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WHAT'S YOUR ROBOTIC MOWER READINESS SCORE?

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The Cutting Edge

From labor to leverage, innovative technologies are empowering golf course superintendents to optimize their operations and enhance the player experience.

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"My biggest highlight is seeing people react to being there for the first time. I saw that twice this year."

SETH JONES, Editor-in-Chief & Associate Publisher

Memories of the 2025 Masters

If I could go back and do it over, I would have kept a journal on all the things I've seen and people I've met during my visits to Augusta National. My first Masters was 2003 — I was a guest of Club Car's — and it's remarkable how things just seem to happen there.

One example from this year's Masters: *Golfdom* editor Scott Hollister and I are walking past the practice area when he mentions Pete Wendt to me, the affable Certified Golf Course Superintendent at Congressional. Scott forgot to tell me, until this moment, that he was on the phone with Pete recently, and he extended an invitation for us to come out to see the crew at the 2025 Senior PGA Championship.

Now it's maybe all of one minute later, and we're near the concessions stand in a sea of hundreds of people. I hear someone call out, "Hey, Seth!" I look over and it's Pete! He's with Paul Schultheis, vice president of sales at Finch Turf, and a group of superintendents. "Pete, we were *literally* just talk-

ing about you," I said. What a coincidence.

This year's Masters — the unofficial kickoff of the golf season — was great on so many levels. The drama during Sunday's round, with Rory McIlroy going into extra holes against Justin Rose, was a thrill. McIlroy's reaction to finally obtaining the career Grand Slam was moving. And for our one day there — I always go on Wednesday — the weather was just perfect.

But my biggest highlight is seeing people react to being there for the first time. I saw that twice this year.

The first was Colby Jones. I ran into him in the parking lot, because it's the Masters and, like I said, these things just happen. Of course I'd see him immediately before

he crossed off this bucket-list item.

I first met Colby last summer when I was paired in his golf group at Bondo Greens (sharp-eyed readers might remember my column about Bondo Greens from last summer; it's the course a neighbor cuts into his hay fields for his son's friends to stage an annual tournament). Apparently, during our round and after a few beverages, I told Colby that he needed to just make it happen and go.

He told me at the Masters that he took my advice, and him and his brother Andrew Jones — superintendent at Deer Trace GC in Louisburg, Kan. — had a blast at Augusta. The Jones brothers came by for our group photo, and before they left, Colby

thanked me for motivating him to get there.

I asked Colby what he loved the most, and he said, "I was just amazed at how beautiful the course is, how each hole flows into the next. I loved everything about my two days there."

The other first-timer was my old friend Thad Thompson, superintendent at Terry Hills GC in Batavia, N.Y. If you follow Thad on X (@TerryHillsMaint) or read his advice column in *Golfdom*, you know Thad can be pretty sarcastic. Seeing him at Augusta National, a course he's admired his entire life, the old superintendent became a softy, soaking in every minute.

I asked Thad what his favorite part was. He said, "How nice everyone was, the bathrooms, the golf course being 'perfect' and every expectation exceeded."

Thad is a guy who has been a Class A GCSAA member for years, and he finally took advantage of that member benefit in 2025.

If you're reading this column, there's a good chance you're either a Class A GCSAA member or you're working to attain that status. And a reminder, Class A members can attend the Masters — a bucket list item for many — for free, thanks to the generosity of Augusta National.

Check out the two-page spread of who we saw at this year's Masters on pages 8-9. You're invited to join us next year. I hope to see you there.

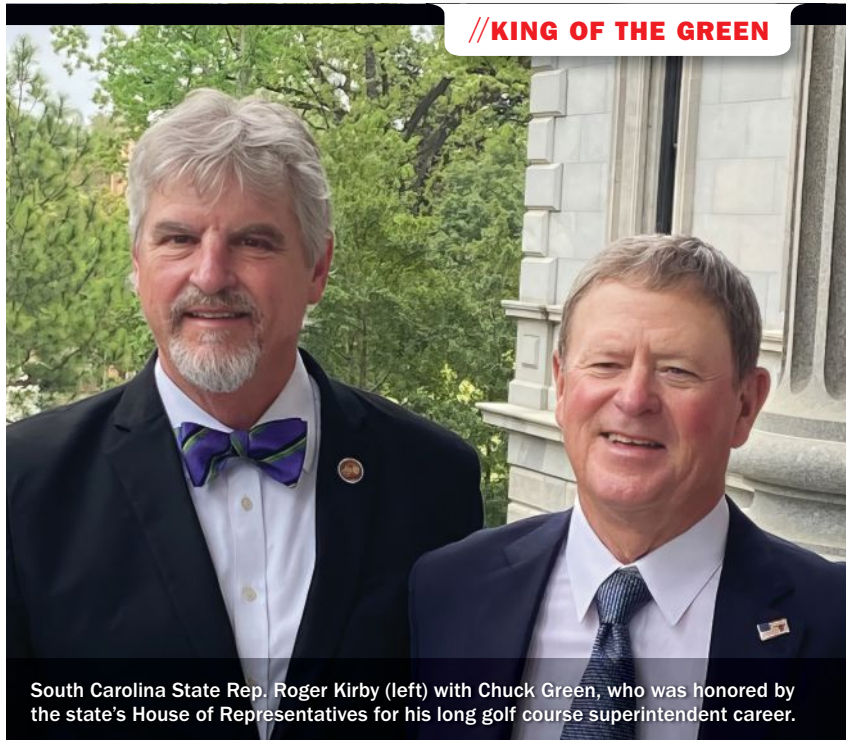
Email Jones at: sjones@northcoastmedia.net.

Starter

NEWS, NOTES AND QUOTES



//KING OF THE GREEN



South Carolina State Rep. Roger Kirby (left) with Chuck Green, who was honored by the state's House of Representatives for his long golf course superintendent career.

SOUTH CAROLINA HONORS SUPERINTENDENT

BY TRENT BOUTS // Tee Media Consulting

➔ South Carolina's House of Representatives recently honored the career of Chuck Green. The House presented Green with a special resolution in front of family and friends at the State House in Columbia.

Green, who is now director of operations at Quixote Club in Sumter, S.C., is a past president of the Carolinas Golf Course Superintendents Association. The association honored Green with its highest recognition, the Distinguished Service Award, in November last year.

The resolution cited highlights of

Green's 40-plus year career in golf course maintenance including his role in growing the Carolinas GCSA and helping transform the association's annual conference and trade show into the largest regional golf course superintendent gathering in the country.

The resolution also noted that Green "received support for his nomination for the prestigious GCSA Distinguished Service Award through an unprecedented 36 letters from fellow past presidents, turfgrass researchers, industry partners and fellow superintendents,

Continued on page 5

//DAN IS THE MAN!

CARROTHERS TO SITEONE

SiteOne Landscape Supply announced longtime industry professional Dan Carrothers as the company's new vice president for agronomic business development. Carrothers will further develop and lead the company's strategy to accelerate growth for large regional agronomic and erosion control customers, including golf and maintenance-oriented accounts.

Carrothers brings 35 years of industry experience with him. He was most recently the director of global solutions for FMC. He's also worked for BASF, Bayer and Monsanto.

"No other distributor out there can bring that vast array of potential solutions to professionals like SiteOne," Carrothers says. "I am excited to be part of a company that has that vision of growth with its customers."



Dan Carrothers

//FLORIDA IN DECEMBER?

GOLFDOM SUMMIT NOW ACCEPTING APPLICATIONS

Superintendents who are interested in meeting with a small group of fellow superintendents from around the country, as well as 20-plus industry partners and the team at *Golfdom* are encouraged to apply to attend the 2025 *Golfdom* Summit.

Dates this year are Dec. 10-12.

The event will again be held at Reunion Resort, near Orlando.

Limited to only 45 superintendents each year, attendees get to meet with the magazine's partners in one-on-one settings to discuss each course's challenges individually, rather than at a busy trade show. Boardroom presentations, a round of golf and the annual Legends induction ceremony are also part of the agenda.

To apply, visit GolfdomSummit.com.

Golfdom Summit

//NEXT STOP, CAPITOL HILL

GCSAA names grassroots ambassadors

➔ Chris Ortmeier, director of agronomy at Champions GC in Houston, Texas, and Clinton Tingen, CGCS, superintendent at Sandhill Crane GC in West Palm Beach, Fla., have been named Grassroots Ambassador Leadership Award winners from the Golf Course Superintendents Association of America (GCSAA).



Chris Ortmeier



Clinton Tingen

outreach and relationship development with a member of Congress.



Through Toro, the winners receive a trip to take part in the annual National Golf Day event in Washington, D.C.

Ortmeier became a Grassroots Ambassador in 2021 and is partnered with Rep. Michael McCaul (R-Texas). “Being an ambassador doesn’t require much prior political experience and, at its core, is about serving for the greater vitality of golf,” he says.

Before joining the Grassroots Ambassador Program in 2020 and beginning his advocacy outreach, Tingen had no idea how important this kind of work is and had assumed that most Congress members already knew about the golf industry’s issues.

“They didn’t know the golf industry relies on H-2B visas or that golf was included in the ‘sin list,’ and it hit me that these people are all busy and fielding asks from everybody,” he said. “If we don’t have a seat at the table, our voice will not be heard.”

