The GRASS ROOTS

AN OFFICIAL PUBLICATION OF THE WISCONSIN GOLF COURSE SUPERINTENDENTS ASSOCIATION

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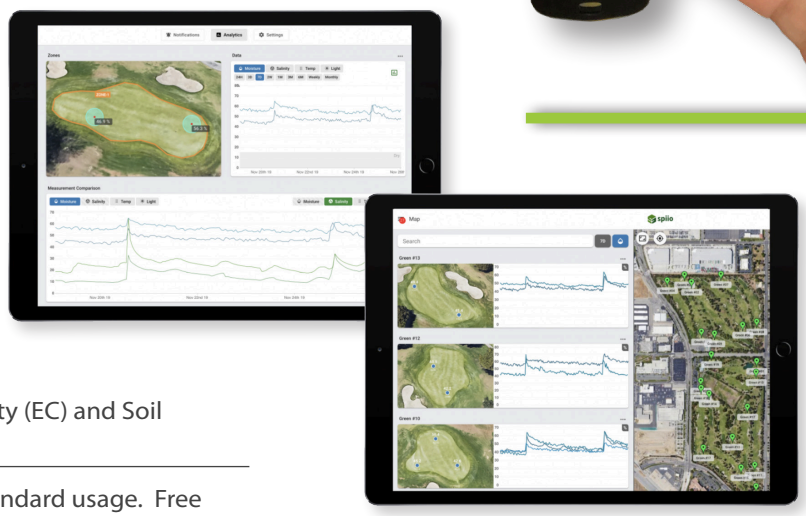

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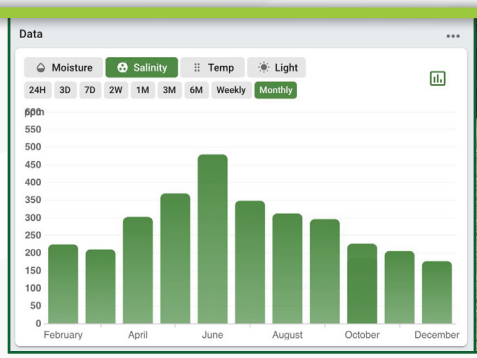

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ABOUT THE COVER

The Par4 9th Hole at Blue Mound Golf & Country Club returns back to the historic clubhouse.

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Golf... is the infallible test. The man who can go into a patch of rough alone, with the knowledge that only God is watching him, and play his ball where it lies, is the man who will serve you faithfully and well.

By P.G. Wodhouse, English Author, 1881-1975

This quote from from Wodhouse can remind of us of the life lessons that can be gained through the game of golf.

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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Wisconsin Golf Industry Best Management Practices Guide is Complete!

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

Although it seems like yesterday, it was 6 years ago and I was the Chapter Delegate for the WGCSA attending the annual Delegates meeting at GCSAA headquarters in Lawrence, Kansas. GCSAA was introducing this new Best Management Practices initiative. CEO, Rhett Evans, discussed some of the regulatory challenges other states were facing regarding water use and quality along with nutrient and pesticide management. In 2015, GCSAA received financial support from the USGA through the EIFG to develop a BMP planning guide and template. Since then, states have been utilizing this framework to develop their own state specific BMP's for golf course management. GCSAA's goal is to have all 50 states offer established BMPs.

After a few years of fundraising, planning, hiring a consultant, sharing state specific information, promoting, writing, collaborating, reviewing, and editing, we fast forward to today.

The work of the Wisconsin Golf Course Superintendents Association and the Northern Great Lakes Golf Course Superintendents Association has resulted in the publication of "Wisconsin Golf Industry Best Management Practices". The two GCSAA-affiliated chapters received a $15,000 BMP grant that GCSAA funded through the association's Environmental Institute for Golf (EIFG) in part by the PGA Tour. The BMPs provide guidance in 12 key areas, including water management, nutrient management, responsible pesticide management, energy conservation, labor and staffing.

The WGCSA and NGLGCS chapterS worked in collaboration with Radius Sports Group, a sustainability consulting firm to develop the guide. Gina Rizzi and her Radius team were outstanding, meet deadlines and produced a superior product. A microsite is currently being developed but for now you should have access to the printable guide via the GCSAA or WGCSA websites. We hope you can utilize this guide to help your operations and tell your story. I know I learned a ton just going through this process. You may need this guide to show your club, a concerned citizen, local municipality, or environmental group exactly how we operate and care for our facilities and the environment. We hope it is one stop shopping for a variety of state specific regulatory information and considerations as you manage your facility. Our board feels that this document offers our members a platform for advocacy, education, recognition, and demonstration of professional land management in Wisconsin.

Besides hiring an outstanding consultant, many thanks to the BMP Steering Committee, the Stakeholder Review team and all of you that sent in photos.

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Stay tuned for more updates, facility BMP opportunities and promotional information.

Let the Grass Tell You How Much Nitrogen to Apply

By Qiyu (Ada) Zhou, Ph.D. Student, Department of Soil Science, UW-Madison

Editor's Note: This student article is eligible for the 2020 Monroe S. Miller Literary Scholarship.

Soil testing helps us better understand whether the nutrients in the soil are likely sufficient for good growth and helps turf managers make fertilizer application decisions. Yet, this tool does not apply to nitrogen. Nitrogen recommendations are not based on routine soil analysis, since the amount of nitrogen present in the soil is dynamic and the climatic, chemical and biological factors controlling its release to the plant vary. Nitrogen application decisions, thus, are usually made according to the visual appearance of the turf and the experience of the turf manager.

