.

"There's a lot of work, but this isn't the first U.S. Open Oakmont has hosted," he says. "The members know what to expect."

Zimmers and staff aerated and seeded the spectator crossing areas on some of the fairways.

"You'd be hard pressed to tell there was a crosswalk there," he says. "We had a plan and jumped on it Monday (June 18). The weather has helped with course recovery. A lot of it is planning and preparation."

Club members – there are 400 – played golf Wednesday after the Open. The course was closed Tuesday, and the media played Monday.

"The USGA was very satisfied, and the members were very proud," Zimmers says. "I don't think you can ask for more than that."

– John Walsh

Editor's note: A longer version of this article can be read at www.golfcourseindustry.com.

Management group reunion

Pete Davison

Something about the recently-formed Sage Golf Group might sound familiar to some. The golf course management company might be new, but this isn't the first time its executives have worked together.

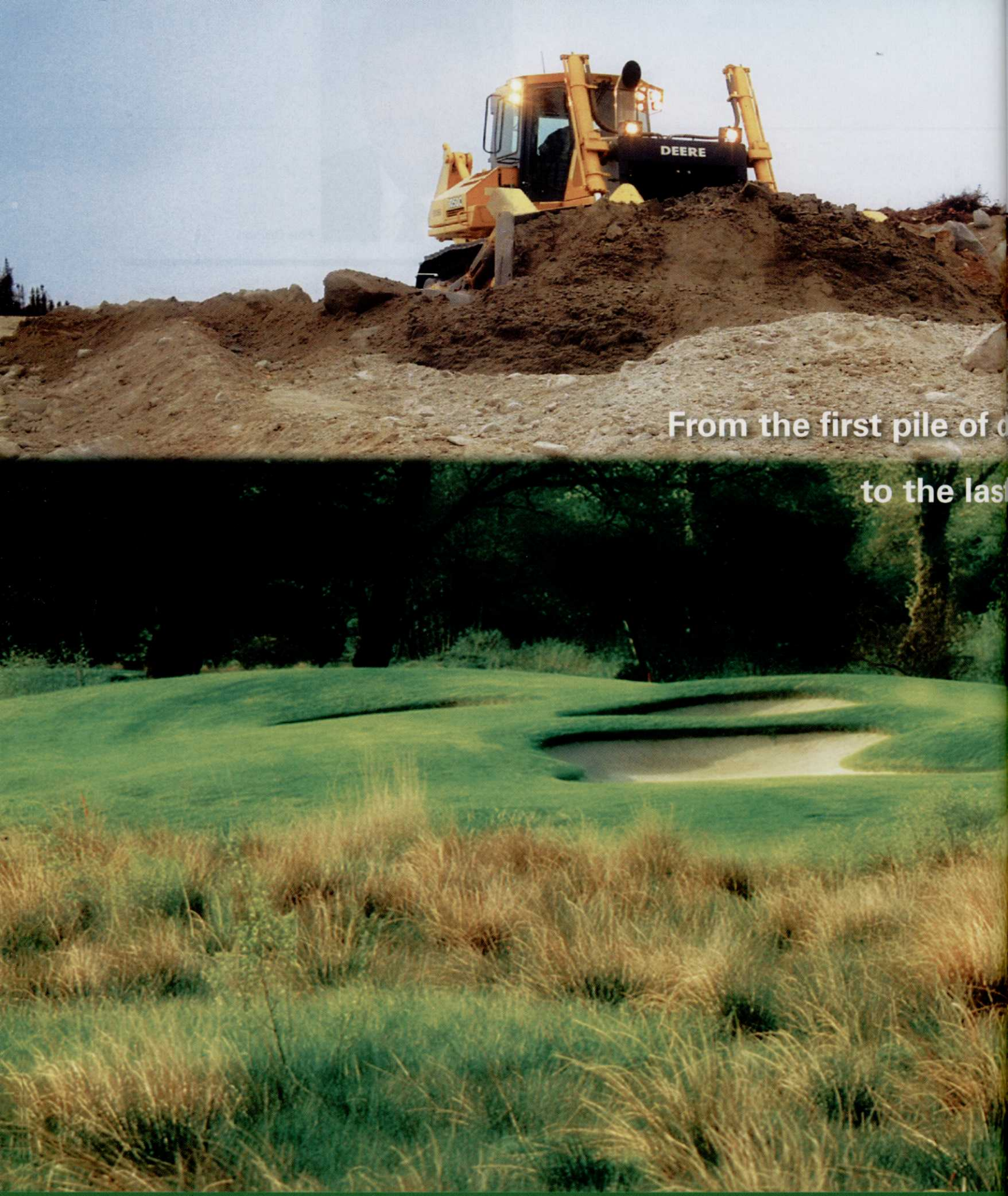
Sage president and c.e.o. Pete Davison worked for the PGA Tour's Tournament Player's Club network for 25 years. Originally a golf professional, Davison was hired to oversee operations at the network's first facility, TPC Sawgrass, in 1980. He worked his way up in the organization, ultimately managing the operation of all TPC clubs.

Most of the other Sage staff members' resumes read like Davison's. His wife, Jayne, ran merchandising at TPC and has similar responsibilities now. Mike Diffenderffer, senior consultant for marketing and membership, was with the TPC for more than 20 years. Roberta McDougal handled accounting and financial functions for the TPC for 20 years and now is the vice president of financing and accounting and a partner at Sage. Chris Wilkerson, senior consultant of construction management and Chuck Green, vice president, were with TPC for about 15 years.

Combined, the team has about 150 years of experience in the industry. They decided to take their experience into an environment they felt suited them better. They recently set up offices in Ponte Verde Beach, Fla., not too far from the PGA Tour's headquarters.

"We enjoy working with each other and agreed we'd get out of the corporate rat race, so to speak," Davison says. "I enjoyed working in it, but I like that we're all owners of this company and the only people we answer to are ourselves."

Davison and the other employees won't conduct themselves any differently than they did while working for the TPC network, but now they don't answer to a board. The other difference is they don't have the well-known PGA Tour or TPC brands behind them, so they have to increase marketing efforts that much more to create a name for themselves.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Davison believes the group can stand out in the industry because he knows of only a handful of management companies that cater specifically to upscale clubs. (A list from 2003 compiled by the Club Managers Association of America listed almost 140 management companies in existence in the U.S.) Plus, high-tiered golf clubs make up a minority of all golf courses, he says.

"We thought we'd have a boutique-type management company," he says. "We manage one club at a time."

Sage's offerings include membership, marking, operational analysis and a fairly extensive range of agronomy services. The company aims to work in concert with owners and developers, taking a hands-on approach to hiring a team to manage a course, develop a business plan and hold them accountable for that plan. The company draws from its successful practices at the TPC network to try and bring about the same results now.

"We try to exceed customers' expectations," Davison says. "If you do that, you're going to be pretty special."

Davison is used to managing in a high-profile-club environment.

"The TPC hosted more than 275 PGA Tour events at clubs while I managed them," he says.

Even with seven staff members transitioning from the TPC to Sage, TPC is well staffed, Davison says. He left at the end of 2004, and the other staff members, with the exception of one, took early retirement and left at different points after he did.

"We hired a lot of good people (at TPC) over the years," he says. "Understudies, so to speak, have taken over where we left off. They're doing fine."

Just a few months out of the box, Sage is focusing on building its client base. Davison is talking to possible clients in multiple parts of the world, including the U.S., Mexico and the central-Caribbean region.

The company is likely to take on 10 properties in its first 10 months, says Davison, who's comfortable with where the company is positioned.

"We're not trying to be the biggest company," he says. "We want to share the knowledge and experience we have with other people and allow them to become successful because of it." – *Heather Wood*

For more information about Sage Golf Group, visit www.sagegolfgroup.com.

With fairways like this,

SOMEONE HAS EARNED HIMSELF A GOLF CLAP.

Don't tolerate Poa on your fairways and tee boxes and all the negative attention it brings. Convert back to lush, green bentgrass rapidly or gradually with Velocity® Herbicide, the first postemergence herbicide for *Poa annua* and *Poa trivialis*.

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Read and follow the label instructions before using.

20 years in the desert

As Desert Mountain Community in Scottsdale, Ariz., celebrates its 20th anniversary, management says golf and the role of golf course communities look different than they did when Lyle Anderson first came up with idea to develop the site. But despite the changes, they're still finding ways to adapt.

Six Jack Nicklaus-designed courses – the most courses by him in one place – are sprawled out throughout 8,000 acres in northern Arizona. The 2,150 people who live in the golf course community comprise the membership.

The courses were built one by one until 2000, says Shawn Emerson, director of agronomy for all six courses. Each course has its own personality and theme, reflecting the different points in time each was built. But each course fits into the framework of the overall community.

"Nicklaus' theory on golf didn't change," he says. "The product changed a little bit, but just sort of the fluff parts. The quality of how he constructed it didn't change."

With each course, the staff became more familiar with Nicklaus' style, and this helped with the courses that came after, Emerson says.

"We had a lot of input on how the operation needs to fit in with the design from experience," he says. "That was key. He had confidence in us and knows what we can do."

Emerson is amazed to see how the industry evolves each time a new course is built and incorporates technology that has been updated since the preceding course was constructed.

Bob Jones, senior vice president of Desert Mountain, agrees the industry has changed from a business perspective as well. Overall, the community of courses experienced a fairly healthy increase in rounds until Sept. 11. Rounds growth has been less than 1 percent since then.

Sports Turf Handbook

LESCO®
Professional Turf Products

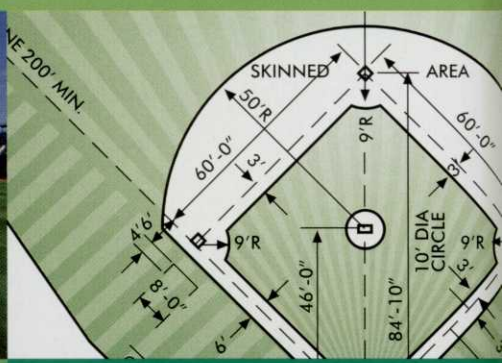
From the experts

Play ball with LESCO.

As the nation's largest supplier to the professional green industry, LESCO is quick to recognize emerging trends and determine innovative ways of meeting customer needs. That being said, LESCO takes pride in serving sports turf managers of all kinds and providing the full range of products necessary to produce top quality playing surfaces. Whether it's seed, fertilizer, control products or equipment, LESCO is the number one choice of professional turfgrass managers because we offer the best products, from preferred vendors, backed by convenience, service, expertise and value. Putting the best products into the hands of our customers, in the most convenient way possible, has been our focus since 1962. It remains our goal today.

A tough job made easier.

This handbook brings together a wealth of practical advice on managing sports turf. Experienced professionals will find it a handy reference, while those newer to the job will value it as an all-in-one source of practices and products. Highlights include an overview of issues relating to field design and construction, turf maintenance practices, suggested annual maintenance programs and official field diagrams and specifications. No matter what type of sport, climate or playing schedule you are dealing with, the LESCO Sports Turf Handbook surely includes information you will find helpful.



Products for Design and Construction

Seed

LESCO offers exceptional quality seed for every field and every climate:

- Establishment of new sports turf
- Renovating sports turf
- Overseeding warm-season sports turf

Fertilizer & Mulch

LESCO offers everything necessary to promote quick germination and establishment of newly seeded sports turf:

- Starter fertilizers such as LESCO 18-24-12 offer the ideal nitrogen, phosphorus, potassium ratio for improved germination and early-stage development
- Mulching products enhance germination, prevent washouts, reduce evaporation and control erosion

Application Equipment

LESCO offers the equipment required for establishing top quality sports turf:

- Rotary Spreaders
- Roto/Drop Spreader
- Drop Spreader
- Spreader/Sprayer Combination
- Turf Renovator
- Hand Tools

Soil Conditioner

LESCO markets the Pro's Choice® line of soil conditioners:

- Improves composition, color and playability of infield areas
- Perfect topdressing for maintaining smooth, resilient infield areas
- Provides exceptional deep red color with staying power
- Wicks away excess infield water
- Bonds to form a solid surface in pitcher's mound and batter's box
- Conditions turf to withstand heavy play and blends with turf color to help camouflage bare or worn areas

Part I. Designing and Constructing Playing Fields

Design Considerations

Constructing a sport field is an exciting project. It is also a big responsibility. From the time the site is selected until the day the players first step onto the field, you have the opportunity to create an extraordinary playing environment. The design considerations in Chart 1 provide an excellent overview for a variety of sports. Use the chart, along with the diagrams in Part III of this handbook, to help achieve the best possible results with your field.

CHART 1

SPORT	AREA REQUIRED	ORIENTATION	GRADE/DRAINAGE
(See Part III for actual dimensions of playing field)			
American Football	1.5 acres (minimum)	Long axis should run northeast/ southwest to suit the angle of the sun for the fall playing season; or north/south for longer periods.	Grade with a 10-18" crown down the center of the field sloping toward the sidelines, with 1% slope from center to each sideline.
Baseball	3.0 to 3.85 acres	Locate home plate so the pitcher is throwing across the sun and the batter is not facing it. The line from home plate through the pitcher's mound and second base should run east-northeast.	Grade so that home plate and baselines are level; provide 1% slope from pitcher's circle toward the bases; provide 1%-2½% slope from centerfield to outside edges of outfield.
Little League	1.2 acres (minimum)		
12" Softball	1.5 to 2.0 acres		
Croquet	3,000 sq. ft.	Orientation is not critical and may be adjusted to suit local conditions.	Turf is to be close cropped and level with a maximum 2% slope and adequate underdrainage.
Field Hockey	1.5 acres (minimum)	Orientation is to be north/south where practicable.	Grade with a 1% slope from the center to each sideline.
Soccer	1.7 to 2.1 acres	Long axis should run northeast/ southwest to suit the angle of the sun for the fall playing season; or north/south for longer periods.	Grade with a longitudinal crown and 1% slope from center to each sideline.
Lacrosse	1.5 acres (minimum)	Orientation is to be north/south where practicable.	Grade with a 1% slope from the center to each sideline.
Lawn Bowling	12,996 sq. ft. to 17,424 sq. ft. (square green with 6 rinks)	Orientation is not critical and may be adjusted to suit local conditions.	Turf is to be close cropped bentgrass and completely level with adequate underdrainage. Sand/clay surface is an alternative.
Rugby	2.0 acres (minimum)	Long axis should run northeast/ southwest to suit the angle of the sun for the fall playing season; or north/south for longer periods.	Grade with a longitudinal crown and 1% slope from center to each sideline.

Drainage

Drainage is critical to:

- Removing excess water
- Maintaining the playing surface
- Allowing the field to better withstand traffic

Three components influencing drainage:

- Soil composition
- Field grade
- Drainage system

Soil Composition

The soil composition of sport fields generally falls into one of three categories:

- New fields, especially those at a professional or semi-professional level, may be constructed of 100% coarse sand offering superior drainage
- Other fields may be composed of native soil amended with 50% or more coarse sand
  - The sand particle size and adequate mixing with the native soil are key to good results
- Many fields are built entirely on native soil
  - Adequate grading and drainage becomes increasingly important on fields built entirely on native soils

Grade

Most playing fields are relatively flat with a slight grade or crown, from the center to the edges:

- Grading/crowning provides natural runoff
- Actual grade varies with the sport
- Check guidelines in Chart 1 for field-specific information

Drainage Systems

To be effective, all sports turf fields require some type of drainage:

- Perimeter drain lines, consisting of plastic drain pipe embedded in gravel, are a basic requirement
- Cross-field herringbone or ladder-type drainage systems are recommended for areas with heavy rainfall or for fields composed of heavy, native soil
- The LESCO vertical turf drain can be beneficial on any field
  - This innovative device is easily installed in new or existing fields as shown in Diagram 1

DIAGRAM 1

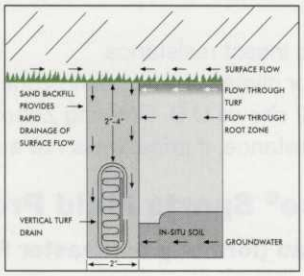
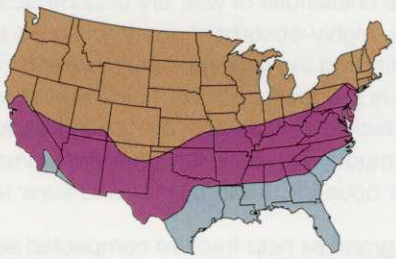


CHART 2



North Transition South Transition & South

LESCO TURFGRASS SEED	CLASSIFICATION
For High-Traffic Sports Fields	
Premium Athletic Mix (001365)	premium
Double Eagle® Blend (011663)	premium
Tuf-Turf Mix™ (007343)	premium
Team-Mates Mix™ (019873)	very good
Team-Mates Plus™ Mix (019586)	very good
TriGold™ (056625)	premium
Duro-Turf (087970)	premium
Transition Blend™ (007330)	very good
Team-Mates Mix (019873)	good
Hybrid Bermudagrass (vegetative)	premium
SunSport (088188)	premium
SunStar Bermudagrass (025915)	very good
For Sports Field Renovation	
Premium Athletic Mix (001365)	premium
Double Eagle Blend (011663)	very good
Classic Sunny Turf (009689)	very good
50/50 Blue-Rye Seed (031403)	very good
Eagle Blend™ Plus Blue Seed (011942)	good
Park and Athletic (001689)	good
Metro Seed (018345)	good
Transition Blend (007330)	premium
Team-Mates Mix (019873)	premium
SunSport (088188)	premium
SunStar Bermudagrass (025915)	very good
For Overseeding Dormant Bermudagrass	
Double Eagle Supreme (011663)	premium
Overseeding Eagle Blend (061638)	premium
ProBlend™ (011545)	very good

Selecting Turfgrasses

Several things must be considered when selecting turfgrass seed for sport fields:

- Durability
- Disease and insect resistance
- Suitability for climate and growing zone
  - Chart 2 shows U.S. Growing Zones
- Drought resistance, if irrigation is not available

Pro's Choice® Sports Field Products

Pro's Choice Red (formerly Soilmaster Red)

Use Pro's Choice Red to improve the composition, color and playability of your field, season after season. Designed to meet the challenges of wet, dry or compacted infields, this unique, highly-absorbent montmorillonite product blends easily into the existing infield mix and creates a more porous soil profile. Pro's Choice Red absorbs excess water and facilitates drainage, eliminating puddles, slick spots and muddy conditions. It alleviates compaction giving truer bounces, fewer injuries and surer footing.

The larger granules help fracture compacted soil, opening narrow channels for water flow. The smaller particles interconnect these channels and absorb excess moisture. Pro's Choice Red granules are very durable and will remain permanently rigid in the soil, releasing stored water as needed to alleviate dust.

To renovate infields:

Usage Rates For Standard Field Renovation

Regulation Field	Softball Field	Little League Field
12 Tons (480 Bags)	10 Tons (400 Bags)	5 Tons (200 Bags)

1. Position bags of Pro's Choice Red soil conditioner evenly over the entire skinned area of the infield. Open and empty bags into piles then spread Pro's Choice Red soil conditioner over the surface with a drag mat.
2. Using a rototiller, blend the soil conditioner into the top 3 inches of soil. Use a drag mat to breakup any clumps and to blend the product into the surface.
3. Moisten the infield lightly and roll with a one-ton roller or hand roller. This will smooth and firm up the playing surface, allowing it to settle.
4. Continue to drag the infield slowly until low spots are level and the soil has loosened. Topdress with at least 20 bags of Pro's Choice Red soil conditioner or Pro's Choice Select topdressing and fine drag the surface again. For that professional ballpark look, topdress periodically with Pro's Choice Pro Red professional topdressing.

To condition infields:

Usage Rates for Standard Field Conditioning

Regulation Field	Softball Field	Little League Field
6 Tons (240 Bags)	5 Tons (200 Bags)	2 Tons (80 Bags)

1. Moisten skinned areas and spread Pro's Choice Red soil conditioner over the entire infield.
2. Apply more to problem areas.
3. Work Pro's Choice Red into the top 1 inch of soil with a nail drag or rake.
4. Smooth with a drag mat.
5. Topdress as above.

Long term benefits:

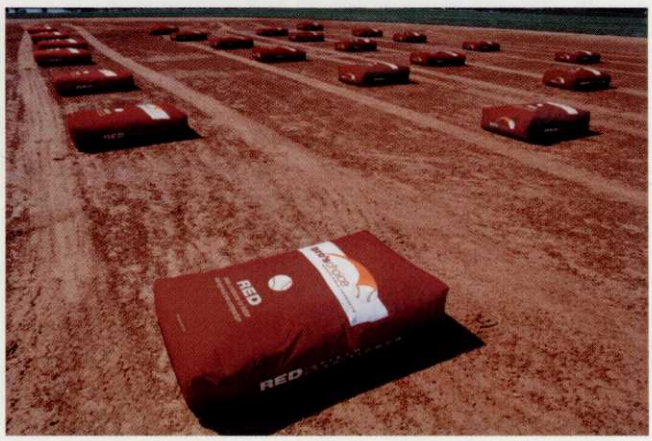
Because Pro's Choice Red soil conditioner granules are heat-treated to enhance durability and reduce breakdown, they continue to work in your field season after season, substantially reducing maintenance costs and labor.

- Application rates of Pro's Choice Red conditioner can vary depending on current field conditions. Ask your LESCO representative for recommendations regarding special conditions. When renovating an infield, the general application rule of thumb is 1.5 tons of Pro's Choice Red conditioner per every 1000 square feet of skinned area. For conditioning, the rule of thumb is 0.75 tons per 1000 square feet.

Pro's Choice Select (formerly Soilmaster Select) & Pro's Choice Pro Red

Use Pro's Choice Select and Pro's Choice Pro Red to give you the look of a professional ballpark.

Pro's Choice Select and Pro's Choice Pro Red are specially formulated to work as the perfect topdressing, enhancing the performance of our original Pro's Choice Red soil conditioner. Small, uniform granules give you the look of a professional ballpark, and deep red color is the perfect match for our Pro's Choice Red and Rapid Dry® products.



To topdress infields:

1. Position 20-60 bags of Pro's Choice Select or Pro's Choice Pro Red topdressing evenly over the entire skinned area of the infield, between the bases.
2. Empty bags into piles and spread topdressing over the surface with a rake or a drag mat.
3. Level and fine drag the infield slowly to an even and finished appearance. Repeat as needed throughout the season.
4. To deepen red color, lightly water after application.

For additional areas of the field:

Base Paths: Apply 3-4 bags to each base path and scratch in with rake or nail drag.

Home Plate Area: Lightly spread 2-3 bags in batter's boxes and around home plate.

Pitcher's Mound: Spread 1-2 bags over the mound to regulate surface moisture.

Rapid Dry

Rapid Dry drying agent. When you need a game saver, you need Rapid Dry in the lineup. It quickly wicks away excess water from your playing field and improves soil consistency. Its perfectly-sized granules improve stability, encourage rapid absorption of moisture and reduce compaction with less dust than other quick drying products. Its sand-like texture improves footing on slippery surfaces. Rapid Dry is the only drying agent available in the same deep red color as Pro's Choice Red infield conditioner. It works quickly so puddles disappear and you're back in the game – fast.

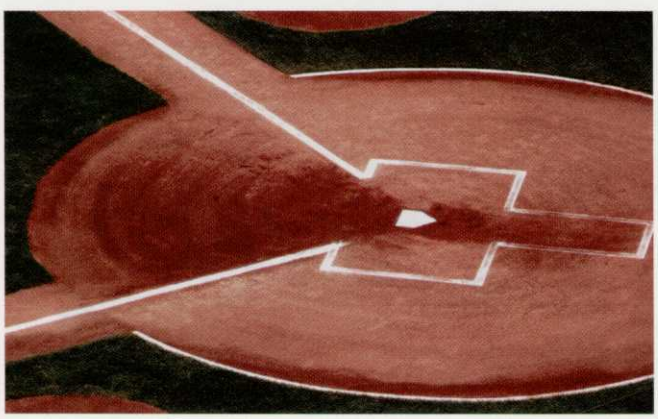
Rapid Dry drying agent is the game-saving fix for wet, muddy ballfields. Because it is specifically formulated to be a drying agent and not just a powdered by-product, it has the perfect granule size to stabilize muddy areas on the skinned parts of the infield and blend into the turf in your outfield. It's easy and economical to use.

To apply to infields:

1. Pour a sufficient amount of Rapid Dry drying agent on top of puddles or soggy area.
2. Spread evenly over the entire wet area with a rake or by hand.
3. Once the water is absorbed, work the material into the soil with a rake. Use a drag mat on large areas. Repeat steps 1 - 3, until desired surface condition is achieved.

To apply to turf areas:

1. Fan out with a shovel or spreader to evenly distribute over wet and soggy turf.
2. Reapply until moisture disappears. A push broom can be used to help work Rapid Dry drying agent into the turf thatch.



Pro's Choice Green

For hall of fame performance in any turf area, put Pro's Choice Green soil conditioner in your lineup. Pro's Choice Green conditions your turf to hold up to even the most grueling traffic. The granules, colored to blend in with your turf, can even camouflage bare or worn areas. Pro's Choice Green soil conditioner is made of the same highly absorbent montmorillonite clay as our regular Pro's Choice Red soil conditioner – making it perfect for topdressing and game day touch-ups.

Pro's Choice Green soil conditioner's hard absorptive granules offer your turf all the benefits of Pro's Choice Red, plus a green color to camouflage their appearance in grass. Incorporating Pro's Choice Green into turf reduces compaction and increases infiltration and drainage. By opening up passageways in the soil, Pro's Choice Green enhances the root zone growing area, allowing moisture and nutrients to flow into the root zone, promoting strong, vigorous root growth and healthy turf all season long.

Topdress worn turf areas:

Pro's Choice Green soil conditioner is the perfect answer for important game day appearance problems. The green granules will give muddy areas a healthy turf look, while drying wet muddy areas and covering worn turf. Pro's Choice Green works well on heavy traffic areas such as between the twenty-yard lines and the hash marks on a football field and at the goalmouths on a soccer field.

Application suggestions:

1. Apply Pro's Choice Green to worn or muddy areas using a top dresser, shovel or by hand.
2. If using a spreader the recommended application rate is 250 lbs. per 1000 sq. ft. Heavier applications can be used for cosmetic applications.

3. After applying Pro's Choice Green, it is recommended to either level off with a rake or drag mat.

This product is perfect for all types of sports turf fields:

- Football
- Baseball
- Field Hockey
- Soccer
- Rugby
- Lacrosse

Non-cosmetic soil conditioning and topdressing:

Use Pro's Choice Turf soil conditioner to repair and modify large areas of your fields. Pro's Choice Turf is cost effective for large non-cosmetic repairs. Aeration followed by topdressing helps alleviate compaction, enhancing root growth, allowing water, nutrients and oxygen to move through the soil profile.

Pro Mound® Packing Clay

Pro Mound packing clay is easy to install. It requires only a shovel, rake, tamp and water. Approximately forty 50 lb. bags (1 pallet) of Pro Mound are needed to resurface and maintain the mound, batters' boxes and catcher's station.

To install:

1. In the mound, remove the top 4-6 inches of soil from the area around and in front of the pitching rubber or only in the high wear areas, such as immediately in front of the pitching rubber and in the foot landing area.
2. Remove 4-6 inches of soil from the batters' boxes and catcher's station (either the entire box dimensions or only in the worn areas).
3. Lightly apply water, to the prepared area. Let soak in. This will help form a bonding base with the existing soil.
4. Apply a 1-inch layer of Pro Mound packing clay to each excavated area. Compact Pro Mound firmly with a tamp. Lightly water these areas and let soak in. Add another 1-inch layer of Pro Mound. This will bring the packing clay to near grade level. Tap firmly. Repeat this process until Pro Mound is within ½ inch of finished grade.
5. Cover each area with a skin coating of infield mix and tamp again. Apply two bags of Pro's Choice Select or Rapid Dry to absorb surface moisture.

To repair:

1. Sweep out any divots made in the Pro Mound and use a rake to level off any high spots.
2. Moisten the area to be repaired.
3. Fill the divots with Pro Mound and tamp firmly.
4. Finally, cover with infield soil and tamp again.

To maintain:

Lightly water mound, catcher's station and batters' boxes and cover with a tarp when not in use. If this is not possible, cover them with a light coating of Pro's Choice Red infield conditioner to maintain the correct moisture level.

Pro's Choice also offers pre-formed Pro Mound Bricks. These packing bricks are also easy to install and very durable.

Initial Seeding and Reseeding

For cool-season areas:

- Seeding cool-season grasses around the beginning of September is ideal
- Seeding can also be done in the spring
- Allow 4 to 6 months for cool-season grass seedlings to fully establish

For warm-season areas:

- Seed or sprig warm-season grasses in late June or July
- Allow 3 to 4 months for turf to establish

More than any other type of turf area, sport fields require frequent reseeding due to wear and tear. Most susceptible to damage are the mid-field sections of American football and rugby fields and the goal-front areas on soccer, field hockey and lacrosse fields. While many sports turf managers make an ongoing commitment to dense turf by regularly putting down seed and allowing the athletes to "cleat" it in, reseeding on a larger scale is often still required.

The procedures listed below provide guidelines for initial seeding or reseeding:

1. Disk or till the area.
2. Fill low spots with good-quality topsoil and level.
3. Adjust soil pH with either ground limestone or sulfur, as required.
4. Apply a high-phosphorus fertilizer (such as LESCO Starter 18-24-12) to promote optimum seed germination and development, or apply Bolster G organic fertilizer with mycorrhizae to promote root growth and to enhance turf survivability.
5. Re-till and finish-grade the area.
6. Seed with the appropriate LESCO seed mixture using a broadcast spreader, cultipacker seeder or by hydroseeding. When reseeding, select a LESCO seed mixture with varieties similar to the existing turf. Chart 3 shows typical seeding rates by variety.
7. If you use a broadcast spreader, drag or lightly rake seed into top ¼" of soil and then firm with a light roller.
8. Mulch the area with suitable mulching material.

CHART 3

Seed Type	Lbs./1,000 sq. ft.
Bahiagrass	8-10 lbs.
Bermudagrass	2-3 lbs.
Bluegrass/Ryegrass mixtures	3-4 lbs.
Tall Fescue mixtures	8-10 lbs.

Overseeding

Overseeding is the procedure used for sports fields where damage is not extensive enough to require complete reseeding, or for converting warm-season playing surfaces to cool-season surfaces during the time the warm-season grass is dormant.

Suggested procedures:

1. In the North, overseed into honeycombed soils from late February through late March. You'll see best results if the soil freezes at night and thaws during the day. Apply seed in the early morning when the soil is still frozen. Apply at one-half to three-quarters of the initial seeding rate shown in Chart 3. Best results are achieved with several applications 4-5 days apart, rather than all at once.
2. In the North, you can also overseed later in the spring. After cleaning up winter debris, aerate the field 8-10 times with a spoon-type aerator. Broadcast the seed or cut it into the turf with a turf-type disk seeder. Then drag the field with a section of chain link fence or similar material to break up soil cores and work the seed into the soil.
3. In the Transition Zone or South, overseeding begins as early as September in the more northern areas and as late as December in South Florida. Use the procedures outlined in paragraph 2 above.

Products for Maintenance of Sports Turf

Slow Release & Top Performing Fertilizers

LESCO offers a complete line of fertilizers ideal for sports turf maintenance:

- TriVex™
- PolyPlus®
- LESCOCote™
- PolyVex™
- Ecosential™
- ProMax™
- TurfVigor®
- MacroN™
- Iron Plus
- Chelated Iron Plus
- GreenFlo™
- Bolster® G

Soil Testing & Irrigation

LESCO offers soil testing services through one of the country's best laboratories, as well as irrigation equipment:

- Complete soil testing and analysis
- Soil testing supplies
- Irrigation supplies
  - » Nozzles
  - » Valves
  - » Conversion Kits
  - » Flexogen® Hoses

Aerators & Mowers

LESCO offers several mowers and aerators suitable for sports turf maintenance:

- Z-Two® Riders
- Walk-Behind Rotaries
- Stand-On Rotaries
- Ride-On Aerator
- Walk-Behind Aerator
- Pull-Behind Aerator

Tools & Protective Gear

LESCO offers tools and protective gear for sports turf managers and crews:

- Rakes & Shovels
- Measuring Wheel
- Safety Glasses
- Hearing Protection
- Paint and Pesticide Respirators
- Boots, gloves, coveralls, rainsuits
- Par Aide® hand tools - special orders only

Application Equipment

LESCO offers the product application equipment required for maintaining quality sports turf:

- Poly Tank Sprayers
- Backpack Sprayers
- Handheld Sprayers
- Portable Spot Sprayers
- Rotary Spreaders
- Roto/Drop Spreader
- Spreader/Sprayer Combination

Disease Control

LESCO offers a complete line of turfgrass fungicides:

- Proven and trusted active ingredients
- Choice of contact or systemic mode-of-action
- Preventive or curative
- Granular or sprayable formulations
- Granular fertilizer/fungicide combination products

Weed Control

LESCO offers a complete line of pre-emergent and post-emergent herbicides for the control of weeds before and after they appear:

- Proven and trusted active ingredients
- Granular or sprayable formulations
- Granular fertilizer/pre-emergent/post-emergent herbicide combination products
- Products for both cool- and warm-season turfgrass

Insect Control

LESCO offers a complete line of insecticides for the control of turf pests:

- Proven and trusted active ingredients
- Products to control surface and sub-surface insects
- Granular or sprayable formulations
- Granular fertilizer/insecticide combination products
- Products for both cool- and warm-season turfgrass

Specialty

LESCO offers specialty products designed to improve sports turf stress tolerance, appearance and simplify product application:

- RegiMax PGR™
- Tracker®
- LESCOFlo™ Ultra
- LESCO Green™
- Moisture Manager

Marking Paint

LESCO offers both the paint and equipment needed to mark sports fields:

- Tournament™ Athletic Field Marking Paint
- Turf Marking Machine
- Marking Paint Wand

Part II. Maintaining Sports Turf

Testing the Soil

Soil testing is the first step toward developing and maintaining quality sports turf. LESCO offers complete soil testing services – contact your sales representative or stop by your LESCO Service Center® for details. A kit is also available if you prefer to do your own testing. A soil test will:

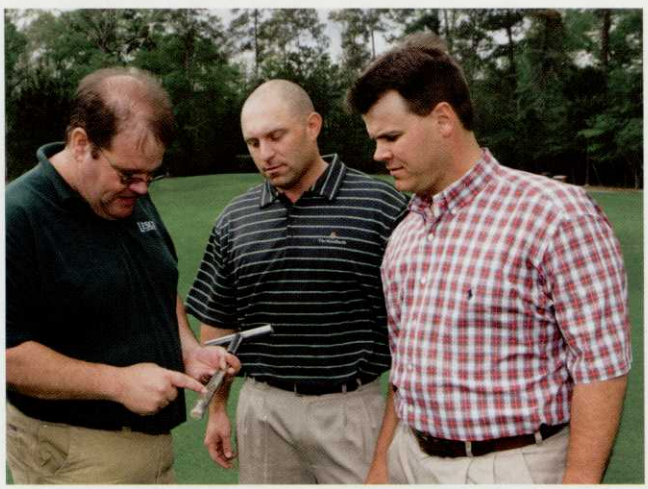
- Specify nitrogen, phosphorus and potassium levels and whether they are high or low
- Specify micronutrient levels and whether they are high or low
- Provide soil pH information (see next section on pH balance)

Based on soil test results, you can work with your LESCO Sales Representative to develop an annual nutrient management program. Re-test as needed to evaluate results and make necessary adjustments.

pH Balance

pH indicates the level of acidity or alkalinity in your soil:

- Neutral soil measures 7.0 pH
- A pH above 7.5 indicates alkaline soil
  - Sulfur can be applied to lower pH
- A pH below 6.8 indicates acidic soil
  - A neutralizing product, typically limestone or gypsum, can be applied to raise pH
- Sulfur and lime can be applied at any time, but typically in the late fall, followed by aeration
- In northern areas, sulfur and lime are sometimes applied during the winter to dormant turf



Fertilizing

The three primary nutrients in professional turf fertilizer are:

- Nitrogen (N)
- Phosphorus (P)
- Potassium (K)

The three large numbers printed on a fertilizer package denote the fertilizer analysis, and correspond to the percentage of N, P and K in the fertilizer – 28-5-12, for example. You can work with your LESCO Sales Representative to select fertilizers and develop an annual program best suited to the agronomic conditions or requirements of your sports turf.

Some basic fertilizer considerations include:

- Fertilizer with a higher proportion of nitrogen can promote quicker greening and encourage growth
- Potassium helps the turf resist stress caused by drought, heavy traffic and high temperatures
- Starter fertilizers typically have higher percentages of phosphorus to encourage root establishment

Most professional turf fertilizers also contain additional essential plant nutrients classified as secondary and micronutrients and often called trace elements. These can include:

- Manganese
- Iron
- Magnesium
- Calcium
- Sulfur
- Others

If soil tests indicate a deficiency in any of these elements, be sure to correct this imbalance with a fertilizer containing an adequate secondary or micronutrient element package or apply a supplemental fertilizer.

The final consideration when purchasing fertilizer is the type of nitrogen source and how the nitrogen is released to the turf. Fertilizers with slow-release technology are very popular and offer several benefits:

- Nitrogen is released over extended period of time
- Provide steady, gradual greening
- Prevent excessive top growth, which can weaken turf and make it more susceptible to drought, disease, insects and other problems

- Can reduce labor requirements by reducing mowing frequency and minimizing clippings
- Minimizes potential of turf burn

Fertilizers can be applied in a granular form, using a rotary or drop spreader, or in a liquid form with spray equipment. A typical fertilizer program for a single growing season might include periodic granular fertilizer applications providing the majority of the required nutrients, supplemented with smaller, more frequent liquid fertilizer, micronutrient, or biostimulant applications.

Chart 4 shows a typical fertilization schedule with recommended application rates.

