

The GRASS ROOTS

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The Par 5 473 Yard 10th Hole at Racine Country Club Host of the WGCSA May Meeting.

And when it rains on your parade, look up rather than down. Without the rain, there would be no rainbow.

By Gilbert Keith Chesterson, English Writer and Philosopher, 1874-1936

This quote by Chesterson reminds us during this unusually wet period that good will come from the rain.

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THE GRASS ROOTS

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PRESIDENT'S MESSAGE

Fall Comes Early

By Josh LePine, Certified Golf Course Superintendent, Maple Bluff Country Club

The 2019 golf season came to a screeching halt in late October. Interesting photo op to have peak fall color with a white blanket of fresh snow. As if the season wasn't stressful enough, we had to finish it by scrambling to blow out the irrigation system, spray snow mold and winterize the pool and club buildings. Projects may be delayed or tabled until spring. The course is a mess with accumulated leaves but too wet to blow and mulch. Sound familiar anyone?

I'm confident we will get more opportunities and access to the golf course again in November and December. Chin up and press on!

All is well with the WGCSA. The Symposium is right around the corner. Please consider attending this great event at a fabulous venue. Special thanks to Jaime Staufenbeil with Milorganite for all of the extra time and effort organizing this event. The Symposium Committee has a great line up of speakers. Please consider coming a bit early for the annual meeting. Chapter Manager, Brett Grams, and our WGCSA Board do a fantastic job balancing work, family and Association volunteerism. Please come hear them share important Association news at the annual meeting. We will see you all there!



Golf courses throughout the state were greeted with multiple October snows to put a damper on the golf season and provide wet conditions after the melt.

Many irrigation systems were blown with snow covering the heads, valves and quick couplers.


BMP Best Management Practices

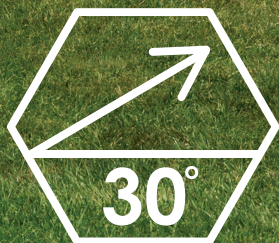
Our Best Management Practices (BMP) initiative is moving along. We will have a lengthy rough draft document to review this fall and early winter. Please check our website for instructions on how you can help by submitting photos for the Wisconsin BMP. There is a list of what we are looking for and how to submit the photos. Let's make this our own and have our courses in the Wisconsin BMP! If you are interested in being part of the BMP review committee please contact Brett, any board member or myself. We have also been busy meeting with our Allied Associations to discuss the BMP including the Wisconsin PGA and the Golf Course Owners of Wisconsin. A joint golf industry effort will benefit us all in the long run. From financial support, to buy in to promoting and communicating with lawmakers. I encourage you to visit the GCSAA website to review some of the other States' completed BMP's. Please contact me



with any comments, questions or concerns regarding the BMP initiative.

In the near future you will be receiving a brief survey from the WGCSA Board. It's been awhile since we've heard from our membership. Your input is valuable and can help steer Board decisions and initiatives. We admittedly struggle to achieve desired attendance at meetings and events. I personally think it relates to work/family balance and finding time to get away from the course. I struggle with this balance myself. I also know that after attending an event, I feel energized and a bit refreshed. Maybe it's simply hearing everyone else is struggling with the same issues I am but most times I learn something new or meet another great person in our industry. I also find, believe it or not, that the course survived my absence!

Enjoy this more manageable time of year and best wishes wrapping up the season. 



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Dollar Spot Control Using Urea and Iron Sulfate

By Kurt Hockemeyer, Turfgrass Diagnostic Lab Manager, O.J. Noer Turfgrass Research & Education Facility

By Brian Horgan, Ph.D. Department of Horticultural Science, University of Minnesota

By Paul Koch, Ph.D. Department of Plant Pathology, University of Wisconsin – Madison

By Doug Soldat, Ph.D. Department of Soil Science, University of Wisconsin – Madison

By Chase Straw, Ph.D. Department of Horticultural Science, University of Minnesota

Author's note: A version of this article appeared in Golf Course Management magazine (May 2019, pages 64-66). It is reprinted here with their permission.

Dollar spot is the most economically important disease of golf course turfgrass and insufficient cultural control measures have led to a heavy reliance on repeated use of fungicides. Iron sulfate (FeSO_4) has been used for decades in the turfgrass industry for its ability to improve turfgrass color (Reams, 2013). Recent research out of Oregon State showed that FeSO_4 can provide excellent control of *Microdochium* patch

when applied at regular 2-week intervals (Mattox et al., 2017). In addition, researchers out of Virginia Tech demonstrated that FeSO_4 can also provide significant reductions in dollar spot on a creeping bentgrass putting green when applied at high rates (1 lb/1000 ft²) every 2 weeks (McCall et al., 2017). However, in both cases the FeSO_4 injured the putting surfaces to an unacceptable level after repeated applications. The objectives of this study are to (1) determine the impact of FeSO_4 and urea, both alone and applied as a tank mixture, on the development of dollar spot and (2) identify the appropriate reapplication

interval and water volume that provides effective dollar spot control and optimal turf quality.

Study Design

Separate studies were conducted for each objective listed above, and both studies were replicated at the O. J. Noer Turfgrass Research and Education Facility in Madison, WI and Minnesota Valley CC in Bloomington, MN. All WI treatments were initiated on May 17th and all MN treatments were initiated on May 23rd and subsequent applications were made at 7, 14, 28, or 42-day intervals. A full list of treatments for both studies can be found in Table 1 and Table 2.

Year 1 Results

Objective 1. Treatments containing iron sulfate generally reduced dollar spot relative to the non-treated control at both locations (**Figure 1**). Iron sulfate applied at a 7-day interval was much more effective compared to a 14-day interval (**Figure 2**). Urea, alone or in combination with other products, was not consistently effective at reducing dollar spot. Iron sulfate mixed with Emerald was extremely effective at suppressing dollar spot at the Minnesota location, however Emerald did not effectively control dollar spot at the Wisconsin site. The poor control provided in Wisconsin may be an indication of fungicide resistance to Emerald, which has been repeatedly used at the research facility over many years.

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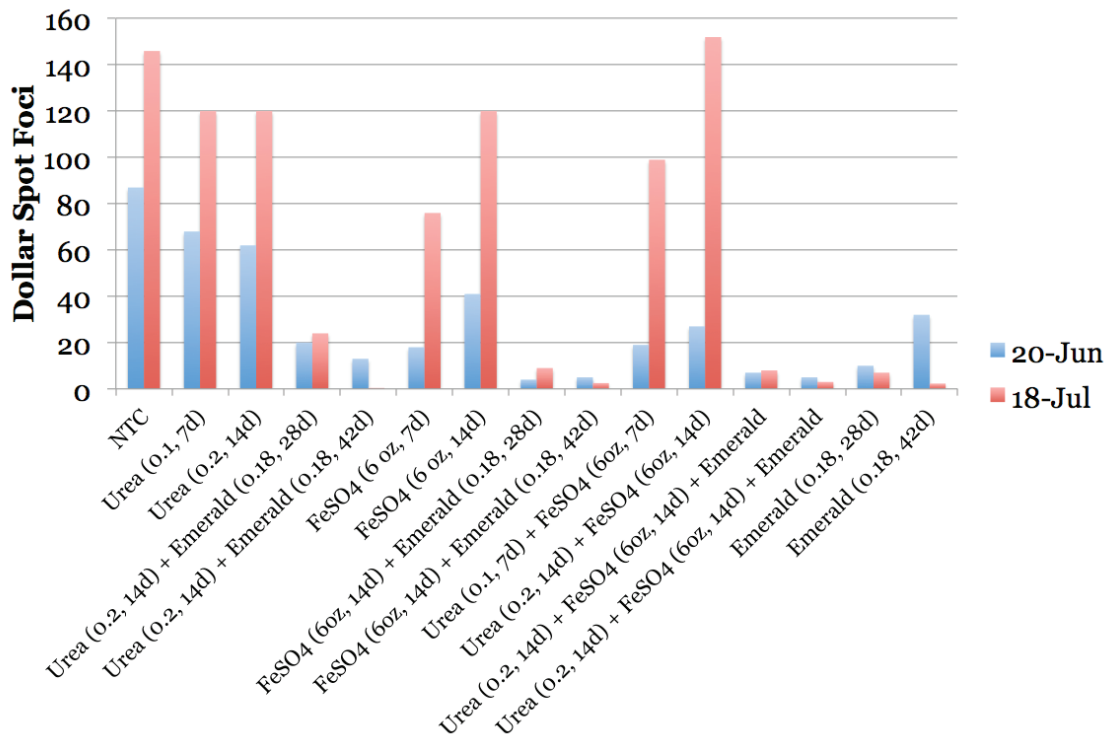
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ABOVE: Figure 1. FeSO₄ and urea combinations for dollar spot control during 2018 at Minnesota Valley CC in Bloomington, MN.

BELOW: Figure 2. Impact of iron sulfate vs non-treated turf at the OJ Noer Turfgrass Research Facility in Madison, WI on July 18th, 2018.



WISCONSIN PATHOLOGY REPORT

Objective 2. At both sites there was a clear dose response within the 7-day reapplication interval where higher rates of iron sulfate resulted in less dollar spot (**Figure 3**). The greatest dollar spot reduction was provided by iron sulfate applied at 12 fl oz/1000 ft² every 7 days, but this resulted in a very dark color that may be undesirable for superintendents. No strong influence of water volume on dollar spot severity was observed.

