

**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@jeffreybrauer.com](mailto:jeff@jeffreybrauer.com).



DESIGN CONCEPTS

## Starting construction

**S**tarting construction is always the ultimate high and I still love making site visits to see how my computer-generated ideas look in three dimensions as construction begins.

In the normal construction sequence, the contractor first moves in equipment, marks out environmentally sensitive areas to avoid and sets benchmarks and staking control points at tees, greens and landing zones. These help us all know exactly where things are.

I visit shortly thereafter to flag tree-clearing lines. Even with a clearing plan, the final clearing limits are determined in the field. Even on a partially wooded site like Firekeeper, it takes a few days, because I work forward and backward along the hole, saving specimen trees. One high-quality tree can cause us to re-do entire clearing lines, and move or redesign entire holes to make best use of the trees. It's difficult to stand those trees back up!

Early Scottish courses built on seaside links land were devoid of trees. American designers have gradually adapted courses to the American landscape, using trees both as backdrops and to provide strategic functions that surface hazards can't supply. Ground hazards like sand and grass bunkers, mounds and creeks can suggest shot patterns, but only trees can force shot patterns. Some still despise trees, calling them "sky bunkers," but we used them in several ways at Firekeeper. Trees:

- Located 180 to 200 yards from the tee match the apex of the parabolic flight pattern of a curved tee shot, best enabling a forced fade or draw.
- Gently encroaching one side of the fairway about 320 to 350 yards off the tee or just to one side of the green make golfers plan the tee shot to avoid them for the second shot. In the field design of the 10th hole, Notah Begay III, who's designing the course with me, removed one particularly tall tree to allow a reasonable chance to hit the green from behind the trees.
- That form a narrow tree chute force a straight shot.

There are also other considerations in tree clearing, such as clearing further on the east and south sides of tees and

greens to allow morning sunlight and good air circulation and brushing to create wind slots. If you look closely, holes that run east and west have more clearing south than north and north/south holes. I also design cart path, bunkers and mounds, etc., on the east and south sides to fill the additional space. North/south holes are cleared wider for more midday sun access, but an exception is the par-5 14<sup>th</sup> because it uses a natural opening and because I wanted one narrow, tree-lined hole on the course.

Knowing we were going to have a triple-row irrigation system with 65-foot rows, the clearing width had to match irrigation coverage. Three rows will water 190 to 225 feet effectively, depending on tree cover and wind direction. Two-hundred-foot play corridors are tough on average golfers, while 225 feet is better and 250 feet is comfortable for most. Some open, crosswind areas needed four rows for coverage and tee areas and par-3 holes used only two rows to save sprinklers.

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My corridors are gently curved for aesthetics and the "inside points" determine effective play width. Most holes should have only a few broad curves, with the distance between outside and inside points about 350 to 600 feet apart. Gentle curves (i.e. curving out about 14 to 20 feet in 200 feet of length depending on trees present) look best. The type of tree also affects clearing width, with tall straight pines suitable for narrower clearing than hardwoods.

The best part about clearing is seeing the hole without tripping over stumps, missing thorns or looking for snakes. It also means earthmoving is about to begin. That's like being a kid and playing in the sand box all over again. GCI



### Design/Construction Journal

Over the next few months, Jeff Brauer's column will detail the ins and outs of his experiences participating in the design and construction of a new golf course in Mayetta, Kan.





**Erik Christiansen** is a licensed irrigator and president of EC Design Group, an irrigation consulting and water management firm based in West Des Moines, Iowa. A board member for the American Society of Irrigation Consultants, Christiansen can be contacted at erik@ecdesigngroup.com.

## BOOST PERFORMANCE WITH MINIMAL RESOURCES

**T**imes are tough and you're not going to get that new irrigation system this year. But let's pretend that you just received a budget windfall – a 5-percent goose in capital funds over last year without any foreseeable increase in expenses. It's not a huge chunk, but an opportunity for upgrades.

Your turf maintenance equipment is in pretty good shape, so you've elected to dedicate the entire lump to irrigation. Finally, those recurring hotspots that show up on your approaches and collars can be more permanently addressed. Where to begin?