Experienced turf managers can adjust the nitrogen rate based on turf visual quality, weather, presence and severity of certain diseases, among others. Therefore, nitrogen programs differ from course to course because of different expectations and the environmental variables present. As we know, nitrogen is the key nutrient driving turf growth. Excessive nitrogen fertilizer makes the grass look green and attractive; however, the excessive growth it causes can make the green spongy and decreases green speed and playing quality (**Figure 1**). The most ideal nitrogen rate is one that keeps the grass at a slow and steady growth rate and allows the turf to recover from environmental stress. If we had the ability to take a peek at the predicted turfgrass growth rate, would it make it easier for turf managers to manage nitrogen fertilizer applications in order to maintain a slow but healthy growth rate?

Experienced turf managers can adjust the nitrogen rate based on turf visual quality, weather, presence and severity of certain diseases, among others. Therefore, nitrogen programs differ from course to course because of different expectations and the environmental variables present.

Originally, the putting green grass height was mainly determined by the grazing habits of rabbits and sheep. Then, with the invention of mowers, we gained the ability to mow the grass at a certain cutting height. For many years turf managers have been focused on what the mower leaves behind, but perhaps we should be paying the same attention to what the mower collects. On Twitter, #clipvol (short for clipping volume) is trending among superintends and turfgrass scientists of late. Briefly, clipping volume can be tracked by pouring clippings into a graduated bucket and recording the volume of clippings from each green. If the green size is known, then the growth rate can be expressed as either liters/100 m2 or quarts/1000 ft2. Making sure the degree of compression of the clippings remains relatively constant from green to green. Micah Woods recommends giving the graduated bucket two firm taps on a solid surface before recording the volume.

Tracking clipping volume is an efficient and simple way to estimate how much clipping mass is removed from a green. One of the reasons why we are interested in clipping yield or growth rate is that clipping yield is an excellent way to estimate nitrogen removal. Clipping yield multiplied by tissue nitrogen content equals nitrogen removal from the green. Usually, the amount of nitrogen removal should roughly be equal to the nitrogen supplied. Knowing clipping yield (or volume) is not only a good way to track turfgrass growth, but also fundamental to precision nitrogen management. In my previous presentations on WTA research day and field day, I have asked superintendents whether they were tracking the clipping volume or planned to do so. The first year only about 5% admitted to the practice, but by the third time about 20% of the people raised their hands. I hope the numbers of managers using clipping volume information continues to grow.

Figure 1. These plots at the O.J. Noer Turfgrass Research Facility receive different nitrogen rates based on various application decision methods. Greener is not always better for putting green performance.

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Precision nitrogen management is a movement that began in agriculture where the goal of it is to apply nitrogen to ensure high crop yields while increasing nitrogen use efficiency for environmental protection. For turfgrass, precision nitrogen management is not about maximizing yields and preventing leaching (which is typically low to begin with), rather it is aimed at maintaining a slow but healthy growth rate while relying on nitrogen in the soil as well as in fertilizer. One way to move towards precision nitrogen management in turf is to build a growth model that accurately estimates turfgrass growth rate.

Generally, there are two different methods to build a yield prediction model. The classic approach is to build a biophysical-based model, a complex model used by scientists that is based on biophysical and physiological inputs, that is quite time and labor intensive to operate. A second approach is to build a statistical-based model like the model proposed by PACE Turf that estimates growth potential and is being used by some practitioners. Statistical-based models don't really simulate plant growth in the way that a biophysical model would, instead statistical-based models build empirical algorithms based on historical data that influence plant growth.

The advantage of statistical-based models is that they require less extensive inputs about plant characteristics, management practices, soil, and canopy conditions. They are also much easier to calibrate using existing data. In a nutshell, yield prediction is essential for precision nitrogen management, and using a statistical model is a "shortcut" but valid way to estimate plant growth. Overall, the goal of building a turfgrass growth model is to develop science-based decision aids for nitrogen application.

Turfgrass growth rate is affected by many external environment factors, such as weather variables, water availability, soil physical properties, soil nutrient availability, and other environmental stresses. All these aspects vary from course to course, even hole to hole. Thus, a good growth prediction model should be able to detect these differences.

To build and train a statistical-based growth model, it requires the integration of grass (eg., clipping yield/volume), soil (eg., soil organic matter and soil moisture content (TDR)), weather (temperature, relative humidity, etc.), nutrients (historical nitrogen application) and whatever other useful data one might be collecting (like spectral reflectance or NDVI). Here, at O.J Noer Turfgrass Research Facility in Madison WI, with funding from the Wisconsin Golf Course Superintendents Association and the USGA, we've built a growth model that is excellent at predicting bentgrass growth for our location. When we use this model to guide our fertilization applications on average, it suggests we apply somewhere between 0.15 and 0.2 lbs of N/1000 ft2/month. This is about 40% less than the amount suggested by the PACE Turf growth model, yet there is little difference in turf visual quality on the two research plots **(Figure 2).**