Summary

Iron sulfate provided significant suppression of dollar spot in the first year of this 2-year study at sites in


both Wisconsin and Minnesota. The 7-day reapplication interval was almost always more effective than the 14-day interval, suggesting that lower rates at shorter intervals is a more effective iron sulfate use strategy than higher rates at longer intervals. The urea treatments in this study did not consistently reduce dollar spot. The study will be repeated at both locations in Year 2 but the fungicide treatment will be changed to account for the possibility of fungicide resistance at the Wisconsin research station.

References:

Mattox, C. M., Kowalewski, A., Mc-

Donald, B., Lambrinos, J. G., Davis-court, B., Pscheidt, J. 2017. Nitrogen and iron sulfate affect Microdochium patch severity and turf quality on annual bluegrass putting greens. *Crop Science* 57: S-293-S-300.

McCall, D. S., Ervin, E., Shelton, C., Reams, N., Askew, S. 2017. Influence of ferrous sulfate and its elemental components on dollar spot suppression. *Crop Science* 57: 581-586.

Reams, N. F. 2013. The effect of Fe-sulfate on annual bluegrass, silvery thread moss, and dollar spot populations colonizing creeping bentgrass putting greens. M.S. Thesis. Virginia Tech University. 

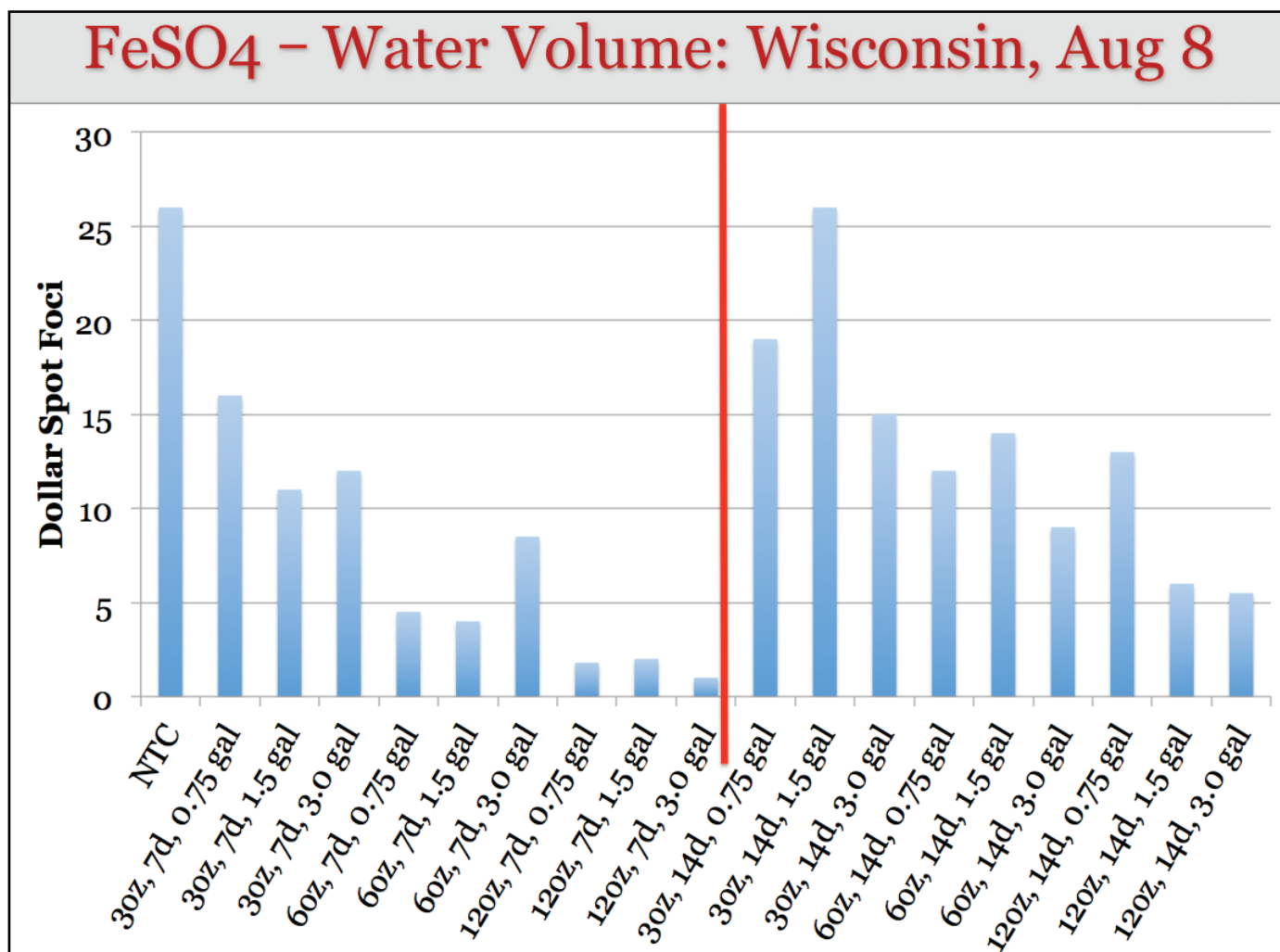


Figure 3. Water volume, reapplication interval, and FeSO₄ rate impacts on dollar spot control at the OJ Noer Turfgrass Research Facility in 2018.

WISCONSIN PATHOLOGY REPORT

	Treatment	Rate	Application Interval
1	Non-treated control		
2	Urea	0.1 lb N/1000ft ²	7 day
3	Urea	0.2 lb N/1000ft ²	14 day
4	Urea Emerald	0.2 lb N/1000ft ² 0.18 oz/1000ft ²	14 day 28 day
5	Urea Emerald	0.2 lb N/1000ft ² 0.18 oz/1000ft ²	14 day 42 day
6	Iron Sulfate	6 oz/1000ft ²	7 day
7	Iron Sulfate	6 oz/1000ft ²	14 day
8	Iron Sulfate Emerald	6 oz/1000ft ² 0.18 oz/1000ft ²	14 day 28 day
9	Iron Sulfate Emerald	6 oz/1000ft ² 0.18 oz/1000ft ²	14 day 42 day
10	Urea Iron Sulfate	0.1 lb N/1000ft ² 6 oz/1000ft ²	7 day
11	Urea Iron Sulfate	0.2 lb N/1000ft ² 6 oz/1000ft ²	14 day
12	Urea Iron Sulfate Emerald	0.2 lb N/1000ft ² 6 oz/1000ft ² 0.18 oz/1000ft ²	14 day 14 day 28 day
13	Urea Iron Sulfate Emerald	0.2 lb N/1000ft ² 6 oz/1000ft ² 0.18 oz/1000ft ²	14 day 14 day 42 day
14	Emerald	0.18 oz/1000ft ²	28 day
15	Emerald	0.18 oz/1000ft ²	42 day

Table 1. Treatment list for the iron sulfate-urea study described in Objective 1.

Table 2. Treatment list for the iron sulfate-water volume study described in Objective 2

	Treatment	Rate	Application Interval	Water Volume
1	Non-treated control			
2	Iron Sulfate	3 oz/1000 ft ²	7 day	0.75 gal/1000 ft ²
3	Iron Sulfate	3 oz/1000 ft ²	7 day	1.5 gal/1000 ft ²
4	Iron Sulfate	3 oz/1000 ft ²	7 day	3.0 gal/ 1000 ft ²
5	Iron Sulfate	6 oz/1000 ft ²	7 day	0.75 gal/1000 ft ²
6	Iron Sulfate	6 oz/1000 ft ²	7 day	1.5 gal/1000 ft ²
7	Iron Sulfate	6 oz/1000 ft ²	7 day	3.0 gal/ 1000 ft ²
8	Iron Sulfate	12 oz/1000 ft ²	7 day	0.75 gal/1000 ft ²
9	Iron Sulfate	12 oz/1000 ft ²	7 day	1.5 gal/1000 ft ²
10	Iron Sulfate	12 oz/1000 ft ²	7 day	3.0 gal/ 1000 ft ²
11	Iron Sulfate	3 oz/1000 ft ²	14 day	0.75 gal/1000 ft ²
12	Iron Sulfate	3 oz/1000 ft ²	14 day	1.5 gal/1000 ft ²
13	Iron Sulfate	3 oz/1000 ft ²	14 day	3.0 gal/ 1000 ft ²
14	Iron Sulfate	6 oz/1000 ft ²	14 day	0.75 gal/1000 ft ²
15	Iron Sulfate	6 oz/1000 ft ²	14 day	1.5 gal/1000 ft ²
16	Iron Sulfate	6 oz/1000 ft ²	14 day	3.0 gal/ 1000 ft ²
17	Iron Sulfate	12 oz/1000 ft ²	14 day	0.75 gal/1000 ft ²
18	Iron Sulfate	12 oz/1000 ft ²	14 day	1.5 gal/1000 ft ²
19	Iron Sulfate	12 oz/1000 ft ²	14 day	3.0 gal/ 1000 ft ²

With Each New Year Comes New Challenges

By Bruce Schweiger, Manager, O.J. Noer Turfgrass Research and Education Facility

Well, to no one's surprise, it happened again, the snow melted and the O.J. Noer Facility went from being snow covered to grass showing in a matter of days. The excitement grew as I watched the snow melt away, but then reality took hold. It was a new growing season and there were changes and challenges awaiting the staff at the O.J. Noer Facility.