Continued from page 4
some of whom he mentored.”

Green has spent his entire career in South Carolina, including stints at Florence CC and Columbia CC before helping establish nationally ranked Sage Valley GC. The resolution also cited his “pivotal” role in establishing Clemson University’s Pee Dee Research and Education Center in Florence.

“I am deeply honored that the House

of Representatives would choose to do this,” Green says. “And at the same time, I am proud that the golf course profession has come so far that our state’s leaders would recognize the work we do. So many people have helped me in my career and so many have helped advance the profession. I hope they all take some pride in this because they should.”

//MEAN TO MOSQUITOES

ENVU UNVEILS BIOLOGICAL MOSQUITO CONTROL

Envu has launched **Barricor Essential Mosquito Control**, formulated and tested to meet evolving industry needs. The FIFRA 25(b) essential oil-based insecticide delivers a powerful 24-hour mortality rate for Aedes mosquitoes, while being safe for bees and butterflies.

“As demand grows for eco-friendly mosquito control solutions, we are committed to providing products that meet both performance and environmental compatibility expectations,” said Gokhan Vergon, head of pest management and public health at Envu. “Barricor Essential Mosquito Control is a direct response to the needs of those who require an effective, reliable and proven solution.”

Barricor is water-based, requires no PPE to apply and is safe for use in a wide range of environments, according to the company.

//2024 WAS GOOD TO GERDES

GERDES NAMED SUPER OF THE YEAR

Jeff Gerdes, a veteran superintendent at Bolingbrook (Ill.) GC, is the KemperSports 2024 Golf Course Superintendent of the Year. This accolade highlights his leadership, dedication to maintaining Bolingbrook and commitment to sustainability and safety.

The award was presented during the 2024 KemperSports Leadership Conference. Bolingbrook also earned the Safety National Facility of the Year Award.

Gerdes has been a staple at Bolingbrook since its opening in 2002. Over two decades, he has fostered a culture of collaboration and innovation among his team, ensuring top-tier course conditions for both recreational golfers and professional tournaments. In 2024, Bolingbrook achieved record-breaking rounds played while maintaining exceptional guest satisfaction metrics.

Gerdes’ leadership extended beyond course maintenance to hosting high-profile events like LIV Golf Chicago, which recently brought international attention to Bolingbrook.



Jeff Gerdes

Turfgrass Diseases: A Persistent Challenge for Golf Course Superintendents



Jesse Benelli, Ph.D.
Envu Green Solutions Team

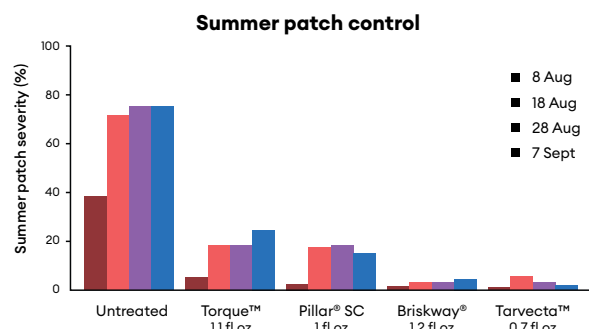


James Hempfling, Ph.D.
Envu Green Solutions Team

Managing turfgrass diseases remains one of the most significant challenges faced by golf course superintendents. Whether it's Pythium root rot on creeping bentgrass or take-all root rot on bermudagrass, superintendents must remain vigilant – regardless of the turfgrass species they grow. The reality is that every turfgrass species placed in a conducive environment has a virulent pathogen ready to strike.

Superintendents have high expectations when it comes to fungicide performance, particularly on high-value playing surfaces like tees and greens. Fortunately, ongoing innovation in fungicide technology continues to raise the bar, offering solutions that perform better or act faster than previous options.

Two standout examples of recent breakthroughs include Serata® fungicide, which has set a new benchmark for Pythium root rot management, and Resilia™ root health solution, the first comprehensive solution targeting pathogenic nematodes, fungal root diseases and Pythium root diseases. Building on this momentum, 2025 brings the introduction of a new advancement in turf disease management: Tarvecta™ fungicide.



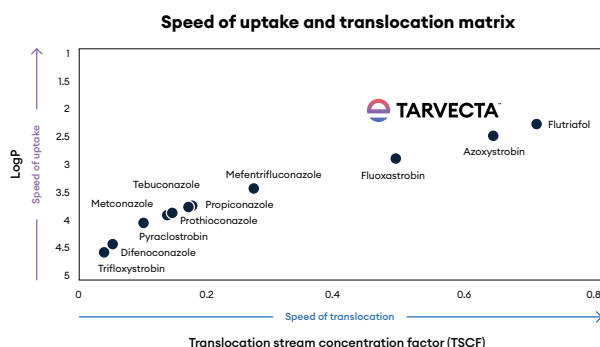
Trial conducted on a stand of Kentucky bluegrass by Dr. Chou at Rutgers University in 2023. All treatments were applied on a 28-day interval with the initial application on May 25, 2023.

Tarvecta™ fungicide: Speed meets spectrum

Developed by Envu, Tarvecta brings together two of the most xylem-mobile fungicides in their respective classes: the QoI fungicide Fame® (fluoxastrobin) and the next-generation DMI fungicide Rayora® (flutriafol). This powerful combination not only enhances the speed of disease control but also provides broad-spectrum activity across a wide range of both root and foliar diseases in cool- and warm-season turf.

University research trials have demonstrated Tarvecta fungicide's exceptional performance against several root and crown diseases, including fairy ring, summer patch, large patch and spring dead spot. Further, one of Tarvecta fungicide's key advantages is its rapid translocation from roots to shoots after uptake. This provides effective root disease management with watered-in applications of Tarvecta while also delivering protection against foliar pathogens like dollar spot, brown patch and leaf spot due to its best-in-class acropetal movement.

With Tarvecta, superintendents gain a fast-acting, broad-spectrum tool designed to protect the most valuable areas of the course and to keep their turf performing at its best.



LogP is a measure of a compound's lipophilicity and is a key indicator for understanding chemical mobility in plants. Generally, lower LogP values indicate faster uptake of fungicides in turf.

TSCF, a formula published by Briggs, Bromilow and Evans in Pesticide Science, provides an indication on how readily fungicides can move and translocate within the plant.

Tarvecta combines two of the three most systematic fungicides on the market, delivering excellent preventative and curative control.

To learn more about Tarvecta and other Envu solutions, visit us.envu.com/golf.



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YOUR TURF BACK
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NEW



TARVECTA™

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Golfdom Gallery

MASTERS
EDITION



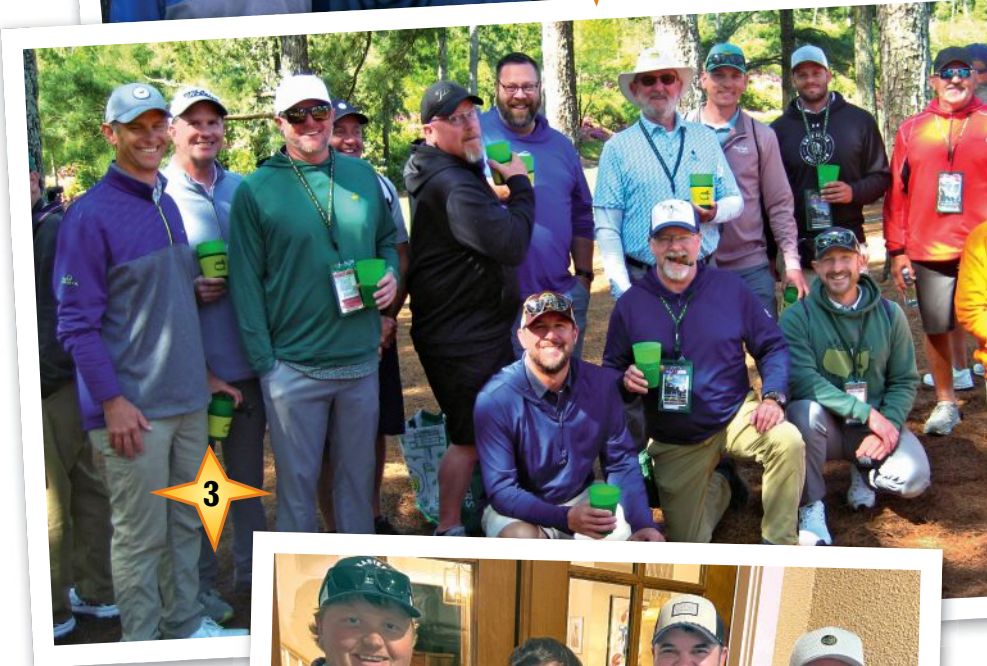
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1 The Thompson Brothers Drew Thompson, CGCS at East Aurora (N.Y.) CC (left) and his brother Thad Thompson, Terry Hills GC, Batavia, N.Y., enjoyed holding down the No. 12 tee at Augusta National during Masters week.