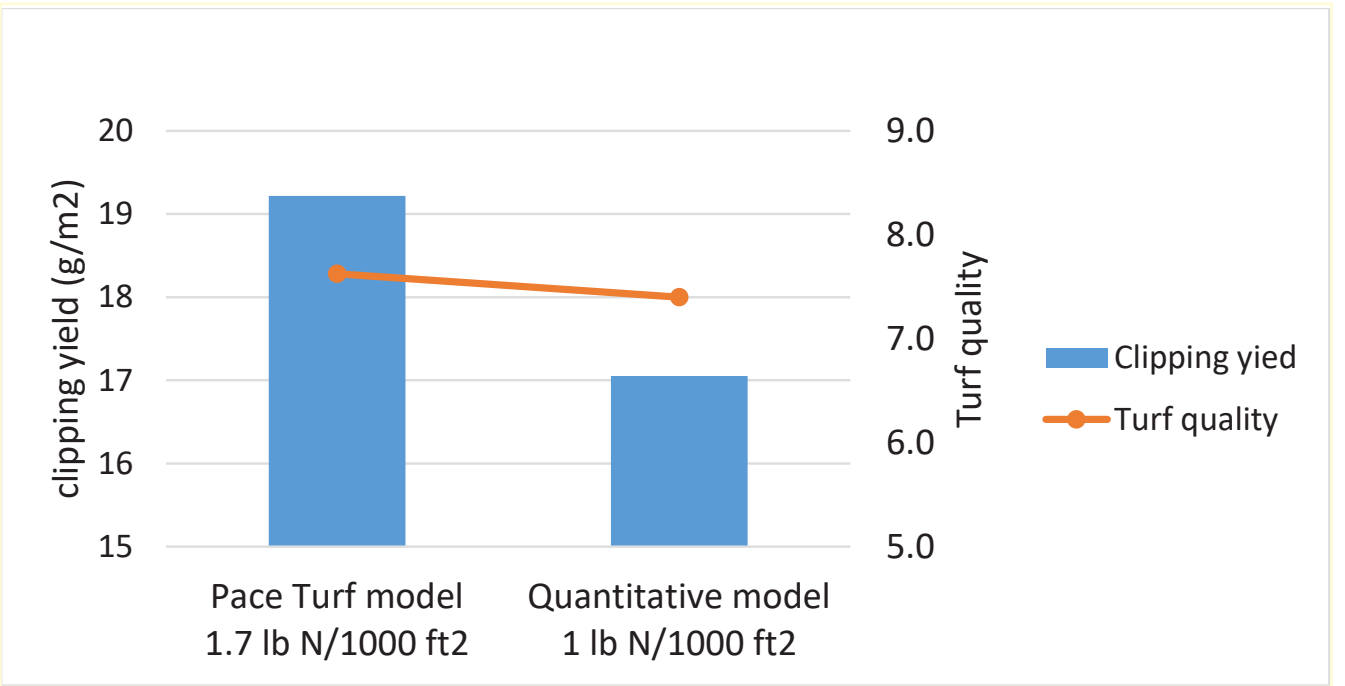

Figure 2. Cumulative bentgrass clipping production and average turf quality on the plots which having individual nitrogen programs that are created by following the Pace Turf Growth Model and our Quantitative model built using a machine learning approach. Data are collected from May 4th to August 13th.

This verified my hypothesis that if we can accurately predict turfgrass growth rate, it is possible to make a nitrogen application decision based on the predicted clipping yield to maintain slow but healthy turfgrass growth. This is exciting to me because the growth model is relatively simple to create. All you need is some basic information, like clipping volume data and weather records. That means in the future each golf course can have its own growth model for a whole course or even for each hole in terms of the different spatial and temporal variables, and be able to have a customized nitrogen program based on it.

A golf course serious about using a growth model to guide nitrogen applications should have about 2-years of clipping volume records to train the model. While I understand the reluctance for turf managers to track clipping volume, the time spent on clipping volume collection is minimum and the long-term benefits of input savings, resource sustainability and improved playing quality will balance out this added labor.

Turfgrass growth rate is affected by many external environment factors, such as weather variables, water availability, soil physical properties, soil nutrient availability, and other environmental stresses. All these aspects vary from course to course, even hole to hole. Thus, a good growth prediction model should be able to detect these differences.

These days, precision nitrogen management is already helping farmers make real-time decisions by viewing future crop yield and performance. It is much wiser than making crop management decisions at harvest time, because there is not much that can be done to improve the yield then. In the golf industry, we don't chase yield but seek maximum visual and playing quality instead. A good growth model will accurately forecast the future growth rate so nitrogen management decisions can be made to achieve the desired condition.

My Ph.D. work involves building a good growth model, or at least outlining the process of building a custom model, that is available to each turf manager. Briefly, we are estimating turf growth with a machine learning approach using clipping volume records and soil, weather, and other input variables. These variables are all easy to access and include weekly weather data, historical nitrogen application rates, soil moisture content and soil organic matter. If you are interested in our machine learning approach growth model and want to know more detail about how the model works, please go to www.wisconsinturfgrassassociation.org and watch my 2020 Virtual Field Day talk.

Summer Trials Done, Winter Trials Put To Bed

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

Hello *The Grass Roots* readers! The last time I wrote for the magazine I was talking about the extraordinarily high levels of summer stress the Midwest was seeing. High temps in the 90s, low temps in the 70s, and very high humidity. Many turf samples were coming into the lab being affected by the typical midsummer diseases like brown patch, Pythium foliar blight, summer patch, etc. Also, many of the samples coming into the TDL were not being affected by a disease. The stacking effects of summer stress were just resulting in grass checking out. This is pretty standard for TDL samples in midsummer, but eventually we made it to fall and more favorable grass growing weather. We ended all of our summer trials as well. Results of these trials can be found on our website (https://tdl.wisc.edu/summer-2020-turfgrass-pathology-research/).

