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MANAGING MICROCLIMATES

Three San Diego superintendents describe how they manage water, agronomics and expectations.

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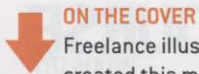


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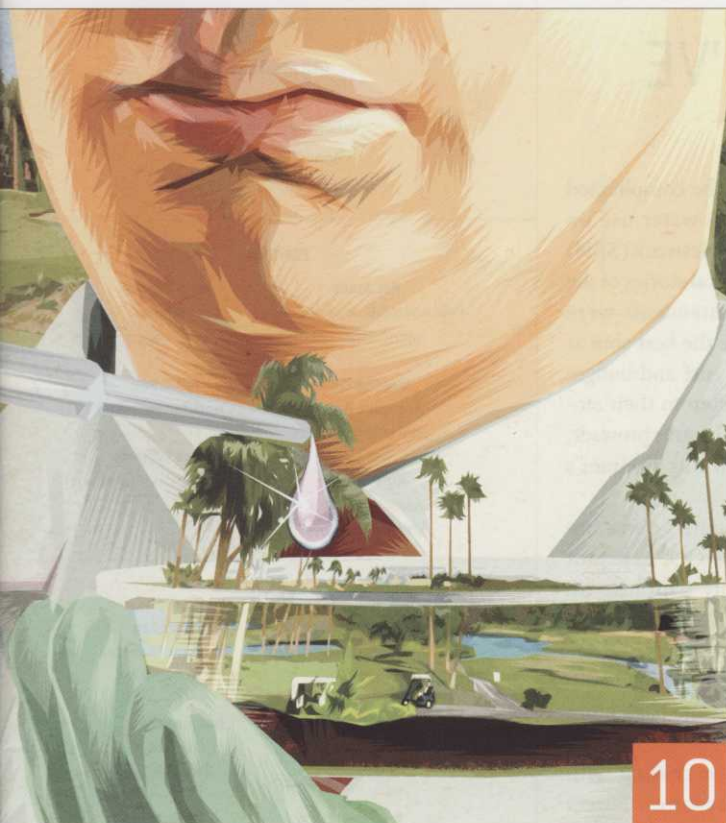
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Freelance illustrator Matthew Laznicka created this month's cover design.

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DON'T KNOW WHAT YOU'VE GOT TILL IT'S GONE

Here in Ohio, on the edge of the Midwest, water availability isn't much of an issue.

I take that back. We, in fact, had a potable water scare for several days this summer after a Lake Erie algae bloom made the water in Toledo undrinkable, even after boiling, but we emerged mostly hydrated. I didn't hear about any golf courses cutting back their irrigation.

But the people I talked to from the area and the voices that bounced around the Twittersphere had a lot to say. People were blaming politicians for not being proactive about the bloom. They were taking shots at the local media for amping up coverage of a localized pressure. They were asking why we couldn't just get water from one of the other nearby sources.

For a brief moment this summer, Toledo and much of California shared some similarities, and the coincidence was surprising for an area that has plenty of apparent water resources. One moment the water was there, and the next, it just wasn't.

Since we started covering the drought in California, the situation has become more and more intense. The statewide restrictions in July capped off what had been uneasy urging for people to use less water as the state withered under record drought for a third year. Though there have been some mild gains in potable water usage reduction, people are still worried about fines and picking at clueless council members wasting the resource.

For all the reporting and fear-mongering going on about it, even in our industry, the issue gets swallowed up by the noise. No single viewpoint is going to cover it. No opinion piece will restore the abundance.

We've already covered the complicated legal history of California water use on the Superintendent Radio Network (SRN) podcast. We broke out several stories of the direct approaches superintendents were taking to give their course the best shot at surviving by keeping the turf and budget healthy. If you want to listen to their stories, enter bit.ly/WCcrisis in your browser, or just look back through this summer's podcast feed.



Kyle Brown
Associate Editor

This month's cover story follows GCI assistant editor Guy Cipriano on a unique tour of three California courses all experiencing the drought differently. Some have more resources than others, and each is dealing with diverse pressures. Forget how far away Toledo is from California – even only separated by a few miles, each San Diego course featured faces its own problems during this drought.

But follow the common thread in his reporting, and you'll see what unifies all three courses, along with the courses mentioned on SRN: Rather than being caught up in crosstalk, they're all taking action to try to provide the best resources they can. Whether they're backed up against the ocean or stuck with poor soil, they've learned from proactive superintendents like their colleagues in Georgia in the past few years.

It's easy to shrug off these stories with a course situated somewhere with plenty of natural resources, but the same varied water issues plaguing California courses right now will almost certainly continue inland. The danger to golf comes from pretending water will always be there, that could never happen here. But the facts say otherwise. One moment the water could be there; the next, it's just not. **GCI**

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Career push

How's this for an industry experiment?

Take 50 assistant superintendents either fatigued from long summers or preparing for the peak season. Send them to North Carolina and place them among highly trained peers. Arrange opportunities to interact with superintendents holding the desired jobs they seek.

Green Start Academy, a 2½-day training program sponsored by Bayer and John Deere, concluded last month with a group of rejuvenated assistants returning to work. "This is some of the best networking out there, being around guys who completely understand what each other is going through," TPC Scottsdale assistant superintendent Josh Minson says.

Zach Anderson, the assistant superintendent at Seven Bridges at Springtree Golf Club in Sunrise, Fla., applied to GSA seven times before finally receiving a long-awaited trip to the Research Triangle. Anderson started working on golf courses as a teenager, earned bachelor's and master's degrees and left a job as the superintendent at a nine-hole country club in his native Illinois to work with different grasses in Florida. GSA placed Anderson alongside other like-minded grinders, a hearty breed of determined assistant superintendents looking to advance their careers. The training program also included tours of Bayer and John Deere facilities and group discussions led by presenters such as Pinehurst's Bob Farren and Oak Hill Country Club's Jeff Corcoran.

"In addition to strengthening my labor management, budgeting, professional relationship and resume/interviewing preparedness, the bottom line is that when you get around such a pool of talented and proven golf course professionals it invigorates your passion to want to be the best again," Anderson says. "Being out of college and in the daily grind for over 10 years, my passion to go above and beyond to advance my career fizzled out a bit. Green Start gave me the spark I needed get back in the game, and I'm forever grateful for that."

The fortitude of assistants isn't going unnoticed. "Something like this tells me the dedication they have for what they do and the passion they have for what they are doing," Farren says. "They see a future in it. It's an employable position. That's one of the things I stress to long-time assistants. You're employed and it's a good job. I hear a lot fewer people complaining about their jobs today than five or six years ago."



Green Start Academy, an annual program sponsored by John Deere and Bayer, hosted 50 assistant superintendents from around North America last month.
JOHN DEERE/BAYER



IN IT FOR THE LONG HAUL

It's fall and that means Pat Jones and the rest of our team are bouncing around the country stopping in to say hello to readers and suppliers. A couple of weeks ago, Pat popped into the Jacobsen headquarters in Charlotte to catch up with their team, including the head honcho David Withers. Check out excerpts from the interview at bit.ly/1w6ISZK.



From THE FEED

We heard about it. We saw pictures of it. We asked superintendents whether they were hearing and seeing the same thing. They quickly responded. Dollar spot made its pestering fall appearance in multiple regions. Those who experienced it weren't alone. Dollar spot, after all, is the No. 1 fall disease challenge, according to our recently conducted fall prep research.



Brad Rozzelle
@turfmanpa

Our experience...need to control or it will slowly chew the turf up, fester through winter, then pop up in the same spots in spring.



David Brandenburg
@Trapking9

Fall dollar spot is the gift that keeps on giving. Lots of it hanging out on fairways.



Michael Frasher
@FrasherMichael

DS and this little beauty. PSM



Ross Dominique
@r_dominique_14

An annoying amount on approaches. Sprayed them and fairways same time, and none in the fairways.



Christopher D. Navin
@Chris_turfgrass

Had a big outbreak in md 10 days ago. Nights were high 40s. Sprayed curative tees, fwys, grns. Growth slowing = slow recovery.



Tim Gravert
@SuperTimG132

I hadn't sprayed in a month... started to see a little bit on tees and fwys sprayed today because of warmer temps coming!!

Join the conversation on Twitter @GCIMagazine!

Winter worries?

A repeat of last winter's extreme cold and snow across most of the U.S., east of the Rockies seems unlikely, according to NOAA's U.S. Winter Outlook.

A similar weather pattern is unlikely this year, NOAA predicts, although it does favor below-average temperatures in the south-central and southeastern states.

The outlook for winter favors above-average precipitation across the southern tier, from the southern half of California, across the Southwest, south-central and Gulf Coast states, Florida, and along the eastern seaboard to Maine. However, NOAA cautions that while drought may improve in some portions of the U.S. this winter, California's record-setting drought will likely persist or intensify in large parts of the state. For a complete breakdown of NOAA's Winter Outlook report, enter 1.usa.gov/1lxvh10 into your browser.



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Brian Vinchesi, the 2009 EPA WaterSense Irrigation Partner of the Year, is president of Irrigation Consulting Inc., a golf course irrigation design and consulting firm headquartered in Pepperell, Mass., that designs irrigation systems throughout the world. He can be reached at bvinchesi@irrigationconsulting.com or 978/433-8972.

LIGHTNING STRIKES TWICE

Many golf courses have lightning warning systems consisting of a detector and horns or sirens to warn golfers of approaching lightning.

The detector – manufactured by Course Alert, ThorGuard and WxLine – is usually located on the pro shop roof and monitors cloud and cloud-to-ground lightning. Horns/sirens are located throughout the course. An 18-hole course may have two to five horns/sirens depending on layout and topography. The system can sound an alarm automatically when lightning is detected – some have a 20-mile range – or manually triggered by the pro shop staff. Wires installed throughout the course, or less-expensive and more-convenient solar panels, power the horns/sirens.

Warning systems have been around for decades and are well-proven for golfers, but you can also use lightning detection systems to protect your irrigation system from electrical damage.

When the proper equipment is added, the lightning detection system can initiate an equipment shutdown procedure. Protection is accomplished by installing detectors, transmitters, sequencers and relays to shut down vulnerable electrical equipment, such as controllers and central computers, through the use of contact closures.

Keep in mind that a lightning detection system that automatically protects your irrigation system will be more expansive than just a system that warns through horns/sirens. And you may want two detectors as opposed to one. The number of detec-

tors is dependent on course politics. Normally, the detector is at the pro shop or clubhouse and operated and monitored by the golf staff. Since the communication is wireless – up to three miles with some manufacturers – you can still disconnect the irrigation components through the use of actuators at the maintenance facility. If the maintenance staff and the pro shop staff do not communicate well, then you may want a completely separate system for the protection system with its own detector located on the maintenance facility roof. The pro shop would have a detector to control the horns/sirens and the maintenance facility a detector to disconnect the irrigation wiring. The two detectors would not interact at all.

The level of equipment protection you want the system to provide varies. If desired, it will automatically:

- Disconnect commercial power lines from the central computer and hardware components while switching to a standby power source;
- Disconnect power source (hot, neutral and ground) feeding each group of field controllers;
- Disconnect communication cables out to the field.

The system automatically restores all connections following safe conditions, and measures and records the number of surges during a storm.

With wireless communication, adding equipment is easy although not inexpensive.

Disconnecting the various equipment is accomplished through a



Around for decades, lightning detection and warning systems can also protect your irrigation system from electrical damage.

series of relays that shut off, isolate and/or shunt to ground the power surge. Basically, it keeps the wiring, which may be carrying an electrical charge, from reaching the central computer interface, computer and field controllers.