CHART 4

RATE PER ACRE AND TIME OF APPLICATION

FERTILIZER ANALYSIS		LATE SPRING	LATE SUMMER	FALL
For cool season turfgrasses:				
034474	LESCO 24-5-11 2%Fe, 1%Mn 50% sulfur-coated urea	180#	180#	180#
016481	or 32-3-8 2%Fe 30% sulfur-coated urea	140#	140#	140#
OR				
000777	LESCO 39-0-0 sulfur-coated urea plus	100#		
032595	LESCO 18-24-12 50% sulfur-coated urea	180#	180#	
For warm season turfgrasses*:				
011695	LESCO 16-4-8 50% sulfur-coated urea	275#	275#	275#
OR				
034474	LESCO 24-5-11 2%Fe, 1%Mn 50% sulfur-coated urea	180#	180#	180#
OR				
000777	LESCO 39-0-0 sulfur-coated urea plus	100#		
032595	LESCO 18-24-12 50% sulfur-coated urea	180#	180#	

**If dormant turf is overseeded, then an additional fertilizer application should be made in late Fall at the same Fall rate.*

Top-Performing Fertilizers

TriVex – homogeneous nitrogen, phosphorus, potassium granular fertilizer

PolyPlus – blended controlled release polymer-coated sulfur-coated urea fertilizer

LESCOCote – blended polymer-coated urea nitrogen fertilizers

PolyVex – blended granular fertilizers utilizing two controlled-release nitrogen sources, Poly Plus and methylene urea

Ecosential – 100% organic and nitrogen-fortified products

ProMax / TurfVigor - complete biostimulant/stress reduction products

MacroN – complete line of water-soluble fertilizer products

Iron Plus – liquid micronutrient supplements

Chelated Iron Plus – chelated liquid micronutrient supplements

GreenFlo – complete line of liquid nitrogen, phosphorus, potassium fertilizers, many utilizing Urea-Triazone slow-release nitrogen

Soil/Turf Amendments – Bolster G granular organic fertilizer with mycorrhizae and biostimulants, limestone/gypsum, phytes and more

Irrigation

To thrive, turfgrass needs adequate water at regular intervals. Since this ideal combination rarely occurs naturally, an irrigation system may be needed for your sports turf. This can range from an in-ground system with pop-up sprinkler heads and automatic timers, to simple garden hoses and sprinklers. Typically, you should install an irrigation system that can deliver 1½" of water to a field every 4-5 days under drought conditions. Consult a local irrigation professional for particulars.

Mowing

The two primary issues with mowing involve cutting height and frequency. In general, you should adjust the frequency so that no more than one-third of the blade height is removed at one time. With proper frequency, clippings returned to the turf will mulch in and decompose, adding their nutrients back to the soil. Chart 5 provides guidelines for various types of grasses.

CHART 5

Grass Type	Mowing Height (inches)	Mowing Frequency (days)
Kentucky Bluegrass	2.0	5-7
Tall Fescue	2.5	7-10
Bermudagrass (common)	1.5	3-5
Bermudagrass (hybrid)	1.0	3-5
Bahiagrass	3.0	7-14

Although reel mowers are considered to provide the best quality of cut, rotary mowers give you excellent results when they are kept sharp.

Aerating

Aerating allows a more efficient and quicker uptake of air, water and nutrients to the turfgrass by eliminating soil compaction.

- Recommended frequency is three times a year
- If field is showing effects of soil compaction, aerate every 10-14 days, but avoid aeration during periods of stress

Always use a closed-spoon aerator (not spike) to remove soil cores. For athletic fields, the core should be ¾" to 1" in diameter. Light aeration means running the aerator 1-3 times over the field and heavy aeration means 6-8 passes. Generally, perform heavy aeration once in the spring prior to fertilization and/or overseeding, and light aeration in late summer and fall. For spring and summer aeration, drag the field afterwards with a chain drag or a section of chain link fence. Do not drag after the fall aeration to receive maximum effect from winter freezing and thawing. To maximize the effects of aeration, always follow with an application of LESCO Starter Fertilizer and/or Bolster G (mycorrhizal product).

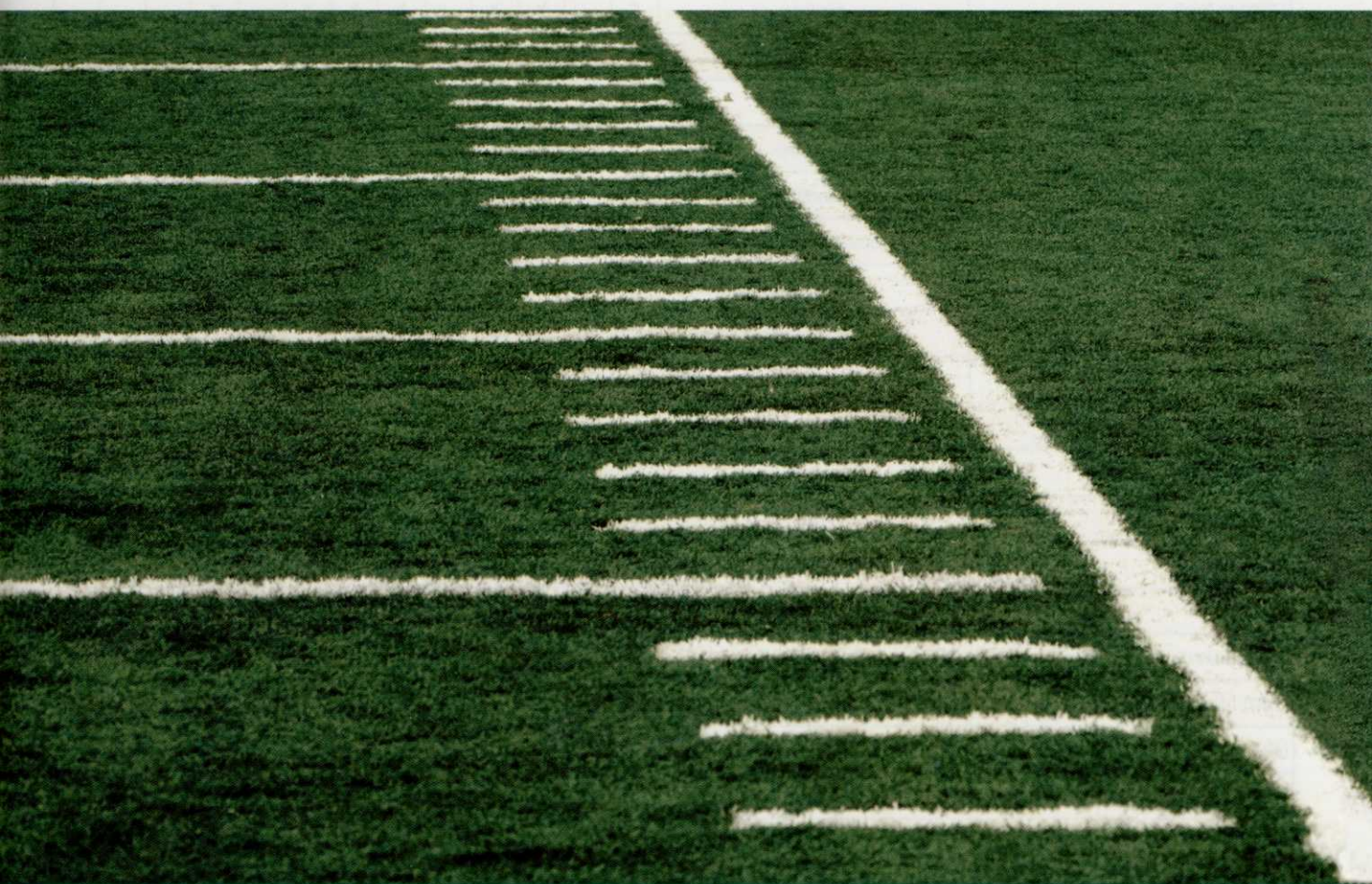
Dethatching

Dethatching is needed to thin the layer of dead and living shoots and stems that form above the soil and reduce the air and water penetration to the turfgrass roots.

- When this thatch layer exceeds ½", the plant's roots will begin to grow in the thatch instead of the soil. This makes them very susceptible to drought, temperature change and disease.
- Dethatching removes these growth clippings mechanically with a power rake that cuts the thatch and brings it to the surface for collection.

Marking the Field

Most sports fields are marked with sidelines, end lines, goal lines, some form of yardage markers and so on. The preferred marking materials are turf marking paint, powdered chalk or other materials that are non-toxic and non-injurious to the players. Never use caustic lime to mark playing fields.



Disease Control

Disease control is an important aspect of sports turf maintenance. It involves accurate pathogen identification, proper fungicide programming, the choice of systemic or contact mode-of-action and resistance management. LESCO simplifies disease management by offering the latest in plant protection chemistry along with tried-and-true favorites in both granular and sprayable formulations, as well as convenient combination products. Contact your LESCO Sales Representative for assistance in disease identification and selection of the appropriate fungicides.

Disease Control Solutions		Contact, Systemic, Both	Anthracnose	Brown Patch	Dollar Spot	Gray Leaf Spot	Gray Snow Mold	Leaf Spot	Pink Snow Mold	Pythium	Red Thread	Rust	Southern Blight	Yellow Tuft
LESCO PRODUCTS	**COMMON NAME**													
LESCO 18 Plus™	Iprodione	S		X	X		X	X	X		X			
LESCO Bayleton® 50	Triadimefon	S	X	X	X		X		X		X	X	X	
Bayleton 1.0% Granular	Triadimefon	S	X	X	X		X		X		X	X	X	
Mancozeb 4F	Mancozeb	C		X	X	X		X	X	X	X	X		
Mancozeb DG	Mancozeb	C		X		X		X	X	X	X	X		
MANhandle®	Mancozeb+ Myclobutanil	B	X	X	X	X		X	X	X	X	X		
Manicure® 6FL	Chlorothalonil	C	X	X	X	X	X	X	X		X	X		
Manicure T&O	Chlorothalonil	C	X	X	X	X	X	X			X	X		
Manicure Ultra 82.5%	Chlorothalonil	C	X	X	X	X	X	X	X		X	X		
PCNB 12.5% + Fert	PCNB	C		X	X		X	X	X					
Prodigy™ Signature™	Fosetyl-Al	S								X				X
Revere™ 10G	PCNB	C		X	X		X	X	X					
Revere 4000	PCNB	C		X	X		X	X	X					
Spectator®	Propiconazole	S	X	X	X	X	X	X	X		X	X		
Spectator Ultra 1.3	Propiconazole	S	X	X	X	X	X	X	X		X	X		
LESCO T-Storm 2G	Thiophanate-methyl	S	X	X	X	X		X	X		X			
LESCO T-Storm™ Flo	Thiophanate-methyl	S	X	X	X			X	X		X			
LESCO T-Storm 50WSB	Thiophanate-methyl	S	X	X	X			X	X		X			
TwoSome™ Flowable	Thiophanate-methyl + Iprodione	B	X	X	X			X	X					

Insect Control

All turf areas can occasionally have problems with insects, and sports turf is no exception. Before applying an insecticide, it is important to properly identify the pest to be controlled. Contact your LESCO sales representative for assistance in pest identification and selection of the appropriate control product.

Nuisance Wildlife Solutions		Nuisance Wildlife					
LESCO PRODUCTS	ACTIVE INGREDIENT	Moles/Voles	Gophers	Geese	Deer	Rabbit	Squirrel
Talpirid™	Bromethalin	X					
Kaput® Mole Gel Bait	Warfarin	X					
Liquid Fence® Mole/Vole Repellent	N/A	X	X				
Liquid Fence Goose Repellent	N/A			X			
Kaput D Gopher Bait	Diphacinone		X				
Flight Control® Plus	Anthraquinone			X			
Deer Off®	N/A				X	X	X

Insect Control Solutions		Surface															Sub Surface					
LESCO PRODUCTS	ACTIVE INGREDIENT	Ants	Armyworms	Black Turfgrass Ataenius - Adult	Bluegrass Billbug - Adult	Chiggers	Chinch Bug	Cutworm	Earwig	European Crane Fly	Fire Ants	Fleas	Grasshopper	Mites (Various Turfgrass)	Sod Webworms	Spittlebug	Ticks	Black Turfgrass Ataenius - Larvae	Bluegrass Billbug - Larvae	Hyperodes Weevil	Mole Cricket	European Crane Fly - Larvae	White Grub Species
Merit® WSP	Imidacloprid						X	X										X	X	X	X	X	X
Allectus® SC Flowable	Bifenthrin & Imidacloprid		X	X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
Allectus Granular	Bifenthrin & Imidacloprid	X	X	X	X		X	X		X	X				X			X	X	X	X	X	X
CrossCheck® Plus Flowable	Bifenthrin	X	X	X	X		X		X	X	X	X	X	X	X		X			X	X	X	X
CrossCheck EZ Granular	Bifenthrin	X	X	X	X		X		X	X	X	X	X	X	X		X			X	X	X	X
CrossCheck PL Granular	Bifenthrin	X	X	X	X		X		X	X	X	X	X	X	X		X			X	X	X	X
TopChoice®	Fipronil	X									X	X					X				X		
Advion® Fire Ant Bait	Indoxacarb										X												
Dylox® 6.2G	Trichlorfon		X					X							X					X	X		X
Sevin® SL	Carbaryl	X	X	X		X	X	X	X	X		X	X		X	X	X	X	X	X			X
Sevin 6.3% Granular	Carbaryl	X	X		X	X	X	X	X			X	X		X	X	X					X	X
Advion Mole Cricket Bait	Indoxacarb																				X		
Fertilizer Combination Products																							
Merit + Fertilizer	Imidacloprid																	X	X	X	X	X	X
Mach 2® + Fertilizer	Halofenozide																						X
Talstar® + Fertilizer	Bifenthrin	X	X	X	X		X	X			X	X			X		X			X	X		
Allectus + Fertilizer	Bifenthrin & Imidacloprid		X		X		X	X		X	X	X			X		X	X	X	X	X	X	X
TopChoice +Fertilizer	Fipronil	X									X	X					X				X		

Weed Control

Weed management is an important aspect of sports turf management. The process can be broken down into two basic categories, commonly referred to as pre-emergent and post-emergent weed control.

Before they appear

Pre-emergent weed control is the process of eliminating weeds before they appear. Pre-emergent herbicides are generally used to prevent annual grassy weeds, such as crabgrass, goosegrass, *Poa annua* and foxtail, and some broadleaf weeds. These products can be applied as either a granular or sprayable and control weeds by establishing a barrier in the soil that prevents germinating weed seeds from emerging. Timing can be critical and many professional turf managers treat the turf twice to maximize weed prevention.

Pre-emergent Weed Control Solutions

LESCO PRODUCTS	COMMON NAME	FORMULATION	Grassy Weeds							Broadleaf Weeds										Misc.
			Annual Bluegrass	Barnyardgrass	Crabgrass	Fall Panicum	Foxtail	Goosegrass	Johnsongrass	Carpetweed	Chickweed	Florida Pusley	Henbit	Knotweed	Lambsquarter	Oxalis	Purslane	Shepherdspurse	Spurge	Ornamental Labeling
Lifeguard® WSP	Dithiopyr	Sprayable	X	X	X		X	X			X		X			X	X	X	X	
Dimension® + Fertilizer	Dithiopyr	Granular	X	X	X		X	X			X		X			X	X	X	X	
PRE-M + Fertilizer	Pendimethalin	Granular	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	
PRE-M 3.3 EC	Pendimethalin	Sprayable	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	
PRE-M® AquaCap™	Pendimethalin	Sprayable	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	
Stonewall® + Fertilizer	Prodiamine	Granular	X	X	X		X	X	X	X	X	X		X	X		X	X	X	X
Stonewall 65WDG	Prodiamine	Sprayable	X	X	X		X	X	X	X	X	X		X	X		X	X	X	X

After they appear

Post-emergent weed control is the process of eliminating weeds after they appear. Post-emergent herbicides are most often used to control broadleaf weeds like dandelions, clover, spurge, chickweed and others. They can be applied as a granular or a sprayable to an entire sports field or spot sprayed on individual weeds or weedy patches.

Post-emergent Weed Control Solutions

LESCO PRODUCTS	COMMON NAME	FORMULATION	Broadleaf Weeds																							Misc.	
			Black Medic	Carpetweed	Chickweed	Chicory	Clover	Curley Dock	Dollarweed	Dandelion	Florida Pusley	Ground Ivy	Henbit	Knotweed	Lambsquarter	Mallow	Oxalis	Plantain, Buckhorn	Purslane	Sheep Sorrel	Shepherdspurse	Speedwell	Spurge	Thistle, Canada	Thistle, Russian	Virginia Buttonweed	Yarrow	Wild Garlic / Onion
Eliminate LO	TIPA 2,4-D, MCPP & Dicamba	Sprayable	X		X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X				X	X
Eliminate™ D	2,4-D, MCPP & Dicamba	Sprayable	X		X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X				X	X
Eliminate	MCPA, Triclopyr & Dicamba	Sprayable	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Momentum® FX2	2,4-D, Triclopyr & Fluroxypyr	Sprayable	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Three-Way™	Amines of 2,4-D, MCPP & Dicamba	Sprayable	X		X	X	X	X		X		X	X	X	X	X		X	X	X	X	X	X				X	
Three-Way Ester II	Esters of MCPA, Triclopyr & Dicamba	Sprayable	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Momentum Force Weed and Feed	2,4-D, Mecoprop-p, Dicamba	Granular	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Atrazine + Fertilizer	Atrazine	Granular	X		X		X		X	X	X		X	X	X		X				X							
18-2-3 (Mini) Weed and Feed	2,4-D, MCPP & 2,4-DP	Granular	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23-0-8 (Mini) Weed and Feed	2,4-D, Mecoprop-p & Dichlorprop-p	Granular	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X

Seasonal Field Maintenance

February/March

- [ ] Overseed cool-season grasses on northern fields
- [ ] Stripe fields with LESCO Tournament Athletic Field Marking Paint, and freshen markings prior to each event

April

- [ ] Every 3-4 years, conduct a soil test to determine nutrient balance and pH level of soil
- [ ] As turf recovers from dormant period, aerate field thoroughly
- [ ] Apply pre-emergent herbicide
- [ ] Reseed bare patches from fall season with appropriate turfgrass seed mixture

May

- [ ] Begin maintenance fertilization
- [ ] Apply systemic herbicide to control broadleaf weeds
- [ ] Repair low spots, puddles to get ready for fall season

June

- [ ] Fertilize and irrigate as needed. Use of specific fertilizers can help minimize the effects of "summer stress" heat and drought
- [ ] Apply systemic herbicide to control broadleaf weeds as needed
- [ ] Do initial seeding/sprigging of new fields in southern areas

July

- [ ] Fertilize, irrigate as needed

August

- [ ] Aerate field
- [ ] Fertilize, irrigate as needed

September

- [ ] Apply pre-emergent for *Poa annua*
- [ ] Fertilize, irrigate as needed
- [ ] Reseed bare patches from spring season with appropriate turfgrass seed mixture
- [ ] Do initial seeding of new fields in northern areas
- [ ] Repair low spots, puddles to get ready for spring season

October

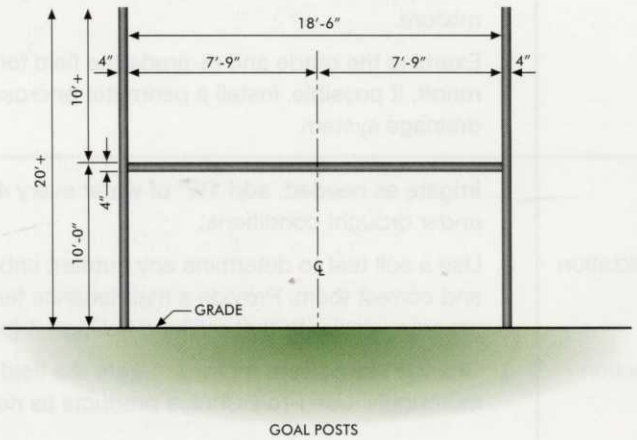
- [ ] Aerate field
- [ ] Fertilize as needed
- [ ] Overseed cool-season grasses on warm-season fields to create a winter playing surface

Troubleshooting

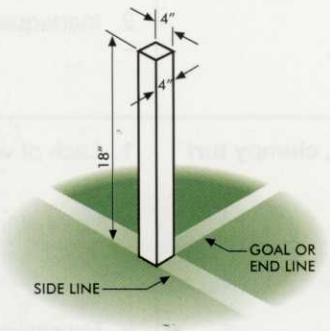
Observed symptom	Possible Cause	Remedy
Puddling	1. Low spots in field	1. Fill the spots with good quality topsoil, Pro's Choice Red or Rapid Dry, level, incorporate into the top 2" of the soil, and seed with appropriate turfgrass seed mixture.
	2. Inadequate drainage	2. Examine the grade and re-grade the field for proper runoff. If possible, install a perimeter or cross-field drainage system.
Sparse, clumpy turf	1. Lack of water	1. Irrigate as needed; add 1½" of water every 4-5 days under drought conditions.
	2. Lack of/improper fertilization	2. Use a soil test to determine any nutrient imbalances and correct them. Provide a maintenance fertilization program similar to that outlined in Chart 4 (page 15).
	3. Excessive soil compaction	3. Change use pattern on field. Aerate the field thoroughly. Use Pro's Choice products as needed.
Excessive scarring	1. Use of field when it is wet	1. Reduce or eliminate play on the field when conditions are wet. Check to see whether there is adequate drainage for the field and install if necessary.
	2. Improper use of the field	
Dead & dying areas	1. Lack of water	1. Irrigate as needed; add 1½" of water every 4-5 days under drought conditions.
	2. Attack by turf disease or pests	2. Determine the problem and provide specific treatment with the recommended control product. Generally, turf diseases and pest problems show other symptoms such as spotting, wilt, the presence of insects and so on.
Poor growth	1. Lack of water	1. Irrigate as needed; add 1½" of water every 4-5 days under drought conditions.
	2. Lack of/improper fertilization	2. Use a soil test to determine any nutrient imbalances and correct them. Provide a maintenance fertilization program similar to that outlined in Chart 4 (page 15).
	3. Excessive soil compaction	3. Change use pattern on field. Aerate the field thoroughly.
Saturated wet field	1. Inadequate drainage	1. Examine the grade and re-grade the field for proper runoff. If possible, install a perimeter or cross-field drainage system.
		2. Install Pro's Choice products as needed.

Part III. Specifications for Design of Playing Fields

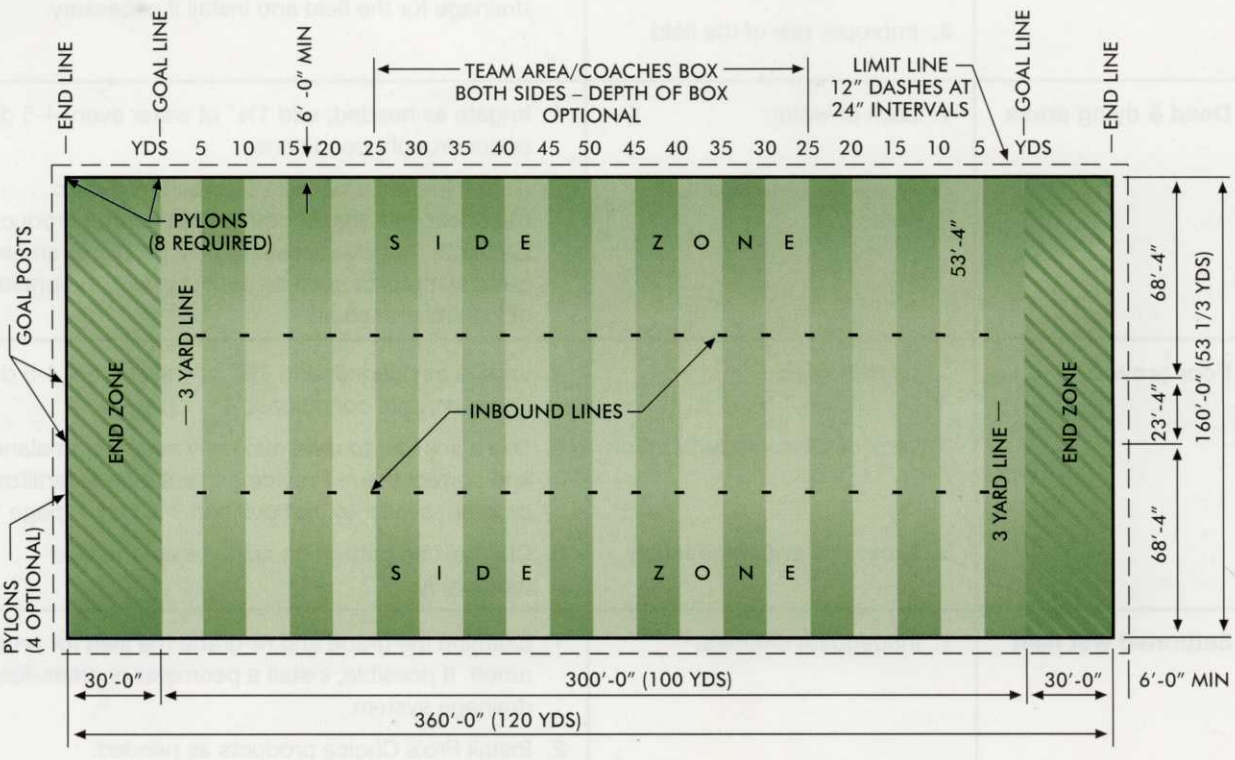
American Football
(NCAA, Pop Warner Junior League)



GOAL POSTS

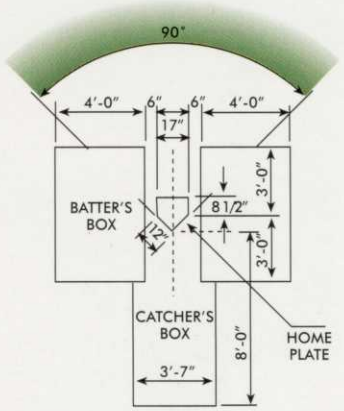


PYLON DETAIL

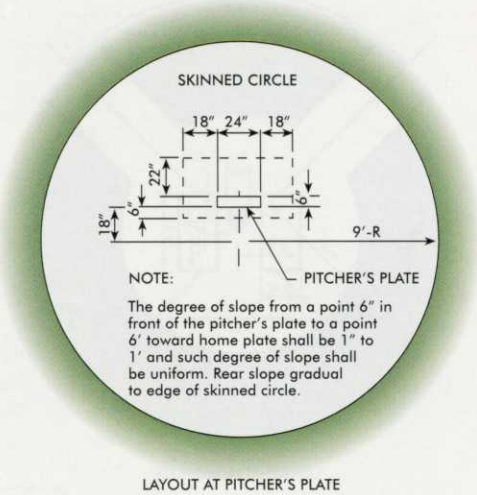


FOOTBALL FIELD LAYOUT

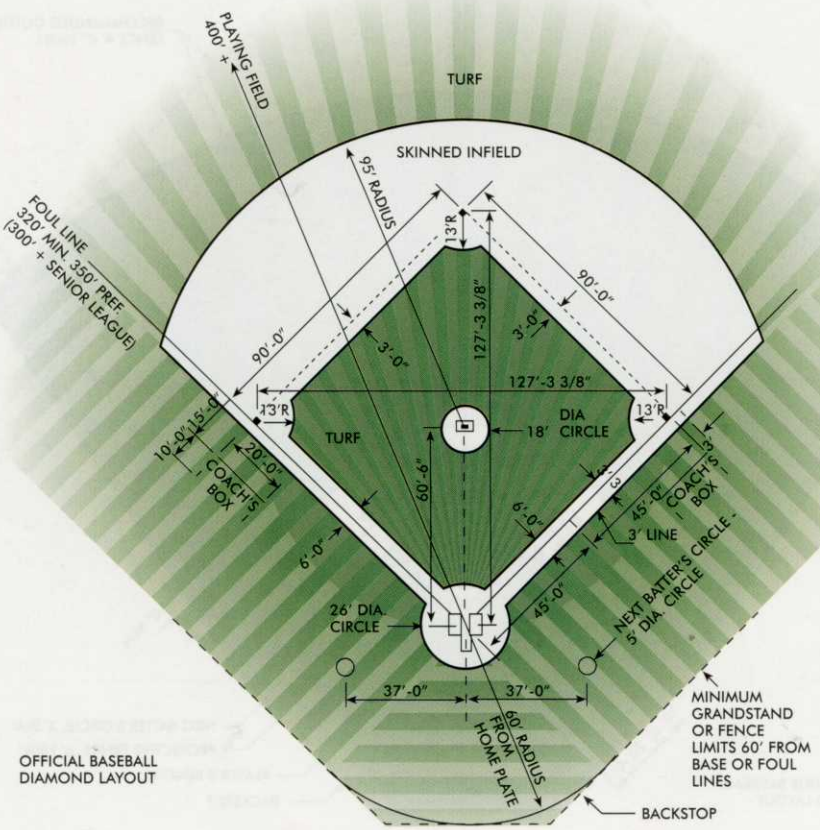
Baseball
(Official, Babe Ruth, Senior League)



LAYOUT AT HOME PLATE

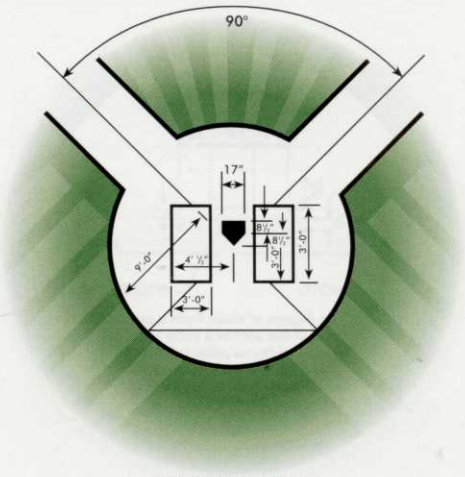


LAYOUT AT PITCHER'S PLATE

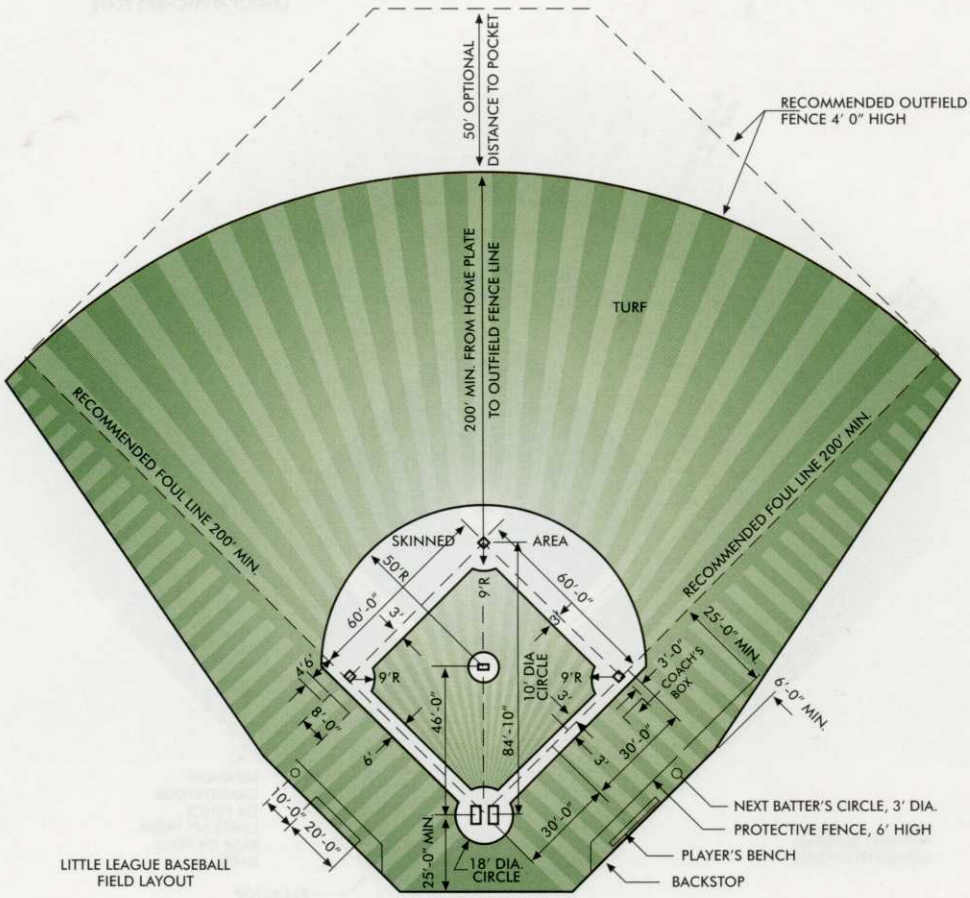


OFFICIAL BASEBALL DIAMOND LAYOUT

Little League
(Little League Baseball, Inc.)

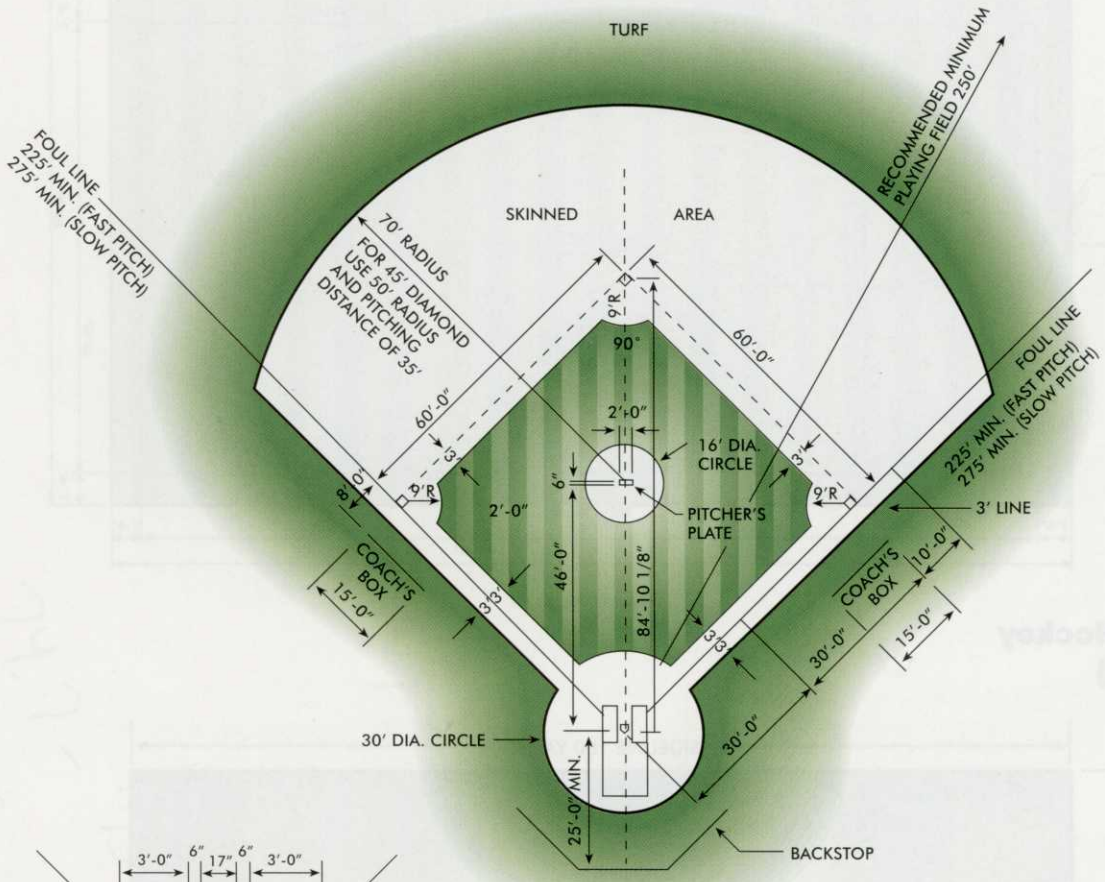


LAYOUT AT HOME PLATE

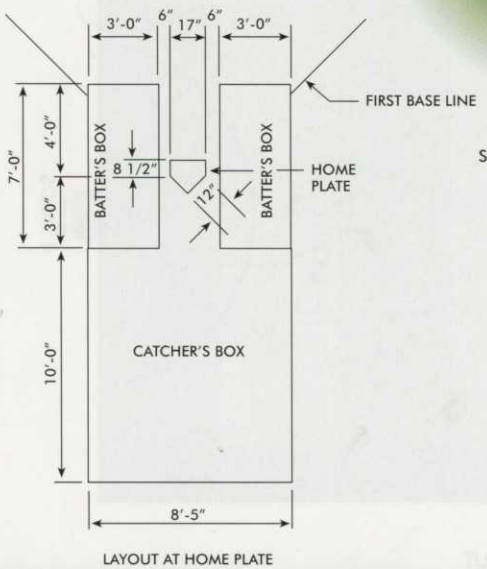


LITTLE LEAGUE BASEBALL FIELD LAYOUT

12" Softball (Fast or Slow Pitch)
[Amateur Softball Association of America (ASA)]

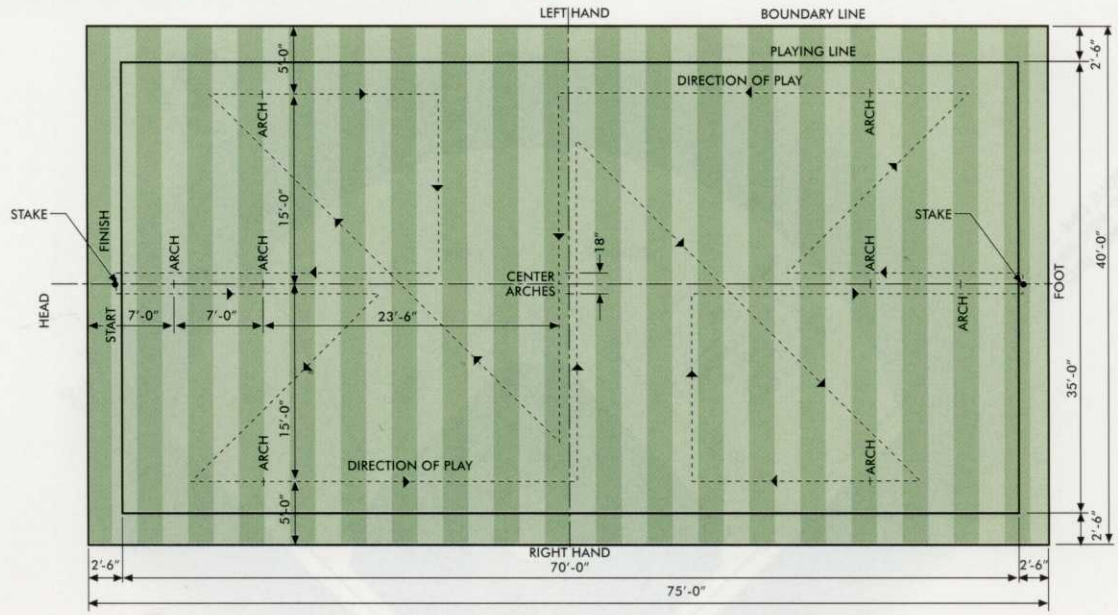


SOFTBALL DIAMOND LAYOUT



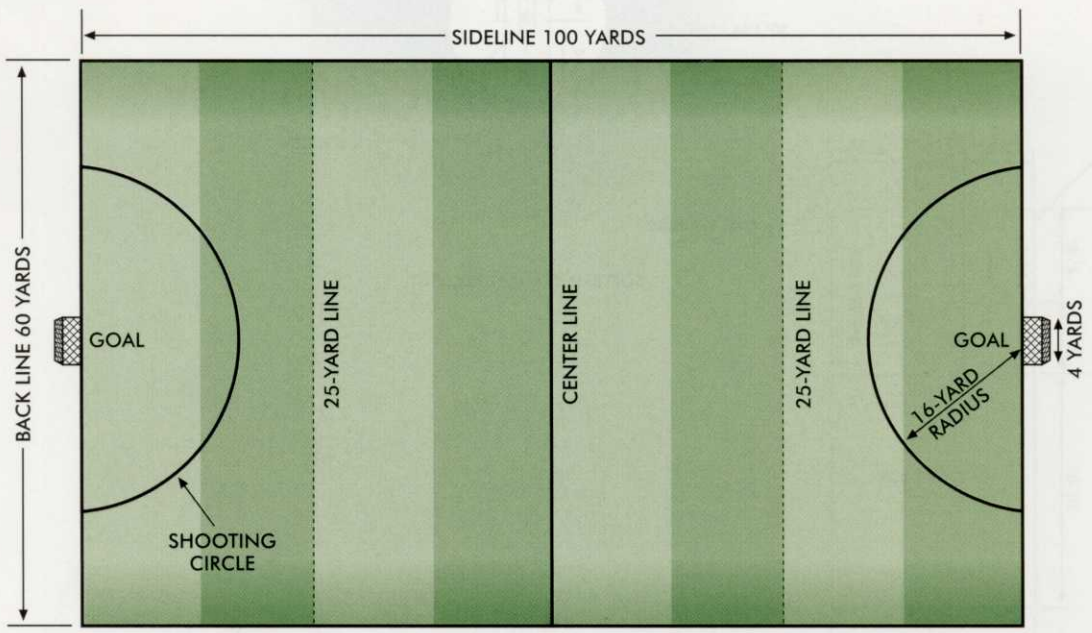
LAYOUT AT HOME PLATE

Croquet
[National Croquet Association (NCA)]