As always, we conducted some of our more standard trials like dollar spot control on greens and fairways. So if you want to compare different fungicides side by side, check out these two trials. Also we had some more specialized trials looking at dollar spot control with iron sulfate. We had a good trial looking at anthracnose control, and also looked at how dollar spot responds long term after you stop applying fungicides. Some very interesting things, in my opinion. I will probably write about some of these specialized trials in more detail in my next article so stay tuned for those or check out our website if you can't wait.

Every year it feels like we move to snow mold trials very quickly, almost too quickly. But prep work for snow mold trials has to start pretty early. We are doing another year of our snow mold timing study. This study, which is replicated in Minocqua, Wausau, and Madison, is aiming to come up with a temperature based timing threshold to help folks properly time their snow mold applications. This study has been going on for several years now and hopefully we get some good data again this year to get this study closer to publication. Our central WI locations in the past have struggled to get meaningful data for various reasons, and that is why it has taken us so long to publish the results from this study.

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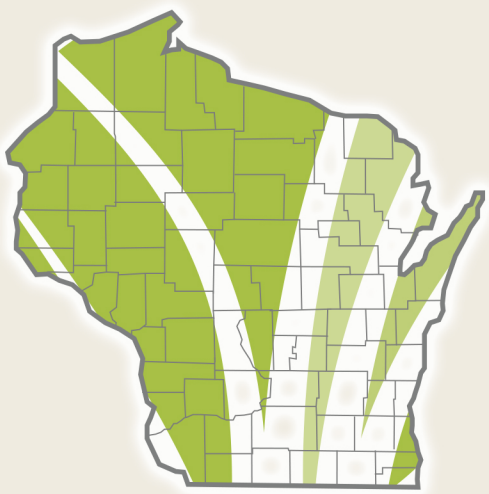

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Our large snow mold study this year is 78 treatments, which is a little bit smaller than we've had in years past. This is fine by me as it just makes things a little bit easier when there are less treatments to apply. This study is replicated in both Marquette, MI **(Figure 1)** and Wausau, WI. The final treatments in Marquette went down in early November and the Wausau treatments went down mid-November. Permanent snow cover at both locations did not come for quite a while I believe, but I will dive into my predictions for how much snow mold we get at each location in a future article.

The pink snow mold study conducted here at the Noer has returned for another year. Currently our technique involves applying various fungicides in 3 ft by 4 ft plots and letting that sit for 24 hours. Then we come in with rye grain that has the Microdochium fungus growing on the grains and spread that over said plots. We have built some wood frames with some pink insulation board on top. These frames are placed over the plots **(Figure 2)**, and a Greenjacket impermeable cover goes on top of the frames. The frames and the Greenjacket help insulate the soil and keep it from getting too cold. This creates the perfect environment for Microdochium to grow and infect the turf under the covers. Pink snow mold pressure in Madison is very inconsistent and so we need to use these techniques to ensure pink snow mold development. For all of these snow mold studies, keep an eye out for our reports this spring on the TDL website (tdl.wisc.edu).

I will close out this article by sharing a few photos of my family. My son James is now 19 months old and running around like crazy. He's also having very long conversations in which my wife and I cannot understand a thing he's saying. He wanted to help us shovel snow during the first big snowstorm in mid-December here in Madison. Also, he kept trying to get his toy mower out despite it being buried in snow. Not sure where he got that from! Our dog Max also really enjoys the cold weather and snow. I hope everyone reading this is doing well and enjoying the winter months. Hopefully we will be able to meet in person soon. Cheers!

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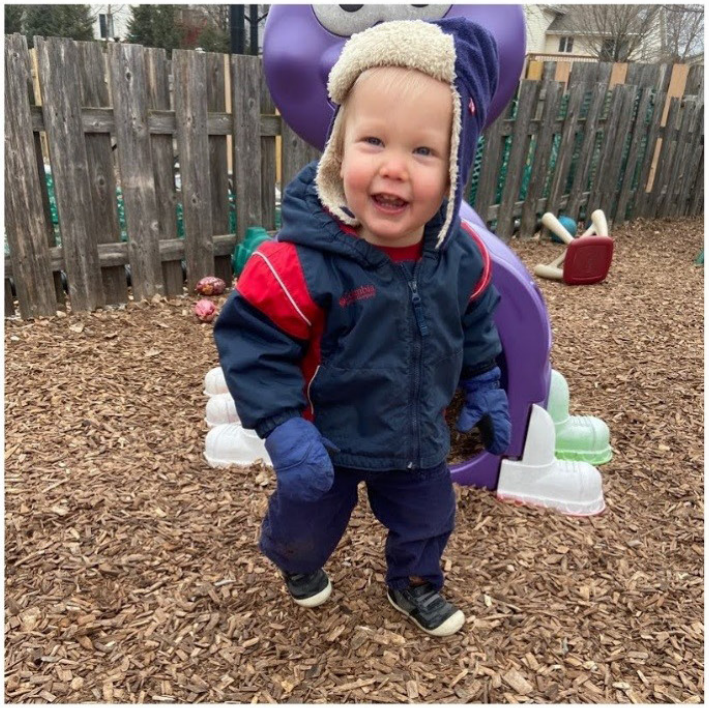
Figure 1. The Marquette snow mold trial. Next spring these 3x10 ft rectangles will be a hodgepodge quilt of various levels of snow mold control.

Figure 2. The pink snow mold trial at the OJ Noer. The insulation frames help create the perfect environment for Microdochium to grow and infect even without adequate snow cover and insulation.