Although the lightning protection system is pretty much independent of the irrigation manufacturer's control system, some attention must be made to the type of irrigation control system installed at your course. For example, a conventional field controller/satellite system will need to be configured differently for protection than a two-wire system.

If lightning is frequently damaging your irrigation system and your parts budget is out of control, a lightning detection/protection system may be a solid investment. And if your course doesn't already have one, you get the added benefit of a lightning warning system. **GCI**



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Illustration by Matthew Laznicka

By Guy Cipriano

MANAGING MICROCLIMATES

Three San Diego superintendents describe how they manage water, agronomics and expectations.

The Omni La Costa Resort is tucked in the epicenter of California's water conundrum.

Batiquitos Lagoon rests across the street from the resort's entrance. The lagoon is 610 acres with a drainage basin of 55,000 acres. The Pacific Ocean meets land three miles away. San Marcos Creek cuts through the resort.

Sitting in a second-floor office inside a maintenance shop surrounded by prime San Diego-area real estate, veteran La Costa superintendent Steve Auckland describes the challenges of maintaining a 36-hole facility that must satisfy members, resort guests and daily-fee players. Seventy-percent of a 30-minute conversation focuses on water. Here's the frustrating part: none of the water near La Costa provides immediate assistance in keeping turf on two upscale courses healthy, playable and economically viable.

THE 3 SUPERS

STEVE AUCKLAND



Superintendent, Omni La Costa Resort

YEARS AT COURSE: 14
NO. OF HOLES: 36
COURSE OPENED: First 18 in 1965, third nine in 1973, fourth nine in 1984; Champions Course renovated in 2011, Legends Course renovated in 2013

TIM BARRIER



Superintendent, Rancho Santa Fe Golf Club

YEARS AT COURSE: 23
NO. OF HOLES: 18
COURSE OPENED: 1927

BRIAN DARROCK



Superintendent, Fairbanks Ranch Country Club

YEARS AT COURSE: 26
NO. OF HOLES: 27
COURSE OPENED: 1984

"It's all of California," Auckland says. "You cannot operate your product and make money at the cost of water. There's no way. You have to make decisions."

Brian Darrock maintains a golf course in the same region and must make similar decisions about the same resource. Fairbanks Ranch and La Costa are 10 miles apart. Contrasting surroundings hide the geographical proximity.

Fairbanks Ranch doesn't border a lagoon and the ocean is further away. The San Diego River, which runs into the Pacific Ocean, borders Fairbanks Ranch. Rugged terrain and horseback riding facilities surround the 27-hole facility.

Frost – yes that does happen in Southern California – covers part of Fairbanks Ranch around 40 times per year, according to Darrock. Enduring frost is easier than handling changes in water policies.

"The biggest challenge going forward is going to be the cost of water," says Darrock, Fairbanks Ranch's superintendent since 1989. "It's going to keep going up. I don't know the percentage it will go up, but it continues to go up. I don't see it going down."

Neither does Tim Barrier, the superintendent at Rancho Santa Fe Golf Club. Fairbanks Ranch and RSFGC are separated by three miles. But they share little in common besides the city name on the scorecard (Rancho Santa Fe). The Olivenhain Municipal Water District directly oversees Fairbanks Ranch's water supply. RSFGC is in the Santa Fe Irrigation District. The local authorities are part of the 24-agency San Diego County Water Authority. The authority is part of

the Metropolitan Water District. The MWD oversees 26 Southern California cities and water districts encompassing a region with nearly 19 million residents.

Large machines moved the land needed to create Fairbanks Ranch in the 1980s. RSFGC was constructed in the 1920s using horse drawn Fresno sleds. More than 500 palm trees create an oasis-like setting on the Fairbanks Ranch grounds. RSFGC's soils are heavy clay and giant water-guzzling Eucalyptus trees line the course. Fairbanks Ranch has paspalum fairways; RSFGC uses a hybrid Bermudagrass. Fairbanks Ranch irrigates most of its turf with reclaimed water. RSFGC can't use reclaimed water because the closest connecting point sits four miles away. The club irrigates its picturesque 18-hole course with potable water, an increasingly expensive resource.

"It's tough delivering great conditions if you don't have

water," says Barrier, who became RSFGC's superintendent in 1992. "If you didn't, it would turn into that..." Barrier stops his golf cart and points toward wayward areas purposely turned brown. RSFGC has started a turf removal project that will yield a generous rebate and save huge amounts of water. "We would be completely demolished if we didn't have water," Barrier continues.

La Costa, Fairbanks Ranch and RSFGC are survivors. They have developed ways to endure distinct microclimates presenting the same dilemma – how to identify and manage useable water.

Welcome to San Diego. Enjoy the surf, views and breeze. Just remember no two golf courses feature the same water-management challenges.

"In Southern California, water has always been critical," says Dave Fleming, a golf course architect who spent 23 years as a San Diego-area superintendent. "If you're in an area



Native areas, including the one shown above on the 18th hole of the Champions Course, were established during renovations at Omni La Costa Resort. The native areas have helped La Costa conserve water during California's most recent drought.



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that gets rain, you don't even think of saving water. We have always tried saving water. If you save water, you save power to pump the water, power to extract water out of a well. It's a power savings and it's a water savings. Superintendents have always been good at managing that."

LESS RAIN, MORE CHANGES

Six inches. Auckland can't escape the bleak total, which represents the average annual rainfall at La Costa since California's current drought started in 2011. The start of the drought coincided with significant changes at La Costa, which hosted the PGA Tour's Tournament of Champions from 1969-98 and Accenture Match Play Championship from 1999-2006.

A revamped Champions Course debuted in 2011. To conserve water, 45 acres of turf was removed and replaced with native grasses and mulch. The rough and native areas include paspalum, a drought- and salt-water tolerant turfgrass. A revamped Legends Course debuted in 2013 with enlarged bentgrass greens, altered bunkers and paspalum fairways.



Fairbanks Ranch Country Club, a 27-hole facility in the San Dieguito River Valley, was one of the first golf courses in the country to install paspalum. The variety has been ideal for challenging growing conditions that include little rainfall and soils with high sodium levels.

Paspalum's roots in San Diego, coincidentally, extend to Fairbanks Ranch, one of the first courses in the country to install the variety. The golf course at Fairbanks Ranch opened in 1984, the same year the club hosted the Olym-

pic equestrian speed and endurance event. Paspalum showed immediate resiliency, withstanding stress created by 50,000 curious spectators trampling on the grounds to witness the first – and still only – Olympic event contested in San Diego. More importantly, paspalum could handle challenging growing conditions.

"The reason they put it in is because of this river valley," Darrock says. "The sodium levels are so high in the soil that they had to find a grass that could survive that. At that time, we just had the well water to use for the roughs. The well water was running at 1,800 TDS. Cool-season grasses, which would be ideal for this climate,

you couldn't grow because of the water situation."

La Costa's soils are heavy clay and laced with salt. On the rare occasions it does rain, some flooding occurs. To combat the flooding, fairways, tees and approaches were raised as part of the renovations overseen by Damian Pascuzzo, Steve Pate and Jeff Brauer.

The majority of the water used on the two courses is reclaimed, which Auckland says includes more salts, but also more nutrients than potable water. The greens on the Champions Course receive reclaimed water. The greens on the Legends Course receive reclaimed water. "We were constantly giving the freshwa-

“The biggest challenge going forward is going to be the cost of water. It's going to keep going up. I don't know the percentage it will go up, but it continues to go up. I don't see it going down.”

—Brian Darrock, Fairbanks Ranch Country Club

ter greens more fertilizer just to keep up with the reclaimed greens, which was very interesting," Auckland says.

Other contrasts exist between La Costa's two courses. The Legends Course is overseeded. The Champions Course doesn't undergo the same procedure. The fairways on the Champions Course are Tifway 419 Bermudagrass.

La Costa didn't overhaul its entire irrigation system during the renovations. But new pump stations featuring variable speeds eliminated major irrigation concerns. The old system operated at one speed, and Auckland says the resort would experience 12-15 main-line breaks per year. Neither course has experienced a main-line break since the renovations. La Costa can receive as much as one million gallons of reclaimed water per day from the Leucadia Wastewater District's Gafner Water Reclamation Plant.

"It's a huge savings in labor," Auckland says. "It's just confidence. You can go home and sleep at night and not worry. Even though we are using reclaimed water, we are spending a lot of money on water. 700,000-800,000 gallons of reclaimed water is what goes out at night.

"Now we have things much better. With the old system, it was 10 minutes at night. That was the max you could put out. We have a new irrigation control system called Lynx from Toro. You can maneuver heads and manipulate things. We are much more efficient with the water we have. Before, it was everything gets 10 minutes. Now, it's like, 'This gets 10, this gets 15, this gets nothing.' You are much more balanced

in what you are doing."

NO GOOD OPTIONS

Efficiency matters in California. When Auckland arrived at La Costa in 2001, he says water costs occupied 20 to 22 percent of the annual maintenance budget. That total has increased to around 35 percent. An acre foot of reclaimed water now costs more than \$1,500 in Carlsbad. "Even though my usage has gone down, my costs have risen dramatically," Auckland says. The Carlsbad Municipal Water District directly oversees La Costa's water supply.

Darrock and Barrier crunch similar sobering numbers. Fairbanks Ranch pays \$1,300 an acre foot for reclaimed water. "It's a big chunk of your budget," Darrock says.

Fairbanks Ranch started using reclaimed water in 2006. The reclaimed water measures around 800 TDS, meaning it includes less salt than the well water that was utilized by the club. The nitrogen found in the water represents an added bonus.

"If I was on potable water like some of the courses in the area, I would be a little more concerned," Darrock says. "They have more reclaimed water in the area than they know what to do with it. They are looking for customers to sell more water to because they are producing it."

California departed a severe drought in the early 1990s when Barrier arrived at RS-FGC, sparking numerous discussions about using reclaimed water on the course. Each dis-

(continues on page 44)



The Carlsbad Desalination Project, scheduled for completion in 2015, could eventually help some San Diego-area golf courses fulfill their water needs.

NOT AS SALTY

A gigantic reminder of the effort needed to develop new water sources in Southern California towers above the Pacific Ocean coastline north of San Diego.

The Carlsbad Desalination Project, in its third year of construction, is 65 percent finished. The project's developer, Poseidon Resources of Stamford, Conn., and the San Diego County Water Authority, are aiming for a 2015 completion.

Desalination is an energy-intensive process that removes salt from water. The Carlsbad Project costs \$1 billion and could meet 7 percent of San Diego County's annual water needs by 2020. A 10-mile pipeline will connect the facility with a regional delivery system.

Golf course superintendents are closely following the project's progress. Widespread desalination remains a curiosity in the golf industry. "It would be as early as 7-10 years when you could go to that water," says Steve Auckland, superintendent at the 36-hole Omni La Costa Resort in Carlsbad.

Some courses, including Rancho Santa Fe Golf Club, are considering installing their own desalination systems. Cost, available space and brine/concentrate disposal are obstacles for golf courses interested in the process.

Eric Johnson doesn't maintain a course in Southern California. But he can relate to the plight facing the region's superintendents. Johnson also understands desalination's potential.

Johnson is the superintendent at Ranchland Hills Country Club in Midland, Texas. Ranchland Hills installed a state-of-the-art reverse osmosis (RO) system to provide desalinated water from tee to green. A new ownership group purchased the system in 2012. The system started providing treated water for the course in 2013. Reduced sodium content in the water has allowed Ranchland Hills to maintain bentgrass greens. TDS levels in well water range from 3,800-4,000 TDS. "To grow bentgrass, anything over 800 is the kiss of death," Johnson says. Ranchland Hills' RO system can reduce TDS levels below 300.