2

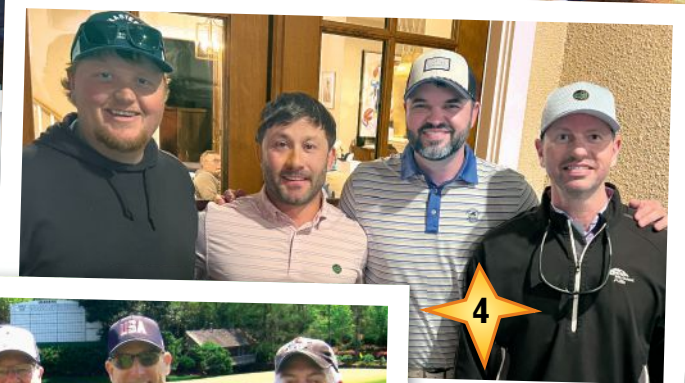
2 Jones, Jones and Jones (Left to right) Andrew Jones, superintendent at Deer Trace GC in Louisburg, Kan.; Seth Jones, editor-in-chief, *Golfdom*; and Colby Jones, CFO, Kauffman Center for the Performing Arts, enjoyed a round of golf together in 2024. This year? They enjoyed Amen Corner together.



3

3 2025 group photo We had a great turnout for our 2025 Friends of *Golfdom* group photo at the Masters! From left to right, standing, are: Andrew Jones; Colby Jones; Patrick Parkins, TPC Las Vegas; Will Benson, Laurelwood GC, Eugene, Ore.; Thad Thompson; Drew Thompson; Kirby Scharmann, Falcon Ridge GC, Mesquite, Nev.; Jake Scharmann, Highland Falls GC, North Las Vegas, Nev.; David Buckner, Conestoga GC, Mesquite, Nev.; Ken Steed, Sunbrook GC, Saint George, Utah; and Jones. Kneeling in front are Steve Sarro, Kelly Plantation GC, Destin, Fla.; Mike Osley, CGCS, Saints Joseph Bay GC, Port Saint Joe, Fla.; and Jason Morgan; Simplot Agri-Business, Las Vegas.

4 Visit to the Jacobsen house Enjoying the post-Masters festivities at the Jacobsen house are Connor Carlisle, Searcy (Ark.) CC; Neil Perez, director of sales, Jacobsen; Andy Short, Country Club of Paducah (Ky.); and Chad Gamble, Ladds.



4

5 2003 U.S. Open champ We spotted Jim Furyk hanging out at Amen Corner; the 2003 U.S. Open champion at Olympia Fields was gracious enough to take a photo with Sarro, Osley and Jones — even though Sarro was wearing an Arizona State University Sun Devils hat (Furyk noted that he's an Arizona Wildcat).



5

PHOTOS BY: GOLFDOM STAFF



6 Parting is such sweet Sarro This would be the last time the Thompsons, Jones, Sarro, Scott Hollister and Osley would be together at this Masters. With no phones and a trip to the pro shop looming, it was easy to get separated. We'll plan better next year!

7 No. 12 tee: fun for patrons, terror for golfers Rodney Russell, PGA director of golf at Springdale CC, Asheville, N.C., and Brandon Ingle, Mountaintop Golf and Lake Club, Arden, N.C., enjoy the view of that tricky tee shot on No. 12.

8 Who took Rory? Drew Thompson; Simon Rainger, vice president of turf, Jacobsen; Brandon Haddock, director of communications, Jacobsen and Jones were happy to debate who had the best odds of winning at Augusta ... but it was Rainger who picked Rory McIlroy.

9 Is that Josh Allen? No, the Buffalo Bills quarterback didn't wear his own jersey to the Masters... that's Adam Mis, Transit Valley CC, East Amherst, N.Y., disguised as Allen, along with his friend Jeremy Boone, CGCS, Springdale Resort, Canton, N.C.

10 Checking out Dad's office Lane Ferguson (right), Southern Turf and Ornamental Products, with his wife, Erin, and son, Finn, got in some family time on Wednesday morning before it was back to work for dad.



“How can a superintendent determine if robotic mowing is a viable option for their course without sitting through another marketing pitch? I’ve been working on a **robotic mower readiness score ...**”

BENTON HODGES, Owner, Mountain West Turf Technologies

Finding your robotic mower readiness score

Most golf course superintendents would agree that autonomous and robotic mowing is the future. But right now, the conversation around it is overwhelming, noisy and, frankly, exhausting.

Magazines, trade shows, presentations, dealers, manufacturers and, yes, even this column, are all talking about new autonomous mowers.

But how can a superintendent determine if robotic mowing is a viable option for their course without sitting through another marketing pitch? I’ve been working on a “robotic mower readiness score,” breaking down eight barriers to full-course adoption of autonomous mowers.

Rate your course on a scale from one to 10 in each category, then add up your total. A higher score means you have fewer barriers to adoption, while lower suggests significant infrastructure or operational changes will be necessary.

Power infrastructure

Self-docking robotic mowers depend on well-placed charging stations since efficiency drops if they travel long

distances to recharge. Many courses splice power from irrigation controllers to adapt on course. Take advantage of existing outlets in pro shops, maintenance buildings, half-way houses or range huts for initial robot placement.

1 = Localized power

10 = Widespread access

Connectivity and cellular coverage

Strong cellular coverage allows mowers to communicate effectively with their control systems. Workarounds exist for weak signal areas but those typically require more infrastructure.

1 = Poor coverage | 10 = Strong signal

Course layout and obstacles

A well-connected course allows for efficient mowing with minimal travel time between zones. If the holes and mowing areas are spread out, or if there are heavy obstacles

such as trees, buildings, steep slopes and leaf litter, you may face logistical issues or need more units. Physical obstacles and slopes can make autonomous mowers inefficient.

1 = Layout and obstacle challenges

10 = Connected, flat and open

Play and traffic

The ability to run autonomous mowers depends on when and how often you can mow. High player traffic and frequent events can limit operating hours, whereas certain courses allow for nearly around-the-clock mowing.

1 = Heavy restrictions

10 = Open schedule

Surface conditions

Poorly draining areas or uneven surfaces can cause mowers to get stuck and need help. Identifying problem areas early can help prevent downtime. Driving ranges are often the worst offenders.

1 = Difficult terrain | 10 = Smooth and dry

Boundary management and complexity

The more complex your course’s mowing zones, no-go areas and obstacles (stakes, benches, signage, etc.), the more initial setup and ongoing monitoring your robots will require, which can lead to inefficiencies.

1 = High complexity | 10 = Free and clear

Security and vandalism risk

Public courses and high-traffic areas are more vulnerable to theft or vandalism. Secure storage and strategic operating hours can help mitigate risk at the cost of efficiency.

Some robots with “drop and go” technology are better suited for these situations.

1 = High risk | 10 = Low risk

Maintenance and service

Some superintendents will need a full-service support model to maintain this new technology, while others will want to develop in-house expertise for repairs and troubleshooting. Early adopters with a willingness for hands-on knowledge will have an easier transition and be well-prepared for the future. 

1 = Needs full-service

10 = In-house expert

Hodges started his career in the turfgrass industry as a researcher at Mississippi State University followed by nearly a decade at high-end golf clubs as an assistant superintendent in the Mountain West. He now focuses his efforts on helping golf courses leverage technology-driven solutions while maintaining a people-first mindset. Find him on X at @BPHTurf or LinkedIn.

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One of the most famous bunkers in golf is the 102-yard-long Church Pews bunker, which sits between No. 3 and No. 4 at Oakmont. The bunker was once six separate bunkers and eventually became one ahead of the 1935 U.S. Open.

Oakmont in the spotlight

What to look for at next month's U.S. Open



Mike McCormick

The 2025 U.S. Open is next month at iconic Oakmont.

Grounds Superintendent Mike McCormick says Oakmont will show some slight differences compared to the 2016 U.S. Open. In 2023, Gil Hanse was brought in for a comprehensive restoration. About 300 yards were added to the course, and some of the grassing lines were changed back to what Henry Fownes did in his original design. The greens and bunkers were also adjusted.

"Oakmont is known for its iconic greens, but what had happened over the years, from all the sand splash, aerification and topdressing procedures, is that the perimeters of the greens had built up in elevation," McCormick says. "Gil came in and referenced historical photos and did some excavations around greens. All the hole lo-

cations we had in 2016 are still there, but on every green we have a plethora of new hole locations as well."

He says it's the same Oakmont, the same bones, but the closest it has ever been to the original Fownes masterpiece.

Tools of the trade

McCormick says that over the last several years, technology in the golf maintenance industry has grown exponentially. He's enjoyed the convenience of new tools to get the job done, especially the GS3 and the Deacon app.

"Some of the data that we're able to collect now, with smoothness and trueness, it's a different data point that we've never had before," he says. "To pick up your cell phone and see it right there is exciting."

He also heaps praise on Quali-Pro for their support with the conditions of the golf course and for supporting the championship.

"We've been using Quali-Pro for several years now, and it's slowly been built into the platform of our chemical program. We use a wide variety of their products, like the QP720s, the tebuconazole, all the way up

to their proprietary products like Su-prado," McCormick says. "The more we work with their products, the more that trust exists. The support we get from their team is unique and special. When they approached us to support the championship, we were excited. And they're great people."

McCormick says that building relationships has been an integral key to his success in the industry. He advises others in the industry to find the right mentors and to work hard on building relationships.