A few pics of my 19 month old son James, my wife Jenn and dog Max.

LAUGHTER ON THE LINKS

A golfer gets to a long par 3 over water. A voice from above says, "Hit the new Titleist Pro V."
The guy tees up the expensive Titleist and takes a practice swing.
The voice comes back, "Nevermind, hit a range ball."

Homeward Bound

By Jake Schneider, Seasonal Worker, Trondeheim Golfklubb, Norway

Back in the day before gray hairs started populating my head, I wrote a lot of scholarship essays that included a statement along the lines of: in the future, my goal is to become the superintendent of a high-end private golf course in Wisconsin. After finishing my degrees at UW-Madison and gaining a few years of experience as the assistant at Blackhawk CC, the pursuit of that position began in earnest, and I became a job board junkie.

I had a brief flirtation with a Milwaukee-area club, but all along, I really wanted to stay in Madison and had my eyes trained on the ultimate prize of taking over for Tom Harrison at Maple Bluff CC. When Tom decided that it was time to retire after decades of amazing service, my eyes lit up. Given that it was a closed job search, being included in the small pool of candidates meant that I had a fighting chance, and after feeling as if I nailed the interviewing portion, hopes were still high. Little did I know at the time that a certain highly-qualified superintendent from Bristlecone Pines shared the same dream, and the very smart folks at MBCC made the correct call to hire our current association president, Mr. LePine.

Shortly thereafter, I had the personal realization that the demanding summer schedule of the golf course assistant superintendent was already starting to wear on me and that I needed a job without the weekend responsibilities and with a more consistent work/life balance. Thus, began my journey spanning from The Bruce Company (where I learned that dealing with snow removal is awful) to the ranks of underemployed house husbands in Norway. Through it all, golf has still been a constant in my life.

During grad school, and while I was employed in the landscaping world, I worked at Blackhawk as time allowed on the weekends, and after I left The Bruce Company, Chad Grimm reluctantly agreed to have me work full-time for a few months before our move overseas. Although it took a bit of luck, my current position at Trondheim Golfklubb eventually came to be, and my 22-year golf course employment streak remained intact and more recently nearly took an unexpected turn.

This spring, I learned that the only other course in the area that isn't mostly manned by volunteers, Byneset Golfklubb, was looking for a new superintendent. At first, I didn't put much thought into it because we were planning on coming back to Madison once Melissa's project wraps up here in May/June 2021, but a confluence of events happened to change that. One part is political in nature, and as an unapologetic Democrat, returning to the US seemed less and less appealing despite the friends and family that we miss dearly. Secondly, I rediscovered how much fulfillment having a say in maintaining a nice golf course brought me, and finally, the realization took place that Norway actually promotes the balanced life that I desired.

So, I applied for the job, but didn't honestly expect anything to come of it, since I was upfront about the fact that I could only commit to working through the 2022 season. Plus, by some measures Byneset is a top-ten course in the country with a very nice shop and skilled mechanic, and I expected it to be a popular opening. Once word of my application got out at my current employer, a Trondheim Golfklubb member who is attempting to buy and improve another course in the area asked me to accompany him on a tour of the property and later said that the superintendent job would be mine to decline should the purchase go through. A month later, I received an email from Byneset asking me to come in for an interview, and after thirty minutes, during which I asked them more questions than they asked me, I walked out with another job offer and a spinning head. For many years, I fought like heck for superintendent positions without success, and suddenly, two of them seemingly fell into my lap.

A month later, I received an email from Byneset asking me to come in for an interview, and after thirty minutes during which I asked them more questions than they asked me, I walked out with another job offer and a spinning head. For many years, I fought like heck for superintendent positions without success, and suddenly, two of them seemingly fell into my lap.

The wheels really started turning in the Schneider-Hunter household as we had to officially decide whether the offer was worth staying for. Pieces such as getting a short-term car lease here, finding a parking spot nearby, and renting our Madison home for longer than expected magically fell in place, and it seemed as if destiny was on our side. So, I told the folks at Byneset that I was officially interested in accepting the job should we come to an agreement on salary (which is rarely advertised here), and I went into my second meeting with them fully expecting to walk out as a golf course superintendent for the first time in my life.

But, it seemingly wasn't meant to be as the strange economics of golf in Norway were fully exposed with a salary offer that was well below the bottom line that Melissa and I had settled on. Given the homework that we had put into the process, I felt at ease formally declining the opportunity. During this whirlwind ride, I have also learned that finding a job in the golf course maintenance industry that fits my wants is a more logical step upon our Wisconsin return. Now, to figure out if such a position exists!

Blue Mound Golf & Country Club Hosts 100th Wisconsin State Open

By David Brandenburg, Golf Course Manager, Rolling Meadows Golf Course

The 100th Wisconsin State Open was played at Blue Mound Golf & Country Club in Wauwatosa August 17th to 19th. It was a fitting location considering the club hosted the 1st State Open in 1919 which was won by Arthur Clarkson who defended his title the next year at Milwaukee Country Club

Blue Mound Golf & Country Club opened in 1904 with a 9 hole course near North 68th Street and expanded to 18 holes in 1909 but later problems with the land lease forced a move to its current location. The new course designed by Seth Raynor opened in 1926 and was the first course in Wisconsin to host a golf major when the 1933 PGA Championship came to town. Gene Sarazen won the then match play format event by defeating Willie Goggin 5&4 to win the his sixth of seven major titles.