Most any irrigation consultant will suggest you begin, well, at the beginning. Where can you make the most effective and logical upgrades with limited funds that will affect the long-term performance of your irrigation system – and therefore your golf course? What single irrigation system component could yield the greatest results for your turf management program?

### EVALUATE AND PONTIFICATE

You dust off your irrigation master plan that was tucked away for such an occasion and know exactly where to go based on system age, wear and overall performance. When considering new features, look toward your control systems first. Pump controls and a central/satellite upgrade can offer new heights of system control that will deliver efficiencies from the piping system to the base of the sprinklers.

Upgraded pump controls and logic can enable you to use your entire system more efficiently by maximizing your pump curves through the optimization of your hydraulic tree in each irrigation set, while keeping your main and laterals filled and pressurized more consistently. This is a significant

move, so unless you're adept at reading pump curves and familiar with the technology, bringing in an outside professional might be in order.

Pump controls also should be considered if you wish to add an injection system to your irrigation set-up. Most superintendents find it cost effective to apply gypsum, wetting agents or other water-enhancing products through their irrigation systems in small, digestible increments, head by head.

Golf courses, particularly muni courses, take tremendous abuse throughout the season. Healthy root growth is important to turf's durability and resilience, so by injecting more frequently you can quickly rehabilitate stressed turf areas without worrying about manual product applications. Moreover, if you're dealing with water or soil pH problems, these tools, along with turf moisture/pH sensors can help establish and maintain the desired balance.

looking at features. As a rule, if you upgrade your field satellites, always select a model that offers more stations than you currently need. For any golf project, future system expansion is inevitable.

Some sites might lend themselves to remote-control capabilities. Activating and programming irrigation from any point on the site can save precious time and grief, especially when troubleshooting irrigation systems or syringing. Larger facilities with multiple functions will find remote-control capabilities particularly helpful.

There are both universal and brand-specific remote control products out there that put power in your hand. Remote control capabilities are one of the more practical upgrades, but at the same time they're amazing time savers. Those who have them vow never to go without again – most state their handheld remote is the equivalent to additional staff.

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Where can you make the most effective upgrades **with limited funds** that will affect the long-term performance of your system?

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### BRAIN POWER

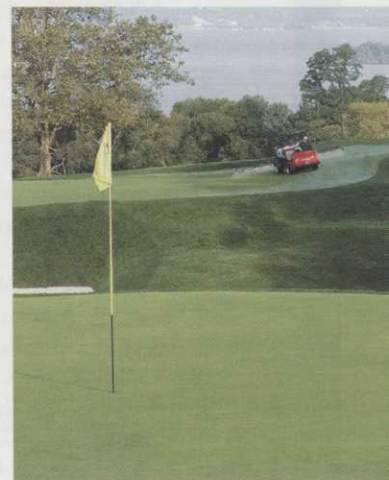
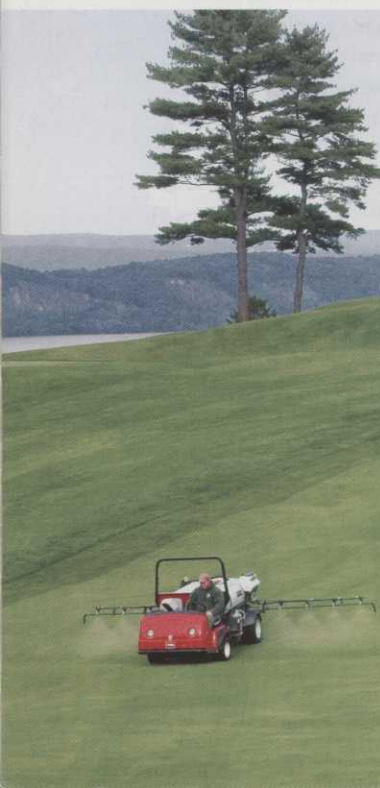
As it relates to controls, it may be time to graduate to a new, digital, solid-state irrigation control system.

Newer controllers are affordable and offer more features than most water managers are willing to use. But most manufacturers offer modularized features, so you can pick and choose your desired functions without buying the total package.