"I think the No. 1 thing is finding the right mentors, finding guys that were going to challenge me and push me to be the best version of myself," McCormick says. "But secondly, just building relationships, networking, going to trade shows; meet as many people as you can. A lot of my own support system, they're not guys that I worked with ... they're guys I met at trade shows and stayed in touch with. Those relationships build, and that's what's most unique about our industry." 

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THE CUTTING EDGE

From labor to leverage, innovative technologies are empowering golf course superintendents to optimize their operations and enhance the player experience.

BY MIKE ZAWACKI

PHOTO COURTESY OF AUTOMATED OUTDOOR SOLUTIONS



olf course superintendents navigate an increasingly complex and dynamic landscape, facing escalating pressures from economic uncertainty, rising resource and material costs and evolving accountability requirements. Fortunately, a paradigm shift is underway, driven by advancements in turf maintenance technology, sophisticated data analytics, autonomous systems, robotics and artificial intelligence.

These innovations aren't just bells and whistles. They're powerful tools that optimize resource use, minimize environmental impact and proactively mitigate pest and disease outbreaks while empowering superintendents to become more effective stewards of the game.

These tech innovations are not mere enhancements but rather critical levers that fundamentally reshape golf course turf management. They not only enable precision resource optimization but empower superintendents to elevate their role as strategic resource stewards who enhance course resilience and, most importantly, the player experience.

To effectively address the challenges confronting today's golf courses, superintendents must embrace and integrate these cutting-edge technologies. Read on to learn more about three innovations revolutionizing aspects of turf management, offering tangible solutions to intricate challenges that fortify long-term turf health, enhance course management and improve playability.



Building Better Storytellers taskTracker Digital Job Board Update

Often, it's the details that make a good story more compelling.

Since its 2013 inception, taskTracker has focused on providing superintendents with the data to close the gaps in their stories, often centered on operational realities and a course or club's stakeholder understanding, says Jaime Sharp, founder and president of ASB taskTracker, headquartered in Hailey, Idaho.

Over the years, superintendent demand spurred the integration of equipment management, staff scheduling and real-time equipment reporting, transforming the taskTracker platform into a comprehensive operational solution. Recognizing the limitations of static reporting, which required laborious data interpretation, Sharp unveiled a robust software update to its taskTracker business analytics platform at this year's GCSAA Conference and Trade Show in San Diego.



Jaime Sharp

This upgrade, rolling out in late June for superintendents using the platform, provides detailed insights into labor and equipment usage. Sharp says that this quantifies work in terms of people rather than just dollars and hours, enabling turf managers to demonstrate their needs to boards and stakeholders more accurately.

"We moved beyond mere financial metrics to illustrate the actual labor required for each task, demonstrating the true scope of staff contributions," says Sharp about the two-year endeavor to roll

out the update. "This is particularly vital in an industry known for demanding long hours and often under-recognized efforts of superintendents and their staffs.

"Our platform now provides concrete evidence of superintendent and staff workload, revealing instances where teams consistently perform the equivalent of nearly double their headcount," he adds. "This data empowers superintendents to advocate for necessary staffing adjustments more effectively."

By enabling year-over-year comparisons, the platform offers unprecedented insight into operational changes, providing a critical tool for strategic decision making and stakeholder communication. Sharp says this evolution represents a significant leap forward in empowering superintendents with the data they require to optimize operations and advocate for their teams.

"Working tirelessly before dawn and after dusk, superintendents and their teams operate largely in the shadows, their efforts frequently overlooked," Sharp says. "This platform aims to illuminate the sheer volume and critical importance of their work.

Superintendents can now precisely pinpoint cost drivers, analyze task-specific resource allocation and, crucially, quantify the human element of their work."

Michael Wolpoff, CGCS, who has used taskTracker for roughly 12 years, test-drove the updated

Continued on page 16



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// CUTTING-EDGE TECH

Continued from page 15

version at this year's GCSAA show and is eager to apply the upgrade's added functionality to his decision making and workflow justification.

"The fact that you can get that data and put it into a PowerPoint and then get it in front of your stakeholders is invaluable when you're trying to do something or asking for something or defending something," says the superintendent of Arroyo Trabuco Golf Club in Mission Viejo, Calif. "If you're being asked to cut labor, then you need to show what will be affected by those actions. Just saying that is one thing, but being able to compare it with visuals gives more credence to what the superintendent is saying ... that those opinions aren't based on estimations but actual data."

Maximized Efficiency, Minimized Error Smithco's Star Command II 4.0 spray system

Steven Johnson jokes that Smithco's new spray guidance system is responsible for producing lazy spray techs.

"It makes spraying a no-brainer (task)," says Johnson, Smithco's vice president of Southwest sales. "It takes the human error out of it, so good spray techs become lazy spray techs because they get used to the technology."

For nearly a decade and a half, Smithco has pioneered GPS integration for golf course turf management. Its most recent innovation, debuting in San Diego at the GCSAA Conference and Trade Show in February, involves a strategic partnership with Ag Leader Technology. This Ames, Iowa-based tech company specializes in precision agriculture.

Through this, Smithco leverages Ag Leader's advanced DirectCommand L2 touchscreen controller and RightSpot pulse width modulation (PWM) technology into its Star Command II 4.0 spray system, providing superintendents greater efficiency in precision turf management. RightSpot is Ag Leader's proprietary capstan technology, an advanced spray nozzle control system that utilizes electronically controlled valves to regulate the flow of liquids through spray nozzles precisely.

"While (Smithco) previously utilized capstan systems — specifically SharpShooter, which employed pulse width modulation — RightSpot distinguishes itself with enhanced precision and control," Johnson says.



Steven Johnson

This technology is a potential game changer for golf course turf managers' spray strategy because it does not rely solely on GPS. According to Johnson, this tech provides superintendents with greater

Continued on page 18



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Continued from page 16

precision and flexibility in their spray activities. Unlike conventional methods constrained by fixed spray tip mechanics, PWM achieves greater precision across a wider speed spectrum.

Similar to a car or truck's fuel-injection system, PWM adjusts pulse duration to maintain a consistent rate, pressure and spray pattern regardless of ground speed. Johnson says this enables more precise application around challenging terrain, eliminates the need for frequent spray tip changes and provides precise drop-let size control to minimize drift.

Historically, golf turf maintenance has lagged behind agricultural practices in terms of spray application technology, Johnson says, and the industry's adoption of advanced techniques has been slow. Nonetheless, the turf industry is gradually evolving, moving away from inconsistent spray practices and overlapping applications. Agricultural-based technology such as RightSpot serves as the foundation for modernizing the spraying methodologies superintendents employ to manage turf, he says.

"Recognizing the compatibility of our flow-based centrifugal pump sprayers with Ag Leader's advanced control systems, (Smithco) forged an exclusive OEM partnership," Johnson says. "This integration provides a seamless, factory-installed solution,



Smithco's Star Command II 4.0 is an effort to bring golf course management spraying technology up to par with the advancements seen in the agriculture industry.

distinguishing us from aftermarket installations."

Additionally, Ag Leader's advanced telematics facilitate seamless sprayer-to-sprayer communication, eliminating overspray and overlap during complex course applications. Johnson notes that its cloud-based platform permits real-time data uploads, streamlining record-keeping and enhancing accountability. Over-

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PHOTO COURTESY OF: SMITHCO

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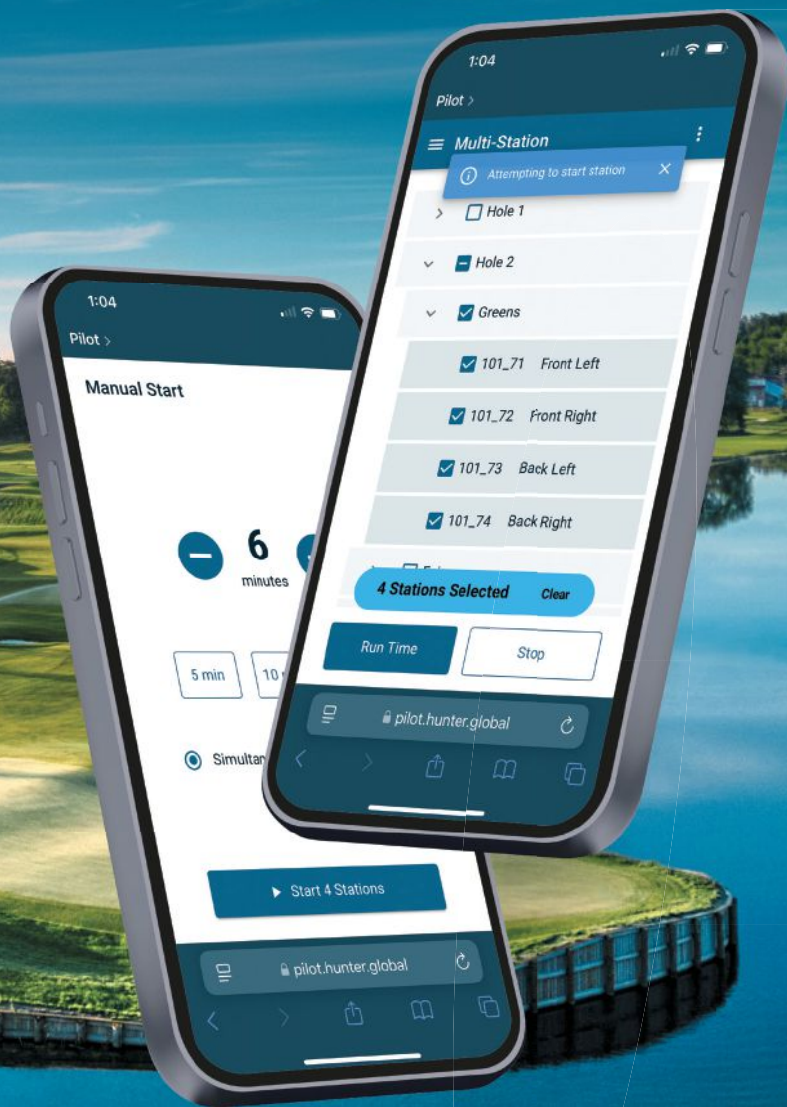
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Pilot Navigator™ App

Continued from page 18

all, the system significantly minimizes the potential for inaccuracies for turf managers.