"There's no way we would be able to operate bentgrass greens here without this water quality," Johnson says. "Members love good greens. It has kept the membership higher because we have a product that other courses don't have unless they get a desalination plant."

West Texas is one of the few places in the United States experiencing water-related challenges comparable to the ones in California.

"We still have access to wells, but we are in a semi-desert area," Johnson says. "People frown if they see a lot of wasted water. Here, the Achilles' heel is the sodium in the water. The water quality is very bad."



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

STARTING THE FORWARD TEE PROGRAM

I have often written about implementing a new forward-tee program as a means to pick up women (players). I have designed them into both new courses and major renovations, but I have started to get calls back from other courses. One such course is Wilderness at Fortune Bay in Tower, Minn., opened 10 years ago, and one of the last courses from my own “Neanderthal” design phase.

It’s a resort course, with lots of female and mixed play, in a state with the highest golf participation rate, where 43 percent of registered handicaps are female. It’s highly ranked by magazines, and weathering the golf recession well, but would like to speed play, cater to women and generally make the course more enjoyable. While back to consult on other matters, I suggested implementing a forward-tee program and they saw the value immediately.

I used a multiple-step process of establishing the parameters, evaluating the existing conditions, setting tees on plan using pure distance and then field adjusting those to their final locations. The last step is most important.

I explained the “proportional theory” of tee placement and hole distance. Old style forward tees were placed by subtracting 20-30 yards from the previous tee. New wave forward tees are placed by a percentage of shot length. There is usually some resistance at first, but after thought, it’s hard to argue the process that greens are generally “meant to be” reached in regulation figures. Extra shots aren’t fun and they slow play.

We presume back-tee players drive approximately the PGA Tour average of 295 yards, with second shots maxing out at 260 yards. We know that many women hit a maximum of 150

yards (although only about 40 percent of the time) and hit fairway woods up to 130 yards, suggests using 51 percent of total distance as a baseline.

A 7,200-yard course such as Fortune Bay should generally play about 3,675 yards. While some forward-tee pioneers have had success at this yardage, most clients prefer a minimum length of 4,000 yards. In a world (or on a course) where the forward tees are over 5,000 yards, 3,600 yards isn’t widely accepted for anything other than junior play. Sometimes, perception is reality, as the managers market them that way.

We decided to use 60 percent and have a target yardage of 4,325 yards. Women will probably hit longer clubs than men into greens, but they should still be attainable in par figures with good shots. There may be three or four holes out of reach, which is better than 18, if not perfect. If using 60 percent as a base, don’t move tees back from the measured locations unless absolutely dictated by site conditions.

Another theoretical item to discuss before detailed planning is whether to design the forward tee golf experience based totally on proportional distance, or to respect USGA established par and length guidelines. While I have seen different hole and course pars at some courses, most prefer to keep the same par from all sets of tees.

Using the 150-130 yard design parameters, the maximum reachable par-4 length is 280 yards, while the USGA says it should be up to 404 yards. On the shorter end of par-4 holes, recreating the play experience of a “possibly reachable par-4 hole” requires forward tees at 150-170 yards, which is below the USGA recommended 205 yards. Having seen the joy women who have actually driven a par 4 from the tee experi-

ence, I favor the proportional holes, no matter how short.

The USGA minimum par-5 length for women of 405 yards is actually about the maximum length they can reach in three shots at 150-130-130, so I never build a forward tee par-5 over 410 yards. Replicating a short- to mid-iron third shot requires a maximum yardage of about 380 yards, below USGA recommendations. However, there are many white tees below the USGA men’s minimum of 471 yards (and increasingly, par 4s with back-tee yardages over 470 yards) so this shouldn’t be a terrible conundrum.

With client and architect firmly on board with both theory and exceptions, the first step of the design process is evaluate what exists. The course measures 7,207 yards, 6,772 yards, 6,147 yards and 5,324 yards (!!?) for forward tees. The first three yardages are popular yardages for the 290-, 255- and 225-yard drivers, which are typical distances by low-, mid- and higher-handicappers. The 5,324 set of tees works well for players in the 180-200 yard tee shot range, which is generally perfect for competitive women and most male seniors. It might be a bit shorter than they play at home, but perfect for a fun day of resort golf.

It was quickly obvious that the solution was to add a new set of tees, and calling the current green tees of 5,324 yards the new white tees. Many courses fit this profile and would benefit from a similar program, while some need adjustments to all tees.

Using maps and aerial photos, we drew arcs at the prescribed 60 percent distance on each hole, working back from the green. This was the basic plan we took to the field to set the final locations, which will be described in detail next month. **GCI**

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TO THE EXTREME

BY GUY CIPRIANO

Glares are nasty. Verbal reactions are unprintable.

The process is, well, gutsy.

Ultra-aggressive and developed by a European sports field manager, Universe fraze mowing has entered the North American golf market.

The process involves removing the top layer of turf

with a Koro Field Topmaker. The height of the cut can be adjusted to fit a user's needs. A proper fraze mow leaves turf looking like it endured extreme scalping.

"The first words out of people's mouths are, 'What have you done? You have ruined this or ruined that,'" says Sam Green, director of business

development for Aqua-Aid Inc. and a former superintendent. Simon Gumbrill, sales director of the United Kingdom-based equipment company Campey Turf Care Systems, succinctly says: "It immediately gets people's attention."

Recovery time following a fraze mow is longer than it would be after other cultural

practices such as verticutting, grooming and topdressing. But Jerad Minnick, the president/founder of Growing Innovations, says the process immediately eliminates thatch, black layer and weed seed.

Fraze mowing was established to benefit cool-season grasses found in Europe. Minnick started tinkering with

the process on warm-season grasses in 2012, and Green says a dozen Southeast golf courses have experimented with the process. Numbers are similar on the West Coast, according to Jock Eddington, owner of Phoenix-based Sports Turf Services. "Everybody that has done work has come back to do more work, which tells you the benefit of it," Eddington says. Shadow Creek, a Tom Fazio-designed course in Las Vegas, and the Titleist Performance Center are among the high-profile West Coast facilities dabbling in fraze mowing.

Recovery time remains the biggest challenge in the golf market. The process has evolved to a point where Bermudagrass can be ready for play less than two weeks after being removed. The recovery time is longer for cool-season grasses.

Green views fraze mowing on courses that aren't being renovated as a process that could work in chunks, meaning portions of the course such as driving range tees, tee boxes and fairways can be completed periodically. "From a golf standpoint, it has to be approached completely different than the sports turf market because in the sports turf market you can stay off something for 21 to 30 days," he says. "The golf market doesn't have that. In today's world, unless you are closing for a project or in the upper echelon of clubs in Florida, name me a course that closes for a period of time? If you are trying to market this to the average golf course, there has to be a plan in place. It's an education to start with."

Some courses are already pairing fraze mowing with renovation work or implementing it with overseeding.

The Golf Club at Cuscowilla in Eatonton, Ga., recently fraze mowed tees and its driving range in conjunction with a transformation from bentgrass to Champion Bermudagrass greens. The course had a 60-day window to complete its work. Tee regrowth took 14-21 days. The course reopened in early September. "The tees looked perfect," superintendent Sam Murphy says.

The work stemmed from a demonstration Murphy witnessed last year. Murphy researched the practice's European beginnings and started pondering potential uses. At first, he wondered whether the technique would work on the slopes surrounding Cuscowilla's greens. He opted for a conservative entry into fraze mowing, performing the operation on flat surfaces, although he now says the process could have worked on areas surrounding the greens.

"My first reaction was that it would be a good seedbed for overseeding," he says. "That's the closest thing I have seen to the final product or finished product. It looks like you severely scalped. I guess that's what started running through my head, 'Jeez, that's really severe.' I also worried about it coming back in time for our purposes. It came back in plenty of time."

Those involved in fraze mowing since its early stages see an opportunity to enter a market they have wanted to reach for almost two decades. A multi-continent investment in the process means more courses will pursue what Cuscowilla recently completed.

"Golf did cross our mind because golf is a bigger marketplace than professional sports



Fraze mowing, which aggressively removes the top layer of turf, has entered the North American golf market. Above: the technique being used on an approach.

turf," Gumbrill says. "The golf market is huge in the world, but also 17 years ago it was a lucrative business. I know the golf market has been beaten up in the last few years, but it still has high demands and cash behind it."

EXPANDING PAST "PITCHES"

Ko Rodenberg had a job with high demands: overseeing the maintenance of more than 100 grass fields operated by the city of Rotterdam. To clean *Poa annua* seed off the top layer of the city's fields, Rodenberg invented a topmaker in 1996.

"He was like everybody else," Gumbrill said. "He had a good gene set, but he had standards that he wanted to meet and he couldn't do it, so he developed his own range of machinery. But he never saw potential for it as a sales idea. It was just for his own personal use."

Like many good ideas in the turf industry, the topmaker de-

veloped by Rodenberg reached the commercial market, sparking a rise in the volume and scope of fraze mowing throughout Europe. The machine and process was geared toward helping off-season renovation work on soccer "pitches."

Similar to U.S. football fields, elite European "pitches" receive extended periods to heal from a season's worth of abuse. The typical recovery time for a ryegrass soccer pitch following a fraze mow in the late 1990s was a minimum of eight weeks, meaning what worked at Premier League pitches would cause discontent at a golf club. "You can't close a course down, certainly in Europe," Gumbrill says. "You have to be open all of the time." Improved technology and enhanced fertility practices have trimmed recovery time on ryegrass from five to six weeks.

Other varieties, though, require less recovery time,

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and creating a rotor with what Gumbrell calls more “finesse” represented a path toward entering the golf market. A more precise rotor also fascinated Minnick, who received his first exposure to fraze mowing while attending a demonstration day in the Netherlands in the summer of 2012.

Minnick was working as the sports field manager at the sprawling Maryland SoccerPlex and developed a friendship with Gumbrell. The pair quizzed each other about their respective continent’s turf management practices, leading to a fraze mowing trial on the SoccerPlex’s thatch-heavy Bermudagrass. The re-growth period lasted three weeks.

Minnick also performed trials on Kentucky bluegrass. A bluegrass field inside the SoccerPlex needed 35 days to become playable following a renovation. “Historically, they tell you that takes three to six months,” Minnick says. “It was a whole new world.”

Discussions about fraze mowing in the United States intensified after Minnick and Gumbrell attended a Washington Nationals game. After the game, the pair noticed members of the grounds crew scarfing. Gumbrell asked Minnick why this was happening. Minnick offered an obvious answer: to remove organic material. Gumbrell then made a bold claim, saying equipment could be developed to eliminate thatch by removing as much as 50 percent of the surface layer.

Three months later, Eddington operated a prototype rotor on a Bermudagrass golf course tee in Phoenix. Minnick flew to Arizona on his own time and money to watch the rotor fraze mow. “We ran the



The amount of plant material remaining after a fraze mowing trial on a golf course in the United States. The practice, which started in the 1990s on European soccer “pitches,” has been used on golf courses in the Southeast and West Coast.

prototype rotor for 10 feet,” he says, “and I knew we were on to something because there were so many plants left behind for regeneration.” The pair immediately called Gumbrell. The excitement was palatable. “They said, ‘We have stumbled upon the future of Bermudagrass maintenance,’” Gumbrell says.