There's a wide selection of control systems available to you. Again, consult your master plan and consider all of your site's needs before you start

These are only a few on the list of opportunities to improve irrigation performance. Any upgrade that significantly affects system delivery and pressure – adding or changing sprinkler heads, zones, pump controls and so forth – needs to be carefully evaluated and accurately specified, so ensure you have access to an expert. If you ever get that budget bump, be ready. Need another good reason to properly plan for such an occasion? The green committee may only give you a short window to act and then the dollars could disappear. **GCI**





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**Monroe Miller** is a retired golf course superintendent. He spent 36 years as superintendent at Blackhawk Country Club in Madison, Wis. Miller can be reached at [groots@charter.net](mailto:groots@charter.net).

## WE NEED A MUSEUM

During my youngest daughter's kindergarten career (she's 29 now), each student was asked to stand and tell about her family. Christie's report was short and simple: "My mom likes to shop and my dad likes dead people."

It was from the mouth of a babe – she meant that many of the trips we took and conversations we had were about the past. Family reunions, cemetery visits, museum trips, old books, antique collecting and nearly anything else connected with days gone by are the things that interest me.

National historical sites are spread all across America, and many small towns have their own local museums, frequently hosted by a core of volunteers whose local pride inspires them.

Sports museums are of tremendous interest to Americans, and I have been to most of them – Cooperstown, Springfield, Canton, South Bend (college football) and Newport (tennis). USGA Golf House and the World Golf Hall of Fame have huge appeal to those of us involved in this great game. Also, in the world of golf history, I love the small upstairs museum at the Foxburg Golf Club, the Jack Nicklaus Museum and the Wake Forest Collection of Arnold Palmer memorabilia.

But there's a huge hole in the presentation of golf's history, a gap made even more evident after my visit to the Turfgrass Information Center in Michigan this summer.

The TIC has done a wonderful job preserving the literature and science of golf turf and turfgrasses. It's a collection that boggles the mind when you see it in person. We all have access to it, and more is available online every day.

I'm grateful for the vision of the USGA, turf faculty and other leaders

who initiated the TIC project and kept it going in its early days.

What we don't have, in a single site, is a golf course museum. We have individual collections, mostly small, and some company collections. A few institutions have some pieces, and I have seen small displays at the old Golf House Museum (equipment mostly loaned or donated by Mel Lucas). The GCSAA has some small equipment at its headquarters in Lawrence, Kan. Dr. Ken Payne and Michigan State have had antique pieces on display at the GCSAA conference in the past, and they were very interesting to see.

Wouldn't it be cool to trace the history of cup cutting, and to have a collection of flags and sticks from around the country?

But I believe there would be great value and interest in consolidating all of these collections at a central site, under the management of a trained and experienced curator. Done carefully, this could be a destination visit for many involved in golf – players and professional staff – as well as the public in general.

And a case could be made for acting soon. A lot of the equipment from the middle part of the last century is being scrapped for lack of space and resources, both on the part of golf courses and distributors. Some is parked outside to rust in the weeds and weather.

The passing of time also sees the passing of superintendents and greenkeepers who can tell the stories of the early years in golf course management in our country. Golf is well over

the century mark in America (121 years) and accurately telling the story becomes more difficult, although not impossible, as time moves away from 1888.