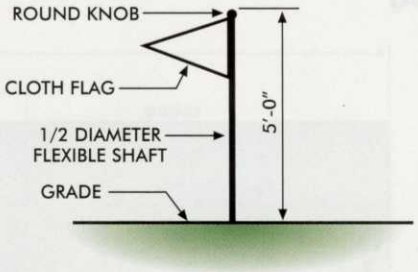
CROQUET FIELD LAYOUT

Field Hockey
(NCAA)

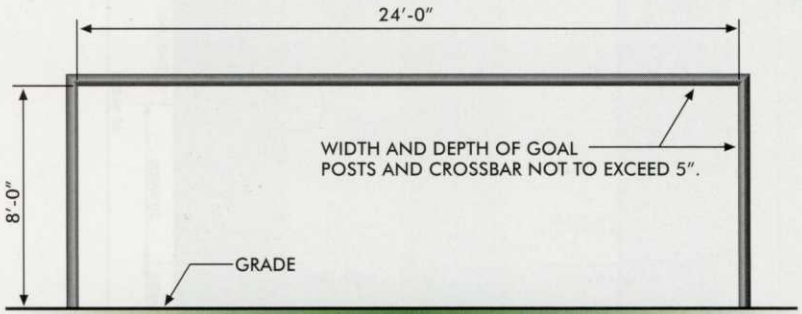


FIELD HOCKEY LAYOUT

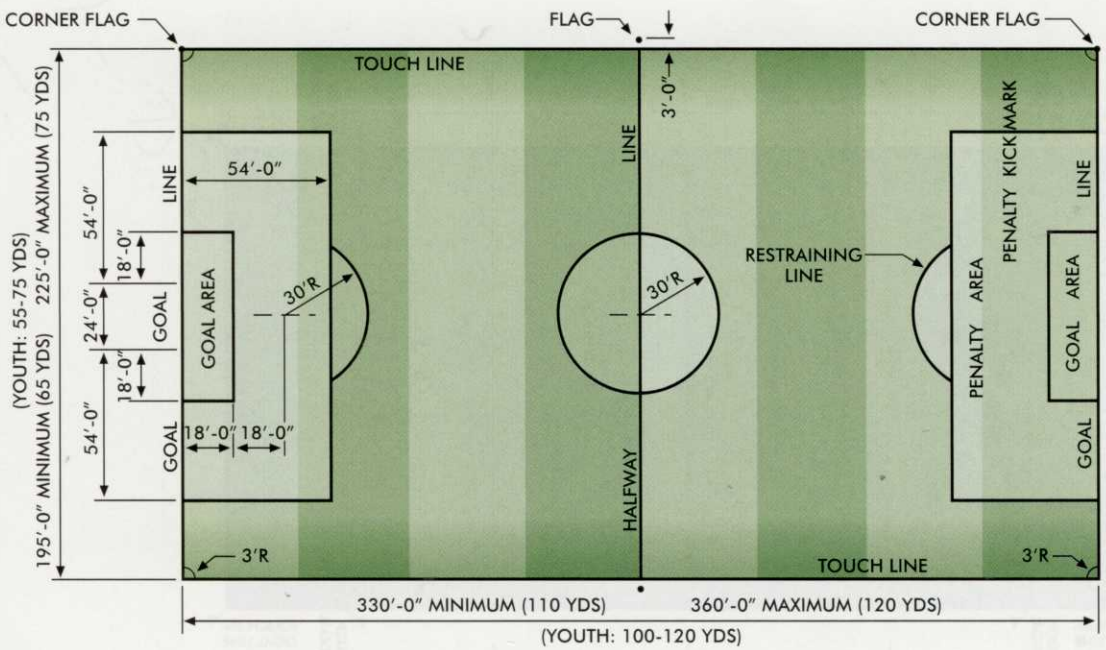
Soccer (NCAA)



FLAG DETAIL

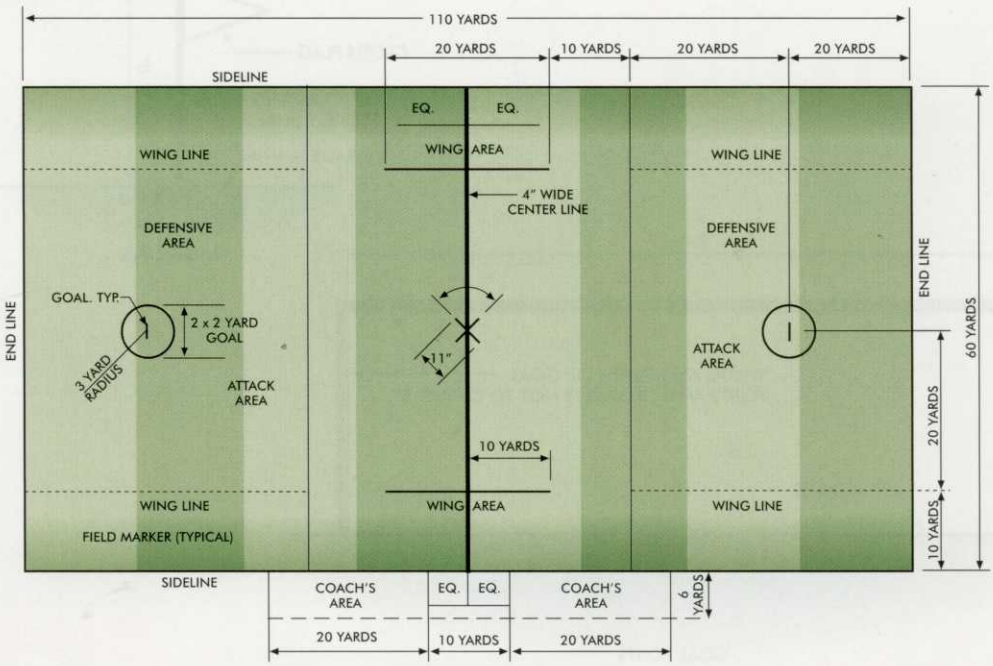


GOAL POSTS



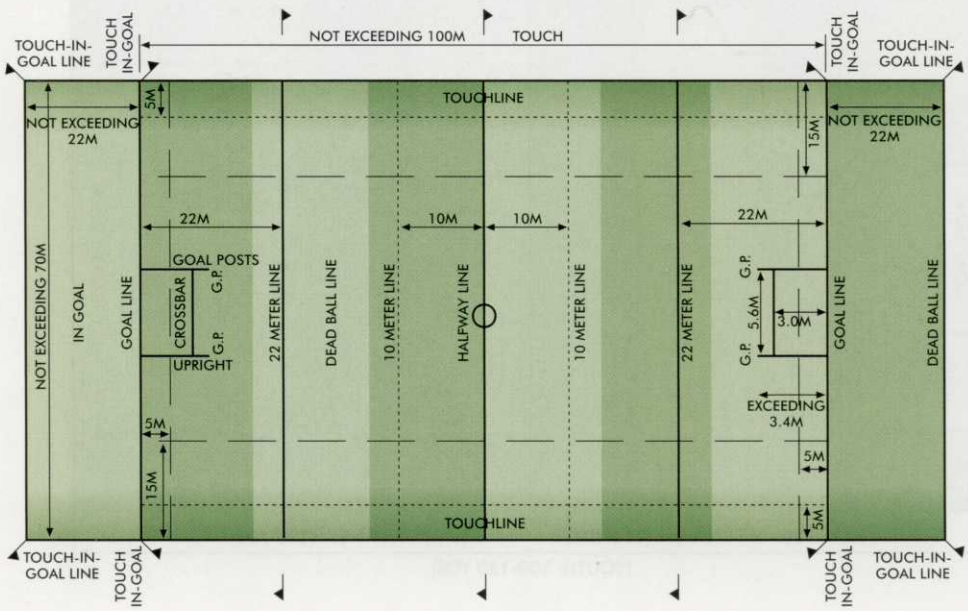
SOCCER FIELD LAYOUT

Lacrosse (NCAA)



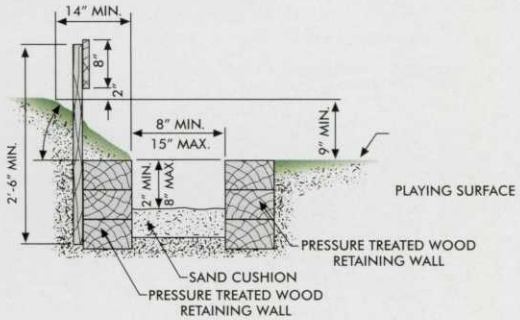
LACROSSE FIELD LAYOUT

Rugby (NCAA)



RUGBY FIELD LAYOUT

Lawn Bowling
[American Lawn Bowls Association (ALBA)]



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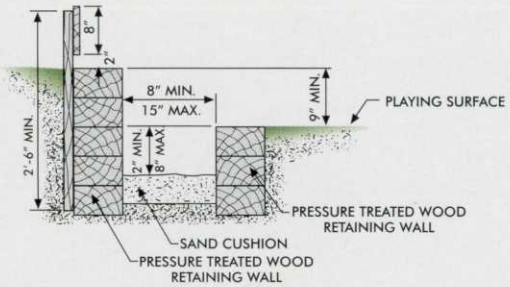

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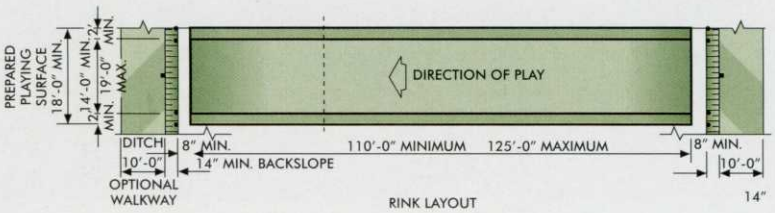
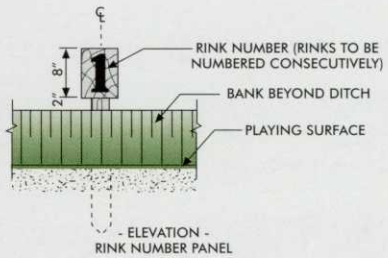
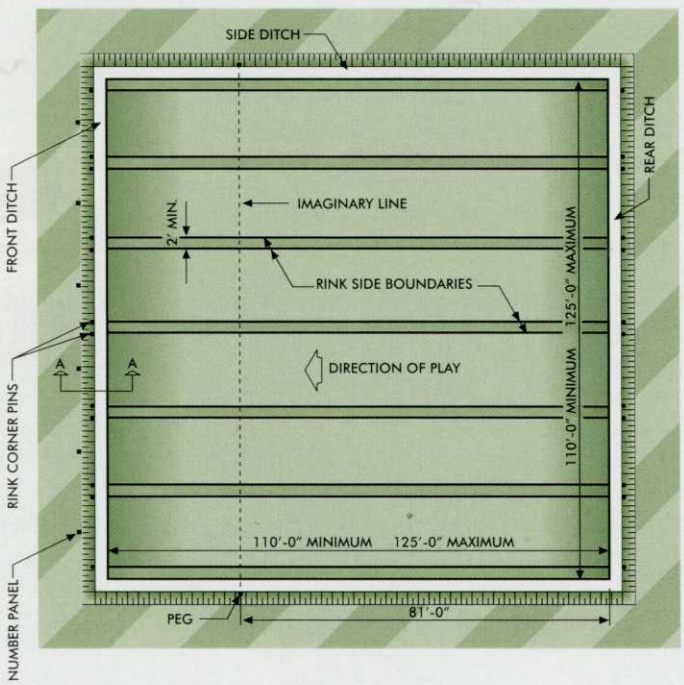


RINK LAYOUT





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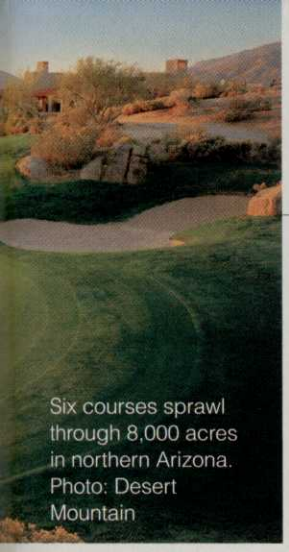

Six courses sprawl through 8,000 acres in northern Arizona. Photo: Desert Mountain

The courses generated about 145,000 rounds last year.

Management has had to change its focus, and it puts more emphasis on the entire experience, not just a golf experience, Jones says. This approach seems to be taking hold, as more people are living at the community year-round, rather than treating the community as a second home or getaway, as they did when Desert Mountain first opened. The members are using more of the community's other amenities, including the increasingly popular fitness and spa-related activities, and golfing less, Jones says.

The club also has faced other golf-related challenges and changes in its first 20 years. The biggest change is the method of irrigating the courses, Emerson says. Because of increasing consciousness of water conservation, the courses have switched to an irrigation system with effluent water. The courses now have irrigation systems that work more precisely, watering only as necessary to prevent waste.

Desert Mountain isn't immune to the skyrocketing costs other courses face. Management tries to stay on top of rising material costs because of fuel costs and other factors and budget for it as much as possible. The business department provides frequent updates.

"We're operating in real-time," Emerson says. "That validated decisions we've made as managers about paths we need to go down. To run a club of this magnitude, you have to be able to pick up on trends."

Another key to running a club of this size is having a capable staff to run each aspect. Jones credits a solid training program for keeping everything running smoothly among the 700 employees. Comment cards and surveys are made available to members to rate their service and their interaction with the employees. A rating of 87 percent or higher must be maintained for employees to receive yearly incentives and bonuses.

Jones retains employees by making it a desirable place to work. Each year, he compares employees' pay with the standard acceptable rate in the industry to make sure all is fair.

Emerson left the course for employment elsewhere, only to return two years later. He has been at the club 11 straight years.

"People always want to look for something greener, but then you realize there's nothing better out there," he says. "What makes Desert Mountain exceptional is that it holds itself to high standards." – *HW*

Better coverage

In 2001, Tony Girardi, CGCS, knew he wanted to increase the irrigation system's coverage at Rockrimmon Country Club in Stamford, Conn. Course conditions weren't what he wanted, and improving coverage seemed to be the answer. But as nearby areas began to impose water restrictions, Girardi knew it wasn't just about water coverage, it was about efficiency, too.

Older than 25 years, the system was aging. The technology was outdated, and the sprinkler heads didn't water the course evenly, creating waste and less-than-desired conditions. So, after receiving the blessing of the green committee in 2001, Girardi chose a new and improved, wall-to-wall, multirow irrigation system.

The new system uses more sprinkler heads that are spaced closer together. The old system had 450 heads in single lines on the fairways. Now, there are 1,350 Rain Bird Eagle 700/750 heads with head-to-head spacing. The number of heads increased dramatically, partly because the coverage area was increased to include the roughs.

"Where we used to irrigate 30 acres, now we water 80 acres," Girardi says. "We're almost tripling the irrigation heads while putting out almost equal or just a little bit more water."

The irrigation system used to consume about 15 million gallons of water per year, and now, with 50 more acres of coverage, water usage increased to about 18 million gallons.

An aging irrigation system caused Rockrimmon Country Club to install a new one. Photo: Rockrimmon Country Club

"It's evident in the numbers that we've been more efficient with water," Girardi says. "I'm pretty confident what we installed is working pretty well for us."

Water efficiency is becoming more important in several areas of the U.S. as it becomes scarce and regions restrict usage. Girardi isn't

It took the contractor from August 2001 to early June 2002 to install the new irrigation system. Photo: Rockrimmon Country Club

oblivious to the situation – Stamford is next to Westchester County, N.Y., which imposed water restrictions.

Restrictions or not, Girardi tries to water efficiently. The new system helps him do that more than he has been able to with the older system. He can control each sprinkler head from his office computer or with handheld Palm Pilots and radio-controlled devices, improving head-to-head coverage. If there's a hot spot or a dry patch on the fairway, Girardi can independently run heads to bring more attention to those areas without wasting water by running all the heads at the same strength.

Although Girardi says he's no authority on irrigation, this is the second complete system he has installed during his career. In addition, he retrofitted Rockrimmon's system after he arrived 13 years ago.

The biggest benefit of the computerized system is the ability to integrate the evapotranspiration rate to water the course most efficiently, Girardi says.

It took contractor C.R.I.S. Irrigation from August 2001 to early June 2002 to install the system at a cost of $1.3 million. The course, which generates about 14,000 rounds a year, remained open during that time. Surprisingly to the membership (the club has 175 members), it wasn't much of a disturbance. At first, it wasn't an easy sell for the greens committee and membership, Girardi says.

"It's something members really don't see because it's in the ground," he says, adding it's not like going into the clubhouse to dine and seeing a difference in the food quality. "They don't see it, so it's hard to justify," he says.

Once the project was completed, it took only one or two seasons for members to realize how much the playing conditions improved, Girardi says.

Because of the system's expanded coverage area, Girardi can't claim he's saving money on water or electricity costs, but he saves in manpower.

"Maintenance and repair costs decreased from $10,000 annually to $7,500 per year," he says. The savings are in the overall conditions of the golf course. We've got one of the biggest wait lists we've seen at the club. We're financially sound, we have a sound membership, and a big part of that is due to the irrigation and golf course conditioning." – *HW*

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Jack Brennan founded Paladin Golf Marketing in Plant City, Fla., to assist golf course owners and managers with successful marketing. He can be reached at jackbrennan@tampabay.rr.com.

ANALYZING DEMAND FOR ROUNDS

In my last column (GCI, February, page 20), I explained how to calculate golf rounds demand for a marketplace. The column left some readers with questions about the demand formula: Where do I find that number? Why do I add or subtract a percentage for age or income differences. What does it tell me?

The demand analysis is just a snapshot of what your marketplace should be producing (golf rounds) based on state averages. Variances will exist based on your region within the state, but state averages don't necessarily pertain to all regions of a state. As an extreme example, golf demand in Manhattan won't compare to North Salem, N.Y., because of population density. Another variation factor in this example is that North Salem is located on the border of Connecticut, and therefore, you would have to blend the participation rates and average rounds of New York and Connecticut to get an average of those for this city. Additionally, there are many statistical market adjustments that need to be considered when preparing an accurate demand analysis (e.g., the percentage of core golfers versus occasional golfers, ethnicity, gender, etc.). For a simple demand analysis, you need to adjust for the two most significant demographics: age and income. That's why it's a snapshot.

But the more important question is, "What does the demand analysis tell me?" First, you need to know how your course's performance compares to the average range you projected for your market. Is it higher, lower or within the range? Is it good, bad or average? If your rounds are lower, that suggests you're not getting your fair share of market rounds. That alone will be cause for you to critically review why. Curb appeal, price, maintenance, service, location and advertising exposure could be several reasons.

Your next step would be to evaluate, objectively and critically, the courses in your market area that compete directly against you for golfers' time and money. Part of your competitor analysis will require you to segment what business they're getting compared to you. How many rounds were generated from outings, hotel stays, seniors, leagues, etc. Are they getting compared to you? Knowing this will provide you an opportunity to target certain segments with your promotions. This becomes the basis for marketing planning.

On a more sophisticated level, a simple demand analysis compared to market demographics can reveal opportunities that might not be observed readily. For example, I was hired by a client who purchased a golf course solely to control the land for other business reasons. He didn't care about the golf course, per se, but he wanted to know if the operation could be profitable (it hadn't been to date). If it were going to be a financial drain operating it, he would be satisfied with just the land. From the simple demand analysis, we knew the course was underperforming.

After all the aforementioned market research was completed, I analyzed the income demographics and future income growth projections. The fastest growing and most substantial income segment was the $75,000 to $150,000 range. In 2000, it was 6.8 percent of the market, but by 2005, it was registering 13.3 percent of the market and projected to more than double (26.8 percent) again by 2010.

My report provided information the client requested. My added observations about this income growth segment drew the attention of several board members, and the strategic planning discussions changed to creating an upscale public facility catering to this growing income demographic. This opportunity proved more successful than allowing the club to compete in an oversaturated medium-level golf market and more profitable than letting the golf course go to seed. The initial demand analysis told us there was a serious positioning problem for the course as is. Then it was a matter of research to determine the most opportunistic positioning.

Now, what if your demand analysis reveals population-based rounds, but after your market research, you calculate facility reported rounds are 25- or 30-percent higher? It means the courses in your market are being played by golfers from outside your market area. Most likely, it means tourism or visitor demand. I discovered this after conducting market research for a client. The employees, pros and g.m.s didn't recognize any tourism play. It took extra time and a few interviews with those in the hospitality industry, but I was able to identify the sources of tourism pressure. Not surprisingly, no course was marketing to this demand. No course until then, at least. Owning that opportunity segment of business will generate significant rounds and revenue.

A simple demand analysis can tell you if you're faring poorly or barely average and will help point you in the right direction to increase your course's slow or stagnant rounds and revenue growth. **GCI**

A demand analysis example

250,000	Market population in a XX-mile radius
10.0	Golfer participation rate in your state
25,000	Number of golfers in the market
25	Average frequency of play in your state
625,000	Rounds of golf projected for the market
610,000 - 640,000	In this hypothetical example, adjust rounds for age (slightly lower than the state average) and income (slightly higher) and create a range of demand.
20.5	Number of 18-hole equivalents in market radius
29,756 - 31,220	Average rounds per 18-hole course in XX-mile radius

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

PROJECT MANAGEMENT

A golf course superintendent's responsibilities as an owner's representative vary with each project. They depend on the construction contract and members of the owner's design team, such as the golf course architect and engineering and financial consultants who will work together to protect the owner's interests.

Golf projects often are defined less formally than vertical construction. It might not be your final responsibility to check the contractor's pay applications for math errors, for example, but there's nothing wrong with pointing out the ones you find. Overall, the team is responsible for the following tasks:

Assure the contractor's compliance with plans, specifications and the contract. This requires daily construction monitoring by knowledgeable people such as yourself.

Attend regular progress meetings. Clear communication always helps create a smoother-run project. Regular meetings can resolve small problems before they become bigger ones, which are more difficult to solve.

Approve acceptable work and materials. An owner must be reasonable and timely when determining acceptable work. Acceptance is conditional to later events. For example, a contractor will have to fix leaks in an irrigation system that develop after acceptance until the end of the guarantee period.

Note defective work to be corrected. This should be done in a consistent, firm and timely manner to reduce conflict.

Reject work and materials that don't comply or haven't been corrected. Rejecting work is serious and occasionally leads to contractor claims and lawsuits, so it shouldn't be taken lightly and should be done only if defective work isn't corrected. You'll want to do this as a team and put it in writing, stating exactly why and what part of the work is rejected and offer the contractor a chance to fix the problem. Rejecting materials when delivered is a common occurrence.

Stop work when it's clear continuation won't yield satisfactory results. Stopping a portion of a contractor's work usually is a last resort because it might lead to a claim for a delay.

Direct the contractor to work within applicable laws written by/for ADA, OSHA and EPA, and provide a work safety plan. While this is a contractor's responsibility, courts sometimes rule failure of the owner to reasonably require contractor compliance might indicate complicity in wrongful acts.

Rejecting work is serious and occasionally leads to contractor claims and lawsuits, so it shouldn't be taken lightly.

Monitor the project schedule. It's the contractor's responsibility to meet the schedule. When he falls behind, it's frustrating and costly because missing grassing by a month can set back a reopening an entire year, which has considerable revenue consequences. An owner has the right to demand corrective measures, but specifying exact measures might make an owner partially responsible for that schedule, leading to disagreements.

Coordinate, monitor, review and/or approve tests, samples, contractor provided designs and shop drawings as required in the contract. Some items, such as greens mix, concrete strength, etc., can be determined to be satisfactory only though testing against specified standards. An owner will arrange to have these made or have the contractor conduct the tests and supply the results for the owner's review.

Interpret plans and specifications in conjunction with the golf course architect when given the authority to do so. In most cases, the golf course architect or irrigation designer will retain this duty, but in some areas they rely on the superintendent, especially when it might be a matter of preference as much as quality.

Resolve disputes and arrange solutions when problems arise. Document daily activities to create a project record. Make anything you write part of the official project record for all to see and make use of.

Review and approve payment applications by the contractor. Make sure they're paid for no more than the work that has been finished in case they leave the project before completion, but don't withholding funds unreasonably. With golf projects, estimating completed work is usually pretty straightforward. If there's mix on six of 18 greens, greens mix placement is 33-percent complete. It's rarely necessary to be more complicated.

As an owner's representative, you'll probably get involved in some trade-outs and negotiations. However, other than minor situations, you're not allowed to revoke, alter, enlarge or waive any of a contract's provisions, at least not without formalizing it and getting approval from the other parties.

The general rules to follow are:

- know what's in the contract;
- set a tone; and
- be consistent and timely.

Most construction disagreements and litigation result when projects begin informally and don't follow contract procedures closely. More next month. GCI

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

MARKET REFOCUS

I can remember not too long ago when it was considered a moral victory to have the name of the host golf course superintendent read at the on-site, post-tournament ceremonies throughout the PGA Tour®. More times than not, however, superintendents weren't invited to closing ceremonies. Since then, respect for the superintendent's work has grown to the point where the names of hosting superintendents customarily are mentioned, appreciatively, within virtually every golf tournament television broadcast. Not surprisingly, the USGA always has been well ahead of the curve relative to recognizing the indispensable role of the golf course superintendent at its national championship events.

Now, thanks to recent GCSAA initiatives, the association's logo, with a short promotional sound bite, is presented within many TV broadcasts of PGA Tour, Champions Tour, LPGA Tour and major golf tournaments. While clearly this is deserved recognition/progress, it's time for the GCSAA to change gears and move beyond identifying itself as representing the nation's golf course superintendents (a necessary first step) to educating the national golf community regarding the person who brings such unique value to the game of golf as a golf course superintendent.

I've often said the game of competitive golf, like baseball, is a statistically intensive environment that lends itself well to self-promotion. (See my May 2005 GCI column). Similarly, the world of golf course maintenance also interfaces with a rich, to this date untapped, statistical environment that begs for attention. Accordingly, the time has come for the GCSAA to adjust its media approach to fill a new role as a media advocate for the previously unfocused on cultural world of the golf course superintendent and the profession that embodies this noble group of warriors.

For example, following are several sample statistical information packets that might be individually presented within telecasts – together with voice-over commentary and a supporting visual with the GCSAA logo. These 15- to 30-second commercial segments would be used to stimulate public interest in the intriguing world of the golf course superintendent:

- Golf course superintendents throughout the country are entrusted with the responsibility for the care and highest quality maintenance of an estimated 2,062,500 acres of golf course properties, with an estimated total real estate value of $20,625,000,000. (Data derivation: 16,500 courses multiplied by an average of 125 acres per course [all sizes] multiplied by $10,000 average value per acre.)

> It's time for the GCSAA to change gears and move beyond identifying itself as representing the nation's golf course superintendents ...

- Golf course superintendents throughout the country are tasked to develop and precisely manage operational maintenance budgets totaling an estimated $11,550,000,000 annually. (Data derivation: 16,500 courses multiplied by the average operational budget [all size courses] of $700,000.)
- Golf course superintendents collectively throughout the United States maintain an estimated 189,000 golf course greens, totaling an estimated 945,000,000 square feet of grass that are mowed an estimated total of 47,628,000 times each year. (Data derivation: 10,500 equivalent 18-hole courses multiplied by 18 greens per course at an average 5,000 square feet per green; then 189,000 greens multiplied by seven cuts a week multiplied by a 36-week average golf season.)
- Golf course superintendents are responsible to efficiently manage the placement of an estimated 821,520,000,000 gallons of water on the nation's golf courses each year. (Data derivation: 130,400,000 gallons or 400 acre-feet per course a year within southern climates and 26,080,000 gallons or 80 acre-feet per course a year within northern climates roughly averages to 78,240,000 gallons per course a year throughout the country; then 10,500 equivalent 18-hole courses multiplied by 78,240,000 average gallons per course a year.)

Far more experienced public information professionals than I working for and with the GCSAA will be able to generate more meaningful data gems than I have presented here. Never has there been a more inviting, more rewarding road to travel. But this should be only the beginning of a much larger game to be played because not only is the golf course superintendent been long recognized as the most essential individual within operational golf – he or she is the imperative. There can be no golf without the golf course superintendent – playingwise, saleswise, manufacturingwise, or any-which-waywise.

I say this not to further praise Caesar; rather to encourage a well-defined, appropriately spread through time, educational-based marketing campaign that would educate America to the personage, educational depth and responsibilities of the golf course superintendent. Can there be a greater disconnect or any doubt that such a campaign is needed when recent industrywide surveys show the majority of superintendents fear annually for job security, often command less respect than seasonal laborers and generally are denied industry norm separation packages when leaving jobs?

I hope the day is soon approaching when once an individual earns the professional title of golf course superintendent, he or she will be accorded the same level and permanency of respect as employed engineers, accountants, lawyers and the like are shown within their professional fields. This day is long overdue. **GCI**

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

THRIVING IN THE HEAT

July and August are the hottest months of the year. It can be too hot for turf, employees, golfers and you. In July, the average high temperature is 104 in Scottsdale, Ariz., 92 in Orlando, Fla., 87 in Valley Forge, Pa., and 84 in Chicago. So here's my top-10 list for making it through July and August with your job enthusiasm and work force intact:

10. Provide positive performance feedback. There's nothing like a great compliment to stay focused or keep going in difficult circumstances like the heat. Be certain the positive feedback reinforces specific actions or outcomes that meet and exceed your expectations.

9. Work alongside employees and lead by example. Seeing that you're able and willing to work in tough conditions motivates employees. When the going gets tough, it's even more important employees see your excitement, passion and willingness to work.

8. Play golf or other activities that refresh you. July and August aren't always the best months to take a vacation, but you can develop habits that relieve the stress of work and create quality time away from work. Research shows how you spend time with family and friends is at least as important as how much time you spend. Schedule time during the day when all family members are together. Talk about the day. Ask each person to share one or two positives from his day – a new friend, an accomplishment, something learned, an exciting experience with an old friend. Go for a walk. Don't look for weeds in the turf or problems with the fairways. Reflect on the serenity of nature.

7. Understand golfers. They can become frustrated more easily and overcritical of the course, your staff and you. Interact with them, work especially hard to understand them and always be empathic – understand their perspectives. You don't always have to agree with them, but you must always understand where they're coming from.

6. Provide redirection and negative performance feedback if necessary. It's easy to justify overlooking inappropriate behavior or inadequate performance because of difficult conditions. Don't be tempted. Obviously, performance expectations have to be adjusted to reflect course conditions; however, continue to provide redirection or negative feedback when there's unacceptable performance. Redirection feedback is redirecting actions without any hint of a reprimand when the inadequate performance isn't caused by the employee. Negative feedback is required when the inadequate performance is because of lack of energy, focus, concentration and effort by the employee. In tough conditions, you should be more focused on redirection feedback and minimize the use of negative feedback.

When the going gets tough, it's important employees see your excitement, passion and willingness to work.

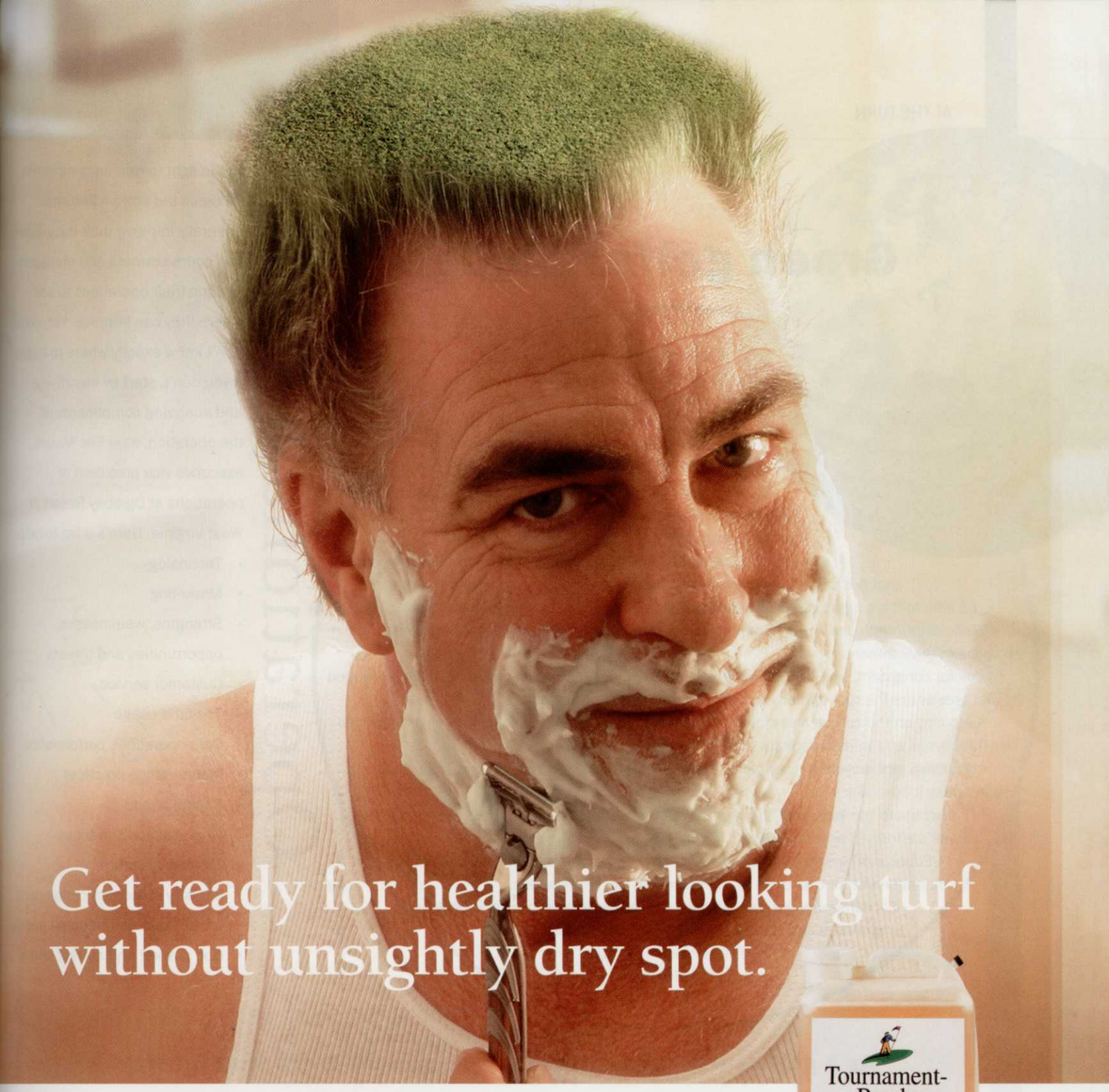
5. Collaborate with others at the course. You're not the only one affected by the heat (although it is nice in the air-conditioned pro shop and clubhouse). Collaborate with course leadership – the golf pro, the clubhouse manager and others – to minimize how the hot weather affects golfers/guests and employees.

4. Have "informal formal" coaching sessions with employees. One of my most common suggestions to managers is to obtain information from employees by asking two questions: "What's going well with you?" and "What could be going better?" I call this an "informal formal" coaching session because it should be more than a time to BS with an employee but less formal than calling him into your office.

3. Spend time with family and friends. In this space, I've talked frequently about the importance of developing the relationship with employees, counterparts at the course or club and golfers. It's also important to develop and strengthen relationships with family members and friends. Spend time with them; you need their support. As many of you know, children grow up mighty fast.

2. Listen. Listening is a powerful supervisory tool especially in stressful times. At this time of year, most of your employees have been with you for several months or more. Don't respond too quickly to their seemingly petty concerns or seemingly unreasonable complains and requests. Often by listening and showing empathy ("I understand your frustration" or "tell me more about what needs to be done"), an employee will vent his frustration or anger, and the situation will resolve itself or be resolved easily.

1. Be fair. The key to supervision is fairness. It's easy, especially in stressful times, to just be nice. If being too nice to one person means others – who might be doing a great job – feel they've been treated unfairly, you have just unmotivated those you least want to negatively impact. **GCI**



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Green golfer pledge

A golf course staff should encourage golfers to be better environmental stewards. One way to do that is have them take the Audubon Green Golfer Pledge. Copies of the pledge can be placed in the pro shop or given to the starter to hand out on the first tee. This is an inexpensive way to promote environmental stewardship among golfers.

The pledge states:

"I value the nature of the game and accept my responsibility to ensure that golf courses are managed in harmony with the environment. I pledge to:

- Be kind to the course: repair **ball marks** and replace divots to help maintain playability.
- **Walk**, rather than use a cart, when possible. Walking promotes physical fitness, healthy turf and a clean environment.
- Look for consistent, true **ball roll** on greens rather than speed. Lower mowing heights required for fast greens are the root of many turf and environmental problems.
- Keep play on the course and stay out of **natural areas**. Respect designated environmentally sensitive areas and wildlife habitats within the course.
- Use **trash and recycling** receptacles and encourage others to do the same. If you see trash, don't pass it up – pick it up.
- Appreciate the **nature** of the game. Watch for wildlife as you play and support the course's efforts to provide habitat.
- Educate others about the **benefits** of environmentally responsible golf course management for the future of the game and the environment.
- Encourage the golf course to be an **active participant** in environmental programs such as those offered by Audubon International."