The rotor was refined and more trials continued throughout 2013, with some occurring on fields at Major League Soccer venues and the SoccerPlex. While Minnick explored uses on soccer fields, Green performed trials on golf courses in the Southeast. Minnick calls golf a “really big piece” of fraze mowing’s 2014 evolution.

Regrowth rates will likely dictate success in the golf market. Minnick has tested 10

different fertility regrowth programs on Bermudagrass, including some on an ultra-exclusive Florida country club that keeps its activities private. By seven days, he says Bermudagrass can recapture its green hue. By 14 days, he says grass can experience 100 percent regrowth. He adds fraze mowing Bermudagrass fairways once every two years could make a big difference in turf health.

READY FOR ACCEPTANCE

Another big part of 2014 has included performing tests on cool-season grasses in the United States as a technique to control *Poa annua*. Cleaning *Poa annua* seed off the top of turf circles back to one of Rodenberg’s primary goals when he designed the topmaker.

“You know the genetics of grass,” Gumbrell says. “It creates its own problem. We feed it, water it and then you create a problem. It’s purity. You can remove the problem.”

Cleaning any type of grass with a fraze mow is an extensive operation. The topmaker attaches to a tractor and hurls massive amounts of clippings to the side. A line of vehicles with beds travel alongside the topmaker to collect clippings. Boards prevent clippings from exiting the far sides of beds. “It’s logistically a big operation,” Eddington says.

The process resembles shaving a head: fluid and controlled but with a shocking result. Turf, though, can be manipulated to regrow at faster rates.

Educating the golf market about the technique and regrowth options represent a big part of Green’s 2015 plans. “You can talk all you want at a trade show, but the superintendent is going to say, ‘You know what, I want to see that on my property,’” he says.

Fraze mowing will eventually become an “accepted” practice in the U.S, with courses cleaning out Bermudagrass fairways and tees every two or three years, Eddington says. As far as fraze mowing on cool-season grasses, Minnick says, “that’s up to the golf community” to decide.

Fraze mowing has achieved a significant breakthrough in its short existence in the U.S. The practice promotes dialogue between superintendents and sports turf managers, groups Gumbrell says are trying to solve similar problems. “The job description is exactly the same in sports turf as it is for golf,” he says. “You’re trying to keep a fit and healthy plant.” GCI



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FEEDBACK

I received this letter in response to my September column, "What's in a Name?" I've edited it to protect the innocent and the guilty.

I just finished reading your article and was happy someone finally touched on the subject of inflated resumes. There is a ripple effect to applicants exaggerating their titles and jobs descriptions when applying for a superintendent position. It not only is misleading to the searching clubs, but it also puts less value on Superintendents that earned it the hard way (like me).

I have applied for every good job that has been open since 2009 and came close many times. It seems to be the same thing over and over. I make it to the finals and start asking around about the other finalists. When I hear I am up against "The Superintendent from Big-Name Golf Club," I can't believe this well-known guy wants the position, only to find out that it is not him but rather one of his assistants that manages the ladies' driving range tee. This assistant obviously has on his resume that he is "The Superintendent of Big-Name Golf Club," the hiring clubs believe it, and more often than not they hire the logo.

Sometimes even the GCSAA makes them look better than they really are. Looking through my GCSAA directory I see Fancy Pants Country Club with three class "A" superintendents and two class "C." I know for a fact that these class "A's" have beat me out of at least one great job. I'm a class "A" but can't possibly compete with a class "A" from those U.S. Open-type courses when the decisions are made on who to offer jobs to. It looks like we are on the same level when we are not. The jobs go to the better club.

The GCSAA allows the non-superintendents who work for three years at a club and are the superintendent of something (driving range, tennis courts,

ladies par 3 course) to become a class "A." This is misleading on a resume. It's a shame, but a fact, that if I managed Big-Name's driving range for one summer and put on my resume that I was "Superintendent," there, I would land a job 100 times faster than being the Class "A" Superintendent where I've been for 12 years. The GCSAA needs to add an extra category for those "Superintendents" at clubs where they are not in charge of the operation but have the title. Possibly "junior superintendent."

Thanks for bringing up the subject. While I doubt it will make anyone actually adjust his or her resumes, at least it will inflict a little guilt.

It's both heartening and depressing to learn how right I was. Hearing from someone I know and whose work I respect, forces me to repeat my assertion that the system is flawed and our industry should take a hard look at our designations, ratings and titles, as well as what it does to help its own move up the ladder.

We are so concerned about sustaining the game, keeping courses in presentable shape and hanging onto our jobs that we don't step back and think how our industry's standards and practices look to those who have to make decisions based on them. But it isn't only an internal problem.

Cachet, or "name," clubs bamboozle members, recruiters and GMs with these inflated, erroneous titles. People want to rub shoulders with and have bragging rights to hiring someone previously associated with a top-name club – whether these potential hires have the authority and responsibility they claim.

Committees, in my experience, often don't have the guts to go with the most-qualified, dedicated, hard-working turfgrass producers. They know

who the best potential new hires are, but it's hard to justify a lengthy search and then present a slate of candidates coming from second-level clubs. Right or wrong, this is the reality.

I'm not saying we shouldn't consider pedigree, but those people doing the hiring have to look beyond the name and focus on course condition, work ethic and overall demeanor. These are more important than a name on a resume.

I know superintendents and assistants with excellent references and proven track records who work at what some perceive as "next-level" clubs. I do everything I can to push these quality, qualified individuals who produce great results yet aren't getting a sniff when better jobs open up. This is the unfortunate norm in our business. And as much as I try to make the case for open-mindedness to the committees I consult with, a name is a name is a name.

Unfortunately, the GCSAA doesn't have a "minor league." Instead, we face the unfortunate prejudice that someone from one of those top clubs is automatically well trained, well educated and qualified to move up. Very often, that's a big leap, and one taken without careful research by those doing the hiring.

We have to change this prejudice. I'm not sure how, but everyone, especially the GCSAA, needs to give this careful and considerate thought.

With course numbers on the decline and more qualified candidates than jobs, how can we level the playing field? This is an important issue, not only for the clubs that are hiring, but for the credibility of our industry and our futures, individually and collectively. We all need to get smart, get serious and get ahead of this situation before it drives good people away. **GC**

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When the boss is away

Assistant superintendents relish an opportunity to lead when their supervisor takes a break.

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Part of becoming the boss involves learning how to handle situations and make decisions when the boss leaves town or shuts down. Entrusting an assistant to make the final decisions for a few days can

yield benefits for superintendents and assistants.

"I think it works in both ways," says Cameron Watt, assistant superintendent at The Redwoods Golf Course in Langley, British Columbia. "For me, it helps me know that I can make a decision and it helps my boss know that he can trust me to make decisions."

Breaks are needed at Redwoods. The 18-hole course 30 minutes from Vancouver markets itself as a place to play golf 365 days per year. The course receives snow, but play is encouraged shortly after it melts.

BY GUY CIPRIANO



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Watt has spent 16 months working with superintendent Peter Szarka at Redwoods. The course is Watt's third stop as an assistant, and he landed in British Columbia after a flood forced his previous course, Kananaskis Country Golf Course in Alberta, to close.

Past experiences allowed Watt to make a bold, yet thorough decision when Szarka took time off last winter. A disease had quickly spread on a fairway. To complicate matters, Redwoods' treatment stock had been depleted. Watt couldn't immediately reach Szarka. Instead of fretting, Watt treated the area using existing products in stock. "I just made the call," he says. "It was getting worse. I just went through the reasoning in my head, why I should make the call, the pros and cons." And what happened? "It worked out," he says.

In South Florida, where temperatures reach triple digits and storms plow through coastal settings, water-related decisions require immediate action. Too little water can wilt greens. Too much water can cause turf diseases.

Troy Hall, assistant superintendent at Indian Creek Country Club in Miami Beach, Fla., leans on past experiences, regular dialogue with longtime superintendent Joe Pantaleo and technology. Hall worked at The Club at Mediterra and Trump National Doral before arriving at Indian Creek, and he doesn't get nervous when Pantaleo leaves. Indian Creek receives most of its play from January-April. If Pantaleo leaves, it's usually in the summer, when conditions reach extremes.

"Irrigation is the most important thing when he's gone," Hall says. "The greens can get

real hot, real quick when it's 95 degrees. When you get a ton of rain, you have to keep your eyes open for disease. It can happen real quick if you don't see the problem. Now the technology is so good. You can take pictures, and send emails and texts with pictures. There are a lot of people out there to help you identify things."

Kyle DeNuys, assistant superintendent at North Jersey Country Club, says disease and summer irrigation decisions are key calls to make when his supervisor can't be reached. But 12 years in the business and two previous assistant superintendent jobs offer guidelines for making sound agronomic decisions. "As far as agronomical, I haven't run into anything where it's been like, 'Oh, I don't know what to do,'" DeNuys says.

DeNuys arrived at North Jersey last summer and found himself in an odd situation when the superintendent who hired him, Dave Dudones, left the club for a position at Westchester Country Club. Tyler Otero replaced Dudones, and DeNuys established a call-often, text-frequently relation-

“I say let them deal with it, because that's the only way they are going to learn.”

— Chris Condon, Tetherow Golf Club

ship with his new boss. That relationship should benefit DeNuys if he's forced to make what he considers a tricky member-related decision such as giving the pro shop permission to allow play to begin 15 minutes earlier than nor-



Oak Hill Country Club's Jeff Corcoran creates lengthy to-do lists for assistants when he leaves for an extended period.

mal, thus setting a precedent of earlier tee times. "That's something I would be leery of because I would like to talk to him before making that decision," DeNuys says.

Most superintendents stay wired when they leave the course. Jeff Corcoran, manager of golf courses and grounds at Oak Hill Country Club in Rochester, N.Y., calls assistants and requests daily update emails. Before leaving the club for an extended period, Corcoran also compiles lengthy to-do lists for his assistants. Oak Hill

Solid work when Corcoran isn't around can help an assistant advance his or her career.

"I would like to see that they get some stuff done that was on their short list that wasn't on mine," he says. "It's kind of cool to see how they do. I have had situations where I have gone away and come back to a bomb and I've had situations where they have done more than I ever expected them to get done."

Chris Condon, the only superintendent since Tetherow Golf Club in Bend, Ore., opened in 2008, operated as a stay-at-home superintendent early in his career. His ways are changing as his career progresses. Last month, Condon left Oregon for three days to participate in Green Start Academy as a guest presenter. When he's not at the course, tries to stay away from work "as much as possible," although he makes himself available to assistants when technology permits. "I say let them deal with it, because that's the only way they are going to learn," he says.

Patrick Brey, the assistant superintendent at Aspen Glen Club in Carbondale, Colo., calls it a "normal day" when superintendent Jake Falke leaves town. A drainage ditch that sometimes overfills and causes water to enter the property creates dilemmas at Aspen Glen. But Brey has spent six years at the club, giving him a solid knowledge of the problems associated with the ditch and a base to formulate decisions when he can't reach Falke. "I can handle things when he's around and when's not around," Brey says. "The expectations don't change. It's the same." **GCI**



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Monroe Miller retired after 36 years as superintendent at Blackhawk CC in Madison, Wis. He is a recipient of the 2004 USGA Green Section Award, the 2009 GCSAA Col. John Morley DSA Award, and is the only superintendent in the Wisconsin Golf Hall of Fame. Reach him at groots@charter.net.

BACK IN THE SADDLE

Some, maybe most, golf courses in our neck of the woods still depend on students – college and high school – home for the summer for the bulk of their seasonal staff. I always felt it was a great answer to our short-term labor demands; the young people have an enthusiasm that is contagious, positive and rewarding.

