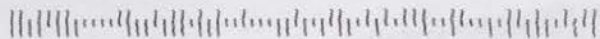


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when the creek rises

An emotional telling of last year's tragic flooding of southern West Virginia and The Greenbrier and its inspirational recovery told by the people who endured it.



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when the creek rises

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BEYOND IMAGINABLE

We wish this issue had a different cover. Nobody at The Greenbrier—or anywhere else affected by a natural disaster—seeks the attention. Floods, hurricanes, tornadoes, earthquakes, fires, blizzards destroy more than golf courses. They ruin lives.

Learning about a disaster such as last summer's historic West Virginia flood is painful. Living through one must be horrific.

I didn't know what to expect when visiting White Sulphur Springs, the small West Virginia community where The Greenbrier has stood since 1778, to begin reporting for our series documenting the devastation and recovery process. I had a working relationship with the resort's agronomic team through a pair of visits last year,



Guy Cipriano
Associate Editor

including one for our May 2016 cover story, "They bleed green." On a subsequent visit for the 2016 Greenbrier Classic media day, I witnessed the resort host the West Virginia Amateur, played The Old White TPC and met future West Virginia Governor Jim Justice, who purchased the nearly bankrupt resort in 2009. The weather was perfect, the golf courses pristine. Trophy trout filled Howard's Creek, which meanders multiple holes on The Old White TPC, a memorable C.B. Macdonald and Seth Raynor design beloved by longtime resort



guests and PGA Tour players.

Seventeen days later, it rained. And rained. And rained. Lifelong residents say nothing compares to what White Sulphur Springs and surrounding areas experienced June 23, 2016. Huge chunks of The Greenbrier's golf courses suffered major damage, but workers lost family members, friends, houses, vehicles, furniture, mementos and the innocence offered by a summer of enjoying the splendid West Virginia outdoors.

Once the soaked rubble dried, the rebuilding started. Our two days in White Sulphur Springs last month revealed a group of exhausted, yet resilient and determined workers who graciously shared their accounts of last June and the following days, weeks and months.

None of it is easy to discuss with an outsider. Think about the most grueling work period of your life. Think about the biggest personal project you have tackled. Combine the two and give yourself no time to prepare for either task. Add the pressure of completing a course for a PGA Tour event and guest play in a remote region where your employer is easily the biggest economic driver. By sharing their story, members of The Greenbrier team will help whomever must cope with the next natural disaster and inspire anybody reeling from a challenging day.

Pursuing an editorial project of this scope requires support, and we could not have asked for a better partner than John Deere. "Deere and Revels Turf have been amazing partners to The Greenbrier before, during and after the flood," GCI publisher Pat Jones says. "It's a perfect collaboration for us to work with them now to tell this remarkable story of catastrophe and rebirth."

So, I hope you agree with us that this is a worthwhile story. We just wish it didn't have to be told. **GCI**

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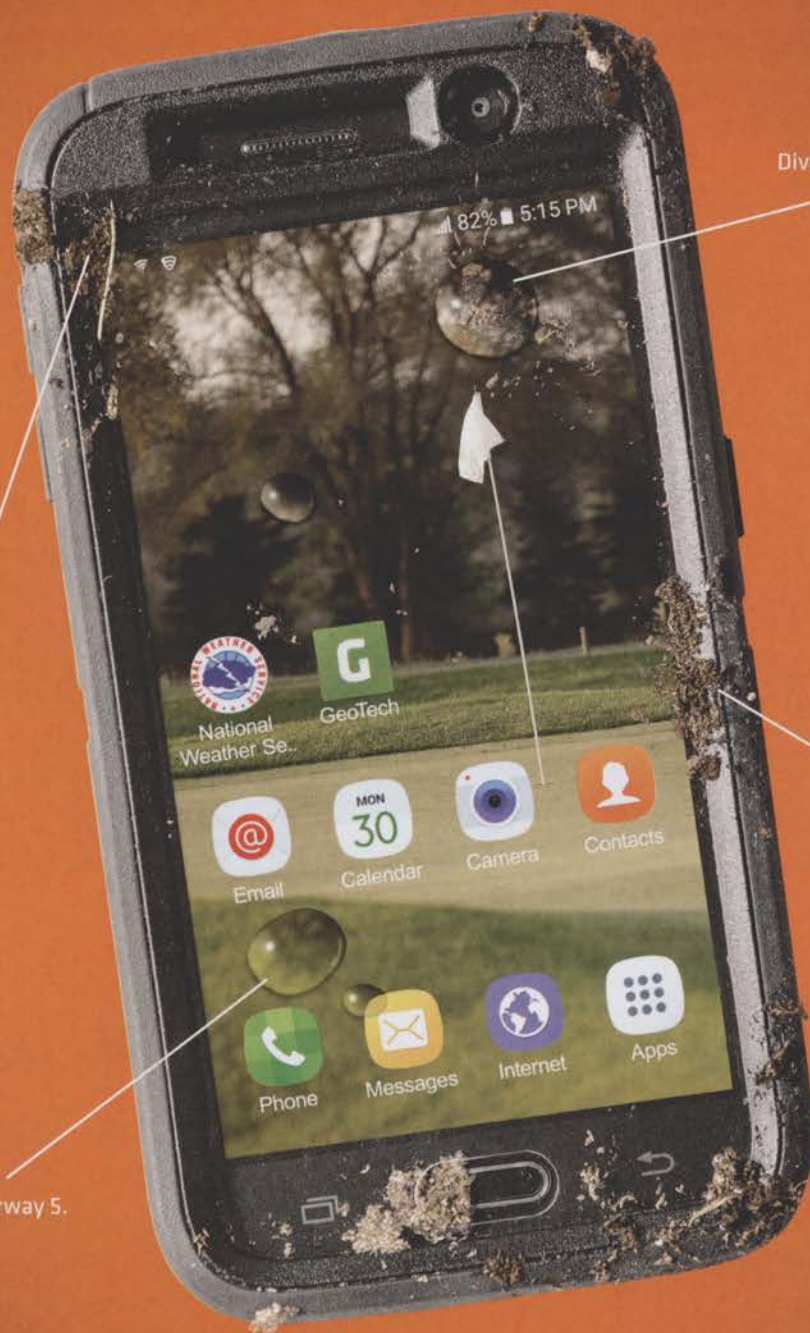
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1:25 PM

Divot repair on driving range.

8:00 AM

Brown patch spotted on 9th green.

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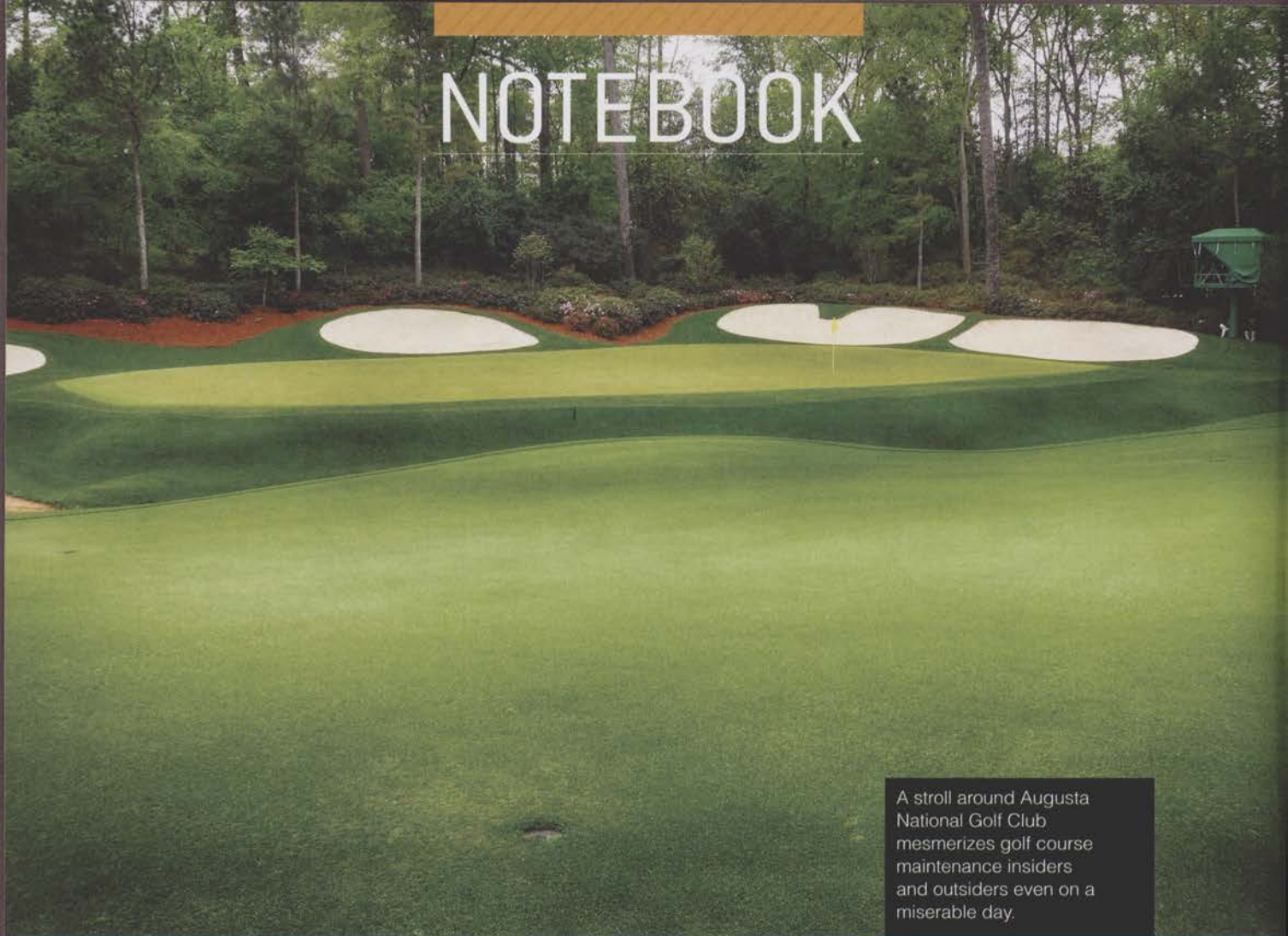
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NOTEBOOK



A stroll around Augusta National Golf Club mesmerizes golf course maintenance insiders and outsiders even on a miserable day.

Golf's biggest star

Guy Cipriano observes the enticing convergence of familiarity and mystery on a wacky weather day at Augusta National Golf Club.

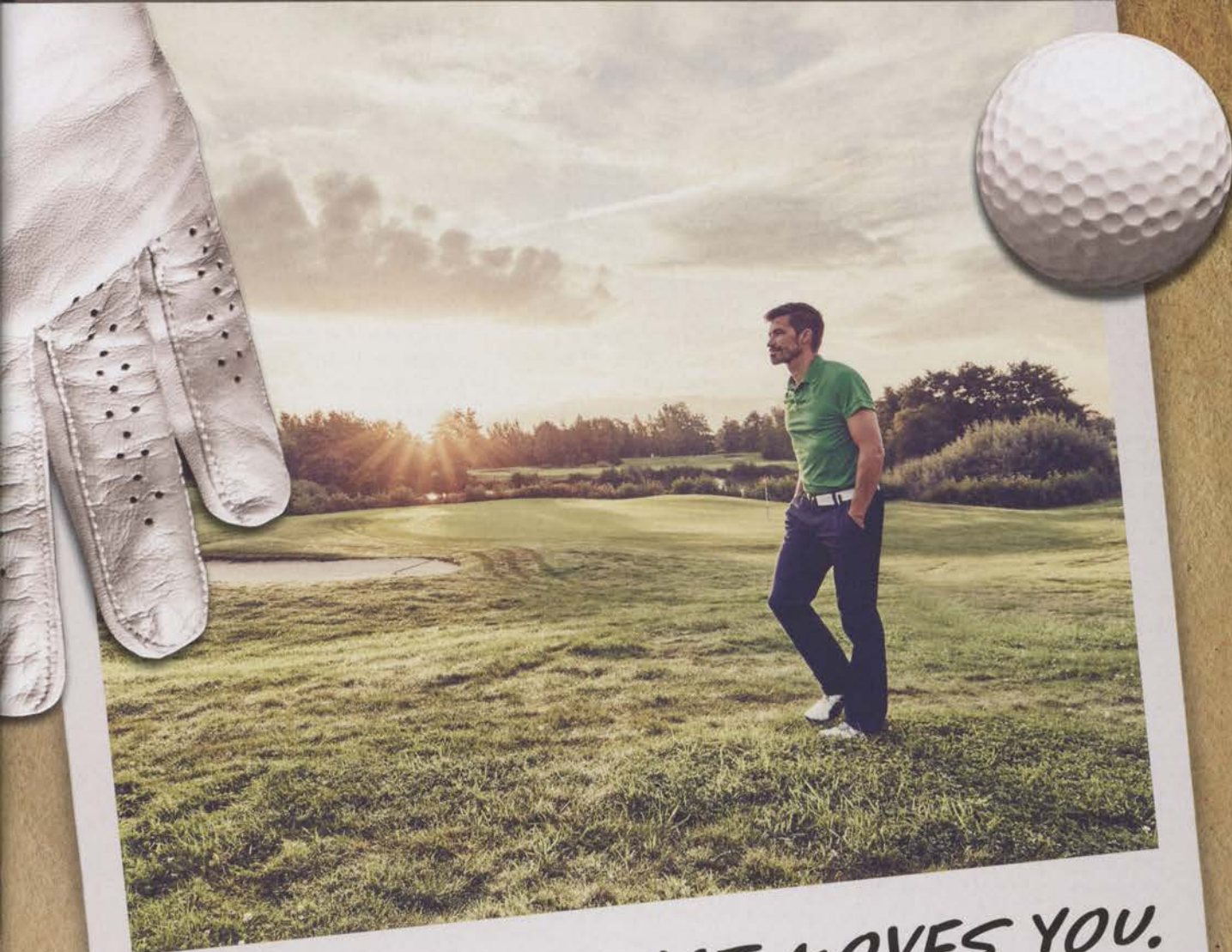
THE GROUND ROARS BENEATH the abundantly overseeded ryegrass forcing patrons roaming between the first tee and ninth green to stop.

They stop partially because they have nothing else to do on days like Wednesday, April 5, the final hours before 2017 Masters commences. Dangerous storms are imminent, with some reports insisting tornadoes lurk throughout Georgia. Golf

champions are spending more time on mobile devices than taking divots from the Augusta National Golf Club turf.