In 1933 finalists would have to endure 36 holes a day for six days. A 36 hole qualifier would pick the top 32 players to move on to 5 rounds of 36 hole daily matches.

It would be 71 years before a major tournament would return to the Badger State which was when the PGA Championship came to Whistling Straits in Kohler in 2004.

From the design of the holes and the greens features, Blue Mound is truly a classic Seth Raynor design. The course is similar to how it was designed back in the 20's although as most courses it allowed trees to encroach into playing areas and fairway and green contours to change.

Bruce Hepner, of Renaissance Golf Design restored bunkers, grass lines and removed trees to return the course to the original design in the late 1990's. What remains is a classic layout maintained to the highest standards by Superintendent Alex Beson-Crone and his staff.

Qualifying Sites for the 2020 Wisconsin State Open

Tuckaway CC, Franklin
Geneva National Palmer GC, Lake Geneva
Bullseye GC, Wisconsin Rapids
Washington County GC, Hartford
Wild Ridge GC, Eau Claire
Fox Valley GC, Kaukauna
The Oaks, Cottage Grove
The River Club of Mequon - Woodlands & Highland Courses, Mequon, WI

If you are looking for a tee time you may have to wait until the next event because Blue Mound represented Wisconsin in Golf Magazines list of toughest tee times to get in all 50 states.

The course has also hosted the 1916 Western Open, 1940 Women's Western Open, 1955 Miller High Life Open, 2010 Western Junior Championship, and the 2011 UW Amateur it co-hosted with Erin Hills. The historic course hosted the WSGA State Amateur in 1909, 1912, 1915, 1919, 1923, 1930, 1947, 1963, 1981, 2003 and the State Open in 1919, 1921, 1928, 1942, 1952 and 2020.

The 2020 State Open is played over 72 holes with a field of 156 players, 81 of which were professionals.

Amateur Harrison Ott, a Senior at Vanderbuilt University, started the final round with a one shot lead over Thomas Longbella and ran away from the field to win by 6 shots over Christopher Colla of Fond du Lac and 4 time Open winner Daniel Woltman of Beaver Dam. Ott's 10 under par was a great score and only 5 players finished under par.

Course Superintendent Alex Beson-Crone entered the golf business at age 14 washing carts at the Bridges Golf Course in Madison while a student at Madison Edgewood High. Alex lettered in golf 3 years and in his senior year earned all-conference and 3rd team all-state honors. The family had a membership at Nakoma where Alex learned to play with his dad and brother.

His first grounds position was with Jeff Rottier during the grow in of Erin Hills in 2005. Jeff and Zach Reineking urged Alex to go back to school for turf after he started UW for Landscape Architecture. Alex recognized Jeff and Zach's passion during his early years in the industry that showed him he could find fulfillment and enjoyment with a career in turf.

Although the heavy work is done at Blue Mound Golf & Country Club, Alex and the staff are continuing to return bunkering, removing trees, changing mow lines and trying to firm surfaces up to return the course back to Seth Raynor's original design.

Although Blue Mound is one of the best courses in the Midwest it is not without challenges for Beson-Crone and his staff. First, the trees were a rude awakening for Alex coming from Erin Hills where there were only 4 trees on the entire property.

Secondly, the pump station is having issues from the storm water that is the primary irrigation source. Fortunately a new irrigation pond will be dug in early spring and a new pump station will be built.

When asked about his staff Alex shared: "We're blessed to have a great management team and seasonal staff at Blue Mound. Working alongside friends translates to my genuine excitement to come in each day. Senior Assistant, Dan Vater, is one of the brightest guys I've known in the industry and has helped innovate the operation since I started."

"Assistant Superintendents, Stephen Ems and Matt McVay, are detail oriented and do an excellent job training staff. Kyle Seavecki, whom I worked with at Erin Hills, has been a great addition and helped as Crew Foreman/ Assistant Mechanic. Jorge Fuentes, who may be the best crew guy I've ever worked with. His demeanor and skill set equates to the perfect turf employee. Last, but certainly not least, I greatly (and probably most) value our Head Mechanic, Steve Spuhler. He's knowledgeable, resourceful, and he can flat out fix anything."

The competitors and PGA of Wisconsin had rave reviews for the course and the conditioning for the 100th Wisconsin State Open. Next on the docket is preparing for the Junior Ryder Cup postponed from 2020 to September of 2021.

Blue Mound Golf & Country Club
Golf Course Superintendents

1904-1926 Greens Committee
1926-1942 Paul Brockhausen
1943-1975 Frank Musbach
1976-1978 Jerry Berkholtz
1979-2003 Carl Grassl
2003-2012 Tim Venes
2012-2018 Steve Houlihan
2019-Present Alex Beson-Crone

Early morning mowing of the fairway height bentgrass clubhouse surrounds. Blue Mound G &CC is unique in that going right to left in this picture the clubhouse surrounds go from 18 green, to the putting green to 10 tee all the way over to 9 green. It provides a beautiful view against the backdrop of the massive clubhouse.

