An Official Publication of the Wisconsin Golf Course Superintendents Association

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THE GRASS ROOTS

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GOLF COURSE SUPERINTENDENTS ASSOCIATION OF AMERICA

THE GRASS ROOTS is the quarterly publication of the Wisconsin Golf Course Superintendents Association. No part of the THE GRASS ROOTS may be used without the expressed written permission of the editor.

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Research Funding

By: Scott Anthes, Superintendent, Brown County Golf Course

As you all know, one of the big things that we do as an association is help to fund research. This is usually done through the University of Wisconsin-Madison and the turf professors there. These funds are usually partnered with the GCSAA. The GCSAA usually matches what we give. These funds are usually in the $20,000 to $25,000 per year range and are normally for a couple of years. This really does depend on the scope of the research project that is being done. The Professors are great at communicating with us, and each other, about each research project. They will wait until one study is ending before they ask for the next one and they will take turns in asking. I can honestly say that working with them has been great. The research that comes out of these projects is nothing but top notch and only benefits everyone in the long run.

I am bringing this up because we used to have an annual auction called PAR 4 Research. This online auction was run and paid for by us. We would get donated rounds of golf from Wisconsin golf courses and auction them off to the general public. Thank you to all who donated in the past to this cause! In previous years, we would average about $7,500 to $10,000 in funds raised. These funds would go directly to the research requests from the turf Professors.

The GCSAA also has an auction called Rounds 4 Research and it runs around the same time as ours did. We, as a board, felt it was time to join the other chapters and join the GCSAA's auction. Again, rounds from Wisconsin are donated to the auction and sold to the highest bidder. The only difference is the number of bidders. The GCSAA has a large pool of bidders from all over the country. A larger pool allows for a larger bids! I am happy to report that we raised $13,000 this year. Again, THANK YOU to all the donors!

I can only ask that if you didn't donate this year, please consider it in the future. It is all done quickly online, and you can customize how you donate. Only want to donate a walking twosome on a Monday--you can do that. Want to donate a foursome with carts that is good for anytime--you can do that as well. You can put any type of limitation of the donation. So again, please consider donating in the future as the money goes to a great cause that only helps you and your golf course.

WGCSA MISSION STATEMENT

The Wisconsin Golf Course Superintendents Association is dedicated to serving its members, advocating on behalf of the golf course management industry, and supporting the future of golf.

WGCSA VISION STATEMENT

Through promoting environmental stewardship and best management practices on behalf of its members, the Wisconsin Golf Course Superintendents Association is recognized as the regional leader in golf course management.

Rounds 4 Research

GCSAA

Thank you to the following courses whose donations helped us raise nearly $13,000 for turf research at UW-Madison! We appreciate your support!

- **Abbey Springs Golf Course:** *Lee Suwalski, Superintendent*
- **Bishops Bay Country Club:** *Marc Davison, Superintendent*
- **Blackhawk Country Club:** *Chad Grimm, Superintendent*
- **Blue Mound Golf and Country Club:** *Alex Beson-Crone, Superintendent*
- **Brown County Golf Course:** *Scott Anthes, Superintendent*
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- **West Bend Country Club:** *Brian Bonlender, Superintendent*
- **Westmoor Country Club:** *Ben LaBarre, Superintendent*
- **Whispering Springs Golf Club:** *Brandon Nebl, Superintendent*

2024 WGCSA Events Calendar *as of 5/7/2024*

June 17, 2024	**June Golf Event at Bishops Bay Country Club, Middleton, WI**
July 15, 2024	**Assistant Superintendent/Equipment Manager Golf Event at The Sandbox**
August 6, 2024	*WTA Field Day at OJ Noer Turfgrass Research and Education Center*
August 26, 2024	**August Golf Event at Horseshoe Bay Golf Club**
September 15, 2024	*Wee One at Pine Hills Country Club*
October 7, 2024	*WTA Fall Golf Classic at West Bend Country Club*
October 22, 2024	***(NEW)* Trap Shooting Event at Milford Hills**
January 8-9, 2025	**Wisconsin Golf Turf Symposium at The American Club**

Bold are WGCSA organized. *Italicized are WTA/PGA/Wee One events.*

Wisconsin Chapter GCSAA GOLF COURSE SUPERINTENDENTS ASSOCIATION OF AMERICA

Growing the Next Crop of Supers

By: Jake Schneider, Editor and Chapter Manager

Unlike some of the fancier magazines, *The Grass Roots* doesn't have any sort of set theme with each issue. Your humble editors, past and present, have largely been grateful for any content submissions as it makes our lives a whole lot easier and the magazine much more interesting. However, you'll undoubtedly notice that youth engagement comes up a few times as you peruse this issue. Attracting and retaining quality labor is one of the biggest challenges that most courses are facing, especially with a growing economy and an industry that has exploded in the past several years and is showing no signs of slowing down.

As Dave Marach touches on in his article, the Noer Center played host to nearly 70 high school FFA students in April, and for the first time, I had the pleasure (and trepidation) of being the co-superintendent of the Nursery and Landscape Career Development Event (CDE) alongside my friend and former colleague at The Bruce Company, Reid Maier. Last year, I was approached by one of the state CDE leaders as they were looking for a new superintendent for this division, and thanks, I think, to the recommendation of former WGCSA president, Brian Zimmerman, they found me. Although I didn't really know that this role entailed, it seemed like a great way to get information about our industry out to some kids who might actually be interested in making a career of it, and after year one, I wholeheartedly believe that increased engagement with the FFA is golden opportunity for us.

Part of the curriculum for the students this year was studying our very own BMP manual. Based on the grades from that part of the exam, there was a wide range of learning that *actually* took place, but regardless, these kids all got a taste of the science behind maintaining a golf course and for the first time may have thought about it as a future job. Maybe, just maybe, we had a future Shane Conroy in the mix who will be filling bunkers and mowing the range on a course in Wisconsin in the coming years.

In my humble opinion, the days of labor falling into our laps has long passed, and the most successful courses are those that are intentional about their hiring and recruitment and who don't just focus on it from February-April. Reaching out to your local FFA teacher is certainly one way to cultivate the next crop of golf course superintendents and another is to host a First Green event.

Earlier this spring, I received a First Green event starter kit from the GCSAA, and I really want to put that bad boy to use in 2024. You can read more than I can type about First Green at thefirstgreen.org, but this is essentially a field trip where students (and their parents) get to experience the benefits of a golf course and their STEAM applications. While the groups are often from local middle schools, you could also host your junior golf program or another local youth group. GCSAA has a ton of resources to make this a successful venture, and I would be helping along the way, too. If you're interested in hosting a First Green event, give me a call or shoot me an email, and we'll make it happen.

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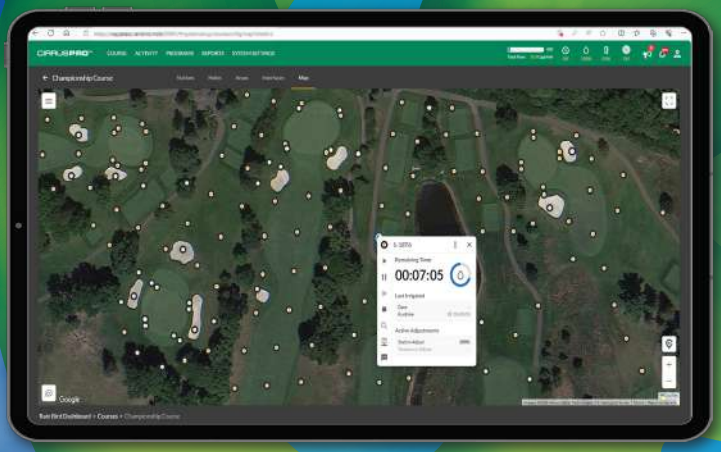

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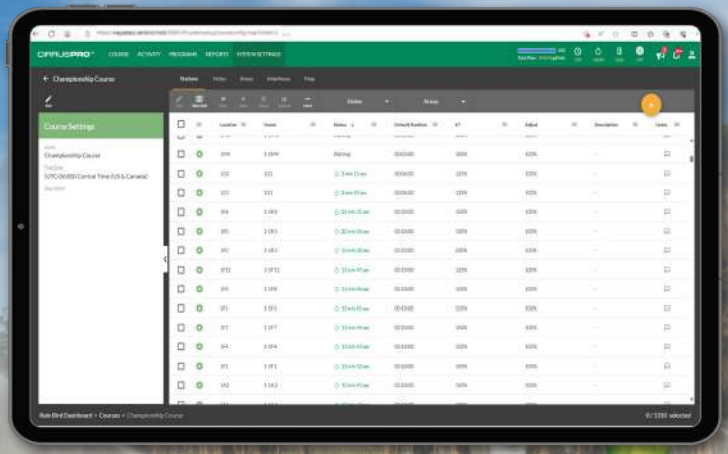

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GROWING YOUR TEAM

By: Shane Conroy, GCSAA Field Staff-Great Lake Regional Representative

A new golfing season is now well underway, and 2024 continues to move along at a pace that only seems to gain steam. Students have finished their school year and some are looking for a summer job. It's during this time of year that I often think back to when I started in the business and how those early days on the golf course were some of the most fun I've ever had in a job.

My golf course agronomy career began at Boulder Pointe Golf Club in Oxford, MI when I was 17. I started working in April when I would show up after school and on weekends. It was early spring in Michigan, and the days were usually cold and wet. My first task on that first day was to add sand to bunkers, probably not anyone's favorite maintenance practice on the course. The course was still under construction when I started and wouldn't open until later that year. In the spring, the bunkers only had drainage and edges and adding sand via Cushmans was how I was introduced to the industry; I loved it.

Working at a golf course which is still under development may be one of the coolest gigs in the industry. I was working with several others who were around my age and the superintendent, Scot Gardiner, CGCS, a 39-year GCSAA member, and the assistant at the time, Phil Hopper, a 24-year association member, didn't make it feel like work.

Once school ended for the summer, I would be there most days from 6:00 am to 2:00 pm, along with the majority of the crew--pretty standard 20+ years ago. As my hours increased, so too did my responsibilities at the course. I went from adding sand to bunkers to triplexing tees and approaches. From there, I started to handle course setup (once the course opened) and mowing the driving range.

I still remember mowing the driving range for the first time. I was on an old Ransomes riding mower. I couldn't tell you the model or the year, but it was the biggest piece of equipment I had ever operated to that point. I was beyond nervous. While I did my best to hide it, I'm sure Scot knew I was nervous as well.

He gave me a tutorial of the mower and went over the safety and

operation. He then watched me for a couple of passes to make sure I didn't drive the thing into the clubhouse, but after a few minutes, he went on his way and I was on my own. I couldn't help but think about how cool it was that I was mowing the range on a mower twice the size of my beater car. Here I was, working at the golf course for only one season, and I was mowing rough, triplexing tees, and changing cups.

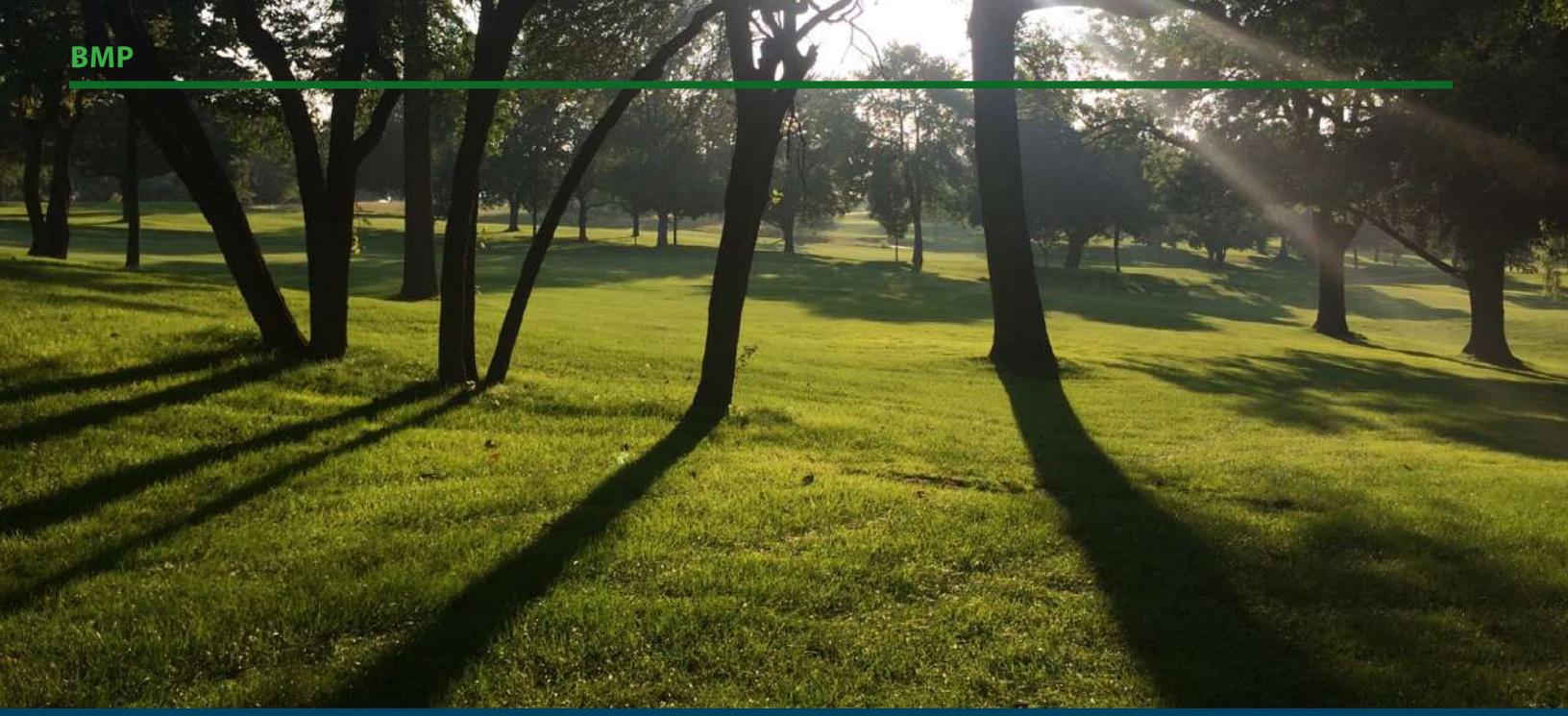
It wasn't just that I was showing up for work every day, it was the fact that I felt a part of something. I felt like I mattered. I wanted to show up for work every day and give it may all. Scot and Phil were putting their trust in me, and I didn't want to let them down. At that point, it was still just a summer job, but I enjoyed it and it was satisfying work. Little did I know it would become my career a handful of years later.