Thousands of patrons must hear the sub-surface roar because a pair of weather-induced course evacuations make passing this spot a necessity on the way to parking lots maintained at fairway height. Whatever is happening and in what amounts

beneath the ground will never be fully revealed. The ninth green is 50 yards away, and the small number of patrons with an inkling of the sound's significance are mesmerized. One man drops to a knee and takes multiple pictures of the catch basin, an entryway to the Augusta National underworld. He listens carefully. He's sure to have heard birds chirp while watching televised coverage of



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the 13th hole. But he's never heard a sound like this on a golf course.

He scurries after taking the pictures. There's plenty to see inside the gates and below the omnipresent trees. And there's not a lot of time to see it.

Everything about a day like Wednesday should be frustrating. Bad traffic. Rollercoaster-length lines to enter a gift shop. Enough time to consume perhaps 20 ounces of beer or sweet tea before being told to evacuate again. Not possessing a mobile device as a serious weather event approaches. No extended Dustin Johnson, Rory McIlroy, Jordan Spieth, Jason Day, or for that matter, Rod Pamplung sightings.

Somehow everybody remains docile, because they hear noises like the roar between one and nine, and see with their own eyes what they have watched on a screen for decades. The short time inside the gates demonstrates topography and undulations television can't possibly depict. Walking the 11th and 10th holes from green to tee makes missing a morning workout tolerable and justifies devouring modestly priced, carb-heavy offerings.

The Masters flourishes because it boasts golf's biggest star: the 18 most familiar and mysterious holes in the world. Even people who don't know a wedge from a fairway wood reserve early April for dogwoods, azaleas, pine trees, slick bentgrass and a spot announcers call Amen Corner. Ask more Americans if they know Rae's Creek or Antietam Creek. One intersects a playground; the other intersects where the bloodiest hours on American soil occurred.

Only a few know how the turf surrounding Rae's Creek remains stable and vibrant. Deep, clean bunkers and ornamental blooms are less appetizing if erosion exists. Had the land Augusta National occupies remained a nursery or turned into residential development, Rae's Creek would be just another teetering

body of water. Inside the gates, it produces interpretative moments. Everybody who watches the Masters feels something when they see the creek.

Golf course superintendents interpret Augusta National in dozens of ways. Enthralling to some, an unrealistic measuring stick to others. Customers also experience interpretative moments. This marks the 50th anniversary of the first Masters broadcast in color. "From that April to this, golf course superintendents all over the U.S. came to dread the Monday after the Masters," author Curt Sampson writes in "The Masters."

A resident living in a cold-weather city says the Masters energized him to purchase his first color television. Stories like his are duplicated by younger generations who used the Masters as an excuse to purchase a HD television. Name one golfer who forced consumers to change the technology in their homes? Tactfully tempering expectations has become one of the most important parts of a superintendent's job because of the Masters.

Communicating why no other

golf course can look and play like Augusta National should be a lesson in every turf school. But teaching "Masters Maintenance" would be akin to leading a folklore or mythology lecture. The club guards its secrets, so the few employees who know the exact science behind the course remain quiet.

Preserving golf's biggest star requires immense human and financial resources. The people responsible for this act make subtle appearances on days like Wednesday. A pair of utility vehicles stop below the sixth and behind the 16th green as patrons evacuate the course. Three men emerge from the vehicles, flip the beds and hoist weighted bags on their shoulders. Patrons clutch their cameras and take pictures from multiple angles. Some ask the workers if they need help. The men say little. They place the bags in a semi-circle behind a catch basin in a low-lying area. They are neither rude nor revealing.

On a day when many admirers never witnessed a golf shot, they endured nasty weather to sneak a few glimpses of a golf course. Nobody wanted to leave. **GCI**

Tartan Talks No. 10

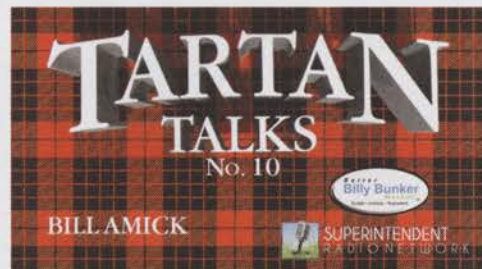
Bill Amick has implemented and shared a few ideas throughout his career.

Amick, who started his own golf course architecture practice in 1959, joined "Tartan Talks" to describe ways to integrate options for learners into existing courses. And here's the zaniest part of Amick's concept – it involves no putting. "It's the most delaying part of the game," he says.

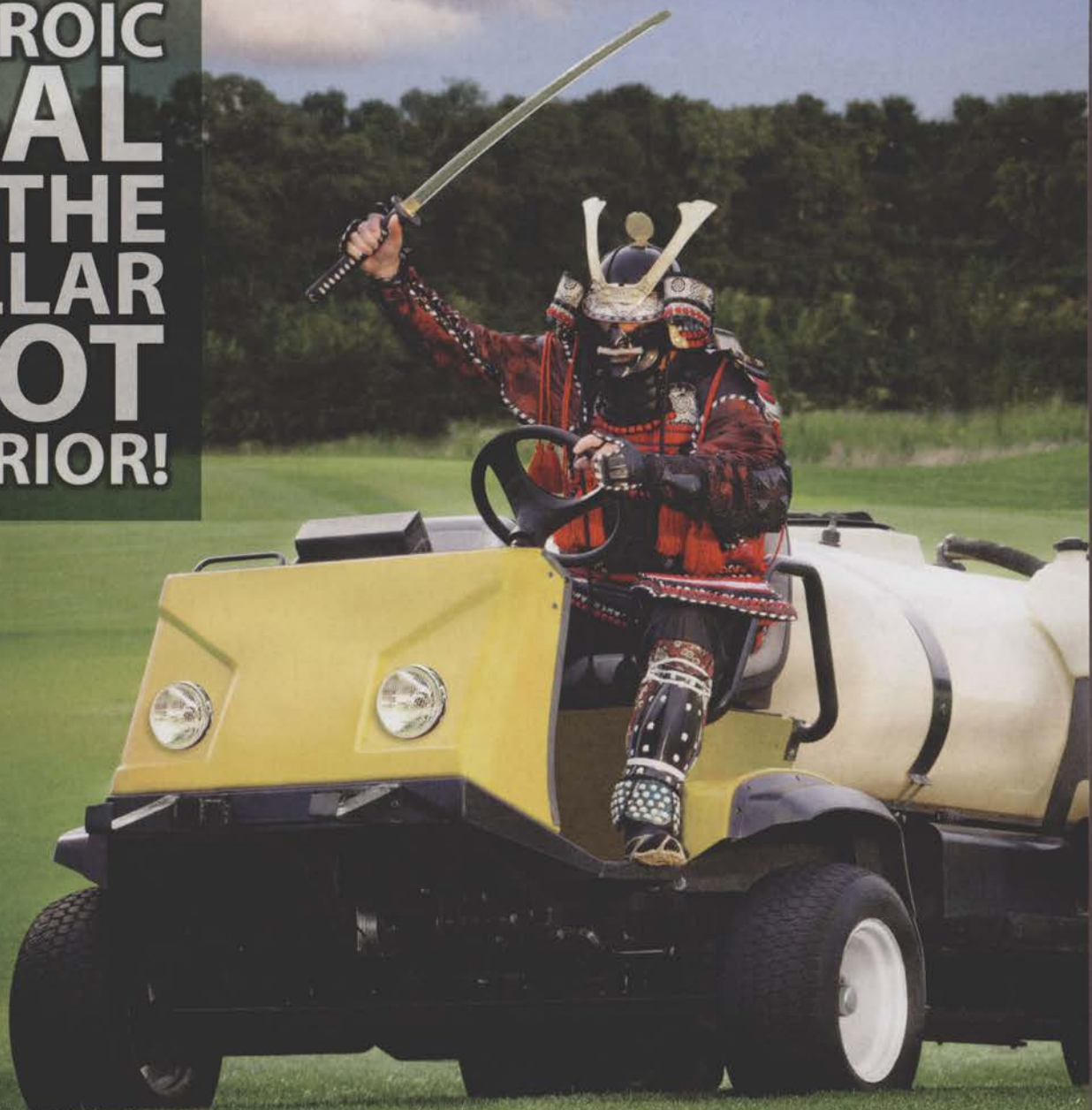


Amick

Seven decades in the business isn't delaying Amick from seeking work in new places. His current project is a collaborative effort with fellow ASGCA member Mike Beebe in the South Pacific island of Tongoa. Enter bit.ly/2nW6PaN into your web browser to learn more about golf without putting and designing a golf course in Tongoa.



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FOCUS ON WHAT MATTERS MOST



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.

William of Occam, a 14th century Franciscan friar, scholastic philosopher and theologian, is maybe best known for "Occam's razor," a principle that states: Among competing hypotheses, the one with the fewest assumptions should be selected. Sometimes known as the "law of parsimony," Occam's razor can be simplified in today's vernacular as "focus on what matters."

What matters most for club leaders and managers are the decisions and actions that affect goals and objectives, budgets and what can be grouped under the heading of immutable truths. Let's examine each briefly.

GOALS AND OBJECTIVES with specific and measurable intentions yield the best results. Targeted performance metrics serve to keep the board, general manager and departmental heads focused. Performance metrics no longer need be limited to financial results and the standard operating results that are easily tracked. Clubs can now source, track and measure all elements impacting a club's strategic goals and objectives in a cost-effective manner.

Before clubs measure performance and adapt based on the results, it is important to understand what can and should be tracked and how to go

about sourcing the information. Taking a systematic approach to defining all important elements of success and measuring these elements against best practice allows a club to set strategic goals and objectives that are both actionable and measurable.

Derek Johnston, a partner in the Global Golf Advisors consultancy, notes that the firm's Strategic Intelligence platform tracks metrics affecting governance, membership, utilization, participation, operations, capital and finance.

"Carefully designed membership feedback mechanisms, market data sourcing techniques, access to best-practice data and internal data capture procedures are critical to tracking and measuring these important elements," Johnston says. "The most intriguing part of these metrics is the relational learnings we are seeing across categories.

"For example, it is logical that when satisfaction increases, so too does a person's tolerance for higher prices, but there is always a ceiling," he adds. "Different clubs have different ceilings and interrelationships between satisfaction and price. Each club should know its ceiling."

Once goals and objectives have been agreed upon, key metrics identified and targets set, a process for monitoring and responding to performance must be implemented. A strategic console of key metrics that keeps the

board and management apprised of actual performance against targets identified in the club's strategic plan and annual business plan is a powerful and essential tool, Johnston adds.

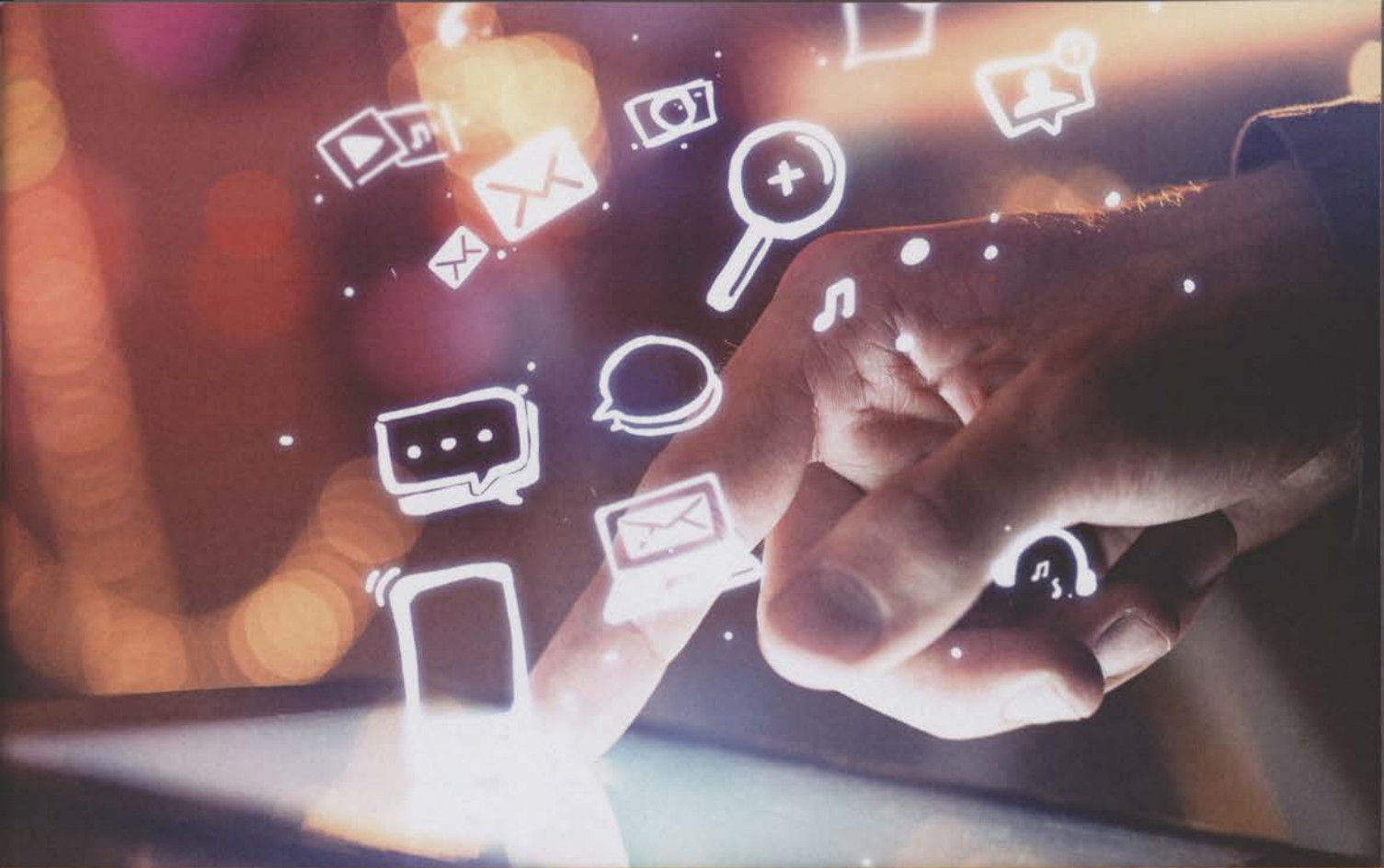
ZERO-BASED BUDGETING is a hard-working discipline that requires managers to begin every year with a blank budgeting page. Philip Newman, a partner at RSM Club Services, an international accounting firm, asks: "Are you throwing numbers together based on prior years or general guesses, or have you taken the time to really drill down and understand what drives the metrics of the business?"

Newman insists that the shortest route to accuracy is fact-based budgeting, which brings us to the third key element of efficient operations.

Immutable facts cut to the chase. For example, most golf-related businesses expend more than half – usually 52 percent to 55 percent – of the budget on labor and benefits costs. An inefficient labor budget dooms many clubs and courses.