To complement this system, Johnson says Ag Leader's remote support capabilities permit Smithco product experts to diagnose and resolve technical issues from anywhere in the world, ensuring minimal downtime. Recognizing the critical importance of expert support, Smithco has invested in its dedicated sprayer specialists, whose expertise and on-site presence are pivotal in resolving complex equipment maintenance issues.

"As a family-owned business, we understand the need to provide exceptional value to offset the competitive pricing of larger corporations," Johnson says. "Our commitment to personalized service and expert support is not merely a differentiator, but a core principle that strengthens our relationships with superintendents and ensures long-term satisfaction."

Johnson estimates the cost of integrating GPS and PWM is approximately \$35,000, with sprayers ranging from \$87,000 to \$142,000 depending on capacity. Johnson emphasized the

"THIS TECH HAS MADE SPRAY APPLICATIONS DUMMY-PROOF"

— ALEX MARSHALL

your golf course."

For Alex Marshall, director of greens and grounds at Pensacola (Fla.) Country Club, the Ag Leader technology has resulted in greater efficiency and accuracy in his spray program, as well as a more effective use of his labor resources.

"You can put a less experienced operator on the spray machine, set everything up, lock it in and let them go out and spray fairways, tees, approaches, whatever, and not have to worry something is going to go wrong," says Marshall, who has his unit retrofitted onto an older Toro Workman. "In the past, there was a lot of worry, even if we were just doing a nutrient app, that sending someone on a spray rig without a ton of experience could

technology's ROI, estimating a conservative 10 percent annual savings for turf managers.

"If you have a \$100,000 spray budget, and you're saving \$10,000 a year, in three years, you've nearly paid for the tech," he says. "But you also saved money on chemistry, and now you have greater consistency and a better product out on

Continued on page 22

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Recognition Herbicide: A Game-Changer for Golf Course Turf Management

Ryan Severidt, CGCS, a seasoned golf course superintendent with over 20 years of experience in the industry, has found a powerful tool in his mission to maintain pristine turf conditions at Woodmont Country Club in Rockville, Maryland. Severidt shared his insight on Recognition® herbicide, a product he believes is revolutionizing the way golf course professionals manage invasive turf species like common bermudagrass.



Ryan Severidt, CGCS

Recognition is a Syngenta herbicide formulation that contains *trifloxysulfuron*, the active ingredient in Monument® 75WG herbicide, with a proprietary herbicide safener called *metcamifen*. Recognition makes it possible to control bermudagrass with excellent safety to zoysiagrass and St. Augustinegrass.

One of the biggest challenges Severidt faces is controlling common bermudagrass in zoysiagrass fairways. “We had just gone through this big

multi-year project of eliminating common bermudagrass from our zoysia,” he says. This involved killing off all turf in affected areas and re-sodding with new zoysia — a costly and labor-intensive process.

Recognition has proven to be a game-changer for Severidt and his team. After hearing about the product from industry representatives and consultants, they conducted trials on selected fairways and saw promising results. “Last year, we did two full applications, and **it provided better control than anything I’ve seen on common bermudagrass,**” he says.

For regions like Woodmont’s transition zone — where both warm- and cool-season grasses face challenges — Recognition provides an effective tool for maintaining high-quality turf. “Anybody who is managing zoysia should try it,” Severidt says. He has already recommended the product to colleagues managing similar turf conditions across the country. **“It’s been a game-changer for us,”** he adds.

Similarly, Nick White, superintendent at Bellerive Country Club in St. Louis, faces the same challenges of managing warm-season grasses. “Controlling common bermudagrass is a no easy task,” White explains, emphasizing the difficulty of keeping playing surfaces pure and consistent.

One of the standout features of Recognition is its compatibility with Fusilade® II herbicide, allowing for higher application rates without compromising turf safety. White explains that this combination provides superior control compared to previous methods. **“We’ve seen better results**



with Recognition than with anything else we’ve used,” he says.

When asked what advice he would give to other superintendents



Nick White

considering Recognition, White doesn’t hesitate: “If you’re dealing with common bermudagrass, **this is a product you need to try.**”

For Nick White and Ryan Severidt,

Recognition represents not just a solution to an age-old problem, but also a step forward in creating healthier, more sustainable turf environments.

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have catastrophic results. This tech has made spray applications dummy-proof.”

The system’s PWM technology has also been crucial to achieving more effective sprays in windy conditions.

“The PWM technology has helped immensely with drift control,” he says. “Here on the Gulf, from November to May, it can get extremely windy. So, we’re always battling drift. Anytime you can control that, it’s a great advantage, and our turf (condition) reflects that we’re doing a good job.”

a nationwide distributor and service provider of robotic mowing solutions, has introduced a unique, three-pronged automated approach that efficiently manages range turf, gathers range balls and then washes them for the next round of players. Each component bypasses manual handling, nearly eliminating range downtime and the need for dedicated labor.



Joe Langton

To start, AOS integrates mowing and picker technology supplied by Echo Robotics, a division of outdoor power equipment manufacturer Echo, that specializes in robotic turf management equipment designed for golf courses, sports fields and large lawns. AOS is the sole nationwide distributor of Echo Robotics’ automated ball retrieval solutions.

AOS CEO Joe Langton explains that Echo’s robotic range mowers are outfitted with floating cutting heads, allowing them to cut range turf while balls are still on it and avoiding “plowing” them out of the way. This can result in balls piling up, which makes retrieval difficult. Instead, these floating cutting heads are positioned to allow balls to either navigate around their strategi-

Continued on page 24

Robotic Juggler

AOS Range Management System

Imagine an employee who works all hours of the day and night shagging and washing range balls while manicuring driving range turf. For most golf course superintendents and managers, this sounds like a dream solution to address a common labor issue.

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Continued from page 22

cally spaced discs or be gently lifted and then released, ensuring a smooth and consistent passage and alleviating potential turf damage.

On days when the mower isn't scheduled to cut range turf, it can be assigned to maintain roughs around nearby holes or other turf areas, further increasing its value to superintendents.

The robotic range picker, which mirrors the mower unit's unas-

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Like many autonomous and robotic advancements seen throughout the industry, AOS's range picker allows employees to focus on other detail-oriented tasks while it does the boring work.

suming profile, features a unique lift mechanism for its picking wheel, a design element Langton says is unmatched in the market. This innovation reduces costly and time-consuming turf repairs that result from traditional pickers that drag their picking wheels during turns.

"It's the only range picker on the market right now that lifts the picker wheel every time it turns," he says. "So, there's a significant increase in turf health. A lot of the repair on driving ranges — or disrepair — is from the range picker. Every time it turns, those (picker) wheels don't lift, and they rip the turf."

A picker can collect 300 range balls every seven minutes and pick roughly 15,000 balls over the course of a single day, Langton says.

However, the AOS systematic approach was incomplete. Langton says cutting and collecting wasn't a comprehensive solution that would satisfy both superintendents and course managers. At high-volume clubs that employ shifts of people to manage range balls, employees tasked with opening the driving range faced the daunting challenge of manually washing thousands of golf balls accumulated overnight by the automated picker, a stark contrast to the previous practice of collecting and washing balls in the evenings.

"I realized I needed a third piece to all of this," Langton says. "If I'm cutting and picking, I have to automatically wash and deliver the golf ball so the people on the range embrace the automation, not just the people counting numbers."

This led Langton to AMS Robotics, a U.K.-based company with a proven range ball washing system. Despite AMS's sole focus on the U.K. market, Langton recognized the system's potential for the U.S. and successfully negotiated its importation. To overcome the logistical challenges of nationwide distribution, AOS strategically partnered with SiteOne Landscape Supply, eliminating the need for AOS to build a costly distribution footprint.

Now, when the capacity is reached, the ball picker deposits its cargo of collected range balls into a designated ball pit. There, a

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Article by STEC Equipment



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Continued from page 24

vacuum transportation system conveys the golf balls through an automated washing unit, ensuring they are thoroughly cleaned and then deposited, completely bypassing any manual handling until they're ready for pickup, distribution and range play.

Crunching the numbers, Langton says the washing management system runs about \$79,000 installed, the range picker is around \$35,000 installed and the range cutter is \$30,000 installed.