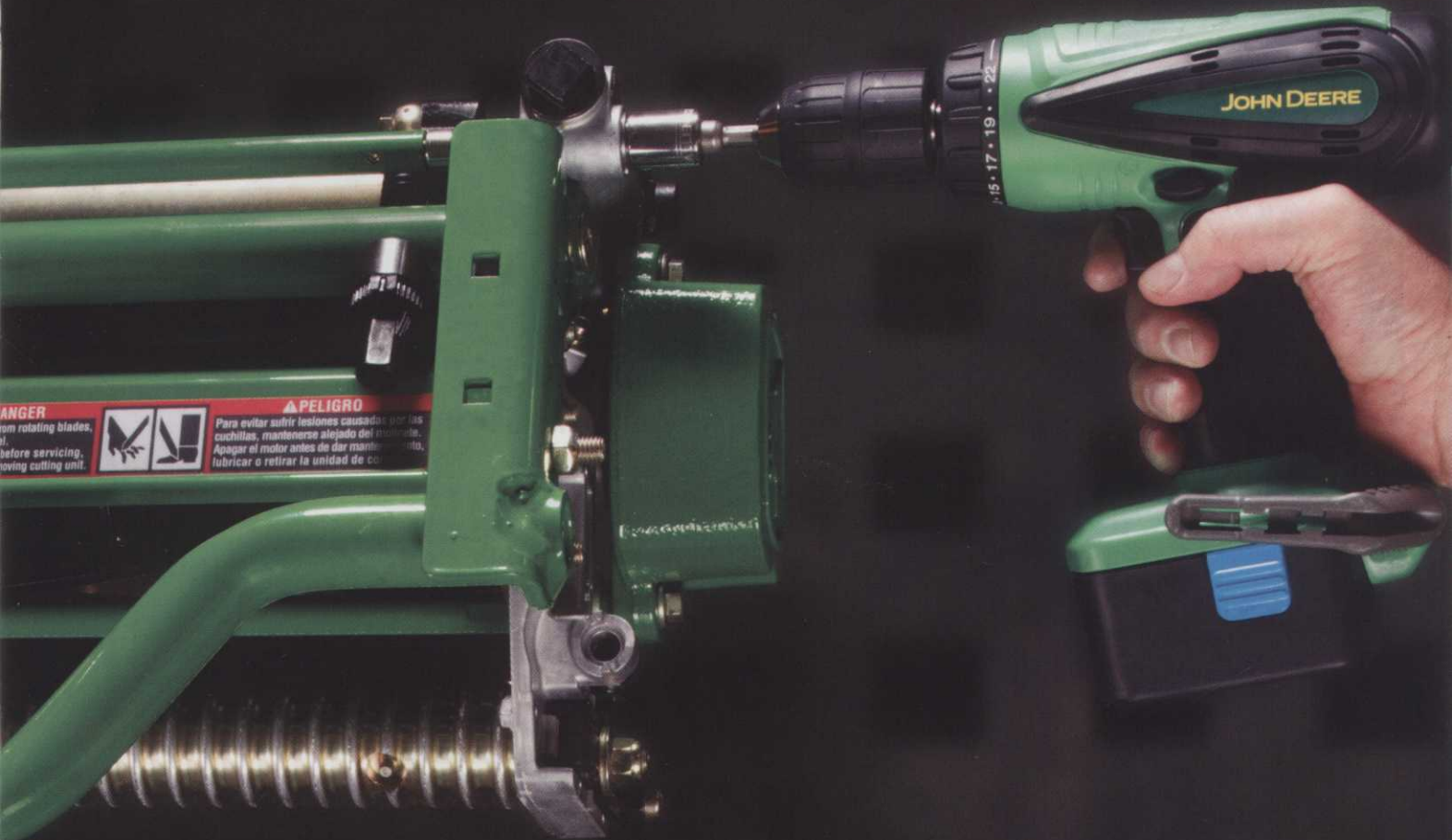
It would be a very formidable undertaking, given the physical size of golf course equipment. It would take a big building to house pickup trucks, tractors, gang mowers, F-6s and Parkmasters, and even sickle mowers.

My meager imagination races when I think about displays tracing the history of golf course aerification, irrigation and spraying. We could have mockups of golf course shops from 1900, 1950 and 2000. Wouldn't it be cool to trace the history of cup cutting, and to have a collection of flags and sticks from around the country? Bunker raking, from hand rakes to the Stan Clarke Power Rake, on through the hydraulic machines of today and back to hand raking would be instructive.

Each year we could have a summer field day with demonstrations of older equipment. The events would involve competitions in mowing, sod cutting, cup cutting and championship racing with Cushmans and Red Ryders and other old trucksters.

Who is going to do this? I don't know. Where? I don't know this, either. Maybe the GCSAA or the USGA or the World Golf Hall of Fame. Maybe it will take a consortium of organizations. We could all contribute, though, of our time, our resources and even some of our personal golf course treasures. I know one gal who would be extremely happy to see our basement and our garage emptied and donated to a world-class golf course museum – the American Museum of Golf Course Management.

I wonder if I'll live long enough to see it. **GCI**



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# CONSUMER RESEARCH

A glimpse of how golfers' behavior affects the business of golf facility maintenance and management.