I don't tell you this story to take a trip down memory lane or reminisce. I wanted to share this story because you too have the power to change someone's life. By adding some responsibility or encouraging additional accountability, there's no telling where it might lead someone. There may not be the next great superintendent, or assistant, or equipment manager on your crew, but if you don't give them the opportunity to take this job to the next level, how will you know?

You may be thinking to yourself: my crew is so short right now, they already do all of these tasks and more. I know that's the case for many of you. If that is the case, look for opportunities to give those on your team more responsibility, or involve them in areas of the day-to-day operations where they may not have had the opportunity prior. You never know where this may lead them.

Additionally, those already on your team should be the greatest advocates for you and the agronomy crew. When I was working at Boulder Pointe, I wasn't shy about encouraging my friends to apply. Why wouldn't I want to work with my buddies and get paid at the same time? A few applied. Not all were hired, but this was 2000, and the labor pool wasn't as tough as it is today. With that said, your team can still act as your best recruiters if you give them the opportunity. Their recruiting is directly tied to their day-to-day responsibilities at the course. Why would someone want to encourage a friend or family member to come work with them when they don't like their job? When they take pride in their work, have responsibilities, and feel like they matter, referrals can become a regular occurrence.

When you give someone the chance to take their career to the next level, they not only oftentimes take that opportunity, but surpass expectations. I don't know what I would be doing if I wasn't given that opportunity by Scot and Phil 24 years ago, but I am forever grateful to them for putting their trust in me and I hope I exceeded their expectations. I'm confident if you do the same, your team will also exceed expectations.



NUTRIENT MANAGEMENT BMPS

CULTIVATING SUSTAINABLE TURF WITH SMART NUTRIENT MANAGEMENT

In Wisconsin, the lushness of golf courses is not merely about aesthetics; it's a result of conscientious nutrient management that enhances turf health while protecting the environment. Proper fertilization, aligned with sustainable practices, enables turfgrass to recover from stress, resist damage, and maintain its vitality, ensuring optimal playability and beauty.

Strategic Nutrient Application

Wisconsin's nutrient management programs strive for minimal yet effective nutrient application to maintain superior playing surfaces. State regulations, including NR-151 and the DNR Turf Nutrient Management Technical Standard (1100), guide these practices ensuring they meet environmental standards while promoting healthy turf growth.

Superintendents across Wisconsin implement a rigorous Nutrient Management Plan (NMP), designed to address the unique conditions of each course. This involves regular soil and plant tissue analyses to determine the precise nutrient needs, minimizing waste and maximizing plant health.

The optimum soil pH for turfgrass in Wisconsin varies from 5.5 to 8.2, catering to the needs of different grass types. For instance, Kentucky bluegrass thrives in a range of 6.5 to 7.0, while ryegrass can adapt to slightly lower pH levels. Soil pH is largely influenced by regional precipitation patterns,

which can lead to the leaching of calcium, magnesium, and potassium ions, being replaced by hydrogen and aluminum ions. This dynamic is also shaped by the soil's parent material, its organic matter content, and ongoing fertilization practices.

BMPs for Nutrient Management

- Comply with NR-151, local, and federal regulations, understanding the implications for your course.
- Identify who will develop and implement the NMP; the nutrient management planner should be qualified with certification of professional management, a bachelor's degree in turfgrass science or related field, or experience equivalent.
- Conduct comprehensive site analyses, including soil testing, plant tissue and water analysis, to understand pH levels and tailor nutrient applications precisely.
- Maintain detailed records of fertilization schedules, types of fertilizers used, and their application rates.
- Use advanced spreading equipment calibrated to ensure even nutrient distribution and reduce runoff potential.
- Understand the components of fertilizers, labels, and functions of each element
- Schedule fertilizer applications to coincide with active turf growth, avoiding periods of saturation from rainfall.
- Opt for slow-release nitrogen fertilizers and light, frequent applications to maintain consistent nutrition and reduce leaching.
- Prepare and regularly update a spill-response plan, training staff on immediate and effective actions to minimize environmental impacts.

Achieving Healthy Turf Through Precision and Planning

The cornerstone of Wisconsin's nutrient management is a well-structured NMP that includes:

1. A detailed description of the site, noting sensitive environmental areas.

2. A site map indicating topography, land uses, and locations of environmental sensitivity.

3. Specific application rates and restrictions tailored to different areas of the course, particularly those near water bodies or other sensitive environments.

4. Regular soil test results to adjust nutrient applications based on current conditions.

5. A robust fertilizer spill-response plan to handle potential accidents swiftly and efficiently.

Engaging with Scientific Expertise Wisconsin

Superintendents often collaborate with the University of Wisconsin-Madison Turfgrass Science program for guidance on nutrient application rates that extend beyond standard recommendations. This partnership ensures that each course's nutrient management is backed by the latest scientific research and tailored to its specific environmental and soil conditions, including maintaining the optimum soil pH necessary for different turfgrass types.

A scientific approach utilizing a NMP and BMPs helps ensure that our golf courses not only sustain their beauty and functionality but also adhere to environmental responsibilities, reflecting the community's broader commitment to sustainability and ecological stewardship.

For full details on Wisconsin Golf Nutrient Management BMPs visit: https://www.wisconsingolfbmp.org/bmphome/nutrient-management

SPRINGING INTO 2024

By: Jake Schneider, Chapter Manager and Editor

While much remained the same inside the cozy confines of the South Hills Golf and CC clubhouse, the scene outside was drastically different than what we saw in 2023. Like seemingly all the other days in early March, it was an unseasonably warm day in Fond du Lac for our annual Spring Business and Education Meeting. Last year, Jim Van Herwynen's course was covered in a beautiful blanket of snow which was obviously in short supply this year. Thankfully, Jim's greens were still covered to remind us that it was, in fact, still technically winter according to the calendar.

Considering that many courses were already open and that most others likely had golfers breathing down their necks, we were pleasantly surprised that 50 folks made their way to Fondy for the day of education, networking, and seeing what the Board of Directors has been up to. After his traditional dad joke, Tim Wegner, education committee chair and superintendent at Brown Deer Golf Course, introduced Ken Rost from Frost Inc to discuss GPS sprayers.

Ken is the founder of Frost Inc and has over 20 year of spray technology experience. Ken's basic test for determining technological advances involves four basic questions: does it improve accuracy, does it improve productivity, does it improve reliability, and is it worth it? During his presentation, he walked through this checklist for automatic rate control, guidance monitors, the various satellite guidance systems, auto steer, individual nozzle control, turn compensation, dual nozzle control, boom level control, mapping systems, cloud connectivity, web tools, and drone spraying.

GPS sprayer guru, Ken Rost with Frost Inc, gave a thorough presentation on the considerations with this relatively new technology that is becoming much more popular.

By and large, the basic GPS spray technologies seem to check the boxes, but the "add-ons" are largely site and user specific in terms of their overall effectiveness. One aspect that isn't up in the air is the return on investment which is shockingly fast when you talk about reducing the amount of both time and product involved in spraying. Additional bonuses that Ken has seen include improved plant health with fewer inputs, younger generations embracing information screens, application data used as a training tool, and better BMPs.

Gabe Lopez with Irrigation Protection Services made us all a little smarter with his talk on pumpstations.

Next up was Gabe Lopez with Irrigation Protection Services. Along with his wife, Christine, Gabe founded IPS in 2012 and has more than 30 years of experience in all facets of golf course irrigation. His topic du jour was the central hub of all irrigation systems—the pumphouse. After the safety portion of his talk where Gabe verified the fears that I had about the powerful pumpstation from my former life at Blackhawk CC, he dove into the types of pumpstations that he typically sees in the field, including the "my buddy does plumbing" model that isn't necessarily recommended.

Gabe then moved on to discussing pumpstation maintenance basics that included tutorials about keeping the building clean, greasing properly (don't overdo it!), regular calibration, and not letting small problems turn into big ones. To wrap up his portion of the day, Gabe discussed the selection and budgeting considerations that need to be addressed if/when you begin looking to replace your pumpstation. Not surprisingly, such a project is often going to be more costly and take more time than you might initially expect, but if you do your homework and educate your decision makers about the

importance of a properly functioning pumphouse that will last you a good 20-30 years, the sell can become a little easier.

Trent and Matt with Northwestern Mutual had the brains churning as was evidenced by the amount of questions that they received after their formal presentation.

The educational portion of the day was wrapped up by Trent Lower and Matt Rewasiewicz from Northwestern Mutual. As you can guess, they weren't there to cover the ins and outs of a solid agronomic program, but instead discussed financial planning strategies in 2024 which was something that certainly applied to everyone in attendance. They had three basic buckets for their approach: protect against the unexpected by managing risk, save and invest for you future goals, and preserve what you're working so hard to achieve.

To begin with, they recommend creating a safety net that is the equivalent of six months of living expenses in an easily accessible account. From there, you should protect yourself should you experience an accident or injury, get sick, or die too early because, for most people, your ability to earn income is your most valuable asset. The wealth accumulation strategy tends to be more personalized based off your family situation, goals, and employer-funded retirement options, but regardless of the plan, you need to consider that Social Security will likely not be fully funded in the future and that people are living longer now that they ever have previously. On the surface, getting to retirement and distributing your accumulated assets to maintain your desired lifestyle might seem like the easiest step, but it can often be the trickiest simply because many people have a hard time taking money out if there isn't any going in. Regardless, it's important to have estate planning documents in place whenever your time may come.

After that light note, we kicked it over to Alex Beson-Crone, director of grounds at Blue Mound Golf and CC, for a brief presentation about the Super Scratch Foundation which is looking to fund turfgrass students across the US (check it out at https://www.superscratchfoundation.org/). We then convened the annual board meeting during lunch and brought everyone up to speed on what had been happening behind the scenes. The association's finances remain strong, and a few new items that you'll be seeing in the coming months include: a new website, WGCSA branded swag for early registrants at our events, and increased investment in scholarships & the UW-Madison Turfgrass Apprenticeship Program.

Despite the favorable outside working temps, we had a solid group taking in the day's lineup.

In a change of format from prior Spring Business Meetings, we scrapped the afternoon education and instead hosted a well-received happy hour thanks to our generous industry partners. Safe to say that there weren't any complaints about having a cold one with friends after three hours of learning!

The WGCSA extends a special thank you to the staff at South Hills for their always-excellent service and to the presenters for taking the time to lend their knowledge to those in attendance!

WGCSA CELEBRATES LONGTIME MEMBERS

By: Brian Bonlender, Superintendent, West Bend Country Club

One of the highlights of every Spring Business Meeting is the presentation of the 25- and 50-year membership awards. The individuals receiving these awards have certainly stood out as industry leaders throughout their careers and by their continual commitment to the Wisconsin Golf Course Superintendents Association. This year, we had four 50-year members and six 25-year members. The fifty-year members are Bob Belfield, Roger Bell, Robert Gosewehr and Bruce Worzella, and the 25-year members are Steve Houlihan, Bret Mullikin, Scott Sann, Steve VanAcker, Paul Schaefer and Andrew Putzer. Congratulations to all of you for the contributions you have made to the industry!

25 years

Steve Houlihan – 25 years

Steve Houlihan currently serves as the superintendent at Oconomowoc Golf Club. Throughout his career, Steve has held positions at Blue Mound Golf and Country Club, Merrill Hills Country Club, Chenequa Country Club, Blackwolf Run, and the O.J. Noer Turfgrass Research Center.

His passion for turf management was ignited by a family tradition, with influential figures like Jim, Pat, Charlie, and Dan Shaw serving as inspirations. Steve's journey in the industry began in 1993 as a dedicated caddie, a role that eventually led him to earn a Chick Evans caddie scholarship in 1999. This scholarship enabled him to pursue studies at UW-Madison, where he obtained both bachelor's and master's degrees in Soil Science under the mentorship of Dr. Wayne Kussow. Steve holds fond memories of Dr. Kussow's guidance and remains grateful for the opportunity to work alongside him.

Beyond his professional endeavors, Steve finds fulfillment in his personal life. He shares 15 years of marriage with his wife, Kate, and together they have two wonderful children.

As Brian mentioned during Steve's presentation, it is suspected that one of his uncles signed him up for membership when he was 15 years old!

During his leisure time, Steve enjoys outdoor activities such as kayaking, biking, and hiking with his family.

Membership in both the WGCSA and GCSAA has played a pivotal role in Steve's career growth, providing access to the latest industry trends, research findings, and networking opportunities. He believes that these memberships have not only expanded his professional network but also facilitated the exchange of innovative ideas and fostered lasting friendships.

Looking to the future, Steve remains optimistic about the turfgrass industry's trajectory and continues to support his beloved Wisconsin Badgers.

Bret Mullikin – 25 years

Bret serves as the superintendent of River Run Golf Course in Sparta, where he channels his passion for turf management into maintaining pristine greens and fairways. While the golf course demands much of his attention, Bret actively supports middle school sporting events during his downtime, finding fulfillment in cheering on these young athletes. Yet, his heart lies in the tranquility of fishing, a cherished pastime he hopes to indulge in once again.

Even outside of work, Bret's connection to green spaces remains strong. He takes pleasure tending to his own lawn, finding solace in the simplicity of the task. This hands-on approach reflects his deep-rooted dedication to turf management, transcending the boundaries of his professional responsibilities.

Throughout his career, Bret has relied on the support and camaraderie of various organizations. Whether seeking advice or sharing insights, he has always found his peers willing to lend a helping hand.

As most of us do, Brett eagerly awaits the seasonal transition, embracing the new opportunities it brings. Armed with unwavering dedication and a genuine love for his work and hobbies, Brett looks ahead to the future with optimism and enthusiasm.

Scott Sann – 25 years

Scott's journey in turf management began at a young age, working as a bag boy at Tuscumbia Country Club in Green Lake at the age of 15. Intrigued by the work of the grounds crew, he embarked on his professional path by joining Mike Berwick's team at Lawsonia Golf Course upon returning from college. Scott pursued higher education at UW-Stevens Point, where he had the opportunity to work under the mentorship of Jeff Bottensek at Stevens Point Country Club. It was with Jeff's assistance that Scott secured a summer internship with Dr. Frank Rossi at the OJ Noer Research Center, where he discovered his passion for turf management and the diverse scientific disciplines it encompasses. Graduating from UWSP with a degree in Biology and a minor in Soil Science, Scott embarked on his career journey and initially served as the first assistant to Kris Pinkerton at Oshkosh Country Club. Returning to Central Wisconsin, he joined Scott Thompson's team at Greenwood Hills Country Club before eventually assuming the role of superintendent, a position he held for 22 years before retiring.

