The GRASS ROOTS

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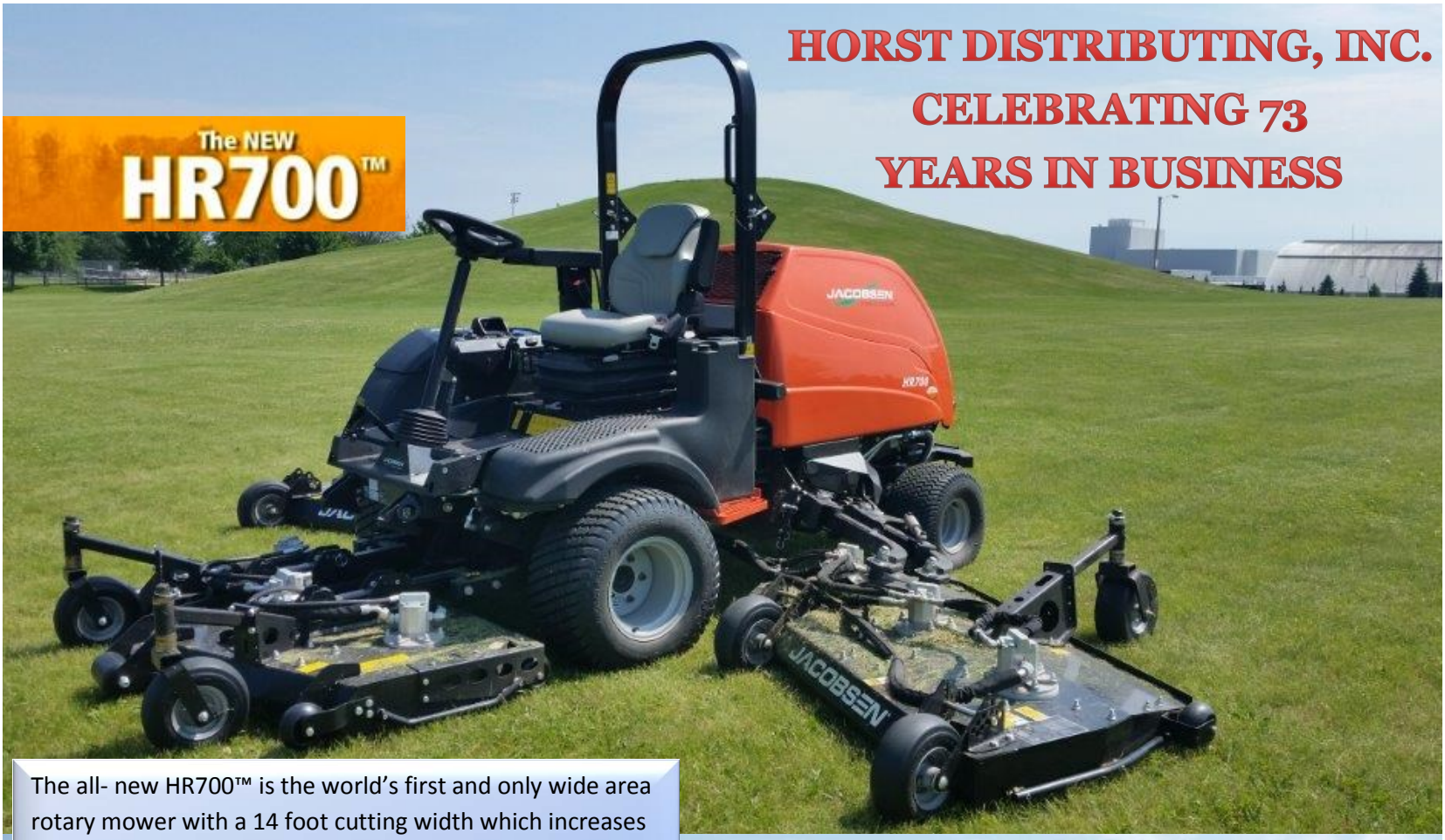

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ABOUT THE COVER

Mr. Josh LePine, Certified Golf Course Superintendent, Maple Bluff Country Club and 45th President of the WGCSA

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"A club 160 acres or more is need for a good 18 hole course. The greens should be generous in size, a minimum of 3,660 sq. feet up to 10,000 sq. feet. The home green, "the holy of holies," should be 10,000 sq. feet without a doubt. Greens should be rolled, hand mowed and watered frequently."

By Golf Course Architect Herbert F. Tweedie, 1864 - 1906, Architect of Maple Bluff Country Club in 1899.

THE GRASS ROOTS

is the bi-monthly 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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Greetings WGCSA

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

What a humbling experience to be elected President of the Wisconsin Golf Course Superintendents Association. Twenty five years ago I remember opening envelopes from this great association and in them were scholarship checks. For someone paying his way through college, that support was needed, appreciated and not forgotten. It is the reason I am here today. To say "thank you", carry the torch and lead this great organization.

After serving on the WGCSA board for the past several years, I have grown a new appreciation for volunteerism. I would like to thank all current and past WGCSA Board Members and Past Presidents for their service. I will honor you by giving 110% as President. I want to thank our industry partners for all of their support. We simply couldn't do it without you. Thank you to Brett Grams, our Chapter Manager, for serving our members, teaching us new board members the ropes and guiding our association through changes in leadership. Thank you to David Brandenburg, our Grass Roots Editor. This award winning publication is one of the highlights of our association. David, and Monroe Miller before him, define volunteerism with countless hours of dedicated work to produce an outstanding product we all enjoy. Whether you are able to attend some, all or none of our industry events, The Grass Roots will always be there to keep you connected. A final thank you goes to you, our WGCSA members. This is your association. You make it great.

On a personal note, my wife and family deserve a huge thank you also. You will meet them in the Cover Story. The work/family balance issue is real for me

and in this industry. I'm not one to write the book on it, I'm more of a "first row" attendee during a presentation on it. My bio and history will also be shared in the Cover Story. Now I know why Ben LaBarre and I don't get many Member Spotlight articles sent back to us. It is difficult to write about yourself. As Golf Course Superintendents, we aren't braggadocios, we don't grab the spotlight. As a bit of an introvert and nose to the grindstone type person, this entire process has been good for me. Forcing yourself out of your comfort zone is personal growth. I've met so many wonderful people and learned more than I could imagine.

Our WGCSA Board consists of outstanding, dedicated men and women who are going above and beyond to serve. I owe it to them, and to you as members, to share my objectives.

I have 5 main goals for my Presidency of the Wisconsin Golf Course Superintendents Association.

1. Maintain the quality work of Chapter Management, previous boards and Presidents in regards to our association's main longstanding functions: Par4 research, scholarships, education/events planning, membership recognition/satisfaction/recruitment, UW research funding, Class C development, Wee One Support, The Grass Roots material and industry partner appreciation.

2. Conduct my business in a transparent, humble and common sense approach to bring our industry together. The WGCSA, the NGLGCSA, the WTA, Industry Vendors and the University of Wisconsin. We are all a cog in the wheel of the Wisconsin Golf Turf Industry and depend on each other. Maintaining strong relationships is critical to all of our success.

3. Take our great work over the past 3 years regarding our Standard Operating Procedure manual, finalize it, continue to update it and begin to use it for our daily association management. A fully functional blueprint for us all to follow and an orientation for new board members.

4. Complete State Best Management Practices (BMP) Initiative, manual and website.

5. Launch, promote, support and build our new Equipment Manager (EM) membership classification and related educational opportunities, shop talks and tours.

I welcome the opportunity to serve the WGCSA. We are here for you. Please don't hesitate to reach out to me or any of our board members with any thoughts, concerns or ideas to help our Association.

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Impact of Nitrogen Rate on Dollar Spot Suppression

By Ron Townsend, M.S. Student, Plant Pathology, University of Wisconsin - Madison
Paul Koch, Ph.D., Department of Plant Pathology, University of Wisconsin – Madison
Doug Soldat, Ph.D., Department of Soil Science, University of Wisconsin - Madison

Author's Note: This article is based on the M.S. research of Ron Townsend and has been submitted for publication in a peer-reviewed journal. Nitrogen rate aspects of this research were presented in the November/December 2018 issue of The Grass Roots.

Fungicides are largely effective at controlling dollar spot, however concerns surrounding their repeated use have been increasing both within and outside of the turfgrass industry. The average U.S. golf course spends 5% of their total budget on fungicides, or an average of $36,000 annually (Golf Course Industry 2015). The majority of fungicide costs for golf courses in temperate climates goes towards controlling dollar spot, and can be a source of major financial strain on golf courses with limited resources (Golf Course Industry 2015). *Clarireedia* resistance to numerous fungicide classes has been documented, including demethylation inhibitors (DMI) and benzimidazoles (Detwiler et al., 1983; Golembiewski et al., 1995; Burpee 1997). Therefore, continued reliance on chemical control may increase fungicide-resistant populations in the future.

Nitrogen source has been implicated in previous research as a factor that can influence dollar spot severity. Sources including activated sewage sludge, ammonium nitrate, ammonium sulfate, urea, sodium nitrate and ureaformaldehyde reduced dollar spot on 'Washington' creeping bentgrass when applied at 489 kg N ha-1 (Markland et al., 1969). Organic fertilizers may promote microbial activity and communities in the turfgrass system that can reduce dollar spot severity (Liu et al., 1995; Davis and Dernoden, 2002). However, when Davis and Dernoeden (2002) compared organic N sources to inorganic N sources they found no difference in dollar spot severity. Nitrogen source may also impact dollar spot severity through alteration of soil pH. Nitrogen sources such as ammonium nitrate and potassium nitrate are relatively neutral and have minimal effects on soil pH, ammonium sulfate has a strong acidifying effect on soil, and calcium nitrate has an alkalizing effect on soil (Pierre 1928; Ma et al., 1990; Carrow et al., 2007).

Acidifying potential of fertilizer sources has been shown to influence certain turfgrass diseases like summer patch (Hill et al., 2001) and take-all patch (Duda 2008), however their impact on dollar spot is less clear. Ryan et al. (2011) tested ammonium nitrate, ammonium sulfate, urea, potassium nitrate, calcium nitrate and a PRO-SOL 20-20-20 containing a mix of various N sources all applied at a rate of 7.3 kg N ha-1 every 14 days. They concluded that ammonium sulfate slightly reduced dollar spot severity, suggesting acidifying fertilizer sources can reduce dollar spot. However, this effect was only observed in one of two years and other studies have shown no pH or N source effect on dollar spot (Markland et al., 1969).

The objectives of the research were to (1) assess the impact of various N rates on dollar spot development using repeated (14-day) applications of urea and, (2) evaluate dollar spot severity in response to different synthetic N sources that have acidifying, neutralizing, or alkalizing effects on soil. Our hypothesis was that dollar spot severity will decrease in a dose-dependent manner with increasing N application rate and that no consistent N source impact on dollar spot severity will be observed.

Materials and Methods

Two independent trials were replicated at the O.J. Noer Turfgrass Research Facility (OJN) in Madison, WI and North Shore Country Club (NSCC) in Glenview, IL during the 2015, 2016, and 2017 growing seasons to investigate the impact of N fertilizer rate and N fertilizer source on dollar spot severity. All plots were arranged in a randomized complete block design with four replications. Trials at both locations were conducted on creeping bentgrass putting greens (*Agrostis stolonifera* cv 'Penncross') grown on a sand based rootzone with United States Golf Association (USGA) specifications and mowed five days a week to a height of 0.125" and irrigated to replace evapotranspiration. Individual treatment plots measured 6 ft by 4 ft and initial applications at both sites for both the N rate and N source trials were made on 17 June 2015, 20 May 2016, and 15 May 2017. Subsequent applications were made every two weeks with the final application being 30 September 2015, 14 September 2016, and 13 September 2017.

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Fertilizer and pesticide applications were made using a CO2-pressurized boom sprayer equipped with XR Teejet AI8004 nozzles pressurized to 40 psi. All treatments were agitated by hand and applied in the equivalent of 1.5 gal water per 1000 sq ft. No nutrients outside of the prescribed treatments were applied to either site during the three-year period. Flutolanil (N-[3-(1-methylethoxy) phenyl]-2-(triflroromethyl)benzamide) (Prostar; Bayer Environmental Science, Research Triangle Park NC) was applied on 29 July 2016 and 4 August 2017 to suppress Rhizoctonia solani outbreaks during the 2016 and 2017 growing seasons at NSCC. The positive control fungicide program was the same for all the trials and was designed based on commonly used fungicides in the region to control dollar spot on golf courses **(Table 1).** All fungicides were applied at high label rates and reapplied based on label recommendations.

Nitrogen source treatments consisted of three synthetic N sources; calcium nitrate (alkaline), ammonium nitrate (neutral), and ammonium sulfate (acidic) as well as a non-treated control and a positive control fungicide program **(Table 1)**. During the 2015 and 2016 seasons these fertilizers were applied at 0.2 lbs of N per 1000 sq ft every two weeks, and ten applications were made each season for a total of 2.0 pounds of N per 1000 sq ft. The application rates were increased to 6.0 lbs of N per 1000 sq ft every two weeks in 2017 based on results from the first two years.

Dollar spot severity was assessed by counting dollar spot infection centers every 14 days between May and September. Turfgrass quality was also rated visually every 14 days using the National Turfgrass Evaluation Program (NTEP) 1 to 9 rating scale where 1=dead/necrotic, 6= minimally acceptable, and 9=excellent. Turfgrass quality ratings included combinations of disease, color, density, and uniformity and were always conducted by the same person to avoid interpersonal variation. Normalized difference vegetation index (NDVI) was collected on 14-day intervals to estimate turfgrass color and was measured using a FieldScout TCM 500 NDVI Turf Color Meter (Spectrum Technologies Inc., Plainfield, IL). Three NDVI measurements were taken within each plot and averaged.

Turfgrass leaf N content was measured monthly from May through September each year. Foliar pH was collected five times per month; zero, two, five, seven, and fourteen days after the fertilizer application. Tissue collection for these measurements was conducted using a Toro 1000 Greensmaster walk-behind mower (The Toro Company; Bloomington, MN) and clippings were collected as the mower was engaged over the middle of each plot. Following collection, the clippings were placed into 0.95 L paper bags and stored at –20 °C until analysis. Total N content was analyzed by Waypoint Analytical (Richmond, VA) and conducted with a LECO FP528 (LECO Corporation; Saint Joseph, MI) using the Dumas method. Foliar pH was quantified using a method described in Cornelissen et al. (2006) that was modified in order to compensate for larger sample volumes. The measurement of foliar pH was conducted by adding deionized water and turfgrass clippings into a 50-ml falcon tube (Globe Scientific, Paramus, NJ). The tubes were then laid on their sides and shaken at 200 rpm for two hours using a Skyline orbital shaker (ELMI, Riga, Latvia). The samples were then centrifuged at 2000 rpm for 15 minutes using a Damon IEC HN-2II Centrifuge (Needham Heights, MA). The substrate pH was then measured and recorded using an Azzota Microprocessor pH/mV Meter (Randolph, NJ).

Results

There were no differences in dollar spot severity among N source treatments in 2015 or 2016 at either location and no differences between the N treatments and the non-treated control when dollar spot severity was assessed as AUDPC **(Figure 1, 2)**. However, some source impacts were observed when individual dollar spot rating dates were analyzed. In 2016, calcium nitrate reduced dollar spot severity at NSCC on 17 June and on 15 June at the OJN **(Figure 3)**.

Ammonium sulfate reduced dollar spot on 8 Aug 2016 at the OJN relative to the other N source treatments. The rate of each source was increased to 6 lbs of N per 1000 sq ft bi-weekly at both locations in 2017 as a result of the findings from the N rate study, and all N sources reduced dollar spot severity relative to the non-treated control. However, there were no differences among N sources and the fungicide program provided the most effective dollar spot suppression. Turfgrass quality largely reflected the dollar spot severity results and the 6.0 lbs N per 1000 sq ft treatment and the fungicide program typically had the highest quality in all three years of the study. No significant differences (P=0.05) were found between the non-treated control and 1.0 lb N per 1000 sq ft treatments during 2015 and 2017, however in 2016 quality was higher in all N application rates compared to the non-treated control.