## EMERGING INTERNATIONAL DESTINATIONS

As part of the KPMG 2008 Golf Travel Insight report conducted in spring 2008, more than 80 specialist golf tour operators in 21 countries were surveyed to find out where they thought the most popular destinations would be in the coming years.

Portugal and Spain, already established tourist destinations, remain firm favorites. However, some surprising destinations are catching up fast.

Turkey ranked third on the list of future golf hot spots, and was closely followed by Dubai – despite figures that reveal the United Arab Emirates has the most expensive green fees in the entire EMA region.

The news for established golf destinations such as Scotland and Ireland was not so good, as operators expect stagnation in inbound golf tourism here.

“From our research it seems well established destinations are not losing market share thanks to their deep golfing traditions and the quality of their golf, but the growing competition doesn't leave much room for further growth,” says Andrea Sartori, head of KPMG's Golf Advisory Practice for the EMA region. “Thailand, Malaysia and Indonesia were widely tipped as emerging destinations, and the quality of service in the U.S., combined with a favorable exchange rate at the time of the survey, makes America very attractive to European holiday golfers.”

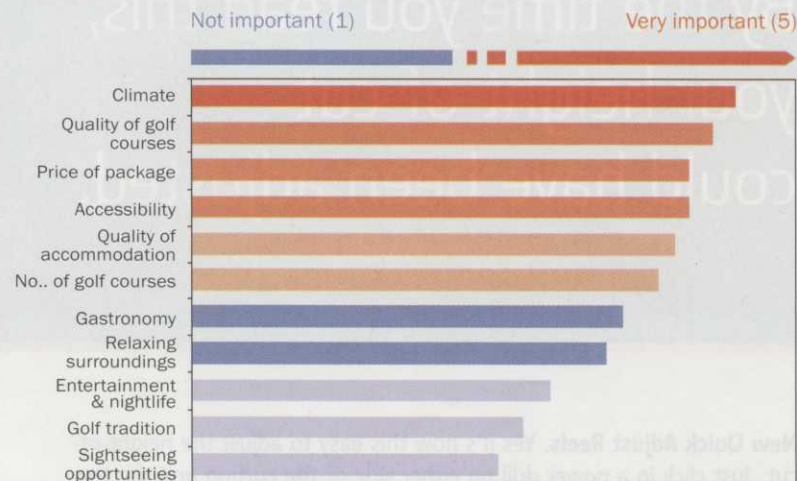
Source: KPMG Golf Advisory Practice's Golf Travel Insight in EMA 2008

### Hot spots for golf tourism in upcoming years



Source: Golf Travel Insight 2008

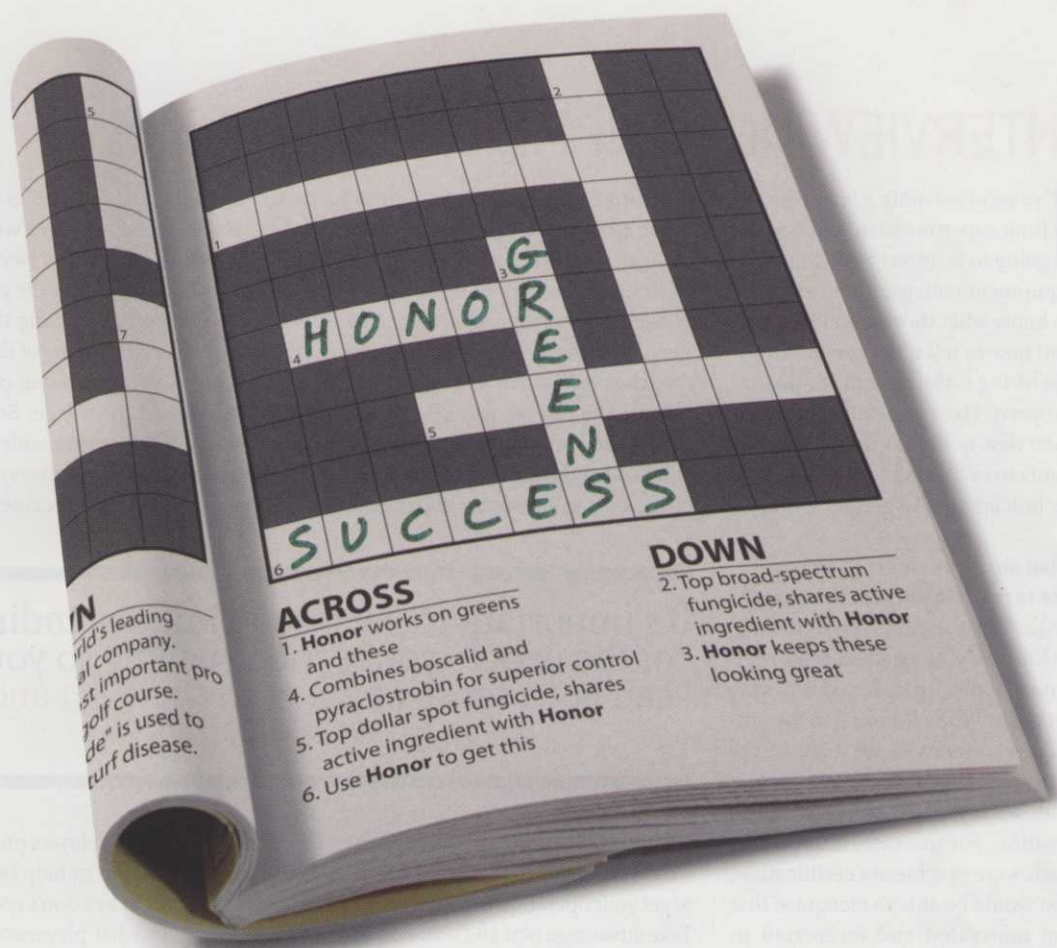
### How golf tourists choose their golf destination