In addition to his career in turf management, Scott is also a co-owner of Turf MD's, a landscaping business he co-founded during his superintendent days to supplement his family's income. Since its inception, Turf MD's has grown into a thriving enterprise, offering a range of services including lawn applications, mowing, plant maintenance, irrigation, snow removal, and landscaping. With a team of six full-time employees and ten seasonal workers, Scott and his partner Mark Brost reached a significant milestone in 2023, celebrating one million dollars in sales.

Outside of work, Scott's favorite pastime is fishing and spending time at his cabin in Cornucopia, WI. While he played plenty of golf during his career, he now prefers the tranquility of the water and the serenity of nature.

Scott recognizes the immense benefits of membership in both the Golf Course Superintendents Association of America (GCSAA) and the Wisconsin Golf Course Superintendents Association (WGCSA). For him, the GCSAA provides invaluable educational opportunities, while the WGCSA fosters relationships and facilitates the exchange of knowledge among professionals in the field.

Steve VanAcker – 25 years

Steve hails from Huntley, Illinois, where he was raised on a family dairy farm. Initially intending to pursue a career as an agricultural teacher, he attended McHenry County College. However, his path took an unexpected turn when he emerged with a turf degree instead. It wasn't until a required summer internship at Turnberry Country Club in Crystal Lake in 1974 that Steve was introduced to the world of golf and turf management. From that moment on, he was hooked.

At the young age of 22, Steve took on the role of superintendent at Midlane Golf Club in Waukegan in 1977,

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marking the beginning of what would become a lifelong career in golf course management. Over the years, he has held positions at esteemed clubs such as Twin Orchard Country Club and Rolling Green Country Club, accumulating an impressive 37 years as a Certified Golf Course Superintendent (CGCS). Currently, Steve proudly serves as the Golf Course Superintendent at Crystal Lake Country Club in Crystal Lake, Illinois, a position he has held for the past 33 years.

Beyond his professional achievements, Steve is known for his unwavering loyalty to the Green Bay Packers, a passion that has endured since 1967. He makes it a point to attend games at Lambeau Field twice a year, passionately cheering on his team with the iconic chant of "Go Pack Go!" And despite any rivalry, his stance remains firm: the Bears still "Suck!"

Paul Schaefer – 25 years

Paul's upbringing in Huntington Beach, California shaped his early years against the backdrop of a quaint surf town that has since burgeoned into a bustling hub. His affinity for golf sprouted at the Meadowlark Golf Club when he was merely 12 years old.

Transitioning into his professional realm, Paul found himself at the heart of Prairie Isle Golf Club in Prairie Grove, Illinois, where he played an integral role in its establishment and evolution over an impressive span of 31 years. Nestled on the grounds of an erstwhile gravel pit, Prairie Isle stands as a testament to Paul's unwavering commitment and expertise in golf course management.

Outside of his professional obligations, Paul relishes the opportunity to engage in his passion for golf, gracing the fairways 2-3 times a week.

Paul's illustrious 46-year career saw him deeply involved in the growth and development of four distinguished golf courses across the McHenry County area in Illinois: Craig Woods Golf Club, Canterbury Golf Course, Bull Valley Golf Club, and Prairie Isle Golf Club. Each project underscored his dedication to crafting and maintaining exceptional golfing experiences for enthusiasts in the region.

His active participation in various local associations affiliated with the Golf Course Superintendents Association of America (GCSAA), including the WGCSA, MAGCS, and NWIGCSA, has been instrumental in fostering enduring friendships and crafting cherished memories. The shared camaraderie and mutual passion for the profession have enriched Paul's career journey, leaving an indelible imprint on his tenure in turf management.

From one West Bend CC superintendent to another, Bruce Worzella accepts his recognition plaque from Brian Bonlender.

50 years

Bruce Worzella – 50 years

Bruce embarked on his career journey at the tender age of 13, initiating his golf course experience by collecting range balls at the Ridges Golf Club in Wisconsin Rapids. Progressing swiftly, Jeff Bottensek entrusted him with diverse responsibilities related to golf course maintenance at the age of 16. Post high school graduation, Bruce secured a full-time role at Bulls Eye Country Club in 1969. By 1974, he embraced the co-superintendent position alongside Cliff Brandl. Driven to further his expertise, Bruce enrolled at Penn State University in 1976, earning a two-year degree in Golf Course Management.

In 1979, Bruce seized the opportunity to become the golf course superintendent at West Bend Country Club, a position he held until his retirement in 2014. Throughout his extensive career, he encountered numerous challenges and triumphs, but it was the camaraderie with fellow turf managers, sales representatives, and golfers that proved to be the most gratifying aspect. Bruce's involvement in various professional associations, including local monthly meetings, GCSAA conferences, and leadership roles such as past president of WGCSA, enriched his career profoundly. His service on the board of the Wee One Foundation stands as a testament to his commitment to giving back to the turf community.

Bruce acknowledges that none of his achievements would have been possible without the unwavering support of his wife Mary and their three daughters. They provided steadfast encouragement through the long hours and challenges of his profession, reminding him that there is life beyond the golf course. Reflecting on his journey, Bruce is confident that choosing a career in turf management was the right decision for him, shaping his life both professionally and personally.

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Continued from page 16

Roger Bell – 50years

Roger, a Middleton native, embarked on his journey in turf management at UW-Madison, where he graduated with distinction. It was during his time at the university that he had the privilege of working under the tutelage of Monroe Miller, a figure who profoundly influenced his career. With a passion for the meticulous care of golf courses, Roger became a Certified Golf Course Superintendent, dedicating his skills to institutions such as North Shore Golf Club in Menasha and Peninsula Golf Course in Door County.

Retirement has found Roger nestled in the tranquility of his cabin on Surprise Lake in the Northwoods for nearly two decades. Yet, his legacy in turfgrass management continues through his son, Jason, who has followed in his father's footsteps, currently serving as a Golf Course Superintendent at Mascoutin Golf Course and a member of the WGCSA.

Roger's impact extends beyond his professional roles; he has been an active contributor to the turfgrass community. As a past President of the WGCSA and a charter member of the WI Turfgrass Association, he has played integral roles in shaping the industry. His dedication is further evidenced by his involvement in advisory boards, including his service during the inception of the golf course at UW-Madison.

For Roger, turfgrass management is not merely a profession; it's been a defining aspect of his life—a journey marked by dedication, mentorship, and a lasting legacy of excellence.

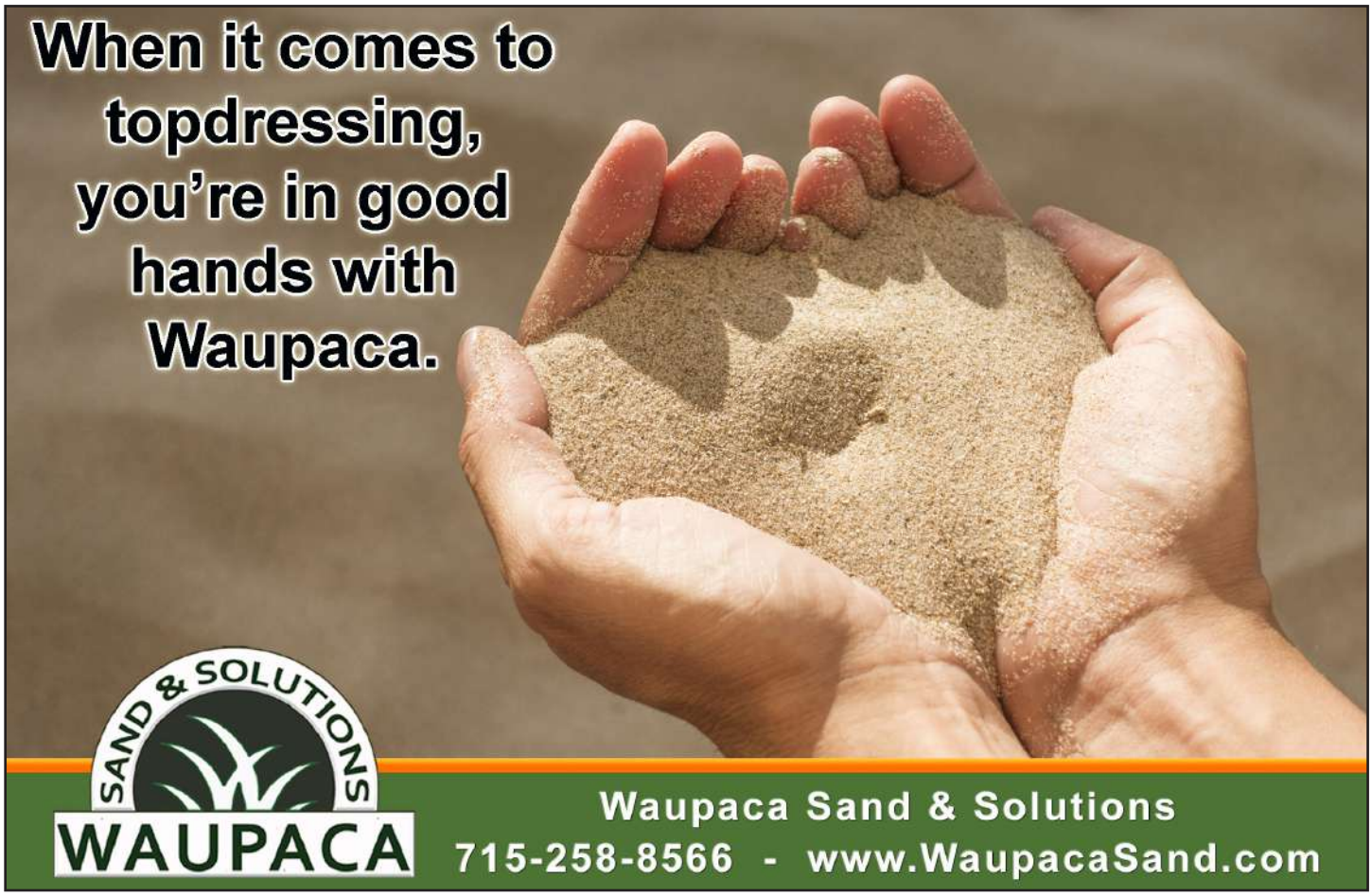
Bob Belfield – 50 years

Bob, a native of Brown Deer, Wisconsin, embarked on his journey in turf management at the young age of fifteen, when he began working on the grounds of Tripoli Country Club. Recognizing his passion for the field, Bob pursued further education at Stockbridge School of Agriculture, where he earned an associate degree in golf turf management.

Bob's career took off with his first superintendent position at Tumblebrook Country Club in Pewaukee, now known as Western Lakes. Over the course of seven years, he honed his skills and expertise before accepting a pivotal role at Kettle Hills Golf Course in Richfield. At Kettle Hills, Bob played a significant part in the construction of the 45-hole golf course and remained dedicated to its maintenance for twenty-two years.

Currently, Bob enjoys a part-time, seasonal position at TLC Landscaping, where he applies his knowledge in pesticide applications. Beyond his professional endeavors, Bob finds joy in riding his motorcycle, playing golf, and spending leisurely days at his lake cottage.

Remaining an active member of organizations such as GCSAA (Golf Course Superintendents Association of America) and WGCSA (Wisconsin Golf Course Superintendents Association) holds significant value for Bob. It allows him to stay informed about pesticide regulations, industry updates, and the professional movements of former colleagues and business associates.



For Bob, turf management is not just a career; it is a lifelong passion that has shaped his professional journey and provided him with fulfilling pastimes outside of work.

Robert Gosewehr – 50 years

Robert, a native of Saukville, Wisconsin, grew up immersed in the picturesque landscapes surrounding Hawthorne Hills Golf Course, located just across the road from his family's farm. From its humble beginnings as a nine-hole course to the expansion that included the land where he once harvested hay for the back nine, Robert's connection to the course runs deep.

His journey into the world of turf management began as a member of the ground crew during summers while attending college. This dedication continued for six years until his graduation. Following his studies, Robert found himself at the helm of preparing Mee-Kwon Park Golf Course for its grand opening, a role he embraced for an impressive 35 years before retiring.

Transitioning into retirement did not slow Robert down; he redirected his energy towards new passions and pursuits. Joining the local historical society allowed him to indulge in his love for old machinery, often demonstrating their workings during tours. Additionally, he dedicated two decades to community theater, managing lighting until he recognized the need to prioritize safety with advancing age.

As a member of the Wisconsin Golf Course Superintendents Association, Robert found camaraderie and valuable networking opportunities with fellow superintendents across the state. Monthly meetings provided a welcome respite from the demands of the course, while visits to other courses sparked inspiration and innovation for his own.

Beyond his professional achievements, Robert cherishes his family life. With 50 years of marriage under his belt, six daughters, and fourteen grandchildren, his home is always filled with love and laughter, as the grandchildren frequently visit, creating cherished memories for generations to come.

Congratulations to Bob Gosewehr on a incredible 50 years of WGCSA membership!

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DARIN HABENICHT

By: Ben LaBarre and Josh LePine

As WGCSA Board members, we want to thank everyone who participated in the Membership survey. The information and feedback obtained was invaluable. The requests for more member spotlight stories inspired us to start this column. We hope to randomly highlight a few members each edition from all geographic areas, facility types and membership classifications. It may take us 20 years to get to everyone in the directory but please be ready for that phone to ring and be prepared to share stories, photos and information about YOU!

Name: *Darin Habenicht*

Company Position: *President*

Years as WGCSA member: *1 Years*

Membership Classification: *Affiliate Member*

Brief BIO: *I'm a 3rd generation sod producer. I received a bachelor of science degree in Jewelry/Painting from Bradley University 1990. I then proceeded to get a bachelor of science degree in Agronomy specializing in turfgrass from the University of Illinois – Champaign in 1992. I married my current (and last) wife, Kathryn, on 12/31/2003. We have 7 children between us ranging in age from 32 down to 10 (4 girls & 3 boys). Grandkids just started to show up last year.*

How did you get started in the turfgrass industry? I was born into it. I started working for my father (Dale) in 1981. Fred Ehrich (the "E" in H & E) and one of his sons, Alfred, worked part time for Illinois Turf Company prior to WW II. Illinois Turf went out of business because they could not find help during the war. In the winter of 1946, Fred approached his son-in-law Carl Habenicht, the "H" in H & E and my grandfather, to start up a sod farm. In 1947, they planted 15 acres of common bluegrass and went to Westmoreland Country Club in Wilmette, Illinois where they picked up some C-15 bentgrass sprigs and planted 1 acres of C-15 vegetatively. From these very modest roots, H & E Sod Nursery was born.