The first change was the O.J. Noer Facility staff would be charge of maintenance on the bentgrass research putting greens. In the past, this maintenance has been done by the Turfgrass Diagnostic Lab Manager. Before I accepted the position of O.J. Noer Station Superintendent in January of 2017, the responsibility of maintaining those research greens was mine as the TDL Manager. Because I provided the greens maintenance duties when I was the TDL Manager, I feel very confident that my staff and I can manage those research greens. My staff last year consisted of a summer college student working 25 hours per week and a season long staffer (78 year old man) working less than 28 hours per week, thus there was not currently enough O.J. Noer Facility staff to complete these newly created job duties. Dr. Koch, Dr. Soldat and Mike Peters, Director of the Ag Research Stations offered to assist in funding an additional part-time seasonal staff position. THANK YOU VERY MUCH!

It is no surprise to anyone who is part of the team that hires staff, the biggest issue is filling seasonal and summer positions. I began advertising for my student hourly position in February and as of April 5th, had not received one application. As of today May 21th I found someone to fill this position who is able to start Tuesday, May 28th. I know we are all in the same situation. Fortunately, I have not had a hir-

ing issue like this in the past. When we all get together and the discussion revolves around recruiting employees, now I can better relate to some of the serious issues superintendents go through.

The newly created season long position has been a completely different story. I have had 13 people apply through various outlets. I attempted to schedule interviews with nine different people. I have interviewed four of those people. Unfortunately, the other applicants that scheduled an interview

It is no surprise to anyone who is part of the team that hires staff, the biggest issue is filling seasonal and summer positions.

never showed up. A superintendent in the area informed me this happens all the time. They schedule an interview for a job they are not interested in so they can fill out their forms for the unemployment office. This has been very frustrating. I was lucky enough to have four good candidates for the position. Their fate went like this:

The number one candidate applied and thought I was the research station in Arlington, WI. He lives in Poynette. For the hourly wage the University is allowed to pay and the limited hours, it was not worth his effort.

The second candidate had some lawn care experience and would have worked out well. I offered the position to them. They let me know that it had been over a week since the interview and they found a much better offer, 40+ hours per week and more money.


The third candidate had a little experience but let me know during the interview that they would not be able to take the job when they realized that pesticides may be sprayed 4-5 days a

week at the Noer Facility. I thanked him for his honesty and wished him well in his job search.

My fourth candidate came in for his scheduled interview. What he seemed to lack in experience, he made up with his positive attitude. He was offered the position. He accepted but needed an extra week before he could begin due to a commitment to his previous employer. This position allows him to make some money while he begins his career path to be a firefighter. He was able to begin May 23rd, for a position was schedule to begin April 15th. Talk about being behind!

Last year during the flood in August, the irrigation pump was destroyed. Although we did not know this for sure until we were able to get all the controls back online, which turned out to be in November. The bidding process for replacement began in November and ended in January. With the winter we had, the actual pump installation was delayed until this spring. With the floods and extra wet weather the pump was finally installed April 23rd. The irrigation system is set and ready to go thanks to the expertise of Gabe Lopez of Irrigation Protection Services and Aaron Goninen of Reinders, Inc.

With the irrigation issues, flooding and staff shortage, I was behind by May 1st. This is not the way I planned to commence the growing season. I did not apply the greens or fairway fertilizers due no irrigation. I did make a small application to a few plots to encourage better turf density. I timed these with a rainy period where the forecast was for 0.75 to 1.25 inches over the following few days. Over that time frame the Noer Facility received 0.1 inches on both days.

It is now May 21 and I am ready for the snow to fall again! Anyone else want to go ice fishing? 

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Spring Finally Seems to be Here

By Kurt Hockemeyer, Turfgrass Diagnostic Lab Manager, O.J. Noer Turfgrass Research and Education Facility

It seems like it's taken awhile for spring to arrive, but this year, I think everyone would be right if they thought that. I've been keeping track of growing degree days (GDDs) in Madison for the past few years and have data all the way back to 2011. I'm mostly interested in when we reach 140 GDDs, base 50°F. Research out of Michigan State has shown that this is the optimal time to apply early season dollar spot fungicide applications. This is well before dollar spot symptoms are present, but multiple studies have shown that these types of fungicide applications will reduce dollar spot pressure for an extended period of time, if not for the whole growing season.

Well according to temperatures measured by NOAA, Madison did not hit this point until May 22nd this year. That is the latest in the year that Madison has hit this point since at least 2011. We just have not been able to accumulate any heat into the environment. But today is 70 and sunny so I think we've finally turned the corner. Hopefully, summer is still a long way off. I wouldn't mind a lot more days between 65-70°F before the truly hot days come around.

I know everyone reading this is likely very busy at this time of year. But I want to take the time to thank the folks who are very busy and still support the Turfgrass Diagnostic Lab by being contract members.

Without this support, the lab would not be here to support the industry with timely diagnoses and reports with pictures and recommendations. So without further ado, below is a list of every company/facility who is supporting the lab in 2019 (Table 1). Facilities listed in bold are \$1000 members and an extra thanks goes out to them.

Table 1. 2019 TDL Contract Members. Thank you!

Company/Facility	City	State
Abbey Springs GC	Fontana	WI
Advanced Turf Solutions	Mendota	IL
Bass Lake GC	Deerbrook	WI
Blackhawk CC	Madison	WI
Blue Mound CC	Wauwatosa	WI
Brown County GC	Oneida	WI
The Bruce Company	Middleton	WI
Chenequa CC	Hartland	WI
Country Club Estates GC	Fontana	WI
Eagle River GC	Eagle River	WI
Eau Claire CC	Eau Claire	WI
Edgewood GC	Big Bend	WI
Evansville GC	Evansville	WI
Fox Valley GC	Kaukauna	WI
Green Bay Packers	Green Bay	WI
Hayward Golf Club	Hayward	WI
Helena Chemical	Edgerton	WI
Hidden Glen at Bentdale Farm	Cedarburg	WI
Insight FS	Jefferson	WI
Jasperson Sod	Franksville	WI
Kettle Hills GC	Richfield	WI
Kohler Golf Courses	Sheboygan	WI
La Crosse CC	La Crosse	WI
La Crosse Seed	La Crosse	WI
Lawnmaster Inc.	Green Bay	WI
Lurvey Sod Farm LLC	Whitewater	WI
Maple Bluff CC	Madison	WI
Milwaukee Brewers	Milwaukee	WI
Milwaukee Parks	Milwaukee	WI
Minocqua CC	Minocqua	WI
New Berlin Hills GC	New Berlin	WI



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Our contract members may have received a gift in the mail a few months ago. We briefly mentioned in one of our last TDL Updates of 2018 that we would be mailing out TDL stocking caps and the 2017 edition of Turfgrass Weed Control for Professionals to all TDL contract members. I ended up mailing the hats and books, but forgot to put a reminder of “why” everyone was receiving these things.

I apologize for the oversight. So if you received a TDL hat and a weed control book, then those were simply a “thank you” for supporting the lab. I still have lots of hats and books available for contract members (**Figure 1**), so stop by the lab or let me know and I will try to ship you the gifts. Thanks again for your support of the lab and good luck to everyone on the upcoming 2019 growing season. 🌱

Figure 1. TDL hats and weed control books were sent as thank you gifts to our contract members. Hats and books are still available to contract members who let me know or stop in and pick it up themselves.

North Hills CC	Menomonee Falls	WI
North Shore GC	Menasha	WI
Oconomowoc CC	Oconomowoc	WI
Oliphant Golf	Plover	WI
Oneida Golf & CC	Green Bay	WI
Paul's Turf and Tree	Marshall	WI
Pine Hills CC	Sheboygan	WI
Portage CC	Portage	WI
Racine CC	Racine	WI
Reedsburg CC	Reedsburg	WI
Reinders	Sussex	WI
Reliable Property Services	Middleton	WI
Rhineland CC	Rhineland	WI
Rolling Meadows GC	Fond du Lac	WI
SentryWorld GC	Stevens Point	WI
South Hills CC	Fond du Lac	WI
Springview Landscape	Green Bay	WI
Summit Seed	Rockford	WA
Superior Turf Services	Eden Prairie	MN
Syngenta	Greensboro	NC
The House on the Rock Resort	Spring Green	WI
The Legends at Bristlecone Pines	Hartland	WI
Tuckaway CC	Franklin	WI
University Ridge GC	Verona	WI
Weedman	Middleton	WI
West Bend CC	West Bend	WI
Westmoor CC	Brookfield	WI
Winfield Solutions	Plymouth	MN





January 7th, 2020 Turfgrass Research Day Conference
American Family Corporate Headquarters – Building A
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8:00 – 8:30am	Registration
8:30 – 8:45	Welcome and Scholarships - Auditorium
8:45 – 9:30	New Insights for Dollar Spot Control Dr. Paul Koch– University of Wisconsin – Plant Pathology
9:30 - 10:15	Highlights and Progress in 2019 Graduate Students
10:15 – 10:30	Break
10:30 - 11:15	Lets Talk Glyphosate Dr. Mark Renz – University of Wisconsin - Agronomy
11:15 - 12:00	Pump House Renovations, Upgrades and Updates Gabe Lopez – Irrigation Protection Services
12:00 – 12:50	Lunch
1:00pm – 1:30	2019 TDL Update Kurt Hockemeyer – Turfgrass Diagnostic Lab
1:30 – 2:15	Summer Trials & Robotic Mowers Dr. Doug Soldat – University of Wisconsin – Soil Science
2:15 – 3:00	Ask the Professionals – Roundtable Discussion Dr. Paul Koch and Dr. Doug Soldat Moderator Jens Arneson – Assistant at Maple Bluff Country Club



Paul Koch is an assistant professor in the Department of Plant Pathology as well as the Molecular and Environmental Toxicology Center at the University of Wisconsin-Madison. He joined the faculty in January of 2014. His research has focused primarily on fungicide breakdown in the environment and snow mold diseases on golf course turfgrass.