"It's interesting to look at payroll compared to budget and payroll to the revenue it is supposed to be generating," Newman says. "If your payroll as a percentage of revenue keeps growing, then you will always be chasing your tail operationally. Make sure payroll moves incrementally in line with revenue, not ahead of it."

REVENUE GROWTH is another necessary truth. All efforts must drive revenue growth regardless of cost-cutting efficiencies and good intentions. Clubs that prosper achieve sustained revenue growth. A good target for revenue growth, according to Johnston, is 8 percent. "There are many factors that affect a revenue growth target, including attributed costs," he says. "Therefore, your growth target must be sizeable, even for mature businesses." **GCI**



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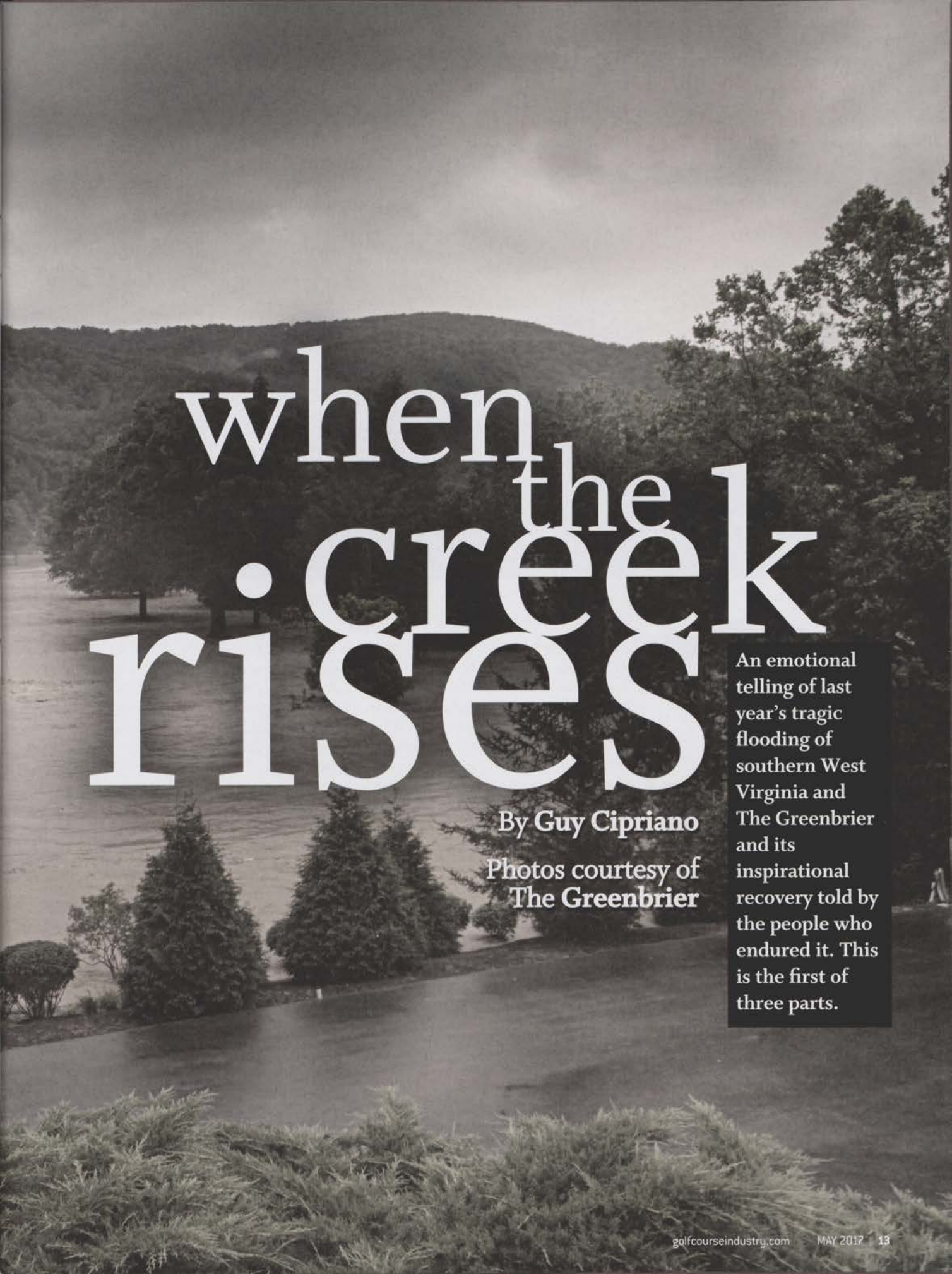
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“THEY SAY IT’S THE 1,000-YEAR FLOOD.
WE JUST HOPE IT’S TRUE. WE NEVER
WANT TO SEE THAT AGAIN.”

— CURTIS PERSINGER



when the creek rises

By **Guy Cipriano**

Photos courtesy of
The Greenbrier

An emotional telling of last year's tragic flooding of southern West Virginia and The Greenbrier and its inspirational recovery told by the people who endured it. This is the first of three parts.



“THERE ARE TRAGEDIES EVERYWHERE. WHEN YOU SEE SOMETHING ON TV, YOU’RE LIKE, ‘OH GOSH, THAT LOOKS BAD.’ BUT THE NEXT SHOW COMES ON AND IT’S LOST. THIS OPENED MY EYES. WHEN THINGS LIKE THIS HAPPEN, YOU HAVE A NEW PERSPECTIVE.”

— KELLY SHUMATE

G

iving three, four, 13, 16, 28, 37, even 47 years to the golf courses intersected by a creek below mountains means enduring a myriad of weather conditions.

The creek rises, then it recedes. Days, weeks, months, years and decades of golf continue without resort guests giving much thought to how

the uncontrollable must be managed to produce the pleasant four hours that lure repeat visitors to southern West Virginia.

It’s a cycle, albeit one without a predictable pattern. And the bad stuff never arrives at a good time.

On a Saturday in 2015, water rose from the banks of Howard’s Creek. Two days later, PGA Tour players started arriving in White Sulphur Springs, like they had been for every

summer since 2010. Another storm lifted the creek from its banks a week after the 2015 Greenbrier Classic. Giving three, four, 13, 16, 28, 37, even 47 years to The Greenbrier also means turning the mucky into memorable for golfers with double-digit handicaps.

Easy summers – or for that matter, easy days – don’t exist. But the work is steady and employees return home to places such as White Sulphur Springs, Caldwell, Lewisburg and Rainelle, combined population 8,718, knowing they made the landscape more enjoyable for resort guests visiting Greenbrier County.

That satisfaction yielded personal conflicts as rain started falling harder on the morning of June 23, 2016, a Thursday two weeks before the start of the 2016 Greenbrier Classic, an event that never happened. A member of the agronomic management team popped into a meeting involving director of

golf course maintenance Kelly Shumate, The Old White TPC superintendent Josh Pope and a vendor supplying divot mix for the tournament. Shumate and Pope checked the radar and sent the crew home.

“We knew we were going to get more rain,” Pope says. “It just wasn’t going to be productive and we could have been doing something counterproductive, especially on my end to hurt tournament conditions.”

The crew made it through a few holes of mowing on The Old White TPC, Greenbrier and Meadows courses. Six-tenths-of-an-inch of rain had accumulated when the work day ended around 9:30 a.m. “We tried to work in it,” says Larry Allen, a 13-year veteran, “but there wasn’t much you could do.”

Irrigation technician Doug Moyer studied the sky and Howard’s Creek as he left the resort to begin the drive to his home atop Muddy Creek

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Mountain. "If there's something to do, I want to stay and work," says Moyer, a member of the crew since 2001. "But that day kind of felt weird. When we left, I looked down at the creek. It was low and clear."

The last normal work day of 2016 lasted less than four hours. Nobody who lived or worked near the creek would view it the same again.

WAKING UP TO WATER

Exhausting tasks follow a storm, and 47 years of maintaining The Greenbrier's golf courses teaches a worker the value of conserving energy during the summer. So, Leroy Foster went to his White Sulphur Springs home, moved a car, fished a neighbor's dog from the water and fell asleep.

Chris Anderson was less than 47 days into his tenure as an assistant superintendent on The Old White TPC. Still recovering from the rigors of handling a new job and honoring a volunteer commitment by working the Memorial Tournament in Dublin, Ohio, a few weeks earlier, Anderson returned to his apartment in nearby Lewisburg and fell asleep.

Nate Bryant, the superintendent of the Greenbrier course, and his brother Carrington, the superintendent of the Meadows course, ate lunch at a Lewisburg Chinese restaurant. Weather alerts vibrated phones throughout the restaurant. Topography promoting runoff from steep hillsides and poor, clay-based soils make parts of Greenbrier County ripe for flash flooding, according to West Virginia state climatologist Kevin Law. But the morning forecast didn't suggest anything alarming

"IT SMELLED LIKE DIESEL FUEL THE WHOLE TIME. I REALLY DIDN'T KNOW THE AREA VERY WELL AT THE TIME. BUT YOU COULD ASSUME THINGS WERE HAPPENING BECAUSE OF WHAT WAS COMING THROUGH HERE."

— CHRIS ANDERSON

loomed. Replacing the din of rattling buffet dishes, the vibrating alerts proved more annoying than concerning.

Shumate and Pope resumed their meeting with the vendor until a jarring sound interrupted the conversation. A lightning bolt struck a vehicle 30 yards from Shumate's office. "It sounded like a bomb went off," Shumate says. The vehicle belonged to summer intern Drew Greene, a Mississippi State student living in the turf care facility apartments. Shumate and Pope ended their meeting with the vendor and made loops around the golf courses, checking for wandering golfers, pump stations possibly hit by lightning and overall water levels. Shop

coordinator Curtis Persinger, mechanics Roy Young and Ray Bonds, and Greene were the only other agronomic employees remaining on the grounds.

The Greenbrier closed the courses before 10 a.m., which vice president of golf Burt Baine says, "isn't typical for us because we drain well." Baine and associate director of golf, Jamie Hamilton, attended a scheduled business meeting with vice president of sales and events services Greg Furlong at the hotel. When they left the meeting around 12:30 p.m., they knew the golf day had ended.

Shumate and Pope traversed Village Run Road, a community road for houses along The Old White TPC. They noticed catch

basins struggling to handle the volume of water dousing the course, but they didn't observe anything abnormal. The pair returned to Shumate's office and discussed tournament preparations, course conditions and whatever else agronomists think about during weather events.

Pope, a weather junkie, studied a pattern on The Old White TPC weather station: rain was falling at a rate of an inch-and-a-half per hour. "I was thinking this can't be good for agronomics," he says. "I wasn't thinking of what was coming down the road in three or four hours."

As Shumate and Pope monitored the storm from the turf care facility, Baine and Hamilton watched Howard's Creek





rise from the back of the clubhouse, which offers views of the first fairway and green, 17th green and entire 18th hole. Water from Howard's Creek started touching the bottom of a bridge connecting skyboxes constructed for The Greenbrier Classic. Baine wondered aloud how long the bridge would remain upright. Water toppled the structure 45 minutes later.

Howard's Creek flows from downtown White Sulphur Springs into the resort, and the debris passing into view switched from what Hamilton describes as "backyard stuff" to medium-sized items such as lawnmowers and full-sized coolers. Large possessions such as ATVs and washing machines then entered their view as water inundated the first fairway

and green. The iconic first tee is raised and occupies a plot of turf to the right of the clubhouse, providing a view of the entire hole with a mountain backdrop. One of the best views in golf foreshadowed a destructive late afternoon and evening. "We knew it was a major event by 3 o'clock," Baine says, "but we still had no idea what the scope was."

CONCERNING TO CHAOS

Foster lived off Big Draft Road, a winding two-lane road above White Sulphur Springs. Multiple streams lining the road flow down the mountain and deposit into Howard's Creek. The streams couldn't handle the water, and a slamming noise woke Foster. He stepped out of bed and into three feet

of water. His furniture floated while rising water covered his house from door to door.

Nate Bryant lives downstream from Foster's former home on O'Connell Street, a block from the creek. He returned home following lunch with his brother and then decided to help the remaining staff at the course open drains in the mid-afternoon. Nate says the scene in White Sulphur Springs "wasn't anything crazy" when he left the house, but he received a call from a neighbor 30 minutes later describing chaos in the area. He left the resort, parked his vehicle and waded two blocks to his house, where he grabbed his cats. Chest-high water filled the garage. Knee-high water covered the interior of the lifted

house. Nate returned to the resort again because a paved spot in the middle of the turf care facility developed into one of the driest spots in White Sulphur Springs.

Pope and Shumate watched water overwhelm tee boxes on The Old White TPC 15th hole before separating around 3:30 p.m. Pope surveyed the scene with Baine and met Hamilton behind the 14th green. Pope started worrying about his own safety after watching water submerge the 15th green, so he drove his Gator toward the tunnel connecting the south and north sides of the golf property. Water filled the tunnel, which passes under Route 60, the main thoroughfare through White Sulphur Springs.

Hoping to find refuge at

the turf care facility across the road, Pope changed direction and spotted Persinger and Young, who reported the other tunnel connecting the property was impassable. With the creek rising, heavy rain falling and cars hydroplaning, the trio traveled in a two-Gator formation along Route 60. Pope says he heard green fencing bordering the courses crackle during the frightening drive; Persinger says it looked like “a waterfall” flowing from the road. Once at the shop, they moved the remaining vehicles to the paved spot between structures. “I really think we were on the only dry spot you could see that night,” Persinger says.

Pope watched the next phases of the storm on a computer and saw formations nobody predicted earlier in the day. Continuous bands hovered over White Sulphur Springs. A complex of storms formed in the Midwest, and a high-pressure ridge in the jet stream directed the storms from northwest to southeast West Virginia, according to Law. “Training” is the meteorological term for the formation.

“It’s basically like when you have cars on a train track and the same line of storms following each other,” Law says. “You have this narrow line of storms traveling over this narrow area. It’s kind of unique in the sense that it’s that narrow area from Point Pleasant (along the Ohio River in Mason County) down to Greenbrier County that had a lot of rain, but it went a little bit to the north and south, the rainfall totals weren’t really that impressive at all.”

The Old White TPC assistant superintendent Greg Caldwell was living with his wife and young child an hour from The

“BY THE TIME
I GATHERED A
COUPLE OF PAIRS
OF CLOTHES AND
WALKED OUT,
I REMEMBER
STEPPING OUT
THE DOOR AND
MY PORCH BEING
RIPPED OFF THE
HOUSE BY THE
CURRENT OF THE
WATER.”