Table 1. Positive control fungicide program used at the OJ Noer Research Facility in Madison, WI and North Shore Country Club in Glenview, IL from 2015 through 2018.

Trade Name	Active Ingredient	2015	2016	2018
Xzemplar	Fluxapyroxad	4-Jun	18-May	10-May
Banner MAXX	Propiconazole	29-Jun	15-Jun	7-Jun
Secure	Fluazinam	15-Jul	28-Jun	21-Jun
Xzemplar	Fluxapyroxad	29-Jul	12-Jul	5-Jul
26GT	Iprodione	4-Sep	9-Aug	16-Aug
Secure	Fluazinam	16-Sep	22-Aug	30-Aug
Banner MAXX	Propiconazole	30-Sep	8-Sep	13-Sep

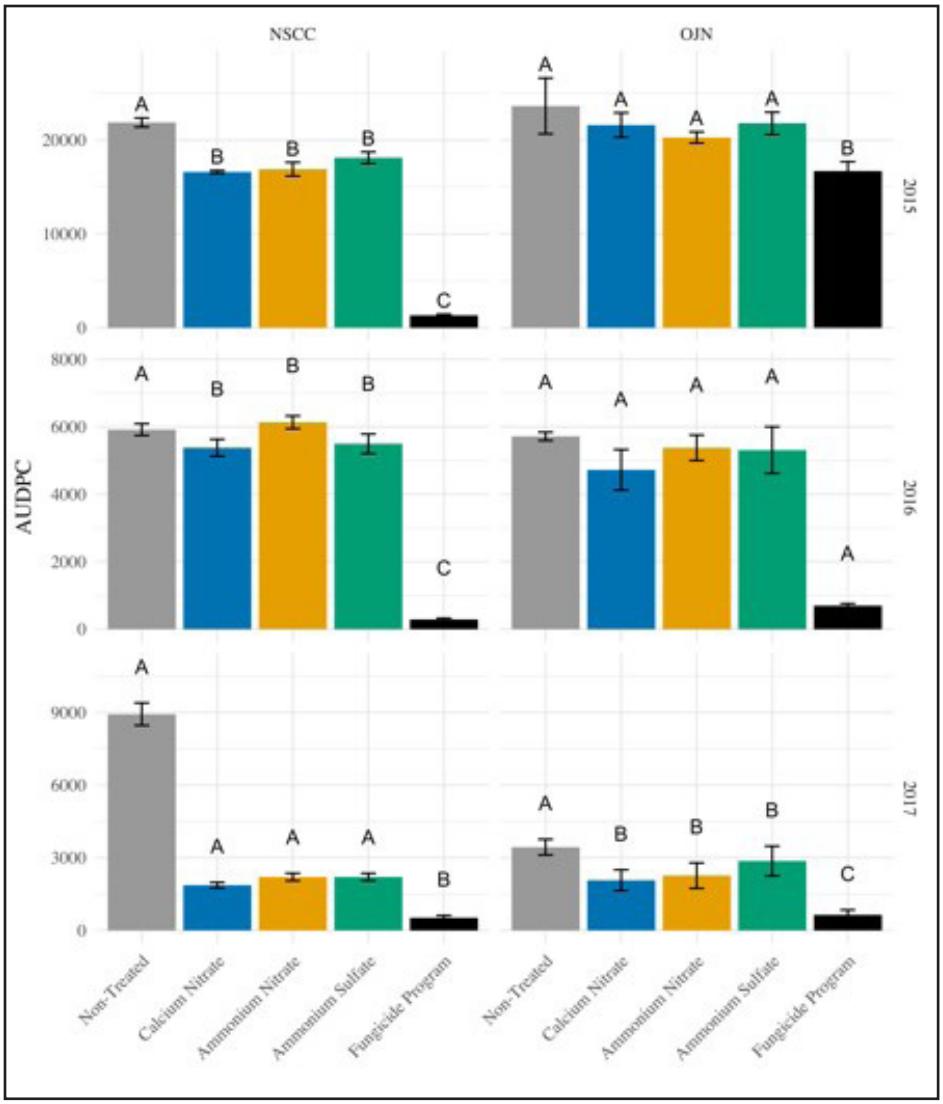

Figure 1. Dollar spot severity as represented by the area under the disease progress curve (AUDPC) at North Shore Country Club (NSCC) and O.J. Noer Turfgrass Research Facility (OJN) in 2015, 2016 and 2017. Statistics for each site-year were calculated independently and values followed by the same letter are not significantly different according to Fisher's LSD (P > 0.05).

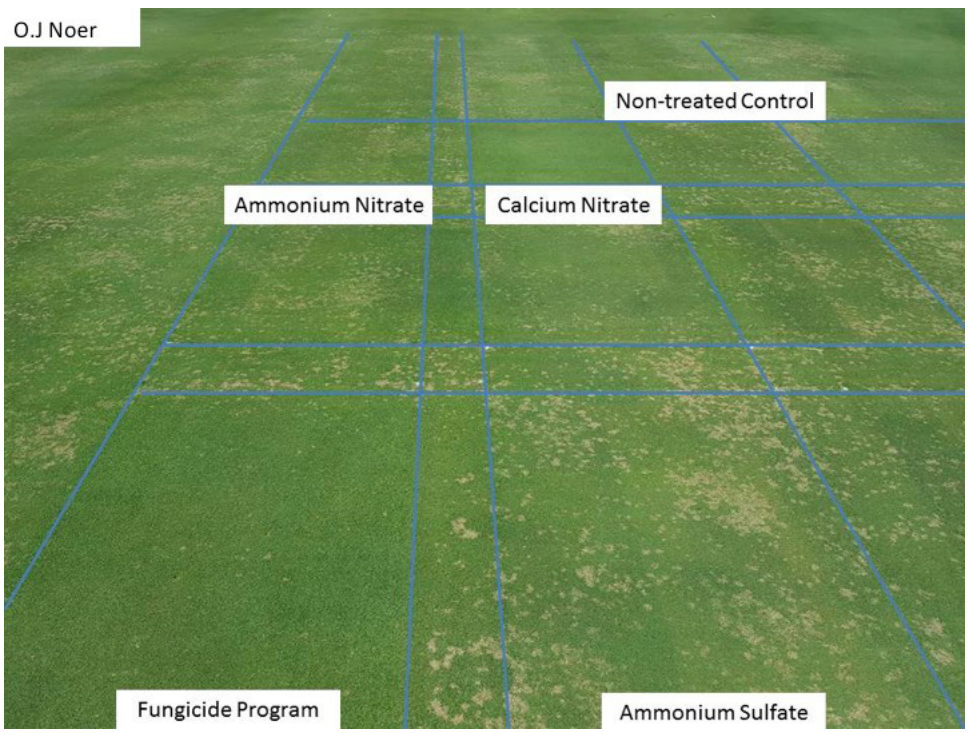

Figure 2. Dollar spot severity on different nitrogen sources at the OJ Noer Research Facility in 2017.

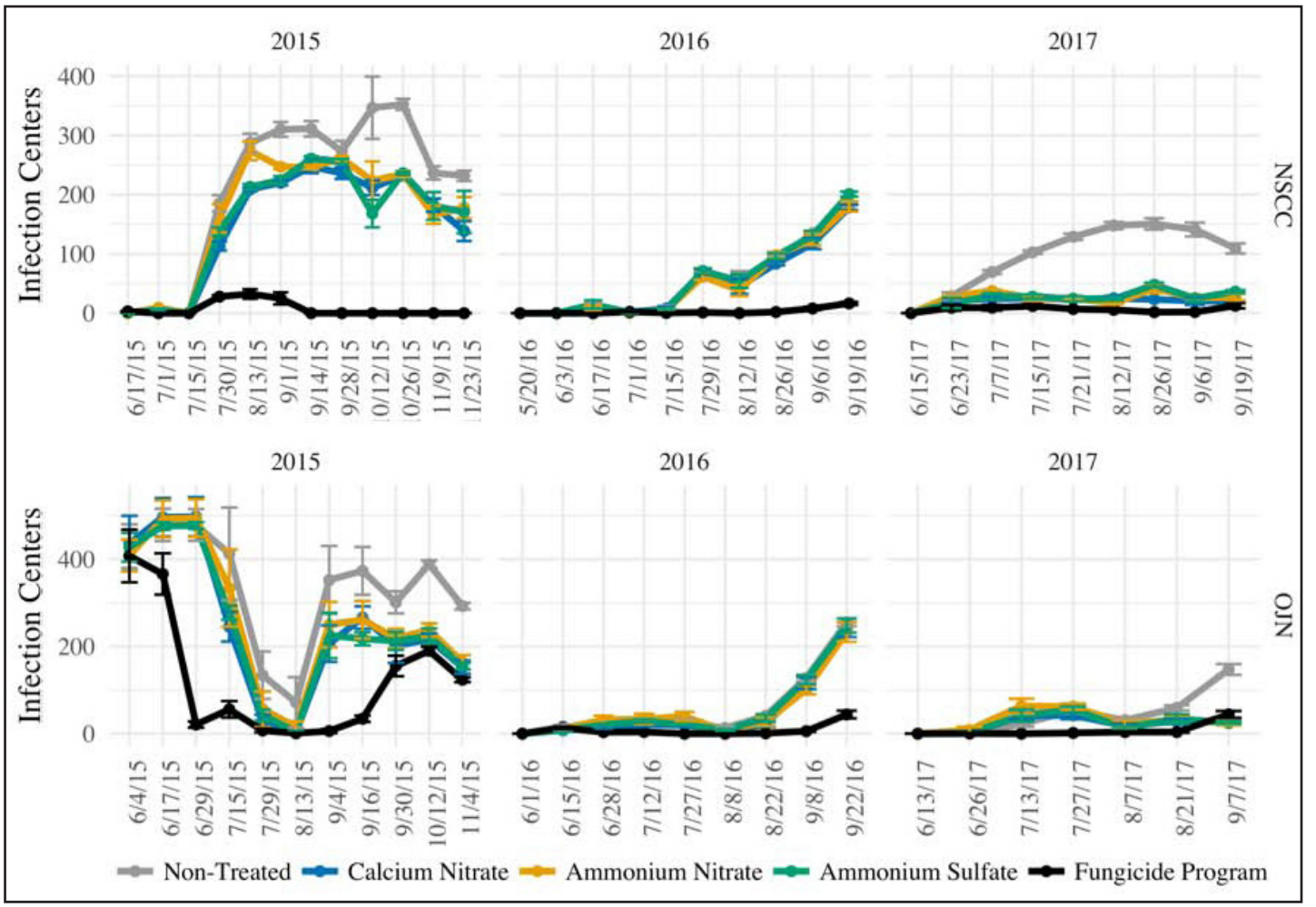

Figure 3. Dollar spot disease progress curve represented as average number of infection centers in 2015, 2016, and 2017 at North Shore Country Club (NSCC) and O.J. Noer Turfgrass Research Facility (OJN). Error bars represent the standard error.

Plant Pathology
at the University of Wisconsin-Madison

Discussion

Synthetic N sources selected based on their ability to manipulate soil pH did not have any effect on dollar spot severity in this research. Despite the regular use of these fertilizers, only minor changes in soil pH were recorded in the field. One potentially mitigating factor in this study was the pH of the irrigation water at both OJN and NSCC, which ranged from 7.8 to 8.5. The alkaline water may have counteracted any acidifying effects of the ammonium sulfate, and future research investigating N source impacts using more neutral irrigation water is warranted to further elucidate this point. However, this research supports previous research by Davis and Dernoeden (2002) indicating that N source and pH do not appear to significantly influence dollar spot severity.

Acknowledgements

The authors would like to thank Dan Dinelli, superintendent at North Shore Country Club in Glenview, IL for hosting the trials at his golf course. In addition, we would like to thank the Wisconsin Turfgrass Association, Chicago District Golf Association, and the Midwest Association of Golf Course Superintendents for providing funding.

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Laughter On The Links!

A man was addressing the ball when an announcement came over the loud-speaker: "Will the gentleman on hole number one please not hit from the Ladies' tee box."

The man backs away, a little distracted, then approaches his ball again. As he does, the same announcement comes over the loud-speaker: "Will the gentleman on hole number one please not hit from the Ladies' tee box."

The man is getting irritated now, and after backing away from his shot, approaches his ball one more time. This time the announcement came: "We really need the gentleman on hole number one to move off of the Ladies' tee box!"

To which the man turns around and yells: "And I really need the announcer to shut up and let me play my second shot!"

Austin Wright

By Josh Lepine, Certified Golf Course Superintendent, Maple Bluff Country Club and
Ben Labarre, Golf Course Superintendent, The Legend at Bristlecone

Author Note: Thank you to everyone who participated in the Membership survey. The information and feedback obtained was invaluable. The requests for more member spotlight stories inspired us to produce 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: **Austin Wright**
Company Position: **Equipment Manager at Sand Valley Golf Resort in Rome, WI**
Years as WGCSA Member: **2**
Membership Classification: **Equipment Manager (EM)**

Bio: I was born in Hutchinson, KS. I lived there until I was 11 years old, then my family moved to Lawrence, KS. I played golf and soccer in high school in Lawrence where I found a passion in golf. I had no idea that it would lead me to where I am today. I attended Kansas State University in Manhattan, KS studying Golf Course Management, where I started off on the "turf side" of the industry. While I was at K-State, I worked at Colbert Hills Golf Course in Manhattan, KS. I interned at Torrey Pines Golf Course in San Diego, CA for the 2008 US Open Championship. I also interned at Baltusrol Golf Club in Springfield, NJ. As I ventured further into the industry, I began to realize there is a huge demand on the "equipment side" of the golf industry.

I decided to attend Washburn Institute of Technology in Topeka, KS for Automotive Technology. While I was attending Washburn Tech, I worked at Lawrence Country Club in Lawrence, KS as an Assistant Superintendent where I learned a great deal of how to maintain cool-season turfgrass in the Kansas heat. After Lawrence Country Club, I had the opportunity to work for the areas Toro distributor, Professional Turf Products(PTP) at their Kansas City location. This was great for my career. I was able to learn the proper way to repair, adjust, and setup golf course equipment. However, I was itching to get back on a golf course and start a new step as an Equipment Manager.

I left PTP and worked at the Country Club of Leawood in Leawood, KS. I learned more at Leawood than I ever thought I would. Maintaining various brands of equipment, dialing in cutting units for the best results, managing a budget, adjusting the shop layout for better flow and safety, and working with the Superintendent and Assistants to achieve common goals. I now know that all of these jobs, facilities, and great people I have meet along the way have been huge stepping stones.

I now work at Sand Valley Golf Resort in Rome, WI as the Equipment Manager. I am blessed to have such amazing people in my life that have helped me grow into who I am today. I look forward to seeing where the road continues to take me in this great industry.

18 Holes With Austin Wright

1. **How did you get started in the turfgrass industry?** I have always enjoyed the game of golf ever since I was a kid playing golf with my dad, Denny, and Grandpa Ron. My mom, Mischia, works for the EIFG, so the golf industry was already part of our family. I knew that I wanted to pursue a career in golf after high school. I started off on the turfgrass management side of the industry, and the more I worked on golf courses, the more I learned about the industry. I saw how it was changing and the demand of the Equipment Manager was increasing quickly so I decided to switch gears and combine my two passions, golf and mechanics.

2. What is the most rewarding part of your career? There are many parts of my career that I find rewarding. I love driving around looking at the after-cut-appearance and quality-of-cut to see a smooth, healthy cut on the turf. It is the side of the industry that has instant gradification with being able to see all your hard work coming to fruition right away, multiple times a week. I also enjoy teaching about the golf industry but especially about the equipment management side. Being able to mentor young technicians and show them a new career path that they never knew existed, makes me feel good about what I do for a living.