Decades of experience have proven to me that they are fully capable for the part they play in keeping a course in excellent condition. I am prejudiced, I admit, because that is where my interest in a career germinated.

The problem that a student staff poses is that they don't start until around mid-May and depart right after Labor Day. That leaves the staff shorthanded during some super golfing days. We filled the shortfall with part-timers, retirees and others available at those times. It may be a little inefficient, but it worked well for a long time.

So it was no surprise when I got a call this fall from Chad Grim, my successor. He wondered if I wanted to help out a bit. I jumped at the chance. They had some events to prepare for and wanted to give those players the same conditions a group would expect only a few weeks earlier. The kids might leave, but the grass continues to grow, diseases still crop up, other problems seem unending and golfer demands are still high.

When I return to work, it's for a short time – a day or two or three – and I operate only as a volunteer. And I have to maintain a low profile otherwise I end up chatting with members I have known for years.

But it is a purely joyful time, an experience you couldn't buy if you wanted to. I love the smell of the shop, the camaraderie with the staff and the immersion in an absolutely

beautiful landscape. It's a bit of heaven on earth.

As soon as I walk into the shop, the insults start. "Are you lost?" Or, "I wonder how long it will take you to break something?" Or, "Did you miss the nursing home bus at the senior citizen bus stop?" Then there's grief about my pay – zero as a volunteer – and how "that's about the right amount, exactly what you are worth!"

It is my role to walk in and start issuing orders, which all the guys are anxious to ignore. I demand the easiest assignment, insist on the newest machine and then I list the jobs I won't do – too hard, too much pressure to perform or not much fun!

“As soon as I walk into the shop, the insults start. ‘Are you lost?’ Or, ‘I wonder how long it will take you to break something?’”

My assignment is usually mowing fairways, one of the best tasks these days. The equipment is operator friendly – quiet, smooth and responsive. I still appreciate having all the cutting units in front of the tires, an emotion common to old gang-mower operators like me. The hydraulic units give a superb cut and the results are immediate and beautiful. No wonder I like it so much.

We mow in teams, and on this day Chad and I were the only team. Obviously, the goal is to keep ahead of play, so there is the usual competition to cut the straightest pass, to minimize turning time and to do the best job on the cleanup round. The challenges can be enjoyed even on a pleasurable task, reminding me that I will probably be a competitive person to the day I die.

The days of fall require comfortable clothes, warm boots and, if lucky, sunglasses. The air is fresh, and the results of one's effort are immediately visible, almost startling. That almost instant revelation appeals to nearly everyone who has worked for any length of time on a golf course. These days there are fewer and fewer jobs that offer that appeal.

Our course is located on the shores of the 10,000-acre Lake Mendota that our city is built around. It is 200 feet from the shoreline to the play areas around the clubhouse. From that promontory, I can look across the lake and see where I have lived for almost 40 of the 50 years since I came here

as a college student. The early hints of fall color and the beautiful days to come remind me why the Sac Indians of 1,000 years ago lived here – the same reason we do.

Mowing fairways like this, when operator and machine are nearly one, gives the operator some great thinking time. And what I was thinking about most is that I am so fortunate to have settled on a career that offers so much. We manage people, budgets and property. We are responsible for assets commonly running into the millions. We are charged with providing conditions that give so many the opportunity to enjoy a great sport.

And occasionally, even in retirement, we get to go back to when we were young, and understand with clarity why we chose this career. It doesn't get much better than that. GCI

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Making the cut

A tree care strategy is essential to properly care for your course's largest natural resource.

By JOHN TORSIELLO

Americans love their trees. Some bloom, others turn color in the fall and put on a dazzling show. Golfers even like them, except when they find themselves behind one. Golf course superintendents? Well, they put up with them and for the most part think about them when they have to. Mark Jackson, head of the golf division for the Davey Tree Expert Company in Kent, Ohio, says that kind of approach leads to problems.

"I really recommend that all superintendents do a tree inventory, make an assessment of what needs to be done and when, and develop a game plan on trees for a five- to 10-year period," Jackson says. "Most superintendents deal with tree pruning and removal in a reactionary way. But by being pro-active and even preemptive in some instances (as in the case of impeding spread of disease among trees) they can stay ahead of the curve to the benefit of the golf course."

"Tree care should be part of the regular golf course mainte-

nance plan," says J. Kelly Lewis, general manager/partner of Ruppert Nurseries, Inc. in Maryland. "Just like there are proper times to overseed or aerate greens, trees have seasonal needs." Removal, he explains, is best done during the winter months when play is slower. Pruning and care is somewhat tree variety specific. Pruning for most evergreen trees is best done between early spring and early summer. Most shade and flowering trees should be pruned while dormant (no leaves).

Specific tree issues often

need to be handled proactively and during the growing season. “Having a tree inventory and management plan can really assist a superintendent with budgeting and justifying the need for funds for tree care,” says Scott Jamieson, vice president of Connecticut-based Bartlett Tree Experts.

That’s why it’s wise to involve management and even membership in a tree removal/care/pruning plan, as taking down or cutting back trees, especially that favorite one of the club president, can alter the way a course looks and raise the ire of your bosses and customers.

“All clubs have different dynamics and relationships between those who take care of the course, those who manage and those who play,” Lewis says. “However, in general, an informed description of what is going to happen, when and why to all those involved may reduce the concern that comes with a surprise.”

It is important for everyone at the club/course to be informed of the facts and able to give feedback on tree removal/pruning, says Jason Wilson, superintendent for ValleyCrest Golf Maintenance at Omni Amelia Island Plantation, Fla. “A well thought out plan should be conceived with a managerial focus group and reviewed before release to the membership,” he says. “The membership should be informed why and how the work will be done, and should be included as a partner in the final decision.”

Dave Tree’s Jackson cites an example of how the simple act of cutting a large tree back can dramatically affect the aesthetics of a golf course.

“One of our private club

clients in Ohio has a huge oak tree by the ninth green that was affecting shots into the green,” he says. “The problem was how to trim the tree so that the golf shot could be hit the way it was designed to be hit, but also preserve the beautiful view back from the green to the clubhouse. At first, two large limbs were going to be taken down, but it would have made the tree look horrible. So a compromise was reached where only one limb was taken down. The hole could now be played as intended and the view was not affected to any great degree. It shows that the matter has to be discussed and a plan of action developed that addresses all concerns.”

Remember, trees are not created equally. That’s why it is important to develop an ongoing professional relationship with a local arborist who knows the trees on your course and how to approach any issues, such as disease or proper pruning.

“What we do in Massachusetts for such things as planting and fertilization times and rates can differ greatly from here to Arizona or southern Florida,” says Dr. Dennis Ryan, professor of arboriculture at the University of Massachusetts. “That’s why it is crucial to have a local arborist do a survey of your important trees once a year. The problem facing the trees on the golf course is the same that Mrs. Smith is facing with her favorite tree down the road and he knows this.”

Brian Benedict, superintendent at The Seawane Club in Hewlett, N.Y., says that most pruning at his course and others in the region is undertaken as “safety pruning,”



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When it doubt, contract it out

When it comes to tree care, some jobs are too big and too dangerous, or just need professional expertise to keep the tree healthy. STIHL spokesperson and certified arborist Mark Chisholm’s rule of thumb is this: Unless you can work with both feet on terra firma, you should hire a professional tree service.

Chisholm says evaluate what you can handle and what’s for a pro – anything not on the ground should be handled by a professional. Working with trees could be life-threatening, so it makes sense to spend the money if you’re not absolutely confident in your skills, or if any of the below situations apply:

- Large limbs are broken or hanging or overhead chainsaw work is needed.
- If a tree is uprooted or downed, it can create an unnatural pattern of pressure points and tension.
- A chainsaw operator may be in severe danger if attempting to cut a tensioned limb or trunk (called a “springpole”) – it may have an extremely violent, catapult-like reaction. If branches are too close or touching utility lines, report it immediately to your local utility company.
- Never attempt to move downed utility lines.
- If there is any task you have not been properly trained to handle or are uncomfortable undertaking.

You want to ensure the tree care company is properly insured and that you will not be liable for damage, accidents or injuries. Try to hire a company with an International Society of Arboriculture (ISA) certified arborist, a Tree Care Industry Association (TCIA) Accredited Business or one employing a Certified Tree Care Safety Professional (CTSP). If work is to be done in proximity to electrical conductors, you will need an Approved Line-Clearance Arborist.

Another important key: Get written estimates from three equal companies to compare prices and understand the scope of the job.



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which reduces the deadwood and potential harm to pedestrian foot traffic below a tree. Another form of pruning may be shaping or vase pruning to create a desired shape for a particular cultivar of tree. This takes much more time and the hiring of a highly skilled and trained climber/arborist.

Benedict believes there is a “percentage factor” of canopy dieback that must be calculated to determine whether a tree must be removed.

“You must also take into account that by pruning too much of the tree and reducing the leaf canopy where the photosynthesis is reduced to the point the tree can’t sustain itself becomes a factor as well,” he says. “Most turf guys will lean towards removing entire trees as opposed to just pruning it unless it is a prominent tree. If a tree is being fought over for keeping, bringing in a certified arborist is always the best call.”

Pruning helps overall tree health, appearance, fruiting and shape. Pruning in late winter, just before spring growth starts, leaves fresh wounds exposed for only a short length of time before new growth begins the wound sealing process. Another advantage of dormant pruning is that it’s easier to make pruning decisions without leaves obscuring branch structure. Pruning at the proper time avoids certain disease and physiological problems.

Outside of this, Wilson says superintendents should always look for diseased wood and weak branches, which can be a potential liability. “Dead wood can easily break off trees and strike people and property,” he says. “For this reason, damaged, diseased or dead limbs should be removed



immediately.”

Pruning trees is more than just cutting branches, it’s a combination of science and art. How a tree should be pruned depends on the location, growth habits and the specific needs of the course, Wilson says.

Generally, there are five types of pruning: crown thinning, which removes smaller outer canopy branches, helping to reduce weight and increase sunlight and air penetration; crown cleaning, which selectively removes hazardous, dead or dying branches from the tree canopy; crown raising, which removes lower branches to increase clearance under the leaf canopy (also known as “elevation” or “limbing up”); crown reduction, which carefully removes certain stems or branches back to lateral limbs (as opposed to “topping,” which leaves large, open wounds that subject the tree to disease and decay); and crown restoration, corrective pruning done over a period of time to restore good structure and appearance in trees that have been damaged. Removal is generally considered if the tree is damaged, diseased or damaging to landscape and fine turf. A certified arborist can help assess the health or safety of a tree, and should be consulted when in doubt.

Of course, tree pruning, and at times removal, has considerable, albeit sometimes subtle, consequences for a golf

To fertilize or not?

If you ask 10 nursery or arborist professionals, you may get 10 different answers as to when and how to fertilize trees.

Actually, most trees require very little, if any, fertilization when planted in the correct location with good soil. However, soil tests are the best way to determine if the surrounding area has the adequate nutrients for a particular tree.

course. Removed and pruned trees allow more light and air circulation, letting grass thrive to a greater degree.

“Based on competition, a tree and its roots will outcompete grass plants every day and twice on Sundays,” Benedict says. “As far as the playing of golf is concerned, trees shape and create features on parkland golf courses. For me personally, the best trees stand alone and have a symmetrical look where the canopy is full, almost in the shape of a light bulb. Trees planted too close together serve no purpose, they should be planted and spaced appropriately so the tree has every chance to grow perfectly. As far as golfers go, they serve as shade and increase aesthetic quality when taken care of the correct way.”