— NATHAN KIRK





Greenbrier on the Virginia side of the border. He drove home in the morning and spent the rest of the day watching the radar and news. White Sulphur Springs received close to 10 inches of rainfall; his home received an inch-and-a-quarter. "It was sometime in the afternoon Josh texted me and all it said was: 'major flooding occurring here,'" says Caldwell, who started his job 17 days before the flood. "I thought, 'What does that mean?'"

Caldwell received his answer when Greenbrier resident and PGA Tour member Bubba Watson shared a video recorded by assistant golf professional David Sanderson of the flooded first hole. "That was about the first thing to come out," Caldwell says. "I never imagined the scale ... I never thought it would be to this magnitude until watching the news and seeing the photos and pictures coming out that evening. It blew me away."

Anderson slept for a few

hours and checked his text messages after waking up. His roommate, an assistant golf pro, texted him a video of the creek level around 3 p.m. and the walk bridge shortly before it collapsed. Anderson decided to return to work to help with drainage. On his 10-mile drive from Lewisburg to White Sulphur Springs, he saw enough water to realize he would be spending the night somewhere near the resort. He parked at the shop and headed to the area behind the 14th hole. He then spent the next three hours watching the storm from the clubhouse patio because he couldn't make it back to the shop.

Anderson describes the rain as "hard, heavy and never ending." He doesn't remember any heavy wind, and he says the amount of lightning decreased as the day progressed. He saw four-wheelers, thousands of fuel cans and parts of houses flow through the creek. "It smelled like diesel fuel the

whole time," he says. "I really didn't know the area very well at the time. But you could assume things were happening because of what was coming through here."

Marty Maret, an assistant superintendent who lives in White Sulphur Springs, tried returning to the resort at 3 p.m. to help drain greens. He needed gas for his Jeep, and the first two stations he passed on the way to work were closed. A third station refused to sell him gas because flood water had contaminated fuel tanks. He turned around and went home. Maret says the situation turned "crazy" between 3:15 and 3:45 p.m. "My Jeep is lifted 4 ½ inches with big mud tires, and I was pushing water to the hood," he says. "It was pretty epic already."

Maret recorded footage of his gutter collapsing and sent the footage to his parents and sister who live outside the state capital Charleston in the central part of the state.

**"IT'S AMAZING
HOW YOU TAKE
FOR GRANTED
THAT YOU CLOCK
OUT AND YOU
GO HOME. YOU
CAN'T IMAGINE
NOT HAVING
ANYWHERE TO GO
HOME TO. THAT
WAS DEVASTATING
TO SEE PEOPLE GO
THROUGH THAT."
— CARRINGTON
BRYANT**



“THEY SAID I WAS
DEAD. I DIDN’T
HAVE PHONE
SERVICE. SOME
OF THE STORIES
WERE TRUE, BUT
MINE WASN’T.”
— LEROY FOSTER

NEVER THE SAME

Crew members in other parts of Greenbrier County also faced harrowing experiences.

Kenny Willis, who lives 35 miles from the resort in Rainelle, noticed saturation in his backyard when he returned home from work. “The next thing I know I was wading through water, carrying my daughter on my shoulder to get her out,” he says. Willis took his daughter to her mother’s house and spent the night in his truck. The water levels at his house reached 7 feet. “It was just totally destroyed,” he says.

Co-worker Nathan Kirk lives adjacent to Rainelle in Charmco. He used a vacation day June 23 and he awoke from a nap upon hearing hail. Two hours later, he spotted water in his backyard. “By the time I gathered a couple of pairs of clothes and walked out, I remember stepping out the door and my porch being ripped off the house by the current of the water,” he says. Kirk evacuated to a neighbor’s house. “I had at least 6 feet of water in my house,” he says. “I remember all of the electrical that was on. There was no way to turn it off. Just really scary.” Rainelle and

Charmco are both 2,400 feet above sea level.

The flood resulted in 23 deaths, including 16 in Greenbrier County, population 35,279 when 2016 commenced. Nearly every member of the crew had a connection to somebody affected by the flood in a life-altering way. The fatalities included the sister of a crew member on the Snead course at The Greenbrier Sporting Club, the private facility between the resort’s main entrance and Interstate 64. A dead body was found by the pump station bordering (FLOOD continues on page 55)

13

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Mark Langner: "By bringing people to FarmLinks, they not only received the information but got to see the technology in real-life situations."



Seeking a fertilizer for premium turf conditioning, the developers of POLYON fertilizer carefully molded longevity and consistency into a superior controlled-release fertilizer that could be applied with confidence.

By **Rob Thomas**

THE WAIT

Like a diamond in the rough, every so often something comes around that just needs a little polishing before it meets its true potential. This could aptly describe POLYON fertilizer, the golf industry's most popular controlled-release fertilizer.

According to David Pursell, former CEO of Pursell Technologies and current Chief Executive Officer of Pursell Farms, his team found out about the undeveloped technology that eventually became POLYON in the late 1980s.

"Pursell Technologies was a relatively small, family-owned fertilizer company, but we were very opportunistic," Pursell says. "It was someone else's idea and they patented it. We had to perfect it."

In short order, production went from a tabletop unit, to a small plant, and beyond.

"We invested a lot of money and a lot of time," Pursell says. "But it turned into a great technology ... Became a very useable and safe product."

Considering Pursell's expertise was in marketing, he began brainstorming ways to make their new product relevant nationally and internationally. With that in mind, they built the world's first research-and-demonstration golf course – FarmLinks, located in Sylacauga, Ala.

"We had a very good product and the industry's most talented team, and the most unique way to showcase it," he says.

Mark Langner, CGCS, Director of Business Development for Aqua Aid, was the

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longtime Director of Agronomy at FarmLinks. “Consistency was missing with fertilizer prior to POLYON,” he says.

“The biggest issue was having a fertilizer that we could apply with confidence ... that the longevity and consistency of the fertilizer would meet the needs of our premium turf conditioning,” Langner says. “POLYON gave us the ability to make a single-season application without flushes in growth and that would maintain color through our growing season. Consistent nutrient release that was predictable and only needed water and temp to activate the release.”

Langner knew how great the POLYON technology was, but saw the industry needed education and information to really understand the product.

“By bringing people to FarmLinks, they not only received the information but got to see the technology in real-life

situations,” Langner says. “The other key component to having groups in was developing a relationship and trust between the customers and Pursell Technologies. They got to see the manufacturing process and the commitment to quality.”

“The attendees became part of the Pursell Technologies family,” Langner adds. “They received great information and education from many of the industry leaders and manufacturers. The opportunity to visit with others from their geography and learn how they were finding success was an unmeasurable benefit. FarmLinks was a private country club built for turf managers and they were the members.”

Referring to FarmLinks as “a living laboratory to demonstrate product,” Pursell would show visiting superintendents how safe POLYON was for their course. As an exhibition, Langner once put eight times

the label rate to demonstrate.

“Really greened it up, but didn’t burn the turf,” he says.

So POLYON was proven safer and more efficient than other fertilizers on the market. “It was a no-waste fertilizer,” Pursell says. “You’d get 100 percent of it as opposed to possibly losing 50 percent right away.”

“You could now meter out nutrients over a period of time,” he added. “The thickness of the coating dictated timing ... Thicker the coating, the longer it took to release. It could rain on POLYON and it wouldn’t release any quicker.”

Robert Mitchell, the current FarmLinks’ superintendent, has used many other products alongside POLYON and has a breadth of comparative knowledge. He makes no secret of his affection toward – and appreciation of – the product.

“I love it,” Mitchell said. “I love the ability to know what my release curve should be and

David Pursell: “Whatever plateau you’re at with any product, there are always new things coming out, but there’s nothing out there that’s better than POLYON.”

when I can expect the product to teeter out. It allows me to plan my fertilizer applications for the fall to prevent the turf from going so far off color.”

It’s also nice to know that the evolution of POLYON has been consistent and the turf continues to thrive. But the turf at FarmLinks isn’t the only feature benefiting from POLYON.

Mitchell is a POLYON fan. “[It’s a] great product that continues to prove itself years after its initial release to the market.”

For Langner, recommending POLYON to golf course superintendents is a no brainer. “Utilizing the technology will allow them to control the nutrients provided without anything more than making the application as prescribed by their POLYON reps,” he says.

Pursell sold the technology in 2006 and it is currently manufactured by Koch Turf & Ornamental. He remains impressed with POLYON’s performance and sees a bright future for the product. “Still the best technology out there,” he says. “Whatever plateau you’re at with any product, there are always new things coming out, but there’s nothing out there that’s better than POLYON.”

As for the future, Pursell envisions thinner coatings, lowering the cost, and maybe tightening release curves.

“Superintendents can’t have lapses in quality,” Pursell says. “They need a product that has consistent performance, a product they can trust. This fertilizer made them look better as a superintendent.” **GCI**



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Your greens need work, but does the project call for a renovation or reconstruction? Our experts help you weigh the options and steer you toward the correct decision.

THE WAY TO GO

By John Torsiello

RENOVATE

RECONSTRUCTION

The condition of your greens will make or break you as a superintendent. So, when it's time to improve a course's putting surface, do you renovate or rebuild completely? It's a crucial issue, one superintendents must vet carefully prior to breaking ground.

The greatest considerations are lost revenue and timing – or when is it ideal to undertake the project, says Steve Hamilton, superintendent at The Dunes Golf & Beach Club in Myrtle Beach, S.C. “Sometimes your business model and agronomic model do not line up,” he says. “It's typically more expensive to renovate due to cost of material and time needed to rebuild putting greens.”

Hamilton did a no-till conversion from bentgrass to Champion Bermudagrass in 2013. “We did not need or want to change any of the architecture of the putting surfaces, so we sprigged on top of what we already had,” he says. “We also wanted to keep the organic material from the dead bentgrass around to help with the grow-in of the newly sprigged Bermuda. We did make corrections to some collar dams, so new sod was needed there. Obviously, cost is a concern, and not having to buy and distribute new greens mix allowed us to use those dollars towards a soil fumigant to kill all unwanted turf and nematodes.”

Resurfacing is generally less expensive than rebuilding entirely, says Tim Jackson, principal at Jackson Kahn Design. It is important to understand what issues are affecting the quality of putting surfaces when deciding on resurfacing versus rebuilding, rather than simply choosing one over the other based on relative cost, he says.

“Many times, there can be multiple factors that, when combined, have a deleterious effect,” Jackson says. “It is important to spend the time to understand what all of those negative factors may be to ascertain the best course of action.”

Jackson cites Brian Sullivan, a good friend and superintendent at Bel-Air Country Club in Los Angeles, who issued “one of the most simple yet profound” statements when consulting with a club considering a greens redo: “Science will determine the scope of the project, not opinion.”

Sullivan's statement bears weight because many times a greens resurfacing will not address the root of the issues and a club can spend tremendous time, effort, dollars and impact to the membership,

for what essentially is a short-term fix, Jackson says.

There are logistical considerations to account for, as well, says Doug Wright, project manager for Heritage Links.

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Greens are rebuilt from the ground up, affecting not only the playing surface but also the sub-surface, in a full renovation.

“Quite obviously, a simple resurfacing project will take less resources and time to complete compared to a full renovation project.”

A resurfacing project requires about one half of the labor hours a comparative renovation project would need, Wright says.

“This is based on our historical knowledge of past projects we have completed,” he says. “Completion time is a bit more complex, as the schedule is typically predetermined by the club.”

In most cases, clubs limit the construction time of a greens project to about six weeks and selects a completion date that places them in an optimal grow-in weather window. The logistical factors are very much the same for each type of project. Both require pre-construction planning of labor forces, travel planning, housing arrangements, equipment mobilization, ordering and delivery of materials, and the execution of the work.

As for any the agronomic differences between a resurfacing versus rebuilding a green, Wright says most of it has to do with the greens’ pre-existing conditions. In a full renovation, the greens are rebuilt from the ground up, affecting not only the playing surface but also the sub-surface. Installing new drainage and greens mix changes the physical properties of the subsurface, including drainage characteristics, water retention capabilities and organic content he says.

With a resurfacing project, these properties remain the same since the work leaves the sub-surface largely intact, Wright says. The primary agronomic impact of a resurfacing project is to the playing surface itself, which is dependent upon grass selection. A new grass variety may play different than an existing one, as well as create new maintenance practices.

A resurface project is likely to last fewer years, but that depends on the original sand



The heat is on

By Mickey McCord

Summer is right around the corner, and while most people look forward to the hot and sunny days, golf course superintendents and their crews often have a different opinion. Summer turf maintenance means long, stressful days that are tough on turf and people. Heat illness and skin damage from exposure to the sun's intense ultraviolet rays are serious health risks for anyone working outside in the summer. Take measures to protect your skin from the sun's harmful rays, but keep in mind the level of UV radiation is higher in the summer. Likewise, the body can lose its ability to cool itself in extreme heat, setting the stage for heat exhaustion or heat stroke, which is deadly. Immediate treatment is critical to saving a heat-stroke victim's life, so train your crew to recognize the symptoms of heat exhaustion (excessive sweating, damp clammy skin, feeling faint or dizzy) and heat stroke (no longer sweating, hot dry skin, nausea, confused, or unconscious) and how to treat heat injuries – move them out of the sun, cool them down, have them drink water or a sports drink, call 911 for heat-stroke victims.

Of course, prevention is always better than treatment. Here are five tips to keep

your crew cool, and prevent heat and sun injuries this summer.

- Apply broad spectrum, SPF-30 sunscreen, in the morning, and reapply every 2 hours. Sunscreen not only protects your skin from harmful UV rays, but also helps keeps you cool.
- Take it easy on those first few hot days. Let your body acclimate to summer heat and stress. Gradually increase your work load over 5-7 days, and rest if you start to feel weak or dizzy.
- Pre-hydrate and stay hydrated. Even if you're not thirsty, drink water – or a sports drink – before, during, and after work. Make sure your crew takes regular water breaks on high-risk days.
- Wear heat protective clothing: wide brimmed hats; lightweight, loose fitting shirts, made of special "hi-tech" breathable materials; and cooling bandanas and vests. They help keep your body temperature from rising to dangerous levels.
- Schedule high-intensity work for the coolest part of the day.

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in the green, says Jeff Brauer, the principal at GolfScapes in Arlington, Texas. "USGA-standard greens may last forever, at least 20 years," he says. "Resurfacing is likely to last only 15 years or so, and some of that is due to turf contamination (also true of USGA greens). If its characteristics were good to start, it often doesn't change much, unless water quality is poor, the greens frequently flood, etc. Sometimes, greens on a windy site can be clogged up with dust-born silt. It really depends on what is there."

When resurfacing 1950-80 era greens, which are now usually too steep for typical green speeds, it is hard to soften

slopes. However, using the USGA's maximum deviation allowance for sand depths (2 inches up and down) you can sometimes shave 1 to 2 inches off a rise, and fill a valley by the same, which can effectively reduce the slope by 0.5 to 1 percent, Brauer says.