Additionally, AOS offers this as a subscription-based service, which includes a cutter, two pickers (for a redundant picking loop) and a washer. Langton estimates this calculates out to around \$16.33 per operation hour. Compared to the hourly wage required to staff a range ball operation, as well as the rate for a maintenance crew member to mow a range once or twice a week, Langton says a financial case could be made for a course to consider the AOS system.

"Also, (these systems) are sustainable," Langton adds. "They're all electric. They're quiet, and they can operate all night, which allows the driving range to stay open longer so they don't have to shut down for staffing."

Amy Volk, director of golf course maintenance at Hunters Run Country Club in Loxahatchee Groves, Fla., has been impressed

with the operational efficiency of AOS's ball retrieval, washer and turf maintenance system at her course.

The automated cutter mows nightly, ensuring a uniformly consistent cut that dramatically enhances the range's aesthetic and playability. She also notes that the implementation of robotic ball pickers has effectively eliminated repetitive traffic patterns and associated turf wear previously caused by human-operated machines.

"With the two (ball) pickers, you don't see that wear anymore," Volk says. "The range looks phenomenal the same day, every day, even with (retrieving) as many golf balls as we are right now."

Additionally, the club now keeps the range open longer for members. Previously, it was closed twice a week for maintenance.

"(The system) allows us to redirect our team members to focus on other details like keeping the divots filled and keeping the edging in perfect condition," Volk says. "In fact, we're looking at adding another (robotic) cutting unit so we can mow rough areas and a median of St. Augustine grass that runs through our property." **G**

Mike Zawacki is a Cleveland-based writer who has covered various aspects of the turf, golf, landscape and agricultural industries over the last 20 years.



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// A HISTORY OF CONSERVATION

THE EVOLUTION OF WATER CONSERVATION IN GOLF

By Mike Kenna, Ph.D.

Proactive conservation efforts are more critical than ever for golf course sustainability. The recently published USGA Water Conservation Playbook provides a strategic framework for reducing water use, reinforcing the industry's commitment to responsible resource management.

Water conservation in golf has been a priority for decades. In the 1930s, the USGA began addressing fairway irrigation challenges. By the 1950s, courses faced government-imposed restrictions, underscoring the need for efficient water use. The 1960s saw the advent of automatic irrigation systems, shifting the focus toward conservation through technology.

The 1970s brought heightened awareness due to severe droughts, such as the one in Northern California. The USGA and allied golf associations organized a wastewater reuse conference to address water shortages. In the 1980s, discussions expanded to wastewater reuse, energy conservation and the scientific principles of turfgrass water management. The 1990s emphasized environmental impacts, with the USGA funding university research on water quality and the effects of pesticides and nutrients on runoff and leaching.

In the 2000s, water use became a regulatory concern, with industry leaders collaborating with policy-makers to shape sustainable practices. A 2006 workshop by the Council for Agricultural Science and Technology (CAST) in addition to the USGA further explored these challenges, culminating in the 2008 Water Quality and Quantity Issues for Turfgrasses in Urban Landscapes publication.

The 2010s marked a turning point, with the USGA funding research to reduce water use and develop water budgets for golf courses. The USGA Water Resource Center provided digital documentation of golf's water use, and the 2012 USGA Water Summit brought together experts to find sustainable solutions.

Today, the industry prioritizes staying ahead of regulations through proactive engagement with water authorities. The USGA Water Conservation Playbook outlines key strategies: Fundamental Irrigation Stewardship, Advanced Irrigation Techniques and Water Sourcing and Storage Stewardship. This month's research article summarizes these approaches and links nine actionable ways golf courses can conserve water. 



PHOTO BY: USGA

NEWS UPDATES

PBI-GORDON BUMPS UP BOURK, BUR

PBI-Gordon, an employee-owned manufacturer of products for the turf and ornamental industry, recently promoted Gilbert "Gib" Bourk and Eric Bur.

Bourk was promoted to vice president and general counsel for PBI-Gordon and its subsidiaries. Bur was promoted to vice president and chief financial officer of PBI-Gordon and its subsidiaries. Both Bourk and Bur joined PBI in 2019.

"PBI-Gordon has experienced tremendous success and growth over the last several years, thanks in large part to our investments in key leadership positions," says Steve Clifford, president and CEO of PBI-Gordon. "I am thrilled to announce the promotions of Gib and Eric and congratulate each of them on a job well done. Both of them are highly experienced and well-respected, and we are fortunate to have them as part of our team of employee-owners. We value their leadership and the world-class expertise they bring to work every day."



Gilbert Bourk

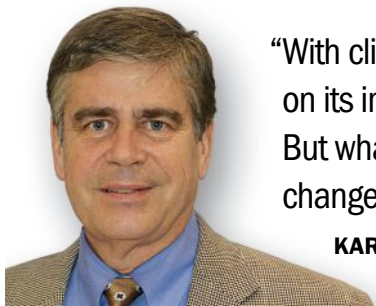


Eric Bur

GOLF COURSE WATER USE HAS DECREASED BY ALMOST 30 PERCENT SINCE 2005, MAINLY DUE TO IMPROVED IRRIGATION PRACTICES."

USGA Green Section

(see story on page 29)



“With climate change, we have focused on its impact on turf management. But what may be the effect of climate change on the game of golf itself?”

KARL DANNEBERGER, PH.D., *Science Editor*

Climate change in golf

According to the National Golf Foundation, a record 532 million rounds of golf were played in 2024. This is the third time in the last four years that a record for rounds played in a year has been broken. If the last few years are any indication, 2025 seems set to be another record year. Golf equipment sales are up more than 40 percent compared to pre-COVID, with apparel up 55 percent based on 2023 data.

Off-course golf participation, which includes Topgolf and golf simulators, is continuing to grow in popularity and use. Golf simulators are notable in that over 6 million Americans used them in 2023, a 73-percent increase from 2019. The global golf simulator market is expected to reach just under \$2 billion in 2025 and double by 2033.

The only thing that can slow the growth of golf is the cost, which at the moment hasn't been a major factor. But as rounds of golf increase, so has the price. Golf equipment prices continue to increase. A new top-line driver has doubled in price in a decade, and a dozen Titleist Pro V1 golf balls range from \$50 to \$65, with most in the range of \$60 to \$65 in the pro shop.

Golf course maintenance continues to be challenged and squeezed in order to meet the expectations of golfers who are paying more and expecting continually improving playing surfaces.

In addition to the ongoing quest for a high-quality playing surface, the increase in extreme environmental events brought about by climate change has been significant. Events like high and low temperatures, excessive water events like thunderstorms, flooding and drought all seemed to have increased in intensity and frequency over the last 20 years.

Superintendents and turfgrass researchers are combating the impact of storms and weather events on turf. We have tried to design and develop management programs to deal with extremes caused by climate change. We've developed turfgrasses that are more drought- and pest-tolerant, implemented management practices such as syringing to deal with rising temperatures and drought and developed pest programs in the face of increasing pest pressure.

With climate change, we have focused on its impact on turf manage-

ment. But what may be the effect of climate change on the game of golf itself?

For example, excessive rain occurs, resulting in flooding or wet surfaces that leads to the golf course being closed. We know what a difficult decision it is for any golf course superintendent to close the course. Golfers book tee times in advance and look forward to that day, only to be canceled. Even if the course is not closed, restricting golf carts to cart paths can frustrate golfers.

Increasing temperatures associated with climate change enhance asthma, allergies and air pollution. Does this make golf unavailable for some golfers during a long stretch of the season?

The above are just a couple of examples we might expect to occur with climate change. I wonder if this is a major reason for increased golf simulator use in the last five years. Are golfers beginning to look for an alternative way to play golf? A form of golf where the course is not closed due to wet, soggy conditions; temperature and precipitation are not issues in a simulator.

As an anecdotal note, I play in a golf league at a nine-hole military base during the spring and summer. The league also includes an indoor winter league using a couple of golf simulators. The number of players in the golf simulator league is twice that of the summer league.

Climate change requires golf course superintendents to continually change or adjust management programs. Why would the game of golf itself not be changing under climate pressure? **G**

Karl Danneberger, Ph.D., *Golfdom's* science editor and a professor at The Ohio State University, can be reached at danneberger.1@osu.edu.

//STUDY UP

An inside look at the USGA Water Conservation Playbook

By USGA Green Section

Golf courses face growing threats from rising water costs, unpredictable supplies and increased water restrictions. Proactive water management is essential to secure the sport’s future. The latest research, technology and conservation strategies offer a path forward.

The USGA has invested \$30 million over 15 years to help courses reduce water use while maintaining playability and aesthetics. For more than a century, the USGA has supported golf courses through turfgrass research and resource management. Now, the organization is collaborating with agronomists, superintendents, architects, engineers and scientists to drive water conservation across the industry.

Golf courses depend heavily on supplemental irrigation to maintain turfgrass and playability, as rainfall alone is insufficient even in wetter climates. The challenges of applying water efficiently — across potentially vast acreage with varying needs and limited staff — are compounded by golfer expectations and the limitations of irrigation systems. Despite these challenges, it’s crucial to understand that golf courses are relatively efficient water users, accounting for only about 1.3 percent of the U.S. irrigation water use annually. Notably, golf course water use has decreased by almost 30 percent since 2005, mainly due to improved irrigation practices.