3. What would you consider to be your greatest career challenge? My greastest career challenge is educating the upper management and other sides of the golf industry on what the Equipment Manager and Technicians do on a day-to-day basis as well as showing them the year-round value. The shop duties never stop, they simply change as the year goes on. The "off-season" is the preparation for the next season and during the "season" is when we keep everything running, serviced, and sharp. It is one big cycle. The number one goal of the Equipment Manager is to ensure the Superintendents have all the equipment and tools ready for them to do what they do best.

4. Which three adjectives describes you the best? Passionate, Analytical, and Loyal

5. Tell us about your family. My family is still in the early phase. I got married to my lovely wife, Katie, over two years ago. We do not have any kids...yet. My wife's family as well as mine both live in the Kansas City area. I grew up in Lawrence, KS and Katie grew up in Overland Park, KS. They are about 45 minutes away for each other, which makes it nice when we travel back to Kansas. We are able to see both families very easily during the holidays or any trips back to the Sunflower State.

6. Any pets? Baron, our 9 year old, German Shepard, Cole and Kodi, our 9 year old Cats. The cats still run the house even with the dog being 10 times larger.

7. What drives/motivates you every day? Being able to do a job that is never the same from day-to-day. It always has new challenges that I have to work through to overcome. I really enjoy being able to bring my dog, Baron, into work with me everyday. He helps keep the shop positive and relax us when we need a break. Petting the dog is a great way to reset and refresh when you are working on something challenging or stubborn.

8. Who Would You Admire? I am very blessed to have great people in my life that have helped me get to where I am today. There are so many people I admire and look up to on both the turfgrass and equipment sides of the industry. Todd Simms, the late Equipment Manager at Baltusrol Golf Club, is one that I owe a great deal to. While I was up there doing my turfgrass internship, he really showed me just how successful an Equipment Manager can be in the golf industry. That was the turning point for me to switch the gears in my career. I am very thankful to have met him. I might be doing something completely different if I had never had that opportunity.

Another great man that I admire is, Chris Rapp, the Equipment Manager at Bellerive Country Club. Chris has always been willing to help me with anything that has been thrown my way that I need assistance or an opinion on. Chris is actively involved with GCSAA and has been a great resource for me when I worked towards building the Equipment Manager programs at the local levels in Kansas City and now in Wisconsin. Chris always has such a good vibe when you go in his shop. Even when he is stressed he still smiles and laughes. I am very thankful he invited me down to St. Louis to help out with the equipment preparation for the 2018 PGA Championship. I learned a great deal being around some of the best in the industry for the week prior to the tournament

9. Who is the person in history you'd most like to meet? It hasn't been long but I would like to go back and meet Arnold Palmer. I would love to hear stories that helped shape him as a person. He was able to touch a great deal of people as well as do wonders for the game of golf. He seemed to be such a humble and standup guy. Even after all his accomplishments, he never changed the person he was. I feel we all could learn a great deal from him and learn how to better ourselves.

Austin and Katie golfing at Mammoth Dunes Golf Course at Sand Valley

10. What's a fun fact that people don't know about you? A fun fact that most people don't know is that I used to do gymnastics as a young kid. I still can roll my stomach and do a mean cartwheel. All the cool flips and other moves are no longer in my capabilities. You will not see me on TV representing the USA at the next Olympics but I still accept cartwheel challenges from time to time.

11. What do you do in your spare time, favorite hobbies? I really enjoy playing golf. I am setting a goal to play more golf in the 2019 season. I want to get back to the level I used to be when I could beat the teaching pros on a regular basis. It always feels great when a mechanic beats a golf pro.

I also recently started racing lawn mowers. Yes, lawn mowers! They are fully custom built to race and have different classes depending on the power and body style. It is great fun racing on ice during the winter and dirt during the summer. The best way to explain it is to think of it as real life Mario Cart.

12. If you could go anywhere in the world on vacation, where would you go? I would like to take my wife over to Scotland, Ireland, and nearby countries to spend a week or so. We could walk around and see other cultures. While we are over there golf would definitely be on the agenda to play all the big courses to see where it all began.

13. What is the one thing you would like to learn/accomplish someday? In the short term, I would like to complete all the GCSAA Technician Exams. In the long term, I would like to work with GCSAA at the local and national levels to continue to build the Equipment Management side of the industry. Someday down the road, I would love to be able to teach golf course equipment management somewhere. Then I would be able to have the summers off and enjoy playing golf!!

14. What is your favorite turf management related tool or technique? I have two hand tools that are key to the success in our shop. The first is the "RHOC (reel height of cut gauge)". We have multiple technicians in our shop and we take a great deal of pride in our precision. I am able to trust that no matter who is checking reels that day, I know they will all be properly set. I also use our "prizm" or "turf evaluator". This tool is very important to be able to see what is actually happening out in the field. As we all know, there is a difference between the actual height of cut and the bench setting. There are many factors that are in play out on the courses. This tool allows me to see what adjustments we need to do with our cutting units to achieve the cut the Superintendents are after.

15. Favorites:

TV Show: Home Improvement
Movie: Caddyshack
Food: Perfectly Grilled Ribeye Steak
Sports Teams: Denver Broncos & Kansas State Wildcats

16. Do you golf? Handicap? Best shot or golf story? I love playing golf and want to play a lot more. When I came up to Wisconsin, I was a 7 handicap. I am probably closer to a 10 at the moment but looking to change that this up coming 2019 season. One of my best golf stories happened while playing a 9-hole round with my Dad at our local course, Eagle Bend Golf Course in Lawrence, KS. I was winning going to the ninth hole. It was a Par-5 and we were both about to hit our third shots. I hit mine on the green with a 30 foot putt to go. He looked over to me and said, "The only way I can beat you is if I sink this shot here". Wouldn't you figure, he holed a 100+ yard shot for an Eagle *(the distance differs depending on who is telling the story).* So now the pressure is on. I stepped up and drained a 30 footer for a Birdie to beat him by one stroke. I shot one under and Dad shot even par. It was one of the most enjoyable rounds we have ever played and we still talk about it today.

17. Top Bucket List Item? I grew up going to the dirt track races almost every weekend with my grandpa in Kansas. I always wanted to have a racecar someday and tear up the dirt as a weekend warrior. It would be great fun to have the whole family out there supporting me while enjoying the loud, dirty, and fun atmosphere. I would love to be one of the hard-working, blue collar racers I grew up getting autographs from.

18. If you could provide one piece of professional advice, what would it be? Always keep your mind and ears open to learn new ideas and techniques. Always continue to learn and strive to better yourself. No matter the age, background, or experience of our peers, we can all learn something from each other. Finally, SLOW DOWN and THINK THROUGH EVERYTHING!

Austin and Baron at the Sand Valley Maintenance Facility.

MEMBER SPOTLIGHT

Austin at the Lawn Mower Ice Races at the Lake Arrowhead Snowblast.

2018 Chapter Delegates Meeting

By Brian Bonlender, Golf Course Superintendent, West Bend Country Club

The GCSAA Board of Directors, 2019 board candidates, and 89 delegates representing 91 of GCSAA's 99 affiliated chapters, convened at the Hilton Kansas City Airport Hotel and GCSAA Headquarters on November 13 – 14, 2018, for the 26th annual Chapter Delegates Meeting. Thirty-six of the delegates were first-time attendees. The Chapter Delegates Meeting is an event that brings together representatives from GCSAA-affiliated chapters. Delegates carry the opinions of their chapter's members regarding initiatives and issues affecting the profession, the association and its members. I want to thank the WGCSA board and members for the opportunity to attend. As your Delegate, I am responsible for communicating the information I received at the meeting to our chapter. Finally, this meeting is also the beginning of a new election year, as delegates we meet the GCSAA board candidates and discuss their campaign platforms. The following is a compilation of the key meeting outcomes provided by GCSAA.

President's Association Briefing

President Darren J. Davis explained goals for this last year, which was to concentrate on being a "TEAM" (Together Everyone Accomplishes More). The focus was on increased unity among the board, increased unity between board and staff, and ultimately between the staff and the 18,000 members. This focus is key to GCSAA's continued success. Mr. Davis reminded delegates of the importance of their role as a liaison between the association and the chapters. He encouraged us to communicate with our chapters, with their fellow delegates and with the GCSAA Board of Directors.

CEO Briefing

GCSAA CEO J. Rhett Evans focused his presentation specifically on the strength of GCSAA's membership. GCSAA has nine regions, 97 affiliated chapters and two international chapters. There are 18,000 members scattered across the U.S. and the world. While there are differences in the specific needs of individual members, there are many common challenges that GCSAA and the members can broach together.

Mr. Evans shared GCSAA's membership trends from 2008 through 2018. The good news is that membership numbers are trending upward, particularly in the equipment manager, students and Class B classifications. GCSAA's membership is aging. Therefore, GCSAA and chapters need to focus on students and individuals transitioning from students into their careers. The goal is to grow the future leaders of the profession. Currently GCSAA has a 48% penetration rate in the U.S. golf market. That means there are 7,555 golf courses with no GCSAA member. This penetration rate hasn't really changed in decades. The traditional models for recruiting this market have not worked, but new ideas and strategies are being looked at with hopes they will bring in new members.

Rounds 4 Research Auction

Rafael Barajas, CGCS and the task group provided valuable insight that helped the 2018 Rounds 4 Research Auction garner its most successful year yet. The number of rounds donated increased 24% from 2017 and the number of rounds sold increased by 21%. The top five fundraisers were:

- Carolinas GCSA - $60,000
- Florida GCSA - $26,720
- Georgia GCSA - $24,338
- Tennessee GCSA - $15,000
- GCSA of New Jersey - $14,534

Wisconsin courses participate in the Rounds for Research program but the WGCSA operates our own successful Par 4 Research program. 100% of all funds generated are directed to UW Turfgrass Research, State BMP implementation and Next Steps. GCSAA's goal is to have all 50 states with a BMP in place by 2020. There are currently:

- 10 states with a BMP in place
- 10 states will finish up in 2018
- 20 states have told GCSAA they will complete BMPs in 2019
- The remaining 10 states are anticipated to be complete by 2020

The second phase in the BMP project is facility adoption. Superintendents will be able to log into the GCSAA BMP tool and create a facility level plan based on the published state BMP manual. GCSAA will assist chapters in training superintendents on how to utilize the tool and write their BMP plan by hosting regional and state workshops.

Sheila Finney, Senior Director of Membership, leads the discussion at the Delegates Meeting with the Board of Directors listening intently behind her.
Sheila is a former golf course superindent and most recently the former Executive Director of the Tennessee GCSAA Chapter and Tennessee Turgrass Association.

Task Group Update

The Equipment Manager Task Group is leading the way in identifying education, programs, and services to enrich the offerings for this membership classification. The more involved an equipment manager is in GCSAA, the more successful they are at their job. Current programs and services for equipment managers include:

- GIS education specific to equipment management
- Equipment management via live and on-demand webinars
- Turf Equipment Technician Certificate Program (TETCP), levels 1 & 2
- Five-Minute Fix videos
- GCSAA support of local EM education events
- Equipment worksheet templates
- Shop talk forum
- Monthly shop articles in GCM
- EM Profile Report
- Edwin Budding Award
- Most Valuable Technician (MVT) Award in partnership with Foley
- EM networking reception at GIS

The Assistant Superintendent Task Group, for those that were unaware, has four certificates that can be earned. They are:

- Principles of Golf Course Agronomy
- Principles of Golf Course Business
- Principles of Golf Course Leadership and Communication
- Principles of Golf Course Environmental Management

The certificates can be taken in any order and range in price from $40 - $50. The feedback has been positive regarding these certificate programs.

CPI Dues Process

In a process created by the delegates and voted on by members, there is a review of the dues structure for Class A, B and C members every two years, using a CPI-based process. The delegates wanted an easy-to-understand dues pricing system that would keep pace with the increasing costs of providing member programs and services, while also reducing or eliminating the negative impact that large, infrequent dues hikes had on membership growth and retention, and facility budgets. The process is not automatic, and the membership must vote to approve the increase at the Annual Meeting in February. If approved, the first members to receive the increase will be those that renew or join in May.

The CPI increased 4.5% over the last two years, which equates to a proposed $20 dues increase for Class A/B and a $10 increase for C members. If passed the new dues would be:

- Class A - $400
- Class B - $400
- Class C - $205

Dues for Affiliate members would also increase by $20 with a corresponding increase of $10 for Associate and International Superintendent Members. There is no increase anticipated at this time for Equipment Manager dues, which are $95. GCSAA dues account for 25% of the Association's budget, which is less than that of comparable associations (38% to 40).

Membership Retention and Growth Strategies/Proposed Bylaw Additions or Changes

GCSAA's strength in numbers would be enhanced by improving membership retention and increasing new member growth. As was previously mentioned, there are approximately 7,500 golf courses with no GCSAA member. What can be done about the 52% of golf facilities that do not have a GCSAA member? Several strategies are being considered to tackle two perennial issues:

- The cost of a GCSAA membership is often prohibitive for potential members at smaller budget facilities
- Many government entities are not allowed to pay for employee's personal association dues but will pay for memberships that benefit their golf facilities or provide training and education opportunities for their employees.

The new potential membership initiatives are designed to expand membership, increase facility penetration and reward loyalty of current members. The new membership initiatives are Friends of the Golf Course Superintendent, Facility Membership Classification, a Rewards/Loyalty program for existing members, and to incentivize members to add additional members at their facility.

Golf Course Friends Membership

The "friend" membership classification would target golfers and potential advocates of golf. Benefits would likely be limited to a newsletter created specifically for this group keeping them informed on GCSAA member awards and good news stories. GCSAA initiatives such as First Green, BMPs and Rounds for Research could also be highlighted. Adding this classification would require an addition to the GCSAA Bylaws.

The proposal reads: *"Golf Course Friends: To qualify for Friends Membership, an applicant must be an individual who supports the course and does not qualify for membership in any other class. Golf Course Friends shall have such rights of the Association as the Board of Directors may specify by Standing Rules, except those of voting and holding office."*

Facility Membership

The facility classification is aimed at smaller budget facilities. Suggested dues would be $200. The recommended qualifications would be:

- No current GCSAA member at the facility
- Must not have had a GCSAA member in the last five years
- Suggested limitation on green fees
- Limited benefits and privileges

GCSAA would use targeted marketing based on green fees to identify the facilities that might be eligible for this new membership opportunity.

The proposal to bylaws reads:

"Facility Membership: To qualify for Facility Membership, an applicant must be a golf course facility that employs no current GCSAA member. Facility Members shall have such rights of the Association as the Board of Directors may specify by Standing Rules, except those of voting and holding office."

Rewards/Loyalty Program

A rewards or loyalty program would be used as a membership retention tool to increase existing member's satisfaction and sense of value with their GCSAA membership. The program would be based on the number of members at each golf facility and would be tiered, the more members at your facility the more perks you would be eligible to receive. This membership growth retention initiative would not require a change in GCSAA's Bylaws and therefore will not be voted on at the Annual Meeting.

Old Tom Morris welcomes the delegates and all visitors to the GCSAA Headquarters.

Incentivizing Member to Add Additional Members

GCSAA is proposing a strategy to incentivize existing members/golf facilities to add new GCSAA members at their facility. Incentives would depend on the number of new members that were added. Class A, B and C dues would not exceed the amount that is set by the members at the Annual Meeting. The potential for growth with this strategy was illustrated by showing that 59% of GCSAA's members only have one member at their golf facility.

Proposed Bylaw Change

"Section 1. Annual Dues: The annual dues shall be sums fixed by the Board of Directors, except for Classes A, B and C. Annual dues for Classes A, B and C shall not exceed the sum fixed at any annual meeting of the Association, as decided by a balloting conducted under regular voting procedures set forth in the Standing Rules of the Convention established by the Board of Directors, in accordance with Article V of these Bylaws. Dues shall be payable in advance of the member's annual renewal date."