Dr. Renz's research focuses on weed management on invasive plants. His goal is to develop information that will improve management decisions related to weeds to maximize benefits while minimizing environmental impact.



Gabe Lopez started out in this business in the fall of 1988 at Lake Lawn Lodge. He then moved onto Geneva National during the initial construction and grow in of the Palmer and Player course simultaneously. Then he went off the grid for a year and worked in road construction before returning to the golf business as the irrigation service manager for Reinders for 17 years. Finally in the fall of 2012 he started his own company, Irrigation Protection Services, focusing on pump station repairs, renovations and sales in the Midwest.



Kurt manages the Turfgrass Diagnostic Lab at the O.J. Noer Research and Education Facility. He also oversees the field trials conducted as part of Dr. Paul Koch's research program. He received his B.S. in Turf Science and his M.S. in Turf Pathology both from Purdue University. He has been a member of Dr. Koch's research team since fall of 2015.



Doug Soldat is a professor and turfgrass extension specialist in the Department of Soil Science at the University of Wisconsin-Madison. He advises turfgrass management students at the UW and teaches courses in the fields of turfgrass management and general soil science.



Jens Arneson is an Assistant Golf Course Superintendent at Maple Bluff Country Club since May 2013. He graduated from the University of Wisconsin-Madison with degrees in Soil Science-Turfgrass Management and Scandinavian studies. He is active on the WGCSA Assistant's committee, is a Grassroots Ambassador and is currently in the GCSAA EXCEL Leadership Program.

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If you have any questions, contact Audra at audra.anderson@wisc.edu or
608-845-6536. Registrations must be received by December 30th, 2019.

May Meeting at Racine Country Club

By David Brandenburg, Editor, The Grass Roots

Mike Handrich, Golf Course Superintendent at Racine Country Club since 1989 hosted the WGCSA one last time before retirement. Mike has been a well known figure at Racine CC and the WGCSA serving on the board of directors and on committees.

The May morning meeting was held May 13th and was one of the nicer days of a cold wet spring. Those in attendance were glad to be enjoying camaraderie and sunshine.

Racine Country Club was one of the 9 founding clubs of the Wisconsin State Golf Association when formed in 1901. According to the club website the original location was a 9 hole layout west of the city believed to have been designed by Thomas Bendelow.

By 1909 the club wanted to expand and found a new property on what was then the Charles Wustum Farm. This location was better suited for a modern golf course and had room for expansion.

The first 9 holes of the new course were designed by Joseph Roseman, Sr. who began his career as a caddy at Philadelphia Country Club prior to becoming the professional/greenskeeper at Des Moines Golf and Country Club in 1907.

Roseman stayed at Racine serving both roles until 1916 when he moved to Chicago and later founded the Roseman Tractor Mowing Company. Roseman is known as the father of the modern mower. It was common at the time for the golf professional to also be in charge of golf course maintenance.

By 1926 the club purchased adjoining property and expanded to 18 holes with the revised course designed by golf professional Todd Sloan, who also designed neighboring Meadowbrook CC.

In 1977 the team of Larry and Roger Packard were commissioned to redesign the facility and made extensive alterations to the layout.

In 2005 the club commissioned Mark Mungeam of Cornish, Silva and Mungeam to oversee the renovation of all the bunkers on the golf course. Racine Country Club hosts a challenging layout with many great views and elevation changes.

The expansive clubhouse has also changed over the years and at times hosted rooms for guests, 4 bowling alleys and multiple porches along with the dining rooms.

Racine Country Club and mother nature provided for a great day and although our team struggled a bit a great time was had by all who participated.

Thank you to Mike and Craig for hosting our group and best of luck to Mike and Karen as they enjoy a well deserved retirement. 🌱



Head PGA Professional Matt Booker and Mike Handrich greet the group after golf. Mike was on the tail end of a 31 year run at Racine and was looking forward to traveling in retirement with his wife Karen.

Mike was quick to thank his entire staff and Assistant Superintendent and soon to be Superintendent Craig Sondergaard along with Mechanic Jeff Christopherson. Handrich also discussed his appreciation for his relationship with PGA Professional Matt Booker and Club Manager John Schneider.

Golf Course Superintendents at Racine Country Club

**1909-1916 Joseph Roseman
1917-1927 Unknown
1928-1949 Eugene A Fox
1950-1970 John Crewe
1971-1978 Harold Schuemann
1979-1988 Dennis "Skip" Willms
1989-2019 Michael Handrich
2019-present Craig Sondergaard**



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Above: Racine Country Club embraces it's long history with this display in the lobby of the historic clubhouse.

Below: The 554 Yard Par 5 18th Hole provides for a great finish down below the clubhouse. The picture shows how blue the sky was for our event. A rare circumstance for the spring of 2019.

4 Person Scramble Results

Gross -

First Place: Peter Meyer, Seth Brogren, Bruce Schweiger and Scott Verdun.

Third Place: Aaron Goninen, Chad Grimm, Rob Johnson and Brian Bucholz.

Net -

First Place: Mike Handrich, Jeff Christopherson, Chris Ruud and Matt Brooker.

Fourth Place: Michael Bremmer, Garrett Luck, Alex Beson-Crone and Ben LaBarre.

Flag Event Winners

Long Drive - Scott Verdun and Nate Boltz.

Closest to Pin - John Rautman, Harrison Beal, Mark Robel and Kevin Knudtson.

Long Putt - Phil Spitz and Ted Reirson.





Above: The well protected 7th green from the 12 th tee.

Left: Tim Schwierjohn of Redexim Turf Products makes the putt while Jake Silkey from Wheeler Highway Products and Andy Kronwall, (Hidden) from Abby Springs Golf Course try to learn from his line.

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Top Left: Assistant Superintendent (Soon to be Superintendent) Craig Sondergaard, and soon to be retired Superintendent Mike Handrich accept a commemorative flag from the WGCSA.

Top Right: Tennis is a big part of Racine Country Club

Left: The expansive Racine Country Club Clubhouse

Bottom: The Par 3 4th Hole plays 184 yards uphill to a well protected green with 3 bunkers and a roll out area to the back left.





Left: The area around the 12th green shows some of the elevation changes at Racine and shows how far behind the trees are for May 13th due to the cool spring weather.

Right: This planting near the 6th tee is just starting to bloom.

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Always Improving

By Jake Schneider, Hjemmevaer, Norway

One reason why I enjoyed winter (not the most timely reference) while working at Blackhawk CC was because it gave us time to reflect on what went well and what went poorly during the prior growing season (another was not having to hand water for a few months). Using this assessment, we could develop proposals for improvements by implementing ideas that we typically gained via networking or attending a conference or educational event. It wasn't often that we came up with anything totally new, but rather, most of today's changes seem to be refined versions of something already tried and true. Given the advances that we have seen in science and technology over the past ten-plus years, the opportunities to improve have certainly been ample, but not always affordable. Luckily, not everything costs money, and you can often see the highest dividends with intangible items such as workplace culture, improved communication, and collecting data on your practices to allow for more efficient schedules and performance evaluations.

Throughout my professional career, I think that the ability to foster change has been one of my strong suits, and in the cover letter that I have thoroughly scoured over the past eight months, I've done my best to highlight that perceived strength. Even in my personal life, I have had some fairly significant goals in recent years—mostly relating to endurance athletic events—and have accomplished most of them through hard work and dedication. These pursuits were admittedly somewhat easy mostly because I enjoyed putting in the time and was given some genetic talent. However, as I spend my time in overseas unemployment, it is becoming increasingly obvious that I need to put more effort into those goals that

don't come naturally and that may not have instant payout.

Cooking is a great recent and personal example of me successfully overcoming this issue. Prior to the big move, I was a lazy cook; Crock Pot meals and chicken breasts on the George Foreman grill were about as gourmet as it got in my house. During that time, it seemed as if cooking creatively and with new recipes was a waste of time and whole lot of effort for 15 minutes of eating enjoyment.

WHO HAVE I BECOME? Some might say a better, more well-rounded person, I suppose. So, it seems as if you can teach a 36-year-old dog new tricks.

Turns out that my perspective changed due to being able to now schedule my preferred leisure activities into a normal person's working hours. Just this week while my wife was out of town for business, I decided to prepare a respectable meal instead of throwing a pizza in the oven. WHO HAVE I BECOME? Some might say a better, more well-rounded person, I suppose. So, it seems as if you can teach a 36-year-old dog new tricks.

Now, back to my failures. For many years even prior to moving overseas, I had the loosely-stated goal of becoming fluent in Spanish. Taking four years of classes during middle and high school and working with Spanish-speaking individuals throughout the majority of my career gave me a leg up, but I never could seem to muster the motivation to devote myself to that goal in spite of wanting to be able to have direct, effective communications with those employees (and bartenders in tropical destinations). Although it would have been an advantageous

skill, it was never truly necessary, and I've had the same issue in Norway.