What is the most rewarding part of your career? Getting to see my children get involved in this industry that I love. Currently family members working include Dale Habenicht (86, owner), my better half Kate (29+, AR/AP), Tyler (27, shop/harvesting), Emily (26, Dispatching/Sales Orders), Ben (son-in-law, shop/harvesting *Keeping Emily HAPPPY*), Riley (13, mowing crew). Sky (too young to work but is chomping on the bit to start)

What would you consider to be your greatest career challenge? Labor especially truck drivers—it's even worse post- COVID

Which three adjectives describes you the best? Passionate – Driven – Sarcastic

Tell us about your family. I am the youngest of 3 children. I'm on my second marriage (this will be my last or she'll kill me, lol) We have every type of child that is currently available.

- **His:** Hailey: girl, 32, married, twin grand babies both boys & boy, Tyler: 27 works in the shop & harvests crew
- **Her:** Ashley: girl, 29, Emily: 26, Face of the company, she is my sales order taker/dispatching. Her husband Ben also works for me in the shop and in production.

- **Our:** Riley: 13, just started working this past season mowing our Bentgrass fields.
- **Rent-to-own:** Dash 14 & Sky 10 (he can't wait to be big enough to drive the tractors) I'm hoping the adoption will be complete by the time this is published. We also foster, and I jokingly refer to them as our short-term lease kids because their goal is to go back home or become independent.

Any pets? We are down to 3 dogs and 6 cats, and rabbit. You don't want to know how many animals left with Emily & Ben when they finally moved out.

What drives/motivates you every day? To produce the best grass for my customers.

Who do you admire? My father & Grandpa Carl who started this business.

Who is the person in history you'd most like to meet? Frank Zappa

What's a fun fact or two that people don't know about you? I suck at golf, and if you seen me play, you know. I went to college for 7 ½ years, & I love to scuba dive.

What do you do in your spare time, favorite hobbies? Photography / Hiking / Downhill Skiing

If you could go anywhere in the world on vacation, where would you go? Japan

What is one thing you would like to learn/accomplish someday? To see just a fraction of the images I have learned about during 8 semesters of art history in person.

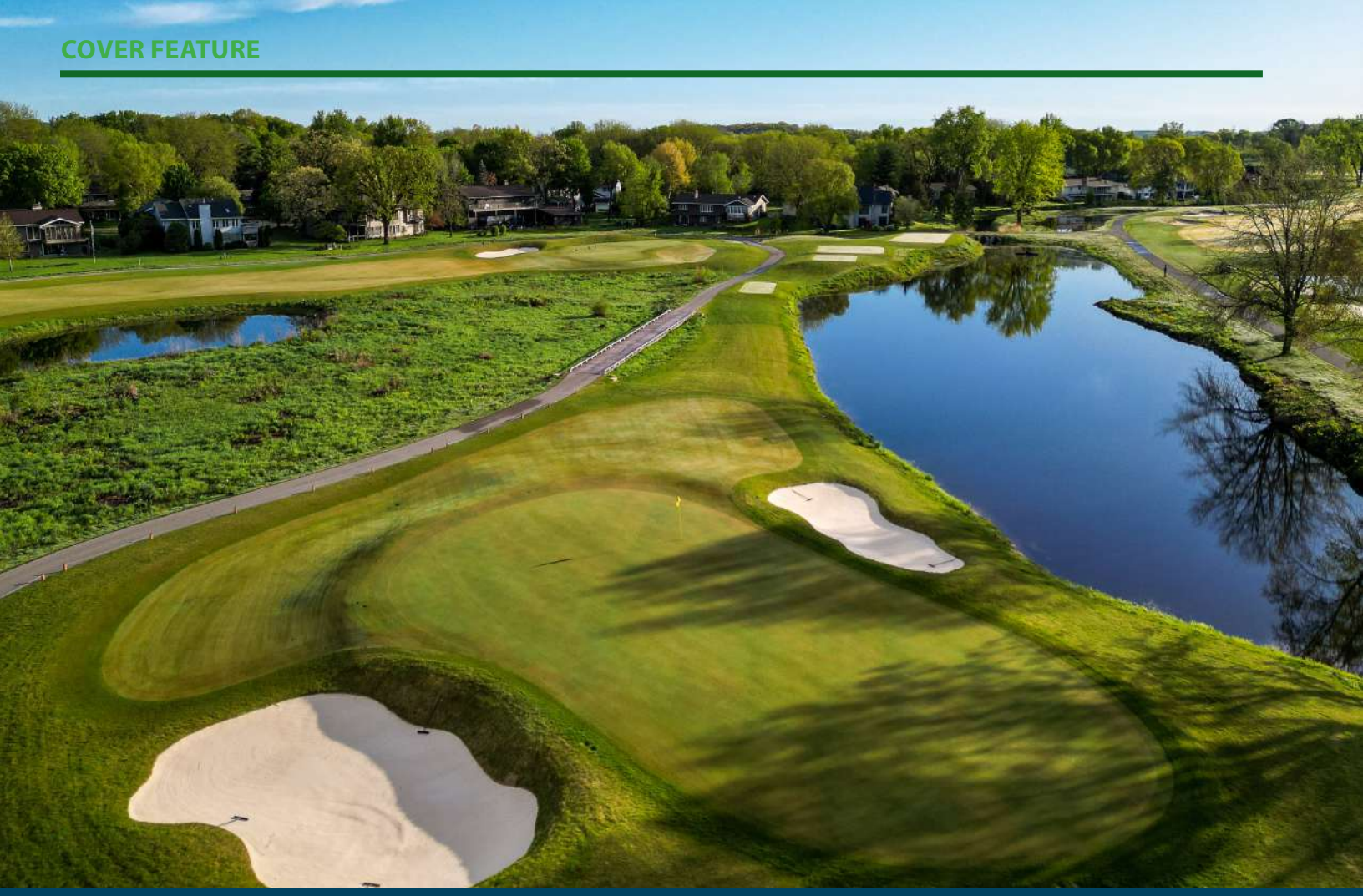
What is your favorite turf management related tool or technique? Nitrogen--homeowners love a dark green grass

Favorites:
TV Show: Dexter
Movie: Heavy Metal
Food: Sushi
Sports Teams: Da Bears & Blackhawks

Do you golf? Handicap? Best shot or golf story? I play, but not very well Handicap? 36 (I'm left-handed & and the only consistent thing about my golf game is my inconsistency. Best shot or golf story? I holed out of a sand trap for birdie.

Top Bucket List item? The Louvre, Athens, the great pyramids of Giza, the terra cotta army, Machu Picchu, just to name a few.

If you could provide one piece of professional advice, what would it be? Find a profession you love then you really never work because you love what you do.



The green on the par 3 14th at TPC Wisconsin, set at an angle to the tees

TPC WISCONSIN:

Eric Leonard's Crash Course in Course Renovations

By: Paul Seifert, WiscoGolfAddict.com

Even among the many picturesque landscapes of the Madison area, TPC Wisconsin's is unique. Nestled amid the Cherokee Marsh Conservation Park and just south of the Yahara River, the former Cherokee Country Club's land is more reminiscent of South Carolina, Georgia or Alabama than Wisconsin.

Beautiful waterways now dissect the playing surfaces and long views across the property and its clean lines provide a high-end look and feel. Large, well-contoured greens complexes beckon for play while run-offs and newly reshaped, flashed white bunkers hint at a heightened level of challenge to what was already a dramatic golf course. The property looks magnificent and is sure to show well on national television when it begins hosting the American Family Insurance Championship in June 2025.

Just three years ago, Course Superintendent Eric Leonard started a major renovation project - the first of his career. In January 2022 the 17-year superintendent veteran was thrown into the proverbial deep end: a $20 million overhaul of his course's layout, systems and natural environment. This was no typical update but a redevelopment whose results have elevated TPC Wisconsin from a mid-tier private club to a premiere site poised to host top-level tournaments.

The transformation reflects a blend of strategic foresight, environmental stewardship and cross-functional teamwork,

setting a new standard in golf course innovation across the Wisconsin golf community and adding a unique style of golf to its upper echelon of world-class courses.

Leonard joined Cherokee Country Club in 2006, assuming the role of Superintendent a year later. With an educational foundation in horticulture focused on turfgrass management from Kishwaukee College and practical experience from his previous tenure at Hawk's Landing in Verona, his skill set has grown as he's dealt with persistent issues caring for a transitional property. During no time, though, has his professional acumen grown more rapidly than during the past several years while helping a world-class project team execute on their sweeping renovation project.

Originally opened in 1962 and designed by David Gill (who also designed the back nine at West Bend Country Club, North Shore in Mequon and Meadowbrook in Racine among others), the golf course at Cherokee was always known for its solid and challenging layout, fast greens and quality private club conditions. The years had taken their toll on its terrain, though, and Leonard and his team had been embattled in fights against non-native species like reed canary grass and phragmites, cattails and Chinese wisteria.

Like many Wisconsin golf properties, its layout was never intended to be tree-lined, yet it had experienced tremendous grow-in over the decades. Large willows and dying ash specimens encroached on playing corridors leading to

The dramatic finish to the par 5 2nd at TPC Wisconsin

target golf, shade, roots and challenging turf conditions. The course faced problems with waterlogging, too, due to its proximity to the water table and a peaty, fluctuating soil composition. Furthermore, a lack of air movement caused by the trees and excessive water led to bad turf pressure and troubling microenvironments across the property.

Considering its breadth and severity of foundational issues, a simple renovation at Cherokee Country Club would probably not have led to a long-lived, successful outcome. Owner and Wisconsin Golf Hall of Fame member Dennis Tiziani recognized that. Along with his son-in-law, Steve Stricker, the team opened lines of communication with PGA Tour Design Services and the TPC Network to transform this challenging marshland course into a vaulted tournament venue.

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Stephen Wenzloff, SVP of PGA Tour Design, worked hand-in-hand with Stricker and Tiziani to radically update the course and improve its functionality at the newly rebranded TPC Wisconsin. A lot was needed for Eric Leonard and his team to successfully manage it, and Wenzloff knew it. "I started out right away going around with Steve (Wenzloff) and talking about 'How can you maintain this area?' We tried to prepare the staff and how we would care for the new course," said Leonard.

TPC Wisconsin Superintendent Eric Leonard at the course's 17th hole

"My staff and the amount of time we'll have to maintain it all goes into the design. That was a great part about Steve - he was very conscientious about how we'd treat the area, how the mowers would turn on it and so on, and we tried to carry that through the whole course."

Hiring high-quality project partners was integral to the project's success, as well, and Tiziani hired great ones in local civil contractor RG Huston for 80 percent of the dirt work, Wadsworth Golf Construction for the fine-tuning and building of greens, bunkers and tees, and Leibold Irrigation for its new state-of-the-art irrigation system.

With the majority of work being outsourced, one of the toughest initial tasks for Leonard was laying off his current staff and working with area courses to find new homes for their talents.

"We hired the right professionals to get the job done instead of doing everything in-house. I worked with other courses' teams across the area to place my people. Josh LePine at Maple Bluff was nice enough to hire some of my staff for three-quarters of a season while we were under construction and then let them come back when I needed them," said Leonard.

"Wadsworth worked on two holes per week starting in August 2022, so we didn't have to ramp up staff quickly afterwards because we were doing incrementally more in a phased approach. It was a lot easier to work on six to eight holes than an entire course," Leonard said. "I got some good help from guys like Neil Radatz at Hawk's Landing to help with the grow-in, too. He and others who have been through multiple new builds and renovations were great resources."

It wasn't just in their work that hiring top-end project partners proved to be valuable, but in the commitment they showed to TPC Wisconsin as a client. "Wadsworth had a really great head foreman, Pedro Carillo, and several months into the project, while driving home to Illinois, he and his son, Angel, were involved in a pretty bad car accident. Thankfully, they are both ok now and have returned to work, but he was out of commission for about six months. In the interim, Matt Lohmann stepped right in to continue the project for half a year. It says a lot about the company that they'd send one of their top guys to handle our project and make sure things were done right."

In lieu of hiring a Construction Superintendent from TPC or Wadsworth, Eric was charged with overseeing the construction process and was surprised at how less stressful it was than he'd expected. "In the end, we hired very quality

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The 8th green at TPC Wisconsin basking in early-morning sunlight

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The drivable par 4 16th - finally a hole set up right-to-left for Stricker's ball flight!

companies so my job was to oversee it all and ensure everything was going accordingly, but not to be overbearing on the project. 'Here's the plan, now let's make it happen.'"

Cherokee's issues were never about design, but about the substructure it was built on. To combat those issues, 600-650 total trees were removed, all waterways (30 acres of wetlands) were dredged or dug deep to improve water quality and aquatic wildlife, the entire property was lifted two to four feet, and a 12" sand cap was installed all the way around the property to help with drainage and provide a more stable surface to manicure. Leibold installed a Toro Lynx 2-Wire irrigation system, HDPE piping and a Watertronics pump station. "We went from 350 irrigation heads to 1,350," Leonard said.

"The layout was already really good," Leonard said, "and had especially solid par threes. We tweaked everything, shifting greens left or right and lifting it to create more structure and flow. The layout hasn't changed much so we built on what we had, created better bunkering, better greens complexes and drainage capabilities while accentuating the natural environment versus letting it hide behind overgrowth."

"The number one most important thing to me when caring for a golf course is playability," Leonard continued. "Drainage is more important to me than anything else because I dealt with so much flooding. We also put in a wall-to-wall irrigation system, so the two go hand-in-hand. The ability of the property to drain and then my ability to water every piece of it is, to me, the best-case scenario that puts playability at the forefront. I always want this course to be as close to firm tournament conditions as we can get it."

In addition to developing a course for peak operations, there was a dichotomy to the design process that it should be both enjoyable for club members while presenting a world-class challenge for Champions Tour professionals.

"The process began with Wenzloff putting together an overall design and then sitting down with Tiziani and Stricker," said Leonard. "They went over the bunker locations, bunker designs, greens complexes and tee angles. It was very interesting to watch the chess match of Stricker explaining how he attacks a golf course and then how the architect (Wenzloff) designed it to combat his approach."

To help with this, a fifth set of tees were added to cater to a greater variety of handicaps. The course's overall yardage, meanwhile, remained remarkably similar to its previous total. In fact, it now plays 40 yards shorter.