Member 9 with Alex Beson-Crone, Blue Mound Golf & Country Club

1. What was your first vehicle? 1983 Honda Civic.
2. Favorite piece of golf course equipment? I'm a big fan of the simple things…A sturdy scoop shovel, a nice hose nozzle, even just a golf ball to see how things are rolling and bouncing. I do like watching the Wiedemann Super 600 do it's thing cleaning up cores, thatch, and sticks as well.
3. 18 Hole Handicap? 1
4. What is your current vehicle? 2018 Honda Accord.
5. Favorite TV shows? I don't have a current one that I'm watching, but I've been re-watching "The Wire". That's probably my all-time favorite.
6. Favorite professional sports team? Badgers, Packers, Bucks, Brewers.
7. Favorite main course meal? A filet at Carnevor (Milwaukee Restaurant).
8. Pets? 2 dogs - Sadly, no. Had a territorial Golden Doodle, Charlie, who didn't get along with our 2 year old daughter. He now lives with my father-in-law. Hopefully we'll have a dog at the course soon though. Every Grens and Grounds team needs a dog in my opinion.
9. Favorite thing about working in the golf industry? I love the game of golf, so a favorite is reaping the fruits of our labor and getting to play the courses we work on. Also, being a part of a network of Superintendents and Vendors who as a whole are just good people. I am grateful for the friendly and down-to-earth nature of people in this profession.

Top Left: Mowing the 4th Green.

Bottom Right: Mowing the 15th tee.

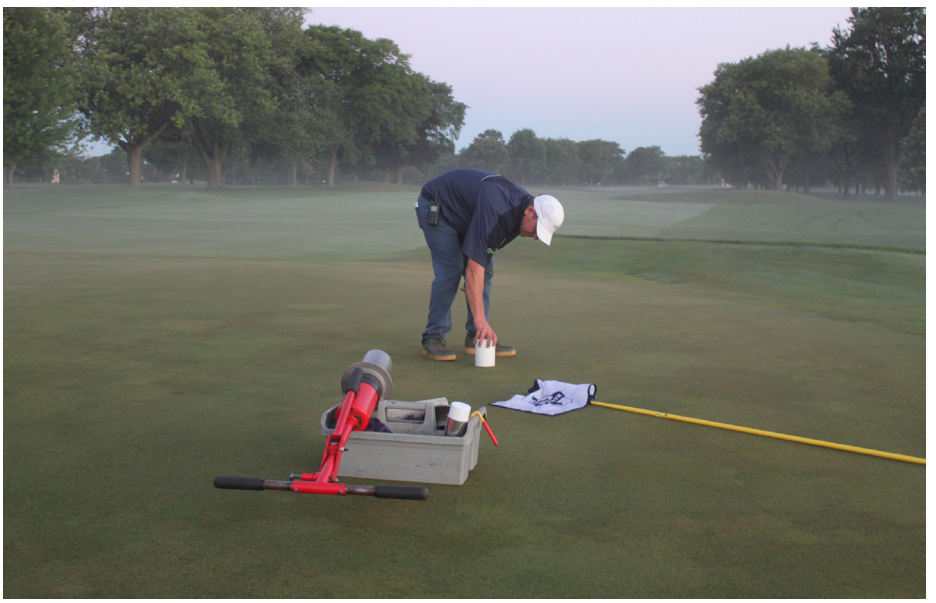
PGA Wisconsin Section

Top Left: "The Short" Hole 7, 167 yard par 3 hole where the moat bunker was returned to original form as part of Hepners work to return the course to the orginal design.

Middle Right: Mowing the 7th green showing the steep banks surrounding the large but challenging green.

Bottom: The view from the 12th tee.

COVER STORY



Top: The golf staff taking a break for a team picture.

Bottom. Alex changing the cup on the 18th green.

COVER STORY

Top: The bunker team posing for a picture.

Bottom Left: A tribute to golf course architect Seth Raynor.

BottomRight: Mowing on hole 12.

COVER STORY

Above: The incredible "Punchbowl" green on the 455 yard par4 8th hole.

Left: Mike Upthegrove voluntering on the roller on the 13th green.This picture shows some of the impressive elevation changes that the course offers.

Bottom. The often lost art of draggin' dew with a hose to remove dew, reduce diseases and provide for better playing conditions early in the day.

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Is It 2021 Yet?

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

As I write this article, it is the third day of cold rain in early September. For the last month, here at the Noer Facility, it has been very dry, **(Figure 1).**

It became very easy to see where there was irrigation and where there was not. If something went wrong with the irrigation, it took only days for the issue to present itself. I am not saying it was dry all year long, but August was very dry. The early part of 2020 had sustainable moisture.

Every year I turn the water off on a bentgrass plot (one not being used for research) to see how long it will survive before I need to begin an irrigation cycle. This year that plot received only Mother Nature's irrigation until August 10th. At that time, it was starting to show signs of stress, I thought it could hold out a while longer. Unfortunately, I was scheduled to take my vacation the next week and I did not want any major damage while I was gone. Yes, I broke down, and turned the irrigation on to make sure it was happy before I left.

Figure 1. Showing the dry spell at the Noer Research Facility in August.

As many of you have also experienced, it has been the year to do more with less. I was never able to hire my two growing season staff members. This summer I had two college workers that stepped up and got me through the summer.

The issue came when I returned from vacation and they had left for school. Although I did know they would be gone when I returned, it didn't really set in until I got back, and I had no outside staff. It was now late enough in the year that the chance I could find an employee to work 25-30 hours per week for 8 weeks seemed unlikely. It appeared I was going to have to be the entire staff for the rest of the growing season. After the first week Audra Anderson came to me and said she would work mowing general grounds this fall. After all these years at the O.J. Noer Facility this shows the dedication Audra has to the Noer, **(Figure 2).**

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NOTES FROM THE NOER

Now we did catch a break early on due to the drought, there was only about half the grass to be mowed. I knew if the rains came, and they would, the entire property would require mowing. It is raining now and the Noer is already greener than last week and has begun to grow.