"That is often enough to make the green putt better," he says. "It can work well, since deeper sand profiles drain faster (which would occur in valleys) and shallower ones drain slower (now on top of crests), which in theory helps maintain constant moisture. I have seen it work."

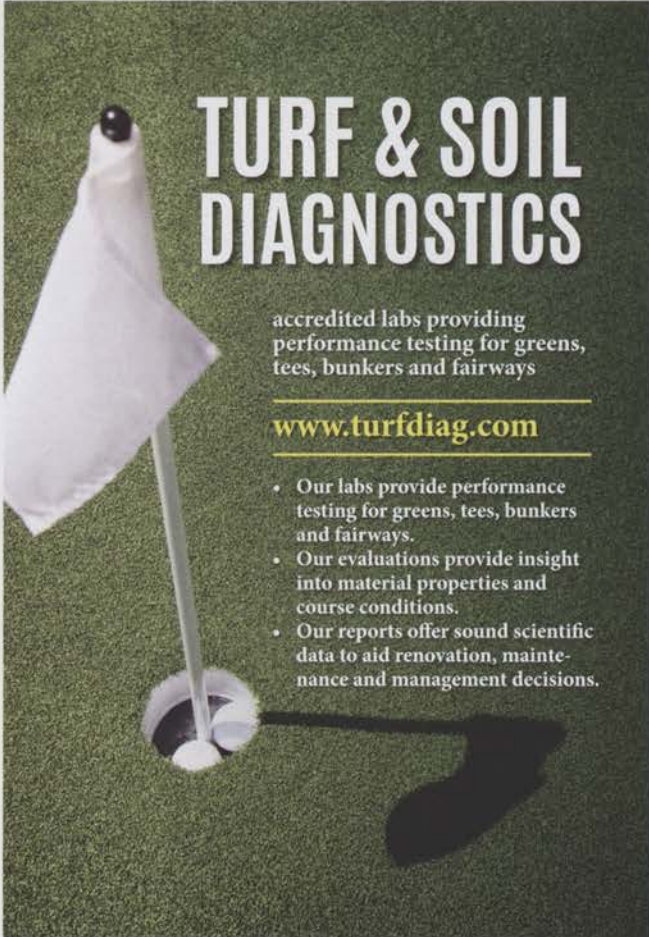
When rebuilding the root zone from the ground up, the

base must be reshaped to proper grade and then the various layers added in close to perfect and consistent depth, Brauer says. "Some superintendents have grown accustomed to working with what they have, and others feel much more comfortable rebuilding to higher standards of USGA," he says. "We always factor their opinions into our recommendations."

As an example of the difference between resurfacing and rebuilding greens, Jackson says for 100,000 square feet of greens with a 12-inch sand base you can expect to remove between 4,500 to 5,000 tons of old greens mix, and replace it with a like amount of new

greens mix. There will be 2,000 tons of pea gravel plus or minus. For reference, that is 4.3 feet of combined material over one acre of land. There also will likely be approximately two miles of 4-inch perforated pipe that will underlay a USGA greens construction at 100,000 square feet.

"Hauling that amount of material through an existing golf course on the cart path system can take a fair bit of time depending on the design and routing of the course, use of relatively small volume hauling equipment so as not to damage the path system, and limited access points," Jackson says "A resurfacing project typically



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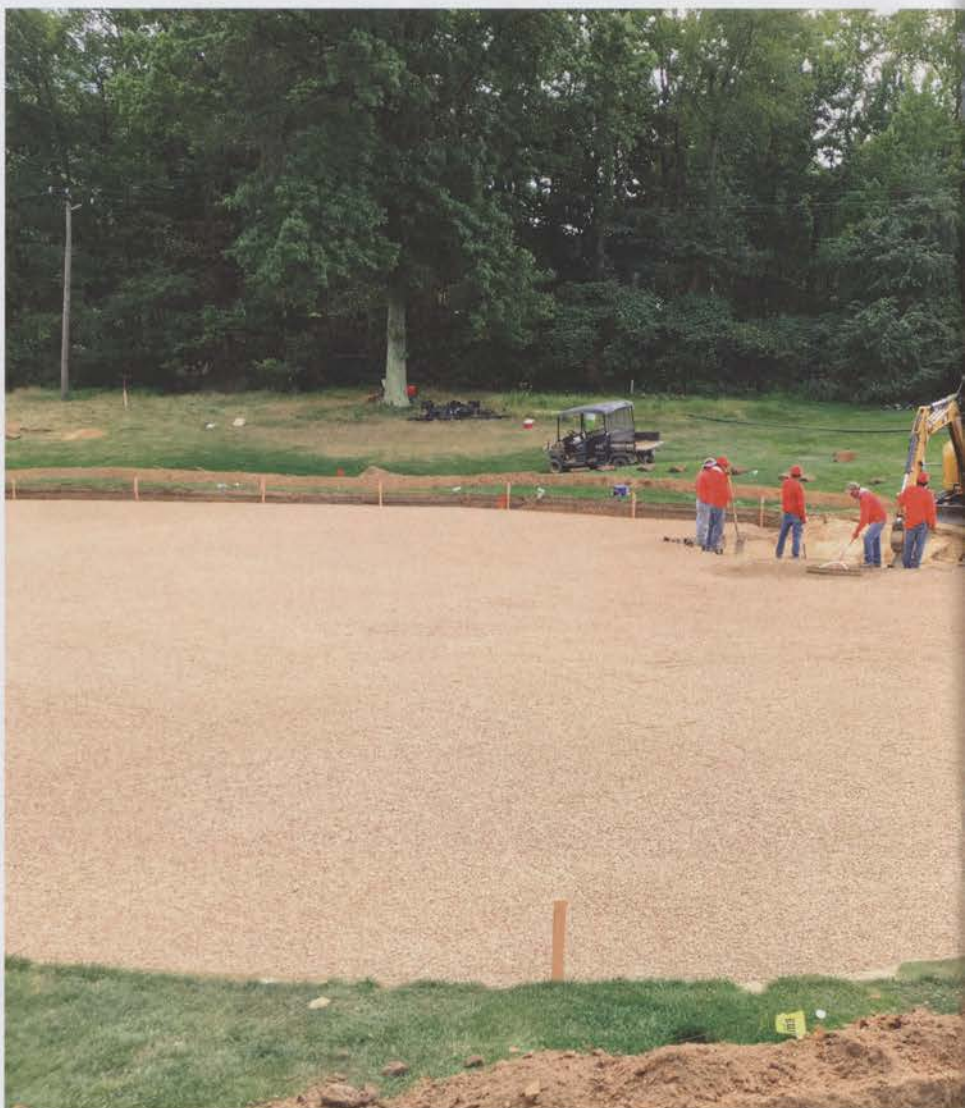
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CONSTRUCTION



The differences in materials needed for resurfacing vs. rebuilding greens can be significant and factor into a facility's decision.

may only remove the top 2 to 3 inches of sand, or not at all. Certainly, the latter is much simpler from a logistical standpoint and the project can be accomplished in a smaller work window."

Slope is the prime determinant when considering resurfacing over renovation, says golf course architect Rees Jones. "A lot of greens were constructed for slower speeds, so that must be taken into consideration," he says. Therefore, if you are going from a push-up green to a USGA green, you will likely have to rebuild.

It is also important to factor in the type of seed intended for the redone greens,

as certain varieties will make for slower or faster ball speeds. Jones says a proper "mapping" of a course's greens to "find out exactly what you have to deal with in terms of slopes and other factors" is essential.

Renovation affords a known, complete ground-up rebuild with drainage, greens mix, with total flexibility to alter green contours/slopes, says golf course architect Bobby Weed. "Through sound design/construction specs, a superior set of consistent greens can be constructed for the long term," he says. "Resurface is living with past construction standards with the only notable improvement being changing out



the turfgrass.”

Some clubs consider a combination of greens resurfacing and renovating. Weed cautions against such a piecemeal approach. “The decision is either one or the other,” he says. “If the short-term decision is cost related and the resurface method is not successful, then a costlier renovation will be inevitable.”

Weed recommends a thorough and exhaustive due diligence process when considering a greens project. He warns an uninformed decision can be costly. For example, a hasty decision to resurface when a renovation would have been the appropriate direction may result in renovating sooner than later.

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"Time-wise, a properly constructed green will better allow a resurface at a later date and provide the longest lifespan of the green," Weed says, adding there is no substitute for a properly constructed set of greens.

Both approaches to a greens redo have been done with great success over the years. "It all depends on the facility, and what they are looking to get out of the project," Hamilton says. "If there are no changes in architecture needed, greens have good surface drainage and current organic layer is not an issue, a resurface may be the best route to take." If a facility desires changes to

slopes or location, there is poor surface drainage, or high levels of organic matter in the greens, then renovation may be needed. "Again, no matter what is chosen, the project comes down to research, proper planning, and a cohesive team that are all on the same page," Hamilton says.

As for any trend favoring resurfacing greens over renovation, or vice versa, Brauer says, "Here in Texas, resurfacing is pretty big among mid- and lower-level courses. It's cheaper, faster and less intrusive, and we grow mostly Bermuda, which is thought to tolerate different soils much better than bent."

There isn't a discernible trend in the industry that favors one over the other, Wright says, adding he sees a lot of both types of projects. "The full renovation projects are probably more noticeable in media and the public eye because they are usually completed by larger contracting companies, often as part of other improvement projects," he says. A lot of the resurfacing projects are completed "in-house" by clubs using their maintenance staff, which results in less exposure.

The only trend Jackson sees is good facilities with good management and good governance tend to make good

choices. It takes a strong, well-informed greens chairman (or committee) or club president (or board of directors) to lead a membership down the correct path, he says.

"We have been fortunate to work with a lot of highly intelligent committee members at clubs with whom we consult, who are motivated to understand the science, the options, and the outcomes," Jackson says. "Cost and time have many times been the secondary consideration. Getting it right has been primary." **GCI**

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



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SENIOR MOMENTS IN GOLF COURSE ARCHITECTURE?



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

Retaining an experienced architect is the best way to assure quality and eliminate design mistakes. However, it doesn't always work out. Every architect, including those at the top of the profession, has occasionally made a dubious or curious design decision that appear to be "senior moments." Some are funny, at least in hindsight. While many of these are documented, some are anecdotal, so I present them only as legend ... (wink, wink)

MATH MISTAKES – PART 1, CORRELATING UNITS

When Donald Ross designed a course in western Canada, he sent plans with horizontal measurements in yards and vertical elevations marked in feet. His green detail showed grades as "0," +5, (-2), etc. The inexperienced contractor assumed all units were in yards, initially building mounds and green contours three-times higher than Ross intended, resembling the nearby ski hills.

Other architects have had problems when first working in meters rather than feet. A meter is 10 percent longer than a yard, causing some exaggerated contours. It happened on my first Asia project, but I liked the boldness, and figured slower greens would allow us to get by with wild contours.

Pete Dye doesn't use plans, but likes to contour greens aggressively, like he did at the original TPC. The pros formed a committee to work with him

to soften greens. One pro commented, "Pete, there is nothing wrong with that mound in the middle of the first green ... but you liked it so well you repeated it 17 times!"

MATH MISTAKES – PART 2, SIMPLE COUNTING

Inverness and Crystal Downs mistakenly were routed with only 17 holes, and fixed by inserting a par 3 hole. Robert Trent Jones is said to have handled a comparable situation by saying, "When you pay me, I will tell you where the last hole goes."

There's an old saying – "If a routing plan is finished easily and quickly, it probably has 17 or 19 holes." At least having 19 holes on the first try allows an excuse – you were proposing a "betting hole."

Another had budgeted 120,000 square feet of bunker sand, but placed an 180,000-square foot sand bunker between the first two holes built, requiring a change order to build the other bunkers on the course.

EVEN THE BEST MADE PLANSE.

Blueprints (and modern digital images, reversed with the click of a button) have been printed backward, or at wrong scale. One architect designed a long and narrow green, but mistakenly drew it 90 degrees to hole, creating a wide and shallow green. In many cases, golfers wouldn't know a green design was wrong, but in this case, the

backing mounds were in front of the green, hiding it from golfers.

Another architect designed the greens in 1 inch = 20 feet scale, but inadvertently put 1 inch = 30 feet scale on the plans, resulting in – to his surprise – greens being built 50 percent too large.

Contour/elevations labeling mistakes occur – one architect designed a 10-foot-high mound, but actually drew – and got – a 10-foot-deep hole. To save face, the architect maintained he wanted the deep hole, even requesting it be made deeper to sell the story.

CROSSING THE LINE

Property lines are sometimes inconvenient, and some have built golf holes on adjoining property. Sometimes the owner will buy the required property as being a cheaper correction than rebuilding the offending golf hole(s).

SOMETIMES YOU DON'T NOTICE IT RIGHT AWAY... OR JUST DON'T CARE

Failure to account for future tree growth is a common design mistake, in back yards or along fairways. However, trees grow so slowly no one notices for decades as their hole gradually becomes poorly designed. I have seen a few large trees used to create dogleg par-3 holes, which tree-hugging golfers seemingly continue to happily play. Tropical trees have been proposed in northern climates, which sometimes lasts a few years, but ends in dead trees sooner or later.

FAILURE TO KEEP TRACK

Busy architect and consulting tour pros hand work off to talented associates, limiting their design participation to sporadic sites visits, where their project unfamiliarity can be embarrassing. One architect, proclaimed a huge mound near a green to be "an excellent spectator mound, just as I envisioned." Everyone else knew it was just topsoil storage pile. Others have had to be told what hole they are on, or maybe even the name of the course. **GCI**

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PRESSURE TESTING



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

Visit lots of golf courses and see a lot of irrigations systems. They vary in terms of their customer base from public, to resort, to country clubs, to high-end private courses. One thing they all have in common, though, is an irrigation system the superintendent does not think is as good as it could or should be. Many times, I am asked to evaluate the condition of an existing irrigation system. The thing I like about golf course irrigation system evaluations is after you see what the system's problems are, you get to figure out the cause. With golf course systems, the problems can stem from many different factors, including pump station issues, pipe size, sprinkler nuzzling, sprinkler spacing, pressure, controls and wiring issues. The trick is to determine the issue's primary cause or whether it's a combination of factors.

One aspect of evaluating an irrigation system is to check the operating pressures to see if the sprinklers operate at the pressure the designer intended and the pressure that meets the sprinkler manufacturer's requirements. In golf, higher pressures are usually regulated to the desired operating pressure based on the sprinkler pressure regulators setting if it is receiving 10 to 15 psi above the required setting. However, low pressures severely distort the sprinklers pattern resulting in poor uniformity and wasting water. You don't need a professional to check pressures. Your staff can do

this task with just two pressure gauges.