Town Hall Session

The town hall format is an open forum where chapter delegates have the opportunity to have a dialogue with the GCSAA Board of Directors who will answer questions and share information on items of interest and importance to chapters and members.

The feedback received generally ran along these themes:

- Overall, the group supported the bylaw changes/additions.
- There was great discussion on many different programs to implement with Membership Retention and Growth Strategies. However, we, as delegates, thought all ideas should go back to committee for review.
- There was good discussion on the First Green Program and working on continuing the current format, as well as creating a high school curriculum, in hopes to promote new avenues for employees.
- There was conversation on a BMP certification program that is evolving, and what a BMP certification would look like and mean.
- There was discussion on future field staff additions and what the Field staff program is to look like in the future.

GCSAA
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Candidate Presentations

We had an opportunity to listen to presentations from candidates running for elected office. After the presentations, delegates participated in the "Meet the Candidates" session where they asked questions of the delegates in breakout groups.

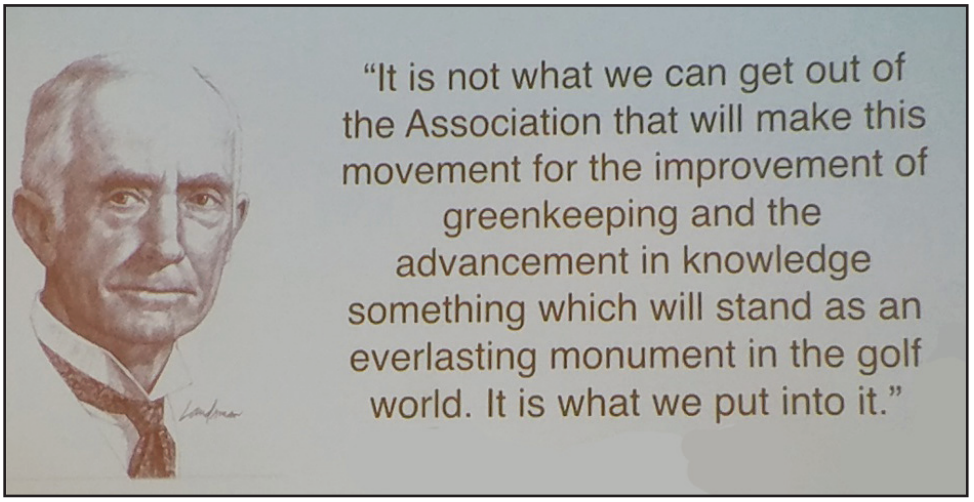
The 2019 GCSAA Board candidates are:

- Office of President – Rafael Barajas, CGCS
- Office of Vice President – John R. Fulling Jr., CGCS
- Office of Secretary/Treasurer – Kevin P. Breen, CGCS and Mark F. Jordan, CGCS
- Director (electing 3) – T.A. Barker, CGCS; Paul L. Carter, CGCS; Douglas D. Dykstra, CGCS and Jeff L. White, CGCS

If Mark Jordan is not voted in as secretary/treasurer, he may be nominated as a candidate for director from the floor. If Kevin Breen is not successful in his bid for secretary/treasurer he will remain as director, as he is in the second year of his director term.

There are three open positions for director, with T.A. Barker, CGCS, Jeff White, CGCS and Mark Jordan, CGCS at the end of their terms. All three open director positions will be for two-year terms. If Kevin Breen is elected secretary/treasurer, the remaining year of his director term will be filled through the voting process.

Please Contact Brian Bonlender with questions or concerns at 262-338-0540 or brian@westbendcountryclub.org.



Colonel John Morley, GCSAA's Founder and First President served from 1926 to 1932.

Best Travels of 2018

By Jake Schneider, Still Unemployed, Trondheim, Norway

Not sure about you, but 2018 is going into my personal, 35-year-old record book as the busiest of them all. And, I wasn't even employed for five of its months and don't have kids. Accordingly, I hope that you are rolling your eyes and muttering profanities at me. Of course, just about everything was self-inflicted and done by my own free will.

Aside from getting married, selling our condo, and moving to Norway, I was fortunate enough to travel more than in any other year. Many trips were for pleasure, and others were born out of obligation as seemingly all of Melissa's friends decided to get married. The wedding circuit brought us to Milwaukee, Bemidji, Bloomington (Indiana), Valparaiso, Denver, and Steamboat Springs. Our wedding dancing skills were even more impressive than normal by September. We are awfully glad to only have one friend's nuptials to attend this year and that the party happens to be in Punta Cana.

In addition, my need to be active and outside brought us to the absolutely frigid Boston Marathon for the second consecutive year and to various ski slopes throughout Colorado and Michigan's Upper Peninsula. Combine this all with training for and completing my first Half-Ironman triathlon, and you have a rather busy first seven months of the year.

While many things in daily life slowed down (sometimes too slow) after the move, our various travels certainly have not, and while I certainly understand that not everyone has the need to explore the world, here are a few recommendations if you need a summer recharge or winter getaway.

Wisconsin

Melissa's Christmas present from me last year was a dog sledding trip near Bayfield. This was a somewhat selfish gift as I'd been wanting to try mushing. While we were only in the area for half the day, we quickly came to realize that we needed to return to further explore the Apostle Islands and the picturesque surrounds. Running a team of huskies was a thrill and highly recommended, too.

Not sure about you, but 2018 is going into my personal, 35-year-old record book as the busiest of them all. And, I wasn't even employed for five of its months and don't have kids. Accordingly, I hope that you are rolling your eyes and muttering profanities at me.

The Midwest

The Boundary Waters was a place that I'd heard of but didn't know much about until my brother-in-law told me that he was planning a journey there via a church auction prize. It so happened that this was during my semi-homeless phase when I was shacked up with my parents, and for many reasons I invited myself on the trip and was graciously allowed to join.

It's quite the drive and requires a fair amount of camping equipment along with an above-average fitness level, but if you like nature, fishing, canoeing, and taking long, muddy portages while carrying the aforementioned gear, this is the place for you. We luckily arrived just after a dry stretch and were thus treated to an almost non-existent mosquito population, which is quite the anomaly.

The United States

Since my cousin and his wife relocated to Denver a few years ago, I've basically become their de facto houseguest due to frequent ski and hiking trips, but I hadn't explored any other urban areas along the Front Range. During my two-week stay there in August, getting out of their hair seemed like a necessity for all parties involved, and after minimal research, I settled on the Fort Collins area.

After a nice hot hike through the Horsetooth Mountain Open Space, I headed downtown for the real business at hand, visiting breweries. New Belgium is the most well-known brewery in town, but there are operations all over the town. Aside from having plenty of beverage options and a Rocky Mountain backdrop, the cleanliness of the city was noteworthy.

International

With visits to Norway, Spain, Netherlands, England, Belgium, France, Sweden, and Denmark, we've checked off more locations on our European list than I ever would have imagined, but my favorite international destination was the one that we began the year with, Costa Rica. We flew into Liberia and spent a few days in Tamarindo. It was a little too busy and loud for our tastes, but that may have been due to it being right around the New Year's celebrations. However, the white-water rafting that we did in that general area was a rush, literally. The river was flowing so fast that what was normally a two-hour paddle took an hour and fifteen minutes.

From Tamarindo, we made our way south to a cliffside Airbnb that overlooked the ocean near Santa Teresa, and we didn't want to leave. Santa Teresa isn't the easiest place to get to, and accordingly, it's a relatively sleepy surf town with a surprisingly good selection of restaurants and a beach that seems endless. Heading back to the cold Wisconsin winter after our stay there was one of the more depressing moments of my life, but we'll be back to explore more of what the country and its friendly people who drive like maniacs have to offer.

There you have it, and I hope that it maybe inspired some of you to visit someplace new or maybe return to an old favorite.

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2018 Thank You List

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

A common phrase I have been hearing over the past few weeks is "Happy New Year." I had one superintendent tell me so long as we don't have another 2018, it will be a happy year!

As the new year begins, there are many end of the year wrap up articles being written. I want to continue with that trend by thanking those that provided assistance for another successful year at the O.J. Noer Turfgrass Research and Education Facility.

I have so many to thank, where do I start?

The WTA and WGCSA once again for the new building. They say you never have enough space so make sure you build it big enough. Well, how big is big enough? As I discussed the new building, the WGCSA board urged me to go bigger and so I did. Attached is a picture of the building this winter. Big enough, well it is much less empty during the growing season. I may be storing some equipment for another facility.

Thank you to Reinders who again provided the O.J. Noer Facility with a new Toro Greensmower 3150-Q, a heavy duty Workman cart and a greens roller for research work. As always, Reinders has stepped up to the plate to support the turfgrass program at the O.J. Noer Facility. John Jensen continues to work hard for the O. J. Noer Turfgrass Facility and I thank him for that.

JW Turf once again donated the use of a John Deere 9009A for mowing the general rough area at the O.J. Noer Research Facility. Larry, my seasonal staff, absolutely loves this mower. On the occasion that Phil from University Ridge needs to borrow it while his rough mower was being worked on, I had a mutiny on my hands. Let's just say Larry does not like or fit easily on the John Deere X724 lawn mower.

As the new shed full of equipment for the winter shows, "you can't build it big enough"

Thank you to Janet Hedtcke, superintendent at the West Madison Ag Research Station, and her right-hand man Dave Rosol for bailing me out during the American Family Senior Championship. As the rains fell that week, my boss Mike Peters came by to assure me he and Janet were there to help if I needed their assistance. As the rain fell and the paths between mobile trailers and cart staging areas turned into mud wrestling pit, Janet had Dave deliver four large dump truck loads of wood chips. Once the wood chips were added to the mud, it allowed us to make it through the balance of the week without injury or stuck golf carts. After everyone left, the clean-up began.

Phil Davidson and the University Ridge staff are always there when I need help. Phil was dealing with the aftermath of the AmFam Senior Golf Championship himself but had time to lend me some equipment to clean-up my mess, more on my mess later. As we all know the rain was horrific this summer. What I have named Schwab Creek, the drainage ditch that flows through the property is typically mowed every three weeks with our John Deere Lawn Tractor or Toro GM-72. But due to the roadwork and rainfall, it only dried out enough to mow four times all season.

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GOLD LEVEL Wisconsin Chapter GCSAA INDUSTRY PARTNER

NOTE'S FROM THE NOER

The first mowing in June was completed after we lost a staff member in the long grass. The bush hog of Phil's was a true lifesaver. I borrowed it three other times, but never lost a staff member in the long grass after that first mowing.

Here is where Phil was a true lifesaver. How do you remove 45 yards of wood chips, with shovels and UTV's? Slowly and backbreaking! Phil came to the rescue with his Steiner with the broom and his dump truck to haul the mulch away. Hours later the area was clean and waiting to dry out to be prepared for seeding. Phil, both my back and I thank you.

Then came the flood!!! On Tuesday morning August 21st the O.J. Noer Facility was a lake. Early in the day Kurt Hockmeyer's crew helped run the carpet cleaner trying to suck up some of the standing water in the building. Thanks Kurt. After they left for the annual Dr. Koch lunch and mini-golf tournament, Larry Wilson, my only fulltime staff member, and I began squeegeeing and pumping the flood waters off of the property. With only Larry and I, it was a very long day, by the way, Larry is 78 years old. Battling against the odds, Larry and I had all standing water off the property when Larry left at 6:00 p.m. By 8:00pm I had as much silt shoveled away as possible, dead tired!!!!!

The day after the water was removed Audrey Simard, Masters student, Entomology, arrived and started raking and cleaning anything that got in her way. She did awesome work without being asked to assist. Thank you! When things dried out a bit more, I double dragged the bentgrass plots and Kurt and his crew helped blow the silt off as much as possible. This was also much appreciated.

Later that week Gabe Lopez, owner of Irrigation Protection Services and Aaron Goninen of Reinders arrived to guide me through the replacement process of the entire irrigation system. This was a big undertaking, but without them I would not have gotten it accomplished with so few issues. So, thanks to Gabe and Aaron.

Throughout this most trying year, the influence of Larry has aided in keeping what is left of my sanity. Thank you Larry!

It takes a village to raise a child and it appears it takes a whole lot of people to get me through a year. Thank you to everyone that helped and the many others that may not have made this article.

Ok, now for 2019?

Above: After the flood the irrigation system was not operational so watering had to be done with a tank and base sprinkler.

Left: Ruts and mud during the American Family Championship were covered with wood chips, however that caused other cleanup issues.

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ET-Based Irrigation Scheduling

By Paul Jacobs, USGA Green Section, Northeast Region Agronomist
Pat Gross, USGA Green Section, West Region Director

Using weather station data and crop coefficients to determine the water use rate of turf takes some of the guesswork out of irrigation programming decisions and leads to more efficient water applications.

The keys to effective irrigation are applying water efficiently and in the proper amount. The obvious question is, what is the proper amount? One of the most important decisions a turf manager must make every day is how much water to apply. This decision has a significant impact on turf health and playability of the golf course. Additionally, the environmental concerns surrounding water use on golf courses elevate the importance of implementing and documenting efficient irrigation practices. So, how do you know how much water your golf course needs?

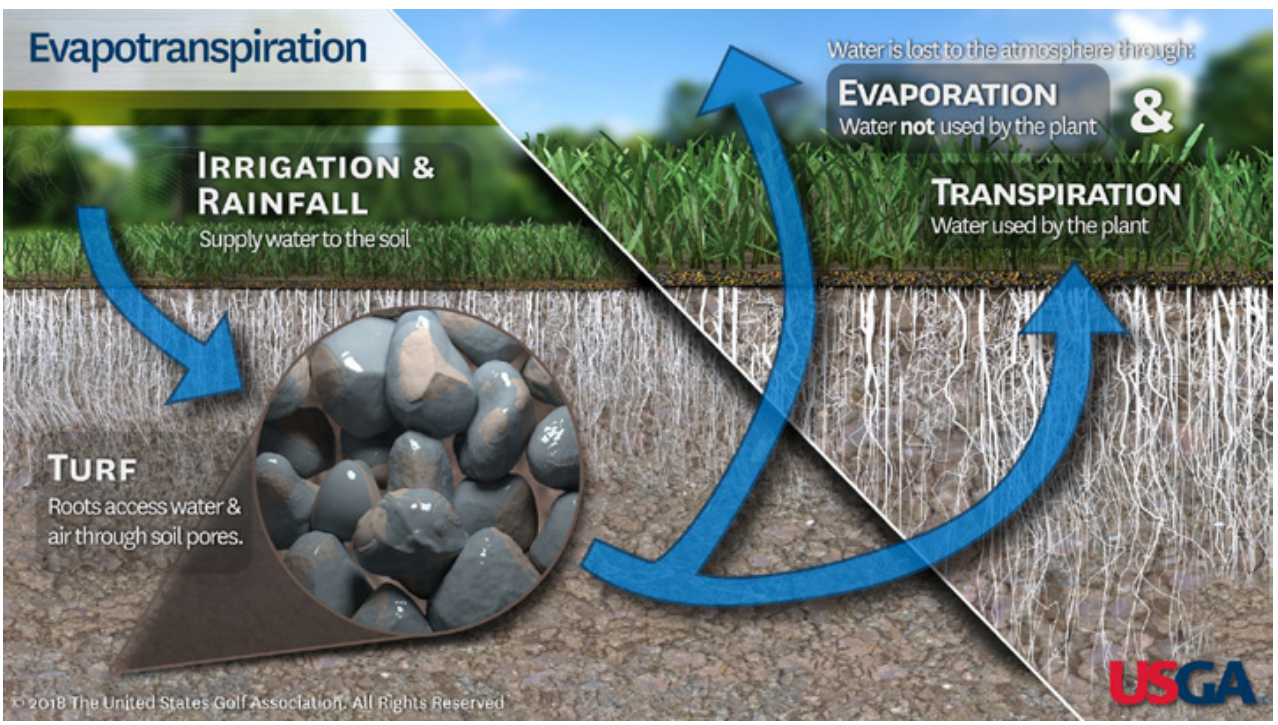
A variety of methods are used to determine how much water to apply to a golf course. Some superintendents rely on visual observations of turf. Others use soil probes to feel how much moisture is present. Still other methods depend on experience and gut feelings. Each of these methods is subjective and can lead to water waste. Today, many superintendents prefer to base daily irrigation decisions on weather data used to calculate evapotranspiration (ET).