Source: Golf Travel Insight 2008

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**Stephen Tucker** is the equipment manager at the Ritz-Carlton Members Golf Club in Bradenton, Fla., and past president of the International Golf Course Equipment Managers Association. He can be reached at 941-309-2913 or [stephen.tucker@ritzcarlton.com](mailto:stephen.tucker@ritzcarlton.com).

## INTERVIEWING EQUIPMENT TECHNICIANS

I've received quite a few requests from superintendents who were going to be interviewing new equipment managers and wanted to know what they should look for and how to tell if the person they are hiring is the right fit for their property. Here are some important interview questions for superintendents to understand what type of technician they're getting:

### What are some career goals you'd like to reach in the next five years?

With this question, you're looking to find out if the person is goal oriented; typically, successful people set goals. While listening to the candidates' responses, see if any of the attributes they tell you correspond with what you're looking for in the position. For instance, if one of my goals were to achieve a certification, you would be able to recognize that I'm motivated and interested in learning more about my profession. If I said I wanted to make \$150,000 a year, you'd know that my drive would be towards making money.

### What do you feel are the key components to running a successful operation?

This question reveals the individuals' expectations and gives you an idea about their management styles. If I said I feel the key components are cutting unit set-up, organization, and communication, you would know that I think setting up cutting units to give a good quality of cut is one of my driving factors and that I would expect people to be organized and be able to communicate with each other effectively.

### What type of improvements do you see that you could make to our operation?

This is one of the tough questions because most of the time no one wants to hear someone else's opinion on what he or she isn't doing correctly. However, it's very important. You need to know if the person coming into the position has vision or not – if he or she can see past all the bad things and identify the possibilities. While it may be difficult to take criticism, keep in mind that the people

what the individual feels he or she is best at. Everyone will have weaknesses; it's the strengths you want to focus on. When you look at the players in college football making their transition to the NFL, many of them will not be playing the same positions they played in college. Some quarterbacks will become wide receivers and some wide receivers may become cornerbacks. It's because the

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It's important to get a good understanding of the people you're interviewing so you can get a sense of **what drives them and what holds them back.**

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you're interviewing are telling you what you need to do for the future to get your operation in prime shape. Take advantage of it and write down their observations. See if the same responses keep coming up.

### What made you decide to get into the equipment management side of the business?

This is another important question. Here you will find out where this individual started his career and what choices steered him in his current direction. Maybe he plays golf (huge benefit) or maybe he was in the automotive industry and wanted a change – another plus because this tells you that his mechanical skills should be excellent. It's important to get a good understanding of the people you're interviewing so you can get a sense of what drives them and what holds them back.