Water conservation is increasingly critical as water becomes more expensive and heavily regulated, even in traditionally water-rich areas. In arid regions like the western U.S., high costs and limited water availability pose significant threats to golf courses, with

TABLE 1
Fundamental irrigation stewardship

Strategy	Expected cost per acre	Ease of Implementation	Potential water savings for affected areas	Highest potential impact areas
Irrigation System Maintenance	< \$25K	Daily maintenance	< 10%	Nationwide
Effects of Chemical Applications on Water Use and Drought Resistance	< \$25K	Daily maintenance	< 10%	Nationwide
Managing Golf Expectations to Help Conserve Water	< \$25K	Additional resources needed		Nationwide

The playbook introduced by the USGA focuses on nine key water conservation strategies across three main categories, elaborating on the costs, benefits, limitations and implementation steps for each.

annual water budgets often exceeding \$1 million. External factors such as drought, population growth and political decisions can impact water availability, requiring courses to adopt strategies for reduced water use and improved drought resilience. This universal need affects courses that typically receive adequate rainfall and those in drier regions.

Efficient irrigation contributes to better playing conditions and healthier turf, reducing the need for other resources such as fuel and labor for mowing and pesticide application. By irrigating fewer turfgrass areas, golf courses can lower maintenance costs, increase environmental benefits and better allocate limited resources.

Since 1920, the USGA Green Section has promoted water conservation in

golf, invested in research and offered educational resources to help courses optimize water use. The playbook introduced by the USGA focuses on nine key water conservation strategies across three main categories, elaborating on the costs, benefits, limitations and implementation steps for each. These strategies range from simple, low-cost approaches to more advanced methods requiring significant investment and planning.

FUNDAMENTAL IRRIGATION STEWARDSHIP

Irrigation system maintenance: A well-maintained irrigation system is essential for sustaining golf course turfgrass in a playable condition

Continued on page 30

TABLE 2

Advanced irrigation techniques and conservation strategies

Strategy	Expected cost per acre	Ease of Implementation	Potential water savings for affected areas	Highest potential impact areas
Site-Specific Irrigation Scheduling	< 25K	Additional resources needed	10% to 30%	Nationwide
Grassing Strategies for Golf Course Water Conservation	\$25K to \$80K	Large capital project	10% to 30%	Western and southern U.S., and throughout the transition zone
Reducing Irrigated Acreage	\$25K to \$50K	Large capital project	> 50%	Nationwide
Subsurface Drip Irrigation	\$50K	Large capital project	> 30%	Arid and semiarid regions like the southwestern U.S.

Continued from page 29

year-round across most parts of the U.S. These systems represent significant capital investments for golf facilities, sometimes exceeding \$5 million. They require continuous maintenance and replacement as they age and become prone to issues. Developing a preventive maintenance program is crucial to minimizing problems, extending the system's lifespan, conserving water, reducing energy use and enhancing playing conditions.

The effects of chemical applications on water use and drought resistance: Turfgrass management practices such as mowing and fertilization directly impact water requirements. Extensive research and field experience supports the idea that applying certain chemicals helps turfgrass cope with drought.

However, the efficacy of many chemicals on water use and drought resilience remains unproven. Superintendents must continuously adapt their strategies to effectively manage turfgrass responses to water stress, promoting healthier, more resilient turfgrass.

Managing golfer expectations to help conserve water: Golfer expectations often influence irrigation practices, with many courses irrigating beyond agronomic needs to satisfy aesthetic demands. However, strategies like deficit irrigation can maintain healthy

turf and offer a pleasant golf experience without compromising aesthetics too much. Adjusting golfer expectations and promoting conservation strategies are critical to successfully reducing water use while maintaining satisfaction.

ADVANCED IRRIGATION TECHNIQUES AND CONSERVATION STRATEGIES

Site-specific irrigation scheduling: Estimating the water needs of various grasses poses significant challenges due to diverse growing environments and countless variables like soil type and sun exposure. New technologies, such as soil moisture sensors and weather data integration, enhance irrigation precision, yet costs and technical limitations hinder adoption. Still, these technologies have the potential for substantial water conservation and improved turf health.

Grassing strategies for golf course water conservation: Selecting appropriate grass species is vital for efficient golf course management, with increasing shifts toward water-conserving warm-season grasses. Converting to these grasses can reduce water usage by at least 25 percent and, despite high initial costs, pay off within several years. The choice of grass significantly affects water conservation

efforts, maintenance needs and overall playability.

Reducing irrigated acreage: Minimizing the area of irrigated turfgrass is an effective water conservation strategy. Golf courses can significantly reduce water use by converting traditional turf areas to landscapes requiring minimal or no irrigation. However, this transition involves considerable investment and challenges in maintaining the desired aesthetic and playability standards.

Subsurface drip irrigation: Subsurface drip irrigation (SDI) systems deliver water directly to the root zone, reducing losses from evaporation and runoff common in traditional sprinkler systems. While SDI is highly efficient, it remains underutilized in golf course settings due to installation costs and the potential for damage during maintenance activities like aeration.

WATER SOURCING AND STORAGE STEWARDSHIP

Surface water optimization: Golf course water features provide aesthetic value, habitat for wildlife and stormwater management. However, they also pose challenges in water conservation due to evaporation and leakage. Optimizing these features involves careful planning to reduce water losses, which can be achieved through strategic redesign or better management practices.

Using recycled water: Utilizing recycled water for irrigation helps reduce reliance on freshwater sources, aligning with sustainable practices as demand for water increases. While recycled water is generally less expensive and less subject to restrictions, it presents challenges such as varying water quality and potential impacts on turfgrass health.

Effective management and regular testing of recycled water are essential for maximizing benefits and mitigating risks. Facilities can significantly enhance their sustainability by addressing these fundamental aspects of golf course irrigation and water management.

TABLE 3

Water sourcing and storage stewardship

Strategy	Expected cost per acre	Ease of Implementation	Potential water savings for affected areas	Highest potential impact areas
Surface Water Optimization	> 50K	Large capital project	Up to 50% with water-loss management. Up to 100% if surface water is replaced by non-irrigated landscape	Nationwide, especially in arid regions with high annual evaporation
Using Recycled Water				
Ongoing mitigation of lower-quality water sources	\$25K to \$50K	Daily maintenance	Depending on availability, recycled water can replace up to 100% of water drawn from other sources	Nationwide, especially in the southwestern and southeastern U.S.
Connection to a water treatment plant	> \$1M per mile			

ADDRESSING THE CHALLENGE

The water conservation strategies presented in the playbook range from basic to highly sophisticated measures. Some can be quickly and inexpensively implemented, while others demand substantial investment and extended planning.

The appropriateness of each strategy for a particular golf course will depend on specific water-saving objectives, available resources, geographic location and numerous other factors. Although many courses may have already adopted some of these measures, there is always room for improvement.

Continuous advancements in turfgrass varieties, innovative technologies and enhanced irrigation management are opening new avenues for golf courses to reduce water consumption. The golf industry encounters numerous challenges regarding water usage, yet these challenges also present opportunities for significant improvements.

In recent decades, numerous golf courses have radically altered their water management practices, achieving notable improvements in playability and overall operational efficiency. Progress in golf course water conservation will necessitate a collaborative effort among superintendents, researchers, regulators, golfers and local communities.

The playbook is a valuable online

Research Takeaways

Experts have outlined in the USGA Water Conservation Playbook nine key actions in three major areas:

Fundamental Irrigation Stewardship

- Monitor water use, schedule irrigation based on weather and maintain systems to prevent leaks.
- Manage golfer expectations to balance playability and aesthetics with water conservation.
- Use water-efficient products to maintain turf quality under reduced irrigation.

Advanced Irrigation and Conservation Techniques

- Use soil-moisture sensors and remote sensing for precise, site-specific irrigation.
- Implement drought-tolerant turfgrass and reduce winter overseeding.
- Minimize irrigated acreage by replacing unnecessary turf with low-water plants and hardscapes.
- Install subsurface drip irrigation to deliver water directly to roots and reduce waste.

Water Sourcing and Storage Stewardship

- Optimize surface water use by minimizing evaporation and seepage.
- Utilize alternative water sources, such as recycled wastewater, to reduce reliance on potable water.

resource supporting sustainable water management efforts, and it can help superintendents think about improvements they can undertake. To view the entire document, visit bit.ly/4cmJBIX. 

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The Shop

// MUST-HAVE NEW PRODUCTS



1 CR-20 fairway topdresser

Turfco Manufacturing says its new, patent-pending CR-20 fairway topdresser and material handler offers a new standard of productivity and precision for golf course and sports turf topdressing, material handling and construction projects. The CR-20's unique spinner design produces a uniform and precise topdressing application over large areas, while the patent-pending digital smart controller allows superintendents to calculate and save their topdressing applications. The CR-20 also features an innovative side conveyor with a 40-degree operational range, ensuring materials are placed exactly where needed.