Evapotranspiration values represent the amount of water lost from the soil due to evaporation in addition to the water used by plants under specific weather conditions. Evapotranspiration is typically calculated daily, and superintendents can use ET values to apply irrigation to replace a portion of the water lost. Using ET to guide irrigation decisions allows superintendents to take some of the guesswork out of the irrigation programming process by basing their decisions on data,research, and some simple math.

UNDERSTANDING EVAPOTRANSPIRATION

Evapotranspiration is the term that describes the total loss of water from evaporation and transpiration. Evaporation is the loss of water from the soil and transpiration is the amount of water used by plants for growth and other metabolic processes. Evapotranspiration is typically expressed in inches or millimeters of water per day.

Several methods have been used over the years to calculate and measure ET, including devices such as atmometers, evaporative pans, and lysimeters. Today, it is more common to use empirical mathematical models based on climate data. Evapotranspiration is a function of four different weather factors: solar radiation, wind speed, humidity, and temperature. The ET calculation is always made for the same reference crop — i.e., a well watered cool-season grass maintained at 3 to 6 inches — is held constant so that any changes in ET are a result of weather factors (Brown and Kopec 2014). These ET calculations yield a number known as reference ET (ETo).



Weather stations collect meteorological data used to calculate reference ET, a number that can be used to accurately estimate turf water use.

OBTAINING ET INFORMATION TO DETERMINE TURF WATER REQUIREMENTS

Several sources can be used to obtain reference ET, including on-site weather stations, state weather station networks, and the National Weather Service. On-site weather stations, which have become commonplace at many golf courses, have the potential to provide more accurate information than off-site weather stations, which could be miles away. Weather stations at golf courses are typically linked to the computer software that controls irrigation schedules.

Some states have a network of weather stations that offer reference ET data free of charge online — e.g., the California Irrigation Management Information System and the Arizona Meteorological Network. Another free source of ET information is the National Weather Service at www.digital. weather.gov, which provides forecast reference ET for up to seven days based on weather patterns. Looking at forecast reference ET can provide a long-term estimate of water requirements and help better plan irrigation applications. It is important to note that different weather station manufacturers and irrigation control software compute reference ET differently, and the differences can be significant (Brown 1999). Using one source of reference ET data is recommended so that the methodology is consistent and irrigation programing decisions are more precise.

The actual turf irrigation requirement is known as the turf ET (ETt). Two variables are used to calculate this number — the reference ET and a crop coefficient (Kc). Turf ET is calculated as follows:

ETt x ETo = Kc

- ETt — Turf ET is an accurate estimate or the water requirement of a specific turf species under particular conditions.
- ETo — Reference ET is a baseline value obtained from weather station data. It represents the combined amount of water used by a reference crop and the amount of water lost from the soil through evaporation. The value is calculated based on climatic data, including temperature, humidity, wind speed, and solar radiation.
- Kc — The crop coefficient is an adjustment factor. It represents a percentage of the reference ET value. Research has shown that turf requires less water than what is calculated by reference ET; therefore, only a percentage of reference ET needs to be applied as irrigation to sustain healthy growth (Kneebone et al., 1992). Cool-season grasses generally have a greater water requirement than warm-season grasses and typically require 80 percent or more of reference ET. Warm-season grasses typically require 60 to 80 percent of reference.

ET. Factors such as turf species, height of cut, turf quality, and stage of development all influence water requirements and crop coefficient values. As mowing height increases, crop coefficient values also increase (Brown and Kopec, 2014).

Additionally, turf stands with high nitrogen fertility rates will typically have greater crop coefficient values and require more water (McGroary et al., 2011).

Turf species, and even cultivars within a given species, exhibit a wide variation in crop coefficient values. Optimizing irrigation applications depends on selecting correct crop coefficients that are matched to the reference ET calculation procedure (Brown, 1999).

PUTTING ET TO WORK

When irrigating a golf course, each superintendent does things a little differently. Some rely heavily on sitespecific knowledge and their feel for conditions, while others have been using ET-based calculations for years. Certainly, local knowledge and an understanding of how a golf course responds to different irrigation regimes is required even when using ET. However, relying strictly on feel can be problematic because it relies upon using turf appearance as a gauge of water use efficiency. This approach may be effective at ensuring turf does not suffer from a water shortage, but how do you know if too much is being applied? To optimize water use efficiency, ET should be used as part of the decision-making process. The following steps will help walk you through using ET to make irrigation decisions:

Step 1: Gather reference ET information. Obtain reference ET information from an on-site weather station, the National Weather Service, or a state weather station network. Some superintendents prefer to irrigate daily, while others like to accumulate ET values for several days and schedule heavier irrigation cycles at less frequent intervals. Such decisions are site-specific and must take into account soil factors, turf species, and operational issues at the golf course.

Step 2: Determine the crop coefficient. Crop coefficient values change throughout the year due to temperature, day length, and turf growth cycles. Comparing crop coefficient values between different climatic regions is difficult because crop coefficient values are lower in arid environments than in wet environments (Carrow, 1995). For better precision, it is ideal to obtain monthly crop coefficient values from a local university extension specialist. An example of monthly crop coefficient values for warm- and coolseason grasses is presented in **Table 1.** Unfortunately, such information is not available in all parts of the country, which presents an opportunity for further research. In the absence of monthly crop coefficient values, using 0.8 (80 percent) for coolseason grasses and 0.6 to 0.7 (60 to 70 percent) for warm-season grasses s baselines and making adjustments based on seasonal growth rates is recommended.

Step 3: Calculate turf water use. To calculate turf water use, multiply reference ET by the crop coefficient. This gives us an accurate estimate of the water used by turf. The equation is:

ETo x Kc = ETt

Example 1: Determine the daily turf water use for a perennial ryegrass fairway maintained to high standards of turf quality. Assume, hypothetically, that the perennial ryegrass reference ET for the day was reported to be 0.15 inch and the crop coefficient was determined to be 0.80:

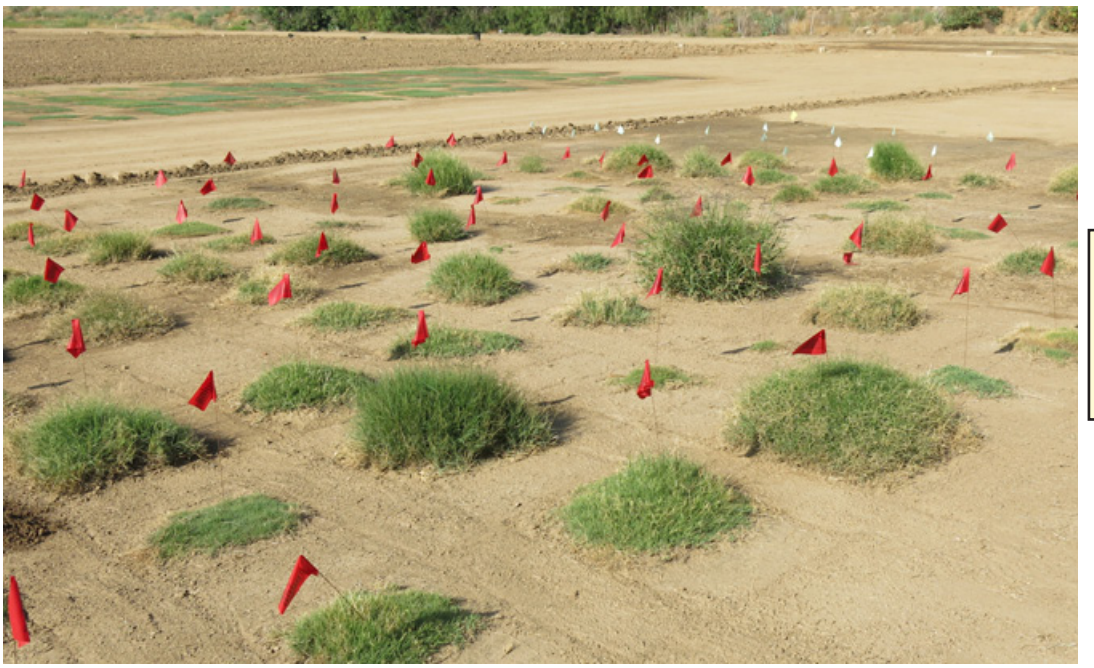
0.15 inch x 0.80 = 0.12 inch

Example 2: Determine the daily turf water use for a bermudagrass fairway maintained to high standards of turf quality. Assume, hypothetically, that the bermudagrass reference ET for the day was reported to be 0.22 inch and the crop coefficient was determined to be 0.70:

0.22 inch x 0.70 = 0.154 inch

Step 4: Adjust for uniformity and site conditions. Once turf water use is calculated, it can serve as a reasonable stimate of the amount of water that needs to be applied. However, irrigation system uniformity must be considered when determining how much water to apply. Also, keep in mind that salts can accumulate in the soil during prolonged periods of drought, especially under deficit irrigation. Both factors can increase the actual amount of water required. To accurately make adjustments, an irrigation system audit and chemical water tests should be performed. An irrigation system that is not uniform will use more water than a uniform system when trying to ensure that even the driest areas receive adequate irrigation.

A relatively low-cost way of determining the uniformity of an irrigation system is to conduct a catch-can test. To do so, place shoebox-sized containers on the ground about 10 feet apart between sprinklers. Run all the sprinklers that affect the test area for a minimum of three rotations. Then, measure the volume of water in each container.



Cultivars of the same turf species can have very different crop coefficients.

TABLE 1

Example of monthly crop coefficients for cool-season and warm-season turf in Riverside, California (Adapted from Meyer et al., 1985)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Cool-season grasses	.61	.64	.75	1.04	.95	.88	.94	.86	.74	.75	.69	.60
Warm-season grasses	.55	.54	.76	.72	.79	.68	.71	.71	.62	.54	.58	.55

Finally, calculate the scheduling coefficient (SC) using the following formula:

$$SC = \frac{\text{average water volume}}{\text{volume from driest area}}$$

For example, if the average volume collected per container was 6 ounces and the container with the least amount of water contained 4 ounces, the scheduling coefficient would be 6/4 or 1.5. In this case, you would need to multiply the value for turf water use by 1.5 to ensure that the driest areas receive adequate irrigation.

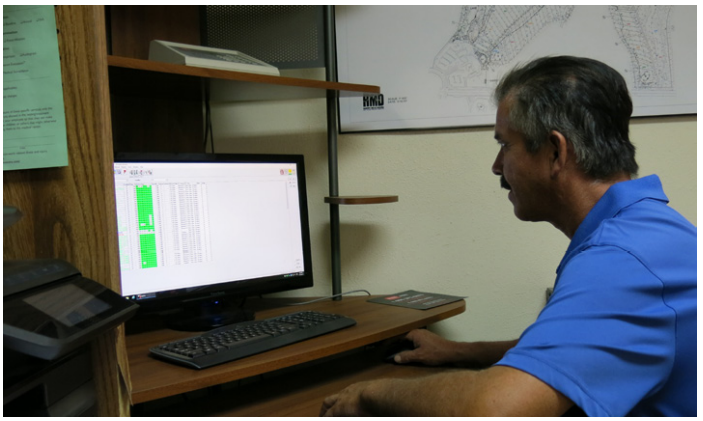
This simple method of measuring irrigation uniformity can be performed with basic supplies and effectively shows how poorly some antiquated irrigation systems apply water. However, scheduling coefficient typically is not used to determine actual irrigation requirements because if adjustments are made to adequately irrigate dry spots, then other areas will be overirrigated.

Moisture meters can also be used to identify inefficiencies in an irrigation ystem. Using moisture meters allows irrigation adjustments to be made based on soil moisture content instead of irrigation system uniformity or scheduling coefficients calculations. Regardless, additional scheduling adjustments will be necessary based on site conditions — e.g., south-facing slopes may require more water and shaded areas may remain wet longer than areas in full sun. Adjustments typically can be made by adjusting the run times of individual stations. For a more thorough evaluation of an irrigation system, conduct a complete irrigation system audit.

Step 5: Programming the irrigation system. When programming an irrigation system, it is important to realize the correlation between water quantity and run time. Often, run times are based on multiples of the time required for an irrigation head to make one full rotation. This makes sense, but understanding the quantity of water that is applied in a given amount of time is most important.

If an irrigation system runs for 10 minutes, it is essential to know how much water is being applied during those 10 minutes. Performing a catch-can test or an irrigation audit is a great way to determine how much water is applied in a given amount of time. However, factors such as nozzle selection and water pressure influence precipitation rate, so changes to an irrigation system should be noted and accounted for in the central controller.

Crop coefficients change throughout the year as turf enters different stages of growth. During winter, dormant bermudagrass requires very little water while overseeded turf requires additional water.



Optimizing water use requires daily adjustments to an irrigation program. Using ET to guide irrigation decisions removes some subjectivity from the process.

CONCLUSION

As the adage goes, you can't manage what you can't measure. When it comes to efficient irrigation management, ET is an objective measurement that helps determine how much water should be applied to turf on a given day. It incorporates daily weather data — including solar radiation, wind speed, humidity, and temperature — and utilizes a crop coefficient to fine-tune the water requirement for a particular site and turf species. While ET-based irrigation scheduling has been used for decades, there is still work to be done to determine accurate monthly crop coefficient values that match local climate conditions and expectations for quality for all parts of the country. Evapotranspiration based irrigation scheduling does not remove all local knowledge and feel from the decision-making process. It utilizes meteorological data and simple calculations to create an accurate estimate of turf water use. Using ET to guide irrigation decisions ultimately results in healthier turf, less water waste, and better playing conditions.

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2019 WTA Turfgrass Research Day Conference & Webinar

By David A. Brandenburg, Editor, The Grass Roots

The 2019 Turfgrass Research Day Conference & Webinar was a great way to start out the 2019 education season. The event provided a great lineup of speakers and topics to educate the 65 in attendance and even more watching on the webinar. Dr. Soldat was giving a talk out of state so Dr. Koch led the way as master of ceremonies.

Paul discussed the 4 Wisconsin Distinguished Graduate Fellowships that the industry has with the Wayne R Kussow Fellowship, filled by Qiyu (Ada) Zhau - Ph.D. Soils, the Terry and Kathleen Kurth Fellowship filled by Audrey Simard - MS Entomology, the Robert C. Newman Fellowship filled by Michael Bekken - Ph.D. - Soils, and the John and Flora Berbee Fellowship which is currently open. Having 4 fellowships not only is good for our students it sets the Wisconsin Turfgrass Program apart from other universities.

Dr. Koch also discussed how the turfgrass program has changed since it was initiated by O.J. Noer in 1960. From the peak years in the late 1990's when 25 students were in the program enrollment has declined to single digits. Similar declines have been seen in other turf programs. To help, the university is starting a 2 year certificate program with plans to be finalized by this spring.

The program will be part of the Farm and Industry Short Course that has been part of the university since 1885.

The Pyle Center provided a good venue for the group and our 3rd floor conference room overlooked Lake Mendota. Normally we watch snowmobiles, ice fishers or ice skaters but this year the lake had very little ice.

The early January date of the conference offers attendees a chance to network and catch up with colleagues after the Christmas holiday. Water, flooding and mud led many of the hallway discussions after the wet second half of 2018.

We look forward to seeing you on July 24th for the WTA Summer Field Day at the O.J. Noer Turfgrass Research and Education Facility.

The Scholarship Winners

Left to Right:

Mitchell VanHerwynen received the WGCSA James R. Love Scholarship ($1,500) sponsored by the WGCSA and awarded to a Junior or Senior in Turf and Grounds Management Specialization. Mitchell is a Junior in Soil Science and has worked in his hometown of Fond du Lac at South Hills Golf and Country Club.