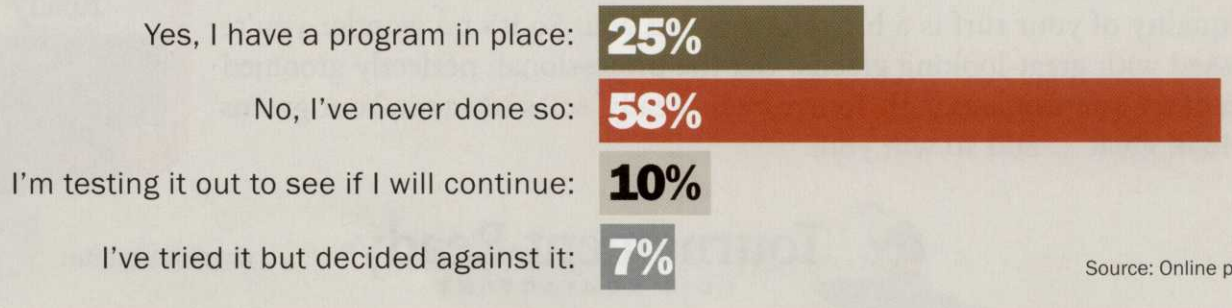
For more information, visit www.golfandenvironment.org.

Operational analysis

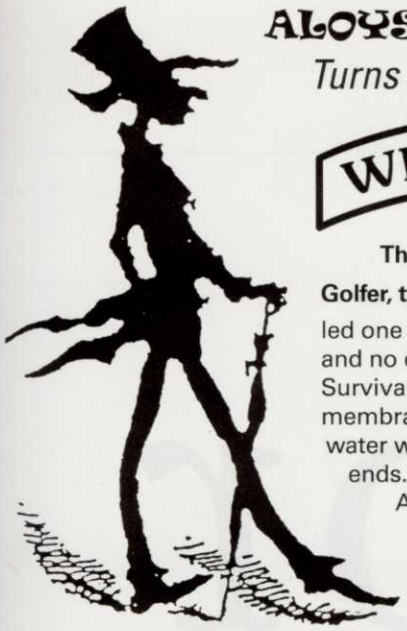
In the fight to remain competitive, increase the bottom line and generally improve their businesses, golf course owners and managers critique their operations to see where they can improve. Yet, some don't know exactly where to begin. If you don't, start by identifying and analyzing components of the operation, says Eric Mauck, executive vice president of operations at Oglebay Resort in West Virginia. Here's a list to help:

- Technology
- Marketing
- Strengths, weaknesses, opportunities and threats
- Customer service
- Tee-time usage
- Core operations performance
- Maintenance practices
- Capital needs
- Financial performances
- Staffing structure
- Industry standards comparison
- Local, state and national trends
- Golf market and market share

As a golf course superintendent, do you topdress your fairways?



Source: Online poll of 134 respondents



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SURF-SIDE

WATER SAVINGS 28 YEARS

WETTING AGENT CLAIMS COME EASY... PERFORMANCE TAKES A WHILE LONGER!

The balancing act between the Golfer, the Superintendent, and the Grass Plant led one Superintendent to remark, "There is no way out, and no excuse for a lack of turfgrass quality." He uses SURFSIDE 37.

Survival using plain water has been the historic approach to turfgrass culture. SURFSIDE 37 changes the membrane characteristics and metabolic rate of the cell. You deal with a different deck of cards. Plain water will never fit the bill. **Water Savings** start before the season begins, and ends when the season ends. Depending on your experience with SURFSIDE 37, you must ponder if it is you or the Wetting Agent that is growing the grass. If your decision is arbitrary – "It's time to put the Wetting Agent out" – you have already gambled away recovery time in the **Water Savings** battle. Wet or dry, the grass plant born and bred on a SURFSIDE 37 diet is a biological gem. This is not in the Turfgrass Textbook – some think it belongs in a Joke Book... take your pick! We prefer the words of a Superintendent who states, "The spray tank never leaves the barn without SURFSIDE 37."

SUPERINTENDENTS SPEAK OUT ON WATER SAVINGS

1980 "...During **1980**, I treated one green with SURFSIDE 37. We syringed the treated green a couple of times during the season, the rest of the greens required over 50 days of syringing... that one SURFSIDE 37 green was incredible! During **1981**, we treated all the greens, and only had to syringe a handful of times - maybe a dozen times all summer – and most of that was on the high spots. **80% to 85% reduction** in syringing during the past ten years has meant ***major water and labor savings***..."

1983 "...We use city water – we're on a meter. Based on comparable figures for 1980, **we reduced water use by 20%** in **1983**..."

1985 "...This year we would water Friday night, and then wouldn't water again until Sunday night. We **used 30% less water**...didn't syringe once this year...just didn't need it! When we first went on water restrictions, ***SURFSIDE 37 kept our fairways alive*** during that long July/August stretch. **You can use it anytime...it doesn't matter how hot it is**. We held our worst fairway with a total of 5 gals. per acre..."

1988 "... With SURFSIDE and our hand-watering program, we only ***water greens two times a week***. We required **50% to 70% less water** on greens than when I arrived two and a half years ago. We spike and top dress the greens every two weeks, and apply SURFSIDE 37 following these cultural procedures. We also Hydroject ten of our twenty greens each week from April until September. We use the SURFSIDE PELLETS on the hose via the Hydroject. This works great in getting the product into the root zone. SURFSIDE 37 is a vital part of our turf management program..."

1993 "...**I saved more than 90% of my syringe labor budget**. Afternoon watering was basically eliminated. During the summer of **1993** we syringed less than ten times in the afternoons. During the summer of **1994** we only had to syringe two afternoons. SURFSIDE 37 has ***helped eliminate hard to wet areas***; by treating the entire green complex, water movement through the soil has been improved. This has **decreased the need for daily irrigation**, and ***nearly eliminates the need to syringe during the day. We have saved our operation over $7,000 per year in labor costs*** during the summers of 1993 and 1994..."

SUPERINTENDENT ASATO-SAN SAYS,
"I TRIED IT, I LIKE IT, I USE IT... AND MY ASSISTANT LOVES IT!!!"
JAPAN PGA CHAMPIONSHIP
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BY PAT JONES

THE Doctor IS IN

A SOCIAL SCIENTIST AND DEMOGRAPHER DISCUSSES KEYS TO OPERATING A SUCCESSFUL FACILITY

The golf industry is chock full of Ph.D. types. You can't swing a dead cat at a turf conference without hitting Dr. Someone who's spent his adult life studying, teaching or researching the art and science of growing grass.

But to my knowledge, there's only one notable industry Ph.D. whose degree is in, of all things, geography. His name is John Rooney, and he has a different perspective about the golf business. It has nothing to do with growing grass, but it's one all need to understand and heed.

Rooney is, perhaps, the leading expert on the demographics of golf. Who plays? How often? Where? Why? At a time when courses are competing for business more fiercely than ever, his perspective has become critical for facilities and manufacturers alike. That's why he's become such a sought-after consultant.

Rooney was a high school jock back in post-WWII Kankakee, Ill., but he never touched a golf club until he got a college job life-guarding at the local country club and started playing on Mondays. He finished school in 1961 at Illinois State University with a bachelor's degree thinking he wanted to teach and coach.

Rooney married, started a family and finished his Ph.D. at Clark University in Worcester, Mass., at a time when doctoral degrees weren't as common as divots on a par-3 tee box. He taught at the University of Wyoming – which featured a geography department full of fellow golf junkies – where the idea of studying the geography of sports arose.

"I picked up a program from one of the Wyoming football games and noted that only about five of the players were actually from Wyoming," he says. "I realized that recruiting was the key to a college program's success and nobody had really researched where all the good players came from. That was the beginning of my first study of the geography of sports."

With piles of data from the NCAA and other sources, he soon began writing and teaching about the subject and eventually published two seminal books that still are used as references today.

By 1969, he'd bounced around teaching at several universities before he was recruited to start the geography department at Oklahoma State University, where he remained for the rest of his career. His coursework on the geography of sports was popular, and his students included Tour pro Scott Verplank, Henry DeLozier, the current president of the NGCOA and golf photographer Mike Klemme.

Rooney's business insights were equally popular, and he began consulting with the NGF, the PGA of America, Golf Digest and major industry corporations to help them gather and analyze data to understand the market more effectively. He also partnered with his son, Dan (see page 108) to buy and operate golf courses, adding reality to the academic study of the subject.

Now retired from teaching, Rooney devotes himself full-time to operating his course in Grand Haven, Mich., and helping the golf business un-

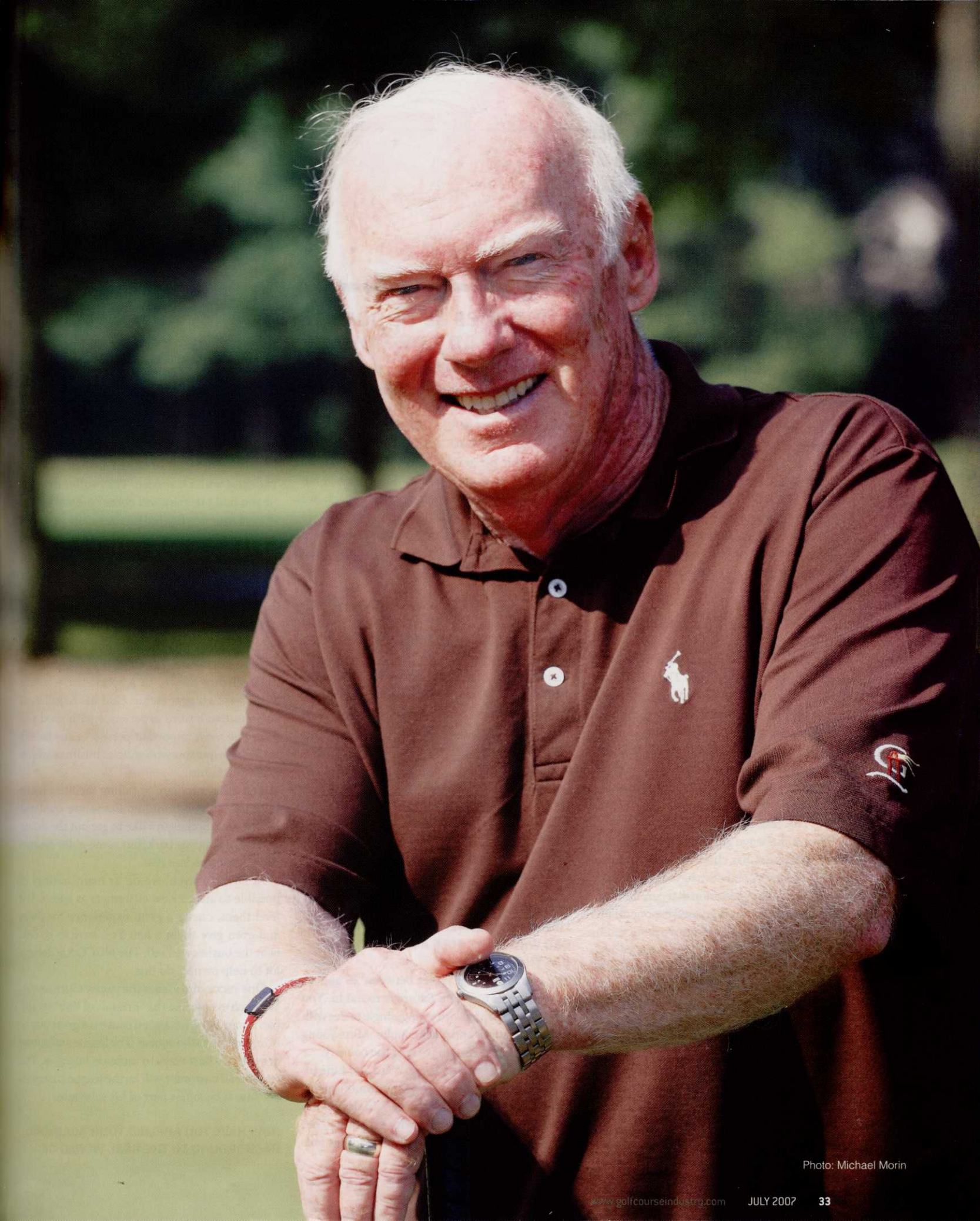


Photo: Michael Morin

> "Some people work on hunches as opposed to information. It's a pitfall any owner can be victim to." - JOHN ROONEY

derstand the market forces that drive success and failure.

WHAT ARE THE KEYS TO SUCCESS IN MODERN GOLF COURSE DEVELOPMENT?

If I'm working for a client, particularly a developer, the key to success is location, innovative management and proper capitalization. It's difficult to overcome a bad location. It can be done, but it's rare.

WHAT'S THE FUTURE HOLD FOR THE INDUSTRY?

I look at the business today, and there's good stuff and disturbing stuff out there. The good is the aging of the population. From a demographic perspective, the boomers should assist in the growth of the game for at least another 20 years. But, there's increasing competition for their leisure time. Many boomers are committed to the game, but others still need to be coaxed into playing.

WHAT'S THE BAD NEWS?

The biggest challenge golf faces right now is in the age group that has children between 5 and 18. Those children's activities have become more organized, and the expectation that parents be involved in their lives has increased exponentially. There's been a decline of play. Working moms factor into this too. Golf has to figure out a way to reach these people. If we don't reach them now, it'll be difficult to reach them later.

The other thing that's getting in the way is that we're a mobile society. The average businessperson works an hour more a day than 10 years ago because of e-mail and cell phones. That's five hours a week. That's a round of golf.

Kid's soccer probably has done more to harm golf participation than any other factor. As long as parents are expected to attend the games and other things, golf will suffer.

CAN'T WE JUST SUCK THOSE SOCCER PLAYERS INTO GOLF PROGRAMS?

Junior golf programs aren't necessarily the answer. They're great and well-intentioned but won't necessarily have a long-term impact. We need to make sure kids have an opportunity to participate. Only 55 percent of high schools even have golf programs. Golf for kids is flat compared to lacrosse, soccer, volleyball, etc.

HOW CAN YOU GET MOM AND DAD ON THE COURSE?

If you can get them to make the game part of their organized schedule – make it a priority – even if it's just a nine-hole league once a week, it makes a difference. Those nine-hole league players usually eat and drink as much as an 18-hole player. That league culture doesn't exist in much of the country. We need to transfer that idea to grow participation.

Believe it or not, we have a much greater supply relative to participation. Access to the game is greater than it's ever been. It's a negative to the owner, but for the golfer, it's a positive. The down market is providing more access, affordability, discounting, etc.

THE AVERAGE CUSTOMER USED TO BE LIKE WARD CLEAVER, THE TRADITIONAL DAD WHO MADE GOLF A PRIORITY. WHY HAS THAT CHANGED?

The average Ward Cleaver between 25 and 45 now struggles to get his Saturday round in. You have to replace him with young, single males with fewer obligations and older couples. More young kids also play in certain parts of the country.

Leagues are one way to get Ward and June involved because it's a smaller time commitment. The other thing to do is pick a certain time of the week where kids play free with an adult. That helps to get more of the younger families out. It's a long-term play … you won't make much money, but you'll build a customer base.

There are still guys like Ward Cleaver who use golf as part of their business. They're important, but we need them to encourage others to go out with them occasionally. I've always been able to attract my friends to the game by scheduling an event or just dragging them to the golf course.

WHICH FACILITIES ARE FAILING BECAUSE THEY'VE IGNORED MARKET CHANGES?

The ones with no service. They suffer from the "if you build it, they will come" mentality. The PGA of America figured this out a few years ago. It encouraged its members to become "customer development people" and teachers. There's been a marked change of professionals' attitudes at facilities that are doing well because they've heard this message, and they're heeding it.

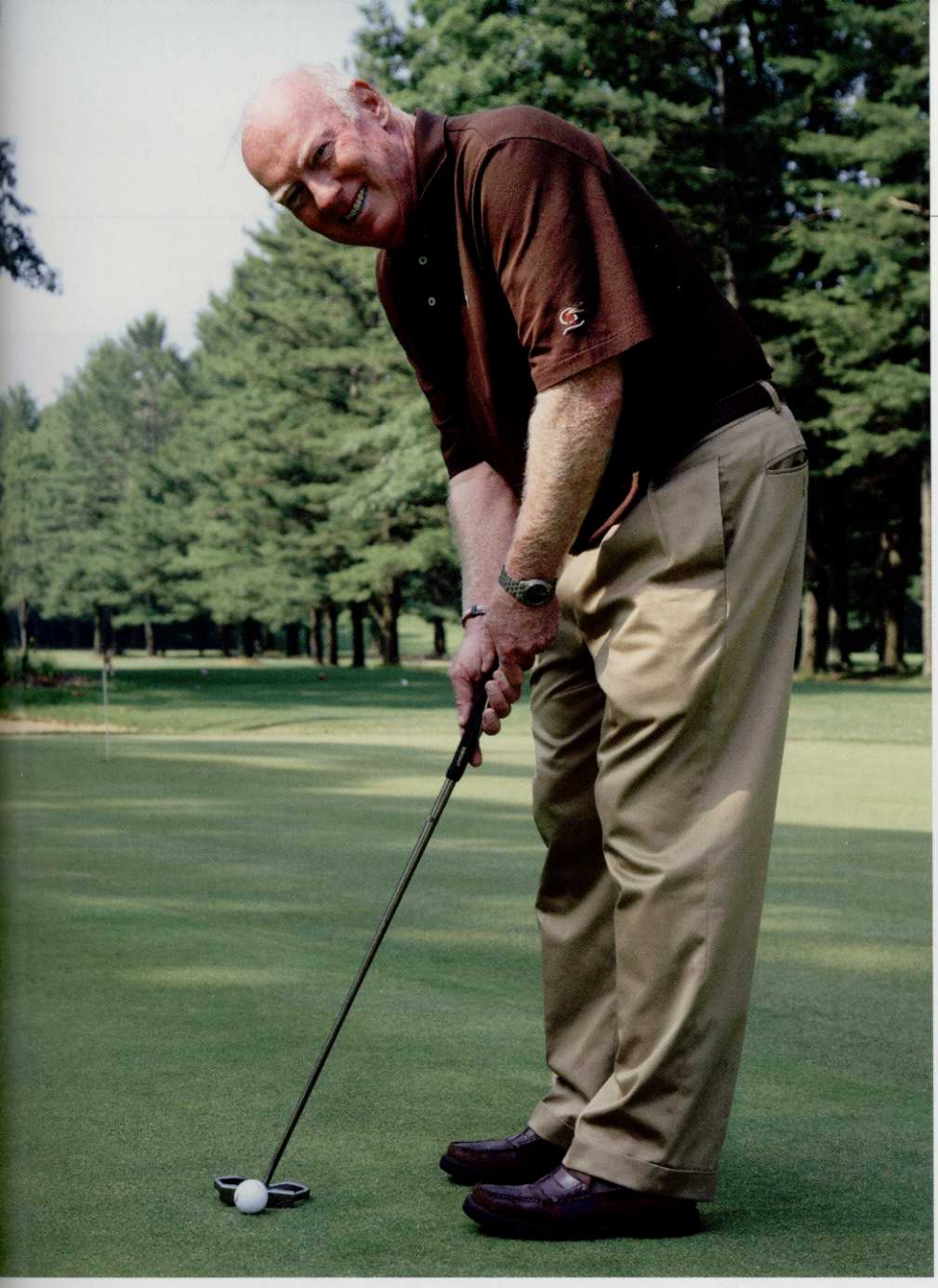
There are oversupplied markets where discounting is hurting. Rounds might be OK, but revenues decrease. Location is one factor, but not realizing they're in a competitive leisure business is a bigger factor. Golf has to sell itself as a positive leisure experience with good service. The most important person in any facility is that salesperson who solicits business within a 30-mile radius.

The other problem at failing facilities is not investing in conditioning. Some are outdated by distance. Some guys like to get out the driver and let the big dog bark, but some older courses can't accommodate that.

At Grand Haven, we do as many outings as possible to attract new customers as guests. We feed them, create a great experience for them and even give them a hat. You have to go out, beat the bushes and sell. The NGCOA is doing a lot to help owners do this.

One successful idea is the vanity tournament. We push events like the "Friends of Bob" scramble. Scrambling for a good cause is a great way to bring people to the course. The league and outing are the two best ways to increase business. The traditional customer will be the league customer because it becomes part of his schedule.

HOW HAVE YOU APPLIED YOUR ACADEMIC BACKGROUND TO THE REAL WORLD OF



Database development and management is one of the biggest trends in the industry, says John Rooney. Photo: Michael Morin

OWNING A GOLF COURSE?

We use analytical techniques to understand the operation better from the expense and revenue sides. As a social scientist and demographer, we've polled people about likes and dislikes. That's important. You need to find about attitudes. We're constantly collecting data about the customers. We want to know who they are, where they play, how often they play, and we offer them incentives to collect e-mail addresses. One of the biggest trends in the industry is database development and management.

Sometimes people still work on hunches as opposed to information. It's a pitfall any owner can be victim to.

TELL US ABOUT YOUR COMPANY, THE LONGITUDES GROUP.

Our system tries to help organizations know more about their customer base and increase it appropriately. Say we want to analyze the sales of golf company XYZ that sells putters. Our first action is to look at its sales by zip code. We compare that to what we know about demand by zip code from our database. We give them share of market – expected vs. real. That gives it a geographic representation of how well it's achieving its potential. We try to get the company's sales territories to match with reality.

Our demand database and GIS software are powerful tools. Oftentimes, the companies' databases aren't good. The same is true with golf courses. We ask managers, "Who are your customers, and where are they coming from?" and they don't know. We also run into many groups who know everything. They say, "There's nothing you can tell me." It's this know-it-all attitude that's the worst thing for most facilities.

DO LARGE-SCALE PLAYER DEVELOPMENT PROGRAMS WORK?

Programs like The First Tee work, but it's at such a small scale, it won't make a huge difference in the long term. Offering special events, getting people out to the facility that wouldn't normally come out and advertising clinics are what bring people out. Play Golf America can work, but it's site specific. The same is true with Bring Your Daughter to the Course Week. Programs like that are only as good as the execution at the local level. If there's no follow through, they don't work.

We do something with juniors – we have about 100 kids in a two-week or six-week program – but we insist the parents accompany them for a Sunday golf day. About 60 percent of the parents do it.

The golf league is the best promotion you can use. Leagues come in all shapes and sizes, and you need to have a mix. Michigan has a golf league championship. It's the kind of activity that overcomes those barriers – time, opportunity, etc. – and it's fun. We'll have a league event, and then we'll have post-round contests. It's a way to encourage people to spend more time, more money and have more fun.

Another example is packaging a Nine and Dine promotion. Offer a steak dinner and golf for a set price. I met a guy from Ohio who's doing this, and he's just packed with customers.

HOW IMPORTANT ARE SUPERINTENDENTS TO THE SUCCESS OF A FACILITY?

They're the focal point the business revolves around. It's a complicated business, but first and foremost, it's about growing grass. If you don't do that, the rest doesn't happen. The superintendent who does a great job of producing a great product makes everyone else's job easier. They also need to be ambassadors to the customers. They need to meet and greet like everyone else does. We have a suggestion box just for the superintendent. Most of the suggestions are ridiculous, but every once in a while there's something good. **GCI**

John Rooney, Ph.D., can be reached at 616-844-0088 or jfxroon@aol.com.

BY JOHN WALSH

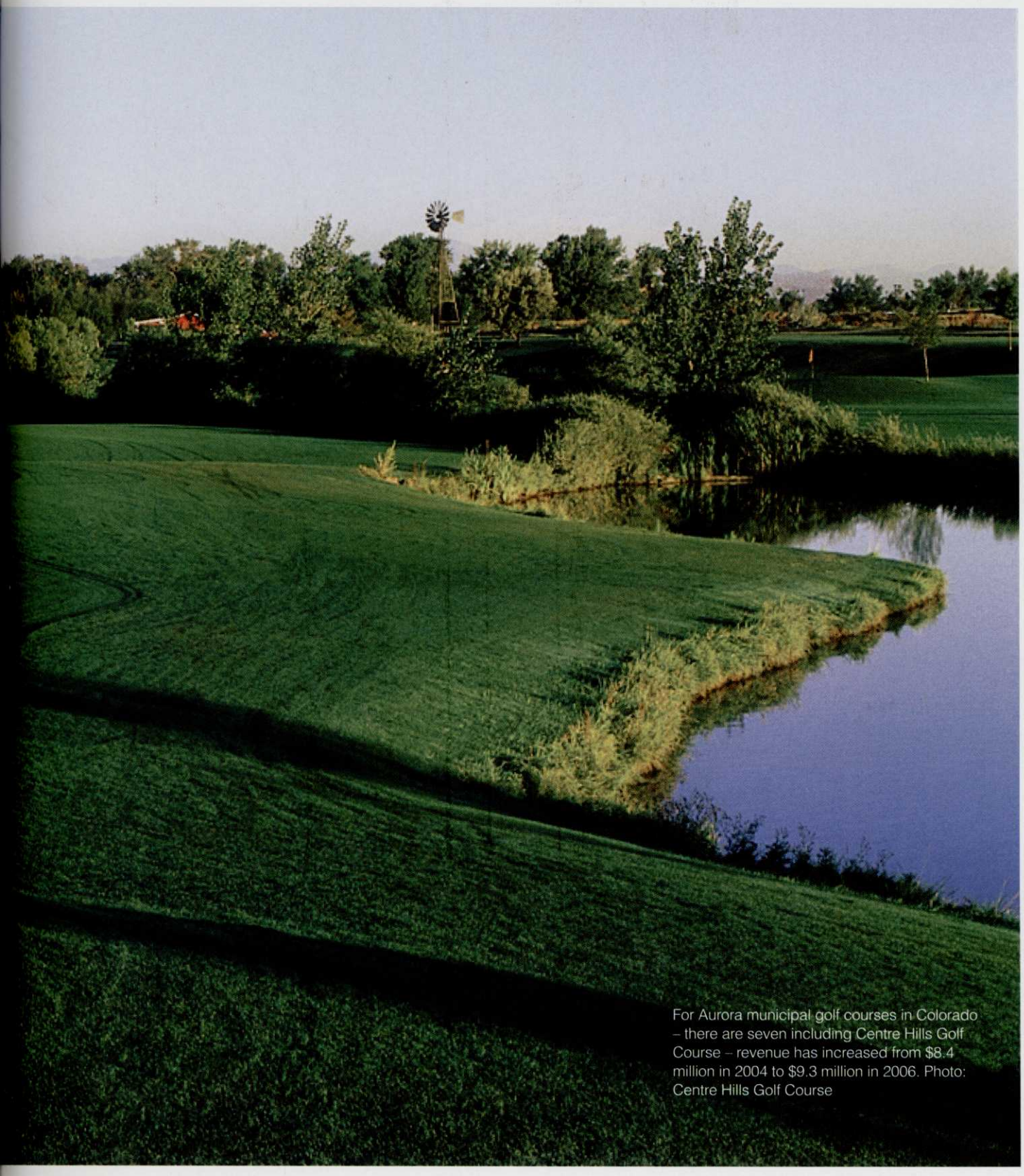
Making munis work

Superintendents share their successes and difficulties working at municipal golf courses

During the past seven years, the supply of municipal golf courses has remained relatively stable (see chart on page 43). Yet muni operations are struggling financially as other facilities in their areas discount and compete savagely for rounds. Many government-owned golf courses operate at a loss and, increasingly, cities and counties must face the decision whether to keep the money-bleeders open because it's a recreational service provided to city residents or close them and redevelop the land for something else.

In Bloomington, Ill., for example, the city owns three 18-hole golf courses – Highland Park, The Den at Fox Creek and Prairie Vista. Highland Park, built in 1924, has serious infrastructure problems, says Kerry Satterwhite, CGCS, superintendent of golf course maintenance. It has a 40-year-old irrigation system and a 150-year-old maintenance building.

"A decision needs to be made – either dump a lot of money into it or get rid of it," Satterwhite says. "The parks director wants to put money into it, but I don't know if the community would support it. It's in a prime location that would lend itself to other uses."



For Aurora municipal golf courses in Colorado – there are seven including Centre Hills Golf Course – revenue has increased from $8.4 million in 2004 to $9.3 million in 2006. Photo: Centre Hills Golf Course

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At Traditions at Chevy Chase, rounds are limited to 30,000 a year because the city and course management don't want the course to be rundown. Photo: Traditions at Chevy Chase

Yet the city's The Den at Fox Creek, an Arnold Palmer design that opened in 1997, is part of a huge real-estate development, so it's highly unlikely the course will ever close, Satterwhite says.

The market in Bloomington has balanced out. Four years ago, a nine-hole course was plowed under, but three years ago, another nine-hole course opened. One golf course was renovated, and another was taken over by a management company. Still, there has been a steady decline of revenue at the three municipal courses – a 10- or 12-percent decrease – since 2001.

"It's a concern," Satterwhite says.

Up until the past two years, the financial status of Bloomington's three courses wasn't a concern for the city, but now, officials are asking questions.

"The city wants us to pay our own bills and show profit," Satterwhite says. "In 2000-2001, we generated $3.3 million in revenue. This year (fiscal ending April 30), we fell just short of $3 million. When $400,000 to $500,000 in revenue isn't there anymore, people start to raise eyebrows. The city is OK with it for now, but we're under a watchful eye. The question is when do we quit subsidizing the golf courses? Up until now, the city administration has been very supportive."

As a result of less revenue, less money is spent on capital equipment, and no capital improvements were made the past few years.

"We're just holding the line on operational expenses," Satterwhite says.

Additionally, Satterwhite isn't fertilizing the courses as much, is cutting back on the number of ornamentals planted annually and is saving one fungicide application a year. There's also less verticutting and topdressing on tees, as well as less divot repair on tees and fairways, which used to be daily, but now is twice a week.

Even with these efficiencies, Satterwhite's staff is focused on customer service.

"I explained to the maintenance guys this is a

customer service job," he says. "They are interacting with golfers more often than ever."

Another challenge for Satterwhite is the expense of union labor, which is $125,000 a year for two workers.

SUPPORTING NONGOLFERS

In Fond du Lac, Wis., the county-owned, 27-hole Rolling Meadows Golf Course operates as an enterprise. The maintenance budget, which has increased 4 percent during the past five years, is $496,000 including labor, $196,000 sans labor.

"It's helpful for us that we're an enterprise fund," says David Brandenburg, GCGS, golf course manager, who says there's no reason why a muni can't be self supporting. "It's better than a course that's part of the county budget where the county can pull money from us. We can borrow from the county, but we pay it back. We have to break even. The money we make, we keep. We pay the county $71,000 each year in lieu of taxes. We've been successful. We're not a burden to the taxpayers because we support the county's general fund, so we're important to the nongolfer. The golf course supports county golfers and nongolfers."

Brandenburg has spent $45,000 to $50,000 on new equipment recently and $20,000 to renovate tees, bunkers and build a new green – all of which was done in-house.

"We're investing," he says. "You have to spend money to make money."

Still, Brandenburg expects the course to break even this year, adding that he feels a lot of pressure because expenses seem to rise higher that what the county can charge for a round, which is $27 during the week and $30 during the weekend to walk. Because of that, he operates efficiently.

"We've cut back on hourly labor and capital purchases," he says. "We have a lot of part-time employees (college students and retirees) and only three full-time employees – a mechanic, an assistant and me. But it's difficult to cut back on fertilizer and chemicals. I'm trying to stretch the fungicide applications and cut back on fertilizing the rough. We added natural areas that are now mowed once or twice a year."

There's been little discussion about selling the 35-year-old golf course but nothing at the committee level, says Brandenburg, who has been at Rolling Meadows for 10 years.

Keys to success for munis

Many golf course superintendents believe a municipal golf course isn't inherently at a disadvantage when it comes to operating a successful facility. Granted, budgets might be smaller than many, but having the right people involved and proper expectations are important.

At Traditions at Chevy Chase in Wheeling, Ill., Allen Parkes, CGCS and PGA professional, says he has a great supporting cast.

"I have a park board, executive director and general manager who understand maintaining turf at a high level is a process, not an event," says Parkes, who has been at Traditions for three years. "They've been patient and have acknowledged the progress we've made the past two seasons. The profitability objective and strategic initiatives are clearly articulated (repeatedly), and resources have been provided to realize those goals. The entire team is passionately committed to excellence. I couldn't ask for a more supportive environment to come to every day. I'm truly blessed."

PARKES CITES FOUR KEYS TO THE SUCCESS OF A MUNI GOLF COURSE:

1. The right people. "Marketing 101 states that to be successful you have to have the right product at the right price at the right place with the right promotions," he says. "I add a 5th P, and that's people. In the current environment of heavy competition, increasing costs and a near-zero growth rate, it's imperative facilities employ true professionals in every department: turf management, food-and-beverage, facility maintenance and golf operations. In this type of competitive environment, you've got to be hitting on all cylinders to retain customers and generate a normal profit. Each department must hold the other departments accountable for success if the entire operation is to improve. If one department is sub par, the weakness ripples throughout the entire operation and eventually will impact the guests' experiences negatively."

2. Realistic goals. The operational goals must be realistic and clearly stated. Also, the right tools must be provided to deliver the desired results.

3. Equipment technician. An experienced and dedicated equipment technician is critical.

4. Employee retention. "The only way we can deliver a high-quality product on a consistent basis is to maintain continuity in a well-trained turf management crew," Parkes says. "We conduct 30-, 60- and 90-day performance reviews. This provides a great opportunity to pat each and every team member on the back and to discuss areas that might need improvement. The quality of the course today becomes the expectation for the conditions the next time the golfer plays Traditions. Golfers want the product or service to be better the next time, but they don't expect to pay any more for it."

PARKES ALSO CITES TWO BARRIERS TO SUCCESS:

1. Labor agreements. These might not be beneficial to the facility.

2. Organizational problems. Support is either not provided for the upkeep because other entities (parks, swimming pool, etc.) are deemed to need the available funds or resources generated from operations are used to subsidize other programs rather than being reinvested back into the facility.

In addition to these keys and barriers, a renovation can contribute to success. What initially pulled people back to Traditions was the buzz that followed the renovation that was completed in 2003, Parkes says.

"Golfers wanted to see the new Chevy Chase," he says. "What has kept us on their play list is the continued improvements to the course and the great service that golf professional Bob Falkiner and his staff deliver once the golfer pulls into the parking lot. Bob provides valet club service, name plates on every cart and an extremely friendly staff that reacts promptly to customer needs. They genuinely like people, and it's demonstrated in virtually every customer touch." **GCI**

There has been a steady decline of revenue at the three municipal golf courses, including Prairie Vista, in Bloomington, Ill., since 2001, says Kerry Satterwhite, CGCS. Photo: Prairie Vista Golf Course

"It's not an overbuilt area, so the land the golf course sits on wouldn't be a premium property," he says.

LACK OF GROWTH

Much like Satterwhite and Brandenburg, Dennis Lyon, CGCS, manager of golf for the city of Aurora, Colo., faces operating difficulties. Aurora owns seven golf courses – six 18-hole facilities (all with budgets of $600,000 or more) and one nine-hole, par-3 course. Lyon's three biggest difficulties are:

1. Uncontrollable increases in operating expenses without the ability to increase revenue at a comparable pace;

2. No real growth of the number of rounds played per 18-hole golf course during the past five years; and

3. The development community building public golf courses to sell houses instead of meeting a demand for golf in the area.

"The course ends up cannibalizing rounds from surrounding courses," Lyon says. "Golf operations are subsidized by home sales, and the developers eventually leave with their pockets full of money and turn an albatross over to the homeowners to figure out how to manage and maintain it."

For Aurora municipal golf courses, total rounds have declined from 322,332 in 2001 to 295,482 in 2006. However, annual revenue has been more stable. The courses generated $9 million in 2001, declined to $8.4 million in 2004 and increased to $9.3 million in 2006.

Lyon cites attitude and corporate culture as the best examples of operational efficiencies.

"By this I mean management sets the bar high; the employees are committed to achieving the expectation; everyone is tasked to figure out how best to do their job given the opportunity to do it; and if there's a dollar to be saved, it's saved and celebrated."

The city of Aurora, Colo., owns seven golf courses, including Saddle Rock (opposite page). It faces uncontrollable increases in operating expenses without the ability to increase revenue at a comparable pace.
Photo: Saddle Rock Golf Course

PATH TO SUCCESS

The biggest mistake Brandenburg sees other munis make is operating like a park with tee times instead of a daily-fee golf course. Some munis add an extra step for players to come play, Brandenburg says.

"For example, residents here complained they needed to buy a discount card, and second, they needed to show the card when they checked in to receive the discount," he says. "Nonresidents felt cheated because they had to pay more, when in reality, they paid the normal price and card holders received a discount. We eliminated the card and went to a single pricing structure to eliminate complaints from both sides. Everyone needs to be treated the same."

County employment can make operating a muni difficult, too.

"It's easier for county employees to be lazy,"

Brandenburg says. "I'm not required to work anymore than 40 hours. But in the real word, you're expected to work extra hours. We work extra hours just like any other golf course. Labor-wise, you have to be a self-promoter rather than working with the threat of being fired."

Munis also are known for bidding things out, which can be detrimental because it's not always about buying the cheapest product or service, Brandenburg says.

"We shop around and get tight specs and buy what works for us," he says. "Doing things strictly on cost can be a negative, though. But if you're not efficient and not on top of things, you'll struggle. A good purchasing operation is key."

For operational success, munis need the right people, need to differentiate themselves from the competition, need continuity of thought and don't need to discount so much, says Allen Parkes, CGCS, (who is also a PGA professional) at Traditions at Chevy Chase in Wheeling, Ill.

"Munis aren't inherently at a disadvantage," Parkes says. "You have to be spending money at the right time and on the right things and on the right people. Competitive markets change. I've seen a county come in and compete with the private sector at a ridiculous price. You have to spend money to make money. Yet, I'll price out generic chemicals, and we buy used equipment. I'm not buying the newest toys either. We'll run fairways mowers well past the five-year lease because we have a good technician."

Traditions, which has a maintenance budget of $700,000 and revenue of $1.5 million in 2006, might be doing better than most munis. Parkes says rounds are limited to 30,000 annually because the city and course management don't want the course to become run down.

The course is competing in the upscale market. As a result, the course was renovated in 2002, Parkes hasn't been turned down for equipment since he has been there, he's been able to spend $20,000 annually on flowers and is investing $20,000 on decorative curbing.

"A lot of the success is location," he says. "We're on the north side of Chicago in a wealthy suburb where there are a lot of retired folks. But the executive director, board and g.m. all want this to be a showcase of the parks district."

To be successful, Lyon suggests munis concentrate on adding value rather than cutting expenses.