The size of the tree and branches to be cut will dictate whether the use of a chain saw, hand saw or hand pruners is the appropriate tool,” Lewis says. On a golf course, much of the pruning will be to remove lower branches so maintenance and golfing activity is facilitated. Other reasons for pruning include dead or diseased branches, structural needs – such as crossing branches – and the general shaping on the tree.

“If a tree is impacting play, then the call of whether to trim or remove is best made by the superintendent,” he says. “However, if the issue is one of the health of the tree, consult-

ing with a nursery professional or arborist is the way to go.”

Jackson cites the difference proper tree pruning or removal can make to the condition of the playing surface.

“Turfgrass, especially the modern strains, needs morning sunlight and good air circulation to grow properly,” he says. “You have to pay attention to how trees affect the sunlight in the morning because if you don’t, all of a sudden *Poa annua* starts moving in and out-competing the desired grass. You may not think that a tree or trees can do that, but that is the problem, not the grass. It’s almost like magic. You take away a tree that is casting a shadow on a green and the grass responds positively in 30 days.”

Paul Brandenburg, course superintendent of Furman University Golf Club in Greenville, S.C., believes tree removal “always helps the turf, and many times helps the golfers. It’s one less obstacle. I have found that involving the golf course architect always helps.”

Often, proper maintenance avoids removals down the road, Wilson says. The total cost of properly maintained trees is much lower than one might consider because a healthy tree is one that may not require removal/replacement, or result in a liability insurance claim. **GCI**

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



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

SOMETHING'S GOTTA GIVE

Everyone wants to save the game. A lot of people even have an idea about how to do it. Six- and 12-hole courses, 15-inch cups, more women, more kids, relaxed dress codes. You can call the people advocating these changes anarchists, revolutionaries or subversives. There's no reason to doubt anyone's sincerity.

All of those audacious souls are telling us the same thing: something's gotta change if golf is going to remain a game and a business with a bright future. We live in an era of change and disruption. Driven by technology and the suddenly empowered consumer, industries and business models are being turned upside down. Except for golf.

At the recent Crittenden Golf Expo, Dave Schreiner, founder of Mature Market Strategies, a lifestyle company that specializes in the boomer generation, put it this way: "Golf is a single-minded business in a multi-tasking world." Seen in that light, golf appears rather quaint. But the fact of the matter is that golf has proven itself remarkably resilient and appealing to a hardcore group of advocates. And that's the catch, isn't it? The game attracts devotees who are your customers for life. At the same time, it churns others who give it a try before moving on to something else. The National Golf Foundation estimates that some three million people start and stop being golfers on a regular basis.

In the spirit of constructive disruption, here are seven things you can consider doing to change your business for the better:

1. Understand Your Market Segments.

Your course serves a number of market segments – not one. Identify the segments that you serve as well as

those within a 20-minute drive. Learn what each group of players wants, and be careful about painting with a broad brush. For example, your early morning weekday golfers are usually retirees who want to play fast and inexpensively. They appreciate a friendly greeting, but will eat breakfast and lunch somewhere else. The Saturday morning crowd wants to be recognized, coddled and well-served. Your women players have various needs based on where they happen to fall in their life and career cycles.

2. Promote Convenience. Your draw area is more specific than you may think. In a time-strapped world, most people choose convenience over other factors. So make sure you're not standing in the way of them getting back to the rest of their life. That means an efficient check-in, getting off on time and playing without delays. When golfers are evaluating where to play, you want them to think of your course as a place where pace-of-play is taken seriously.

3. Create Clans. Futurist Faith Popcorn describes "clanning" as the natural affinity we have for people like ourselves. In simple terms, people like to gather with people like them. Golf facilities should facilitate clanning by organizing groups and networks of like-minded members and customers. Everyone wants to fit in with their group, so make it easy for them. Then get out of the way and let them enjoy each other's company.

4. Study Your Golfers' Habits. The capability for collecting and analyzing use and participation habits has never been easier. Your tee-sheet and database management systems are organized for this task already. Jon Last,

who runs Sports and Leisure Research Group, advises that one should track frequency, what he calls "recent-cy" and spending. How frequently do your golfers play at your course? How recently did they do so? How much did they spend and for what? After collecting this information, spend time deciding what the numbers are telling you. Then do something to take advantage of tendencies and preferences.

5. Increase Customer Loyalty. Retailer Sy Syms always said, "An educated consumer is my best customer." Today he might amend that to say that an educated and a rewarded consumer is your best customer because everyone wants more for their money. So give it to them. Find ways to increase value. And that doesn't always mean defaulting to discounting. When the pro stops to say hello on the putting green and pauses long enough for a quick tip, that's value that builds loyalty – and it didn't cost a dime.

6. Maximize Social Opportunities. Most people play golf to socialize. So make your facility friendly to everyone. See that newcomers are greeted and welcomed. Help golfers connect with one another by posting sign-up sheets to encourage single players and twosomes to find a group and a game that suits their interests and skill levels. Host parties, conduct ice-breaker games, mix-and-match foursomes, ABCD events and anything else that helps golfers know – and be known by – more of their fellow golfers.

7. Keep it Fun. You could be selling shower curtain rods. Instead, you're facilitating a few hours of leisure time in the great outdoors. Golfers are paying a premium to have fun. Make it easy for them. **GCI**

DR. JAY MCCURDY, ASSISTANT PROFESSOR, MISSISSIPPI STATE UNIVERSITY; DR. SCOTT MCELROY, PROFESSOR, AUBURN UNIVERSITY; DR. JOHN BYRD, JR., PROFESSOR, MISSISSIPPI STATE UNIVERSITY

Resisting the resistance

Preventing and managing herbicide resistance in turf.

Herbicide resistant weeds are among the most troublesome issues facing the turfgrass industry. The loss of effective and economically viable herbicides results in lower quality turf and increases weed management budgets. Herbicide resistance is the inherited ability of a plant population to survive and reproduce following treatment with a normally lethal dose of herbicide. This is not a new issue. Simazine and atrazine resistant groundsel (*Senecio vulgaris*) was reported as early as 1970 (Ryan, 1970). Simazine resistant annual bluegrass (*Poa annua*) has plagued golf courses, sports fields, industrial turf, and sod producers in the southeastern United States for more than two decades. As of 2014, more than 420 unique cases of herbicide resistant weeds have been reported globally (Heap, 2014). That equates to 232 species having evolved resistance to 22 of 25 known herbicide sites of action and to 152 different herbicides. Table 1 lists herbicide resistant turfgrass weeds of the United States as of 2014.

Preventing and managing herbicide resistance is crucial to preserving key chemistries that turfgrass managers use

EDITOR'S NOTE

A version of this article first ran in the Alabama Green Journal. It was updated by the authors and is reprinted with permission.

Table 1. Herbicide resistant turfgrass weeds reported by the International Survey of Herbicide Resistant Weeds (Heap, 2014). Readers should note that there are often confirmed instances of resistance not yet officially reported.

Resistant Weed	Mode-of-Action	Active Ingredient	Trade Name
Goosegrass	Mitotic inhibitors	pendimethalin, trifluralin	Pendulum, Treflan
Large Crabgrass	Acetyl CoA Carboxylase (ACCase) Inhibitors	sethoxydim, clethodim	Segment, Envoy Plus
Lawn Burweed	Synthetic Auxins	Clopyralid, Triclopyr	Lontrel, Confront
<i>Poa annua</i>	Acetolactate Synthase (ALS or AHAS) Inhibitors	bispyribac-sodium, foramsulfuron, imazaquin, trifloxysulfuron-sodium	Velocity, Revolver, Image, Monument
<i>Poa annua</i>	EPSP synthase inhibitors	glyphosate	Round-Up
<i>Poa annua</i>	Mitotic inhibitors	prodiamine, pendimethalin	Barricade, Pendulum
<i>Poa annua</i>	Photosystem II inhibitors	atrazine, simazine	Aatrex, Princep

to provide a playable and aesthetically pleasing turf surface. It is important to understand some basic terminology associated with herbicide resistance.

MODE-OF-ACTION (MOA)

Herbicides are active at one or more target site(s) within plants. Target sites are often enzymes that play a critical role in plant metabolism. The term site-of-action is used interchangeably with MOA; however, the terms have

somewhat different connotations. The MOA is how a herbicide kills a plant. For instance, atrazine inhibits photosystem II, subsequently leading to a build-up of oxidative free radicals and a decrease in photosynthesis. Site-of-action is where the herbicide binds in order to kill a plant. Atrazine inhibits photosystem II by binding to a specific site-of-action, the Quinone B binding niche on the D1 protein.

Table 2 lists common turfgrass MOA's

Table 3. Mode-of-action and classification of common turfgrass herbicide site of action according to the Weed Science Society of America (WSSA) and the Herbicide Resistance Action Committee (HRAC).

Timing	Mode-of-Action	WSSA Group	HRAC Group	Common Name	Trade Name
Pre	Mitotic inhibition	3	K1	dithiopyr	Dimension
Pre	Mitotic inhibition	3	K1	pendimethalin	Pendulum
Pre	Mitotic inhibition	3	K1	prodiamine	Barricade
Pre	Lipid biosynthesis inhibition	8	N	bensulide	Bensumec
Pre	Photosystem II inhibition	7	C2	siduron	Tupersan
Pre	Protoporphyrinogen oxidase (PPO) inhibition	14	E	oxadiazon	Ronstar
Pre/Post	Mitotic inhibition	15	K3	dimethenamid	Tower
Pre/Post	Mitotic inhibition	3	K1	pronamide	Kerb
Pre/Post	Mitotic inhibition	15	K3	metolachlor	"Pennant Magnum"
Pre/Post	Photosystem II inhibition	5	C1	amicarbazone	Xonerate
Pre/Post	Photosystem II inhibition	5	C1	atrazine	Aatrex
Pre/Post	Photosystem II inhibition	5	C1	metribuzin	Sencor
Pre/Post	Photosystem II inhibition	5	C1	simazine	Princep
Pre/Post	Cellulose synthesis inhibition	29	L	indaziflam	Specticle
Pre/Post	Lipid biosynthesis inhibition	16	N	ethofumesate	Prograss
Pre/Post	Carotenoid biosynthesis inhibition	28	F2	mesotrione	Tenacity
Pre/Post	Protoporphyrinogen oxidase (PPO) inhibition	14	E	flumioxazin	SureGuard
Post	Synthetic Auxin	4	O	2,4-D	multiple
Post	Synthetic Auxin	4	O	dicamba	Banvel
Post	Synthetic Auxin	4	O	quinclorac	Drive
	Inhibition of cell wall (cellulose) synthesis	27	L		
Post	Acetolactate synthase (ALS) inhibition	2	B	bispyribac-sodium	Velocity
Post	Acetolactate synthase (ALS) inhibition	2	B	foramsulfuron	Revolver
Post	Acetolactate synthase (ALS) inhibition	2	B	imazaquin	Image
Post	Acetolactate synthase (ALS) inhibition	2	B	metsulfuron	Manor
Post	Acetolactate synthase (ALS) inhibition	2	B	rimsulfuron	TranXit
Post	Acetolactate synthase (ALS) inhibition	2	B	sulfosulfuron	Certainty
Post	Acetolactate synthase (ALS) inhibition	2	B	trifloxysulfuron	Monument
Post	Acetyl CoA Carboxylase (ACCase) inhibitors	1	A	diclofop	Illoxan
Post	Acetyl CoA Carboxylase (ACCase) inhibitors	1	A	clethodim	Select
Post	Enolpyruvyl Shikimate-3 Phosphate (EPSP) synthase inhibition	9	G	glyphosate	Roundup
Post	Glutamine synthetase inhibition	10	H	glufosinate	Finale
Post	Photosystem II inhibition	6	C3	bentazon	Basagran
Post	Photosystem I inhibition	22	D	diquat	Reward
Post	Photosystem I inhibition	22	D	paraquat	Gramoxone

and example trade names. The fundamental principle for managing herbicide resistance is this: repeatedly relying upon a single MOA selects for populations that are resistant. Herbicides do not cause a mutation; they merely select for populations that tolerate a dose of herbicide. Subsequently, those populations expand in number.