The actual layout was only altered slightly with the 10th, 15th and first holes changing locations. The first is now the old tenth but shifted over. The old 15th is now played backwards as the 10th hole and was converted to a 472-yard par four, and the new 15th is the former first hole played opposite. These "slight" changes led to a reduction of par from 72 to 71.

One of the other most significant changes made was on the 16th, which was moved up at the recommendation of co-designer Steve Stricker, who the team began calling "Steve Ross" because of his affinity for Donald Ross's golden age architecture.

Playing the roles of ambassador, host sponsor and 2023 champion of the AmFam Championship, Stricker was triple-

The long, challenging finish on the par 4 18th at TPC Wisconsin

invested in the redesign. The tournament is one of the most well-attended stops on the PGA Tour Champions schedule since its 2016 inception at University Ridge.

"Steve was very involved in the renovation, especially around the greens complexes," Leonard told me. "That's his staple, his chipping and putting, so he provided a lot of input around the greens. They are much more undulated now, and there are several with quite drastic differences. There aren't two-tiered greens, but definitely transition slopes - they're sneaky tricky like with tall back sections or elevated entrances."

"Stricker plays right-to-left, always drawing the golf ball," said Leonard. "We didn't change the layout of the golf course much and the majority of holes out here were already left-to-right. When it came to 16, Steve wanted a drivable par four. So, we shrunk it down to 308 yards. It was originally left-to-right, and Steve showed up with the architect and said, 'No, we need one hole out here that's right-to-left.' He's now got his 305-yard par four that sets up nicely for a draw coming down the stretch."

When I photographed the course in May 2024, two areas that shined were the greens and bunkers. The property's greens have always been large in size, averaging between 7,500-9,500 square feet. They were "big, round pancakes" before, as Leonard called them. "Now, there aren't two greens alike. There's undulation in them now, but it's more subtle which is trickier because you need to study them a bit to figure them out."

While the bunkers were flat before, they now have great shape and are flashed slightly so to be seen. All tee boxes have been squared off with a clean, traditional aesthetic and all greens have been designed around tournament pin locations and proper slope to meet PGA Tournament standards. Tournament tees were made with v-drain and USGA greens mix. Viewing locations were created for grandstands and cart paths were made wider and stronger for tournament preparation. Signature 900 bunker sand from Ohio was installed for a glorious, bright white visual appearance. "Dennis Tiziani said from the beginning of the project that we were building a tournament golf course," said Leonard, and the results prove it.

The transformation of TPC Wisconsin under Eric Leonard's guidance encapsulates more than just a physical renovation. It represents a legacy of meticulous stewardship and a renewed commitment to the golf community. As the course stands ready to host the Champions Tour next spring Leonard says "the general feedback from players so far has been consistent that the course is tough, but fair. We like that response. We don't want it to be unplayable but we wanted it to be a challenge. I believe the design was a great success."

To me, the project stands as a testament to what can be achieved through collaboration, innovation and a deep respect for the game of golf, and I cannot wait to watch Stricker and many of the world's other best players attack it next season.

INFLUENCE OF TOPDRESSING ON THE FIRMNESS & SOIL ORGANIC MATTER CONTENT OF BENTGRASS PUTTING GREENS

By: Doug Soldat, Ph.D. and Travis Miller, M.S., Department of Soil Science, University of Wisconsin-Madison

Topdressing is one of the most important management practices for producing high quality playing surfaces. While inputs like water, fertilizer, pesticides, and growth regulators are increasingly being applied using data driven approaches (i.e. irrigation by soil moisture, fertilizer by growth potential, fungicides by disease prediction models, and PGRs by growing degree days), topdressing typically follows a calendar-based approach. In addition, many turfgrass managers are unable to easily estimate annual topdressing rates in quantitative terms (cubic feet per thousand), and typically talk about topdressing in terms of frequency alone.

One of the primary purposes of topdressing is to dilute organic matter, and organic matter production can be predicted. Therefore, it is likely that topdressing recommendations can be driven by things correlated with organic matter production like weather/climate and plant growth.

Annual topdressing recommendations are currently based on generalizations, ranges, or survey data. In 2003, O'Brien and Hartwiger wrote that 40-50 ft3/1000 ft2 of topdressing per year is recommended to keep soil organic matter below 3-4%. Schmid and Gaussion (2014) reported that greens having <3.3% organic matter applied at least 20 ft3 of sand/1000 ft2. Most recently, Whitlark and Thompson (2019) suggest applying 25 – 35 ft3/1000 ft2 for a golf course with a growing season of 30 weeks (approximately 1 ft3/1000 ft/growing week). PACE Turf published a sand topdressing calculator that is based on turfgrass growth potential. Using 4 ft3/1000 ft2 per month as the maximum sand application amount, the PACE calculator estimates that 18.1 ft3 should be applied annually based on the climate of Madison. With more turf managers actually measuring clipping production each year (and basing fertilization and PGR decisions on that data) it follows that clipping volume may also be useful for guiding sand topdressing amounts or intervals.

Identifying the proper annual topdressing is important for controlling the accumulation of soil organic matter, but on a small temporal interval, topdressing decisions can affect putting green performance and playability. Putting green firmness is one of the most important putting green performance characteristics. Unfortunately, the factors affecting firmness remain poorly characterized. The USGA developed and utilizes the TruFirm device for quantifying putting green firmness, the R&A uses the Clegg Impact Soil Tester, and the PGA Tour measures the depth of the depression created by a steel ball dropped from a height of 6 feet. The USGA also just released the GS3 – a multifunctional tool that also can be used for firmness measurements. Clearly, the major golf organizations value the surface firmness of putting greens. Yet the research into the factors affecting surface firmness is remarkably thin. The majority of the information on putting green firmness exists in non-peer reviewed publications. A search for "putting green" AND "firmness" on the Turfgrass Information File turned up only 16 hits in the refereed literature, nearly 10 times fewer than a similar search turns up for green speed.

Firm surfaces are desirable for tournament conditions, but also for resistance to and recovery from ball marks (Nemitz et al., 2008) which can influence annual bluegrass encroachment. The greatest amount of work has been done on the relationship between soil moisture and surface firmness. Bauer et al (2017) studied the impact of 13 wetting agents on firmness. In the first year of study, the wetting agents did not influence firmness, while in the second year a handful of the 13 wetting agents tested resulted in significantly firmer surfaces on approximately half of the rating dates. In that study, significant differences in soil moisture content among the treatments were not observed. Linde et al. (2011) explored the relationship between soil moisture and firmness measurements across 53 golf courses and reported a significant inverse relationship, but noted that factors such

as turf variety, verdure, thatch, mat, soil texture, and soil bulk density impacted putting green firmness in addition to soil moisture content. Researchers at the University of Arkansas studied the relationship between firmness and soil properties (soil moisture, bulk density, and organic matter) and noted that the TruFirm was well correlated with soil bulk density (r2=0.73), while the Clegg Impact Soil Tester was well correlated with soil moisture (r2=0.78) (O'Brien et al. 2018). Cultivation operations influence surface firmness. Schmid et al. (2013) reported that vertical cutting and core aeration increased the firmness (measured via CIST) of a velvet bentgrass fairway long-term. From the reviewed literature, it is clear that firmness is somewhat related to soil water content, soil bulk density, and soil organic matter. For the past two seasons we've been studying how topdressing rate, sand application frequency, and particle size decisions affect surface firmness. We are also looking at the relationships between the various tools that measure surface firmness.

Materials and Methods: Three annual sand topdressing rates were evaluated and each was applied at either weekly or monthly intervals. In addition, two sand particles sizes were tested (properties in Table 1). The three topdressing rate methods include what we call the USGA method, the PACE Turf method, and the clipping volume method. The USGA method is based on the Whitlark and Thompson (2019) article that recommends 25-35 ft3 per 1000 ft2 for a golf course with a 30-week growing season. The bentgrass growing season in Wisconsin is approximately 26 weeks, 87% of Whitlark and Thompson's example, so for this study we applied 26 ft3/1000 ft2 of sand for the USGA method. The PACE Turf Method relies on the use of the PACE Turf Growth Potential Model, which estimates cool-season grass growth based on weather or climate inputs. Using climate data from Madison, WI, the PACE Turf Method recommends 14 ft3/1000 ft2 of sand, substantially less than the USGA method. Finally, many turf managers are measuring clipping volume from their putting greens, while there is little research data to suggest how clipping volume could be used to guide topdressing, Dr. Micah Woods has suggested applying 1 mm (3.3 ft3/1000 ft2) of sand for each L/m2 of fresh clippings collected; this method is referred to as the clipping volume method and will vary depending on the grass growth rate. All treatments receive one annual hollow-tine core cultivation event in September where ~8 ft3/1000 ft2 of sand is used to fill the holes left by the tines.

Table 1. Particle size distribution of the two sands used.

Sand	Coefficient of Uniformity	V. Coarse	Coarse	Medium	Fine	V. Fine
			%			
Standard	2.0	0.4	31.5	56.6	9.1	1.5
Finer	2.5	0.1	22.7	42.9	26.8	7.3

We measured putting green surface firmness weekly using four devices:

1) Clegg Impact Soil Tester Hammer (2.25 kg hammer, flat bottom), 23 Newtons force

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2) Clegg Impact Soil Test Hammer (0.5 kg hammer, round bottom), 5 Newtons force
3) Spectrum TruFirm, 5 Newtons force
4) Precision USA Putting Green Firmness Meter (aka PGA method), 11 Newtons force

In addition to firmness measurements, we measured soil moisture, normalized difference vegetation index (NDVI), soil surface strength, and visual turfgrass quality weekly during the growing season. Once a month, we measured ball roll distance and collected clippings from the plots. Surface organic matter was measured using loss on ignition prior to the trial initiation using a 2-inch diameter probe with five subsamples per plot. The sampling depths were 0-1, 1-2, 2-3, 3-4, and 4-5 inches, and the verdure and living roots were included in the sample. These measurements were repeated after the final topdressing event of the season. At this same time, verdure biomass and shoot density were quantified using three, 2-inch diameter subsamples from each plot.

Results: These results reflect the second year in a three-year study. We found that annual sand volume had the largest impact on overall putting green performance compared to the other main effects of application frequency (weekly vs monthly) and sand particle size (standard vs finer). When the annual volume of sand was increased, visual quality increased, surface firmness decreased, and surface organic matter decreased (Table 2). The decrease in organic matter in response to increasing sand application was expected, but we were surprised to see that surface firmness was decreased with increasing topdressing rate despite lower surface organic matter. Also surprising was the finer sand (with a lower CU) resulted in a less firm surface (6.13 g for the standard sand vs 6.04 g for the finer sand). We expected the increased coefficient of uniformity from the finer sand size would lead to an increase in surface firmness. The frequency of sand application (weekly vs. monthly) had no impact on any of our measurements.

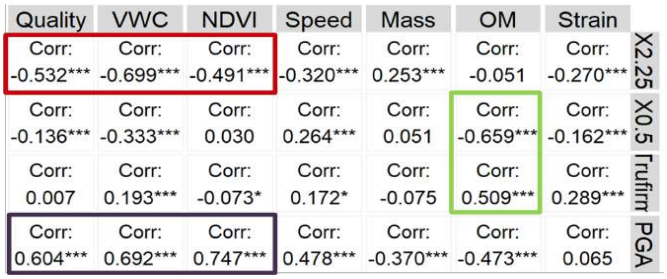

Figure 1: Relationships between the firmness measurement devices and putting green performance criteria. Highlighted in red is the relationship between Clegg 2.25 kg device and turfgrass quality, volumetric water content (VWC) and n NDVI. Highlighted in purple is the relationship between PGA method and quality, VWC and NDVI. Highlighted in green is the relationship between Clegg 0.5 kg and TruFirm and surface organic matter content. Values closer to 1 or -1 indicate stronger relationships, close to 0 indicates no relationship.

We observed interesting differences among the four firmness devices tested and the putting green performance criteria. The Clegg 2.25 kg had the highest impact force (23 Newtons), followed by the PGA method (11 Newtons) and the Clegg 0.5 kg and Spectrum TruFirm (both 5 Newtons). The two devices with the greatest force had stronger correlations with visual quality, NDVI, and soil moisture when compared to the two lower force devices which were both poorly correlated with visual turfgrass quality, NDVI (essentially turfgrass color), and soil moisture. However, the opposite was true for surface organic matter, and the lower force devices were more strongly correlated to this property compared to the two higher force devices. The PGA method was intermediate in force and had a better correlation with surface organic matter than the Clegg 2.25 kg. This result suggests that important differences exist among the most popular surface firmness devices.

While this is what we've learned in the first two years of the study, we are excited to see what we can learn in year 3. New this year will be the evaluation of the USGA's new GS3 device – which can estimate green speed, smoothness, and firmness all in one small package. ***Consider stopping by the Wisconsin Turfgrass Field Day on Tuesday, August 6th to learn more and see the study for yourself!***

Table 2. Turfgrass quality, surface firmness, and surface organic matter as affected by annual topdressing amount. Means within columns followed by a different letter are statistically significantly different at the 0.05 level.

Annual Sand Rate	Turfgrass Visual Quality	Surface Firmness with Clegg 2.25	Surface Organic Matter, 0-1 inch
$ft^3/1000\ ft^2$	1-9, 9=best	g (greater is firmer)	%
26	5.95 A	6.08 B	4.1 B
18	5.70 B	6.01 B	5.4 AB
14	5.61 B	6.18 A	5.9 A

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ACADEMIC SUPPORT BEYOND AGRONOMICS

By: Paul Koch, PhD, Department of Plant Pathology, University of Wisconsin – Madison

Many of you are familiar with the various types of support that turfgrass professors such as Professor Soldat and I provide to the turfgrass industry. One type of support is conducting applied research to assist superintendents in producing optimal playing conditions or better manage a problematic disease. Another type of support is through our extension programs where we respond to specific problems at your course (i.e. a disease outbreak, a nutrient deficiency) and develop specific plans for recovery. The third primary type support we often provide is to teach and educate future turfgrass managers through our 4-year and Turfgrass Apprenticeship Programs.

However, another less visible type of support that we often provide is guidance, education, and response to governmental regulations that impact the turfgrass industry. These regulations can come from local municipalities, state government, and the federal government and impact what pesticides can be used, what types and how much fertilizers can be applied to turf, and in certain cases, even what kind of grasses can be planted. Support in response to regulations can come in many forms. For example, I have provided support in the form of presentations and research reports to smaller towns like Stoughton and large cities like Minneapolis (Figure 1) detailing our research on how pesticide risk can be reduced through precision management strategies and product selection. These are typically done to support turfgrass managers in response to proposed pesticide bans on publicly owned turfgrass spaces.