Lily Gonzalez Vazquez received a Wisconsin Turfgrass Association Scholarships ($500) awarded to a student in Horticulture, Plant Pathology or Soil Science with a interest in turfgrass. Lily is from Puerto Rico, received her B.S. from the University of Puerto Rico and is working towards her Ph.D. in Plant Pathology.

Audrey Simard received a Wisconsin Turfgrass Association Scholarship ($500) awarded to a student in Horticulture, Plant Pathology or Soil Science with a interest in turfgrass. Audrey is from Quebec, received her B.S. from UW - Madison and is working towards her Ph.D. in Entomology.

Qiyu (Ada) Zhou received the James W. Huggett Memorial Scholarship ($1,000) sponsored by the WTA and awarded to a student in Horticulture, Plant Pathology or Soil Science with a interest in turfgrass. Ada is from China and received her B.S. from Michigan State/Sichuan University, her MS from UW-Madison and is working towards her Ph.D. in Soil Science.

Michael Bekken received the Charles O. Newlin Scholarship in Turfgrass Management ($1,500) sponsored by the University of Wisconsin Foundation and awarded to a undergraduate or graduate student studying turfgrass science. Michael is from Blacksburg, VA and received his B.S. from William and Mary in Biology and Geology, interned with the R&A at Saint Andrews and is working towards his Ph.D. in Soils.

Jessica Cebula, University of Wisconsin, Health Services Department, discussed safety for the green industry. This important topic can be overwhelming when superintendents start reading the many regulations and rules offered by OSHA regulations. Adding to the confusion is the fact regulations vary from industry to industry, are based on the number of employees a business has and the amount of exposure an employee has to an hazard.

Respiratory protection is a commonly cited issue by regulators when inspecting businesses. If employees need to wear a respirator to perform certain jobs a club needs a written program and someone in charge of the program that understands the different types of respirators. A employer cannot just simply say wear a respirator.

Respirators are not one filter for all materials. An assessment should be done to determine what work is being done and what contaminate needs to be filtered out to protect employees. Honeywell and other safety product companies provide universal color coded filter reference charts on their website to use as a guide.

Employee respirator training should feature fit tests, cleaning and proper storage.

Occupational Noise Exposure is an important but rarely cited item during inspections. Jessica expressed that a hearing conservation program should be part of every company safety program/manual. OSHA Standard 29CFR 1910.95 provides a guide for putting together a program but according to Jessica the standards are outdated and 17 to 20% of people will suffer damage at 85db which is below the scale that starts at 90db.

A dosimeter worn near the shoulder is a good tool to measure noise exposure from different jobs. Hearing loss from noise is not usually from single incidents but a time weighted average. The louder the noise, the shorter period of time it takes to have damage. Jessica suggested that a business with a hearing loss prevention program have hearing tests at the date of hire and then periodically throughout a employees career to track changes. She also explained that most workers do not know how to put in foam ear plugs and she suggested a good training tool is to find a 5 minute YouTube video. Ear muffs that do or do not play music should meet the hearing protection standards but noise canceling headphones do not have noise reduction ratings and therefore should not be used as hearing protection.

Research done on golf course employee's exposure to silica sand has shown that working outside with silica sand does not provide a risk because the dust cloud is usually behind the operator however inside where the dust can hang is an issue. Most silica dust damage to lungs occurs from moderate to low exposure over a period of 15 to 20 years but high exposure events can be just as problematic.

Qiyu (Ada) Zhau, Ph.D. Student, University of Wisconsin Madison, Department of Soil Science, discussed Effects of Nitrogen Rate, Golf Footwear Traffic and Soil Organic Matter on Creeping Bentgrass Growth.

Ada started explaining why we as turf managers care about growth rates. The easy answer is playability. If we can control growth, we can provide the playing quality we want on greens, tees and fairways.

Zhau's work found higher nitrogen rates increased growth rates. Operators need to adjust nitrogen rates to reach our ideal clipping yield and growth rate. To measure clipping yield she suggested we as operators just measuring clipping volume rather than the scientific dry clipping mass. Liter per 100 square meter is the common measurement. She warned it is important to be consistent with settling the clippings in the bucket used to measure.

Ada's work reguarding traffic with golf shoes showed it took a high amount of traffic to effect clipping yield and growth. For the research they had plots with a ridiculous amount of foot traffic to see how the turf would react. It is still early but normal foot traffic under normal weather patterns and healthy turfgrass did not change clipping yield.

Her study of organic matter amounts and growth rate is a work in progress and the next step will be to increase the difference between her high and low organic matter plots. Overall, growth rate and clipping yield are very hot topics in the golf industry as maintenance staffs strive to produce high quality playing conditions.

Michael Bekken, Ph.D. Student, University of Wisconsin, Department of Soil Science, discussed Methods for Quantifying Sustainable Resource Use on Golf Courses.

Michael has had some great experiences for a young man in the turf industry. He played college golf for William and Mary, did an internship for the R&A in 2015 and worked at St. Andrews during the British Open. At St. Andrews he helped develop the GolfPark Concept and coordinate sustainability initiatives for the Open Championship.

After his internship Bekken was hired by the Golf Environment Organization in North Berwick Scotland to help develop a program called OnCourse that uses analytical tools to optimize water, fertilizer and pesticide use.

He discussed his work to quantify the resource inputs used to maintain playing surfaces. First metrics need to be developed to compare one course to another and then the information has to be used consistently. Inputs include water, energy both fuels and electricity, pesticides and fertilizer.

Michael is looking at how playing quality may influence resources use but has found it is hard to measure quality and may look at playing price as a comparative measuring device.

Following up on Michael Bekken's talk, Dr. Brian Horgan, University of Minnesota, discussed the Value of Urban Greenspace as a Natural Resource.

The University of Minnesota, in conjunction with the USGA, is working on showing the value of a golf course in an urban area beyond the recreational aspects of the game. How does a golf course benefit the environment?

The number of people living in urban areas has surpassed the number living in rural areas for the first time so green space is becoming more valuable. Valuable in property value for development but also valuable for the greenspace that once lost is usually gone forever.

Dr. Horgan discussed the benefits of green space; cooling effect, aquifer recharge, storm water control, and pollinator habitat. Horgan's group has done work showing the baseline value of a golf course by using virtual programs to replace greenspace with commercial, housing or just natural areas.

Work is also being done with golf courses to use traffic maps to show areas golfers rarely use and then those areas can be naturalized to increase water filtering and cooling.

With 103 golf courses across the Minneapolis Metroplex the cumulative benefits to the environment are expansive. The work will continue in Minnesota before being expanded out to other areas of the country.

More information on this project can be found at scienceofthegreen.umn.edu .

WISCONSIN TURFGRASS ASSOCIATION

Audrey Simard, M.S. Student, University of Wisconsin, Department of Entomology, to present Effects of Pesticides in Guttation Water on Pollinators. Audrey explained that guttation water is xylem sap exuded from the plant to purge excess water. Her work has focused on fungicides rather than other pesticides due to early work by Glenn Obear on propiconazole effects on Japanese Beetles on putting greens. If propiconazole effects beetles it stands to reason it could affect pollinators.

Bees bring water to the hive to evaporatively cool the hive. Commercial bees are moved around the country by contract to help facilitate crop pollination. Being new to an area these bees may not know where to get water when they show up in a new location by semi-truck but do they know they can get water from turf guttation.

Simard explained it took some practice to collect guttation water with an eyedropper and it can only be done without collecting morning dew which would dilute the sample. Dew is formed on the plant surface due to condensation while guttation comes from the plant. After collecting the water, testing was done to find the level of chemical in the guttation. Then that level of chemical can be used to see how bees react to it. This work will continue with herbicides next.

There is more work to be done but there should be a workable solution to reduce the risk of bee exposure. One possibility is producing a guttation water forecast to forecast days of higher guttation development and then plan pesticide applications around those days of high guttation.

Audrey also discussed her work with bee hives on 6 golf course locations. Some of the bees survived all summer but struggled through the winter months. Studies have been done to measure pollen and pollen diversity to show the symbiosis between bees and the golf course which have proven to be fantastic locations for pollinators.

WISCONSIN TURFGRASS ASSOCIATION

Kurt Hockemeyer was first after a delicious lunch to discuss the activities of the Turfgrass Diagnostic Lab in 2018. The lab saw 265 submissions with nearly 55% from our home state. In 2018 golf samples led homeowner samples. Kurt attributed this to the wet year. In dry years homeowners submit more samples. Either dry or wet abiotic samples are most common and represent problems with soil, location or stress from traffic, poor construction etc.
Summer patch and bipolaris leaf spot led the disease submissions followed by take all patch and basal rot anthracnose and other diseases related to the warm humid weather with above average rainfall.
The weather resulted in 2 gray leaf spot on ryegrass submitted from northern Illinois. This was as far north as the disease has ever been found.
Hockemeyer expressed that when sending samples to the lab pictures are important and can make up for a poor description. Pictures should reveal any field patterns to help diagnose the problem. Wisconsin Turf Managers are fortunate to have a well-respected and professionally staffed turf lab for our diagnostic and educational needs. *(More on the year in review can be found on page 38 of this issue of The Grass Roots.)*

The tag team of Mike Krupke, Insight FS and Josh Veit from Midwest Athletic Fields presented Resurfacing Made Easy. They covered a recap of work done to Madison Memorial Mansfield Stadium that serves both soccer and football.
The field had drainage issues and was 60% poa providing for a poor playing surface. The school wanted to re-do the field but a unplanned expense to replace the tower lights after one fell over in a storm limited the options Mike and Josh had to get the field back in play for the next season. The best option would be to strip the turf and drain and grade the surface before applying sod but the budget for that was used up purchasing new light towers.
The field had to be ready for an August 17 football game so seeding from scratch did not seem to be an option. Instead the group decided to use "fraze" mowing to remove the thatch and most of the field and to regrade the few areas that had bad drainage. Xonerate herbicide was applied twice to reduce poa populations and then the field was fraze mowed before it was aerifyed with a "aerivator" 3 times and slit seeded with a mix or 70% bluegrass and 30% tillering ryegrass.
The cold wet spring did not help the project but regular rains and timely applications of starter fertilizer did the job despite a couple flooding incidents due to extreme rain events. Fraze mowing to re-new stands of turf is popular in Europe but has not caught on in the states.

Mitchell VanHerynen is congratulated by WGCSA President Josh LePine for being awarded the Dr. James R. Love Scholarship.

Dr. Paul Koch, University of Wisconsin, Department of Plant Pathology gave the closing talk on the Impacts of Cultural Practices and Pesticide Applications on the Turfgrass Microbiome. The microbiome is an often ignored and ill understood subject but yet it is all around us. Paul stated there are more microorganisms in a teaspoon of healthy soil than people on the earth.

In humans, a recent trend has been to study the microbial community of our guts and how differences can effect health, disease, obesity and other human functions.

Work on the impact of varied nitrogen rates on dollar spot disease showed disease reduction at N rates of 6# per thousand per year. That rate would not be feasible in our seasonal climate and would cause growth rates that are too high for quality turf. A higher N rate changed the bacterial makeup of the soil but work will continue to see what impact, if any, those changes in bacteria had to impact dollar spot.

Work was also done on greens that had been fumigated to determine how different types of compost material effected the microbial population under a gas and re-grass scenario. In early results, there was no change between the different types of compost and the soil microbe populations quickly returned to normal.

Work will continue on this topic but so far we have seen that we can change soil microbe populations and types but we do not understand what that means. A change in populations is not necessarily bad but we don't know it is good either.

2018 Turfgrass Diagnostic Lab Year in Review

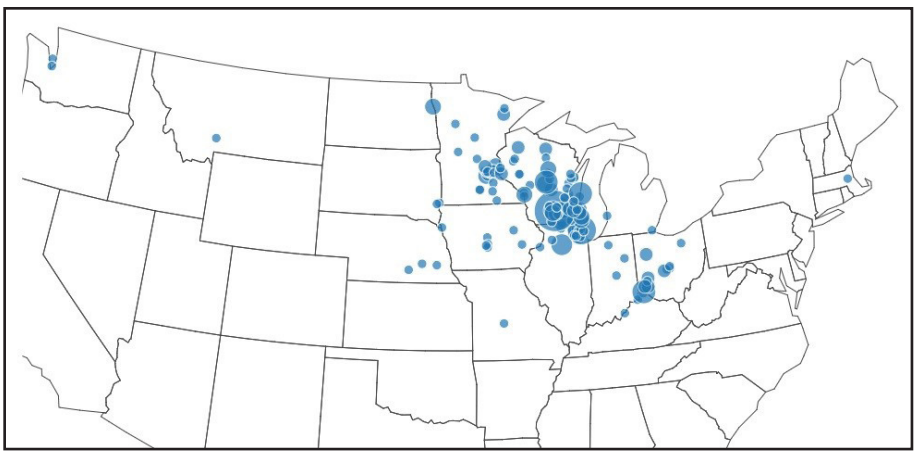
By Kurt Hockemeyer, Turfgrass Diagnostic Lab Manager, O.J. Noer Turfgrass Research and Education Facility

2018 will probably be remembered by most as a year they would rather forget. That's probably a little harsh and exaggerated, but with all the hot and wet weather last year came a lot of "hot weather" diseases into the lab. Even more frustrating, turfgrass areas were just dying with no pathogens detected. When trying to grow bentgrass greens at around 0.125" (or lower), there's just not much wiggle room when it comes to environmental stresses. Waterlogged rootzones and very hot temperatures took up that wiggle room very quickly, and turfgrass areas checked out.

In 2018, I received 265 sample submissions from all over the Midwest and across the country **(Figure 1).** Samples came from as far east as Massachusetts, and as far west as Seattle. I always enjoy getting a sample from outside the Midwest because it can be very interesting. One of the samples I received from Seattle was from an annual bluegrass putting green, and this sample by far had the longest roots I've ever seen on an annual bluegrass putting green **(Figure 2)**. Normally annual bluegrass samples that I get during the summer have less than 1 inch of roots **(Figure 3)**. If you are going to grow annual bluegrass, I guess the Pacific Northwest is where you want to do it. To no one's surprise, most of the sample submissions come in during the growing season. But I was surprised when looking at the numbers that over 95% of the samples came in over a 5 month period, from May through September. From Figure 1, you can see that the majority of samples come from Wisconsin (54%), followed by Illinois (15%), Minnesota (13%), and Ohio (8%).

Last year saw an increase in the proportion of samples coming from professional turf managers (golf courses, sports fields, sod farms, etc.) compared to homeowners. One of the trends typically seen in the lab is that when the weather is wet, golf courses tend to send in samples. And when the weather is dry, homeowners tend to send in samples. Last year we saw above average rainfall as a whole across the Midwest, which then reflects the increased samples from golf courses. According to NOAA, the summer of 2018 was the 4th hottest on record across the contiguous United States. If you break this information down a little, we see that nighttime temperatures were especially high last year. You've probably heard me, or Dr. Koch or any other plant pathologist talk about this, but high nighttime temperatures are one of the biggest drivers of a lot of fungal pathogens in turf. Cool nighttime temps slow down fungal infections, but when those temps don't dip down as much as they normally do, pathogens can take off overnight.

Due to these warmer temps, I saw a lot of the "hot weather" diseases that I might not normally see a lot of in Wisconsin. These included things like Bipolaris leaf spot, summer patch, Pythium foliar blight, gray leaf spot, and brown patch. A first for me was seeing brown patch occur on Kentucky bluegrass over a very hot and humid weekend. Due to Kentucky bluegrass being fairly naturally resistant to brown patch, the damage was superficial. But to see that even occur in the first place indicates how conducive environmental conditions were during that weekend. Another first for the lab was seeing gray leaf spot TWICE in the greater Chicago area, the furthest north Dr. Koch has seen this disease. Gray leaf spot spores cannot survive a typical Midwest winter, and spores need to move up from the south every summer. To see that this fungus is causing disease that far north, goes to show how hot the weather was last summer. Hopefully this is not a trend that continues to march northward.