Put one gauge at the highest point of your golf course and the other at the lowest. Attach the gauges to the hose connection of a quick coupler key and insert the keys into the appropriate quick coupler/snap valve. Put one person on each gauge and someone in the pump house. The person in the pump house will log the pressure at the pump house, as well as the flow and what pumps are operating. Even though the purpose of the test is to evaluate the sprinkler operating pressures and piping system, a side benefit of pressure testing is it also shows how well the pump system operates, maximum available flow, how well the pumps switch, etc.

Once everyone is in place, slowly turn on a number of sprinklers at a time. The number to turn on at a time will vary with your pump station flow

capacity. You don't want the test to take forever. A good rule of thumb is 0 to 1,000 gpm, two sprinklers at a time; 1,001 to 2,500 gpm, four sprinklers at a time; and more than 2,500 gpm, eight sprinklers at a time.

At each step, record the pressure at the three locations and the flow, as well as what pumps are operating. Spread the water out throughout the course as you would your central control system. On a small pump station, you may want to do two tests – even holes and then odd holes.

Keep turning on a set of sprinklers until you run the pressure at the high point well under the desired sprinkler operating pressure or the capacity of the pump station. On a system with an 80-psi operating pressure, turn sprinklers on so the pressure at the high point is down to at least 60 psi or less. Keep all the sprinklers on for about an hour so nothing turns off during the test. The results will give you the maximum flow the station can produce at the intended operating pressure and how many sprinklers that represents. Expect to see significant differences between the high and low points. You will see the pressures change significantly at each step as you get closer to the pump station capacity and turn on sprinklers on the holes where the gauges are located. You may see the flow change as each set is turned on and get smaller as you reach the pump station capacity. **GCI**



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The windmill on the National Golf Links of America grounds is one of the most iconic images in golf.

MODERN MEETS *Classic*

National Golf Links of America: Modern irrigation design and principles meet classic golf

By **Ian Williams**

Awalk through the former golf course maintenance building at National Golf Links of America in Southampton, N.Y., is like visiting a museum. Golf course superintendent Bill Salinetti has preserved a mix of early 20th century equipment, converting an area of the former maintenance building into a showcase for these relics. It's truly a visit to the past, which makes one consider how irrigation — specifically, how water is applied and controlled in the

golf industry — has come a long way over the years.

The only thing missing from Salinetti's "museum" are the old images of horse-drawn carts carrying water storage drums with hoses for supplemental hand watering that were common prior to pressurized water systems. It's readily apparent that irrigation has gone through significant changes. Technological advances have kept pace with player expectations, course conditioning

trends and the need for environmental responsibility.

NATIONAL'S RENOVATION

Given the costs of upgrading and modernization, many courses are forced to work with an inefficient irrigation system and try to minimize any negative effects on the turf and course playability. The \$1 million- to \$2 million-plus price tag for an irrigation system renovation is a hard sell to a club whose members won't

notice the upgraded system buried underground, as readily as they might notice new bunkers or cart paths. Often, it's difficult for clubs to communicate the agronomic benefits of increased water distribution uniformity, efficiency, control and system management. However, Salinetti saw past the barriers and replaced an outdated, circa-1998 irrigation system with a new, state-of-the-art system in 2007.

Built in 1911, National is a classic C.B. Macdonald links design with deliberate mow lines, different turf types and striking contrast between roughs, fairway cut and putting surfaces. Outside the nar-

row strips of primary rough are seemingly unplayable native grasses that penalize the errant golf shot. By 2007, technology and knowledge had advanced significantly, making National's previous irrigation system outdated and inefficient. With its new system in 2007, National improved irrigation system efficiency, saving water while also improving the course conditioning for members, day in and day out. Salinetti is known for providing firm and fast course conditions with remarkable attention to detail and consistency. Salinetti will be the first to tell you how important irrigation system control and reliability is to provide repeatable,

consistent course conditioning. "The control and precision we have with our current irrigation system is incredibly important to providing consistent results," Salinetti says. "I know when I leave at night, the course is receiving exactly the irrigation needed. The intelligence of the central control software allows it to make instant adjustments as conditions change, even in the middle of the night when nobody is at the course."

OUT WITH THE OLD

The old system consisted primarily of double-row irrigation throughout the course. It was also referred to as a "block-style" system, meaning multiple

sprinklers were controlled by one electric remote valve. There were approximately 600 sprinklers on 76 acres of maintained turf. Spacing was consistent with irrigation system designs of that era, with fairway sprinklers spaced at 75-plus feet apart. This design provided little control, and its distribution uniformity was particularly poor, given National's windy conditions and required sprinkler throw distance.

As if the lack of sprinkler control, low distribution uniformity and an undersized pipe network weren't bad enough, Salinetti and his staff faced numerous other challenges with the old system. Pipe and fittings

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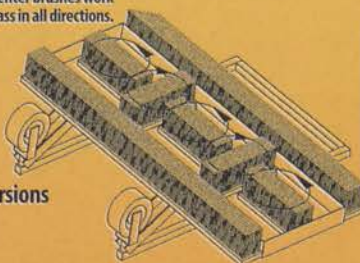
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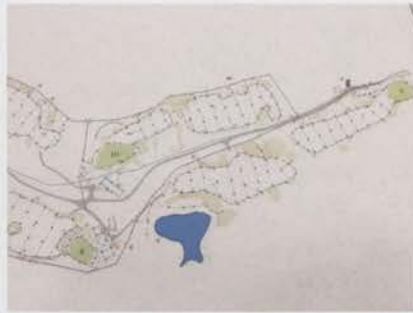
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The evolution of golf course irrigation can be observed when studying the changes in the system at National Golf Links of America.

failed at a frequency of one per week, forcing them to devote labor hours away from golf course management activities to repair pipes and wire. To further complicate matters, there were few points available to isolate leaks, and consequently, the staff was forced to address them immediately or several holes would be without water until the leak was repaired.

An already stressful situation would become even more dire when multiple holes were without water in the heat of a Long Island summer.

With the old system's challenges continuing to build, the club decided in late 2006 to move forward with a complete irrigation system replacement. The new system would be designed by Aqua Agronomic

Solutions of Clinton, N.J., and installed by Leibold Irrigation of East Dubuque, Ill. National's irrigation system renovation was justified and approved based on the long-term benefits of water management and improved uniformity. The renovation would also serve as a tool to help Salinetti continue to deliver championship-level playing conditions.

IN WITH THE NEW

The new irrigation system was installed from November 2006 through March 2007. The new system was designed with 4,000 sprinkler heads and a new control system manufactured by Rain Bird Corporation and supplied by Atlantic Irrigation. Fairway irrigation was designed at closer 65-foot triangular spacing with single

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TANGIBLE SAVINGS

Salinetti can now precisely control when, where and how much water is applied to the different turf types throughout the property for proven, responsible water savings. The large number of sprinkler heads throughout the hundred acres and tighter sprinkler spacing give Salinetti the ability to irrigate specific areas and control both playability and turf health like never before. The new sprinklers' dramatically improved water distribution efficiency, resulting in shorter runtimes, achieving excellent turf health with less water. Multiply that over the thousands of sprinklers and the water savings add up quickly.

Supplemental hand watering is still used to precisely apply water to very small, stressed areas without utilizing the overhead sprinklers. However, the new, more efficient irrigation system has reduced the amount of necessary hand watering. Salinetti estimates they are saving 75 to 100 labor hours per week in hand watering over the older system.

Despite the improvements in pipe sizing, spacing and sprinkler efficiency, an irrigation system manager must still make sound scheduling decisions to truly maximize water savings. Salinetti and his staff utilize other tools such as a weather station, soil moisture sensors and sophisticated central control features that react and adjust irrigation based on environmental conditions such as rainfall and wind. They have also taken advantage of the numerous added features and improvements to the software as well as other equipment over the 10 years since the new system was installed.

HISTORICAL WATER CONSUMPTION

National has been recording actual water use as far back as 1971 when they first received permits to install three on-site wells for irrigation and other needs. Water usage can vary widely throughout the year on Long Island as it does in most of the Northeast. Southampton typically receives an average of 36 inches of annual rainfall, with extreme years varying from a very wet 68 inches in 2011 to a very dry low of 30 inches back in 1969. National increased the num-

“I know when I leave at night, the course is receiving exactly the irrigation needed.”

— Bill Salinetti

ber of sprinkler heads with the new, modern system by 600 percent, but is using the same amount of water or less than before.

Looking at years with similar rainfall totals and comparing them to National's irrigation amounts is quite eye-opening. In 1998, Southampton recorded 39.27 inches of rainfall, and National applied 23.6 million gallons of water (72 acre feet) through both time-intensive hand watering and the older, less-efficient irrigation system. With a similar rainfall total in 2008 of 39.57 inches, National applied only 53 acre feet of irrigation water, even though the new system covered a larger area of the course. In 2013, with 42.95 inches of recorded natural rainfall, National applied 70 acre feet of irrigation water, while in 1993 and 1994 with similar rainfall amounts, National applied 79 acre feet and 90 acre feet, respectively.

Of course, these numbers can be interpreted in different ways. That aside, there are many lessons to be learned, and now that the system has turned 10 years old, the collected data over the lifespan of the new, modern system shows the return on investment associated with fewer labor hours, less power, lower water consumption, greater playability and improved

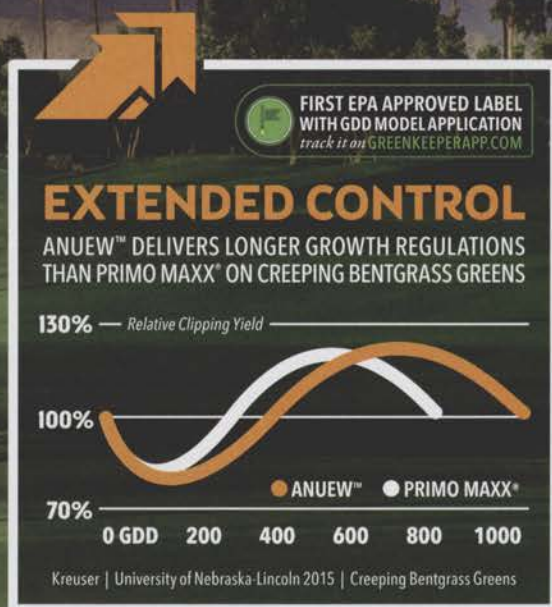
turf health. Furthermore, Salinetti and his staff are less stressed thanks to their reliable, efficient irrigation system with its built-in intelligence to make application and runtime decisions. It's a powerful story even in the Northeast where irrigation amounts can range between 15 and 30 million gallons for a typical 18-hole layout. Imagine the potential in the South and Southwest where irrigation demand is year-round, and water usage for 18 holes can be as great as 100 million gallons annually.

STILL GOING STRONG

National has solidified its position as an elite course due to the architectural brilliance of its century-old design and layout. Obviously, the meticulous manicuring and course conditioning provided day after day by Salinetti and his staff contribute to this honor. These tasks are made easier by an efficient, reliable irrigation system capable of providing precise water distribution. Responsible management of the now-10-year-old-system by Salinetti and his staff has resulted in water, energy and resource savings that testify to the importance of efficient irrigation. **GCI**

Ian Williams is an area specification manager for Rain Bird Golf. This is his first article for GCI.

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THE LOW DOWN ON LOW TECH



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.

This past winter someone at our Wisconsin Turfgrass Research Day asked if I had received a certain text. “No,” I replied. “I neither send nor receive texts.” He accused me of being a liar.

“Emails? Yes. Texts, tweets, Facebook and whatever else there is – no.” That small incident got me to thinking about all the technology that surrounds us, and when I first embraced it. I was taking a grad school class in quantitative chemistry, and each lecture included some extensive problem sets which involved a fair amount of math. I spent too much of my time doing those math problems “long hand.” Finally, my wife and I agreed I absolutely had to have a slide rule. We were poorer than church mice, so I went to the University of Wisconsin Credit Union, applied for a loan, and was granted it. The loan was the first of my life.

I took my \$35 loan (honest – it was a \$35 loan) and bought a slide rule. It was the best purchase of my life to that point and made my academic life enjoyable again. This event clearly demonstrates that I am not averse to technology and devices and machines that make our lives easier.

But sometimes high technology comes at a cost too high, I think. Simple jobs are actually made more difficult or more frustrating, and when the technology doesn’t work, sim-

ple tasks can become impossible. Circumstances like these make a guy look back fondly to simpler times.

The summer before I was drafted into the Army I attended the first Jacobsen School for College Turf Students. The highlight was our introduction to Jake’s prototype triplex greensmower. The wave of new technology, available after two years in the service, was that greensmower, a Toro bunker rake that was vastly superior to the Stan Clarke rake and automatic irrigation systems.

Rotary mowers have replaced reel mowers for most rough areas, and hydraulic units have replaced pull frame mowers for fairways and other golf course features. Large area hydraulic aerifiers have replaced Ryan Renovaires for fairway aerification and done a better job in a fraction of the time.

And if you really want to gauge how much technological progress golf courses have seen, look at what’s available in irrigation equipment, controllers and pump stations. The plant sciences have profited tremendously from improvements in seed technology, pesticides and plant nutrition. Golf course conditions are better because of them.

However, I am suggesting that sometimes high technology goes too far, and an occasional return to time proven practices, procedures and equipment of past years can actually

be progress. That is why superintendents often hand rake bunkers for big tournaments, and explains why many greens are cut by walking mowers, not triplexes. There is a reason it is called “hand-watering;” sometimes syringing with a 1-inch hose and a flattened pipe nozzle does the best job.

Sometimes it is exhausting to listen to someone asking over and over, “Where’s my phone?” Or to walk into a shop lunchroom at noon and experience silence, not because the crew is eating or reading the paper. They are all on their phones. Gone are the days, I guess, when noontime meant conversation, a few hands of cards or a long-running trivial pursuit game.

Maybe the difference between low technology and high technology defines the difference between the art of greenkeeping and the science of contemporary golf turf management. It is likely the best golf course operations are a blend of both. At least that is what I would like to think. I wouldn’t want to return to the days of yesteryear. Times change, and as the old saw goes, you have to keep up with those changing times.

One of the highlights of my life came during the 2015 PGA Championship at Whistling Straits. Michael Lee, manager of the four Kohler golf courses, arranged for me to lead a parade of staff and equipment from the shop yard to the south end of the golf course where play had cleared and preparations for the next day could begin. I led this parade of the latest in golf turf equipment down a county road driving a Toro General tractor, the same one that we had in our shop for my entire career. He rescued it and I got to drive it that day. I loved listening to that six-cylinder Continental engine with its overhead valves purring along the entire way. What a thrill.