### What do you feel are your strengths?

This question will give you insight to

coaches want the best players on the field for that position to help build the best team. Coaches don't spend time working on what players can't do; they maximize the things they do well to help them be that much better. This question will help you identify the strengths so you will know the talents of your new hire.

There are many different personalities and thoughts when it comes to maintaining golf course equipment, and there is no one formula that's going to get you the best person.

However, if you take the time to really listen to the answers to these questions, they will tell you if the personality of your staff and the individual will work well together. They also will reveal what your applicant is really looking for in a position – just another job or a career. Hopefully these pointers will help you select the right applicant for your position and help raise the standards of your facility to where you feel they should be. **GCI**



If you work in the turf business and you've never heard of Dr. Milt Engelke, you should probably go find a new profession.

Engelke has been an innovator in research and education in the industry for nearly four decades. Think buffalograss. Think zoysia-grass. Think Texas A&M – and you pretty much have to think of the man known as Dr. Milt to thousands of superintendents worldwide.

Like so many turfheads, Engelke came off of a Wisconsin dairy farm. But, unlike most, he majored in physics as an undergrad at Plattsville College. Despite the high-end academics, he spent summers and free time working with his hands and became a licensed plumber and learned all he could about electric, HVAC and carpentry. That paid off when he was drafted in 1968 and, instead of going to the jungles of Vietnam, ended up in El Paso working on rocket electronics. Easy to see how he'd end up as one of the world's leading turf authorities, huh?

But, he jumped over into ag thanks to a fascination with genetics. To make a long career story short, he moved from Wisconsin to Oklahoma to Mexico. During his time south of the border, he focused on wheat hybridization and worked with the recently deceased Nobel laureate, Dr. Norman Borlaug.

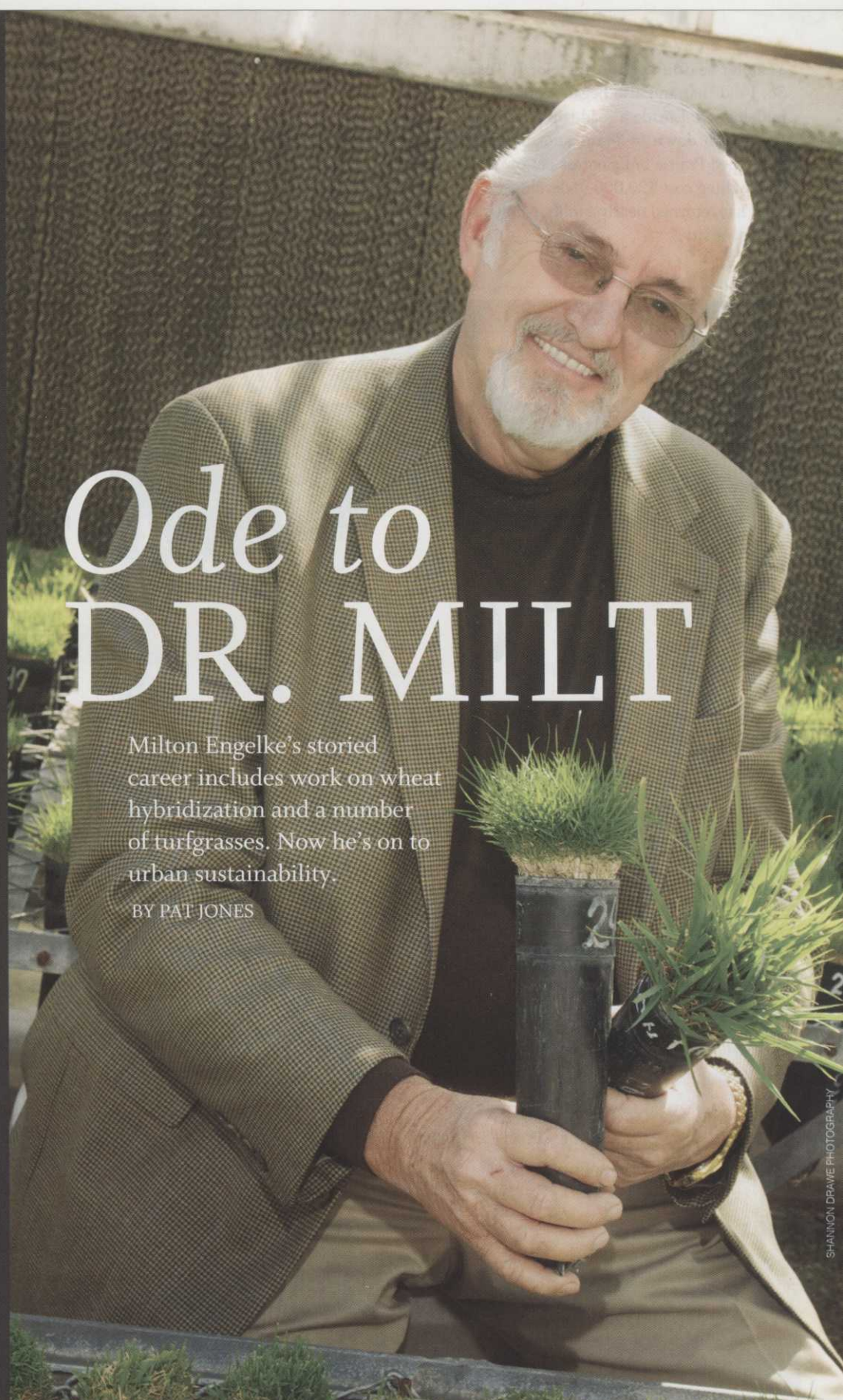
Finally, after a brief stint in private turf breeding, he ended up at Texas A&M in 1980.