	2018	2019	2020	Percent Reduction from 2018 to 2020	Percent Reduction from 2019 to 2020
Lbs AI					
Greens	178.35	178.57	25.98	85.43	85.45
Tees	28.56	23.48	13.50	52.72	42.49
Fairways	352.21	199.1	64.18	81.78	67.77
Hazard Quotient					
Greens	39822.59	37912.08	7802.30	80.40	79.42
Tees	14395.66	9840.94	3500.46	75.68	64.43
Fairways	19473.53	12605.09	2629.30	86.50	79.14
Environmental Impact Quotient (per acre)					
Greens	1494.73	1497.6	170.26	88.61	88.63
Tees	263.85	233.61	121.55	53.93	47.97
Fairways	531.83	252.58	88.02	83.45	65.15
Environmental Impact Quotient Acres					
Greens	5978.91	5990.39	681.05	88.61	88.63
Tees	791.55	700.84	364.65	53.93	47.97
Fairways	11168.38	5304.14	1848.34	83.45	65.15

Figure 1. A table from a report produced for the City of Minneapolis Parks Board summarizing the results of a pesticide risk reduction study at Theodore Wirth Golf Course in Minneapolis, MN in 2020. This report was produced in response to a proposed pesticide ban on all City of Minneapolis golf courses.

More formal support includes serving on boards that advise industry associations and/or governmental agencies. In Wisconsin, I serve on the Species Assessment Group that advises the Wisconsin Department of Natural Resources on additions to their invasive species and noxious weed lists. At first glance, this seems like an odd group for me to serve on, but in 2019, there was a proposal to add tall fescue to the list of invasive species in Wisconsin and a turfgrass expert was needed to advise the group on how tall fescue is used, what it's invasive properties might be, and what the consequences would be for the state were tall fescue to be listed as invasive or noxious. Fortunately, the group agreed that tall fescue was not an invasive

or noxious threat to Wisconsin's natural landscapes and the proposal to add tall fescue to these lists was quickly and unanimously scrapped. But without a turfgrass expert on the panel, it's not clear what the outcome might have been.

Much of my support at the federal level has been as an Environmental Advisor for the Golf Course Superintendents Association of America. In this role, I work closely with GCSAA Director of Government Affairs, Chava McKeel, to advise and, when appropriate, coordinate the response of turfgrass academics to governmental regulations based on the latest research. Two particular items this past winter and fall were especially concerning and required a significant academic response. First, the EPA proposed several pilots around the country to protect certain endangered species in response to a flood of lawsuits from environmental groups suing the EPA under the Endangered Species Act. One of these pilots was slated to be held in Milwaukee County to protect the habitat of the rusty patched bumble bee. Many golf courses in and around Milwaukee were likely to be impacted, and the impacts would have been significant. Drastic reductions in pesticide usage in these areas and approval required from other state or local officials before pesticides could be applied were two of the more onerous restrictions being proposed. Working with both the WGCSA and the GCSAA, I wrote a letter to the EPA detailing the difficulties in enforcing the proposed regulations and the negative impacts the pilot would have on the local golf economy, including several municipally owned courses. While I have not heard the final response from the EPA, it appears that any pilot program will be dramatically altered, if any is imposed at all.

The other major regulatory response I've conducted this winter is one many of you are familiar with--the EPA's proposed restrictions on chlorothalonil. I've written support letters to the EPA for many fungicides over the years, detailing their importance for resistance management and the economic health of many golf courses. However, none were as potentially impactful as the restrictions on chlorothalonil, and none of them garnered the response from both academia and industry that chlorothalonil did. Many of you are familiar with the past research I have done encouraging alternatives to chlorothalonil be used when possible because of the relatively high toxicological risk ratings associated with chrolothalonil usage. However, chlorothalonil does still have important uses and I feel that it remains an important tool for golf course superintendents to use in controlling algae, managing for resistance, and aiding in control of particular

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diseases. The EPA restrictions would have in many cases resulted in a near total chlorothalonil ban and would have also been very difficult to enforce. Highly impactful regulations that aren't clearly defined and are difficult to enforce are not how a product like chlorothalonil should be regulated, and I led the development of a letter signed by 18 other turf pathologists that voiced our concerns as academics. Combined with the hundreds of letters submitted by golf course superintendents around the country I'm optimistic that many of the original proposed restrictions will be altered to allow more flexibility while still protecting the environment.

One of the great parts about being a professor is that no two days are alike, much like the life of a superintendent. One day I'm giving a presentation to superintendents on disease control or the turfgrass microbiome, the next I'm teaching in the Turfgrass Apprenticeship Program to a great group of students that will be superintendents soon, and the next I'm analyzing a dataset trying to determine which treatments are important for superintendents to know about. Even though responding to various proposed regulations isn't the most visible thing I do to most superintendents, they are one of the most impactful. Combining the applied experience from superintendents with the science from turf professors makes a pretty potent combination, and one that I'm proud to be involved.

Melanie Biscoe
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Pesticide Re-Evaluation Division (7508P)
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EPA–HQ–OPP–2011–0840

Dear Ms Biscoe-
The 9 authors and 11 additional reviewers and supporters of this letter are all turfgrass pathologists and extension specialists at land-grant universities from around the country who work closely with turfgrass managers to provide effective disease management. We are providing public comment on the Proposed Interim Decision (PID) for the fungicide chlorothalonil (docket EPA-HQ-OPP-2011-0840) based on our extensive experience in turfgrass disease management and concern over the proposed mitigation measures.

There are over 13,000 golf courses in the United States of America, which are used by roughly 37 million people each year and provide an estimated worth of $84 billion. Golf course superintendents and staff that apply fungicides in the US are pesticide applicators certified through testing by their respective state department of agriculture in compliance with state and federal laws. These applicators also receive annual training to maintain their licensing. A major component of annual pesticide applicator training in the turfgrass and ornamental category is mitigating environmental contamination of pesticides like chlorothalonil.

Chlorothalonil is an essential tool for disease management on golf courses across the country because of its broad spectrum of activity and suppression of fungicide resistant fungal populations. Pathogen ranges are in flux and severity of many diseases is increasing in response to the rapid onset of climate change. Golf course superintendents are scrambling to react to these changing conditions and removing or greatly reducing the use of chlorothalonil would leave golf course superintendents vulnerable to a range of destructive pathogens that can result in severe damage with significant economic consequences. We are particularly concerned about the dramatic mitigation measures proposed for 'vulnerable soils' and large buffer zones around waterways and the resultant restriction of chlorothalonil use on the highest value areas of golf course properties. Below we have laid out the primary benefits that chlorothalonil provides as a key tool in disease management on golf courses around the U.S., and we also comment on mitigation measures that we feel would result in acceptable disease suppression while simultaneously reducing the potential for environmental contamination.

Management of Fungicide Resistant Populations
Golf course turfgrass is maintained as a perennial plant system and is subjected to multiple fungal disease pressures throughout the year. Chlorothalonil is unique in its mode of action as a chloronitrile (FRAC Class M5) fungicide. Fungicide resistance and the availability of effective tools is a concern as resistance to site-specific fungicides such as methyl benzimidazole carbamates (FRAC Class 1), demethylation-inhibitors (DMIs, FRAC Class 3), quinone-outside-inhibitors (QoIs, FRAC Class 11), and succinate dehydrogenase-inhibitors (SDHIs, FRAC Class 7) has been documented for several turfgrass pathogens. Chlorothalonil has never had a single documented case of resistance since its original registration in 1966, which makes chlorothalonil a critical rotation and mixture tool to maintain effective disease control and manage resistance throughout the season. The lack of new fungicide chemistries coming to the turfgrass market will only increase the need for effective resistance management strategies, and chlorothalonil usage, in the future.

Figure 2. The first page of the public comment letter that myself and 18 other turf pathologists wrote in response to the EPA's proposed interim decision on chlorothalonil. These letters, combined with superintendent advocacy, are critical to educating the EPA and other federal agencies about the importance of pest management tools for golf course management.

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THE HOCKEMEYER SNOW MOLD PREDICTION MODEL V5.0: THE FOLLOW UP

By: Kurt Hockemeyer, Turfgrass Diagnostic Lab Manager

It's my favorite time of year. It's time to reveal the results of Paul's and my predictions on how much snow mold damage would be present at each of our snow mold research sites. My last article for The Grass Roots had Paul and me reviewing soil temps, air temps, snow depth, and various other things to create our predictions (8 studies at 6 locations). This is the 5th winter season of Paul and me trying to accurately predict snow mold damage. Some of our locations behaved just as predicted, while others surprised us. The results are in and are tabulated at the end of this article. As a reminder, my prediction scale is as follows:

Prediction Scale	Percent Snow Mold in Nontreated	Description
Snow Mold Utopia	75-100	Just about absolute perfect conditions for snow mold infection for a long time. Early snow cover, deep snow, all winter long.
That's a lot of snow mold	50-75	Might have been a short period where snow mold conditions were not ideal resulting in slightly less snow mold infection.
I've had better snow mold	25-50	Decent amount of infection, but Dr. Koch would not tweet a GIF of an excited puppy if he saw a picture of it on Twitter.
"Baby Bear" snow mold	10-25	Just the perfect amount of snow mold. Enough that you feel like your snow mold app was worth it, but not a single sclerotia more.
What's snow mo'u'ld?	0-10	So little snow mold infection you can't even spell it right.

Marquette, MI

Kurt's Prediction: Snow Mold Utopia (75-100% disease in nontreated plots)

Actual Disease: 71.3%-WRONG

It's hard to complain about a snow mold study only getting 71% disease, but I just barely missed this one. Despite my prediction being wrong (and Paul's being correct), the Marquette study was a great study this year. The great snow mold treatments performed well, and weaker treatments didn't do as great (Figure 1). These types of studies allow us to continue to tease out which treatments typically will perform the best on your courses.

Paul's Prediction: That's a lot of snow mold (50-75% disease in the nontreated plots) CORRECT

Figure 1. Plots in Marquette, MI on Mar 18, 2024. There was good separation between good and poor treatments.

Minocqua, WI

Kurt's Prediction: That's a lot of snow mold (50-75% disease in the nontreated plots)

Actual Disease: 20%- WRONG

Northern and Central Wisconsin had very little snowfall for the winter of 2023-2024. According to my manual calculations on NOAA's website, Minocqua had 33 inches of snow fall from October to April compared to an average of 98 inches during that span. The lack of snow cover meant that the soils were not insulated and soil temperatures dipped well below freezing anytime there were frigid temperatures. This results in very little snow mold infection. I'm honestly surprised the study had 20% infection.

Paul's Prediction: I've had better snow mold (25-50% disease in the nontreated plots) WRONG

Wausau, WI

Kurt's Prediction: "Baby bear" snow mold (10-25% disease in the nontreated plots)

Actual Disease: 6.3%- WRONG

Wausau fared slightly better than Minocqua in terms of snowfall deficits. Wausau received almost 38 inches of snow compared to an average of 64 inches. Despite faring slightly better, very little snow mold infection was observed in Wausau (Figure 2). There were two studies in Wausau and both were less than 10% disease. Paul and I missed both points in Wausau.

Paul's Prediction: "Baby bear" snow mold (10-25% disease in the nontreated plots)- WRONG

Figure 2. Spraying nothing in Wausau resulted in great snow mold control!

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Madison, WI

Kurt's Prediction: That's a lot of snow mold (50-75% disease in the nontreated COVERED plots)

Actual Disease: 42.5%- WRONG

Madison also had a below average snowfall year. 43 inches of snow vs 52 inches on average. But, the odd thing for Madison and surrounding areas was that about 23 of those inches came in January alone, and preceded the largest cold snap we had all winter. So, during this cold snap, we had over a foot of snow on the ground. This perfectly timed soil insulation, combined with a very warm December and February resulted in gray snow mold infection with only 3 weeks of snow cover (Figure 3). The textbooks say that gray snow mold needs at least 60 days of snow cover for infection! So, definitely an odd year, but interesting to say the least.

Paul's Prediction: That's a lot of snow mold (50-75% disease in the nontreated COVERED plots)- WRONG

Kurt's Prediction: That's a lot of snow mold (50-75% disease in the nontreated NONCOVERED plots)

Actual Disease: 40% - WRONG

Similar story to the other Madison study. Only 21 days of snow cover resulted in moderate gray snow mold infection.

Figure 3. Gray snow mold infection in Madison with only 3 weeks of snow cover. One interesting fact was that fungicide applications from fall of 2022 were still visible in spring of 2024.

Paul's Prediction: I've had better snow mold (25-50% disease in the nontreated NONCOVERED plots) CORRECT

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Duluth, MN

Kurt's Prediction: "Baby bear" snow mold (10-25% disease in the nontreated plots)

Actual Disease: 16.3%- CORRECT

Like Minocqua, Duluth received about 39 inches of snow compared to an average of 90 inches of snow every winter. Very little soil insulation resulted in low levels of infection.

Paul's Prediction: I've had better snow mold (25-50% disease in the nontreated plots)- WRONG

Brainerd, MN

Kurt's Prediction: What's snow mo'u'ld? (0-10% disease in the nontreated plots)

Actual Disease: 4.3%- CORRECT

Same story as Duluth. Very little snow outside of a few snowy days in March.

Paul's Prediction: What's snow mo'u'ld? (0-10% disease in the nontreated plots) CORRECT

That brings us to the end of our snow mold locations. Let's tally up the score and see who wins between Paul and me.

Kurt: 2 points out of a possible 8

Paul: 3 points out of a possible 8

Oh boy, Paul finally gets his first win in this hotly contested match up. Well, it was bound to happen at some point. I guess I'm not too upset about losing this year. The sting of this major upset is offset by my Purdue Boilermakers making a Final Four for the first time in 44 years and making the championship game for the first time in 55 years. Still missing that national championship though…

Thanks for reading about our snow mold predictions. This year was a particularly brutal year, at least for me. The lack of snow really reduced snow mold infection across pretty much all of our sites except for Madison. In every case where I was wrong, I overestimated the amount of snow mold infection. I guess that makes me an optimist (remember that researchers love disease). Oh well. I'll keep hoping for snow mold for our studies. That's fine by me. I think with the end of this article I can finally stop thinking about snow mold and move on to summer trials. A few of our summer trials are starting this week, with the rest set to start in the next couple of weeks. Hopefully, with a La Nina year, we can get a little more disease pressure for our studies. Good luck to everyone on the upcoming growing season!