Preventing herbicide resistance requires rotating herbicide MOA's in order to avoid the expansion of resistant populations. Classification systems have been developed to help herbicide applicators alternate MOA's. The most common are those developed by the Weed Science Society of America (WSSA) and the Herbicide Resistance Action Committee (HRAC).

The WSSA system assigns each herbicide a number based upon the MOA. The HRAC system assigns a letter based

upon an alphabetized list of herbicide MOA's, hence inhibition of acetyl CoA carboxylase (ACCase) is assigned the HRAC grouping of A. HRAC further amends herbicide groupings with a subscript numbering system that indicates different binding behavior. In the case of photosystem II inhibiting herbicides, subclasses C1, C2, and C3 indicate different behavior with a key binding protein.

Resistance can be either evolved or innate. Evolved resistance is a change in a specific weed species that was once susceptible to an herbicide. Innate resistance is the ability of a plant to survive and reproduce following an herbicide application from the very first exposure. Innate resistance is also known as tolerance.

From a biochemical standpoint, plants develop resistance either through target-site or non-target site-based resistance. Target-site resistance is a change in the

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Chris Hoff
Minnesota

Table 2. Modes-of-action commonly used by turfgrass managers listed with active ingredients and trade names for reference.

Mode-of-Action	WSSA	HRAC	Active Ingredient	Trade Name
Acetyl CoA Carboxylase (ACCase) Inhibitors	1	A	"diclofop clethodim"	"Illoxan Envoy"
Acetolactate Synthase (ALS or AHAS) Inhibitors	2	B	"bispyribac-sodium foramsulfuron"	"Velocity Revolver"
Photosystem (PS) II Inhibitors	5	C1	simazine	Princep
Photosystem (PS) I Inhibitors	22	D	diquat	Diquat
Protoporphyrinogen Oxidase (Protox) Inhibitors	14	E	"oxadiazon sulfentrazone"	"Ronstar Dismiss"
Carotenoid Biosynthesis Inhibitors	28	F2	"mesotrione topramezone"	"Tenacity Pylex"
Enolpyruvyl Shikimate-3-Phosphate (EPSP) Synthase Inhibitors	9	G	glyphosate	Round-up
Glutamine Synthase Inhibitors	10	H	glufosinate	Finale
Mitotic Inhibitors	3	K1	"prodiamine dithiopyr"	"Barricade Dimension"
Cellulose Synthesis Inhibitors	29	L	indaziflam	Specticle
Fatty Acid and Lipid Biosynthesis Inhibitors	16	N	ethofumesate	Prograss
Synthetic Auxins	4	O	dicamba	Banvel

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biochemical target of a plant that prevents the herbicide from binding to the site of action or acting as it would normally. Many herbicides are very specific in their activity; for example, acetolactate synthase-inhibiting herbicides, such as Revolver, bind to the enzyme acetolactate synthase (ALS), thus preventing the production of branched-chain amino acids. Enzymes such as ALS are several hundred amino acids long. A change in one amino acid may prevent the herbicide from binding. Similar types of target site resistance are known to occur in photosystem II inhibiting herbicides (atrazine, simazine, diuron, amicarbazone), acetyl-CoA carboxylase inhibitors (fluazifop, diclofop, fenoxaprop), and mitotic-inhibiting

are steps that can be taken to prevent resistance and control already resistant populations. The WSSA and HRAC classification systems are tools for the development of resistance management strategies, but they should not be relied upon solely. Principally, proper cultural management enhances turfgrass vigor and reduces the reliance upon chemical weed control. Mechanical weed removal and application of non-selective herbicides via spot-spraying are also crucial elements of resistance prevention and management.

Rotate modes-of-action. Repeat applications of the same MOA will select for resistant plants within a population. The more frequently herbicides with the

“By utilizing herbicide tank-mixtures with different MOA’s that are active on the same species, the weedy population would need to have tolerance to two different MOA’s at the same time in order to survive.”

herbicides (prodiamine, pendimethalin, oryzalin).

Non-target site herbicide resistance is a change in the ability of the herbicide to be absorbed, translocate throughout the plant, or be metabolized by the plant. Changing the way herbicides absorb, translocate, or metabolize is much more complicated. To change absorption, for example, the plant may develop a thicker epicuticular wax layer or change the cutin amount in the cuticle. This would be a highly complex, multifaceted system to change, but it does happen. For example, glyphosate resistance in horseweed (*Conyza canadensis*) occurs due to reduced translocation of the herbicide (Koger, 2005).

STEPS TO PREVENT AND MANAGE HERBICIDE RESISTANCE

Herbicide resistance is real, but there

same MOA are used, the more quickly resistant weed populations will develop. Rotation from Brand A to Brand B does not slow resistance development if both herbicides have the same MOA. Not only do managers have to rotate different herbicides, but they also have to use different MOA’s. For instance, using atrazine in rotation with simazine is a futile approach, as both are photosystem II inhibitors (Group 5 herbicides). See Table 3 for a more complete list of WSSA and HRAC classifications.

Use tank mixtures. By utilizing herbicide tank-mixtures with different MOA’s that are active on the same species, the weedy population would need to have tolerance to two different MOA’s at the same time in order to survive. This may decrease the potential for resistance; however, there are differences of opinion surrounding the issue. It is, however,

likely that multiple MOA's improve the spectrum of weeds controlled, simultaneously reducing plants that need follow up applications.

Use both pre- and post-emergence herbicides. Integrating both pre- and post-emergence herbicides into a weed management plan, will diversify MOA's and eliminate weeds before they mature and develop seed. In such a plan, it would also be necessary to rotate both the pre- and post-emergence MOA's used each year. Atrazine followed by simazine would again be futile, because they possess the same MOA. Reference publication 1532 for Weed Control Guidelines for Mississippi.

Maximize control and minimize escapes. It is important that herbicide applicators use the maximum labelled application rates in order to maximize control. Plants that escape control should be removed manually, or may be removed chemically using a high rate or non-selective spot-spray application, according to label recommendations.

Optimize the environment for turf plants. As always, the most important ap-

proach for weed management is to simply optimize the environment for the desired turf species. Doing this will decrease the number of weeds that are actually treated by herbicides, thus decreasing the potential for resistance development.

SUMMARY

Herbicide resistant weeds are an increasing problem. An effective cultural and chemical management plan are required to achieve maximum weed control in turfgrass systems; however, emphasis should be placed upon rotating herbicide modes-of-action and eliminating escaped weeds after herbicidal treatments have been applied. The Weed Science Society of America has developed a five part training module on herbicide resistance awareness and education. Those modules can be accessed online at <http://wssa.net/weed/resistance/>. **GCI**

Dr. Jay McCurdy is an Assistant Professor at Mississippi State University. Dr. Scott McElroy is a Professor at Auburn University. And Dr. John Byrd is a Professor at Mississippi State University.

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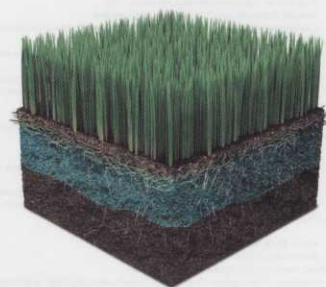
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COVER STORY

(continued from page 15)

cussion featured the same conclusion: affordable ways to bring reclaimed water to the site didn't exist. "Getting reclaimed water here is extremely expensive, in the order of \$15 million," Barrier says.

The course rests on a floodplain six miles from the Pacific Ocean and features hybrid Bermudagrass fairways and *Poa annua* putting greens. Every acre of the course is irrigated with potable water, and the club's annual water bill has risen to \$600,000. The average U.S. golf course spent \$40,949 on water in 2013, according to GCI's 2014 State of the Industry report. The Santa Fe Irrigation District charges customers more than \$1,700 per acre foot for potable water.

RSFGC is exploring the possibility of an on-site desalination plant, but disposing of the brine/concentrate is tricky. In the meantime, RSFGC has improved the efficiency of its irrigation system and embarked on an ambitious turf removal project.

The turf removal project overseen by Fleming started in late-September, and 18.6 acres will be replaced with drought-tolerant landscape. The club is eligible to receive \$1.62 million as part of a Metropolitan Water District rebate program.

Less turf helps Barrier manage his biggest maintenance problem: less rain. RSFGC hasn't received nine inches in a single year since 2009. "When I got here in 1992, it was all about the drought," he says. "And then everybody stopped talking about it. We were fine for six, seven, eight years and then we had a drought again, and we're like, 'What are we going to do?' This has been a vicious cycle, and I have seen it happen three or four times."

At least Barrier has company. Neighbors with contrasting microclimates are stuck in the same cycle. Oceans, lagoons and creeks can't mask this reality. **GCI**

Guy Cipriano is GCI's assistant editor.

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AWAY IT GOES

Remove turf. Get a check.

The hassle caused by construction should be worthwhile for Rancho Santa Fe Golf Club. The historic club outside of San Diego embarked on a project that will swap 18.6 acres of turf for \$1.62 million as part of a Metropolitan Water Authority rebate program. The sum represents a huge windfall for a project that had been part of the club's master plan.

The wait caused by a temporary inconvenience – a visitor's late arrival to an appointment – led to superintendent Tim Barrier contacting a Santa Fe Irrigation District representative to discuss turf rebates. One particular part of the call shocked and intrigued him.

"I made a phone call just on a whim," Barrier says. "I know Las Vegas, Phoenix and Palm Springs have had a rebate program. I thought I would fire a shot in the dark to see if our local water agency is doing any type of a rebate. I talked to a woman and she said the Metropolitan Water District just started a \$2 per square foot rebate. I said, 'Did you just say \$2?' She said there was no real limit on the square footage because they want people to participate in the program to save water and money. I immediately got a hold of my club leadership."

The Rancho Santa Fe Association board approved funding for the project this past summer and work started Sept. 21. The reduced acreage will also save the club \$80,000 on its annual water bill. RSFGC is working with Golf Design Properties, a Southern California firm led by Dave Fleming, a former superintendent turned architect. "It's a win-win," Fleming says. "The club gets money for doing the renovation and the club enjoys savings every year on water and maintenance"

A spray application in August killed the turf slated for removal. Soil was then pulverized to aid the installation of drought-tolerant California native plants and grasses, including four species of manzanitas. The native areas take a year to establish and 3-5 years to mature. Disruption to play is minimal, according to Barrier and Fleming. Work should be completed by late November, and Fleming says the changes will not affect the course's playability.

"That's our job as an architect," he says. "We don't want to discourage golf, we want to encourage golf. Areas we look to remove are areas they don't play in, around the tees, the zones between the green and next set of tees. We give them an ample golfing corridor."

The project trims the acreage of irrigated turf from 115 to 97. Barrier says the club wants to drop to around 90 acres of irrigated turf by identifying more out-of-play areas for removal. Fleming envisions a slew of Southern California courses devising similar plans. In addition to RSFGC, Fleming is overseeing large turf removal projects at two other San Diego-area courses: Carmel Mountain Ranch Country Club and Del Mar Country Club.