MUNICIPAL GOLF COURSE SUPPLY (18-HOLE EQUIVALENTS)

Year	Openings	Closings	Total at 12/31
2000	21	NA	2,222.5
2001	24.5	NA	2,205.5
2002	15.5	NA	2,192
2003	16	3.5	2,195
2004	15.5	2.5	2,219
2005	10.5	4	2,239
2006	9	3.5	2,256

Source: National Golf Foundation

"Avoid discounting with coupons etc., because you diminish your value in the eyes of your customers," he says. "Implement a loyalty program that caters to your core golfers, not the one-time bargain hunter. Develop new golfers and concentrate on customer service throughout the golfer's experience."

Regarding the future of muni golf, Lyon doesn't make a distinction between muni and public access golf but says the price of public access golf is increasing in response to the cost of doing business.

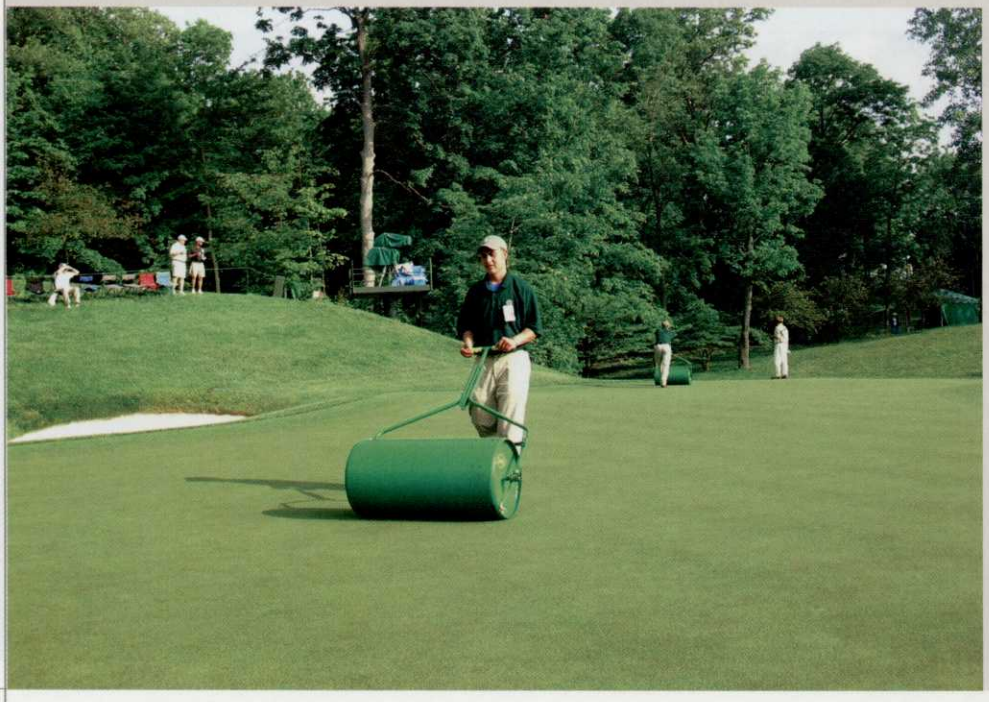
"The marginal operators might not survive because of product, location or management," he says. "Courses with debt will have an even more difficult time. The ability to invest in infrastructure and equipment replacement for the foreseeable future looks grim."

Overall, munis have the same challenge most other facilities do – declining or stagnant rounds. But it's not dollar driven, it's a competition for time, Satterwhite says.

"Golf has to be faster," he says. "People don't have five or six hours to play golf. We need to find out what the needs of the golfer are and meet those needs. For example, The Den wanted to cater to the competitive golfer. Now we're hearing golfers think it's too hard. If we weren't a muni, we wouldn't be in business. Munis aren't concerned as much about making money. They have more flexibility to weather the storm." **GCI**

BY T.R. MASSEY

roll away... to faster green speed



Rolling greens is an age-old practice that fell out of vogue between the late 1920s and the 1980s. Because research showed its merit, the practice has caught on again. Photos: Muirfield Village Golf Club

Researchers and superintendents extol the benefits of using rollers

For a long time, everyone thought lowering the height of cut on greens was the only way to achieve faster speeds. Turns out everyone was wrong.

Research shows a combination of mowing and rolling greens is the way to go. Rolling greens is an age-old practice that fell out of vogue between the late 1920s and the 1980s. Twenty years after the discussion of rolling reemerged, when research showed its merits, rolling greens has caught on again. Since the beginning of this decade, superintendents throughout the country have rediscovered how rolling, in addition to mowing, can save time and money; produce smoother, faster greens and even stop the spread of disease.

"I know more and more people who are doing it," says Thom Nikolai, Ph.D., turfgrass academic specialist at Michigan State University. "I don't know anyone who doesn't roll."

Nikolai wrote a book about greens rolling, "The Superintendent's Guide to Controlling Putting Green Speed," which was published by Wiley & Sons in 2006. Nikolai says if he writes another edition, he'll write more like 80 pages rather than the 20 he did in his latest book.

Nikolai also lectures about greens rolling.

"I believe it was 2002 in Orlando where I gave a talk," he says. "I was given 25 minutes. I asked how many people roll regularly. Two hands went up of the couple hundred people who were there. I gave my talk, and someone came up and said, 'You just sold a roller to every single

guy in that room.' I was trying to get a couple of roller companies to fund a study with me prior to that presentation, and they wouldn't. After my presentation, they all decided to fund research that year. It worked out well."

Nikolai has access to a repository of almost every paper ever written about golf course management practices called the Turfgrass Information File. The mechanical mower was invented in 1836, and before that, courses were "mowed" by bunnies and sheep, he says.

"I strongly believe rolling was the first mechanical practice, but I have been unable to find a reference to green rolling prior to 1900," he says.

Nikolai believes rolling lost favor for two reasons. First, in the mid- to late 1920s, there was an outburst of new mower invention, and suddenly, grass could be mowed to .187 inch. With those heights, greens were fast enough. The second reason was that people thought compaction as a result of rolling wasn't good for root growth.

"So rolling disappeared from the literature," Nikolai says. "From 1900 to 1928, we'll say you could find numerous articles about lightweight rolling on greens. You get to the point where there's a debate about it, how often and how much they should weigh. From the late 1920s to the late 1980s, every hit you get is for rolling once in the spring for home lawns or for cricket or lawn bowling. It's just gone."

Because people began to demand faster green speeds during the mid-1980s, the discussion reemerged. That was when research about the subject began. Today, Nikolai conducts three studies per year at Michigan State. Other schools throughout the country also conduct studies.

"It's safe to say from these studies that rolling every other day on greens that have a normal topdressing program results in no compaction and is beneficial to the turfgrass and golfer satisfaction," Nikolai says.

The biggest negative of a roller is that it can spin out when it hits the collar of a green and cause abrasions or wear because the sidewinding action of modern rollers means fast stops and starts.

"This can often be corrected by using a different kind of roller or the operator using it in a different manner," Nikolai says.

But a superintendent has to know what he wants to do with a roller before he purchases one.

"How do you want to use it in your frequency, what's your topography, do you want to use it for something other than rolling the greens, like rolling after you topdress with a vibratory roller?" Nikolai asks. "I know of one gentleman who vibratory rolls after applying organic fertilizers so he doesn't pick up so much the next day."

Sidewinding riding machines cost between $8,000 and $12,000 each and vary by the number of rollers, width, weight, speed and setup. Other units attach to triplex mowers, and older drum-style rollers are pulled behind maintenance carts. Most modern rollers are ridden sideways by a staff member who needs to have the skill and practice to do it well. On average, it takes two operators two hours to roll 18 greens.

"Find someone who has one and talk to him," says Nikolai about advice for buying a roller. "Demo three or four."

As with many aspects of turfgrass management, the art and science of rolling need to be considered.

"We know a little bit of the science of rolling, but incorporating it into a program is the art of greenkeeping – how to take the tools and employ them at your facility," says Chris Hartwiger, a senior agronomist for the USGA Green Section since 1995.

In the early 1990s, Hartwiger conducted greens rolling research at North Carolina State University for his master's degree. He found rolling increased green speeds and improved smoothness. He also found there were no compaction issues. He conducted tests on a sand-based green and a clay-based green and, even at highest rolling frequency (70 consecutive days), he couldn't detect any change in compaction levels.

"Hopefully, we busted that myth," he says.

Neither Nikolai nor Hartwiger know of a golf course superintendent who doesn't roll greens, except for those who can't afford the machines.

"Our mission is to help each golf facility produce the best product given the existing cir-

It's possible to raise the height of cut on greens 25 percent by rolling them, says John Fulling, CGCS. Photo: Kalamazoo Country Club

At Muirfield Village Golf Club, Paul B. Latshaw, CGCS, rolls greens three times a week, morning and night. Photo: Muirfield Village Golf Club

cumstances," Hartwiger says. "At a course with a lower budget, I might not recommend it. But if they have one, I'll recommend rolling, and we'll talk about how to do it best."

THE REAL WORLD

Aside from researchers and consultants, golf course superintendents are experiencing the benefits of greens rolling firsthand. John Fulling, CGCS, of Kalamazoo Country Club bought two new DMI Speedrollers this year, and swears by them.

"You couldn't rip these out of my cold dead fingers," he says. "I can't imagine doing it without them. I don't get excited, ever, and these excite me. It's worth the investment. Imagine the turf health. If you can raise the height of your green by 25 percent, imagine what you've saved in the time and effort and hand-watering."

At Muirfield Village Golf Club in Dublin, Ohio, Paul B. Latshaw, CGCS, prepares the golf course for the PGA Tour's Memorial Tournament each May and maintains course conditions for an upscale membership during the rest of the year. He rolls greens three times a week, morning and night. He uses three mechanical rollers and six pushing rollers.

Mark Swygert, golf course superintendent Sage Valley Golf Club in Graniteville, S.C., bought a roller immediately following the opening of the course in 2001. Since then, he has purchased a second Tru-Turf roller.

"Basically, it was a way for us to get better green speeds," he says. "There are a lot of benefits having them, but our initial one was green speed. After topdressing and aerifying, it's something you've got to have."

Swygert mows Sage Valley's bentgrass greens at .115 inch and raises them to .140 inch when it's really hot.

"We roll probably two or three times a week, and when we have a tournament, we bump that up a little bit," he says. "After aerification, we roll to smooth out the surface. After topdressing, we use the roller instead of a mower so we don't pick back up the sand we just put down on the greens. So there are other uses of a roller than just green speeds."

Swygert realizes savings when he sends out five employees to mow and two to roll instead of 10 workers double-cutting. He uses seven guys and gets the job done faster, saving labor costs as well.

"Especially for us in the summer time, we can let the plant grow to make it healthier," he says. "We might skip a cut and roll, and you really don't lose much speed. In the summer, the plant's not growing that much. You don't lose the speed, and the plant isn't as stressed."

Sean O'Connor, CGCS, is another superintendent who promotes rolling. He oversees two courses, the East Course and West Course, at Forest Akers Golf Course at Michigan State. Both were redesigned in 1990 by Arthur Hills. O'Connor rolls the greens on the West Course but not the East Course.

"I do it for financial reasons," he says. "I don't have the money or staff."

This unique way of practicing, though, produces side-by-side comparisons.

"I started experimenting with rolling three years ago," says O'Connor, who uses two DMI Speedrollers. "I started off because of pressures about green speeds, and I didn't want to reduce my height of cut. I'm to the point now where I'm rolling every day and alternating my mowing. I'm rolling more often and getting more consistent and faster green speeds."

For O'Connor, rolling means disease control, too. He uses the same fertility and disease management on both his courses, yet the greens he rolls have fewer dollar spots.

"On the East Course, I was having breakthroughs," he says. "I never saw any active dollar spots at all on the West Course last year."

At the Alister MacKenzie-designed Crystal Downs Country Club, which rests on a bluff overlooking Lake Michigan and Crystal Lake, Mike Morris, CGCS, rolls greens daily.

"There's less disease with rolling, less localized dry spots," he says.

O'Connor also can mow the annual bluegrass greens higher and achieve faster speeds.

"I get faster green speeds at .135 with rolling than at .125 and not rolling," he says. "There's a great benefit to it. I went into it with great trepidation, and now I'm completely the opposite."

At Kalamazoo, a 1909 Tom Bendelow/Willie Watson design, Fulling switched from triplex rollers to sidewinders this year.

"Rolling is the greatest thing that ever happened to golf," he says. "I get as much as 20 inches extra with rolling. There are no compaction issues, and the plant is healthier. When I Stimped, we saw between 15 inches and two feet after rolling. It's been fantastic."

Fulling wants to raise mowing heights to .125 inch and keep his speed. Last year, he cut at .100 inch. He used to double and triple cut. Now he mows and rolls once a day.

"There's 25 percent more leaf blade, plant food production, carbo storage – everything," he says. "It's gotta be better. They're already looking better." **GCI**

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SPOON-FEED YOUR TURF

WHILE IT MIGHT NOT COMPLETELY REPLACE TRADITIONAL FERTILIZER APPLICATIONS, FERTIGATION ALLOWS SUPERINTENDENTS TO BE EFFICIENT AND HAVE MORE CONTROL

BY JOHN TORSIELLO

At Old Ranch Country Club (opposite page), Richard Swinhart, golf course superintendent, fertigates as a supplement to traditional fertilizer methods. Photo: Old Ranch Country Club

At Bayville Golf Club, Cutler Robinson, CGCS, uses fertigation to apply about 20 percent of his chemical treatments. Photo: Bayville Golf Club

Fertigation, using an irrigation system to deliver fertilizer, wetting agents and other chemical treatments to fairways, tees and greens, has become a more popular and effective way to help manage turf conditions.

"I had experience with fertigation at other courses, and when I got here, I started running a micronutrient program through our irrigation system," says Kevin Jasinski, golf course superintendent at Minisceongo Golf Club in Pomona, N.Y. "I saw an immediate change in some of the greens – they gained color. I'm also running a wetting agent through the system. That allows me to use less water and also keeps the turf healthy in spots where we've had drying problems."

Fertigation may never completely replace spreader applications of fertilizer, other chemicals and wetting agents on golf courses, or even eliminate the need for manually treating troublesome spots. But it's a valuable tool superintendents have at their disposal in their ongoing struggle to maintain the best possible playing conditions.

"No, it doesn't replace fertilizing a golf course through traditional methods, but it's a nice supplement," says Richard Swinhart, golf course superintendent at Old Ranch Country Club in Seal Beach, Calif. "With our high salt content, we really push the gypsum, and it makes a big difference in the quality of the turf. We've had the injector break down and be out of action for a few weeks. When we got it up and running again, you could see the difference in color."

Fertigation is a great tool for a grow-in and spoon-feeding certain areas of a course during its first seven to 10 years of growth, says Mark Mansur, golf course superintendent at Wintonbury Hills Golf Course in Bloomfield, Conn.

"It's a nice way to enhance manganese levels, and you can incorporate wetting agents into the system to enhance turf conditions," Mansur says.

Brad Fox, golf course superintendent at New Jersey National Golf Club in Basking Ridge, N.J., believes he has found a magic potion to keep the course's playing conditions top-notch.

"I'm using the irrigation system to inject sulfuric acid with small amounts of urea to eliminate localized dry spots in the fairways," Fox says. "This treatment is common out West where they might have poor water quality. I can set the pH level anywhere I want, usually around 6.5, and injecting the acid allows the water and fertilizer to get through the soil profile more effectively. When I run fertilizer and acid through the system I'm killing two birds with one stone.

"One of the key advantages is that I've reduced my water usage by about 50 percent," he adds. "I'm running the spinning heads only between 15 to 20 minutes four to six times a week. And I don't need 18 guys going around the course hand-watering fairways. We don't do any of that, so it saves on man power as well."

IMPROVED TECHNOLOGY

Using an existing irrigation system to apply fertilizer, wetting agents and other chemical treatments is nothing new to the industry – it's been around since the 1970s. But the technology has improved, prices of the pumps and injectors needed to fertigate have decreased, and chemicals used in fertigation are more attainable, although golf courses compete with agricultural enterprises for product. Chemicals can be pumped through various types of irrigation systems, from fixed sprinklers to drip and surge irrigation systems.

One of the main benefits of fertigation is that chemical applications can be targeted to specific areas and fertilizer can be applied directly into the soil where it can be most effective for improving and maintaining turf. Because superintendents can spoon-feed turf through fertigation,

Fertigation is a valuable tool for spoon-feeding certain areas of a golf course. Photo: Rain Bird

the needs of the plant can be met with a higher degree of specificity, producing a better density in the turf canopy, improved grass quality and color, and enhanced plant strength.

Ali Harivandi, Ph.D., a researcher with University of California, is a proponent of fertigation because it's an effective turf management tool.

"One of the major pluses is that the labor involved in spreading large applications of fertilizer once or twice a year isn't there," Harivandi says. "And more importantly, because the plant is receiving a smaller amount of material regularly, the plant can use it more efficiently. What you're doing is spoon-feeding the plant. It's like a human eating five or six times a day instead of one big meal. You process the food better if you spread out your meals and eat smaller amounts."

Fertigation systems have improved considerably during the past 10 to 15 years, Harivandi says.

"Because most systems are now automated, which means levels of fertilizer passing through the system can be closely controlled by a computer, the systems are more reliable and efficient," he says. "I'd say the use of fertigators on golf courses has doubled during the past 10 years."

Many new courses design their water pumping stations to include fertigation equipment. The cost of installing fertigation equipment into an existing water pumping station, while not inexpensive, isn't cost prohibitive for many facilities – somewhere between $10,000 to $15,000. The cost might be recouped within a few years through the decreased use of fertilizer and other chemicals, as well as a reduction in labor.

A fertigation system is tied to liquid fertilizer tanks and injection rates are monitored by an injector pump that's tied into the irrigation control panel. The injector pump can be adjusted to several flow rates depending on the specific fertilizer being applied. Control valves allow for multiple tanks to be employed on the same system. Thus, fertilizer can be applied separately or combined to create a specific blend.

"The systems have improved like any other technology," says Joe McCleary, CGCS, at Saddle Rock Golf Course in Aurora, Colo. "We monitor our fertigation system every day and keep track of what we're putting out there and how many gallons of water and chemicals we're using. You can't count on fertigation

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for all your needs, especially in the summer in Colorado when it's dry, but it's an excellent tool when I want to green-up the course quickly before a big event. I can be specific about how much fertilizer I put down."

CONSIDERATIONS

At Bayville Golf Club in Virginia Beach, Va., Cutler Robinson, CGCS, uses fertigation to apply about 20 percent of his chemical treatments.

"Fertigation lets me slow release my chemicals," Robinson says. "I use a baseline of potassium to build the turf. My perfect world would be doing 20 to 30 percent of my feeding through fertigation, another 20 to 30 percent through organic feeding and 50 percent or more through traditional fertilizing methods.

"One of my biggest problems is that I can't get product all the time, and some of it's very expensive," he adds. "So, cost and availability are factors, at least for me."

Swinhart gets around those obstacles by planning ahead.

"Sure there's a cost factor involved because the products you use with fertigation are more expensive than most granular products," he says. "I tend to buy all my gypsum and fertilizer in bulk, and that helps me with my per-bag price. I'll bring in two truck and trailers of both each year."

Any course with an irrigation system can fertigate. A system's effectiveness might vary from course to course, depending on topography and climate. In areas that receive high average rainfalls, it might be more of a challenge to monitor the application or fertilizer through an irrigation system because of the possibility of runoff caused by heavy rain. If the topography of a golf course is severe, the benefits of fertigation might be less because fertilizer and other chemicals applied through the irrigation system might accumulate at the bottom of berms and hills.

"A superintendent should study the lay of the land and where the irrigation lines run," Harivandi says. "You also need to know what times of the year are best for fertigation. Weather changes the needs of a plant, whether it's dry or wet, warm or cold, and you have to adapt to that. Courses in Nebraska, for instance, don't need nitrogen in the middle of the summer. Because you aren't looking at a date on the calendar and blasting fertilizer four times a year, you need to be more diligent and precise with your feeding if you fertigate."

There are subtle side benefits to fertigation, Harivandi says.

"When you're fine-tuning a system, you learn more about your course and how best to care for it. You use less water with fertigation. But you do so because you're more tuned into your use of water and not overwatering like many courses do."

There also might be environmental benefits to fertigation. It reduces the need to broadcast large amounts of fertilizer and other chemicals onto the turf, which can lead to runoff into aquifers or other nearby above ground water supplies.

At Old Ranch Country Club, Richard Swinhart buys gypsum and fertilizer in bulk to save money. Photo: Old Ranch Country Club

Because they contain chemicals, the tanks used for fertigation must be placed in a containment building to avoid soil and water contamination if there's a leak in a tank.

And while tanks containing pesticides can be tied into an irrigation system, most superintendents shy away from using these chemicals in their irrigation system because of environmental concerns.

"I consider having the ability to fertigate my course a huge plus," Jasinski says. "I worked at a course that didn't have it, and the superintendent was very persistent with the president of the green committee to approve buying a system to add onto the existing irrigation system. It's better to have a fertigation system than to not." GCI

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THE SKINNY ON FERTIGATION

Pros

- Allows more efficient fertilizer, other chemical and wetting agent use
- Running wetting agents through a fertigation system can reduce water consumption
- Reduces manpower costs associated with hand-watering and spot fertilization
- Can be fine-tuned to meet specific demands of turf during various times of the year
- Reduces potential for environmental harm by avoiding runoff associated with using large amounts of fertilizer at one time

Cons

- Somewhat costly, especially if adapted to existing irrigation systems
- Chemicals used in fertigation systems can be expensive, and availability is an issue sometimes
- Fertigation can be used only on golf courses that have irrigation systems
- Demands careful planning and monitoring to assure maximum benefits
- If a course's irrigation system is old, using it to fertigate might provide uneven results and spotty color

BY STEVE AND SUZ TRUSTY

Change with the times

FACILITIES IMPLEMENT EFFICIENT STRATEGIES TO REFLECT MARKET CONDITIONS

As rounds have declined in various markets in the golf industry, facilities have sought operational efficiencies to reduce expenses, increase revenue and compete more effectively in the marketplace. Some of these changes have been driven by the impact of economic pressures. Others have been adopted as proactive measures to avoid such pressures. Though the areas of focus are varied, almost all appear to be long-term changes – a permanent shift in the operating structure of a golf facility.

ASSESS CURRENT CONDITIONS

Although golf course management companies usually don't reveal the details about their operational efficiencies, input from such companies in other course-specific situations provides ideas. First, bring in an experienced individual from outside your course administration or management team to review and rate your current operation. If the budget won't allow you to hire an outside consultant, consider bringing in one of your peers in exchange for providing similar services at his facility.

Next, identify problem areas and group them within the two main categories they impact: expenses and revenue. Cre-

The Crystal Springs Golf Resort, which includes six courses is connected by a wireless network. And, all the different software programs used at the facility are interactive. Photo: Crystal Springs Golf Resort

ate more specific subgroups under each category to fit the operational structure of your facility. Break down the specific problems under these subgroups. Identify the patterns. Brainstorm for solutions, first with your consultant/peer, then with your staff and administration.

Two major areas frequently targeted for improvement are personnel and technology. Generally, personnel is one of the top expenditures of the golf course. Restructuring to eliminate most mid-management positions usually proves to be beneficial.

With greater access to high-speed Internet connections for remote courses and the advancements in software programs designed for the hospitality industry, including golf courses, there are multiple technology options to explore. One resource for working though this process is the Club Managers Association of America and the Hospitality Financial & Technology Professionals joint publication: "RFI (Request for Information) Tool for Managers to Use When Selecting a Club Management System." A document explaining how to use the tool and a copy of the RFI that can be customized to fit the needs of a course are available for downloading at the organizations' Web sites, www.cmaa.org or www.hftp.org.

Another resource to help compare your facility to similar ones is the CMAA 2007 Club Operations and Financial Data Report. The report includes data for club operations during 2006. The survey tracked a series of questions about club operations during the past 20 years. Results also are available in a customized format that allows clubs to compare the overall results to their specific profile of club type, region, membership size and operational statistics.

AHEAD OF ECONOMIC FORCES

The economic downturn in the auto industry has affected the entire Detroit area, driving businesses to seek operational strategies to increase efficiency in the leaner and meaner environment. Jim Kokenyesdi,

Wild Turkey, one of six golf courses part of Crystal Springs Golf Resort, is highlighted in a golf package that cross-promotes all six courses. Photo: Crystal Springs Golf Resort

manager of Fore Lakes Golf Club, a 7-year old, 18-hole public course in Kimball, Mich., says he and his staff have taken an aggressive approach to the market from the beginning. Still, they've seen a decline of many of their corporate events, and most of the remaining ones are smaller with tighter budgets.

"Gas prices are hovering around $3.50 a gallon," Kokenyesdi says. "Business is tough. Throughout the past few years, we've started utilizing more advanced technology, including software programs that work with each other, to help integrate our overall operations and manage our expenses better."

The course initially used paper-based systems with computer-generated documents or spread sheets. Keeping the information current and sharing it between departments consumed valuable staff time and often kept the client waiting as schedules were checked. Kokenyesdi researched the options and started initiating the conversion four years ago. Now the kitchen software ties directly into the purchase orders, and the banquet and meeting event software tie into the booking program. Everything in the pro shop is automated.

Kokenyesdi uses the Active Network for the club's electronic tee sheet and point-of-sale information. Tee times also are generated online through the Web site www.activegolf.com.

Scheduling data for all departments can be checked from any computer on site, or even from linked Blackberries off site, and new information is immediately posted so anyone can book a tee time or meeting event, Kokenyesdi says. All financial information automatically feeds into the QuickBooks accounting system, including purchases from anywhere on the course.

Another major benefit of the software is maximizing tee times.

"We can see where the down time is and take steps to capture it," he says. "We might offer a special promotion or send an e-mail blast to a targeted group of our regular golfers. We now start league play on the first and 10th holes and are able to book nine holes before that by using the computerized system. The system color codes nine-hole and 18-hole play, making it easier for those booking tee times."

Another high-tech addition is an upgrade to a Toro automated irrigation system that incorporates a GPS program. Details of the existing system were posted on the computer, but in a coded format developed by the previous superintendent that was difficult for others to follow. With the new technology, details can be accessed from any computer and from a hand-held PDA while on the course. The exact square footage of greens, tees, fairways, bunkers and ponds also will be mapped out creating greater efficiencies in planning fertilization and control product applications.

Staffing is another area of change.

"We've basically eliminated the mid-level management positions with Kathy Torello-Almanza, events and clubhouse manager, and I filling the roles of department heads," Kokenyesdi says. "We've asked our department-level managers to take on greater responsibilities. We anticipated the cost savings. The bonuses are improved communications and the ability to set priorities and act on them more quickly."

Kokenyesdi is exploring advertising options with a few trial spots on regional cable stations. He's found the targeted e-mail blasts effective but is cautious about overusing them and lessening their impact.

As part of planned growth, Kokenyesdi seeks a new market segment each year. He's generated

More golf facilities adopt high-tech

TECHNOLOGY ADVANCEMENT	2007	2004
WIRELESS CONNECTION AT THE CLUB	61%	32%
MAINTAIN A WEB SITE	91%	76%

Source: CMAA Club Operations and Financial Data Report, Computer Equipment and Software.

Expense categories as percentage of total golf-related income by club type

EXPENSE	YEAR/TYPE	YEAR/TYPE	YEAR/TYPE	YEAR/TYPE	YEAR/TYPE	YEAR/TYPE
	2007/GC*	2007/CC*	2004/GC	2004/CC	2002/GC	2002/CC
SALARIES	15	16	18	18	15	14
HOURLY LABOR	27	24	24	24	25	25
PAYROLL TAXES AND BENEFITS	7	9	8	8	7	8
TOTAL	49	49	50	50	47	47

Source: CMAA Club Operations and Financial Data Report

Note: Golf-related personnel expenses have remained fairly stable as a percentage of golf-related income according to CMAA reports generated in 2007, 2004 and 2002. This reflects personnel level adjustments keeping in line with income adjustments during this period. However, with total golf-related personnel expenses ranging around 50 percent, this is one area to track closely when considering operational efficiencies.

*GC=Golf Club, CC=Country Club

success expanding into Canada and reaching out to seniors. A considerable upgrade of the banquet space one year, followed by construction of a gazebo the next, drew more special-event business. High-speed Internet access became available last November. The increased transmission speed boosted efficiency. It's part of the next outreach, along with the upcoming installation of retractable flat-screen TVs in the meeting rooms to attract smaller, education-based group and corporate events.

"I see the need to adopt operational efficiencies as an industrywide challenge," he says. "To hold our own in the marketplace, we need to gain a little more strength each year."

MARKETING OPPORTUNITIES

Crystal Springs Golf Resort in Hamburg, N.J., features six golf courses, four practice facilities and the David Glenz Golf Academy. Along with two luxury hotels – the original 175-room Minerals Hotel & Spa and the 200-room Grand Cascades Lodge, which opened in July – amenities include two spas; an array of indoor and outdoor pools; basketball, tennis and racquetball courts plus a 6,000-square-foot fitness center; as well as 11 cafes, bistros and restaurants.

The focus on creating a recreation destination doesn't stop there. The owners, who took over Crystal Springs Golf Resort in 1995 and started building from there, previously developed a ski business that operates adjacent to the complex. They're also involved with a large real estate operation covering much of the adjoining area.

Crystal Springs' target market is metro New York and New Jersey that's filled with upscale, computer-literate consumers. So, management spends a lot of effort drawing people to the resort's Web site, says Art Walton, vice president of golf operations.

"We make sure it's up to date, delivering the information in a user-friendly format," he says. "We offer several types of memberships, some focused on the golfer and others, like our social membership for area residents, more on the other amenities. All provide extra benefits as incentives for using more services. Some memberships obligate the user to spend specified amounts in certain areas."

The facility operates as one entity all connected with a wireless network. The different software programs – Micros for the restaurant functions, the Active Network for property management and accounting programs – are interactive. The reservations system can handle tee times or hotel rooms and offers alternatives from the variety of choices. The software allows management to distinguish the various membership types, accomplish the customer tracking and centralize the billing. The centralized billing ensures a customer at any part of the facility receives an integrated statement. Revenues and expenditures are posted as they occur.

With the cluster of golf courses in a relatively small geographic area combined with the broad range of other amenities, comes the opportunity to cross-promote, selling the package. The challenge is exposing potential buyers to all possible sales opportunities – without overkill. On site, brochures and collateral pieces are placed strategically where people gather, subtly suggesting other experiences to explore.

Good systems only work well if they're matched with good people, so Crystal Springs focuses on recruiting, training, supervising and developing people.

"We promote from within, which has been a valuable element of our growth," Walton says. "As a result, we have relatively low turnover in our key positions. Most of those at the senior levels have worked up from junior positions, gaining experience as they advanced. That also allows us to leverage our personnel over multiple areas. While we have a superintendent at each course, our three directors of golf each oversee two facilities. Food-and-beverage has similar multiple site management."

Three, soon to be four, of the courses have been built during the past 10 years. Just six miles separates the furthest course from the central hub.

"We realize great efficiencies by operating multiple courses out of a single clubhouse, as well as trimming personnel needs, property taxes and insurance are reduced," Walton says.

Much of the maintenance equipment, other than what's used daily, is shared among the courses. Though each superintendent develops the maintenance program specific to the needs of each course, product purchases generally are consolidated for better price points.

Frequent department meetings and overall strategy sessions keep everyone focused and moving in the same direction.

"But you can only trim operations to a certain point," Walton says. "There are so many fixed costs and factors beyond your control that affect costs. Revenue is the first priority, so we hold marketing meetings weekly. If you can control the revenue side, operate efficiently, and differentiate your product, you can stay ahead of the market." **GCI**

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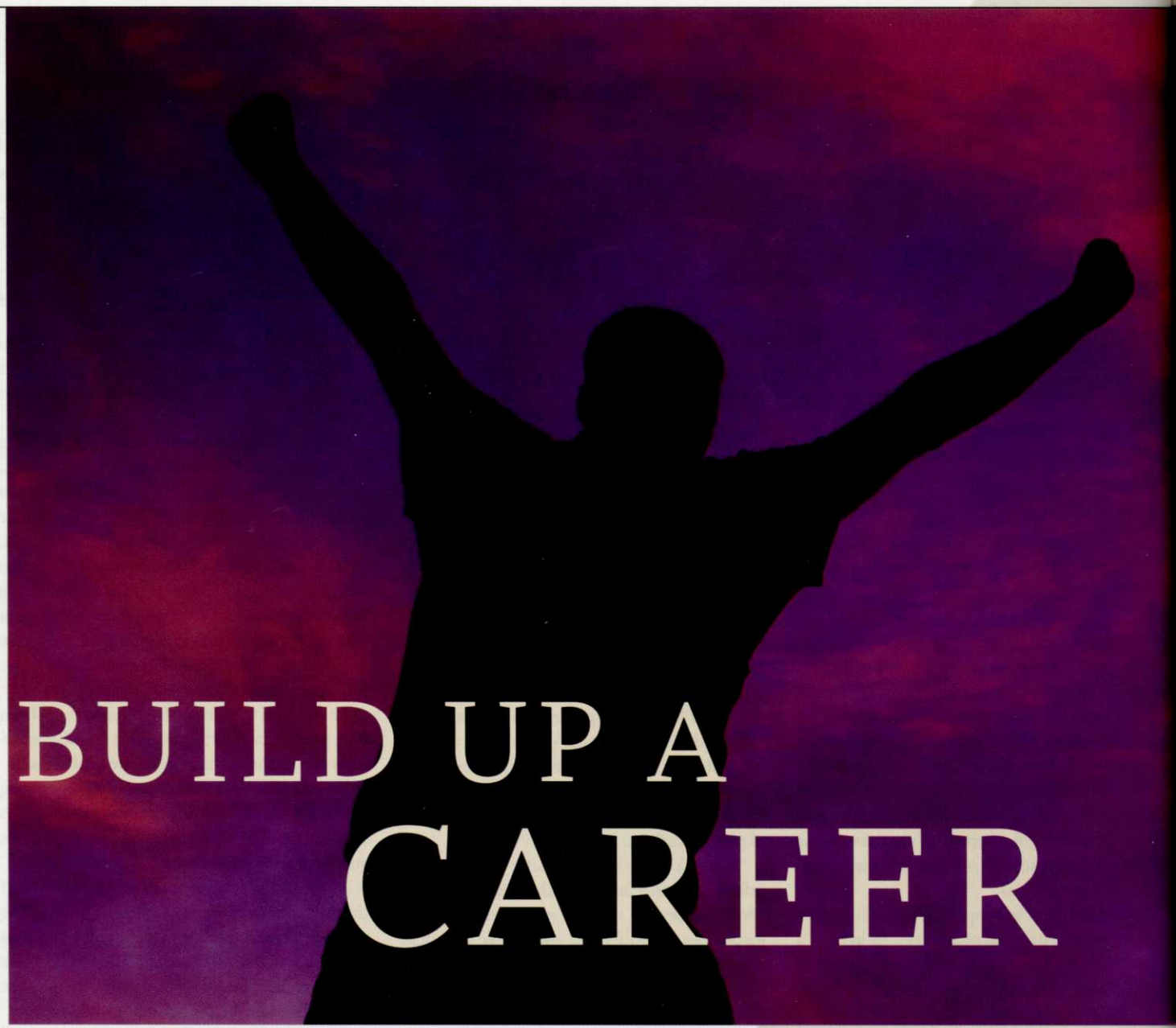

BUILD UP A CAREER

SUPERINTENDENTS NEED VERSATILITY, OPTIMISM AND BUSINESS SAVVY TO SUCCEED

BY MICHAEL COLEMAN

Welcome to the challenge of life – a career. Between the jagged rocks and the icy slopes, there's a path to the top for those that are up to it. Reaching the pinnacle of your career is like climbing Mount Everest – you need to hang on because an avalanche of challenges will convince you it's just that.

The real question is: Can you reach this goal?

To get to the top of the mountain, you have to keep your professional eye on the summit, whether it's a prized location or maybe the perfect family scenario. Achieving success as a golf course superintendent depends on how you define it and go about it.

"I never targeted myself for any one club or name," says Jon Jennings, CGCS, who's been at the Chicago Golf Club for the past eight years. "You also need to have a clear vision and communicate with the people

Photo: istock.com

that work for you, whether it be your assistant, technicians or staff."

Jennings' approach has been to keep an open mind about opportunities. If an opening put him on a road to where he wanted to go, he looked into it. He started as an assistant at the private Onondaga Golf & Country Club near Syracuse, N.Y., and then at En-Joie Golf Club, a municipal course in Endicott, N.Y. Then he stepped up to Hiland Golf Club, a resort in Queensbury, N.Y., and later Patterson Golf Club in Fairfield, Conn., a private club where he was superintendent for seven years.

Relocating is a job aspect that needs to be considered as a career progresses, especially if you have a family.

"We've discussed it openly with our children and let them know there's a possibility we could move at some point," Jennings says. "They're aware of it ... but I don't know that it makes it any easier."

Balancing family priorities can have a significant impact on a career. For those who strive to keep the family happy, a lot of movement might not be the best option. Not every family can pick up and move like a MASH unit.

Experience in many areas contributes to a successful career, says Joe Baidy, CGCS, at The Alps Club in Moscow. Willing to relocate doesn't hurt, either. Armed with an agronomy degree from Penn State and experience at well-conditioned golf courses, Baidy landed the position in Russia after previous stints at Oak Hill Country Club in Rochester, N.Y.; Fox Chapel Golf Club in Pittsburgh; Acacia County Club in Lyndhurst, Ohio; and Turning Stone Casino Resort in Verona, N.Y.

However, relocating doesn't guarantee success. Charles Dey has been the superintendent at Springdale Golf Club in Princeton, N.J., since joining the club in 1974. His professional position at Springdale was his second one.

"I thought it would be a stepping stone and I could move on to any place I wanted," he says. "And then I thought, 'Why not make this a place to have a career?'"

Since that day, Dey has been improving the course while his experience and knowledge have grown, bringing the club up the ranks along with him. He attributes his ability to balance career and family as a factor of his success in life.

"I was very fortunate," Dey says. "I still have the same wife, and I put two kids through college."

Family time is seen as optional in the eyes of some employers, says Joe Flaherty, CGCS. The 42-year veteran has been able to successfully balance family and career through his progression at Baltusrol Golf Club in Springfield, N.J., from 1964 to 1999 and, since then, in his position as superintendent at Hyatt Hills Golf Course in Clark, N.J.

"The biggest pitfall, as far as career development and maintenance, are the absolutely crazy hours some courses ask guys to work," Flaherty says.

Working 60 or even 70 hours a week has become too common at many courses, Flaherty believes, and is a pitfall he's been able to avoid throughout the years.

"To me, you're not well-rounded if you're working those kinds of hours as a young person," he says.