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Happy Hour with the Turf Docs with a Twist

By: Dave Marach, Superintendent, OJ Noer Turfgrass Research and Education Facility

The Wisconsin Turfgrass Association continued its relatively new tradition, Happy Hour with the Turf Docs, and added a new option this year. Besides the virtual version that has been offered in the past, there was also an in-person option at three venues around the state. Our gracious hosts at Hawk's Landing in Madison, The Wisconsin CC in Milwaukee and South Hills Golf & CC in the Fond du Lac allowed us to eat, have a beverage or two, and talk with our friends in the industry in-person to figure out what in the world was going on with "winter" this year. Altogether, about 60 people took part and enjoyed the camaraderie. Another change was the interactive quiz from the Turfgrass Apprenticeship Program finals, just the week before. I'm sure everyone passed with flying colors.

Neil Radatz, WTA Vice-President and superintendent at Hawk's Landing Golf Club, welcomed the Madison-area attendees.

The hot topic here, much like most northern states, was how this winter or lack thereof was going to affect the growing season. The reapplication of snow mold products, prolonged exposed turf through the winter, opening, mow or not to mow--the talking points were endless. Several of us have been through these scenarios before, but maybe not this extreme. There are some things that can help such as knowing your property well like you all do. Also, area weather trends and gut instincts will help you know when to pull the trigger with all the decisions that come any time of year for every turf manager. For those that use growing degree days for any application, this might have been the year when it is more of a guideline to know you're close but not necessarily ready, especially with fluctuating spring weather. It also never hurts to get opinions from others in the area if you have never experienced this before; I know it helped me out a time or two.

We had great turnout at Hawk's Landing, and if you haven't been to this event before, it's a casual, interactive way to pick the brains of our awesome turf docs while catching up with your turf industry colleagues, too!

In the discussion, there was also talk of what is going to happen with chlorothalonil. Many turf managers use it during the summer or in their snow mold applications, so it certainly is a critical issue at hand. This is one of several turfgrass pesticides that are coming under the microscope of the regulators (iprodione and thiophanate methyl are two other fungicides), but certainly the most important. There are several application factors that were proposed in the new chlorothalonil registration including depth to groundwater and soil type. It'll be interesting, to say the least, to see how it all shakes out.

Doug and Paul also shared some of the new studies they would like to implement including involvement of a Kentucky Bluegrass NTEP trial. For those that had missed some of the previous meetings and seminars, Doug spoke on what has been going on with the standardization of soil organic matter and how to utilize this information. A property can then take this information and help plan your next season's cultivation and fertility programs for the upcoming year to achieve the level of soil organic matter that is right for your property.

The turf docs mentioned that the UW-Madison Turfgrass Apprenticeship Program wrapped another year with 14 graduates this year. The students studied the agronomic basics and even took some tours of some local facilities to talk equipment and reel grinding. All great information for an up-and-coming turf manager that they can use when they go back to their properties for the growing season.

We would like to thank the three hosting sites for the hybrid portion of the Happy Hour, Hawk's Landing, Wisconsin Country Club and South Hills for their hospitality. Thank you also to the event's sponsors, Advanced Turf, Pendleton Turf, Clesens Pro Turf and Simplot Turf and Horticulture.

Until next year's Happy Hour, cheers!

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SPRING AND SUMMER AT THE NOER

By Dave Marach, Superintendent, OJ Noer Turfgrass Research and Education Facility

There has not been a dull moment at the Noer since beginning in January. Planning for the research season, understanding where everything is, learning the plots and what to do or not do for them, the list goes on. There is routine business to take care of that happens every year such as field day prep and staff hiring/orientation to name a few.

One event that has happened in the last several years is the FFA Nursery and Landscape Career Development Event. Students come from all over the state to take part in identification, practical exams, give presentations and learn what the turf and horticulture industry have to offer. Last year, 8 teams competed in the competition, and this year it doubled! 70 students were all at the Noer learning and competing in this event. Several industry vendors and employees from local companies and golf courses came to judge practical exams and listen to presentations. These vendors and employees not only donated their time but also donated equipment for the practical exams. The students learned how to safely operate and maintain chainsaws, skid steers and zero turn mowers for a job in the horticulture and landscape industry. By the looks of the turn out, the horticulture and landscape workforce might have some new stars.

Just like every year, the Noer will host the WTA field day August 6th. The professors will talk about some of their continuing and new research including:

- Round Up resistant Kentucky Bluegrass
- No Mow May impacts on pollinators and turf health
- Organic vs. Conventional Lawn Management
- Impacts of mulching tree leaves on turf and soil health
- Multiple Dollar spot research discussions
- Topdressing and putting green firmness
- Growing degree days for wetting agents

These are just a few of the great research presentations at the field day this year. Not only is it valuable information, but it is always a fun time reconnecting with our fellow turf industry professionals.

Nearly 70 FFA students from around the state took over the Noer for the Nursery and Landscape Career Development Event. It was a full house!

Students were tested on ZTR mowers by Scott Neary from Reinders. Besides the ZTR and chainsaw, they also had to show what they knew about operating a skidsteer.

Jens Arneson from Hawks Landing Golf Club (and a former FFAer) tested the students on how to safely operate a chainsaw.

Here, a group completes the landscape estimation exam. The day also featured a 50-question multiple choice test, a 20-item identification exam, and a team activity that included a presentation before a panel of judges.

Another big event happening this year, which will be its last, is that the Noer will assist University Ridge during the Am Fam Championship. Over the last several years, the Noer has hosted several key components for the tournament. The Golf Channel will have their trailers staged there and miles of cable will begin at the Noer feeding crews out on University Ridge. We will serve as the security central command post and are also a staging area for several other key parts of the tournament.

Good luck to everyone this growing season and I hope to see many of you at Field Day. May you get timely rains, warm days, and cool nights.

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Jeff Bisbee, who partnered with Peter Meyer from National Golf Graphics, lines up a long putt on a cloudless day in Lake Country.

Bushman Finally Claims Super-Pro Title

By Jake Schneider, Editor and Chapter Manager

Great course: ☑
Delicious food: ☑
Nice weather: ☑
Record attendance: ☑
Worthy victors: ☑

Chenequa Country Club was the host course for the WPGA Super-Pro in late April, and longtime superintendent, Jim Shaw, and his staff had the course in excellent condition for the record turnout of over 100 golfers. Chenequa was established in 1911 as a nine-hole layout, and the "original" nine is laid out over rolling acreage near Beaver Lake and features many mature trees. The newer (upper) nine is less undulating and features several strategically placed water hazards. The club is also getting ready to undergo an ambitious tee addition project which will keep Jim busy for a few years.

Out on the course, the Fox Valley Golf Club team of Scott Bushman (WGCSA) and Jason Haack (WPGA) found the existing layout to their liking and claimed victory at long last. The winning team in the modified Chapman alternate shot event shot an impressive gross score of 70 for a net 66.25. Just 0.20 shots back in second was Washington County GC team of Dave Jahnke and Andrew Kosloske. Michael Anderson and Craig Czerniejewski, also from Washington County, rounded out the podium for the traditional division.

Division two, which consisted of teams without the standard super and pro from the same facility, was won by Brian Placzkowski and Kyle Dreger from Reinders; they had the low net round of all teams with a 64. The runners-up were from Premier Golf and Utility, which sponsored the day, were Ben Rudolph and Justin Olson.

To round out the competitions, the team of Chris Deckard and Dan Hastreiter from Blackwolf Run won the skins game with an eagle on the par 4 fifth hole and took home some nice pocket change. Congratulations to all the winners!

The historic clubhouse at Chenequa sits above Beaver Lake and offers a beautiful view of the lake from its back deck.

Aside from the outstanding course and food, Mother Nature also cooperated nicely during an event that is occasionally subject to chilly April days in Wisconsin (I'm looking at you, Bristlecone Pine in 2022). Thanks to everyone who came out for a fun day of golf and camaraderie, and we hope to see you at many more golf events in 2024!

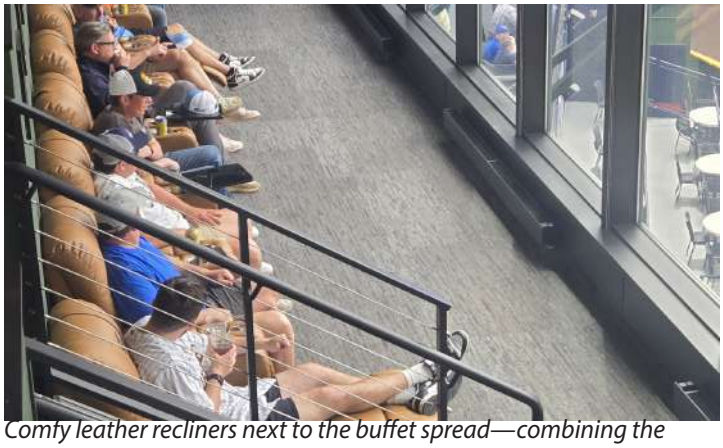
The fifth hole at Chenequa features a tight fairway and a fairly small green that requires precision on every shot.

Jim Shaw has been at Chenequa Country Club for nearly 50 years! Thanks for having us, Jim.

WGCSA Takes Over X-Golf

By: Jake Schneider. Editor and Chapter Manager

In our third iteration of having the May meeting at a Brewers game, we switched things up and moved our outdoor tailgate inside the comfy confines of X-Golf in the left field at American Family Field. After selling out our 85-ticket allotment, I think it's safe to say that we'll be back. Here's a pictorial look back on our day in Milwaukee. Thanks to everyone who took time out of their busy schedules to attend; we hope to see you and many more in the future.



Comfy leather recliners next to the buffet spread—combining the joys of watching from your living room with actually being at the ballpark. Surprisingly, no snoring was heard from this group.

Thanks to our awesome industry partners who made it such an affordable and fun day! Besides the tailgate buffet, everyone got three drink tickets and unlimited simulator time. All attendees also received the sweet hats that you see on the table. Look for more of this type of swag at all WGCSA events this year.

The Wisconsin Country Club crew (and a few others) took over one of the seven simulators that were reserved for our group.

Although most of the X-Golf space is inside, they did block off an adjacent outdoor terrace for our group, and it was a gorgeous day to take in a resounding Brewers victory over the Rays.

Our tremendous hosts at X-Golf held closest to the pin and longest putt contests. Here, Ethan Bublitz from Hidden Glen and Rob Johnson from Waupaca Sand and Solutions take a crack. The winners were Jake Schneider who miraculously hit it within 1' on the par 3, and Travis Block from Mayville Golf Course who drained the long, undulating putt. They both walked away with a Brewers-themed Paige Spiranac bobblehead and an X-Golf gift certificate.

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What Golfers Want

Gunnar Stapp, Assistant Golf Professional, Hidden Glen Golf Club

As golf exploded over the past 4 years, a new generation of golfers, both young and old, was introduced to the game - each with a vision of what their experience should be on the course.

In a perfect world, these golfers want a golf course that looks like Augusta, has the price point of a small bucket at the local driving range, and maintenance only occurs at night… is that too much to ask?

Self Awareness - Who are you and Who are your clients?

Working alongside superintendents at a variety of golf courses, one common theme exists - you must set realistic expectations for your golfers. You must also be consistent in maintaining or exceeding those expectations. Never promise something you can't sustain.

If Grantsburg Golf Course claimed to be the "Ozaukee Country Club of the Northwest", based on a few 200-year-old oak trees, golfers would be sadly disappointed. Instead, it advertises itself as a short (only 1,950 yds) but challenging golf course, offering a family friendly environment at a reasonable price. Because of this, GGC thrives in rural Burnett County. The experience relative to the expectations of its customers is consistently high.

Roll for Dough

Whether Private, Public, Big or Small - one common theme exists within the golfing community - golfers care about their greens. If your club has every amenity imaginable, but the greens are poorly maintained, you will lose golfers. What are the greens rolling at? Are the greens aerated? How did the greens come through the winter? These are the most common questions we receive in the golf shop during the opening weeks.

Next questions - Are Golf Carts allowed today? Why aren't carts allowed today? etc …. As your biggest asset, you must always protect the course…ALWAYS…But golf carts are also one of your club's biggest revenue streams. If possible, adjust your traffic control practices to allow carts on wet days and create long term water management solutions to prepare for future storms.

Amenities on the Course

If you choose to have on-course amenities like sand buckets, water coolers or ball washers (in my opinion, a pointless amenity but that's a discussion for another time), they need to be stocked the same way - every day - all day. Once customers expect these items will be available, frustration arises when they are not. Work with other departments to ensure these items are refilled after your staff leaves for the day.

Staff Interactions

Although the staff member blowing leaves isn't a traditional customer service representative, their ability to create a positive or negative experience for golfers is indisputable. As your staff works around golfers, make sure they smile and wave. Ask the golfers how their day is going. These simple actions minimize the frustration of a customer trying to putt as a mower fires up nearby.

Playing Politics

Golfers LOVE to speak with superintendents on the golf course and around the club house. As a golf professional, I can explain why something is happening on the course. However, that same information is accepted more openly if it comes from the superintendent. If you don't already do so, set aside time to converse with your golfers or post regular articles in the club house. Keep these conversations friendly and explain why you do some of the processes on the course or why you open later/ close earlier than the course down the road. Once golfers know the importance of these agricultural practices, they are more likely to accept the accompanying inconvenience.

Throw on a nice shirt and a smile. The more allies you gain through early and open communication, the fewer headaches you will encounter.