"They hired me in May of 1980," Engelke recalls. "I had really enjoyed private industry and began to understand the necessity of getting plant materials into the marketplace. My job was to work on St. Augustinegrass and other native grasses – St. Augustine was about 40 percent of the lawns in South Texas at the time – and everyone wanted

# Ode to DR. MILT

Milton Engelke's storied career includes work on wheat hybridization and a number of turfgrasses. Now he's on to urban sustainability.

BY PAT JONES





a cooler-season version for North Texas. So, I did that and also began working with buffalograss. I made a road trip from North Dakota on down to Texas and eventually developed Prairie buffalograss out of it. The whole thing cost \$20,000 to develop and, to date, has returned nearly a million dollars to the university."

We caught up with Dr. Milt as he continues to grow into his new role heading up A&M's urban sustainability program.

It just figures that a man who started with physics and moved into the world of grasses is now moving far beyond turf as associate director of A&M's Urban Solutions Center.

#### Where exactly are you now?

The Urban Solutions Center is 180 miles north of the A&M campus. You'd think it would be Siberia, but I have all the sciences working together right here with me. There are no silos or barriers. We're trying to solve problems that go way beyond golf or turf, but turf represents a huge opportunity in so many ways.

#### You're not really just a turf guy anymore. Tell us about it.

Right now, I'm focused on sustainability, and sustainability in our world is germ plasm. It's just like Rutgers where Dr. (Reed) Funk created such a diverse library of germ plasm. Had we not maintained the old germ plasm and kept it from being dumped, who knows where we'd be today. We can't lose those genetic resources.

#### What's the one thing that's made you successful?

I hired people better than me. I didn't need another me. I needed someone better who could complement me and eventually replace me.

Mike Kenna (now of USGA) was the first. He worked on zoysia. Virginia Lehman did bentgrass. David Huff, Richard Light, Jen Markham... I know I'm forgetting a bunch, but I've been incredibly lucky to have people who brought talents in that we didn't have.

#### Turf science has taken you all over the world. What are some of the most eye-opening things you've experienced?

Well, the Far East is always wild. Jack Murray and I went there in 1982. Korea was the most interesting. We went from one field with people using oxen to another a half mile away where they were using modern tractors.

The place where I collected a lot of original zoysia specimens is now covered by an airport. It's more proof that urbanization of the world is destroying a lot of our genetic resources. Urbanization is a worldwide challenge for any of us in agriculture. It impacts everyone.

#### How does the science of breeding compare now to when you got started?

I think we're not as far as we should be. (Dr. Jim) Beard said 30 years ago to make sure you don't lose sight of water (as a breeding issue) and we still have a long way to go on that. It absolutely has to be our priority moving ahead.



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