Flaherty encourages assistant superintendents to find a balance and use time off to re-

Photo: Dreamstime.com

> "The biggest pitfall, as far as career development and maintenance, are the absolutely crazy hours some courses ask guys to work."
>
> -JOE FLAHERTY, CGCS

charge because it's difficult to be sharp at work if you never get a chance at downtime. Worse than that, it's hard on the family constantly working 10- to 12-hour days.

"You can do it, but it'll wreck your personal life," he says.

Overworked staff is often caused by poor management, says Flaherty, who was president of the Golf Course Superintendent Association of New Jersey in 1978-79. High-quality superintendents don't simply work their staff until dark; they plan ahead and manage the crew so tasks are completed in an efficient time frame. Because keeping experienced staff helps a club run better, treating employees fairly is good business, good management and good for your career.

KEEP LEARNING

As far as successful maintenance operations are concerned, Dey encourages superintendents to be frugal with money and understand budgets, which isn't a common skill right out of college. In other words, Dey suggests superintendents respect the courses for which they're responsible.

"Treat it like it's your own, but remember it's not yours," he says.

Dey also reminds veterans to stay hungry and be open-minded. Learning from a technically savvy assistant can be a bonus for veterans that started before computers were on every desktop.

Baidy also says learning is important. He attends seminars, conferences and GCSAA activities to keep abreast with new trends in the business. Complacency can be a drag on one's career advancement, he warns. Assistant superintendents should look at options outside a traditional superintendent position such as course construction, irrigation installation and commercial opportunities.

Jennings says he generally attends his compliment of classes for continuing education in fewer than two years – but he doesn't stop there because learning is crucial to being the best you can be.

"The information is growing so fast, you've got to stay on top of it," says Lyne Tumlinson, director of career services for the GCSAA.

Tumlinson recommends focusing on the areas that might hold a superintendent back. For superintendents with more experience, it's the skills far from turf care that tend to lag behind.

"A lot of them don't have as much knowledge or education in the areas of business, communications and leadership," she says.

While the soft skills such as leadership and communications are helped by experience, educational opportunities can speed learning significantly. The GCSAA has numerous classes on its Web site to address common gaps.

In addition to learning, just keeping a positive attitude and enjoying the work and coworkers is a big part of success.

"I'm pleased with my career," Baidy says. "I've been connected with golf since I was a caddy at the age of nine, for more than 50 years. I enjoy the challenges and people I've met during my career."

BUILD RELATIONSHIPS

Remembering the names of colleagues one meets is beneficial, too, Jennings says. Little things like that help you stand out from others and can lead to opportunities to discuss the next phase of your career.

"The key is, when you meet someone, to follow up with them," Jennings says. "Send an e-mail or a quick note afterward to help the memory of you stick in their mind so that if, down the road, there's something you might need assistance with, that person recalls who you are."

All superintendents need to build relationships at the local and national levels, Tumlinson says. She recommends finding a superintendent that holds the kind of position to which you aspire, get together with him and learn the profile of his career and how he attained success.

Dey agrees networking is an important factor to success, especially for younger professionals. He recalls working side by side with his first superintendent and talking with him even after getting the Springdale job. When you have a good relationship with colleagues at nearby clubs, even borrowing equipment occasionally is a possibility.

EXPERIENCE AND MENTORS

For younger professionals, versatility comes in handy. Early on in a career, a superintendent should plan ahead, examine all the options and

Education shift

> Education is an integral part of a superintendent's success. Here's an eight-year comparison:

	1998	2006
Master's and beyond	3%	3%
Bachelor degree	37%	44%
Associate degree	23%	24%
One to two year certificate	17%	13%

Source: GCSAA

not jump at the first plausible opportunity. Tumlinson cautions that some rookie assistants say, "I'm gonna go to the highest level private club," but they don't look at all their options.

Superintendents shouldn't limit themselves once they've chosen a path either. It's quite possible to move from a public course to a private one or vice versa because the skills needed at both are similar.

"There's not a great deal of difference between private, where I've been all my life, and the place I'm at now, a high-end municipal course," Flaherty says.

The size of a club is something to think about because larger facilities often give assistants opportunities to grow, Tumlinson says. They can learn about negotiating, budgeting and planning, how to run a crew and top-flight management skills.

"If they don't know those things before they get to be a superintendent, they aren't going to last very long," she says.

Tumlinson believes the best first job is a quality internship that gives you a look at the entire industry.

"If they spend their internship raking bunkers then they're not going to get an idea of operating any kind of facility," she says. "But if they spend their internships learning about the profession, then they'll be better prepared."

Whatever your goals, you should make the best use of your time gaining experiencing to get to the top, but you should be patient as well.

"It's a fact – assistants today have to remain assistants longer than they did 10 years ago," Tumlinson says. "But it's invaluable time under the right mentor."

A mentor, too, is critical to your long-term success, especially at the beginning of your career. Finding your first position should be as much about finding an excellent mentor as it is about location, prestige or pay. A mentor will help you learn how to deal with agronomic issues, but the nuances of the political pitfalls at a highly visible course can be a bigger challenge to navigate without a guide.

Being hired at a top-notch club isn't as hard as one might think, Dey says. He recommends assistants approach the superintendents they work for directly and offer to take on whatever work is available.

"There's always a job out there, and if you shine, they're gonna move you up," Dey says. **GCI**

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Common-sense guidelines

Some say having a successful career depends on one's ability and attitude, as well as following some common-sense guidelines.

1. **Pay attention – most superintendents that get fired aren't doing this.**
2. **Hire good people – those that are as happy with their job as you are with yours.**
3. **Be a jack of all trades.**
4. **Play golf at your course and others to get a true read on conditions.**
5. **Attend seminars and take every opportunity to learn.**
6. **Be loyal, but not blindly so, when it comes to equipment dealers.**
7. **Focus on training your staff well.**
8. **Develop a strong portfolio – show and tell about the problems you faced and how you solved them.**
9. **Hire people that balance your traits – if bookkeeping isn't your bag, hire an assistant that loves numbers.**
10. **Learn more Spanish.**
11. **Step back and look at how your course fits into the market mix of your area. Hone the features on the course to attract more golfers.**
12. **Find your niche.**
13. **Be confident but not arrogant.**
14. **Don't become close friends with individuals at your private club. Politics has doomed many good superintendents.**
15. **Use more than one vendor for purchases if possible.**
16. **Like what you're doing.**
17. **Don't hold grudges against coworkers. Professionals can get along with anyone.**
18. **Be patient.**
19. **Weigh the higher salary of private clubs against the better retirement at most municipal courses.**
20. **If you need help, ask for it.**

Source: Golf Course Industry research

BY MARK LESLIE

Superintendent's dream turns into reality

KYLE EVANS OPERATES BELGRADE LAKES GOLF CLUB A LITTLE DIFFERENTLY THAN MANY OTHERS WOULD

No range. No locker room. A sandwich shop but no 19th hole. Not even a pro. Yet "Top 100" is written all over Belgrade Lakes Golf Club in Maine. The driving forces behind its quick ascension to America's elite group of public golf courses are two diverse personalities –Harold Alfond, a Maine businessman and philanthropist, and Kyle Evans, a former golf course superintendent who once happened to tell Alfond about his aspirations of operating his own golf course.

It's a classic story: boy works at golf course growing up; learns the ropes from mowing to working the pro shop, managing the books and cleaning toilets; goes to college and gets a job at a big-time, out-of-state golf course; returns to his roots; is befriended by a wealthy club member; and, together, they make his dream come true.

Along with two other partners – realtors Pat Donahue and Gail Rizzo, who found the property – Evans, Alfond and British golf course architect Clive Clark developed a golf course on a hill that features a 360-degree view of several lakes and a forest.

"We knew we had a unique piece of property, but we never imagined we'd be 'Top 100 in America, Best New Upscale Public Course in America,' one of only a dozen courses given five stars by Golf Digest," says the 49-year-old Evans.

The 120-acre golf course, which is part of a larger 260-acre property, has appeared in golf calendars, desk calendars, books and in a series of postcards. Sparkling white birch trees flash through pine trees and dark evergreens, and piles of sun-washed white stones form 12-foot-high walls and line several fairways. The first hole features a 100-foot drop to a wide hilltop that falls away to the green, and the 18th hole features a 20,000-square-foot double green with the nineth hole snuggled at the foot of a steep incline about 150 feet below the clubhouse.

Evans shared his dream with Alfond about a dozen years ago.

"My course will be public-access only – no members, a quality product, playable and built to be easily maintained," Evans says.

PROFESSIONAL DEVELOPMENT

There have been two defining moments in Evans' career: the day he began working at Naples (Maine)

Kyle Evans and his dog McKinley drive throughout the golf course with an eye for detail. Evans says every day has to be the best because the staff never knows who's coming. Photos: Belgrade Lakes Golf Club

The first hole features a 100-foot drop to a wide hilltop that falls away to the green. Photo: Belgrade Lakes Golf Club

Golf and Country Club as a teenager and the instant Alfond asked him if he was ready to risk he and his wife Margie's "fortune" and add it to those of Alfond, Rizzo and Donahue to realize his dream.

When Evans was 15 years old, he worked with golf pro and superintendent Chet Cutting, an old-school hard worker who taught Evans a strong work ethic and how to treat people the right way. A competitive golfer, Cutting took Evans as his caddy to tournaments throughout New England and exposed him to the golf culture, including excellent golf courses, players and superintendents. Donald Ross's Portland Country Club and Poland Spring Golf Club became Evans' favorite local layouts while playing on his high-school golf team.

With a degree in commercial recreation from Springfield (Mass.) University – where Evans also played on the men's golf team – he returned to Naples in 1980. He intended to teach – like his father, Dean, who, now retired, works at Belgrade Lakes part time – but Evans became more interested in golf and drifted toward the maintenance end of the business.

"It was more interesting than the pro shop," he says. "I had never realized how technical maintenance had become."

At that point, Evans met Joseph Troll, a professor at the University of Massachusetts' Stockbridge School. Troll encouraged Evans to attend the Stockbridge School, which accepted only 30 students at the time. Evans did, and, with the help of Troll, eventually became an assistant superintendent at Spook Rock Golf Course in Ramapo, N.Y.

"It's a terrific product and one of the really successful municipal golf venues," Evans says. "It hosted 50,000 to 60,000 rounds a year and held a PGA qualifying event while I was there. Angelo Palermo ran a well-orchestrated machine that was profitable and a good model for other towns. That's where I learned golf is big business."

Evans also was exposed to the operations at Winged Foot Golf Club, Westchester Country Club and other classic golf courses in eastern New York.

Meanwhile, the golf course industry was changing rapidly. Vast strides were made with lightweight mowing, automatic irrigation systems and new types of turfgrasses. Also, chemical controls for turf disease were being developed.

After two years at Spook Rock, a homesick Evans returned to Maine as superintendent at Springbrook Golf Club in Leeds. There, he made a number of changes to the course and oversaw its maintenance during the two years it hosted the Maine Open.

"That was probably the toughest job I ever had because of the lack of resources," he says. "In New York, if they needed it, they had it. But when you can afford just two fertilizer applications a year, you want to make sure you use them the right way. The same with other chemicals. If you ran out, you didn't get more. Also, using older equipment and dealing with the labor force – there were no full-time people – was challenging. For example, we used a fire truck to pump water to the entire golf course."

After five years working with Shirley Hamel and Joe and Jeanine Golden, Hamel's son-in-law and daughter who had become Evan's close friends, Evans wrested himself away and became superintendent at the private Waterville Country Club in Maine. It was there he met Alfond, and it was a friendship that led to the second defining moment in Evans' career and life.

After walking the Belgrade Lakes property with Rizzo and Donahue, having completed preliminary engineering work and a business outline, Evan's dream suddenly became a scary reality one night.

"Mr. Alfond told Gail and Pat the only way he'd invest in the project was if I agreed to go in on it; and I had to put my mortgage on it," Evans says. "That's the way he does business. He wants everyone who's involved to have a financial part in it so you won't quit, and you have three or four minutes to make a decision."

Evans and his wife Margie have two sons, Tyler and Rees, who were 9 and 5 years old at the time, so there was much to weigh.

ATTENTION-GETTER

Alfond's mantra was golf, golf, golf and don't get caught up in anything else, just go with what we know, Evans says. That simplicity, along with the beauty of the location and challenge of the golf course, attracts wealthy people.

One day, Wayne Huizenga, a billionaire businessman, helicoptered in with Bobby Wadkins,

a PGA Tour pro, and Tom Fazio, a golf course architect only to return for an encore a couple days later. Another time, Hootie Johnson, the president of Augusta National Golf Club, helicoptered in with friends. One summer, Paul Newman was a frequent visitor while filming a movie nearby. Many others, well-heeled enough to have their own helicopters but unfamiliar to Evans, have landed on the practice green atop the hill.

"They all changed their shoes on the bench next to the putting green," Evans says. "We treat everyone the same."

Since joining the Belgrade Lakes project, Evans has been involved in operating a facility that has attracted attention from the beginning. The course opened shortly before The Country Club at Brookline outside Boston hosted the Ryder Cup. Since Clark, a former BBC color commentator and British amateur champion, had designed the course, media and professionals from Britain, Europe and America traveled to Belgrade to play it.

Though the center of attention at times, Evans defers credit to those around him, some of whom have worked with him for 20 years, including business manager Nate Fulling, superintendent Phil Landry and mechanic Doug Gordon. Fulling has worked for Evans since he was 14, and Landry and Gordon were on Evans' crew at Waterville.

THE MENTOR

For Evans, he is to his employees as Chet Cutting was to him.

"He is my mentor," says Fulling, 32, who has worked for Evans since he was a high school freshman. "One of Kyle's major strong points is dealing with people and employees in particular. To use a sports analogy, compare him to some of the better football coaches. Some guys you want to play for, and some you don't. The atmosphere that Kyle can instill makes you want to work hard and do your best for him."

"Kyle always treats us with respect," says Landry, a business school graduate who has worked for Evans since 1990. "He always listens. We feel a pride in the golf course. We all treat it like it's our own."

Landry says that, like Evans, he instills pride in his crew by being flexible and listening to them.

"We have a lot of retired guys who have a life outside here, and we try to make it a great place to come to work," Landry says.

The most important thing Landry has learned from Evans is paying attention to details.

"It's the little things that count, whether listening to an employee or picking up a piece of trash on the golf course," Landry says. "People see the little things."

Keeping employees long term is important to Evans, who says the bottom line is hiring the right people, seeing their best traits, having confidence in them and giving them the tools to succeed.

"If you can't get them exactly what they need, if they know you're trying to help, it makes a big difference," he says. "Employees are involved and have a part in the decision-making. We're a team, and that's how everybody looks at it. Consistency with our employees is a great help to our business. Everyone has a vested interest."

DIFFERENT OPERATION

Evans and his staff treat every golfer, rich and famous or not, the same, which means treating them specially. People-carriers meet golfers at their cars in the parking lot down the side of the hill, as well as at the ninth and 18th greens, and carry them up the hill to the golf shop and first and 10th tees. Guests are treated like royalty by all the staff, from the pro shop to the starter to the grounds crew. And 15-minute tee times mean nobody is rushed.

"We only have one chance with golfers," Evans says. "Every day is a member-guest day for us. We have a unique approach to golf compared to most private clubs. We make sure we don't bother golfers – every day, not just on tournament days. We get out of people's way and make sure they have a great time. We don't have the luxury of just gearing up for the weekends. Every day has to be the best for us because we never know who's coming. Whether you're answering phones in the pro shop or raking bunkers, the attitude is the same among our employees."

Even though many operators reduces their rates in the fall, Evans doesn't.

"That's the best time to play up here," he says. "It's cool. The colors are gorgeous. We don't reduce rates in the fall. The days are shorter, and there are fewer tee times. I'd like to charge more."

In a world of cookie-cutter clubhouses, parking lots and practice ranges, simplicity and natural beauty set Belgrade Lakes apart.

"You can't mimic what we have here," Evans says. "People are blown away by the simplicity of it." **GCI**

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The crew, from left: superintendent Phil Landry, managing partner Kyle Evans, head mechanic Doug Gordon and business manager Nate Fulling. Photo: Belgrade Lakes Golf Club

BY JOHN WALSH

PREPARING FOR THE FUTURE

TURFGRASS STUDENTS AND GRADUATES RECEIVE ADVICE FROM SUPERINTENDENTS DURING A CAREER-MINDED PROGRAM

Mark Swygert, golf course superintendent at Sage Valley Golf Club in Graniteville, S.C., discusses the finer points of his cultural practices with attendees of Jacobsen's Future Turf Managers Seminar, Milt Engelke, Ph.D., right, and Jacobsen employees. Photo: John Walsh

The industry values the people of its future like a child values a stuffed animal or blanket. Once again, that was evident at Jacobsen's annual Future Turf Managers Seminar, which returned in May from a brief hiatus. The program, which had its 31st session this year, started in 1971 and has had more than 600 students participate throughout the years. This year was the first time it was held at the Jacobsen University training center at the company's new headquarters in Charlotte, N.C.

The program provides participants with an opportunity to learn and interact with turf professionals in an educational environment under the guidance of industry leaders.

Fourteen turfgrass students and recent graduates from throughout the country attended this year's event, which included plant tours, equipment testing, golf course visits and guest speakers.

Mark Wilson, CGCS, at Valhalla Golf Club in Louisville, Ky., was one of the speakers. Wilson gave attendees advice about entering the superintendent profession and golf course maintenance industry. Wilson, who has been in the business for 36 years, a superintendent for 26 years and at Valhalla for 18 years, has survived the ups and downs of the business, including dealing with millionaires and workers who could barely read and write.

"It's not about the money," he says. "It's the value of what you do. Love your job, be humble no matter what, and have a good work ethic. At the top of the profession it's still very prosperous."

Wilson says he has always been around good people. He employs 25 to 35, many of whom who have turfgrass

Jacobsen's new training center is located at the company's new headquarters in Charlotte, N.C. Photo: John Walsh

degrees, and hires five interns a year. He has three assistants (who make $35,000 to $40,000 a year) – one in charge of the front nine, one in charge of the back nine and one in charge of the grounds. He has one full-time worker for every three holes.

"The past 10 years, I've always promoted from within," he says, adding that assistants can expect to put in 60 hours a week.

Currently, Wilson and his staff are renovating the course in preparation for the 2008 Ryder Cup, which he says will generate $125 million of economic impact the week it's in Louisville. For tournament preparation, there will be 70 volunteers and 30 staff workers to maintain the course. The $3-million renovation includes:

- Renovating 14 holes;
- Regrassing all greens;
- Rebuilding five greens;
- Building a $400,000 waterscape;
- Rebuilding three new tees;
- Renovating all bunkers; and
- Lengthening the course to 7,515 yards.

The course, which opened in 1986, featured Penncross bentgrass on the greens. Now they're being changed to an A-1/A-4 bentgrass mix. Renovating the greens includes stripping the sod 1 inch, aerifying 3 inches deep, deep tining, making slope changes, applying methyl bromide then seeding. After the greens are grown in, they're mowed as soon as possible. During the grow-in, Wilson applies fertilizer every week.

"It takes two weeks from the time you seed to the first mow, and you have 95-percent coverage," he says, adding that A-1 grows in more quickly than A-4.

Valhalla, which is owned by the PGA of America, has 250 members and a liberal guest policy, Wilson says. It generates between 18,000 and 20,000 rounds a year, 60 percent of which are with caddies.

Before coming to Valhalla, Wilson worked at public and private courses in Ohio, Florida and Kentucky.

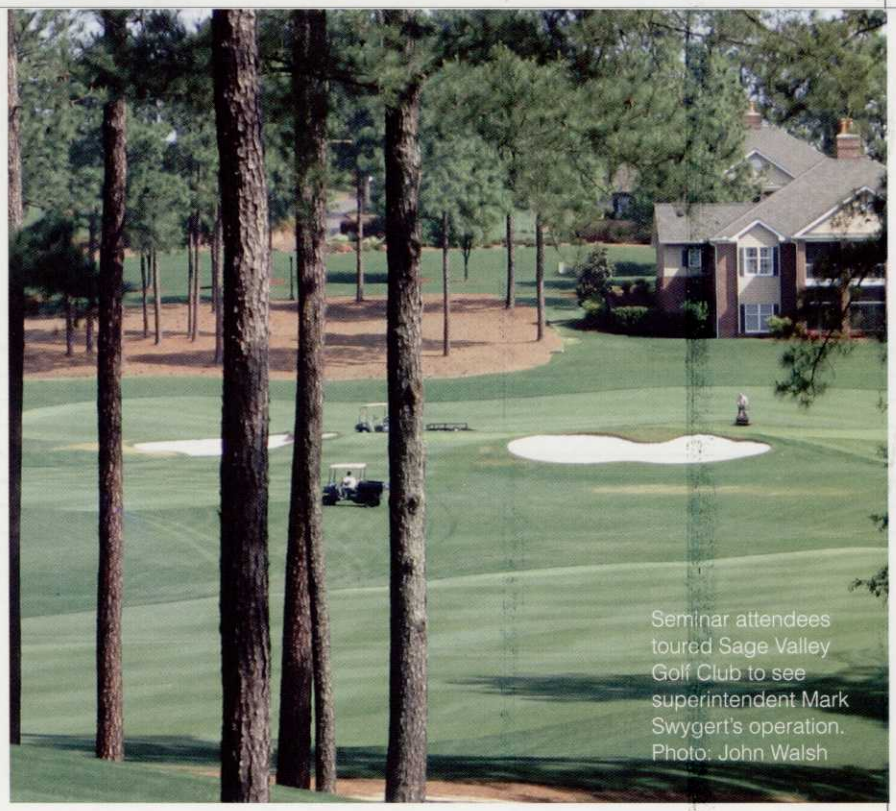
"At a high-end course, you're basically a people manager," he says. "You make decisions and motivate people. The team concept is important to wipe out any big task. You find solutions to problems. The trend is how quick can you fix things."

Wilson believes one out of every five turfgrass graduates eventually will become a golf course superintendent, pointing out some of the harsh realities of the industry, including that of 250 golf courses in Kentucky, 50 have budgets of a half million or more, and seven out of 10 golf courses are struggling.

Another speaker, Fred Gehrisch, CGCS, at

Highlands Falls Country Club in Highlands, N.C., emphasized the need to be a member of local, state and national superintendent associations to reach the top of the profession. Associations have relationships with professors and help get students jobs. Associations also provide benefits such as:

- Research
- Networking
- Education
- Scholarships
- Industry promotion
- Lobbying
- Best practices
- Political power
- Public relations
- Retirement programs
- Insurance
- Discussions forms
- Seminars
- Trade shows
- Marketing tools
- Resume service
- Career development
- Negotiating.



Seminar attendees toured Sage Valley Golf Club to see superintendent Mark Swygert's operation. Photo: John Walsh

Gehrisch advises those entering the profession to work through superintendent associations to volunteer at major tournaments.

Gehrisch, who is working to finish his MBA, also emphasizes continuing education. He says being certified helps superintendents land jobs in the top 20 percent of the market.

Jeff Kent, golf course superintendent at Quail Hollow Country Club in Charlotte, N.C., told attendees they need to want a job more than the next guy. Preparedness is the key to moving up in the profession, he says.

"You need to make sure you're prepared as much as possible before you say you want to be a superintendent," he says. "You need to swim at the deep end of the pool and swim with the sharks to know if you can do it. It's tough to get into the business and get to the top. Details are important. Set yourself apart and surround yourself with good people."

The panel of Wilson, Kent, Texas Agricultural Experiment Station Research & Extension Center professor Milt Engleke, Ph.D., and Clark Cox, sports turf manager for the University of South Carolina, gave other advice to attendees:

- Know some Spanish.
- Know the game of golf.
- A degree qualifies you, but doing hands-on work is an important part of the learning process.
- Work at a top club and at a smaller club where you do it all.
- Volunteer to work preparing for tournaments. It's the little things that count.
- Grin and bear it. There's no room for whining. You need to be willing to put in the time.
- Be able to explain agronomics in layman's terms and the consequences of your agronomic decisions.
- Sacrifice, work late and work overtime. Be patient because you won't be on a fast track to the top of the profession.
- Las Vegas is a hot market right now for golf. Go there to get in on the ground level of a project.
- Be willing to relocate.

FEEDBACK

Steve Loughran, one of the attendees, will earn a Bachelor of Science degree in urban horticulture and turfgrass management from the University of Rhode Island in December. Currently, Loughran is an assistant-in-training at Fairview County Club in Greenwich, Conn. Loughran, like the rest of the group, was nominated by one of his turfgrass professors to attend the program.

"I thought it would be a great opportunity to network with peers with the hope of becoming a superintendent," he says about attending the seminar. "The Jake staff treated us like professionals, not students. This was geared for us. It was awesome that we had so many guys we could talk to about different concepts and ideas about running premier golf courses. Jeff Kent shocked us all back to who we really are and the difference of the industry compared to 25 years ago. This event is a resume builder."

Jason Frank, a 2005 University of Florida graduate with a degree in turfgrass science, is in graduate school earning a master's degree in turfgrass science. Frank says he's always looking to meet new people and learn new things.

"Everyone has four-year degrees," he says. "It's things like this that set you apart and further yourself. All the prominent members in the industry that spoke on a personal level stood out. Jake brought these tops guys in to advise us and help us get to where they're at. Attending this event might open connections in the future. Maybe a job opens up, and somebody I saw here could open a door, or maybe a job opens up with Jake. As a result of all the networking with other students here, maybe we each know of a job opportunity." **GCI**

BY DOUG SAUNDERS

GIVING BACK

COMPANIES AND INDIVIDUALS RAISE AND DONATE MONEY FOR CHARITIES UNRELATED TO GOLF

The golf industry is an integral part of charity. In fact, according to the National Golf Foundation, U.S. courses host more than 140,000 fund-raisers annually that generate $3.2 billion per year for good causes. Course managers understand the importance of these events to their organizers. Managers also balance requests for the use of their facilities with the bottom line in a way that allows them to be good benefactors.

The PGA Tour has developed a strong connection between its events and charities. Throughout the past 15 years, it has raised more than $1 billion for charity. This type of giving has filtered through the entire industry in many forms.

Most companies are involved in philanthropic endeavors, such as contributing to the Red Cross, United Way or Salvation Army; but many find more personal reasons to connect with smaller charities to improve the human condition.

Throughout the past 15 years, the PGA Tour raised more than $1 billion for charity. This type of giving has filtered through the industry in many forms. Photo: Dreamstime.com

HELPING SICK CHILDREN

The spirit of giving has lead to a stronger commitment by those who are touched deeply by the causes they embrace. Floratine Co., which went through a management change about eight months ago when younger members of the company took over, wanted to be more involved in its hometown of Memphis, Tenn.

"Our management team is relatively young and we all have small children, so it seemed obvious to us to become involved with St. Jude Children's Hospital, which is located here in Memphis," says Brian Goodwin, the 42-year-old president and c.e.o. of Floratine.

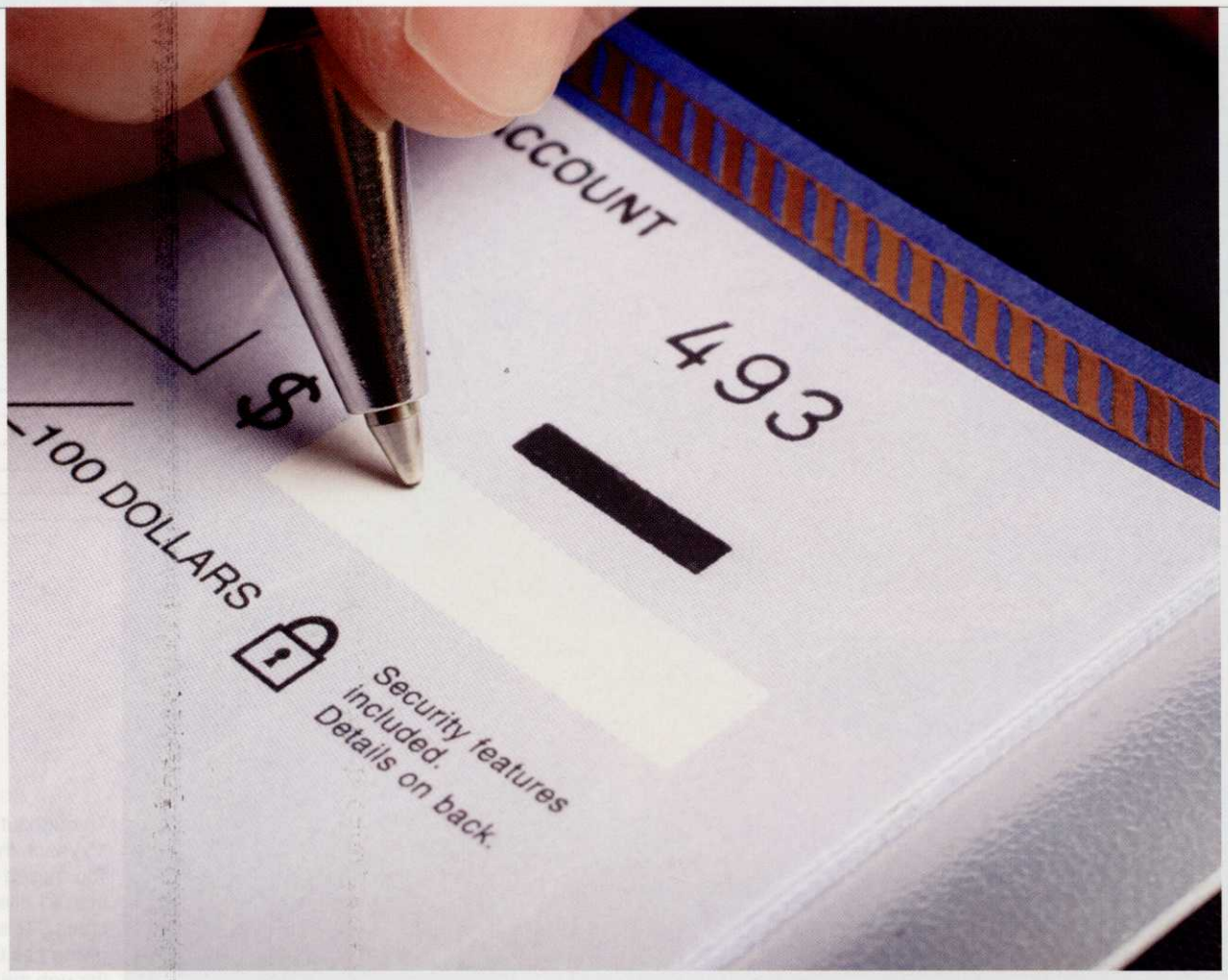
But as Goodwin learned more about the 50-year-old hospital and research center that was founded by entertainer Danny Thomas, his commitment to helping its work grew stronger. The research work on catastrophic childhood diseases at St. Jude and the knowledge and protocols it has developed are available to children worldwide.

"Its research is an incubator that has helped to treat children from all 50 states and 70 countries," Goodwin says. "It has its own pharmacology center to create their compounds quickly. After spending one day at the facility, it helped transform our commitment."

Goodwin set the goal of raising the funds necessary for one day's operation of St. Jude – $1.3 million. Floratine also is planning to create a nationwide series of tournaments hosted by U.S. and international GCSAA members as part of the effort.

"Our concept is to hold a series of 50 tournaments throughout the country in which teams will be competing for and have a chance to play in an international championship to be held in Memphis where the winners of events will come together," Goodwin says. "Our vision is to create a branding effort between superintendents and St. Jude's. As superintendents and club managers learn more about the center, they'll want to participate more.

"When you become involved in a cause, you truly learn the meaning of the old saying 'the more you give



John Deere, The Toro Co., and Floratine Co. are examples of golf industry companies who donate to nongolf-related charities. Photo: istock.com

the more you receive,'" he adds. "It's a lesson that's good to embrace."

MEANINGFUL CONTRIBUTIONS

Companies' charitable activities usually are based on a distinctive corporate philosophy that defines how funds are spent. An example is the philanthropic work of Toro, which has been building a legacy of giving since the creation of the company in 1914. The Toro Giving Program handles the dispersing of a fund that represents 2 percent of pretax profits. The program focuses on programs that fit the company's philosophy, which is geared toward beautifying the outdoors.

Toro donates funds to projects within communities where the company has a manufacturing facility or corporate office. Its donations come in various forms that include equipment donations to parks and open-space projects, volunteer donations and educational support.

"The various donations we make are determined through quarterly reviews where a grant review committee determines support for organizations that fit within the giving strategy," says Judson Tharin, community co-coordinator for the Toro Foundation.

Toro's contributions include donations to turf research and various education programs as well as large donations to the United Way. The company also gives to smaller organizations, such as the Minnesota Zoo and Minnesota Keystone Program, to make meaningful contributions to local communities. For example, Toro helps bring cultural events such as the Minnesota Orchestra to various towns where the company has manufacturing facilities.

> **"Our vision is to create a branding effort between superintendents and St. Jude's."**
> - BRIAN GOODWIN

The Giving Program also supports employee volunteerism by making a dollar-for-dollar match to employee groups who do volunteer work for organizations like local sports teams, the Boy Scouts of America and the Girl Scouts.

"The Giving Program reinforces our cultural values of respect, integrity and trust," says program director Stacy Bogart. "We're committed to enhancing the health and well-being if our communities by active outreach an involvement."

HELP ABROAD

Deere and Co. has deep roots when it comes to making a difference. Company founders began a legacy of giving since the company was founded almost 200 years ago. The John Deere

Foundation was founded in 1948 to administer its charitable resources better to more worthy causes. Today, that commitment supports many varied organizations, including the FFA (Future Farmers of America), the Global Resources Program and Habitat for Humanity.

The John Deere Foundation's 2007 contributions, totaling $12 million, were given to an array of programs in the U.S. and abroad. The foundation also consists of the John Deere Foundation of Canada, the European Goodwill Fund and the Funacao (Foundation) of Brazil.

A recent contribution has been helping address poverty and hunger in Africa by developing a relationship with KickStart, a nonprofit organization that helps farmers in Kenya, Tanzania and Mali escape poverty by developing and selling low-cost farm equipment such as irrigation pumps and seed presses. The impacts of these simple tools, such as a treadle pump, can be significant. One pump can increase a farmer's annual income from $100 to more than $1,000 and help create a net income for an impoverished village. During the past few years, these tools have helped 47,000 families rise out of poverty and become commercial farmers.

The John Deere Foundation's commitment of $3 million during the next three years will allow KickStart to expand its programs into three more African nations with a goal of selling 125,000 pumps to impoverished farmers.

FINANCE A DANCE TRIP

Individuals, too, can make a difference in their own communities. Mike Brown, CGCS, at Starmount Forest Country Club in Greensboro, N.C., is a father of two daughters who became involved in the On Stage School of Dance, which teaches girls age 8 to 18 all forms of dance. The school develops choreographed dance teams that perform at competitions throughout the Southeastern United States.

"As my daughters reached the level to be able to travel to competitions, I found out some dancers in the organization couldn't afford travel costs for these trips. I wanted to find a way to help send these deserving dancers to competitions, so I created a fund-raiser at my golf course," Brown says.

Five years ago, Brown put together his first golf tournament with help from the various vendors and personal contacts at Starmount. He also received support from the Carolinas Golf Course Superintendents Association, which helped spread the word about his fund-raiser and helped bring in golf teams for the tournament.

"When I started on the first tournament, I felt it would be a 'one-and-done' event," Brown says. "All of the participants enjoyed the day on the golf course, but afterwards, one of the dance teams form the school put on a presentation that helped showcase their talents and helped people understand what the fund-raiser was about. I was surprised to have so many participants tell me they wanted to be a part of this event the following year."

Brown's event, held in April each year, draws 32 teams by invitation only and receives support from 22 industry vendors who sponsor teams and tees on the course and help to underwrite the cost.

Brown also has brought out local media, including newspapers and the local television station, to showcase the event as well as the On Stage School of Dance to increase its exposure and the sponsors' exposure. The event is culminated by a black-tie awards dinner that draws sponsors, club members and dancers' families.

Brown found doing this type of fund-raiser on a local level was easier than he expected. If the event is created to help a good cause, it can take on a life of its own and be easier to do each year. **GCI**

Doug Saunders is a freelance writer based in Truckee, Calif. He can be reached at dougs@sierra.net.

(Editor's note: We know we're just scratching the surface of nongolf charitable activities by industry companies and superintendents. If you have a similar story, let us know by e-mailing jwalsh@gie.net.)

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BY HAL PHILLIPS

securing the future

A CONSTRUCTION TEAM RESTORES A STREAM AND REBUILDS AN ENTIRE COURSE IN PENNSYLVANIA

The restoration of Shober's Run, which presents lateral or perpendicular hazards on 12 holes, was the key to the course reconstruction project. Photo: The Bedford Springs Resort

It's called "legacy sediment," and if your golf course is located somewhere on the Eastern Seaboard – or anywhere early Americans dammed streams for milling and logging purposes – it might be the reason a nearby creek is always flooding your golf course.

That was the case at The Bedford Springs Resort in Bedford Township, Pa., where 18 historic, often-tweaked golf holes reopened for play in July, following a comprehensive course renovation authored by architect Ron Forse and implemented by contractor Frontier Golf. The original routing at Bedford, laid out by Spencer Oldham in 1895, was revamped by A.W. Tillinghast about 20 years later. Donald Ross would completely retool the layout again, finishing in 1923.

Forse and Frontier were presented with the tasks of preserving and integrating the disparate aspects of these three vintage design styles by rebuilding every green, tee and fairway and undergirding it all with up-to-date drainage, irrigation and soil profiles.

But it was the restoration of the creek named Shober's Run that obliged the renovation team to address the ancient issues and secure the resort's maintenance future.

"We broke ground at Bedford in early June 2006 and essentially built and seeded an entirely new golf course by the middle of October," says Nick Scigliano, president of Jones Mills, Pa.-based Frontier Golf. "But in many ways, the creek restoration, which we handled at the same time, was the key to the whole project. Certainly, the lasting quality of our work, the designer's work and the course superintendent's work, depended on it."

It's easy to see why. Shober's Run flows right through the Bedford property and presents lateral or perpendicular hazards on 12 holes. For as long as anyone could remember, it flooded every time there was a significant rain. Not surprisingly, its banks were eroded and stood

For long stretches of the project, Frontier Golf employed more than 110 men on its crew. It ran two shifts for about six weeks near the end. And because of the crew size, it brought out lights and used some of the equipment double time, at night. Photos: The Bedford Springs Resort

further deterioration. Clearly, any responsible renovation of Bedford Springs would have to include a Shober's Run solution.

Enter the self-described "creek geeks" from LandStudies out of Lititz, Pa. After digging several test pits, they determined Shober's Run had been dammed in the 18th century, perhaps earlier, to allow for logging and the creation of various mill operations downstream. The bigger the dam, the bigger the pond that forms behind it, and the more legacy sediment builds up on top of the original creek channel.