Coming to Trondheim, I fully expected to become somewhat proficient in Norwegian by the time that our stint ends, but after initially using Duolingo and taking two language-learning classes, almost all ambition has been lost. When I think about why this has happened, it boils down to two factors—it's hard to learn and seemingly everyone here speaks really good English. I fully acknowledge that these are poor excuses to not take advantage of learning the language while living here, but I can think of only one instance where I interacted with someone who didn't understand English. Being born in America is great because you get to learn a commonly-spoken language, and it's also a curse in that we are bums when it comes to expanding our horizons in those regards.

I need to stop being a bum, and I think that the best way to start is to write down my goals. My wife likes to say that I'm a bit like Ron Burgundy in these regards: anything you type, Burgundy will read. In my current life, this mostly applies to the grocery list, and my friends enjoy making me well aware of this fact. So, in no particular order, here is what I'm shooting for over the next 18 months.

1. Become proficient in Spanish because it has more universal practicality. Seems like a logical thing to do in Scandinavia, right?

2. Learn how to perform road bike maintenance and deal with a flat tire. Gotta have an easy one.

3. Run a marathon PR. Setting a sub-2:55 goal sounds a bit aggressive, but it will be in the back of my mind.

4. Do a better job of managing my occasional anxieties. For some reason, I worry more when I have less to do. 🌱



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First Green Field Trips Continue Around The Region

By Shane Conroy, GCSAA Field Staff - Great Lakes Regional Representative

As First Green field trips continue to be hosted by superintendent across the country, it's no surprise this program continues to gain steam. Hot on the heels of many successful field trips this spring and summer, the First Green is making headlines again thanks to Ken Melrose, former CEO and chairman of the Toro Company.

The Kendrick B. Melrose Family Foundation has donated \$500,000 to the Environmental Institute for Golf (EIFG), the philanthropic organization of the Golf Course Superintendents Association of America (GCSAA). The endowment will support First Green, which provides hands-on STEM (science, technology, engineering and math) education at golf courses.

The Melrose Family Foundation is supported by Ken Melrose, who retired from the Toro Co. as CEO in 2005 and from the chairman position in 2006. That same year he formed Leading by Serving, LLC, a company whose mission is to advance the principles of servant leadership in business organizations.

The First Green was founded in 1997 in the Pacific Northwest and officially became part of the EIFG in 2018. First Green is the only STEM education and environmental outreach program that uses golf courses as learning labs. Field trips average 75 students who not only learn about science and the environment but are also exposed to the game of golf as well. For most students, this is their first-time stepping foot on a golf course. In the year since GCSAA took over leadership of First Green, more than 2,000 students across the country have partaken in First Green field trips.

"As the child of an educator, I am



pleased to have the opportunity to support a program that provides hands-on education while introducing students to the many benefits of a golf course," Melrose said. "Under GCSAA's direction, First Green has expanded nationally and is reaching more students than ever before. STEM education is vital in preparing students for the future, and I am proud to be a part of that." Melrose's mother, Dorothy Lumley Melrose, taught math, English and public speaking at Memorial Junior High School in Orlando, Fla., in the 1940s and 1950s. In 2014, Melrose honored his mother's memory with the creation of the Dorothy Lumley Melrose Center for Technology, Innovation and Creativity at the Orlando Public Library.

This is the third large gift to GCSAA and the EIFG from the Melrose Family Foundation. In 2012, the foundation gave \$1 million to endow the Melrose Leadership Academy, which focuses on professional development for golf course superintendents through opportunities to attend the annual Golf Industry Show. Since it began, 113 superintendents have experienced the Melrose Leadership Academy. In February, a second \$1-million gift was announced to create the Melrose Equipment Management Endowment. The endowment will have four focus areas: continuing education, a certificate

program, growing membership in GCSAA and the Melrose Equipment Management Experience, which will bring GCSAA-member equipment managers to the GIS for leadership and education sessions.

"GCSAA is truly blessed to have Ken Melrose as a good friend." GCSAA Chief Executive Officer Rhett Evans said. "His generous gifts have made a difference in the professional lives of superintendents and equipment managers and have helped us fulfill our mission of serving our members and advancing the profession. Now, he is helping us achieve the third part of our mission, which is enhancing the enjoyment, growth and vitality of the game of golf. Countless school children around the country will be the beneficiaries of Ken's latest philanthropic act of kindness."

For more information on the First Green or any of GCSAA's programs contact Shane Conroy by email at sconroy@gcsaa.org or by phone at 1-800-472-7878 ext. 3635. 🌱

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Mowing and Rolling Greens to Manage Green Speed and Turf Performance

By Elliott Dowling, Agronomist, USGA Green Section, Northeast Region
Patrick Gross, Director, USGA Green Section, West Region

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High-quality putting greens are the result of balancing mowing and rolling with available equipment, labor, and weather.

Since the day Edwin Budding invented the first mechanized reel mower in 1830, there has been steady improvement in the conditioning and playability of putting greens. Today, mowing and lightweight rolling are the primary practices used by superintendents to achieve smooth, fast greens.

In the early days of golf, the height of the grass on putting greens was controlled naturally by the intense grazing of rabbits and sheep. This changed with the invention of mechanized mowers and the ability to mow the turf lower and more consistently. Rolling was also an important practice in the early days of golf, and it gained popularity in the early 1900s. The equipment used at that time was

what many today would consider a heavyweight roller, and frequent use resulted in soil compaction and a decline in turf health.

Over time, advances in equipment technology resulted in mowers that can cut grass to less than 0.1 inch and a variety of lightweight rollers to provide fast, true putting surfaces on a consistent basis. In the quest for faster and faster green speeds, many superintendents have experimented with different mowing and rolling programs to see what combinations are best for creating smooth, fast greens while preserving the health of the turf.

Unfortunately, there have been situations where unreasonable golfer demands for faster and faster greens have resulted in turf loss as superintendents implemented excessively low mowing and frequent rolling over a prolonged period. Where is the balance and what is realistic? The goal of this article is to examine the various factors associated with mowing and rolling greens and to put forth a practical guideline for developing an agronomically sound strategy that achieves an appropriate green speed without risking turf injury.



Combining mowing and rolling to achieve a desired green speed and improve smoothness is possible, but caution is necessary to not overstress turf, especially during the heat of summer.

USGA GREEN SECTION

WHY MOW AND ROLL PUTTING GREENS?

Frequent mowing benefits putting green turf in several ways:

- Controls vertical growth.
- Helps grass spread laterally.
- Promotes high shoot density.
- Produces smooth surface conditions.
- Creates less friction with the golf ball and increases green speed.

Lightweight rolling has also become a common practice on putting greens. Primary benefits include:

- Increases green speed.
- Promotes smooth surface conditions.
- Allows for raising the cutting height while maintaining green speed.
- Aids with the incorporation of sand topdressing.
- Corrects soil heaving and mower scalping in regions with freeze-and thaw cycles.
- Reduces algae and dollar spot disease.

The quality and frequency of mowing and rolling operations have a direct impact on both turf quality and surface conditions. Sharp, precisely adjusted mowers do a better job cutting grass blades cleanly and evenly. This benefits turfgrass health and putting quality.

BASICS OF MOWING AND ROLLING

Mowing injures the grass; therefore, healthy and actively growing grass is a prerequisite so that it can withstand and recover from the injury caused by mowing and rolling. If putting green turf is experiencing any type of stress (e.g., high temperatures and humidity, frozen conditions, or a pest infestation), mowing and rolling practices need to be adjusted and scaled back until the turf recovers, otherwise the risk of additional decline is possible.

TYPES OF MOWERS

There are two basic styles of putting green mowers: walk-behind or triplex. Walk-behind mowers have an 18- to 22-inch-wide cutting reel and are propelled by a gear-driven rear drum. The operator guides the mower back and forth across the green in straight lines, creating an attractive stripe pattern. Walk mowers are lighter than triplexes, leading to less stress on the turf, especially on the cleanup passes.

Triplex mowers feature three mowing heads mounted on a three-wheeled motorized frame. In most cases, the actual cutting head is identical between the triplex and a walking mower. The major advantage to triplex mowers is that one employee rides the machine over the green rather than walking, which, when combined with the larger cutting swath at 60 inches, leads to a quicker mowing operation.

Both walking units and triplexes provide excellent mowing quality when properly sharpened and adjusted.

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Improvements in mower technology have resulted in newer triplexes that cut grass with the same quality as walking units, which is why many courses are returning to triplex mowers. Additionally, the labor shortage that the entire country is currently facing is forcing many facilities to utilize triplex mowers to save time with a reduced labor force. For example, a typical 18-hole golf course uses four to six employees to walk mow putting greens, while half the staff — or less — can perform the exact same job in the same amount of time with triplex mowers.

HEIGHT AND FREQUENCY OF CUT

Another basic concept of mowing putting greens is determining the height of cut. This adjustment is entirely course specific and is determined by the superintendent based on the type of grass, surface contours of the greens, seasonal growth rate, and the desired green speed. What may be appropriate at one course may not be appropriate at another.

One very important point that is often misunderstood is that not all grasses are equal. A mowing height that is considered appropriate for creeping bentgrass might not be appropriate for *Poa annua*, ultradwarf bermudagrass, or seashore paspalum. Determining the mowing height is not only dependent on grass type but also equipment, expectations, and labor availability. All grasses have a height-of-cut tolerance. It is typical for the height of cut to be adjusted up and down throughout the year based on seasonal growth rates and in response to stressful environmental conditions. Proper mower setup is necessary to achieve the desired height of cut and playability. Proper adjustment is critical to producing the cleanest cut, highest quality putting greens, and desired green speed.