Left: Figure 1. A graphical representation of where in the US each of the TDL samples came from. Larger circles mean more samples came from that area.

Right: Figure 2. Poa annua roots from the Pacific Northwest. The most roots I've ever seen on annual bluegrass putting green.

TURFGRASS DIAGNOSTIC LAB

One of the most difficult phone calls that I have to make is telling a superintendent that their dead grass is not due to a disease, but rather caused by abiotic factors such as heat or drought. Lee Butler, the turfgrass diagnostician at NC State, often says this a lot. And I agree with him 100%, sometimes it's easier to blame a pathogen for turfgrass decline. But this past summer I saw a large increase in the number of samples in which no pathogen was found. In over 50% of all the samples submitted, no disease was found. As I mentioned before, there is just not much wiggle room when it comes to growing greens, and this past summer often environmental conditions were just too tough for a lot of turf areas.

Once again our summer turned out to be an interesting one. Every year is a little bit different and has its own flavor. So as we look forward to 2019, it's that time of year for the TDL to ask for your support. Many of you already have contracts with the lab, and for that we thank you. Without those contracts, the TDL simply would not exist since we don't receive any university funding. In the past few months, we've contacted many folks who do not currently support the lab, and the reality is that not very many new contracts have come in. It's still very early in the year, so they may not have gotten around to it yet. But if you know of anyone who does not have a contract with us, please tell them about the services that we offer and the promptness of those services as well. I can write an entire book about how supporting the lab can help you as a superintendent, but I don't think that would count even half of the recommendations from fellow superintendents who have worked with us before would mean. Thanks again to those who have supported us in the past and I look forward to helping you in 2019 and beyond.

Figure 3. Poa annua roots from the Midwest. I saw many of these types of samples in 2018. No disease found and simply a lack of root structure.

Josh LePine Takes The Helm of WGCSA

By David A. Brandenburg, Editor, The Grass Roots

Josh LePine followed a natural path to the golf industry and now, to serve as the 45th President of the Wisconsin Golf Course Superintendents Association.

He started his work career on neighboring farms in Stoughton, WI harvesting tobacco, bailing hay, picking strawberries and sweet corn. He enjoyed working outdoors which led him up the street to the 9 hole Private Stoughton Country Club.

Josh's parents were clear to point out that if he wanted a car when he turned 16 he better start saving his pennies. 1988 was LePine's sophomore year of high school and the year he entered the golf industry serving Stoughton Country Club as a bus boy, dishwasher, server and grounds crew member. He was hired by longtime GM and Golf Professional Steve Hlavacek and luckily could walk to work.

Josh figured out quickly that the kitchen was not for him and transitioned to working full time on the grounds staff for Golf Course Superintendent Andrew Nelson. Stoughton is a small club and Josh had an opportunity to do just about every job there was at a young age. Night waterman, equipment operator and course set up were all part of his duties. He quickly fell in love with working outdoors and golf course maintenance.

After graduation from Stoughton High School in 1991 Josh attended the University of Wisconsin, Madison. It was there he met the late Dr. Wayne Kussow who helped him enroll in the Soil Science Turf and Grounds Management Program. Dr. Kussow and then Dr. Frank Rossi were Joshe's academic advisors and he credits both of them for mentoring him along his career path.

Dr. Rossi gave Lepine a gentle nudge to broaden his work experience after 7 summers at Stoughton. In the spring of 1995 Josh found himself heading to Winged Foot Golf Club in Mamaroneck, NY working for renowned Certified Golf Course Superintendent, Robert U. Alozi.

Winged Foot is a private 36 hole facility designed by A.W. Tillinghast in Westchester County just north of New York City. At that time the club was busy planning and preparing for the 1997 PGA Championship which was fast approaching.

The internship was a major milestone in Josh's life. For the first time he was not only on his own but half way across the country and at one of the top golf clubs in the nation. The internship at the esteemed club meant that Josh was literally and figuratively living at the course. The poa annua playing surfaces were kept on the edge at all times and required extra care.

At Winged Foot Josh was able to utilize his Spanish and bonded with the diverse crew. At the end of the summer Robert offered him an Apprentice Superintendent position for the next spring. It was a good opportunity to be part of the PGA Championship and the historic club.

Sonja and Josh LePine with their 3 children Joseph (19), Naomi (16) and Matthew (9) at Kegonsa State Park in Stoughton on the bench dedicated to late Grandpa Ken LePine. Ken was a longtime volunteer at the park performing bookwork and mowing.

As a Certified Pool Operator, Josh oversees the maintenance of the new aquatic facility at Maple Bluff Country Club.

Maple Bluff Country Club, Hole #1: 290 yards. A Short but narrow drivable Par 4 with lots of trouble on the East Shores of Lake Mendota. The UW Campus and State Capitol are in the background.

Davis Love III celebrates his first major golf tournament on hole 18 at Winged Foot Golf Club in New York with a rainbow overhead.

Maple Bluff Country Club, Hole #6: 204 yards Various tee and pin options along with the elevation change and length make this a signature Par 3.

At the end of summer, Josh returned to Wisconsin to finish his last fall semester and earn his degree. He states it was the best semester of his life. He had a job lined up after graduation and he met his wife to be, Sonja. Soon after they started dating Josh knew she was the one.

After graduation LePine had a month off and then moved back to New York in February to start his full time career as an apprentice at Winged Foot Golf Club. At the time, Sonja was still in nursing school in Madison so the long distance relationship led to many phone calls, letters and visits back and forth. Josh stayed at Winged Foot for two more years, through the 1997 PGA Championship, when Davis Love III won his first major on the 18th Green of Winged Foot's famed West Course.

After hosting the PGA Championship and the tough task of restoring both courses back to shape for member play, a job opportunity opened up back in Wisconsin. It was Josh's intention to return to the Badger State and become a superintendent here. He had kept his WSGA membership active in hopes of returning.

Josh was offered and accepted the Golf Course Superintendent position at Bristlecone Pines Golf Club in Hartland in February of 1998. Bristlecone was a new 18 hole semi-private golf club and housing development designed by Schott Miller. Josh worked directly for the sole owner and developer, John Malec. With the long distance relationship over, the couple were married.

Lepine spent 14 years at Bristlecone, earned his certification from GCSAA and started a family. At work he completed a master plan, converted the course and property to a full scale private country club, constructed a swimming pool, completed countless renovation projects including townhome villas construction and a subdivision development.

Josh will admit he wasn't quite ready for the workload and knowledge needed to succeed at Bristlecone. It was a unique situation with much more responsibility than just the golf course. He learned by good old fashioned trial and error, effort and determination. In 2009 Bristlecone Pines was sold to The Legend Group and suddenly he was under new ownership which was stressful for him and his team.

After successfully transitioning to the new owner in Hartland, Josh's dream job opened up in Madison and he was all in. Tom Harrison was retiring from a wonderful 43 year career as the Golf Course Superintendent at Maple Bluff Country Club in Madison and the club reached out to Josh to interview for the position. He had toured Maple Bluff back in college and had always admired the course and the tenure of Tom Harrison. It was also a chance to return home to the Madison area for he and his family.

Josh just completed his 7th year at Maple Bluff and hopesy he can stay throughout his career. He has found the membership to be great and the club is thriving. His team is unbelievable and he could not ask for a better situation.

It is an interesting experience to replace a legend like Tom Harrison. Josh wanted to "make waves without making waves". The club was in great hands for so long that Josh embraced the challenge of deciding what routines and practices to continue and where to start to implement his own ideas and introduce change.

Bristlecone Pines Golf Club, Hartland, WI. Josh LePine served 14 years as Golf Course Superintendent before moving on to Maple Bluff.

Maple Bluff Counry Club Greens Department, 2018
Josh's Full time staff includes Dave Browne, Jens Arneson, James Behl, Jim Ballweg, Van Phi Nguyen and Boe Jentree. Seasonal staff is a mix of high school & college students, teachers, veterans and retirees.

Member 9 With Josh LePine

1. **What was your first vehicle?** *My first vehicle was a used but well cared for Chevy S-10 Extended cab 4x4 Pickup. Paid for by countless hours of golf course and clubhouse work at Stoughton Country Club, tobacco harvesting, hay bailing and sweet corn picking and selling.*
2. **Favorite piece of golf course equipment?** *Hands down the TDR Moisture Meter. Once you dial in your wilt point and use it religiously, it's like having a crystal ball. Countless irrigation adjustments, major resource savings and improved playability and surface consistency are the major benefits.*
3. **18 hole Handicap?** *I'd say I'm a solid 25. Although I really enjoy playing, especially experiencing other facilities, playing the game is not my strong suit.*
4. **What is your current vehicle?** *My current vehicle is a 2009 Ford F-150 Crew Cab pickup. She has 160,000 miles and is showing some wear but is a dependable and roomy vehicle. Not too great in the tight parking garages of downtown Madison however.*
5. **Favorite TV shows?** *Probably Sportscenter. I'm currently into the Game of Thrones series.*
6. **Favorite professional sports team?** *Wisconsin born and bred. Professional teams have to be the Packers, Brewers and Bucks. On the collegiate side, I'm a UW alum and I bleed Badger Cardinal.*
7. **Favorite main course meal?** *Start me with French Onion soup and salad followed by Prime Rib and Shrimp with a baked potato. Throw in a few Korbel Brandy Old Fashioneds during the night and Chocolate Mousse Pie w/ Coffee followed by a nap, I'm a happy camper.*
8. **Pets?** *We have a 10 year old yellow Lab named Daisy and a black cat named Jaguar.*
9. **Favorite thing about working in the golf industry?** *Aside from the wonderful people I get to interact with on a daily basis, I'd say my favorite thing is the immediate gratification of enjoying the fruits of our labor. As stressful as this career can be sometimes, to me, the manicured golf course is a therapeutic place.*

Josh has found the club to be great, welcoming of new ideas and Harrison is always there for him if needs a history lesson on anything related to the club. Although Lepine never worked with Tom, he knows he is the definition of a professional. Harrison's humble approach and welcoming demeanor towards Josh as a incoming replacement will never be forgotten. Of course they are just a couple of Norwegians from Stoughton. Josh is sure to say, thank you Tom.

Maple Bluff Country Club was founded in 1899 and in 1901 was one of nine Wisconsin golf clubs to form the Wisconsin State Golf Association. Many changes and improvements have been made over the years but the basic layout of the course has remained unchanged since 1967. A master plan remodel of the course took place in 2003 with Arthur Hills/Steve Forrest. Major renovations have been made over the years to the clubhouse with the most recent in 2016. At that time, the addition of a new pool, fitness center, golf simulator, snack bar and upper patio/bar areas occured. Today the 18 hole, 6,402 yard (par 71) course is a mature, beautifully manicured and challenging layout.

Maple Bluff is predominantly poa annua on greens, tees and fairways. One of the biggest challenges Josh has found is the shade and turf vs trees and the politics of tree removal. Like many established clubs, Maple Bluff is over planted with trees. The trees themselves are suffering due to competition for light, space, water and nutrients. The staff is slowly removing ash and other trees effecting each other. A major pruning effort is also underway to increase air flow across the property and sunlight to the turf.

Josh explains he owes his wife and family a lot. They have been extremely understanding of his long hours, weekend work and passion for the golf course. Like many Superintendents, he runs himself ragged attempting to be here and there and has found it his biggest challenge.

Sonja and Josh have been married for 19 years and Sonja is a Registered Nurse at the University of Wisconsin Hospital Emergency Room. Their oldest, Joseph is 19 and a Freshman at Iowa State University. Joe is enrolled in the Naval ROTC program Marine Option. He wants to obtain his degree while training to be an officer in the Marine Corp. Joe worked 4 seasons at Maple Bluff on the golf course.

Naomi (16) is a Junior at Stoughton High School. She plays Lacrosse and enjoys caring for children. She has an interest in Nursing and Child Life.

Matthew is in 3rd grade and enjoys flag football, baseball and swimming.

When Josh and Sonja can force the kids off of their electronics, the family enjoys canoeing on the Wisconsin River, water sports and fishing on Lake Kegonsa and camping at Devil's Lake State Park.

Outside of work, Josh enjoys fishing, hunting, water and snow skiing and remodeling their home in Stoughton.

It is clear the WGCSA is in good hands under the leadership of our 45th President, Mr. Josh Lepine, CGCS. His experience and education will help guide him during his tenure.

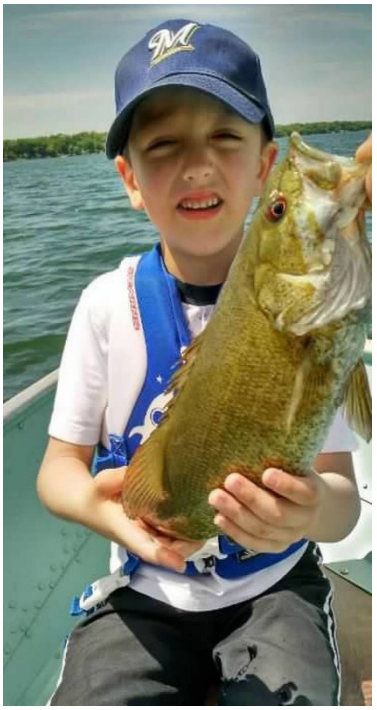
Top Left: LePine family enjoying a Teepee site at Devil's Lake State Park.

Top Right: Joseph LePine a freshman at Iowa State University Naval ROTC program, Marine Option.

Left: Naomi LePine is a Junior at Stoughton High School who plans to follow her mother's footsteps and study nursing.

Bottom Left: Matthew and Daisy enjoying some quality time on Lake Kegonsa.

Bottom Right: Matthew LePine hooked into this smallmouth bass while fishing for panfish on Lake Kegonsa in Stoughton.



Why Do We Need Science?

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

While preparing for my supporting role in Chris Tritabaugh's seminar on bentgrass management at GIS this year, I had the chance to think about the role that turfgrass scientists play in the lives of golf course superintendents. Science has been around a long time. In fact, the origin story for the scientific method is widely credited to Francis Bacon's Novum Organum published in 1620. In that manuscript, Bacon described a new way to acquire knowledge through reduction and the use of inductive reasoning and experimentation. But golf has been around even longer. Nobody knows for sure when the game originated, but the word golf first showed up in documents from the Scots Parliament in 1457 (thank you Wikipedia). Clearly, turf managers were managing turf for a long time without any scientists telling them how to do their jobs. In fact, we only recently lost Dr. Jim Beard, a person often described as the father of turfgrass science. In a recent TurfNet article, Dr. Karl Danneburger aptly stated that "[Dr. Beard] put the word science into turfgrass science" (Rietman, 2018). So given that turfgrass scientists have been around for only 10% of the time greenkeepers have been doing their thing, what do you really need us for anyway?

To answer this question, let's start with another. What is science? Science is a process. It is a method that we use to answer questions about the way the world works. Science starts with an observation. Golf course superintendents are not just managers of the golf course, but are observers of the course. Every management decision you make starts with an observation. After making a series of observations, you make up a story to explain the observation. The five-dollar scientific word for that story is hypothesis. Those two steps in the scientific process are completed by superintendents all the time. But the next step – hypothesis testing – is much harder to do without ample time and resources. Without hypothesis testing, the first two steps amount to storytelling. The stories could be correct or off-base, and without hypothesis testing you never really know.

Hypothesis testing involves reducing a question to its essentials, a process that removes all other possibilities that could serve as alternative explanations of your story. But when the stories quite clearly explain the observation, the hypothesis testing part can seem so unnecessary that they get highlighted on late-night T.V. People laugh because they can't believe people get paid to conduct the research. For example, one study demonstrated that when it gets cold out, people wear warmer clothes (De Carli et al., 2007). One of my favorite examples in this vein is from a 2006 article called "Sword Swallowing and its Side Effects". Turns out sword swallowing can be dangerous. The authors conclude: "Major complications are more likely when the swallower is distracted." "Sore throats are common, particularly when the skill is being learnt or when performances are too frequent." "Sword swallowers without healthcare coverage expose themselves to financial as well as physical risk."