"Basically, what we had was a perched creek bed," says Doug Show, Frontier's project superintendent at Bedford, borrowing language usually reserved for water tables and thatch layers.

When the dams are drained, the creek channel is perched and remains so. Thereafter, the surrounding area's waters aren't gathered nor drained away with the same efficiency of the original streambed. Sooner or later, flooding ensues.

"Most of the courses we work with either have an old dam on the course or one within a half mile, so it's pretty easy to see the problem," says Mark Gutshall, president of LandStudies. "We're working on several course projects right now where the dam is right on the property. That was the case at Bedford. Most of the streams in

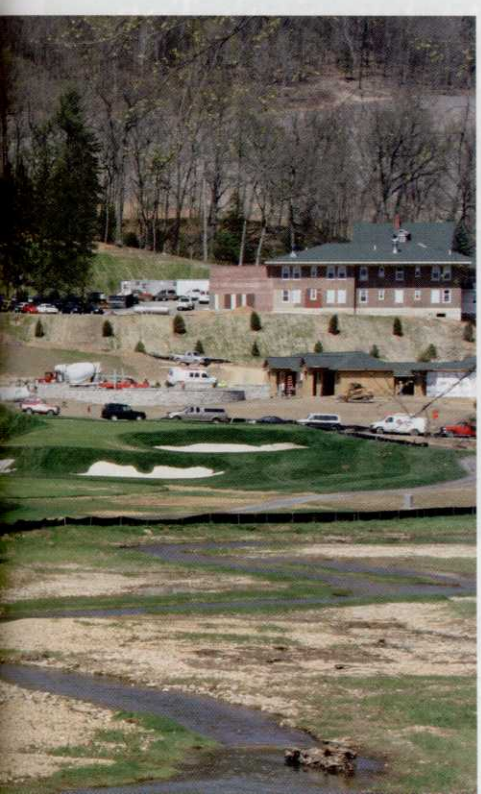
AT A GLANCE
Bedford Springs Resort

Location: Bedford Township, Pa.
Type of project: Reconstruction
Architect: Ron Forse
Builder: Frontier Golf
Superintendent: Dave Swartzel
Owner: Bedford Resort Partners, Ltd. (managed by Benchmark Hospitality International)
Project started: June 2006
Project completed: October 2006
Cost: Total resort, $108 million; golf course, $6 million-plus considering grow-in, creek restoration, and new maintenance facility
Notable: A creek restoration that affected 12 holes

the state of Pennsylvania have been altered in this way. In Lancaster County, the average dam pipe was 8.5 feet high, and the average ponded area behind it was 1.2 square miles."

The dam that LandStudies found on site at Bedford was only 3 feet high, but there's an old mill just downstream (less than half a mile off the Bedford property) where Gutshall estimates the dam was 5-feet high.

"That means water backed up a huge distance, onto the course, and the channel was buried under the sediment that piled up," he says. "That's legacy sediment, and it's all dependent on the height of the dam. The bigger the dam, the more sediment."



The dams at Bedford were abandoned, and the ponds drained years before the original golf course was ever built, meaning the stream-flooding problems predate the golf course.

"That's pretty typical," Gutshall says. "The design of the golf course can make the matter worse, but most of the time it doesn't contribute much. The real damage was done years before."

DOING IT RIGHT

Identifying a perched creek bed, then pegging the cause of said perching (about 200 years after the fact), is one thing. Rectifying that situation is quite another.

Gutshall says many of LandStudies' golf clients (the company is in the midst of eight course-related stream restorations) don't have the luxury or can't muster the collective will to conduct a proper remediation. He pointed to a recent project at Lehigh Country Club in Allentown, Pa., which was prompted by the stream-bank erosion around the base of a bridge. The entire stream needed rechanneling, but the club wasn't prepared to radically alter any fairways, greens or tees.

"There's a difference between stream stabilization and stream restoration," Gutshall says. "Lehigh was a stabilization. At Bedford, we had the luxury of working with a client, course architect and contractor who understood the vision, and because the course renovation plan was already so sweeping we were able to incorporate a full stream restoration into the course-renovation plan."

LandStudies and Frontier ultimately resolved to unearth the original creek bed that lay under about four feet of legacy sediment, while creating a flood-way about 7,000-feet long and 80-feet wide (in places) to mitigate future flood threats. Show estimates his crews moved only 80,000 to 100,000 cubic yards of dirt during the entire golf course renovation while it moved 70,000 cubic yards of dirt separately in the careful rechanneling of Shober's Run.

"LandStudies had one of its partners on site at all times to work with Frontier's excavator operator," says Jim Nagle, the Forse design associate who spearheaded the Bedford project. "At first they did about 100 feet of the rechanneling together, just to get the method down. That's all it took. Frontier just took it and ran with it after that."

The work on Shober's Run originally was to be a design-build project, but LandStudies is moving away from the building side of the business, Nagle says.

"Frontier was approached about doing this work and Nick [Scigliano] said, 'Yeah, we can do that,'" Nagle says. "And they did."

Frontier was already on site and doing all the other construction so it made sense to keep its workers out there, Gutshall says.

"They really stepped up to the plate and did some things very different from what they normally do – and did them very well," he says.

Frontier broke ground in June 2006 and essentially built and seeded an entirely new golf course by the middle of October that same year. Photo: The Bedford Springs Resort

A CONSTRUCTION FEAT

For long stretches of the Bedford project, Frontier Golf employed more than 110 men on its crew. During this time, the company was simultaneously rebuilding The River Course on Kiawah Island in South Carolina in collaboration with Tom Fazio Golf Course Designers, another five-month project that required more than 80 workers mobilized out of Frontier's Southeast Division in Camden, S.C.

"It was a busy summer and a lot of work, but we had the resources to handle concurrent jobs of that magnitude, and our client supported us in every way possible," Show says. "We ran two shifts at Bedford for about six weeks near the end. Because of the crew size, we brought out the lights and used some of the equipment double time, at night. We handled things like asphalt paving, cart-path paving and seeding that way."

Frontier and Forse also engineered a deft hole-switch: The former 16th and 17th holes were removed, returning the course to the 1923 routing, which included a par-3 17th and a par-4 finishing hole, which had been the driving range. Today, what had been the 16th is the new driving range and practice facility. What had been the old 17th hole is now a stream/wetland.

Golf course superintendent Dave Swartzel, a veteran of three new-course development projects, still marvels at the overall construction feat.

"The only thing we didn't have on this project was the initial clearing and grubbing process," says Swartzel, who came to Bedford Springs after building, then maintaining, the new course at Philadelphia Cricket Club. "In every other way, it was basically new construction.

"Frontier did an outstanding job on an extremely tight time line," he adds. "Considering the scope of the work, they went above and beyond the call of duty to get this done on time. When you're working that fast, sometimes corners can be cut. There was very little of that, but when we did see something, there was no hesitation to go back and make it right. The quality of Frontier's work was very good."

The work had to be good because stream restoration is like any other aspect of golf course construction: If done well, the superintendent has one less thing to worry about down the road. LandStudies has a special name for this dynamic.

"It's called an E3: an economically enhanced ecosystem because there's a big maintenance cost to streams that aren't stable," Gutshall says. "When a stream is responding to a buried floodplain, it moves laterally. And that's not good when you're trying to maintain fairways and greens and bridges."

Gutshall and Scigliano point out another future, a somewhat hidden benefit of this sort of restoration.

"When you've accounted for flood episodes by removing all that soil – we're talking a strip 4-feet deep, 7,000-feet long and 80-feet wide – we've created what's basically an enormous storage volume on course," Scigliano says. "It might as well be pond, one that has benefits to the surrounding resort in terms of storm-water retention."

These days, Gutshall says he's talking to many superintendents in urban settings about these types of projects becoming regional stormwater management tools.

"The state of Pennsylvania is starting to recognize this and recommend it as a best management practice – one where the golf course industry can be the good guy." **GCI**

Hal Phillips is a freelance writer based in New Gloucester, Maine. He can be reached at onintwo@maine.rr.com.

BY ERIK H. ERVIN, PH.D.

Surviving summer

A seaplant extract-based foliar nutrition program might improve stress tolerance

Given prolonged stress, root tip cytokinin production will decline sharply, resulting in little or no cytokinin xylem transfer to leaves. Adequate leaf tissue cytokinin levels signal the plant to keep producing antioxidants and resist senescence (or programmed cell death). Once leaf tissue cytokinin levels fall, antioxidant production isn't maintained, and programmed cell death (and accompanying translocation of energy reserves to crown storage tissues) is allowed.

How can we intervene and forestall this decline? First, we can fine-tune our irrigation, mowing, cultivation and fertilization practices so as to produce as robust a plant as possible (within the demands of your budget and clientele) before the summer stress season. A balanced, but not overzealous, nutrition program is a must, and True Foliar nutrition appears to offer the right balance.

Second, application of a university-tested biostimulant based on cytokinin-containing seaplant extracts before the onset of summer stress might help forestall decline.

FOLIAR FERTILIZATION

Bob Carrow, Ph.D., and others define foliar fertilization as the application of a nutrient solution in a low volume of water (less than one gallon per 1,000 square feet or 40 gallons per acre). Typically 95 to 100 percent of the water and nutrients remain on the foliage and are able to move into the leaf apoplasm through cuticle and stomatal pores.

Application of nutrient solutions at higher water volumes (three to 25 gallons per 1,000 square feet) as done by liquid lawn care companies and with fertigation isn't considered to be true foliar fertilization because these higher application volumes function to wash most nutrients off the leaf surface, resulting in nutrient uptake by shallow roots.

When open, stomatal pores are greater than 10 micrometers, while cuticular pores are 1,000 times smaller at 1 nanometer or less. Urea (COH_4N_2) in solution, for example, has a radius of 0.44 nanometer and is uncharged making foliar uptake quite fast. Thus, smaller molecules such as ammonium (NH_4^+) and nitrate (NO_3^-) will be absorbed foliarly but at different rates because of their charge differences.

For example, D.C. Bowman and J.L. Paul (1992) reported that foliar application of three nitrogen sources to perennial ryegrass resulted in about 40 percent urea and ammonium uptake after 24 hours, while only 25 percent nitrate was absorbed. Synthetic chelates, such as FeEDTA, are much larger molecules and will be excluded from cuticular pore uptake but not stomatal uptake. Organic chelates, like ferrous citrate, most likely will allow cuticular pore uptake because they're much smaller molecules.

The cuticle consists mainly of cutin, a mixture of long-chain fatty acids. The outer surface of the cuticle is hydrophobic, while the inner surface is more hydrophilic. Cuticular pores are lined with fixed negative charges (mainly from polygalacturonic acids)

Seaplant extract contains cytokinin, which contributes to heat- and drought-stress resistance. Photo: Nick Seaver

increasing in density from the outside of the cuticle to the inside. Accordingly, cation permeability along this gradient is enhanced whereas anions are repulsed from this region, but not completely excluded as seen with the Bowman and Paul data mentioned above.

What about cuticular pore uptake of phosphorus, potassium, and micronutrient sources? Ingredients such as potassium citrate and potassium acetate will most likely disassociate in water, leaving potassium to move easily into the leaf. The same is true for manganese citrate, zinc sulfate, copper sulfate and ammonium polyphosphate. Thus, the textbook evidence indicates mineral elements can be absorbed by foliage successfully.

So what's the fate of mineral elements that aren't absorbed by the foliage? In the case of foliarly applied urea, for example, Wesely and others (1987) reported about 30 percent was volatilized as ammonia during the four days following application. In a two-year field study, Miltner and others (1996) estimated about 20 percent of nitrogen from applied urea was lost to volatilization, while about 38 percent was found in clippings, and 40 percent was immobilized in soil and thatch layers.

Reducing potential volatilization and immobilization are areas where nitrogen-use efficiency could be increased due to proper formulation and foliar fertilizer use.

Proper formulation of foliar sources to decrease potential nitrogen volatilization and nitrogen immobilization would involve applying nitrogen sources that are most readily foliarly absorbed – urea and ammonium – and are recommended to be applied at a concentration (0.05 to 0.20 of a pound of nitrogen per 1,000 square feet) and volume (one gallon per 1,000 square feet) low enough so as not to overload the leaf's capacity to absorb them during a 24-hour period.

Less ammonia volatilization will occur because small rates of urea and ammonium are absorbed readily through pores and not left on the leaf surface for urease to convert urea to ammonia. Furthermore, less soil/thatch immobilization of nitrogen will occur because less nitrogen will be available to be washed from the leaf surface by rainfall or irrigation. Of course some irrigation or rainfall washing of nutrients from the leaf surface will happen, but the small concentrations reaching the surface soil solution most likely will be effectively root absorbed, again leaving little nitrogen to be immobilized and stored in soil organic matter or microorganisms or to be leached.

Adequate cytokinin levels in leaf tissue signal plants to keep producing antioxidants and resist programmed cell death. Photo: Virgina Polytechnic Institute and State University

However, a potential drawback to such efficient use of foliar nitrogen might be no stored organic pool of nitrogen to be released by microbial mineralization following cessation of the summer foliar fertility program (as Richardson's research indicated). Supplementing foliar fertilization with a sound spring and fall granular program will easily overcome this limitation.

Is there any experimental data that indirectly supports the above reasoning concerning greater nutrient use efficiency? Putting it another way, can fewer overall nutrients be applied, compared to conventional approaches, and still provide equivalent or better summer bentgrass performance? Two recent studies are helpful in answering these question.

Frank Rossi, Ph.D., (Cornell, 2003 bioproducts comparison trial) conducted a trial from June through November comparing the Emerald Isle seaplant extract greens nutrition program to a standard water-soluble synthetic spoon-feeding program. The standard program plots received 0.1 pound of nitrogen per 1,000 square feet every seven days plus granular fertility, while the seaplant extract based foliar program plots received 0.1 pound of nitrogen every 14 days: a 77 percent nitrogen reduction during the season on this Penn G2 green mowed at 0.100 inch. In spite of the significant difference in nutrient inputs, equivalent quality was maintained with the foliar program.

Mike Richardson, Ph.D., (Arkansas, reduced

Sea plant extract is linked to stress tolerance because it contains cytokinin, which increases a plant's pool of antioxidants, boosting its immune system. Photo: Nick Seaver

summer nutrient input study on a four-year-old sand-based Crenshaw bentgrass green) compared a four-pound nitrogen program (standard slow-release synthetic and natural organic sources) with a 1.5-pound nitrogen seaplant extract based Emerald Isle foliar nutrition program. Quality was high for both programs with no significant difference between the two. However, clipping yields and thatch accumulation were reduced with the Emerald Isle programs, which is typically correlated with better putting conditions.

SEAPLANT EXTRACT DATA

Before 2004, we published numerous studies documenting increased antioxidant content and, subsequently, greater drought or heat tolerance due to prestress foliar applications of seaplant extract (see references online). However, we had yet to tie antioxidant increases to increased leaf tissue cytokinin levels. In 2004, we published the results of a creeping bentgrass (L-93, Penncross and Penn G-2) drought experiment that provided evidence supporting our supposition that cytokinins in the seaplant extract will result in greater leaf tissue cytokinins, antioxidants and quality under drought.

The seaplant extract used in the study on page 87 contained 70 micrograms per gram cytokinins (zeatin riboside plus isopenteyl adenosine). Leaf tissue levels are 10^{-3} lower than that present in the extract spray solution. Hormones act in minute concentrations (a nanogram equals 10^{-9}), and it takes only a slight increase to have an effect of metabolic significance.

We have quantified the level of the predominant cytokinin, zeatin riboside, present in the product used (CPR) on two occasions. Those levels were: 90.2 and 127.1 micrograms per gram. We measured a zeatin riboside level of 80.0 nanograms per gram in greens-height bentgrass leaf tissue following six summer 2003 applications. No heat or drought stress occurred during this field trial, so we didn't get to observe whether this elevated cytokinin level would have provided greater stress resistance. However, it appears the leaf tissue was primed for action.

In a study completed in 2003, we also quantified the difference in levels in leaf tissue cytokinins between a standard soluble fertility program and the Emerald Isle seaplant extract based foliar nutrition program. With comparable levels of nitrogen inputs (.09 pound of nitrogen per 1,000 square feet every 14 days), the Emerald Isle program produced significantly greater cytokinin levels (zeatin riboside) in late July and August.

CYTOKININS AND STRESS TOLERANCE

Hormones are defined as plant-synthesized compounds that, in very low concentrations, cause a physiological response or regulate growth and development. In other words, hormones are one of the necessary compounds that must be present in a specific tissue, at the right concentration, to allow a certain metabolic (or growth) event to occur. Additionally, each hormone doesn't operate in a vacuum, as it's the concentration ratio of one hormone class relative to another that determines which developmental or metabolic event occurs.

For example, auxin and cytokinins induce cells to divide so new roots and shoots can be initiated, but their ratio determines priority. Thus, it's well documented that a higher ratio of cytokinins to auxin in meristematic (crown) regions promotes tillering (or shoot development), while root initiation lags behind. However, a higher ratio of auxin to cytokinins in the same tissue will result in greater root initiation at the expense of tiller formation.

The key moment in all this comes when we consider where in the plant each of these hormones are produced primarily: Cytokinins are produced in new, viable root tips, while auxin is produced in new shoots. Thus, if the plant has enough healthy roots, enough cytokinins will translocate from the root tips to the crown and shoot tissue and serve as the signal to say: "We're doing OK down here, so go ahead and use some energy to increase shoot density."

Correspondingly, if enough healthy new shoots are being produced, more auxin will translocate to the crown and serve as the signal to say, "We're doing OK up here, but we need to use some of our energy (photosynthate) to initiate and grow some roots to continue supporting this growth."

Obviously, this is simplified, but it clearly makes the point: Lower cytokinin amounts coming to the crown serve as a direct feedback signal – don't grow new tillers at the expense of existing root viability.

Alternatively, heavy mechanical or pest damage on the surface will result in less auxin moving to the crown, thereby changing the balance to favor cytokinins, which will result

Tips for efficient foliar fertilizer uptake

- **Apply between 7 a.m. and 1 p.m. when stomates are most open.**
- **Apply to turgid or nonwater stressed leaf tissue as the intercellular solution (apoplast) will be more dilute creating a greater diffusion gradient for nutrient absorption and cuticle waxes will be thinner.**
- **Do not water in as this will wash the minerals from the leaf surface.**

New ProteSyn - Make A Strong Stand Against Stress

With summer in full swing, superintendents are feeling (and seeing) the stress that comes with the summer season, including heat stress and the effects of increased foot and cart traffic.

Floratine Products Group recognizes this, and has responded with a new formulation of its popular ProteSyn turfgrass nutrient, now with advanced Amino-Lok technology.

The key amino acids that sequester nitrogen for slow linear release and promote the linkage process toward mature protein synthesis are the major advantage that Amino-Lok technology provides.

This advantage, as part of the new ProteSyn formulation, provides increased plant strength by aiding and enhancing the completion of photosynthetic activity, encouraging healthy cell division, respiration and energy conservation. This means that ProteSyn actually beats respiration stress by putting fuel back into the plants faster than they can burn it.

In addition, the carbon-rich compounds in ProteSyn contribute directly to plant energy reserves, mature protein production, complete amino acid resources, enhanced cell division and the appropriate carbon-to-nitrogen ratio.

Because ProteSyn with Amino-Lok technology works so well in providing plant strength, it is one of the recommended products in two of the Management Action Plans from Floratine.

Management Action Plans (MAPs) provide customized solutions to specific turf problems by detailing Floratine product solutions targeted for turf response. ProteSyn is a key component in the Heat Stress MAP and the Spring Start MAP, both of which can be found at www.floratine.com.

With product solutions like ProteSyn and detailed action plans from Floratine, superintendents can feel a little less stressed this summer. For more information on these or any Floratine nutrient technologies, call Floratine at 901-853-2898, or visit www.floratine.com.

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Amino-Lok TECHNOLOGY

Antioxidants reaction sequence

1. $O_2^- + O_2^- + 2H^+ \xrightarrow{SOD} H_2O_2 + O_2$
2. $H_2O_2 \xrightarrow{catalase} H_2O + \frac{1}{2} O_2$
or
3. H_2O_2 + ascorbate $\xrightarrow{APX}$ $2H_2O$ + dehydroascorbate

in more tiller initiation to replace those tillers being lost.

There are other important points about cytokinin function. Cytokinins have been shown to operate not only as chemical signals to allow or disallow certain developmental events, but to act directly as antioxidant and antisenescence chemicals. The stress resistance message here is that higher leaf tissue levels of cytokinins are overwhelmingly correlated with longer maintenance of functioning (photosynthesizing) green leaves that contain higher levels of antioxidant vitamins (E and C) and antioxidant enzymes (SOD, CAT, APX) when subjected to heat and drought stress. Refereed papers in Crop Science and HortScience authored independently by Bingru Huang and me provide replicated data that confirm the above statements.

OK, what does all of this have to do with summer stress? A brief walk-through of the oxidative stress cycle that occurs in response to summer heat, drought, mechanical and disease stresses should provide some answers. Plants possess antioxidant defense systems that function to protect cells against damage. This system needs to be operating under all conditions, stressful or not.

A natural consequence of radiant (light) energy hitting leaf surfaces is that some of this energy will be absorbed by chlorophyll and excite an electron to move through the photosystems and serve as the fuel for turning light energy into chemical energy. Other excited electrons won't be transferred in this manner and will react with oxygen in the chloroplast to produce reactive oxygen species (or free oxy-radicals) such as superoxide (O_2^-).

A robust pool of antioxidants in the chloroplast are always required to deactivate free radicals such as superoxide and hydrogen peroxide (H_2O_2) or else membranes and other essential organic molecules will begin to be destroyed. The antioxidants required for protection and their reaction sequence are listed above.

Superoxide dismutase (SOD) – as shown in equation one – is required to turn superoxide radicals into hydrogen peroxide and ground-state oxygen (equals good or nonreactive oxygen). However, hydrogen peroxide (bleach), as we know, is quite a dangerous, reactive substance. The plant has two antioxidant enzyme systems to deal with hydrogen peroxide. Catalase – as shown is equation two – will convert some to water and oxygen, while ascorbate (or vitamin C) will react with some and, with the help

Demand for fast and firm drives foliar feeding

BY PAT JONES

Ask any low-handicapper what kind of conditions he wants at his club or regular course, and the response is predictable: fast and firm.

Fast and firm have become buzzwords among avid golfers. They usually can't define what they mean by the term, but they know they want it. It's like art: They don't know much about it, but they know what they like.

As superintendents strive to meet that vague but compelling demand for fast and firm, they've increasingly sought to reduce the amount of nitrogen they use to eliminate puffiness and other side effects of traditional N-based fertility programs. Thus, foliar feeding – which just a decade or so ago was considered by many to be tantamount to snake oil – has emerged as a huge trend in the business.

Foliar feeding is rarely a one-shot deal, although foliar products are often used as tank-mix supplements for plant growth regulators or fungicides. Instead, foliar nutrition products usually are packaged in programs based on needs determined by soil testing and local conditions. Some programs require careful calculation and measurement. Others, like the one described in the above article, have simplified the process to help reduce the possibility of misapplication by packaging product in premeasured doses.

Typical programs are based on a core product – usually a seaplant extract, amino acid or other nutrient source – plus smaller amounts minerals like magnesium, calcium or iron. Again, the recommended combination of products needs to be based on an objective analysis of turf and soil needs determined by lab testing.

Foliars once were considered to be a luxury item reserved for high-end facilities; but, over the years, pricing has declined and superintendents have recognized they can – with the right program – realize savings in terms of fungicide applications and other curative measures that might be required when low-nitrogen turf becomes stressed out.

That said, foliar programs can be a sticker shock for a facility used to relatively cost-effective traditional fertilization programs. A full foliar program can run anywhere from $5,000 to $30,000 a year, depending on which product is used and whether fairway applications are part of the system. Clearly, those costs have to be weighed against the agronomic benefits and potential chemical savings.

Golfers – despite the best efforts of golf organizations and superintendents – will continue to demand fast and firm conditions and wall-to-wall green color.

The right foliar program can be more expensive but can meet those expectations. The best advice: Do your homework, talk to colleagues and reps and make sure you've chosen wisely before you make the jump into foliar feeding.

SEAPLANT EXTRACT INFLUENCE

End-of-trial average creeping bentgrass responses as influenced by seaplant extract (5 grams dry weight per 1,000 square feet) under the presence or absence of drought stress.

Response	Drought stressed (5% soil moisture)		Well watered (35% soil moisture)	
	Untreated	Seaplant extract	Untreated	Seaplant extract
Quality (9=best)	4.4	5.5*	7.9	8.4*
Photosynthetic efficiency	0.23	0.30*	0.66	0.68
Shoot weight (grams)	0.96	1.46*	5.27	5.56
Root weight (grams)	0.59	0.69	0.86	0.91
Vitamin E (micrograms per gram)	10.7	14.3*	2.1	3.7*
Zeatin riboside (nanograms per gram)	18.3	28.9*	19.4	27.1*

* Indicates a significant difference from the untreated at a 95 percent level of probability.
Data compiled from Xunzhong Zhang and Erik Ervin. Crop Science 44:1737-145 (2004).

of ascorbate peroxidase (APX) – as shown in equation three – convert it to water and dehydroascorbate. The dehydroascorbate then, in a short series of reactions, cycles back to ascorbate. The production of these antioxidant enzyme proteins requires plant energy.

Heat and drought stress greatly increase free radical production. Initially, plants respond by increasing production of antioxidants to protect photosynthetic function. However, if the assault is persistent antioxidant pools will become depleted and substantial leaf senescence will occur as the plant stops all leaf growth and new root development and conserves energy reserves in the crown and surviving roots.

As mentioned earlier, cytokinins are produced in the tips of relatively new and viable roots. Given prolonged stress, root tip cytokinin production will decline sharply, resulting in little or no cytokinin xylem transfer to leaves. Adequate leaf tissue cytokinin levels signal the plant to keep producing antioxidants and resist senescence (or programmed cell death). Once leaf tissue cytokinin levels fall, antioxidant production isn't maintained and programmed cell death (and accompanying translocation of energy reserves to crown storage tissues) is allowed.

How can we intervene and forestall this decline? First, we can fine-tune our irrigation, mowing, cultivation and fertilization practices so as to produce as robust a plant as possible (within the demands of your budget and clientele) before the summer stress season. A balanced, but not overzealous, nutrition program is a must, and True Foliar nutrition appears to offer the right balance. Second, application of a university-tested biostimulant that is based upon cytokinin-containing seaplant extracts before the onset of summer stress might help forestall decline.

How? Our research-backed reasoning is that by purposefully boosting leaf tissue cytokinin levels and, in turn, increasing the plant's pool of antioxidants, the plant can fight off (or deactivate) stress-induced free radicals for a longer period of time. The result is a boosted immune system that prolongs photosynthetic efficiency, allowing for a minor amount of sustained energy production and maintenance of leaf and root tissue viability during summer stress. Of course given prolonged stress, even plants with boosted immune systems will succumb and die.

The point isn't that these programs will create a supergrass, but they might provide a little added insurance during the summer, especially during the member-guest tournaments when you're asked to double-cut at 0.095 inch, roll and not irrigate or syringe. **GCI**

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Editor's note: References for this article can be found online at www.golfcourseindustry.com.

BY MICHAEL AGNEW, PH.D., AND MICHAEL FIDANZA, PH.D.

A manageable process

A solutions-based approach to disease control on *Poa*/bentgrass greens in the Northeast

Developing an effective disease control program for golf course turf requires a multifaceted approach. If superintendents break down the process into four steps, the process becomes manageable. This process should be done separately for greens, tees, roughs and fairways. Disease control of a mixed stand of creeping bentgrass and annual bluegrass on established greens is a solutions-based approach that can be applied to any turfgrass species on any part of the golf course. It's also a proactive way to keep a course disease free.

STEP 1: IDENTIFY TURFGRASS SPECIES.

The first step in the development of any disease control program is to identify the turfgrass species and to understand its strengths and weaknesses. The majority of golf course greens in the Northeast are a mix of annual bluegrass and creeping bentgrass.

Annual bluegrass can be found on all parts of a golf course as a winter annual weed (*Poa annua* var *annua*) or a weak perennial type (*Poa annua* var *reptans*). Annual bluegrass is a shallow-rooted plant that survives under adverse growing conditions and will produce copious amounts of seedheads from early April through June. This process channels much of the stored carbohydrates to the production of seedheads at the expense of root production.

It's possible to grow annual bluegrass as a desirable plant species, especially if the bulk of the annual bluegrass population is a perennial biotype. The strength of annual bluegrass is in its ability to adapt to poor growing conditions such as low mowing heights, compacted soils, low soil nitrogen and traffic. So, to maintain annual bluegrass as a desirable plant species, it's important to minimize mechanical and environmental stresses to the plant. While superintendents might not have control over all imposed stress, such as excessive rainfall or extremely high temperatures, they can control management practices to reduce environmental stresses.

Creeping bentgrass (*Agrostis stolonifera*) can be established on greens, tees or fairways. Within this plant species, there are many cultivars that have a wide genetic diversity. The most commonly used cultivar is Penncross. It was developed during a time when mowing heights were higher and emphasis on green speed wasn't as great. Newer high-density cultivars have a greater tolerance for lower mowing heights, thus a better choice for newly established greens. In general, creeping bentgrass is tolerant of cold temperatures but prone to winter desiccation. Creeping bentgrass also has poor shade tolerance, low soil O_2 levels and builds up thatch quickly. The primary quandary growing creeping bentgrass is the relative ease with which annual bluegrass invades the turfgrass stand. This forces superintendents to decide whether to control annual bluegrass or manage it on a golf course.

STEP 2: IDENTIFY KEY MANAGEMENT FACTORS THAT INFLUENCE DISEASE DEVELOPMENT.

The primary management factors that influence disease development on a *Poa*/bentgrass green include mowing, plant nutrition, cultivation, topdressing, seedhead control, irrigation and herbicide applications.

The effects of mowing on disease development can be enormous. To maintain acceptable playing conditions, mowing is a necessary physical stress on the turfgrass plant. If possible, raising mowing heights during periods where weather conditions are conducive to disease development can reduce disease significantly. The mowing height range for annual bluegrass greens is 0.15 to 0.25 inch. Mowing heights for creeping bentgrass range from 0.08 to 0.20 inch, with cutting heights of 0.125 or less for newer, high-density cultivars.

Double cutting, rolling and turf grooming also can encourage disease development. Double cutting increases wounding of the plant and soil

The key to controlling diseases such as summer patch is to know how and when conditions favor their development. Photo: BASF

compaction and wear, providing a point of entry for pathogens. If done too often, lightweight rolling also can increase soil compaction and wear, but rolling three times or fewer each week will increase greens speed without significantly impacting the soil. Grooved front rollers lead to increased wounding and should be avoided when anthracnose is active.

Maintaining sufficient nutrients to the turfgrass plant can improve plant quality and reduce disease development. While all plant nutrients are essential, nitrogen is the most important by far when it comes to plant vigor. It's essential to provide adequate nitrogen to maintain a healthy, vigorous plant that can defend itself from infection. The amount of nitrogen will vary by site and with weather conditions. Sandy sites require greater amounts of nitrogen than heavier soils such as clays. Turf grown under dry conditions requires less nitrogen than turf growing under wet, warm conditions. Typical nitrogen rates will vary between 0.1 and 0.3 pound per 1,000 square feet. While appropriate levels of nitrogen are important, superintendents should avoid excessive nitrogen because this can lead to other problems such as poor surface quality, increased thatch and increased wear damage.

Cultivation practices are important tools for alleviating soil compaction and thatch. Superintendents should avoid summer cultivation practices that cause excessive plant wounding. A wounded plant will be more susceptible to attack by an opportunistic pathogen such as *Colletotrichum graminicola*, the causal agent for anthracnose.

Topdressing is used to reduce thatch and to provide a smooth, firm putting surface, but the topdressing process can result in plant injury, especially if the topdressing material is applied heavily and brushed in. If done during periods of high temperature stress, the abrasion of the topdress and associated processes can result in elevated levels of anthracnose.

Plant growth regulators and herbicides are used often to reduce annual bluegrass seedhead development. It's important to begin a fungicide program before applying PGRs to avoid injury and discoloration. Recent research also suggests increased anthracnose could result from the application of plant growth regulators.

Irrigation also influences the health of a turfgrass plant, and it's important to maintain a soil profile that's not too wet or too dry. This can be tricky during extremely wet years and droughts. To reduce disease activity, syringe the turf when soil temperatures are greater than 75 F. To avoid wilt stress, greens might need to be syringed several times during the late afternoon, typically from 10 a.m. to 5 p.m.

When developing a disease control program, it's important to understand adverse plant reactions to other plant protection products. Specifically, care should be taken when using preemergent herbicides on annual bluegrass stands. Many preemergent herbicides caution against use on desirable annual bluegrass. If using a preemergent herbicide, a strong fungicide program should be initiated before application.

STEP 3: IDENTIFY POTENTIAL DISEASES.
Many plant diseases attack annual bluegrass and creeping bentgrass, but some target one plant species or the other. In an established mixed

It's a science ... and an art

BY PAT JONES

Last month, I went to Lubbock, Texas, to give a speech to the West Texas GCSA. I talked with a dozen or so superintendents from the area and found that – although they often suffer from drought-related problems, fire ants, desert weeds and other problems typically associated with their part of the world – they rarely have to deal with disease.

Until this year, that is. Following an unusually wet spring, some courses were finding those nasty yellowish spots on greens. In some cases, it looked like take-all patch. In others, it could have even been pythium. A couple of guys told me it was the first time they'd sprayed fungicides in years. A few at higher-end facilities even said they had to spray monthly. Imagine that.

For a Yankee like me, it was interesting to hear about a different world of disease management where, in the worst case scenario, a 30-day application schedule was necessary for three or four months. Compare that to most of the rest of the golf world where two weeks is pushing the edge of the envelope. Such are the demands of growing plants at less than $^1/_8$ of an inch.

The article above describes a simple, four-step approach to establishing a sound disease management program. It's a good framework that allows you to examine or reexamine the foundations of your control efforts.

However, the science of disease management has to be combined with the art of greenkeeping to be successful. As the authors point out, weather patterns, cultural practices and changes in disease patterns need to be part of the equation as well.

But, keeping an ear to the ground is perhaps one of the most important parts of the art in the process. Comparing notes with neighboring superintendents, local reps and manufacturer's reps can be invaluable as well.

It's not unusual for fungicides to be the largest nonlabor expense in a golf course maintenance budget. Figures from a few years back suggest the national average spending for fungicides is about $22,000 per course. That includes facilities like those in west Texas and other parts of the West where disease pressure is nearly nil. So, it's not uncommon to find Northern private clubs spending $50,000 or more – in some cases way more – on disease management. It's simply the price most need to pay for stress-free turf.

It might sound overly simplistic, but disease management is the trickiest and most expensive part of the art and science of golf course maintenance. Thus, it should require the most thought and examination. By using a simple approach as described in the article above, you can bring a little more science to the art ... and maybe even sleep better.

An example of a programmatic approach for turfgrass disease control compared with single products

FUNGICIDE	RATE	PERCENT DISEASE		TURFGRASS QUALITY	
	AMOUNT OF PRODUCTS PER 1,000 FT²	JULY 20, 2005	AUG 18, 2005	JULY 20, 2005	AUG 18, 2005
SYNGENTA PROGRAM*	SEE BELOW	6.3	0.4	7.0	7.8
CLEARY'S 3336	4.0 OZ	22.5	3.5	5.5	6.5
DACONIL ULTREX	3.2 OZ	12.5	1.6	6.3	6.3
BANNER MAXX	1.0 FL OZ	13.0	1.1	6.3	6.3
UNTREATED		41.3	11.2	5.0	4.5

Data from efficacy trial conducted at Bethlehem (Pa.) Municipal Golf Course (Fidanza, 2005)

* Syngenta Program (all rates are based on amount of product per 1,000 square feet applied at 14-day intervals)
Application 1: Banner Maxx 2 fl oz., Daconil Ultrex 3.2 oz., Primo Maxx 0.125 fl oz.
Application 2: Medallion 0.25 oz., Daconil Ultrex 3.2 oz., Primo Maxx 0.125 fl oz.
Application 3: Heritage TL 2 fl oz., Banner Maxx 1 fl oz., Daconil Ultrex 1.8 oz., Primo Maxx 0.125 fl oz.
Application 4: Medallion 0.25 oz., Banner Maxx 1 fl oz., Daconil Ultrex 1.8 oz., Primo Maxx 0.125 fl oz.
Application 5: Heritage TL 2 fl oz., Subdue Maxx 1 fl oz., Daconil Ultrex 3.2 oz., Primo Maxx 0.125 fl oz.
Application 6: Medallion 0.25 oz., Banner Maxx 1 fl oz., Daconil Ultrex 1.8 oz., Primo Maxx 0.125 fl oz.
Application 7: Heritage TL 2 fl oz., Subdue Maxx 1 fl oz., Daconil Ultrex 3.2 oz., Primo Maxx 0.125 fl oz.
Application 8: Medallion 0.25 oz., Banner Maxx 1 fl oz., Daconil Ultrex 1.8 oz., Primo Maxx 0.125 fl oz.
Application 9: Cleary's 3336 4 oz., Daconil Ultrex 1.8 oz., Primo Maxx 0.125 fl oz.

stand of annual bluegrass and creeping bentgrass, primary diseases will be anthracnose, dollar spot, brown patch, leaf spots, Pythium blight and summer patch. The key to controlling these diseases is to know how and when conditions favor their development.

Anthracnose is most destructive during warm weather but can occur at any time of year. It causes irregularly shaped patches that range from yellow to brown in color. Leaf lesions that are yellow with black centers might also occur. Anthracnose also causes a basal stem rot from late winter to fall. Infected shoots are detached easily. Dead foliage and stems become covered with acervuli – tiny, spined, black fruiting bodies.

Anthracnose development is favored by temperatures warmer than 78 F. It occurs in areas that experience more than 10 hours a day of leaf wetness for several consecutive days. Soil compaction, low mowing heights and low amounts of nitrogen fertility also contribute to this disease.

Dollar spot causes sunken, circular patches that measure as wide as two inches in diameter on golf greens and several inches on higher turf heights. The patches turn from brown to straw in color and might eventually coalesce, forming irregularly shaped areas. Infected leaves might display small lesions that turn from yellow-green to straw color with a reddish-brown border. The lesions can extend the full width of the leaf. Multiple lesions might occur on a single leaf blade.

Dollar spot is favored by temperatures between 59 F and 86 F and continuous high humidity. Warm days, cool nights and intense dews particularly contribute to this disease. It infects areas with low levels of nitrogen and becomes more severe in dry soils.

The symptoms of brown patch can vary depending on the grass cultivar, climatic and atmospheric conditions, soil and intensity of turfgrass management. This disease typically causes rings or patches of blighted turfgrass that measure from 5 inches to more than 10 feet in diameter. It also causes leaf spots and "smoke rings" – thin, brown borders around diseased patches that appear most frequently in the early morning dew. After the leaves die in the blighted area, new leaves can emerge from the surviving crowns.