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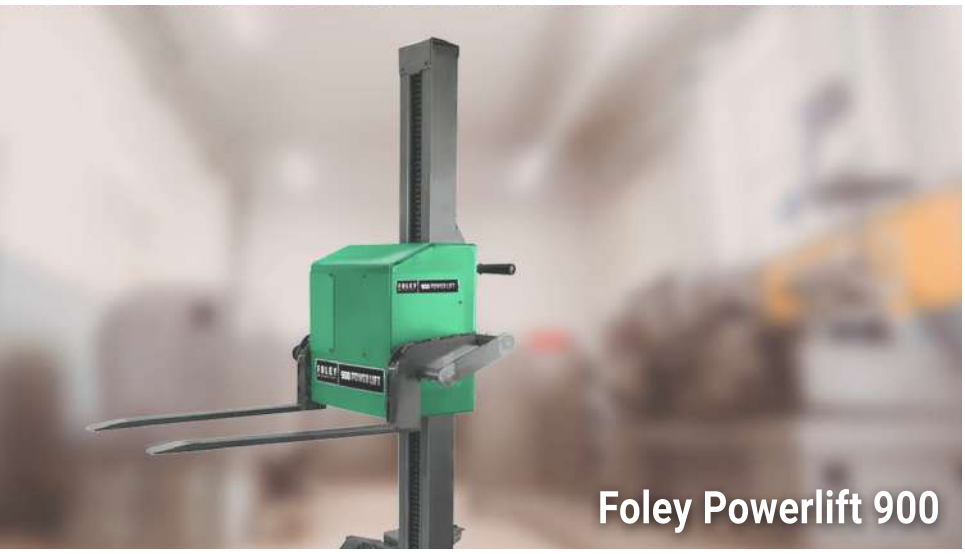

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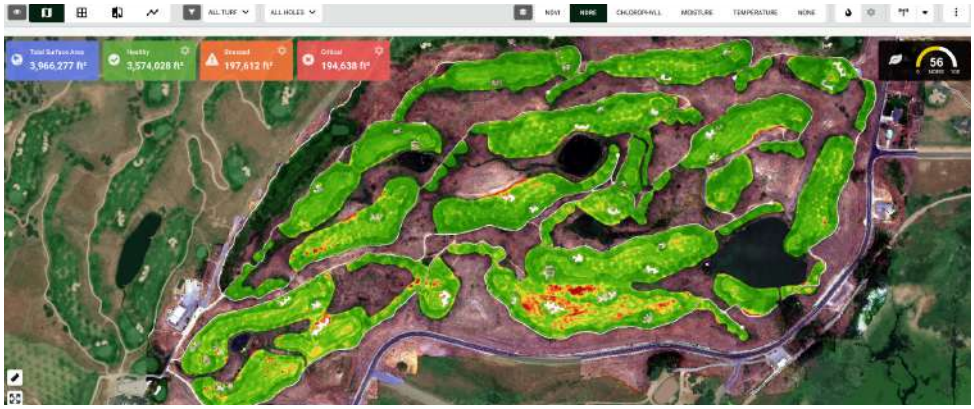
By: Kendall Marquart, CGCS, Precision Drone Mapping



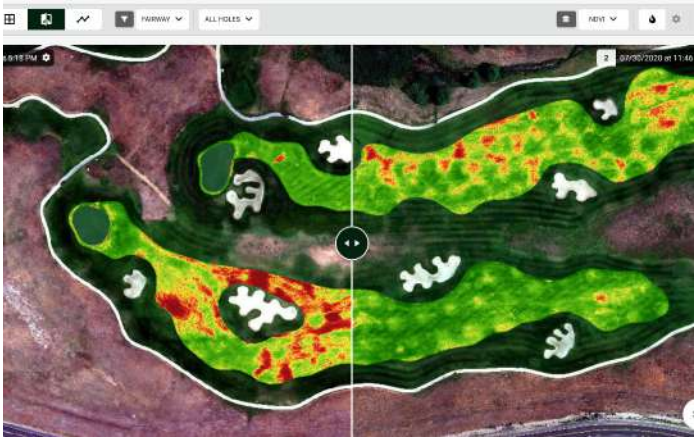
which is then accessible through a web portal, on any device. Using this cutting edge drone data collection and analysis solutions enable stakeholders to proactively monitor and take action in order to provide quality and consistency of turf conditioning in an environmentally conscious manner. The following image shows the effects of a targeted fertilizer application.

Development of agronomic management tools for the turf industry has always followed developments for production agriculture. Back in the early days of golf course management, many of the early superintendents were farmers and their field management knowledge and experience were transferred to the golf courses they built and tended. The golf course superintendent of today has evolved into a highly specialized role, frequently consisting of several areas of responsibility. Keeping up with the demands of today's course operations is a fast-moving train. Leveraging drone data and analysis technology to better manage operations is becoming very important and going forward, it will play an increasing role in day-to-day course management. How? The use cases are really only limited by the specific needs of the operation. Planning, tracking and memorializing course features, construction and maintenance are all functions an sUAS (small Unmanned Aircraft Systems) can address with ease in a short period of time, usually an hour or less of flight time, and capture a vast amount of detail that enables you to see the course like never before, all at once. This article will focus on the most exciting and consequential development in drone use cases for superintendents--multispectral turf health analysis.

Multispectral plant health analysis is common in production agriculture and while the outputs do show relative plant health on turf, it is not as user friendly as needed to be of value to a course. In an answer to that need, software platform developers have created a turnkey web-based system to collect, process and analyze the drone multispectral data,

Multispectral refers to the special camera "payload" mounted on the aircraft. Pictured below is the DJI Mavic 3 Multispectral with an RTK positioning correction module in the little "can" on top. There are five cameras reading different bands of light, and the photos which are captured are then processed or interpreted by cloud computer processing and subsequently displayed on the web interface.

Using the tools available on the platform, you can filter the output maps for several types of agronomic ratings of the turf and compare conditions from the entire course down to individual areas, zooming in as well. The comparison function shown below, show the same holes at different times. You can then move the slider to see changes and trends in turf health health:



This information literally allows you to "see" stressed turf, typically 7-14 days before you can actually see it in the field. The insights of the analysis allow you to target areas for response: saving time, being more effective, saving resources, environmental benefits and finally, producing more consistent turf throughout the course, which is the common goal. It's a win-win thing all the way:

- ***See*** the impact of maintenance practices on turf
- ***See*** cart and maintenance traffic impact on conditions
- ***See*** areas of concern before they become critical, conceive a plan of action and communicate the proactive response to stakeholders BEFORE phone calls happen
- ***Multiple user*** access means more eyes checking conditions
- ***Do more with less*** by targeting resources
- ***Know*** the turf on a macro level, to better manage the many micro environments on a course

Seeing the course from this perspective can instantly give you insights on what is happening in the field, and the platform can be shared with staff, club officials or other stakeholders:

For turf researchers, this platform offers the potential of visual and statistical analysis at the plot level and a different window into the health of turf, along with other agronomic insights such as differential reflectivity plant ID, which could lead to quantitative evaluation and analysis of Poa annua populations in a bentgrass putting green. I am currently mapping the turf research plots at the University of Wisconsin OJ Noer Turf Research Facility for the faculty and staff to evaluate how this technology can possibly help with turf research.

What is the process and cost involved with using this technology?

The first thing to understand is your location in regard to any FAA controlled airspace issues, where drone flight may be restricted or in some cases, not possible. Assuming all is well, you would:

- Purchase an annual subscription to the platform of $1,200 and a one-time set up fee per 18 holes.
- Get a multispectral flight mission done, either by a drone service provider or with your own equipment/licensed pilot. Pilot rates vary by market, but around $500 per flight, more or less
- Upload the image data from the flight memory card for processing. Processing fees for the average 18 hole course is about $150. It takes about six hours to complete the processing and analysis
- See the results through the web portal on any device, for analysis and response planning.
- Repeat the flight as often as desired - during the active growing season weekly is preferable, but it's really what works best for the individual course

In my opinion, this is a revolutionary, game-changing application of drone technology that is a quantum leap forward for turf research, turf management, and golf by extension. In the realm of environmental stewardship and responsibility, utilizing this technology is an essential tool for optimum turf and conservation of resources, across the spectrum of management inputs.

With visual insights of turf moisture and overall health of the entire golf course at one time, conditioning consistency of top performing turf is now possible at the highest levels. Better data = a better program. It's time for precision agriculture technology to be thoroughly applied in the golf industry, and the exciting thing is that the capabilities and uses of the tech will continue to evolve, for the better of all golf.

Images courtesy of TerraViewSolutions.com

CATCHING UP WITH AUSTIN WRIGHT

By: Garrett Luck, Superintendent, Hidden Glen Golf Club

Prior to moving across the Mississippi, Austin spent several years as Sand Valley's equipment manager and was also the WGCSA equipment manager committee chairman.

Give a brief background of your history in Wisconsin (are you originally from Wisconsin? If not, how did you end up here?):

Growing up in Kansas if you asked me where I would live throughout my career, I would have never guessed that Wisconsin would have been on the list. I am thankful to have had the opportunity to be the Equipment Manager of the Sand Valley team and play my role to build the amazing, growing golf resort. I can remember where I was standing when I received phone calls from Rob Duhm and Joe Jehnsen about a Keiser project in central Wisconsin. After coming up to visit the "sandy desert", I knew it was the real deal and was something I wanted to be part of. It is hard to believe that was eight years ago now. I will forever be grateful for the many great years working with the awesome people at Sand Valley. I learned more working there than I ever thought I would learn in the golf industry.

Why would you ever leave Wisconsin and what have you been up to since you left?:

I never thought I would leave Sand Valley or central Wisconsin, but life has a funny way of keeping you on your toes. I was presented with the opportunity to take over for the retiring Equipment Manager at Hazeltine National Golf Club in Chaska,

Austin with his wife, Katie, and daughter, Olivia have recently relocated the Twin Cities where he is the equipment manager at Hazeltine National Golf Club.

Minnesota. I always wanted to be part of a team and facility that hosted Championship golf on a regular basis. Ralph Arnt, previous Equipment Manager, retired after 36 years with HNGC, so I knew that it was a great place to work. My family and I moved to Minnesota in September of 2023. I had the chance to work with Ralph for 6 months prior to his retirement which was a best-case scenario to get a full grasp of the operation as the baton was being passed. I am excited to be part of the future we have at Hazeltine National Golf Club, hosting the US Amateur Championship this year in 2024, KPMG Women's PGA Championship in 2026, and Ryder Cup in 2029. Hazeltine is the only golf course in the United States to be selected to host a second Ryder Cup.

Nina, the Wright Family's three-year-old husky, has settled in nicely to land of 10,000 lakes.

What is your favorite thing about your current job?:

Coming into an older operation has presented its own set of challenges that are very different from what I was used to prior. Those who know me best are aware that I enjoy cleaning and organizing. Being able to come into the facility with a new set of eyes and see things in a different

way than before has been fun for not only myself but all the elite team members here at Hazeltine. I enjoy listening to their ideas on what they would like to change while incorporating my own techniques into the mix has created a strengthened bond between the shop, agronomy managers, and crew members. These are changes and adjustments that don't take place overnight but may take years to fully get there. Being part of the culture that Chris Tritabaugh, Superintendent, has built over time is so much fun. The team members are empowered and hold everyone to the highest standards while maintaining a relaxed environment focused on Championship conditions every day.

What is the thing that you miss the most about Wisconsin?:

I miss our friends and community. Living in the small town of Rome, everyone is friends with everyone. There was a sense of community that is unlike anywhere else. We all are friends outside of work with our spouses and kids spending time together. We had so much fun golfing in the local Big Cup Tournaments and playing on the best intramural basketball team in central Wisconsin. Those were times that I will carry with me for the rest of my life.

Have you been back to Wisconsin since you left? If so, what is the one thing that you most forward to doing upon your return?

We have been back to Wisconsin a few times. We always look forward to seeing our friends again and picking up where we left off. We try to get back for friends' birthday parties or events. We are very lucky that my in-laws have a vacation home in Rome in our old neighborhood, so we can have a place to stay that is close to our friends when we come back. Now, when we travel back for the big summer holidays, we will be the "out-of-towners" that the locals complain about. Those of you living in the tourist areas know what I am talking about.

Olivia and Nina checking in to make sure that Dad is doing a good job at work.

If a Wisconsinite has to travel to Minnesota, what is the one thing they must do or see?

Only living in MN for less than a year, I still have much more to learn. That said, near the small town of Jordan where I live, there is Minnesota's Largest Candy Store. It is wild and will take you back to when you were a kid. They have any candy you can think of from around the world. It will blow your mind. For you burger lovers, some bars/restaurants through the cities have what they call Juicy Lucys (a stuffed cheeseburger). If you see one on the menu, give it a try and you won't be disappointed. It can almost start an argument over who makes the best Juicy Lucy in Minnesota.

BADGER STATE TURF CLIPPINGS

- Congratulations to **Zak Houfek** and **Steve Wasser** with Clesens on their recent awards. **Matt Kinnard**, Director of Sales, thanked both Zak and Steve for their commitment and performance during the past year. This was the first year for the award and recognition.

  Zak Houfek: Irrigation Purchaser and Branch Manager - Art Clesen Team Member of the year.

  Zak is a native of WI and has past experience with golf course agronomics at both Westmoor and Milwaukee CC. Zak now supports the Germantown warehouse for customer sales and service.

  Steve Wasser: Sales Representative in N WI and UP - Outstanding Sales Achievement

  Steve is native to WI and started at Abbey Springs as an assistant then moved on to Prairie du Chien. Steve made the transition over to sales working with Lesco and Site One before accepting his role with Clesens ProTurf.
- Two former past presidents renewed their CGCS status. Kudos to **Jeff Barlow** at Waupaca CC and **David Brandenburg** at Rolling Meadows GC for maintaining this designation!
- Congrats to **Brent Graybill** at Milwaukee CC for completing level 1 of the Equipment Manager Certification Program.
- Our very own **Dr. Paul Koch** recently received the Pound Extension Award from UW-Madison. This award is presented annually to an outstanding Extension-funded faculty member of the College of Agricultural and Life Sciences.

We've had several folks taking new positions lately, including:

- **Brian Moesch**: Superintendent at Lake Breeze Golf Club
- **Karl Stewart:** Superintendent at Pinewood Golf Club
- **Paul Baker:** Superintendent at Kestrel Ridge Golf Course
- **Kyle Benish:** Superintendent at Coldwater Canyon Golf Course
- **John Turner:** Assistant Superintendent at Lake Wissota Golf and Events

Welcome to our new members:

- **Tyler Arends:** Student at UW-Madison
- **Mitch Bucholz:** Superintendent at Mayville Golf Course
- **Riley Carlson:** Director of Communications at GreenSource USA
- **Nicholas Crosswhite:** Assistant Superintendent at Genena National
- **Thomas Hauser:** Assistant Superintendent at Blue Mound Golf and Country Club
- **Shawn Henrichs:** Equipment Manager at Tribute & Trapp River Golf Courses
- T**yler Kregel:** Student at Penn State World Campus
- **Brian Placzkowski:** Territory Manager with Reinders
- **Theodore Ryder:** Assistant Superintendent at Milwaukee Country Club
- **Brad Straseske:** Assistant Superintendent at Mayville Golf Course
- **Dave Vander Heyden:** Assistant Superintendent at Butte Des Morts Country Club
- **Landon Wiet:** Vice President at Natural Lake Biosciences

If you have news to share regarding your personal life (big achievement, trophy buck, marriage, baby) or your professional life, please send it my way! It's always fun to hear what WGCSA members are up to.

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TOP FIVE

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