Surface contours and architecture also are factors in determining the height of cut. Putting greens with sharp contours or undulations are



Proper mower setup is critical to achieve a quality cut and limit bruising and mechanical stress that can lead to suboptimal turf health.

subject to scalping from mowing too low. Once an area is scalped, recovery is often slow and seeding or even plugging is necessary to accelerate recovery.

How often putting greens are mowed is dependent on staff size and budget, but grass type and weather also play a role. On average, greens are mowed at least five days per week, and in most cases six or seven days per week. Courses that choose to mow five or six days per week will take advantage of a closed Monday or Tuesday to skip mowing and focus more on agronomic programs like topdressing or aeration. Another reason to take a day or more off from regular mowing is as a precautionary measure during periods of hot temperatures or moisture stress when the added mechanical pressure could damage the grass.

ROLLING BASICS

Rolling is a practice that improves surface smoothness and uniformity and increases green speed. There are a variety of lightweight rollers used on greens, including sidewinder units and roller attachments that can be mounted on a triplex mower.

Some superintendents choose to roll in conjunction with regular mowing, often rolling two to four times, or more, per week. Conversely, some superintendents choose to alternate between mowing and rolling to reduce

plant stress during hot temperatures or periods of slow growth. Research from the University of Tennessee showed that there is no statistical difference in green speed between plots mowed six days per week and rolled three days per week and plots that alternated mowing and rolling. That same research showed that turf quality improved during stressful weather when mowing and rolling were alternated (Samples et al., 2008).

Another rolling strategy sometimes used by superintendents is rolling a 20- to 30-foot-diameter area around the hole location, a practice known as target rolling.

Rolling a limited amount of area around the hole location takes less time while still achieving the speed and smoothness desired by golfers in the area where they are most likely to notice it. Furthermore, this strategy can be implemented daily while giving the remaining area of the green a rest as the hole location and rolling treatment are rotated.

HIGH-LEVEL MAINTENANCE AND SPECIAL EVENTS

Nearly all golf courses host tournaments or special events where faster green speeds and a higher level of conditioning is desired. There are four critical areas that must be addressed to successfully bring putting greens into peak performance for such events:

USGA GREEN SECTION



Surface management plays a significant role in optimizing green speed, firmness, and plant health. A layer of sand at the surface protects plant crowns, improves resilience to compaction, and smooths imperfections.

- Putting greens must be healthy prior to the event, and a sound agronomic program must be in place for routine maintenance — i.e., aeration, topdressing, nutrient management, water management, and pest control.
 - There must be adequate staffing to perform the additional practices that will be implemented on greens. This must include an adequate budget for labor and overtime pay.
 - There must be adequate equipment in the inventory that is in good condition for implementing the necessary practices.
 - Sufficient time must be allowed to perform the necessary tasks ahead of play.
- Preparing greens for tournaments and special events is mainly a function of increasing the frequency of mowing and rolling. Multiple mowing and rolling treatments each day impart extra stress on the turf and therefore should only be done for a short duration of seven to 14 days to avoid potential turf loss.

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One of the main strategies for increasing green speed for special events is lowering the height of cut. Care must be taken to avoid lowering the height of cut too quickly and beyond the tolerance of the turf species. Aggressive reduction of the height of cut leads to thinning of the turf canopy, scalping, moss invasion, and an overall reduction in color and turf quality.

Reducing the height of cut can be safely done in 0.005-inch increments at two- to three-day intervals until the desired green speed is achieved. This process can take one to two weeks and must be planned well ahead of a tournament.

It is important to point out that there is no specific cutting height that correlates to a specific green speed. There are too many site-specific variables that influence cutting height and green speed, including turf species, climate, season, slopes and surface contours of greens, and other such variables. Multiple studies have been done on the impact of lowering the height of cut on green speed.

Michigan State University looked at the impact of 1/32-inch (0.031 inch) height-of-cut reductions on *Poa annua* and creeping bentgrass putting greens. When the cutting height was lowered by 1/32 inch from 3/16 inch (0.187 inch) to 5/32-inch (0.156 inch), there was an increase in green speed of 8 to 12 inches. Lowering the cutting height an additional 1/32 inch to 1/8 inch (0.125 inch) resulted in an increase in green speed of only 6 to 8 inches. The smaller increases in green speed with each reduction in cutting height is what Dr. Thomas Nikolai refers to as the law of diminishing returns (Nikolai et al., 2005). Reducing the height of cut will only take you so far and is just one aspect of producing fast greens. To balance green speed and turf health, it is recommended to mow as high as possible to achieve the desired green speed, which preserves extra leaf material for photosynthesis and growth.

Increasing mowing frequency is another common method to improve surface quality and increase green speed. Double mowing in perpendicular directions removes additional leaf material from the turf canopy, resulting in smoother surface conditions. Interestingly, double cutting does not result in a rapid increase in green speed. It is typically necessary to double cut greens over several days to see an increase in green speed, often in the range of 6 to 11 inches (Nikolai et al., 2005).

After multiple days of double cutting, green speed will tend to plateau. Although double cutting requires more time and labor, the main advantage is that an increase in green speed can be achieved without resorting to a drastically low cutting height. If double cutting in preparation for a tournament, the process must be initiated three to seven days in advance to achieve an increase in green speed for the event. During a tournament, some facilities with adequate resources mow greens in the morning and



Rolling greens for tournament preparation is normally done as a supplement to mowing to increase green speed and promote smooth surface conditions.

in the evening.

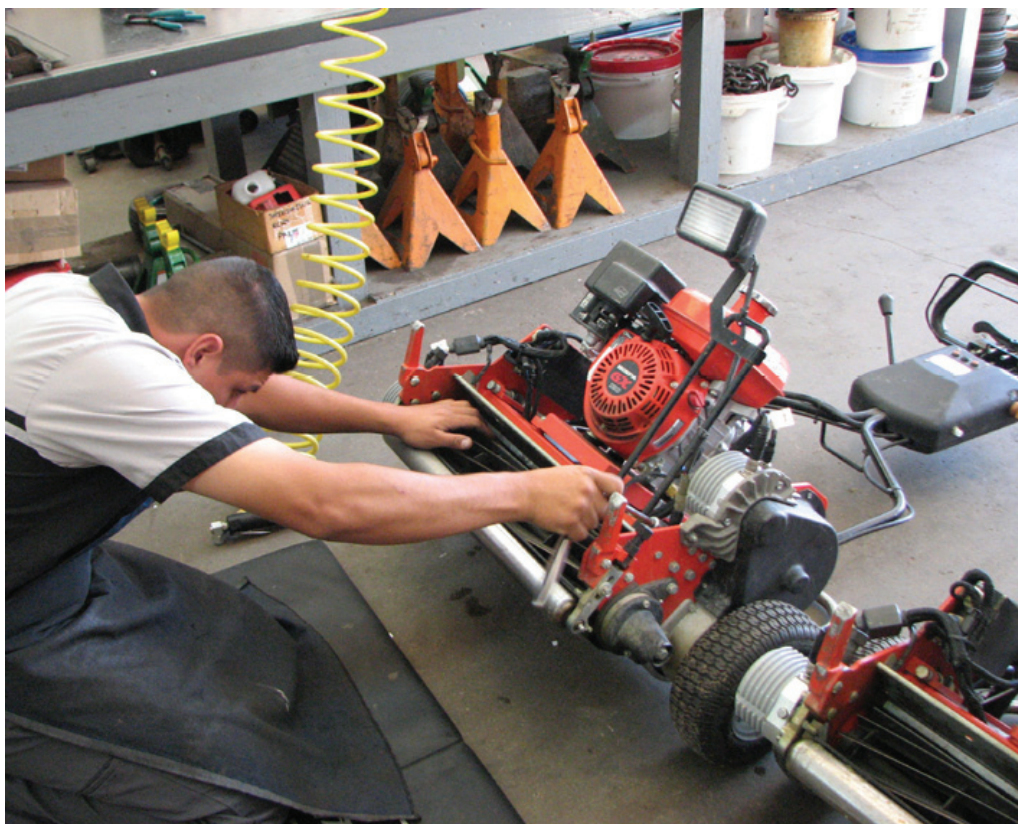
Although leaf growth from the previous 10 to 12 hours is removed, the resulting change in green speed is variable but can have a positive cumulative effect when practiced over several days.

Rolling greens is normally done as a supplement to mowing for tournament preparation. It is common to see an initial 6- to 12-inch increase in green speed immediately after rolling. In some cases, the increase in speed can last for hours or have a residual effect for one to two days. How long the rolling effect lasts is dependent on several factors, including season, day length, and turf growth.

One of the hazards of rolling greens daily during tournaments is the wear pattern and turf thinning that can occur on the edges of greens where the roller changes direction. Turning boards made of carpet, wood, plastic, or other materials are often placed on the edges of greens and moved during equipment operation to minimize turf damage in the areas where rollers and mowers are turned.

If possible, rotating the direction of rolling each day helps to reduce the amount of damage on the edges of greens.

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DETERMINING THE PROPER COMBINATION OF MOWING AND ROLLING FOR YOUR FACILITY

The effects of various cutting heights, mowing frequencies, and rolling programs will be different for every course. Obtaining benchmark measurements for several days in a row is the only way to determine the effects of different mowing and rolling treatments for a facility. The following protocol is typical for USGA championship preparation and can be used as a guideline for developing a mowing and rolling program for putting greens at any facility.