[Turfco.com](https://www.turfco.com)



2 Snake S3

The new Snake S3 from Trimax Mowing Systems builds on the previous Snake series with a range of features designed to deliver zero daily maintenance and enhance ease of use. The Snake S3 features a deck and blade design that optimizes airflow through the cutting chamber to cut and distribute grass cleanly. Key design changes on the Trimax Snake S3 include the Titan Roller Bearing System, which has multi-layered seals and a sophisticated ingress channel that prevents debris from entering the bearing, plus maintenance-free wheel hubs which are sealed automotive bearings engineered for durability.

[TrimaxMowers.com](https://www.trimaxmowers.com)



3 Standard Golf hole cutters

Standard Golf has introduced a trio of new hole cutters for its 2025 product lineup. The SG Pro hole cutter is a hammer-down hole cutter that delivers clean, consistent cuts with minimal effort and uses a ratchet release to easily remove plugs and move on to the next hole. The Hammerstrike hole cutter (pictured here) uses a slide-hammer mechanism for powerful, straight cuts with less strain and uses a foot-pedal ejection mechanism to remove the need for a cumbersome handle. Finally, the Magnum Pro hole cutter has been enhanced with reinforced handles and precision-ground cutting blades. It has a locking ejection handle with a golf grip for added comfort.

[StandardGolf.com](https://www.standardgolf.com)



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4 | Range Pro 100

The Toro Co.'s Range Pro 100 is an autonomous golf ball picking robot designed to streamline the labor-intensive task of collecting golf balls from the driving range. Capable of collecting up to 19,500 balls in 24 hours, the company says the Range Pro is a game changer for golf courses looking to save time and labor while maintaining a clean, tidy range for golfers. Its efficient design minimizes the need for manual labor, enabling course staff to focus on other critical tasks throughout the day. The Range Pro features wireless monitoring and control capabilities, allowing superintendents to easily track and adjust performance.

Toro.com

5 | 590BTS/590BFS

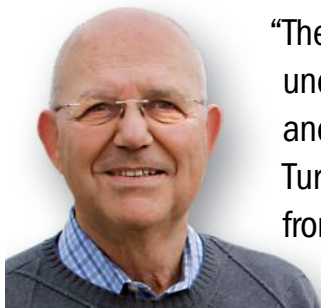
Husqvarna has introduced the 590BTS and 590BFS backpack blowers for professional use. These all-new blowers boast 56 newtons of blow force and deliver 1245 CFM of air volume. Powered by a 79.4 cc X-TORQ engine, the 590BTS and 590BFS were designed with a focus on power-to-weight ratio, aiming to be one of the world's most powerful backpack blowers, according to the company. The 590BTS and 590BFS feature an AutoTune-controlled carburetor to automatically adjust air/fuel mixture. The backpack blowers also have a new simplified starting procedure with an easy "start" button that eliminates the need for a manual choke.

Husqvarna.com/us

6 | 2775 E-Cut electric triplex mower

John Deere unveiled its new 2775 E-Cut electric triplex mower at the 2025 GCSAA Conference and Trade Show. The 2775 E-Cut — a fully electric model designed for greens, tees, fairways, approaches and surrounds — builds on the proven chassis of the John Deere PrecisionCut and E-Cut hybrid triplex mowers. Powered by a four-battery, 58-volt, 14.24 kWh MAX power pack, this mower delivers electric power to the traction, steering, lift/lower and mow circuits. The 1,200-watt offboard charger recharges the batteries in 12 hours or less, allowing operators to mow more than 22 greens on a single charge.

JohnDeere.com/Golf



“The 1980s brought a deeper understanding of water conservation and its long-term implications ... Turfgrass water conservation moved from art to more scientific decisions.”

MIKE KENNA, PH.D., *Research Editor*

Milestones in USGA's water history

As the golf industry navigates increasing water regulations, proactive conservation efforts have become more critical than ever. This month's research article summarizes the recently published USGA Water Conservation Playbook with links to the nine ways you can help conserve water.

The challenges golf facilities face today are not entirely new and share similarities with those encountered in past decades. The USGA Green Section timeline offers a historical overview of the evolution of water use in golf dating back to 1931.

For example, in the 1930s, the USGA began addressing the challenge of watering turf. Articles from the time encouraged the installation of fairway sprinklers. As golf courses incorporated more turf, a complex water management issue emerged. By the 1950s, the importance of water conservation gained prominence. Golf courses, often under government restrictions, recognized the need to save water.

The 1960s brought significant advancements in irrigation technology. Automatic irrigation systems became more common, and courses began exploring water management strategies and the benefits of advanced irrigation.

In the 1970s, the USGA joined other

allied associations by sponsoring the Proceedings of Wastewater Conference. The Chicago conference in November 1978 was planned to correct the lack of wastewater reuse on golf courses.

The 1980s brought a deeper understanding of water conservation and its long-term implications. Discussions revolved around coping with saline water, the efficient use of this natural resource and the relationship between water use and energy consumption. Turfgrass water conservation moved from art to more scientific decisions.

The 1990s saw an increased focus on the environmental aspects of water management. The USGA sponsored several university projects to evaluate pesticide and nutrient fate through runoff and leaching. The January/February 1995 issue of the *Green Section Record* provided results from this research effort. The American Chemical Society (ACS) followed up on the USGA environmental research on water quality with

ACS Symposium Series 743 Fate and Management of Turfgrass Chemicals in 2000.

In the 2000s, the industry recognized the importance of not waiting until the well runs dry. Making every drop count became a mantra for golf courses seeking to reduce water use. Water regulators and the golf industry worked together to map the direction for regulating golf course water use.

The 2010s marked significant progress in water management strategies. The USGA continued to play a pivotal role by funding research to reduce water use. Developing water budgets became an essential aspect of golf course management. In 2012, the USGA sponsored a water summit and published *Golf's Use of Water: Solutions for a More Sustainable Game*. The Water Summit brought together science, government, business, academia and golf experts to identify and discuss the most challenging issues regarding golf's water use.

Now, golf courses are encouraged to engage with water authorities proactively to implement water conservation strategies. The goal is to showcase the industry's commitment to responsible water use and demonstrate leadership in water conservation. To help with this initiative, the USGA Green Section published the Water Conservation Playbook in February.

Strategies to reduce water inputs include three sections: Fundamental Irrigation Stewardship, Advanced Irrigation Techniques and Conservation Strategies and Water Sourcing and Storage Stewardship. This month's research article summarizes the playbook with links to the nine ways you can help conserve water (Editor's note: To access many of the publications mentioned in this column, view the digital version on Golfdom.com). ©

Mike Kenna, Ph.D., is the retired director of research for the USGA Green Section. Contact him at mpkenna@gmail.com.

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The 19th Hole

Charlie Fultz

GENERAL MANAGER / SUPERINTENDENT // Heritage Oaks GC, Harrisonburg, Va.



Charlie, what can I get you? You're going to laugh... I need a fatty Dr. Pepper. I don't want a 12-ounce can, I want that big bottle, I call it the "fatty" Dr. Pepper. I have an addiction to it, I always have a 12-pack in the fridge.

Tell me about Heritage Oaks. We're a Bill Love design. I've got to talk to Mr. Love several times over the last couple years, and he said it's one of his favorite tracks. He took a really old flood plain in a rock quarry and laid out a gorgeous 18-hole golf course. And I'm happy that we've increased rounds each of the last four years that I've been general manager.

Do you have a family and what do you do for fun? I have two sons, ages 26 and 21. I'm still playing drums. I'm in a band — Shotgun Shiver. I'm generally playing two to three times a month, pop and rock. And if I'm not drumming, I'm hanging out with my girlfriend, Jane. She's a kindergarten teacher. We're enjoying the dating scene at a young 54; she's fantastic. And I just purchased my great grandmother's house, and I've been doing some renovations to it. That's all kept me busy.



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"DICK FISHER IS A LEGENDARY SUPERINTENDENT IN VIRGINIA. HE TOLD ME, 'IT'S NOT IF, IT'S WHEN (YOU LOSE TURF). THE GOOD ONES ARE THE ONES WHO CAN GET IT BACK. BE GOOD ON THE OTHER SIDE OF IT, AND THE PEOPLE YOU WORK FOR WILL ALWAYS APPRECIATE IT.'"



Are you a sports fan? Who do you root for? That's a sensitive question. For 29 years and counting, I've been a Dallas Cowboys fan. I miss the days of Troy Aikman and Michael Irvin! I'm also a Philadelphia 76ers fan, and they're even worse because they're all hurt. And I'm a Los Angeles Dodgers fan, and they just buy their way into the World Series.

Talk about a sensitive question... I first met you years ago when we worked together on an article for Golf Course Management magazine. Do you mind talking to me about what your new article for them is about? Over the last year and a half or so, I had a lot of personal life issues. Some health issues with one of my sons, some legal issues with my other son, some health issues with my father. And life hit me all at one time. I did not know how

to handle that much. My article is about realizing there's a point where maybe you need outside help. It's called "I need help," and it's about me going to counseling and trying to figure out what was going on with my life and finally admitting that my ADHD was not manageable. I finally started medication, and I realized that and counseling together have made life a lot better.

What's the best thing about having your job? I have the best office window in the business. There's nothing like watching the sun come up over the mountains in the morning. Now, I don't like still being there when the sun is starting to set, but you see the deer start to come out, the turkeys come out of the woods, and you realize this is a pretty good gig.

As interviewed by Seth Jones, Feb. 4, 2025.

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