It was sentimental, have no doubt. But it also confirmed that a 60-plus year old tractor driven by a 70-year-old guy can still be useful. **GCI**



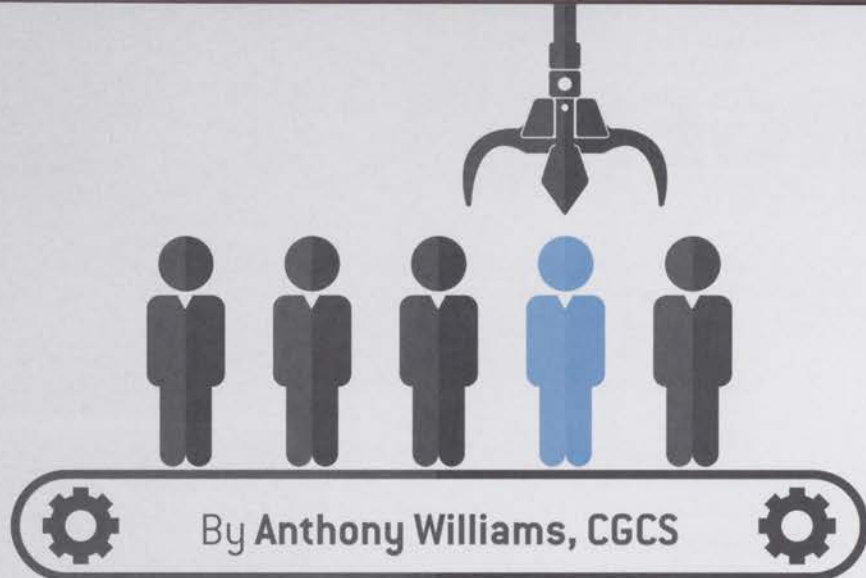
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THE NEW SUPERINTENDENT'S SURVIVAL GUIDE

Starting an unfamiliar job can be daunting and fulfilling. Here are proven ways to make a strong impression with your new employer and crew.

Congratulations! You have earned the superintendent position at ABC Golf and Country Club and today is your first day on the job. You are parked in front of the maintenance facility sitting in your truck gathering your thoughts before you walk into the promised land. What is going through your mind? What is your plan? What happens if your plan goes up in smoke, do you have a plan B or plan C even? There are many factors at work here on Day 1 of your tenure as golf course superintendent. General things like expectations of members, staff and management, and let's

not forget those specific things like budgets and spray schedules. The years of education and experience have brought you here, and now the quality of your decisions and performance from this moment forward will have a direct impact on the level of your success. It is show time.

There are three common roads that lead to a new superintendent job. The first scenario is that you have been promoted after years of service at the facility and now you are assuming the golf course superintendent position. The second scenario is that you were chosen after a lengthy interview

process and entering the operation from outside the property/company. The third scenario is a hybrid: you are coming into a distressed property that is either financially or agronomically challenged (sometimes both) and facing specific problems that must be solved for the operation to survive. You are "the solution." We are going to break down these areas of opportunity for a new superintendent and share strategies and career tools that will help you find success in your new superintendent position whether you are a true rookie or seasoned veteran with a new address.



SCENARIO 1

YOU HAVE BEEN PROMOTED TO GOLF COURSE SUPERINTENDENT WITHIN YOUR CURRENT PROPERTY

You have worked hard, started at the bottom, paid your dues and as of today moved from assistant golf course superintendent to superintendent. You know the crew and are familiar with the property and its systems and politics. These are all positives and will work in your favor. Then why is it so hard to thrive in your first year as superintendent? Mostly the job is inherently tough and the dangers are sometimes hidden. Dangers to watch for in this situation are common, but not obvious. Here are three common dangers for the promoted from within superintendent to be aware of:

No changes please. Stakeholders may expect you to manage exactly like your predecessor and are seeking a more of the same with a no drama style of operation. You may feel that it is time to make some changes, and that now is your time. But now we have a problem.

The best solution to this problem is an equal dose of patience and communication. Start by setting up meetings that will allow you to actively listen to stakeholder expectations and gradually move your ideas into the discussion and eventually into the operation as you earn credibility as the head superintendent. Remember this is an emotional time for everyone, so slow things

down and make sure you do not overreact and keep in mind they chose you for the job for a reason, find the reason and build on that foundation.

Staff resentment syndrome.

This one is as old as soil. These issues sometimes are public but usually are subversive. They somehow always find their way back to the superintendent.

Curing this situation requires a large dose of transparency and some thick skin (do not react to the words or rumors of words rashly spoken). Words are powerful and negative comments that are left unchecked can create bigger problems later. Meet with the primary perpetrators and discover why they are so unhappy. Be in control, be empathetic and ultimately create a new relationship that requires buy-in and accountability both ways up and down the organization chart. Your role as superintendent will require leadership and nothing shows leadership better than converting a naysayer back into a valued team member.

Not quite ready for the big chair.

After your promotion, you find yourself ignoring new superintendent job responsibilities and prefer to spend your time doing more menial and comfortable tasks that could easily be delegated and performed by staff. You are not the first superintendent who dreamed of getting out of the budget review meeting and mowing some grass, checking on the crew or starting a project. Try not to bump your assistant out of the way if this happens. There are times this is not an issue. You know if you have everything under

control or not. If not, the first step is a mentoring session with your new boss to review your new duties with deadlines and expectations. Handle the new higher-priority tasks first and only when the new boxes have checks in them should you return to lesser tasks that are now the responsibility of your subordinates. Lead by thought (planning) and appropriate action (delegation and personal action). Mastering this will be the difference between an average career and a stellar career because you will always be ready for your next position.



SCENARIO 2

YOU WERE CHOSEN AFTER A LENGTHY INTERVIEW PROCESS AND ARE COMING INTO THE OPERATION FROM OUTSIDE THE PROPERTY/COMPANY

The person who gets the position is indeed fortunate, but it's the person who excels and exceeds the new expectations that truly succeeds. This situation requires quick results, like Clark Kent jumping out of a phone booth as Superman quick. (Dear millennials, faster than your latest iPhone app, that kind of quick). So rather than talk about negatives or dangers, let's focus on the positive. The top three skills that an outsider/new hire superintendent needs in their first year are:

Watch, listen and learn. In the first 30 days, try to be a sponge and gather as much information about procedures, policies and people (past and present)

as you possibly can. Unless there is something illegal going on, try to limit major changes during the "welcome period." Build trust by becoming the student and let the existing staff show you their ways and means. Maximize any formal orientation process and participate in each session with enthusiasm and demonstrate the ability to communicate in a 360-degree manner with all operational stakeholders. Remember you are only as good as the information you use to make decisions.

Serve somebody. During the first 90 days of your employment or the traditional probationary period, one way to gain a quick following throughout the operation is to simply serve somebody and do the right thing no matter how small it may seem. Volunteer to help with the company charity drive, offer to do the tough stuff like clean the bathroom, empty trash or cut down the storm damaged tree. Buy those Girl Scout cookies, buy someone's lunch, send hand-written thank you notes and be on the lookout for a chance to invest yourself in your new team. The smallest action trumps the grandest intention, and people notice the difference.

Become part of the property's

culture. The legacy of your first year as superintendent begins even before you arrive on property. Be aware of the potential impact of your first email, phone conversation, green committee meeting and procedure adjustment. Your physical arrival on property should enhance any business and personal protocols that exist and produce a visible

change that will become your trademark. Your ability to genuinely understand and value the property's culture and your role in it is critical to success. Craft yourself into the perfect fit for your property's unique puzzle and you will be rewarded every day, thus eventually becoming a major contributor to the protocols that govern the property.

In closing this section, I did not forget about the importance of agronomics in the success of any superintendent. I would point out that agronomic and cultural practices with preferences should completely integrate the day-to-day and strategic planning of the

superintendent and would be intricately woven into the three areas covered.



YOU ARE THE NEW SUPERINTENDENT BROUGHT IN TO SOLVE A SPECIFIC PROBLEM OR PROBLEMS

You have just accepted your next challenge, you are the golf course superintendent at a club in trouble, but a club with a lot of potential if things turn around. All you must do

now is solve the problems and turn this job into a gem. This is serious business because the National Golf Foundation tells us that we lost another 150 or so golf courses last year so success is certainly not a guarantee. However, sometimes a superintendent committed to the cause with the right skills can give even the most critical patient a new life. Here are five unwavering skills needed to find success as a superintendent even when the odds are against you:

Accurately identify the problem or problems to be solved.

Why are revenues down? Is it a conditioning problem or an infrastructure problem? Is it mar-

keting, competition, weather, rate or volume driven? Find the real problem and then real solution, and your role in it becomes clearer.

Skills trump titles when the chips are down.

There are two powerful skills that a great superintendent possesses: the skills that he personally brings to work each day and skills he can replicate by teaching others to do them. When times are tough, creating a well-trained staff from whatever human resources are available is borderline miraculous whether you have a staff of two or 200.

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driven "to-do" system that is simple to record, track and refer to for planning. Firefighters have a plan before they rush into a burning building and so should a problem-solving superintendent. These plans are created from great data collected in similar circumstances and properly evaluated after the fire has been put out and strategic thinking can show critical options for future decisions.

Persevere, you will be tested.

Whether the problems are financial, environmental, cultural, political or even at times personal, you will be tested as you take on superintendent duties in a distressed property.

It will at times be unforgiving and unfair, and you must rise higher than the situation to make things better. You will certainly grow from the experiences, but managing the stress and focusing on the brighter future will keep your perseverance meter on high. Talk to other superintendent mentors frequently for advice and encouragement. You are not alone.

A line in the sand.

In difficult situations, we can all be tempted to cross the line of behavior and ethics. It is important to give 100 percent effort to be successful for the property and yourself, but you must always


know where to draw the line. It is perhaps the most important skill we have as superintendents working in difficult situations because it is our anchor in rough seas and our lighthouse in the dark times reminding us what is most noble about our profession.

It takes a special person to take a tough assignment as a superintendent and make the most of it. It is long hours and certainly days full of peaks and valleys, but if you have the skills and are given the opportunity, you can find success where most fear to look. Press on.

The road for the new superintendent is seldom wide or straight. It is in the small

details that we often find our greatest truths. In 2017, I stand as a new superintendent for the fourth time in my 30-plus year career, and I have embraced the full spectrum of the life of a superintendent. I hope that you found something helpful in this article and you will in turn share it with another superintendent because we are after all a brotherhood that is only as strong as our weakest link. **GCI**

Anthony Williams, CGCS, started his current position as the director of golf course maintenance and landscaping at the Four Seasons Resort Club Dallas at Las Colinas in Irving, Texas, earlier this year. He's a frequent GCI contributor.



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

Whenever my phone rings, I wonder who it will be: a potential client or a superintendent unhappy in his job and looking for my advice on his next move.

Job dissatisfaction isn't limited to our profession. But given that we are on the front lines in a people-pleasing industry and, as I've written before, we get the short end of the stick when it comes to customer appreciation. The usual reasons remain the same:

- Money (not being paid enough)
- Lack of appreciation for one's efforts from members and/or management
- Unpleasant work environment
- Differences of opinion with management about club or facility direction
- The thrill, or challenge, is gone

That's when the voice on the other end of the line says something like, "So I'm thinking maybe it's time to go somewhere else."

You may be right. Maybe you should get another job at another club. And there could be a hundred great reasons to do so. However, before going too far down that path I have some advice: Be honest with yourself.

Before you do anything, conduct a self-evaluation of yourself, your current job, what you think another job will do for you and much more. Take the emotion out of the process and

look at all sides of the situation. There are right and wrong reasons to change jobs, but don't do so with your eyes wide shut.

Start by asking yourself these questions. And spend a good amount of time thinking about each one:

- Why do I want to leave my present job?
- How much disruption would it be to my life and my family? Will it be worth it?
- Are my relationships with the GM, golf pro, and members that bad? Do I want to have to form new ones?
- Do I want to take a leap into the unknown?
- Is the grass really greener somewhere else?

If you've honestly asked and answered those questions (and dozens more you can come up with) and still want to change jobs, great. By all means, go for it.

How? You can check job boards and send out resumes, but be careful. Even a casual inquiry to a friend can get back to your current club and have negative ramifications. Which might not be a bad thing, but could accelerate your departure.

Ask yourself what you want out of a new gig: More money? More responsibility? Less hassle? Remember, life is a trade-off: What are you willing to give up to get any of those?

When you start talking to other

clubs, be ready to ask yourself more questions, including:

- Am I good enough to do this job? (This is probably the toughest question, so be really honest with yourself. And it might not be are you good enough, but are you ready and willing to prove yourself again?)
- Can I handle the extra pressures that come with a new, probably upgraded position?
- How will this job change my personal situation?

Think about family. If you have kids in school, especially high school, do you want to relocate them? Will they be able to handle it? Check out the schools in the new area before talking seriously with a new club.

What about your spouse? If you are currently in a situation that's running well so you can get home for dinner, soccer games or holidays, consider what will happen if that changes with the new job? Not only changes to your free time, but who is going to have to pick up the responsibilities you can't? Will your spouse be able to find a job in the new area or would your spouse need to give up a terrific position?

Turning the family question on its head, I recently talked to a superintendent who took a job in a different state but six months in knew he'd made the wrong decision. However, his family is happy in the new location— schools, neighborhood, friends, church. He's in a bind.

How about spare time? Consider your involvement in the community, charities or whatever is important to you when you're not at the club. These activities make you a well-rounded, fulfilled person. Are you ready to give up the ones you do now? Will you be able to commit yourself to such projects in the new job? Factor flexibility and quality of life into the equation when appraising a new opportunity.

Sometimes a new job is the right answer. But not unless you've asked all the right questions. **GC**

BACK IN ACTION

By Paul F. Grayson

Essential mechanical checks, tweaks, adjustments and calibrations to make before you send your sprayers and spreaders back into action.

Throughout the winter there are cosmic forces at work, as well as mice, intruders, well-meaning co-workers that may cause you to find the equipment to be in less than ready condition. The best thing to do is to avoid blame and just fix it.

Each year the average golf course makes a substantial investment in turf management chemicals, everything from pesticides to PGRs. For that investment to not be wasted, the chemicals must be applied in the right amount, in the right places, and at the right time. The operational status of the machinery used to properly apply those chemicals goes a long way toward determining if the money spent on each application does what it was intended to do. You want to make sure there is nothing that is going to interfere with proper application. You need your sprayers and spreaders in tip-top shape and for them to work flawlessly.

Here's a rundown of the checks and tweaks you should make prior to calling this equipment back into service.

CHECKING THE SPRAY TRUCK BATTERY.