High relative humidity and temperatures of warmer than 85 F during the day and 60 F at night favor brown patch. It also occurs in areas that experience more than 10 hours a day of foliar wetness for several consecutive days.

Leaf spot (melting-out) causes purplish-brown to black spots with tan centers on the leaf blade and sheath. Leaf spot favors temperatures between 40 F and 80 F. It occurs in areas that experience more than 10 hours a day of foliar wetness for several consecutive days and also favors high amounts of nitrogen and low mowing heights. Lower leaves of infected plants become shriveled and blighted. When infection is severe, almost all leaves and tillers die, causing severe thinning of the stand or melting-out. On cool-season turfgrasses, melting-out typically follows the appearance of leaf spots.

Pythium blight appears suddenly during hot, humid weather. It's common in the wettest areas of turf, such as drainage patterns. This disease causes greasy, brown circular spots that are initially about $^{3}/_{4}$ inch to 2 inches in diameter and then rapidly enlarge in size. The spots are water-soaked and dark-colored early in the morning. They also form fluffy white masses of fungal mycelium (cottony blight) and can coalesce to form large, irregular areas of dead turf. Infected patches might appear bronzish-orange in color.

Pythium blight is favored by night temperatures warmer than 68 F. It occurs in areas that experience more than 10 hours a day of foliar wetness for several consecutive days. It's found in areas with poor drainage and air circulation as well as in locations that are high in nitrogen.

Summer patch is a root disease. It appears as circular or irregularly shaped patches that measure from several inches to several feet in width. The patches are bronzish-yellow to straw-colored and can coalesce as they increase in size. The leaves of the plant turn yellow to brown from the tip to the base. The roots turn moderate to dark brown. Summer patch can also cause frog-eye – a symptom in which a less susceptible grass survives inside the diseased patch.

Root infection is initiated when soil temperatures at a 2-inch depth exceed 65 F. Foliar symptoms of summer patch occur six to eight weeks after root infection begins and are favored by temperatures warmer than 85 F during the day and warmer than 70 F at night. It's also commonly found in areas with alkaline soils, high soil moisture, compaction, poor drainage and low

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JULY 2007

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

_____

4. Number of Holes: *(check one)*

❑ A-9 Holes
❑ B-18 Holes
❑ C-27 Holes
❑ D-36 Holes
❑ E-Other

6. Total Annual Maintenance Budget: *(check one)*

❑ 1-Less than $50,000
❑ 2-$50,000-$99,999
❑ 3-$100,000-$249,999
❑ 4-$250,000-$499,999
❑ 5-$500,000-$749,999
❑ 6-$750,000-$1,000,000
❑ 7-$1,000,000+

7. Total Course Acreage _____

8. Course Renovation Plans for the Next 12 Months

❑ 1-Full Reconstruction
❑ 2-Partial Reconstruction
❑ 3-Greens
❑ 4-Tees
❑ 5-Fairways
❑ 6-Irrigation System
❑ 7-No Renovations Planned

9. If Only a Partial Reconstruction is Planned, Please Indicate the Number of Holes _____

10. What is the Name of the Architect Who Designed the Course?

_____

11. What Year was the Course Built? _____

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2. Golf Course Management Company
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mowing height. This disease is typically more severe in turfgrass that has been fertilized with nitrate-nitrogen.

STEP 4: MAP OUT THE POTENTIAL TIMES FOR DISEASE PRESSURE AND FUNGICIDE APPLICATIONS. After the diseases requiring control has been identified, the next step is to map the potential times for disease pressure. Typically, history is the best guide. There are tools that offer historical data to help determine these times.

The mapping process is done by creating a series of boxes representing each month of the year and marking them accordingly. In months where disease activity frequently occurs, the box is colored green. In months where disease activity occasionally occurs, the box is colored yellow. If disease rarely occurs during a month, the box is left uncolored. This practice helps superintendents visualize the development of a disease control program.

Next, place a star in the month when you plan to make a fungicide application to control the particular disease.

This process should be done for each disease on your list. The final step is to create a spray schedule that accomplishes all that is mapped out. In creating a schedule, list all fungicides that will control each disease. Look for broad-spectrum fungicides that control multiple diseases, as this increases efficiency of fungicide applications.

Once the program is committed to paper, it's easy to add other scheduled management practices. One that shouldn't be forgotten is fertilization. It's critical to maintain good plant vigor when dealing with diseases such as anthracnose, dollar spot and summer patch.

When planning a disease control program for greens, it's best to not extend any application longer than two weeks. Plant protection is limited by how long the fungicide can remain in or on the plant. The residual activity of fungicides is affected by many factors, including rainfall/irrigation, height of cut, frequency of cut and depth of roots. **GCI**

Michael Agnew, Ph.D., is a field technical manager for Syngenta Professional Products and can be reached at michael.agnew@syngenta.com. Michael Fidanza, Ph.D., is courtesy professor of turfgrass science at Penn State University and can be reached at maf100@psu.edu.

Example of a fungicide spray program for *Poa annua*/bentgrass greens using a solutions approach to disease control

Diseases of bentgrass: Dollar spot (DS), anthracnose (A), Pythium blight (PB), brown patch (BP), yellow patch (YP), fusarium patch (FP)
Diseases of *Poa annua*: Dollar spot (DS), anthracnose (A), brown patch (BP), Pythium blight (PB), leaf spot (LS)

APPLICATION	TIMING	FUNGICIDE/PGR	RATE/1000 FT²	TARGET PATHOGEN
1	APRIL 1	BANNER MAXX DACONIL ULTREX PRIMO MAXX	2 FL OZ 3.2 OZ 0.125 FL OZ	A, LS, YP, FP
2	APRIL 15	BANNER MAXX DACONIL ULTREX PRIMO MAXX	1.0 FL OZ 1.8 OZ 0.125 FL OZ	A, LS
3	MAY 1	MEDALLION CHIPCO 26GT DACONIL ULTREX PRIMO MAXX	0.25 OZ 2 OZ 1.8 OZ 0.125 FL OZ	A, LS, YS, FP
4	MAY 15	HERITAGE BANNER MAXX PRIMO MAXX	0.4 OZ 1.0 OZ 0.125 FL OZ	A, DS, LS, SP
5	JUNE 1	CLEARY'S 3336 DACONIL ULTREX PRIMO MAXX	4 OZ 3.2 OZ 0.125 FL OZ	A, DS, BP, LS
6	JUNE 15	HERITAGE MEDALLION DACONIL ULTREX PRIMO MAXX	0.4 OZ 0.25 OZ 1.8 OZ 0.125 FL OZ	A, DS, BP, SP, PB
7	JULY 1	BANNER MAXX SUBDUE MAXX DACONIL ULTREX PRIMO MAXX	1.0 FL OZ 3.2 OZ 1.0 FL OZ 0.125 FL OZ	A, DS, BP, PB
8	JULY 15	HERITAGE MEDALLION DACONIL ULTREX PRIMO MAXX	0.4 OZ 0.25 OZ 1.8 OZ 0.125 FL OZ	A, DS, BP, SP, PB
9	AUG. 1	BANNER MAXX DACONIL ULTREX SUBDUE MAXX PRIMO MAXX	1.0 FL OZ 3.2 OZ 1.0 FL OZ 0.125 FL OZ	A, DS, BP, PB
10	AUG. 15	BANNER MAXX MEDALLION DACONIL ULTREX PRIMO MAXX	1.0 FL OZ 0.25 OZ 1.8 OZ 0.125 FL OZ	A, DS, BP
11	SEPT. 1	CLEARY'S 3336 DACONIL ULTREX PRIMO MAXX	4 OZ 1.8 OZ 0.125 FL OZ	A, DS, BP
12	SEPT. 15	BANNER MAXX DACONIL ULTREX PRIMO MAXX	.5 FL OZ + 1.8 OZ 0.125 FL OZ	A, DS
13	OCT. 1	BANNER MAXX DACONIL ULTREX PRIMO MAXX	1.0 FL OZ 1.8 OZ 0.125 FL OZ	A, DS
14	NOV. 1	MEDALLION BANNER MAXX DACONIL ULTREX	0.5 OZ 2 FL OZ 5.1 OZ	A, YP, FP

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BY JOHN WALSH

An ongoing battle

A superintendent in New Mexicao experiments with wetting agents to combat localized dry spots

For Steve Campbell, wetting agents aren't a miracle product; they're just another gun in the arsenal of turfgrass management.

"If you know how to use them and what they're supposed to do, they work," says Campbell, director of agronomy at Las Campanas, a 36-hole facility that sits on 5,000 acres of high desert in Santa Fe, N.M. "If you don't know what they do, you won't get good results. There's no 'follow A, B, C and D,' and you'll be successful. Find out what your problems are and figure out how to fix them. If wetting agents work for me, I believe they'll work for everyone if they apply them to their individual needs and situations. Each golf course is different. You don't treat them all the same."

Campbell manages 100 employees and runs the golf course, landscape, public works and revegetation divisions at Las Campanas, a Lyle Anderson development. Budgets are confidential, but Campbell's is more than $1 million.

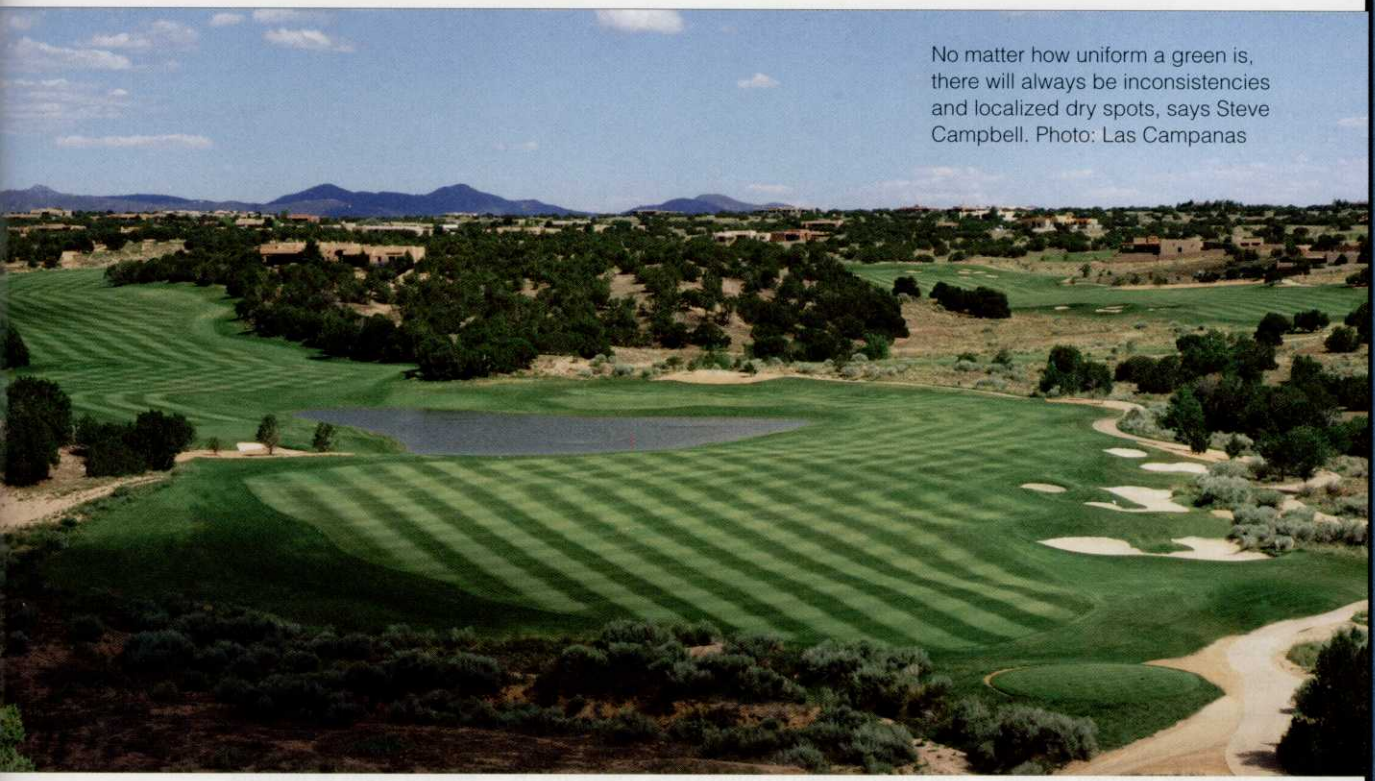
Campbell, who's been at Las Campanas for 12 years, is a big believer of wetting agents and has used them his entire career. He injects wetting agents into the irrigation system, using $^{1}/_{16}$ to ¼ of an ounce per thousand square feet of turf per day.

Las Campanas receives just 12 inches of rainfall a year, so water is king.

"I need to make water wetter to conserve and use every drop," Campbell says. "Wetting agents break the surface tension of the water droplet and force it to go into the soil."

Under water conservation mandates, the most water Campbell can use per golf course per day is 600,000 gallons, even though he says he can use less than that during less stressful months of the year. Determining

Superintendent Steve Campbell uses eight ounces of wetting agent per thousand square feet every two weeks. Photo: Las Campanas



No matter how uniform a green is, there will always be inconsistencies and localized dry spots, says Steve Campbell. Photo: Las Campanas

how much water he uses is a complicated system, he says. He checks water use every morning via a computerized monitoring system and reports it monthly. Other parties, namely municipalities, can check his water use daily if desired.

The water is high in salts and bicarbonates, which makes it difficult for Campbell to flush the soil. He can flush salts down into the soil profile with the annual 12 inches of rainfall and the wetting agents he uses.

The bentgrass Campbell grows isn't native to the area. He says there has been ongoing talk about changing the turf, but the native grasses (buffalograss, for example) would never be used because they wouldn't survive if cut at turf heights.

"I have bentgrass on greens, tees and fairways," he says. "The temperature will go down to zero degrees Fahrenheit in the winter, and if I don't have snow cover, I irrigate the turf once a week because the plant will freeze dry if I don't because of the high winds and very low humidity. The crown needs to stay wet or it desiccates. We're at 7,000-feet elevation. The Rocky Mountains begin here in Santa Fe."

To treat localized dry spots, Campbell uses eight ounces of wetting agent per thousand square feet every two weeks. No matter how uniform a green is, there will be inconsistencies and localized dry spots, which is compounded with salts, he says.

Campbell says he has tried every wetting agent on the market and started using them in Philadelphia where it was hot and humid with an entirely different set of weather, soil and agronomic conditions.

"Surfside is the best wetting agent I've used," he says. "I use it exclusively."

Campbell uses wetting agents throughout the year and is always looking for a deal. He buys the 55-gallon drums even though the shipping is expensive.

"I spend a minimum of $12,000 on wetting agents a year," he says. "There has been no year where I spent less than $10,000 on wetting agents. The drier the year, sometimes as little as four inches of rainfall a year, the more I need to supplement my irrigation."

Campbell acknowledges there's an uncertainty about wetting agents in the industry, but he says a superintendent has to know his soils, drainage, irrigation and turf problem areas.

"You need to spend the time to experiment," he says. "One size doesn't fit all. What I used in Philly is different than what I use out here. It's no different than any other business. Attention to detail is the key, and versatility is key to success. You need to make adjustments. You don't just dump a wetting agent in the tank and go."

When Campbell sees a water-related problem, he applies a wetting agent, which alleviates the problem but doesn't eliminate it.

"It will be different for me every year," he says. "It's frustrating, but just because it worked last year, doesn't mean it will work exactly the same way this year. It's an ongoing thing."

Superintendents will always deal with localized dry spots and wetting-agent use, Campbell says.

"Every superintendent should have a wetting agent as part of his arsenal," he says. "They've been around a while, but they must be doing something for someone because they've last a long time. That's somewhat of a testimonial." **GCI**

BY JOHN WALSH

More than one use

Wetting agents contest localized dry spot and wet turf while reducing labor for a superintendent in Indiana

Golf course superintendents have long turned to wetting agents to combat localized dry spots. John Parker, golf course superintendent at the French Lick (Ind.) Springs Resort, does. But he also uses wetting agents to keep certain areas of the course dry and reduce labor.

There are a lot of improvements being made to the French Lick Springs Resort as part of an overall $382-million renovation. The resort features the 18-hole Donald Ross Course built in 1917 that was newly renovated by a team led by architect Lee Schmidt.

"We've been called one of the most originally kept Ross designs in the country," Parker says. "Throughout the years, we've had only one hole changed to build a lake. There are 16 holes that are completely original."

Currently, the Tom Bendelow Course, which was known as the Valley Links and used to be an 18-hole course, is being renovated and converted to a nine-hole course scheduled to open this fall. A casino was built where the old driving range used to be, and a new one is being built nearby. The casino opened in November 2006 along with the newly renovated French Lick Springs Hotel. A brand new 18-hole Pete Dye course is expected to open in 2008 atop the second highest point in Indiana.

Resort improvements include an increased golf course maintenance budget, from $450,000 to about $800,000. Parker says owner Bill Cook wants to restore the historical grandeur of the area (French Lick was home of the largest standing dome, the West Baden Springs Hotel, before the Astrodome was erected, Parker says), improve the quality of the golf courses and meet the higher guest expectations that will be likely once the renovations are complete.

"We've improved the green complexes using Best Sand, and we're using more fertilizer by spraying iron on the fairways," Parker says.

The turfgrass is Penncross bentgrass on the native soil greens and approaches, Quickstand Bermudagrass on the tees and fairways, and turf-type tall fescue in the rough.

"We're in the transition zone, although it's been a rough year for the Bermudagrass because of the cold spring," he says. "We had been using a systemic fungicide with a wetting agent, but now with the Bermudagrass, I don't need the fungicides, so I spray just the wetting agents. On the greens, it's still a mix."

Parker spends about $3,000 a year on wetting agents and uses them to help cure localized dry spot on greens and fairways. He

Superintendent John Parker spends about $3,000 on wetting agents annually. Photo: French Lick Springs Resort

also used wetting agents to help establish sod for greens expansions. Some greens were rectangular and eventually became rounded. Parker used wetting agents to establish the grass in the areas that made the greens rectangular again.

Parker says that when he started at French Lick 11 years ago there was a lot of localized dry spot, but now there has been less because he has been using wetting agents. Using wetting agents also eliminates a lot of labor, such as dragging hoses to certain areas on the courses, even though Parker's crew still drags hoses sometimes.

Because the water Parker uses to irrigate the golf courses has high sodium content and is of poor quality, he can't flush the soils well. So, he uses wetting agents and when it rains, and the combination of rain water and wetting agents helps flush the soils properly.

Parker applies wetting agents starting in late May or early June then reapplies them every three or four weeks on the greens and fairways through the first part of September.

"We have hills and valleys here, and wetting agents help on the high peaks," he says. "Wetting agents also help percolate the water in the valleys to keep them drier."

Parker purchases wetting agents as needed, usually monthly.

"I can't buy a year's supply, but with the new budget, I will buy the 50-gallon barrels to save money."

Parker has tried different brands the past two years but is now stuck on one – Revolution from Aquatrols.

"Ten years ago, if you applied a wetting agent and you didn't water it in right away, it would burn the grass, so I've been cautious," he says. "Now the products are better than 10 years ago, and you can wait a bit before applying water."

Parker applies 6 ounces of Revolution per 1,000 square feet every three to four weeks on the greens. On fairways, he uses Primer Select by Aquatrols. He says the difference between the two is cost.

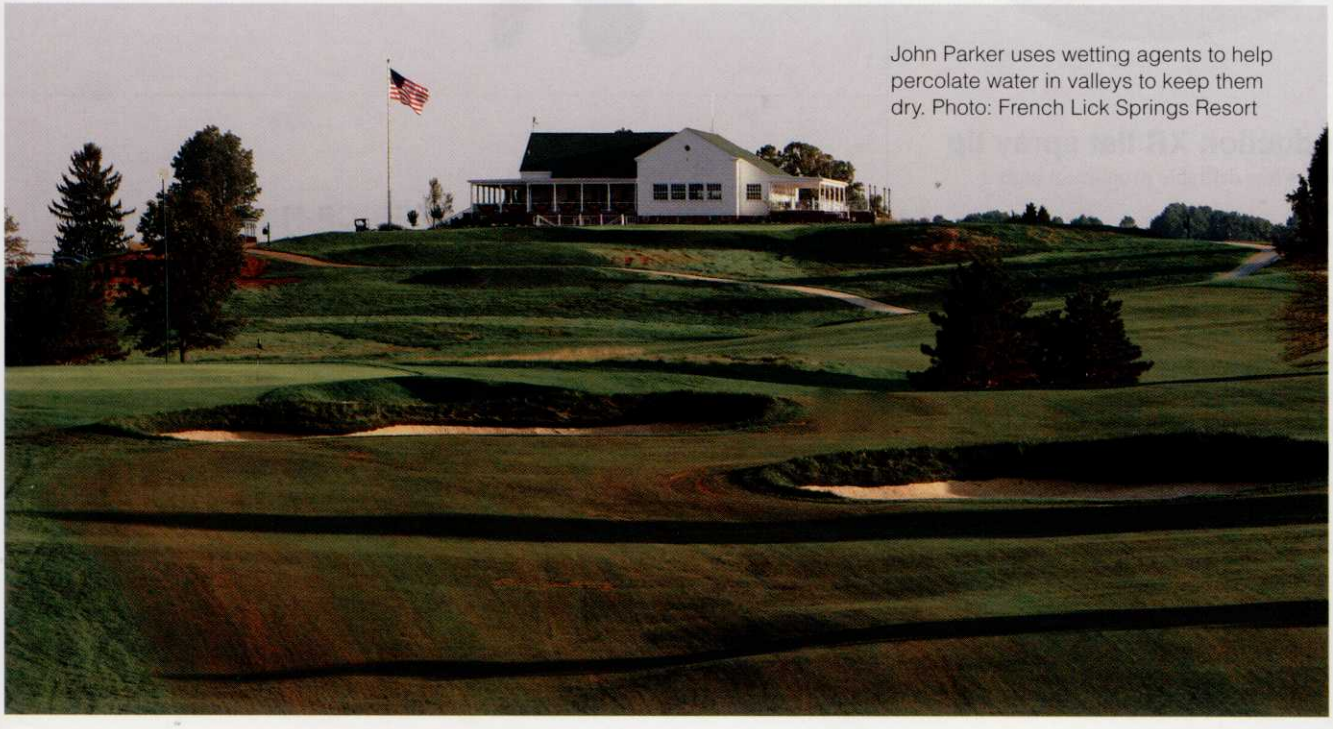
"I've used Cascade – it's a good product – and a lot of wetting agents," he says. "But Aquatrols conducts research and is committed to wetting agents, which eases my mind."

Parker spot treats certain areas with wetting agents and makes blanket applications on the greens and fairways throughout the summer. He would like to inject Dispatch into the new, three-row irrigation system (he used to have a two-row system) to reduce labor but hasn't done so yet.

"I'm not using it now but will in a few months after I use the rest of the Revolution," he says. "It's always good to have wetting agents on hand to treat problematic areas."

Parker is convinced wetting agents help organic matter slide off the sand in the soil profile and allow water to collect between sand particles.

"The benefit of wetting agents is you don't have so much dew on the bentgrass, so you'll be less prone to dollar spot," he says. "If you choose not to mow and applied a wetting agent, you don't have dew, but rather a nice green complex because all the moisture goes down into the soil." **GCI**



John Parker uses wetting agents to help percolate water in valleys to keep them dry. Photo: French Lick Springs Resort

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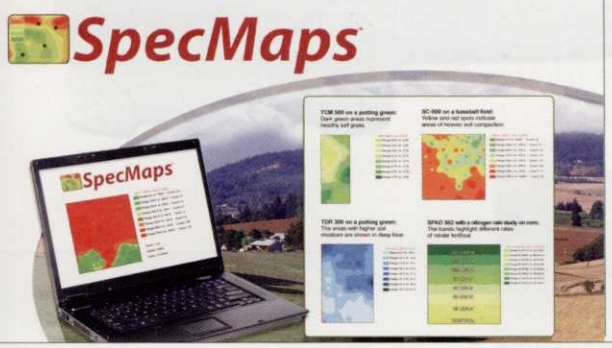

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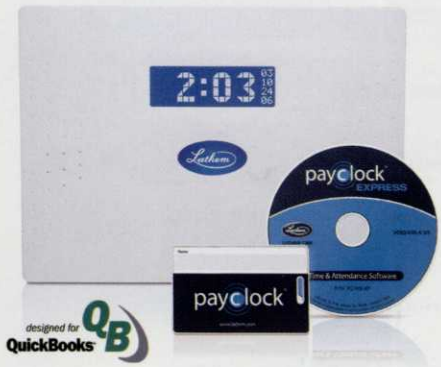

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Consumer RESEARCH

This year, *Golf Course Industry* is publishing feedback from golfers throughout the United States. We're conducting this research to establish a dialogue between the professional community and golfers. On this page, we'll report trends, likes/dislikes, suggestions and other information we gather through our face-to-face, Web-based and phone research.

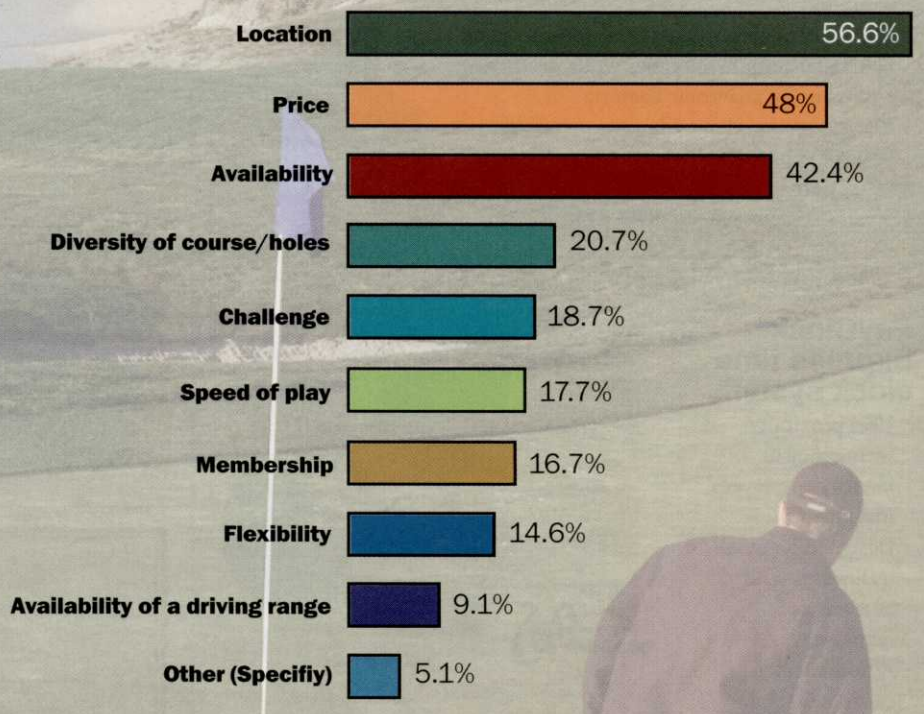
The regulars

It's every public golf course operator's goal to increase his solid base of regular golfers or core customers. Whether it's the group of ladies who play every Tuesday morning, the group of retired men who play weekly or the executive-types who play with business associates, the regulars are important to a business. They're a good base on which to grow. Location, price and availability are the three most important factors that determine which courses golfers play regularly.

Below are a few charts that provide insight into what golfers consider when choosing to play certain golf courses most often. Tap into the minds of the golfers who play at your facility to help figure out how you can increase your core customer base. Do you believe you have enough regulars?

A random sample of golfers throughout the country were surveyed by InsightExpress, a market research company. Golfers surveyed play at least five rounds a year. There were a total of 200 responses, and multiple answers were allowed. Given the sample size and desired confidence levels, the data tolerance is +/- 7 percent.

What determines the course you play most often?



How many different courses have you played in the past year?

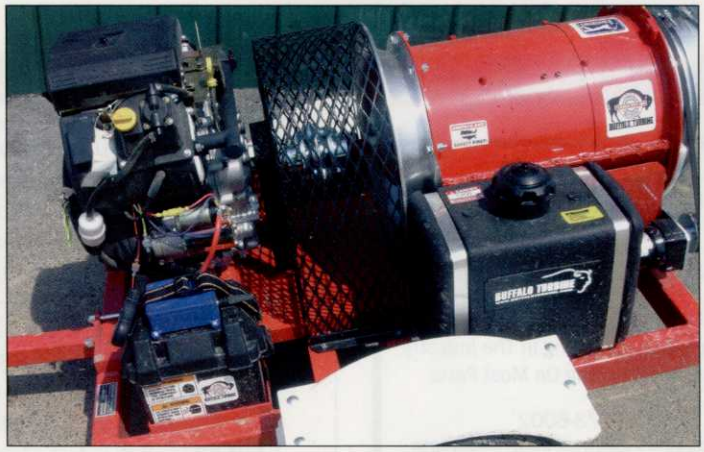
Average:	6.28
Median:	4
Max:	63

How many different courses do you play regularly?

Average:	2.91
Median:	2
Max:	20

Terry Buchen, CGCS, MG, is president of Golf Agronomy International. He's a 38-year and AA life member of the GCSAA. He can be reached at terrybuchen@earthlink.net.

Power the blower



At The Club at Admiral's Cove in Jupiter, Fla., where Bill Brousseau is director of golf course maintenance, a two-cylinder gasoline engine had to be replaced on a trailer-mounted Buffalo Turbine blower. Equipment manager Jim Matis came up with the idea of replacing the worn-out engine with a used, John Deere 2653, hydraulically operated reel motor.

A 10-inch-diameter pulley and a 3-inch-diameter pulley with a half-inch-wide, standard-size v-belt were used to power the blower at the same 3,600 RPMs as the engine.

The reel motor was bolted to a quarter-inch thick steel plate using elongated holes so the motor could be moved back and forth to tighten the v-belt. The hydraulic hoses and fittings, which were built in-house, connect to the two-spool rear hydraulic couplers on the back of a John Deere ProGator. The engine battery still is used to change the blower nozzle direction because it's hooked up to the alternator on the tow vehicle with pigtails to keep the battery charged at all times. The same wire mesh cover is used to keep the pulleys and v-belt protected for employee safety.

The blower RPMs are changed as needed by changing the ground speed of the tow vehicle and by using the throttle lock. The blower is significantly quieter than when it was powered by the engine.

The used reel motor cost about $65, and the labor required to install it was about eight hours.

Canada Goose cleanup

At the public, 18-hole Chemawa Golf Course in North Attleboro, Mass., which generates about 55,000 rounds annually, goose droppings were loosened with a steel drag mat then removed with a blower; but this was too time consuming. Golf course superintendent Jeff Lefebvre and equipment technician Paul Boutiette found a way to drag and blow the goose debris in a single operation to save time. A Buffalo Turbine blower was bolted to a diesel engine-powered Cushman Truckster. Four 4-inch-by-2-inch channel iron pieces were welded to the blower frame. Half-inch diameter holes were drilled through the bed of the Cushman, and four half-inch diameter nuts with washers were welded to the bottom of the bed. Half-inch-by-1.5-inch bolts were ratcheted down to hold the blower in place. The Cushman and blower are used as a dedicated unit.

The arm that holds the drag mat in an extended horizontal position on the left side of the Cushman was built using 2-inch, thin-walled box tubing – one piece is 8-feet, 6-inches long, and another identical piece is welded at a 40-degree angle. The ends are reinforced with flat stock and capped. One-inch-by-one-quarter-inch flat stock was used to make the brackets to attach the frame arm to the Cushman with half-inch diameter bolts. The ends of the tubing were drilled to accept a quarter inch bolt to act as the hinge. A child's swing set chain was used to prevent the end from resting on the ground. A 360-degree caster wheel was bolted to the flat stock so the end of the frame wouldn't hit the ground on steep banks near the greens. The drag mat attaches with nylon rope to a climber's hook and clips to a welded loop near the end.

The caster wheel was painted yellow for safety reasons, and all of the other metal pieces were painted glossy black.

The drag-mat frame is transported vertically when not in use and is held in place with a bracket.

It took Boutiette five hours to build the piece of equipment using materials already in stock and news materials, which cost less than $100. **GCI**

Travels With Terry

Globetrotting consulting agronomist Terry Buchen visits many golf courses annually with his digital camera in hand. He will share helpful ideas relating to maintenance equipment from the golf course superintendents he visits – as well as a few ideas of his own – with timely photos and captions that explore the changing world of golf course management.

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REQUEST FOR PROPOSAL

Public Golf Course Expansion:

The City of Taunton, Massachusetts, is soliciting proposals for design-build construction and operation, (20 year lease) to expand its Municipal Golf Course from 9 to 18 holes on 113 acres. The selected bidder will design and construct the additional nine holes and then be licensed for a twenty-year lease to fully manage and maintain the course. Requests for Proposals may be picked up at the Law Department, City of Taunton, City Hall, 15 Summer Street, Taunton, Massachusetts, on Thursday, July 5, 2007. A pre-bid meeting will be held on July 13, 2007 at 10:00 am. Bids will be due August 3, 2007 at 2:00 pm.

Requests for Proposals

18 HOLE GOLF COURSE AT FERRY POINT PARK, THE BRONX

The City of New York Department of Parks & Recreation requests proposals for the development, operation and maintenance of an 18 hole golf course and ancillary facilities at Ferry Point Park, The Bronx.

All proposals must be submitted no later than Friday, September 7, 2007 at 3:00 p.m. All interested parties are urged to attend a site tour at Ferry Point Park on Tuesday, July 10, 2007 at 11:00 a.m.

For more information, contact: Jeffrey Shatz, Project Manager or Anthony Macari, Revenue Architect, Parks & Recreation, Division of Revenue and Concessions, 830 Fifth Avenue, the Arsenal-Central Park, Room 407, New York, NY 10021, call (212) 360-1397, or e-mail to jeffrey.shatz@parks.nyc.gov and anthony.macari@parks.nyc.gov. The Request for Proposals can also be downloaded at www.nyc.gov/parks.

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Pat Jones is president of Flagstick LLC, a consulting firm that provides sales and marketing intelligence to green-industry businesses. He can be reached at psjhawk@cox.net or 440-478-4763.

NOONAN'S CRUSADE

Golf course owner Dan Rooney loves the business but frets about the little things that keep golfers happy at Grand Haven Golf Course near Muskegon, Mich. He's a PGA of America member who played on a few minitours after his college golf career at the University of Kansas.

Rooney is your typical young golf course operator … except in his spare time he flies one of the world's most sophisticated warplanes and already has done two tours in Iraq where his job was to scream through the skies at 800 mph to protect the good guys on the ground and, when necessary, drop bombs on the bad guys. Not so typical after all.

These days, Rooney splits his time between Michigan, where he and his dad, John Rooney, Ph.D, own Grand Haven, and his home in Tulsa, Okla., where he spends 10 days a month as an F-16 jockey in the 125th Fighter Squadron of the Oklahoma Air National Guard. He likely will go back into combat in a year. "I'm a lifer," he says. "I have 32 of the greatest guys in the world in my unit. When they go, I want to go, too."

Rooney fell in love with golf as a kid thanks to his dad – an avid player and now-retired university professor who also happens to be an expert on the demographics of golf and other sports (see the profile on page 32). But he also felt the pull of flying: "I was always one of those kids who stopped in his tracks and looked up every time I heard the sound of a plane."

He spent a few years living out of his car and humping around to minitour events in places such as Rapid City, S.D., and Duluth, Minn. He was torn between trying to make it to golf's big show and pursuing his big dream of flying jets for the country. He finally put his Tour aspirations aside, joined the Air National Guard in 1998 and earned his wings two years later. Since then, he's earned the rank of captain and the respect of everyone who knows him in both vocations. And get this: His nickname when flying is Noonan, as in Caddyshack.

So, great guy, great patriot, great story, great nickname … that's enough, right? Nope. The really interesting thing is Rooney wants to do something special for the families of his fellow servicemen who didn't return from Iraq. It all started last year on a stormy night on what should have been a routine commercial flight from Chicago to Grand Rapids, Mich.

"I had just gotten back from Iraq and was already feeling like I was stuck on the sidelines and wanted to do something. When I got on the plane, I noticed a guy in first class in full Army dress and thought, 'Cool, they upgraded a GI.' Then, the pilot announced we had a hero on board. But, it wasn't the guy in first class. It was the remains of another soldier, Brock, in a coffin in the cargo area. The soldier in first class was Brock's brother who was escorting his body home.

> What started as a simple benefit tournament at Grand Haven last year is growing into something huge for the entire golf community.

"When we got to Grand Rapids, they asked everyone to stay on board so they could take Brock's body off first. We all watched through the windows. They had an honor guard and his family was there, including his 4-year-old son. There it was … the flag-covered coffin … the whole deal. I cried thinking about what it would be like for his family and all the other families."

I cried, too, as Rooney told me what he witnessed, and I cried later on thinking about how that same scene has played out almost 3,500 times at other airports in the past four years.

But tears won't help that 4-year-old boy whose dad gave his life for our nation and us. Love, support and money will help that child, and the thousands more like him who face a future without a parent and, often, without the financial wherewithal to achieve the American dream that parent died to defend.

That's why Rooney launched the Fallen Heroes Foundation, a first-of-its-kind national effort within the golf business to provide college scholarships and other support for the children of servicemen and women killed in Iraq and Afghanistan. What started as a simple benefit tournament at Grand Haven last year is growing into something huge for the entire golf community. "It's like a wildfire," Rooney says. "Everyone I talk to wants to help."

With commitments of support already in place from several of golf's major associations and Golf Digest, Rooney wants to make Sept. 1 Patriot Day within the golf industry. The idea is for every golfer who plays on Patriot Day to donate $1 per round or make a contribution to the foundation. Corporate and individual donations are welcome. When I mentioned there are many patriotic superintendents and turf companies who want to help, he said, "Oh my gosh. I never even thought about that!"

Rooney believes the golf community can raise at least $2 million for those children this year. Think about that for a minute. Sure, we can donate golf clubs to troops overseas, we can put magnetic ribbons on the backs of our trucks, and we can all say we support the troops; or, we can do something that really matters. We can make sure these kids have better lives.

The Fallen Heroes Foundation isn't so much a program but a call to action. It's our chance to let the nation know the golf business cares passionately about the people who take care of us. Right now, it's Noonan's crusade. Let's join him and make it ours, too. **GCI**

To find out more about the Fallen Heroes Foundation, visit www.fallenheroesfoundation.com.

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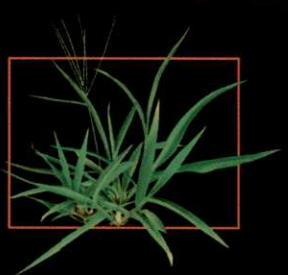

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