Rancho Santa Fe Golf Club started a turf removal process in September. The club is replacing 18.6 acres of turf with drought-tolerant California native plants. The changes are expected to save the course \$80,000 annually on its water bill.

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Travels With Terry

Globetrotting consulting agronomist Terry Buchen visits many golf courses annually with his digital camera in hand. He shares helpful ideas relating to maintenance equipment from the golf course superintendents he visits – as well as a few ideas of his own – with timely photos and captions that explore the changing world of golf course management.



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

BALL MARK REPAIR TOOL

The Yokota Air Base in Tokyo, Japan, is home to the U.S. Air Force and also to Tama Hills Golf Course, where American Al Bancroft is the superintendent and Takahiro Suzuki is the head mechanic. This ball mark repair tool is made from an 8-mm diameter side-eject green's aerifier tine that is welded to a 30d nail (.20 inches in diameter). Duct tape is added to where the parts are welded together which also acts as a handle. The magnet that holds the tool to the 2012 John Deere 220SL walk-behind greens mowers is 1 inch in diameter and was acquired from a Jacobsen Magknife Kit. The applicable ball mark depression is plugged-out with the aerifier tine, which is discarded into the grass catcher – and then the nail is used to move the turf closer together to close the hole. This idea was conceived by Kyle Jacobson, who worked with Bancroft when they were assistant superintendents at Whistling Straights. The materials were in inventory and it took about 20 minutes to make each tool.



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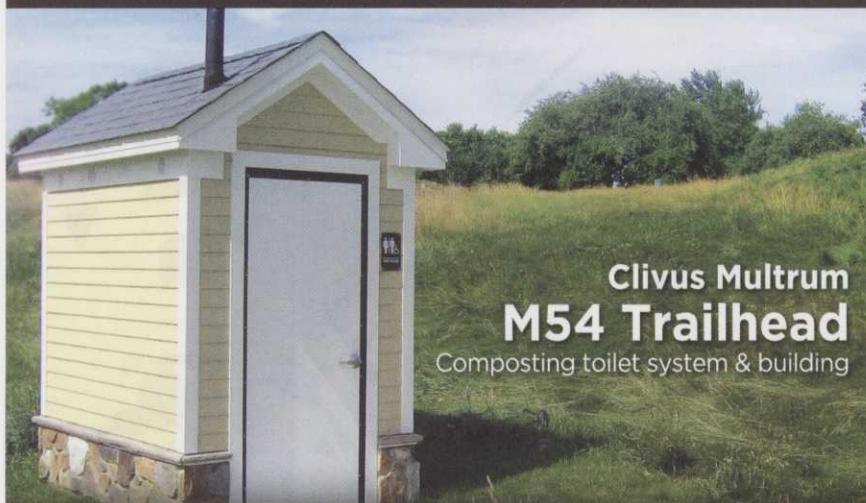
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This 1998 Old Bell Green's Mower Trailer was recycled as an air compressor trailer. It now holds a 2011 Honda (#EU2000i) 2,000-watt generator (\$1,000) that is held in place to the mounting plate by a turnbuckle strap. The 2007 Craftsman 10-gallon, 175-psi air tank was donated and attached to homemade brackets welded to the trailer. A 2013 Makita (#MAC700) 2-hp., 2.6-gallon, 3.3-cfm @ 90-psi air compressor (\$260) is welded to the top of the air tank on homemade metal brackets. The 2013 Reelmaster (#4625) OLP hose reel (\$180) measures 16½ inches by 5¾ inches by 17½ inches with a 25-foot hose. The air compressor is used primarily to face the greens mower's bedknives during topdressing, refilling tires and using air tools out in the field. It took about five hours to assemble. Brian Goleski is the superintendent and J.R. Wilson is the equipment manager at the Noyac Golf Club in Sag Harbor, N.Y. GCI



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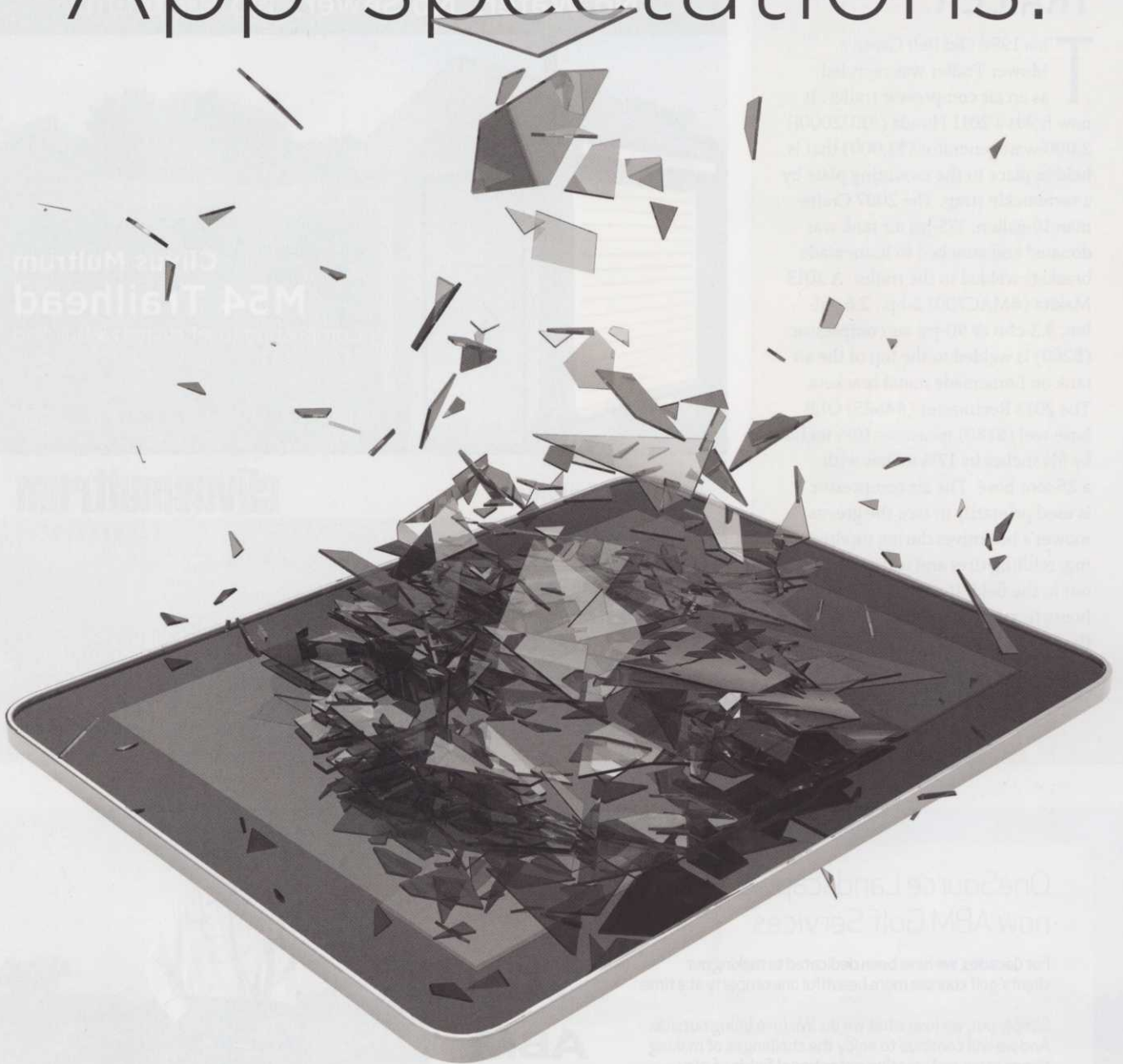
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Pat Jones is editorial director and publisher of Golf Course Industry. He can be reached at pjones@gie.net or 216-236-5854.

GRATITUDE

Once again I glance up at calendar and realize Thanksgiving is careening towards me like Ozzy Osbourne's crazy train.

It suddenly reminds me we have to figure out which kids will be home from college and how much turkey we'll need to feed them. It's also a wake-up call that it's "that time of year" to get our sponsors and advertisers finalized for 2015. And it provides a gnawing reminder that I need new tires on my aging Jeep before another brutal Cleveland winter rolls around.

Crap...lots to do before Thanksgiving! Gotta get busy!

But, then that little voice in the back of my head interrupts me with a whisper: Don't get too busy to stop and truly live the spirit of the holiday by giving thanks.

Duh.

Basically, the idea of a holiday to remind us to be grateful is beginning to seem dumb to me. As I get older, I've come to realize we should wake up every morning and start counting our blessings and not stop until head meets pillow. Yes, we all have problems and challenges...but we're also all on the green side of the grass and, I hope, have much else to celebrate.

Allow me to share some of what I'm grateful for as we approach the official day of thanks...

BEING OUTDOORS. I am nearly always happier when I'm outside and I suspect most of you are too. After 15 years in often-dreary Ohio, sunshine is my favorite thing. I always try to remind myself to look around and soak in the moment, particularly when I'm out on a course or anyplace natural. Just stop, breathe it in and be grateful for Mother Nature.

FAMILY. When Kim and I got married last January, we created this wonderful modified "Brady Bunch" family. I gained two daughters plus a boatload of amazing in-laws, cousins and other kin. It's been awesome to get to know an entirely new family at my stage in life. But what's really awesome are those very rare moments when we have all four of our grown kids in one room. They couldn't care less about it but it's very meaningful to me. I am always deeply grateful when that happens...once in a blue moon.

SOBRIETY. On November 30, I'll have five incredible years without alcohol under my belt. A few drinks are fine for 90 percent of the population, but I was addicted and it poisoned my life. I'm immeasurably grateful for the help and support I got when I quit... and 1,807 days later I'm still finding contentment one day at a time.

OUR TEAM. See how good this magazine is? Like the website? Think our social media feeds are cool? Thank my team. I'm the least important person in this operation. I kid you not. I just point us in the (hopefully) right direction and they do the rest...magnificently. I am ever so grateful to be surrounded by talented, fun, passionate people.

YOU GUYS. Thank you for the love. I mean it. Kind words and support from readers and friends have made me eternally grateful to be part of this wonderful, nutty community.

MY JEEP! This sounds crazy, but the most important non-human in my life is my 2009 Jeep Grand Cherokee. We just celebrated 100,000 miles

together and it has been uber-reliable. It's like that Jeep knows I need some bedrock in my life. It even still looks pretty damned good except for a rusty little dent on the front left bumper that I have left unrepaired as a daily reminder not to text and drive. I'm very grateful that Jeep has been with me through thick and thin.

HEALTH. Despite 30 years of slow attempted suicide via vodka and Marlboros (which I also quit two years ago), I'm shockingly healthy. More importantly, so are the people I love. Super grateful all of us are thriving!

WALKING NINE HOLES. Power-walking a quick nine is the best combination of exercise and meditation ever. I'm really grateful for that time by myself to clear my head, enjoy the beauty around me and, occasionally, just making that one good shot that gives me hope that someday I will not suck as badly.

MRS. JONES. She hates it when I write about her but I can't help it. She's my golden girl and I'm eternally grateful fate brought us together for this remarkable second chance at happiness.

Okay, I showed you mine. Now it's time to share your gratitude with your loved ones, friends and colleagues. If you're so inclined, send me a note about what you're grateful for this year. Or, if you're a Twitterific kind of person, send us 140 characters of happiness with #gratitude. Mostly, tell your loved ones what you're grateful for. After all, it's not about giving thanks...it's about living gratitude. **GCI**

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