- Identify relatively flat areas on greens for taking Stimpmeter® readings. The surface slope should be less than 1 percent in the measurement areas and preferably 0.1 to 0.2 percent. The areas used for taking Stimpmeter readings should be marked with a felt-tip marker so that readings can be taken in the same exact location each time. One or two greens will provide an acceptable amount of data, but taking measurements on more greens makes the information more dependable.
- Take Stimpmeter readings before and after mowing to determine the amount of green speed increase as a result of a single cut at the determined height.
- Take Stimpmeter readings before and after rolling to gauge the increase in speed from the rolling treatment.
- On a separate green, take Stimpmeter readings after a single cut. Place the grass clippings in a 5-gallon bucket that has markings on the inside at 1-inch increments. Mow the same green a second time, take Stimpmeter readings again, and place the grass clippings in another marked 5-gallon bucket. Compare how much grass was removed with a single cut versus a double cut as well as the change in green speed. Note that



The effects of different cutting heights, mowing frequencies, and rolling will be different for every course. Testing different combinations and taking Stimpmeter readings after each procedure is the best way to determine what works best.

this is a volume measurement of clippings and not a weight measurement.

- Take Stimpmeter readings at various cutting heights and record the results.
- Use a prism gauge to evaluate mowing quality and the effective cutting height in the field. Ideally, this should be done with the mechanic so that there is a better understanding of any adjustments that are needed to the sharpness and cutting height of mowing equipment.
- Stimpmeter readings should also be taken in the morning, at midday, and in the afternoon to check the variability in speed and the amount of growth or “bounce-back” from rolling that occurs.
- Record the amount of time necessary for each activity so that a realistic calculation can be done for labor requirements.
- Constantly evaluate turf quality throughout the process to monitor potential negative impacts to turf density and overall quality.

The measurements taken through-

out this process will provide valuable data to determine the impact of different mowing and rolling treatments. It is typical to see a gradual increase in green speed over several days when multiple mowing and rolling treatments are implemented. Then it's up to the superintendent and other decisionmakers to determine what is realistic given the available resources.

SURFACE MANAGEMENT

Mowing and rolling play an integral role in managing green speed and putting green performance, but other cultural programs to promote surface smoothness, relieve compaction, and remove/dilute organic matter also play a role. Light and frequent sand topdressing is one of the most important practices for maintaining quality putting greens because it smooths the surface and dilutes organic matter. Topdressing throughout the growing season is a very effective practice for maintaining a firm and fast playing surface and is also effective at reducing anthracnose severity (Murphy et al., 2018).

Cultivation is equally important because it removes organic matter (OM) to maintain consistent and appropriate levels so that excessive moisture retention does not lead to soft surfaces. Some of the more common cultivation practices include:

- Core aeration with hollow tines set at a specific spacing and depth to remove a target percentage of OM.
- Vertical mowing is often used to remove OM from the very top portion of the soil profile and reduce leaf density. Vertical mowing is not a substitute for core aeration, but it is an effective way to remove OM and clean up dead leaf tissue without disrupting the surface as much as core aeration.
- Grooming is a less aggressive form of vertical mowing, but it is no less effective in maintaining healthy, smooth putting surfaces. Grooming works much the same as vertical mowing without cutting as deep into the thatch layer.

CONCLUSION

Mowing and rolling greens seems so simple, yet there are many nuances involved that must be executed properly if the desired green speed and surface conditions are to be achieved. Key aspects that must be considered include:

- Maintain the highest possible cutting height to achieve the desired green speed so that turfgrass health can be preserved.
- Mow with sharp and properly adjusted mowers.
- Experiment with different mowing and rolling programs — e.g., height of cut, frequency, and other variables — to see what produces the best results for the putting greens at your facility.
- Attend to basic agronomic programs to keep the grass as healthy as possible so that the added stress of mowing and rolling can be tolerated.


There is no one-size-fits-all approach to managing green speed and turf performance. Before you even begin to develop or refine your putting green management program, you must first detail what it is that you want out of your putting greens. This is the opportunity to take a hard look at your course, clientele, budget, and labor force, and set



Triplex mowers can provide excellent mowing quality and require fewer employees to mow greens compared to the use of walk-behind greens mowers.

realistic goals that are achievable and repeatable. Balancing mowing and rolling with available equipment, labor, and current weather will help you achieve the smoothest and highest quality putting greens on the most consistent basis. Coupling these maintenance practices with proper agronomics to provide your putting green turf with the best opportunity for optimal turf health and will help you achieve your goals effectively and efficiently.

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Are Robot Mowers in Your Future?

By Doug Soldat, Ph.D. and Nick Bero M.S., Department of Soil Science, University of Wisconsin – Madison

I'm a SciFi nut. It all started with Star Wars movies as a kid growing up in the 1980s. These days, I am always reading a science fiction novel (just finished *The Three Body Problem*), and watching SciFi TV shows (can't wait for season 3 of *Westworld* to begin). I also love reading what others have to say about how technology will continue to shape our world for better or worse. I am particularly fascinated by the potential challenges presented by the rapidly developing field of artificial intelligence (AI). I recommend reading this Wait but Why blog post on AI <https://waitbutwhy.com/2015/01/artificial-intelligence-revolution-1.html>, and if you like that, then try Superintelligence:

Paths, Dangers, Strategies by Nick Bostrom.

So with my future-looking bias laid bare, let's talk about robotic mowers. Like most "new" technologies, they have been around a lot longer than you think. In fact, the first one showed up in 1969, and could mow 7,000 square feet on a single charge by randomly walking around the lawn defined by a perimeter wire – nearly identical to the specs of today's robot mowers. But, in 1969, a robot mower would set you back about \$800 -- over \$5,000 in today's dollars.

Today, you can get a new robot mower for around \$1,000, still pretty steep for most consumers. Battery technology will continue to get bet-

ter and cheaper and with continued decreases in technology costs, these devices will likely make their way into more turfgrass areas. I imagine someday soon, a consumer grade robotic mower will cost the same as a consumer grade push mower. Then, the choice will be simple for most homeowners in the market for a new mower. Lawn care companies are entering the robotic mower business. For homeowners that don't want the upfront cost of a mower or the pain of installing a perimeter wire, Turf-Bot Madison will install their robot mower in your lawn for the season, and send you a mowing bill based on the size of your lawn and the length of time the mower is installed.

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Mechanix Illustrated

A picture and description of the Mobot, an early robotic lawn mower (Mechanix Illustrated, January 1969).

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Overall, robotic mowers make a lot of sense for golf courses and other turf areas. They have few moving parts, which means there are fewer things that can break, and they are almost free of regular maintenance needs. They don't have any fuel or hydraulic oil to leak. They make a lot less noise, and can be scheduled to mow at night. They cut using easily replaceable razor blades so the quality of cut is extremely high and changing blades takes only a screwdriver and a few minutes per unit. They can be easily managed to never violate the 1/3 rule, and anecdotal evidence suggests they produce healthier turf than turf mowed with a rotary mower (this is something we are currently quantifying). They use electricity, so the environmental impact is tied to how clean your electricity source is. While many electric plants burn coal or natural gas, more and more electricity is being produced using solar and wind energy. You could install solar chargers for these units to be off-the-grid.

Robotic mowers also have disadvantages, but many of these can be solved. The largest disadvantage is cost, but as with all technologies, I expect the cost to eventually become compara-

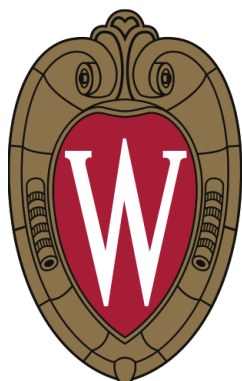
ble or cheaper than the conventional methods. Right now, the laying of perimeter wires is laborious. Perimeter wires are a safety feature. While GIS could be used in place of a wire, it can be costly for high accuracy or not reliable enough. But, eventually some company will develop a wireless mower that has a safety profile that meets or exceeds the perimeter wire systems for the same or lower cost. There are also safety unknowns – what happens when a robotic mower hurts someone? While conventional mowers aren't accident free by any means (about 70 people die and 250,000 are injured each year), better the devil you know. Also, stealing of robotic mowers may be a bigger concern than conventional mowers, but I doubt it.

Aside from the disadvantages discussed above, there is a philosophical reason that some turf managers are not welcoming the robotic mowing revolution. Nobody wants to be replaced by a robot, and many turf managers don't love the idea of a workforce with more robots than people. I get it, and expect things to change more slowly on golf courses than on the home lawn and landscape sectors. A golf course is already set up to use

conventional mowers, and switching to a robotic mowing system would take a lot of money, time, and planning. I believe robotic mowing will start in the driving range, move to the roughs, and eventually the fairways as managers start to see the benefits firsthand. Humans will still be required to do the bulk of the trimming, detailed mowing (bunker banks, steep areas), and greens mowing and rolling. I doubt if a single person will be let go as a result of a robotic mower purchase, but overtime the staffing needs will shift from people who sit on mowers, to those who manage and maintain mowers while addressing other tasks. Time will tell, but I think a shift to robotic mowing will be one of the major trends in turf management in the coming decades.

This year at the O.J. Noer Facility, we are demonstrating and evaluating the four robotic mowers detailed below. Whatever your views on robotic mowing, I hope you came to the summer field day and saw a few of the units yourself and asked some questions. I am excited to gain some experience working with them this summer and hope to have some new insights for you in the future. 