Tools needed: automotive battery tester, starting amp battery charger. Because there is a computer on-board, proper operation of the electrical system is a critical for this computer to work correctly. To identify electrical problems that have caused computer glitches in the past, I have added both a charging amp meter and a system volt meter to the dash board.

A working battery is necessary to power up the vehicle and start the engine, but after six months being idle the battery will be weak or dead. Batteries typically last five years so there is a good chance that the battery will spring back to life. In case it does not, keep a spare battery on the bench in the shop. The battery life will be longer if it is charged slowly, so while the battery is charging slowly, I go to the next item, the tires.



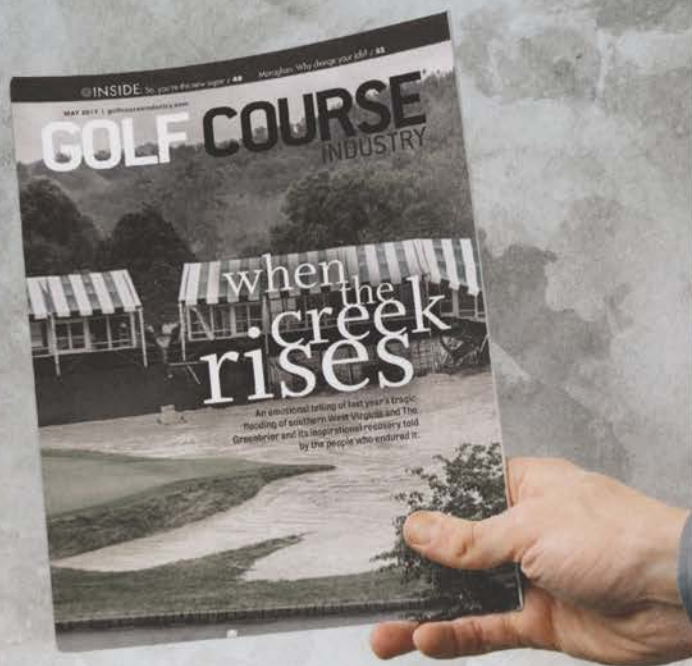
TIRES. Tools needed: chalk, tire pressure gauge, tire chuck, air hose and soapy water. Tires that are low or have gone flat might be able to be saved if they are aired up before trying to move the spray truck. Often a



tire that has gone flat will re-seal itself when aired up. A quick check with soapy water will indicate if there are any leaks that need to be addressed. All the tires should be aired up to what the tires are rated for. Date and air pressure should be written on the tire with chalk. Each vehicle must be up on its tires so that it can be moved without damaging the tires. Expect some flats that can be aired up and some tires that will need to be replaced if the sidewall is cracked and leaking. The easiest way to move the equipment is under its own power.



CLUTCH BELTS. Using belts as a clutch on a 22-horsepower drive line is a clever idea, but not necessarily a good one. There are guide guards that when properly adjusted are supposed to keep the belts from flying off when relaxed. Positioning the guards so they block the escape of the belt



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EQUIPMENT

when loose but not touching it is a difficult and tedious adjustment while head down in the engine compartment for the length of time that it takes to accomplish this. These guards and the other things in the engine compartment make access to the belts difficult. When done right, it seems to take a long time to replace when belts need changing.

plication rate of 50 gallons per acre if everything is working properly.



SPREADERS

The average assortment of spreaders could include a tow behind wheel driven hopper, a front axle mounted electric spreader and a wheel driven walk behind. The baby dump truck that pulls the big spreader needs some of the same start of the season attention that the spray truck needs to get it ready for use. The spreader itself has only a few items to check.



ENGINE. Tools Needed: Starting fluid. Check the fuel tank level and sniff test the fuel for freshness. Stale gasoline smells like varnish. A few cents worth of fuel stabilizer added in the fall can preserve a tank full of fuel until the spring, preventing it from turning into varnish. Other vehicle fluids to check: crank case oil, transmission oil, coolant level and brake fluid level. Starting fluid is usually needed for the first start of the season because it is still cold and these engines are set for quick starting in warmer weather. Starting fluid is not for all engines. Be sure to only use starting fluid on engines that allow it.

BATTERY. Put one of the battery chargers on the battery while airing up the tires.

TIRES. Air up the tires and note how well they hold air.

FUEL. Gasoline should be fresh smelling and the tank should be full.

ENGINE. Electronic fuel injection, starting fluid not needed here. The engine should start without any hesitation. Other "under the hood" fluids need to be checked: crank case oil, transmission oil, hydraulic oil, coolant level, brake fluid level all should be in operating range.

COMPUTER PROGRAM. With the engine running, check battery amps and system voltage on the dash board gauges. If they are in the operating range, power up the spray control computer and scroll through the program settings to see that they are still there from last year. If they are, you are ready to go. If not, use your calibration cheat sheet (the settings written in the margins of the "settings page" in the operator's manual) to re-enter the settings. A test run with water in the spray tank should show an ap-

SPREADER. While moving the spreader around, the wheels should drive the spinning disk. The pull cord that starts and stops the flow should be checked so that it is not worn or frayed. **GCI**

Paul Grayson is the equipment manager for the Crown Golf Club in Traverse City, Mich., and GCI's regular equipment columnist.

(FLOOD continued from page 20)

the turf care facility. More dead bodies were found on or near golf ground. “There are tragedies everywhere,” Shumate says. “When you see something on TV, you’re like, ‘Oh gosh, that looks bad.’ But the next show comes on and it’s lost. This opened my eyes. When things like this happen, you have a new perspective.”

Entire sections of homes have been eliminated because of the flood, which damaged more than 5,000 homes. Forty-four of West Virginia’s 55 counties were declared a state of emergency, with then-President Barack Obama making “major disaster” funding available in Greenbrier, Kanawha and Nicholas Counties. The Greenbrier’s hotel served as a temporary shelter for more than 700 victims. “It’s amazing how you take for granted that you clock out and you go home,” Carrington Bryant says. “You can’t imagine not having anywhere to go home to. That was devastating to see people go through that.”

More than 60,000 West Virginians lost power. Some Greenbrier County residents went weeks without electricity and hot water. The National Weather Service called the flood “a one in a thousand-year event,” meaning it has a .1 percent chance of occurring in a given year.

Nate Bryant spent the night of the flood at his brother’s house in a drier part of White Sulphur Springs. Persinger and Young, who have worked a combined 65 years on the crew, left the shop around 10 p.m. and their eight-mile drive home took close to three hours. Anderson didn’t attempt returning to Lewisburg, and he spent part of the night with Shumate look-

ing for residents or employees who needed moved to higher ground. Shumate was so determined to rescue people that Anderson at one point urged his boss to not cross a bridge bordering a vulnerable hillside. Six trees fell and raging water pelted the bridge shortly after Shumate reversed his truck.

Shumate made the treacherous drive on Route 60 to bring Pope, Anderson, Persinger, Young and Greene from the turf care facility to the hotel. Pope, Anderson and Greene stayed in a room in the West Virginia wing. “It was scary getting back up to the hotel,” Pope says. “Water was coming across Route 60, it was dark, it was crazy. When you got there, you are just walking around like a zombie pretty much not knowing what the heck is going on.”

The most somber moments of the night involved Foster, the agronomic team’s longest tenured employee. The flood destroyed Foster’s neighborhood, and he lost cell phone service, leading to social media

chatter about whether he survived the storm. “Everybody was out of juice, so it wasn’t like you could contact people and find out,” Shumate says. “You really didn’t know what was going on.”

Water receded fast, allowing safe travel through most of White Sulphur Springs the following day. Employees who made it to the shop started sharing what they knew about Foster’s situation, and Shumate, Carrington Bryant and then-assistant Nathan Holbrook jumped in Shumate’s truck and headed toward the neighborhood. Foster’s house was gone, but the man who has spent close to 10,000 days working on The Greenbrier’s golf courses was alive.

“I will never forget it,” Shumate says. “He looked like he was dressed in his Sunday best sitting in his car being Leroy. Words can’t describe it. His house was destroyed, but he was fine.”

Foster says an internet rumor started that he had been “washed away” by the flood.

He escaped his house at 12:30 a.m. and spent the night with a neighbor. “They said I was dead,” he says. “I didn’t have phone service. Some of the stories were true, but mine wasn’t.”

What remained of Foster’s house – and other houses in his neighborhood – has been demolished. The process of rebuilding lives, including ones some thought had ended, started almost immediately.

Personal reminders of June 23, 2016 are omnipresent. Nate Bryant drives past parts of White Sulphur Spring at night and remembers how they remained dark for weeks after the flood. Young spots trees with scars created by flood debris that clobbered bark. Foster visits his old neighborhood and describes the scene as a “desert” among trees.

“They say it’s the 1,000-year flood,” Persinger says. “We just hope it’s true. We never want to see that again.” GCI

Guy Cipriano is GCI’s associate editor.



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.

SAND BOOSER

The 27-hole Star Valley Ranch (Wyo.) Golf Course receives significant snow throughout a typical winter. To remove the 24-plus inches of snow off the greens in the spring, a 2014 The Andersons PowerPro 2000 12-volt electric spinner rotary spreader (\$800) was mounted, using a homemade bracket made of square tubing and flat steel to a 1970 SkiDoo Ski-Boose MK II sled. The windshield was removed from the sled, a 12-volt electrically operated ram formerly used to control the throttle on a Buffalo Blower was modified to open and close the spreader's rate control plate. The control panel for the ram was modified to control the rate control plate and the 12-volt spreader's spinner. It was attached to the 2013 Ski Doo Skandil 600 ETec (\$12,000) snow mobile's battery using alligator clips. The tongue to pull the sled was made of 2-inch square tubing that mounts to the snowmobile with a quick-disconnect hitch. Unipar Black Sand in 50-pound bags (\$9.40 each) was applied at 10 pounds per 1,000 square feet using about 100 to 150 pounds per green. The black sand was applied in mid-March in 40–50 degree temperatures on a sunny day and about 16 inches of snow was successfully melted. It took about four hours to apply the black sand on nine holes. It took about 40 hours on and off for about a year to mount and modify the spreader. Kurt Richmond, superintendent, Steve Stohr, equipment manager, and James Bort, irrigation specialist, make up this great turf care team.



THE HULK

This Kuger 1,500-gallon water trailer was not used for many years, so it was modified by building a 90-inch by 40-inch by 18-inch dump trailer using ½-inch steel sheets, 2-inch by 2-inch square tubing ¼-inch thick and 2-inch channel stock. A hydraulic ram raises and lowers the bed that is hooked to the hydraulic spool quick connect on the John Deere 4600 Tractor. A step made from 2-inch angle iron with a handrail made out of 2-inch bent solid steel leads to the standing area made with 2-inch angle iron and 1-inch wire mesh. The tailgate is held in place during transport using a 2-inch flat steel bracket with a notch that slides over a ½-inch diameter bolt welded in place. The trailer is used for transporting materials such as sand and mulch. It took about 30 hours on and off to build and about \$300 for materials. Brad Twidwell, superintendent, at the Cape Girardeau (Mo.) Country Club and his team performed this modification.



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STILL PREACHING



Pat Jones is editorial director and publisher of Golf Course Industry. He can be reached at pjones@gje.net or 216-393-0253.

Last month, I focused my thoughts in this space on how all of us need to do a better job of preaching what we practice. In short, we have an amazing story to tell to golfers and non-golfers alike and we should all be able to recite how golf benefits everyone in ways big and small.

And we did that successfully on April 26 in Washington, DC. National Golf Day was, as always, an extraordinary event featuring more than 100 turfheads who carried our story to their elected representatives in Congress. They also spent a rainy day beforehand pitching in to help Mike Stachowicz with the turf around the National Mall. It was another very successful NGD and a real coup for GCSAA and the We Are Golf team (led by Steve Mona) who are working to capture hearts and minds on Capitol Hill.

But (you knew there was a “but” coming, didn’t you?) I still think we can continue to do better. Let me offer a few observations.

First and foremost, where the hell are our “friends” from the PGA of America? Why aren’t there also a 100+ PGA professionals up on Capitol Hill telling a great story about golf? And why aren’t there thousands of them tweeting about how golf contributes to the U.S. economy and creates 2 million jobs? Seriously? Were they all too busy folding a huge new shipment of shirts that arrived at America’s “bustling” pro shops on

April 24 to come to Washington to help?

(Wait, I probably shouldn’t use the old “shirt folder” joke because it’s derogatory to golf pros. And I probably shouldn’t suggest that pro shops are the last place anyone buys golf equipment anymore, either. I really shouldn’t say anything about how supers have emerged as the MVPs of golf business social media while most pros can’t be bothered. Nah...I shouldn’t say any of that. Just ignore that part.)

One thing that non-turf types could do to help promote golf is to get PGA Tour players involved in supporting important golf industry causes. One of the most important of those is funding scientific research to find more sustainable ways in the future to maintain golf courses using less water.



For once, we weren’t just preaching to the choir ... we were getting big names to help us preach to the heathens and raise money for a cause that really matters.”

After all everyone in the business benefits from better turf, right?

Yet it was a bunch of turfheads who pulled off a pretty remarkable effort to get PGA Tour players to support turf research.

Our friends at the Carolinas GCSA – the folks who originally launched

the Rounds4Research initiative to try to raise money to replace waning university and government funding – decided to go big this year by getting Tour players and other celebrities to promote the R4R auction. The videos started showing up shortly after National Golf Day and included the Tour’s Jay & Bill Haas, Ben Martin and William McGirt, Kevin Kisner and, in the biggest coup, Jordan Spieth. All had the same basic message: buy rounds through the R4R auction and help support turf science.

This awesome effort was the brainchild of our friend Tim Kreger and his merry band of leading Carolinas GCSA members including Kyle Traynham, Billy Bagwell, Chuck Connolly, Brooks Riddle, Adam Charles and Brian Stiehler. They worked every angle they could to connect with the players and shoot quick iPhone videos. Then they blasted them all over social media to try to reach out beyond the turf world as much as possible. It was very cool.

For once, we weren’t just preaching to the choir...we were getting big names to help us preach to the heathens and raise money for a cause that really matters.

So, there are three pretty clear messages here as we continue efforts to preserve and grow the game.

First, superintendents continue to take an important lead role in telling golf’s story in Washington and on the national stage. That’s a huge win and an amazing opportunity for any of y’all who get a chance to do it.

Second, for reasons that elude me, very few of our brethren in the pro shop or dining rooms seem to take this as seriously as we do. That’s a shame...but it’s also an opportunity to continue to develop professionally while others don’t.

Finally, let’s continue to get imaginative and have fun finding ways to support our industry. The Carolinas GCSA team showed it doesn’t need to be fancy. It’s just needs to be done. **GCI**

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