Aside from sometimes being too obvious, science can be frustratingly reductionist and may seem to contradict itself, or never arrive at a definitive answer. David DiSalvo (2017) wrote a good summary in Forbes about scientific findings around the health impacts of drinking coffee. As you may have guessed, there are as many studies that document benefits of coffee drinking as there are warning of risks of drinking coffee. None of these studies can actually say whether drinking coffee is good for you or not. They are too reductionist, and therefore only say specific things like coffee causes insomnia, or that coffee may preserve your liver. It is up to the drinker to decide if it is worth drinking or not. If you ask a scientist if coffee is good for you, they'll often ask you what you mean by the word "good".

Okay, we've covered some frustrations about science so far, but on the other hand science has been one of the most important ways we've been able to overturn what we thought was obvious and has fundamentally changed the way we think about the world. For example, the world was thought to be flat for a very long time (and reasonably so), until scientists showed it was round. Then it was round, but the Sun revolved around the Earth, until scientists demonstrated the Earth actually revolved around the Sun. Before the early 1900s, nobody believed the continents could move – because how could they? We now know that not only do the continents move by subduction and seafloor spreading, those motions explain the patterns of earthquakes and volcano eruptions we experience. Before the 1920s, we thought the Milky Way was the entire universe, but science (particularly Edwin Hubble) helped us see that it is just one of billions of galaxies. All of these changes in how we view the world around us started with observations, hypotheses, and were ultimately settled upon as fact by hypothesis testing. Without hypothesis testing, you could just believe whichever story you liked the best. Scientific knowledge doesn't care which story you like.

Science helps create new knowledge, but science can help you do your job better by helping you recognize your deficiencies as an observer. Golf course superintendents are generally excellent observers. But don't get too cocky, because believing in your stories (hypotheses) too strongly can get you stuck in a rut. It's always worthwhile to remember that you are also a terrible observer and some of your stories are probably flat wrong. **For example, the middle gray bar in the figure below is all the exact same shade of gray. But you would never have guessed that or even thought of checking that by blocking out the surrounding shades (give it a try!).**

Similarly, Morrot (2001) gave two glasses of the same white wine to a panel of 54 tasters. One glass of white wine was dyed red by an odorless dye. Then, the drinkers were asked to use words to describe the wine. Red wines and white wines have very distinct descriptor words. For example, red wines are often described using words like chicory, coal, prune, raspberry, cherry, cedar, musk, chocolate, tobacco, cinnamon, etc. While wine descriptor words include honey, lemon, grapefruit, acacia, mango, melon, butter, pear, apple, flower. The panel of tasters used almost exclusively white wine associated words for the white wine, and almost exclusively red wine words for the same white wine that was dyed red. The conclusion was that the color had such a strong impact on the tasters' expectations that they were unable to make a correct assessment of the wine. Does anyone remember Clear Pepsi?

Your observations (good and bad) fuel my scientific studies. For example, you told us that Primo Maxx doesn't work very well in the summer. We checked that, and agreed. You told us that it seems to work better if you apply it at lower rates more frequently. We checked that and agreed too. But our checking process was very labor intensive and very accurate. So instead of just telling you that you were right, we were able to turn the data from the checking into a growing degree model that helps you apply Primo Maxx and every other growth regulator out there with a level of accuracy that your observations alone could not achieve. But sometimes the observations we follow up on with hypothesis testing turn out to be wrong. Without naming any names, dozens of products have been delivered to the O.J. Noer Facility over the years with marketing materials full of miracle claims but have performed just like the non-treated control when subjected to reductionist scientific hypothesis testing. Your favorite miracle product may not be a miracle after all. You won't really know until your story gets put to the test.

In conclusion, you, me, and all the rest of the humans on Earth are simultaneously excellent and terrible observers of the world around us. You definitely don't need a turfgrass scientist to be able to maintain turfgrass. Your observations and storytelling would keep moving the needle forward, just as they have done for the last 600 years of the history of turf management. But science is the relatively new tool and the process that you can use to help you know when your observation-based story is correct, and when your story is mistaken. That hypothesis testing process moves the turf management needle in the right direction even faster. My career in science has humbled me by showing me the inadequacies of my observation alone and it has shown me the utility and the power of the scientific process. While it is intimidating to think of all the things we have left to learn, it is comforting to know that we have found a process that can help us get there one experiment at a time. So please bear with me when I tell you something you already knew, or when I am unable to answer a question like "should I use Primo Maxx?" Science can't answer every question, but it can provide you with some additional insights that will make you a better turfgrass manager. Thank you for your continued support of the turfgrass research program at UW-Madison, and elsewhere!

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DEPARTMENT OF SOIL SCIENCE
University of Wisconsin-Madison

Wisconsin Chapter GCSAA

December 15th, 2018

Please consider providing a Golf Package for our PAR 4 RESEARCH Online Auction!

Preparations for the 10th Annual PAR 4 Research On-line Auction have begun. Since our inception we have raised over $85,000 for Turf Research at our UW! PAR 4 Research was created in 2010 to assist in funding sustainable turfgrass and environmental research to benefit golfers, homeowners and everyone in between who enjoys a little green in their life. As turfgrass managers and green industry professionals, we are the primary beneficiaries of the cutting-edge science that comes from the skilled researchers at the University of Wisconsin-Madison, and as such, we need your help in maintaining the strong tradition of turfgrass research in Wisconsin.

There is such great potential for PAR 4 Research online auction growth and success as the WGCSA membership represents over 225 facilities. Yet only 25% of the facilities participated as donors. More facility participation is the ONLY way to help the PAR 4 Research effort grow. Your support allows golfers the opportunity to give directly back to research that helps our game, our industry and our Association.

The 2019 Par 4 Research online auction is targeted to run March 5th – April 14th (Master's Week). Time is of the essence and the first call for donations is to be confirmed by **February 15, 2019**. Please, talk to your course's decision maker(s) as soon as possible and consider donating to this very worthwhile cause. Popular auction items include but are not limited to:

- Foursome(s) with carts
- A stay-and-play package
- A lesson from your golf professional
- Season pass(es)

If your facility is willing to make a donation please complete the enclosed application and return to Brett Grams, Chapter Manager. He will again be processing all donations by loading them on the Auction Website for viewing.

If you have any questions or concerns, please do not hesitate to contact Brett at 920-643-4888. He can also provide assistance by helping you with letters or communications to your decision makers if needed.

Lastly, help us spread the word about this great cause! **Please communicate about the Par 4 Research Auction in your communications to your members or golfers during the winter months.** Our auction is timed to run during Masters Week and the start of the golfing season. The more people that know about our efforts the more money we can raise!

Thank you,
The PAR 4 Committee – Josh LePine, Brian Bonlender, Garrett Luck, Kate Lifke, Tim Schmidt, Brett Grams

2019 Donor Information

Golf Course Name: _____

Golf Course Physical Address: _____

_____

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Authorized Donor/Contact Name: _____

Position: _____

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Donation Information

*All donations will be valid from May 15, 2019 through the end of your 2019 golf season unless otherwise specified.

____# of tee times donated Each tee time consists of: ___ 2 sets of 2 green fees

__ with carts __ without carts ___ 1 set of 4 green fees

Please list any restrictions, such as dress code or blackout dates, in the space below:

_____

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Additional Donation Goods or Services

__Lesson(s) with Golf Pro __Accommodations __Meals __Other

If yes, please provide details in the space below:

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$_____ Estimated Retail Value of Donation

___The WGCSA should provide the necessary gift certificates for my donation

___We have provided our own certificates, valid for the 2019 golf season with this form.

PLEASE SEND COMPLETED FORM TO:

Please return promptly

(The sooner we receive the sooner we can promote!)

WGCSA
N1922 VIRGINIA DR
WAUPACA, WI 54981

THANK YOU!

Winter Days

By David A. Brandenburg, Certified Golf Course Superintendent, Rolling Meadows Golf Course

It was a dark and stormy night.... Well, not really. But we do have a big winter storm bearing down on us much of the state. If the forecasts are correct Fond du Lac will see 12" to 15" of new snow and 50 mile per hour winds over the next 24 hours. It sounds like storm we will talk about 20 or 30 years from now.

From mid-December to mid-January it has been warmer than normal but very dreary with cloudy day after cloudy day. January can feel like a long month for the golf industry. The holidays are over and shop activities have turned to grinding and equipment maintenance. Not that grinding isn't important, it is, but it is not as satisfying as green grass, prepared bunkers and the sound of mowers.

Thus far winter has brought more rain than ideal and until 2 weeks ago most of the southern half was without snow. Fortunately a nice blanket of snow arrived before the temperatures dipped well below normal.

****

Congratulations to Alex Beson-Crone for being selected as Golf Course Superintendent at Blue Mound Golf and Country Club. Alex had been at Erin Hills since construction working his way up to assistant golf course superintendent.

Beson-Crone grew up in Madison, played competitive junior golf and enrolled at UW-Madison to obtain a degree in Landscape Architecture. He took a break from school to work on the grow in at Erin Hills and found his passion was maintaining rather than designing golf courses.

After a few years at Erin Hills he changed his major to soil science with a emphasis in turfgrass management and he finished up his degree. Congratulations Alex on the new position!

****

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EDITOR'S NOTEBOOK

Rob and Angelica Johnson welcomed Ezra James Graham Johnson on Oct 22. Ezra was born at 12:26 p.m., was 7lbs 1 oz and 20 inches long. Congratulations to the new parents.

The agenda is out for the Northern Great Lakes Golf Course Superintendents Association spring conference. The NGLGCSA is well known for putting on a great educational conference. This years event is Wednesday February 27th but come early and participate in Tuesdays Pesticide Applicator Training, the hospitality room or bowling at Island City Lanes.

The events are held at The Waters of Minocqua, in Minocqua. If you have not been to Minocqua in awhile, the trip driving has been made a lot easier as most of it from the south is now on 4 lanes.

Dr. Tom Nikolai, Michigan State University will give presentations titled 'The ABC's of Putting Green Management" and "The Top Ten Reasons to Light Weight Roll". Dr. Nikolai has been a leader in putting green and rolling research and is a regular speaker at the Golf Industry Show.

Heidi Pritzl and Courtney Weber from Ascension Koller Behavioral Health and Tammi Boers, Vilas County Public Health Department will cover "Suicide Prevention Training". This is not a turf topic but it is important just the same as our industry has recently lost some members to suicide.

Dr. Doug Soldat will present "Watching The Grass Grow: Is Measuring Clipping Volume Useful?" Dr. Soldat along with Wisconsin native Dr. Bill Krueser have been industry leaders on this topic.

Mike DeVries, DeVries Designs, Inc will present "Design/Renovation Consideration for Northern Climates. Mike works out of Michigan and some of his designs include Greywalls, the Kingsley Club and Sunningdale Country Club.

Check out the agenda and details at www.nglturf.org .

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The WGCSA is now offering a Equipment Manager/Mechanic membership category. Membership is only $50 per year and will include increased EM specific events and education.

Austin Wright, Sand Valley Resort is the board representative for the EM members. He and all the board members information can be found on page 3 of each issue.

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January can seem like a longer than normal month with the dreary days and less than ideal weather. On the positive side we start the month with 9 hours and 4 minutes of daylength but end with nearly 10 hours so we are on our way towards spring.

Thank you to our writers and contributors and I look forward to seeing you at our educational events!

2019 Event Schedule!

February 27 - (Wednesday) Northern Great Lakes GCSA Educational Conference - The Waters in Minocqua
March 5 (Tuesday) WGCSA Spring Business and Education Meeting, South Hills G&CC, Fond du Lac
TBA - WGCSA Assistant Superintendents Seminar, Whispering Springs Golf Course, Fond du Lac
TBA - WGCSA Equipment Manager Seminar
March 13 & 14 - Reinders 24th Green Industry Conference - Waukesha County Expo Building, Waukesha
April 24th - (Wednesday) WPGA/WGCSA Super Pro - Blackhawk CC, Madison
May 1 - National Golf Day GCSAA - Washington DC
May 13 - (Monday) May Meeting (Morning Start) - Racine CC, Racine
June 4 (- Tuesday) NGLGCSA Rounds for Research Outing - Golden Sands Golf Course, Cecil, WI
June 18 - (Tuesday) WGCSA June Meeting - Hidden Glen at Bentdale Farm, Cedarburg
July 24 - (Wednesday) WTA Summer Field Day - O.J. Noer Research Facility, Madison (CHANGED DATE)
August 19 - (Monday) Joint NGLGCSA/WGCSA Member Guest - Fox Valley GC, Kaukauna, WI
September 16th - (Monday) Wee One Fundraiser - Pine Hills CC, Sheboygan
September 30th - (Monday) WTA Golf Classic - Tuckaway CC, Franklin, WI (Tentative)
TBD - Couples and Guest Evening - Madison
December 4 & 5th - 54th Golf Turf Symposium - American Club, Kohler

Visit our website at www.WGCSA.com for the most up to date calendar and registration forms.

EDITOR'S NOTEBOOK

TOURNAMENT VOLUNTEER OPPORTUNITIES.

American Family Insurance Championship June 17-23, 2019

Phil Davidson and University Ridge Golf Course will need volunteers to cover a.m. and p.m. shifts preparing the golf course for the PGA Tour Champions American Family Insurance Championship.
People of all abilities and experience are able to volunteer and you do not need to make every shift. Morning shifts are generally 4:45 to 8:00 A.M.. Evening shifts start between 3:00 and 6:00 P.M. and generally last 3 hours.
Volunteers will receive a cap (provided by Sygenta) and a golf shirt (provided by Burris, Site One or Pendleton Turf). Meals are also available (provided by Reinders, Clesens Pro Turf and Advance Turf Solutions) and snacks and drinks are available (provided by Waupaca Sand & Solutions and Helena).
The American Family Insurance Championship has come to be one of the most attended tournaments on the Champions Tour and has donated over 4.6 million to charities.
University Ridge was designed by Robert Trent Jones and opened in 1991.
Contact Phil Davidson at pnd@athletics.wisc.edu for more information or to volunteer.

71st U.S. Girls Junior Championship July 20-27, 2019

Matt Smith and Sentry World Golf Course will need volunteers to cover a.m. and p.m. shifts preparing the golf course for the USGA U.S. Girls Junior Championship.
A meal will provided with each shift worked and on site housing will be provided upon request.
The Girls Junior will have a field of 156 players who are under 19 years old as of July 21. 36 holes of stroke play over 2 days will determine the field of 64 who will move on to match play for 4 days. The list of past champions reads like a list of LPGA stars.
Sentry World Golf Course was designed by Robert Trent Jones Jr. and opened in 1982. The course is well known for it's flower hole. A redesign of the golf course was completed in 2014 by the team of Robert Trent Jones, Jr., Bruce Charlton and Jay Blasi.
Contact Superintendent Matt Smith at Matt.smith@sentry.com or Assistant Superintendent Dustin Schneider at Dustin. Schneider@sentry.com for more information or to volunteer.

Janesville Golf Classic - August 2-4, 2019

Jeff Rottier and Janesville Country Club will need 12 to 20 volunteers to cover a.m. and p.m. shifts preparing the golf course for the Janesville Golf Classic.
The Golf Classic will feature both LPGA Symetra and LGPA Legends Tour players. 144 Symetra Tour players will play 36 holes and then the numbers will be cut to the top 60 to play for the purse of $150,000 over the final 18 holes. Uniquely after the cut 30 LPGA Legends Tour Players will join and play for their own $150,000 over 18 holes.
Janesville Country Club is thought to be the oldest golf club in Wisconsin and sixth oldest in the nation.
Contact Jeff Rottier at jrottier@janesvillecc.com for more information or to volunteer.

Reinders 24th Green Industry Conference

MARCH 13-14, 2019

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