Mower	Grade	Mowing Area	Approx. Purchase Price
Echo Robotics TM2000	Commercial	6 acres	\$15,000
Robomow RC304	Consumer	0.1 acres	\$1,000
WORX Landroid	Consumer	0.25 acres	\$1,000
Husqvarna Automower 315x	Commercial/Consumer	0.4 acres	\$2,000



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Where Is My Grass Roots?

By David A. Brandenburg, Editor, The Grass Roots

As I write this on December 1st, many of you are asking the question "Where is my issue of *The Grass Roots*"? I as editor will take the blame for the gap in issues. After 9 years at the helm as editor I just did not get it done this season. Interruptions of work and life got in the way. I was able to get to most of the tournaments and association events but putting those events on paper and providing the layout of the issues fell by the wayside.

I offer no excuses but will offer my apologies for this happening and my confidence it will not happen again. We will catch up on our issues and association events from 2019 will be covered.

I thank our writers for their continued contributions and support as they have never missed their deadline.

I also thank our advertisers for their support as they are the reason you receive these pages and the education therein.

In the next few pages we celebrate the career of Mike Handrich who spent 31 years at Racine Country Club and retired to enjoy life with his wife Karen. It is a great end to a career bringing quality conditions to the members of Racine and mentoring plenty along the way.

After that we remember the lives of 4 long time Wisconsin Golf Course Superintendent Association Members who passed away this year. All of them had a influence on golf course maintenance in the Badger State in different ways.

I can share the pain of loss with their families as my family lost a Cousin Jackie and a Uncle Dan both who were "Rock Stars" in their community. Known by all and loved by most in their small community both will be missed by family and friend alike.

Jackie 48 was lost to addiction and Dan 68 to a cancer he fought valiantly for years. Even though I am over 50 each loss of our family back home in Marion, WI is still a loss of part of my childhood. It is a disappearance of anyone who knew me while I grew up and could share stories and memories of those times.

Our work family at Rolling Meadows also lost two members this fall. Rick a longtime golf industry employee came to our town to help out his sister and joined our staff in August and died in his sleep in September. Not a bad way to go but he was only 56 with no known health problems besides a bum leg.

This week we lost a 5 year member of our staff at the age of 62 from a heart attack at home while preparing Thanksgiving for his wife and 4 children and grandchildren.

Brian was a big man with a big heart. He had a great sense of humor and a smile that gave away if he was serious or pulling your leg.

Brian joined our team after selling off his milking herd of cows and worked by us and at Fleet Farm as he still had payments to make on the family farm before he could relax a little.

We do not know when our time here will end. All we can do is enjoy the time we have and be prepared for what may happen. Our discussions in the shop centered on our memories of Brian and the realization we need to finish wills, pick a funeral home and burial site so our families are not left scrambling after we are gone.

Death is not a pleasant thought but it is better to be prepared than your spouse or kids guessing at what you want while they mourn your loss.

Enjoy the start of winter and the slower time it can bring. Safe travels to those of you with trips planned over the holiday season. Your next issue of *The Grass Roots* should arrive in 2 short weeks. ✓



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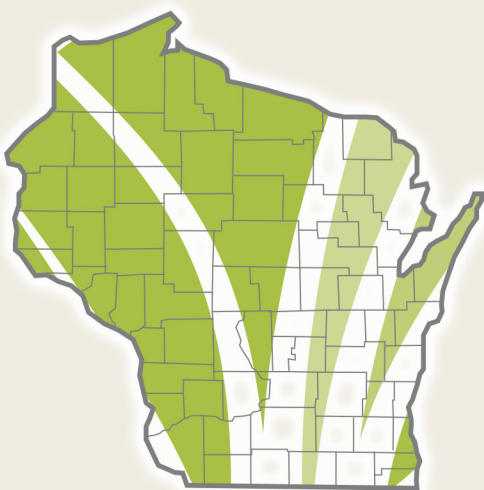
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EDITOR'S NOTEBOOK

Happy Retirement to Mike Handrich who hosted our May WGCSA meeting featured on page 40. Mike retired from the club shortly after the meeting and was looking forward to enjoying the summer camping and traveling with his wife Karen and friends.

Mike was at Racine for 31 years after taking over for Skip Wilms and was a regular participant in WGCSA activities and a writer for these pages. Mike penned articles on greens management, quad time aeration before it was cool and a excellent tribute to Wayne Otto as the inspiration for the Wee One Foundation.

Handrich was also involved with Jacobsen when they were still in Racine speaking at and hosting tours during their "Future Leaders" conferences.

Craig Sondergaard who has worked with Mike for 7 years took over as superintendent in late May.

Congratulations to both Craig and Mike.



Left: Mike and Karen Handrich at the 1997 GCSAA Conference.

Below: Dan Quast, Bob Maisbusch, Mike Handrich and Bob Vavrek spoke at a Jacobsen Future Turf Managers Seminar in 2001.



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EDITOR'S NOTEBOOK



Left: Mike Handrich gave students hands on instruction during the 1998 Jacobsen Future Leaders Session.

Right: Mike speaking at his retirement party hosted by Racine CC. (Photo courtesy of Racine CC)

Below: Handrich lines up a putt at the 1997 Dinner Dance at Drugans Castle Mound.



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EDITOR'S NOTEBOOK



Richard Reinders, long time Executive Vice President of Reinders Corp passed away November 8th.

Richard was born in Elm Grove, was a volunteer fire-fighter in Elm Grove and served in the US Army. He loved mechanics and his '58 Corvette and Corvair. He was a pilot and loved to fly his Cessna airplane.

Reinders was involved in local politics and served as a Village Trustee in both Elm Grove and the Town of Concord.

He along with his brother Robert led their 150 year old family business into one of the largest green industry wholesale distribution businesses.

In 1987 he and his son Rick founded Watertronics, a leading manufacture of water pumping stations.

Richard is survived by his children Laurie, Richard, Craig and Joel Reinders and Shelly (Jon) Peters.

John Jolin, 76 passed away May 8, 2019. After a 25 year career as a plant superintendent for Neenah Foundry he became the golf course superintendent at Chaska Golf Course in Greenville.

John was honored to receive the 2007 Leadership Award from the Golf Course Owners of Wisconsin.

John was from Marion, WI and was a classmate of this editor's father. He was quite the athlete in high school and played football and basketball. He had a calm demeanor to his leadership style and was well respected in his second career at Chaska Golf Course.

I enjoyed his and his wife Dolly's drop-in visits in retirement anytime they would drive through Fond du Lac.

He and Dolly traveled often and spent 30 years wintering in Florida.

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EDITOR'S NOTEBOOK



How many of the 1967 officers and directors of the WGCSA do you recognize? From left to right: Director "Ham" Hanneman, Secretary Don Hornibrook, Director Peter Miller, President Art Post, Director Buddy Holly (a.k.a. Bob Musbach), Vice President Bill Sell and Director Allan Kress.



Allan Kress, 84 died on January 28, 2019 in North Branch MN. Allan was born in Milwaukee in 1934 and was a longtime member of the golf community.

Allan joined the golf course business at the age of 10 and became one of the top golfers in the Milwaukee Area. Kress was drafted and served in the Army during the Korean War.

He returned home and re-entered the Milwaukee area golf industry and learned to design and construct golf courses with Rolling Meadows Golf Course as one of his better known designs where he teamed with Homer Fieldhouse and served as the first superintendent.

Allan served the WGCSA and became Chapter President in 1963 becoming one of 2 father son combinations to hold the association Presidency as his father Frank served in 1950 and 1951. Frank at the time was Golf Course Superintendent at Tuckaway Country Club. Allen Kress was President while Superintendent at Parc-Wood Golf Course which later became Villa Du Park and is now the River Club in Meqon. (Frank Musback 58-59 and Bob Musbach 1970 was the other father son presidential combination.)

Kress went to Oneida Golf & Riding Club in Green Bay 1976 and helped make the facility the respected golf course it is today.

In 1983 Kress purchased Westwood Golf Club and during his 15 years replaced the irrigation system, and improved the Phillips, WI golf course until selling the course to his son Jon and his wife Shannon.

Allen was a 49 year member of the association and was still serving on the Scholarship and Research Committee in 1981.

Allan is survived by his wife of 61 years Judith, and his son's Michael (Renee), Jon (Shannon) and Andy (Tracy) and his wife Judith. He was preceded in death by his son Scott.

Dr. David Cookson, 86 passed away on August 7th. Born in New Jersey but raised in Kalamazoo, MI, Cookson entered Harvard Medical School at age 19 and served two years of duty as a doctor in the Air Force.

Cookson was a longtime member of Maple Bluff Country Club and served as Greens Committee Chairman for decades.

He had a love for all facets of the game of golf from rules to turf.

Cookson was a longtime Honorary Member of the WGCSA and frequent contributor to these pages through the 1980's.

es through the 1980's.

He also served as president of the WSGA in 1977 and '78 and received their Distinguished Service Award in 1993 and was elected to the WSGA Hall of Fame in 2006.

In 2015 Dr. Cookson received the Joe Dey Award from the USGA for his lifetime of service as a rules official and volunteer to the game of golf.

Cookson is survived by his wife of 65 years, Christine, and their sons David (Lynn), Daniel (Holly), and Matthew (Gail) and their daughter Sondra (Eugene) McLinn.

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