One more blessing for 2020 and it was to come from John Jensen and Reinders, Inc.. John heard about my lack of staff and went to work to see if he could arrange for a short-term large area mower. John came though one more time with a Toro GroundsMaster 5900. Wow, sixteen feet of cutting power. The Noer does not have many banks or hills so the GM5900 works great. This is a huge upgrade from a 62" John Deere lawn tractor. Now between Audra and I we should be able to keep the general turfgrass mowed.

My plan was in place and I was confident it would work for the next eight weeks. Then on a Friday the antique Toro 5200D blew a hose. Being a one man show, I sent the mower off to Reinders for repair. How was I going to finish the fairway and keep them mowed until the 5200D returned? One more miracle, Phil Davidson from University Ridge stepped in and allowed me to use his back-up fairway mower. The staff at University Ridge is minimal at best this year and he did not have enough staff to use their back-up. Thank you, Phil! I had to re-set the mowers and he permitted me to use that fairway mower until mine was returned.

The good news is from what I am told all the research has and is being completed. The Coronavirus did create a few challenges for turfgrass research at the Noer, but the Turf Team made it all happen.

As the year progressed there was some interesting work being done. Much of the summer research has been completed and future articles and/or some form of the Winter Turfgrass Research Day and the Turf Team results will be shared. I guess just one more reason to attend the Winter event. As you all know the Virtual Summer Field Day has been posted on the WTA website so you can check in on the reports on numerous summer research projects.

It has been a long year for all of us. We have been pushed, pulled, challenged, prodded and directed to make it work! As a group of Turfgrass Professionals we all did it. As an industry we have proven golf can be played safe. Golf maintenance can be done safely and never count a golf course superintendent out. They make MacGyver look like he only has a learner's permit! This year, more than any of the many years I have been around, I am proud to be in this business.

Now the good news, by the time you read this the WTA Fall Golf Classic at Westmoor Country Club will be in the books. The attendance might be slightly down because of the pandemic but with social distancing and the great effort by all the staff at Westmoor Country Club it will have been a success. The next issue I will provide a Fall Golf Classic wrap-up.

Wishing you a great Fall and a seamless journey to irrigation winterization and snow mold application!

Figure 2. Audra and her new toy! A real team effort with a donation from Reinders and Audra helping Bruce mow while the staff was reduced.

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Winter Internships, the Unseen Side of Management

By Travis Miller, Undergraduate Student, Department of Soils, University of Wisconsin - Madison

Editor's Note: This student article is eligible for the 2020 Monroe S. Miller Literary Scholarship.

COVID brought many hardships for the industry and for our lives in general. We have had our normal lives stripped away from us, classes are remote, and we can't hang out with our friends and colleagues. Though difficult, this online change left us with a unique opportunity, the chance to work full time during school and winter break.

As a student at UW- Madison I knew that we would be going fully online after Thanksgiving break, presenting me with a unique opportunity to look for work from Thanksgiving through winter break. Over the summer I worked with another intern who knew the superintendent at Wade Hampton Golf Club in North Carolina, solidifying the fact that connections are important. This is a course that I had always wanted to see in person and work at, since there is not a lot of information about it online.

The club being private was a draw for me as I had only ,worked on public courses such as University Ridge in Madison, WI and Whistling Straits in Sheboygan, WI. Also, the location is unique as they have a similar climate to Wisconsin, but with milder winters, presenting an opportunity to work on cool season grasses in the winter. I had also never been to the transition zone or worked on a mountain style course. Finally, and perhaps most importantly, the course was going under the knife for a large drainage and aesthetic renovation. This would be completely different than other places I had worked, I would get to see construction, tree removal, large scale sodding and off-season planning. I had only ever worked in season, so this provided an opportunity to see off season work, the unseen and perhaps more important part of golf course management.

Installation of drainage tile on the left side of number 10 primary rough next to a roll off area by the green, which has drainage issues.

The 12-hour drive to get to Cashiers, NC was like nothing I had ever seen before, with interstate highways climbing higher and higher into the Appalachian Mountains. I knew I was in for a change of pace when I was about 45 minutes from the course, and I couldn't drive faster than 30 miles an hour since there were so many hairpin turns.

Wade Hampton is just one of many very exclusive courses in this region of North Carolina, with most being designed by Tom Fazio. Being a top 100 golf course certainly has its appeal, but when it is one of the hardest courses to get on to play, and with very little information or even pictures online, I did not really know what to expect. The only indication I had of what the course even looked like was 3 reference pictures and a YouTube video from a simulator recreation. Luckily enough, Superintendents Nathan Martin and Greg Burelson, were kind enough to show me around before I started work, and then and there I knew that this wasn't like anything I would ever see in Wisconsin. A prevalent sight is Chimney Top mountain which is visible from holes 6-18 as you creep ever closer to it. Chimney Top, is a sheer rock face and the course was carved out at the bottom of it, leading to one of the most beautiful landscapes I have ever seen.

Before I arrived, I knew the general plan of what we would be doing for work on the course, drainage installation. They had closed the week before I got there, meaning it was all hands-on deck to get the projects done that they had slated for the winter before opening day in May. The primary goal of my time here was to work on installing drainage on some low spots and cap with sand. This was completely different to me as the only drainage experience I had was what I've read in textbooks and burying bunker drain lines over the summer. I'll be the first to tell you that this is completely different than reading about it.

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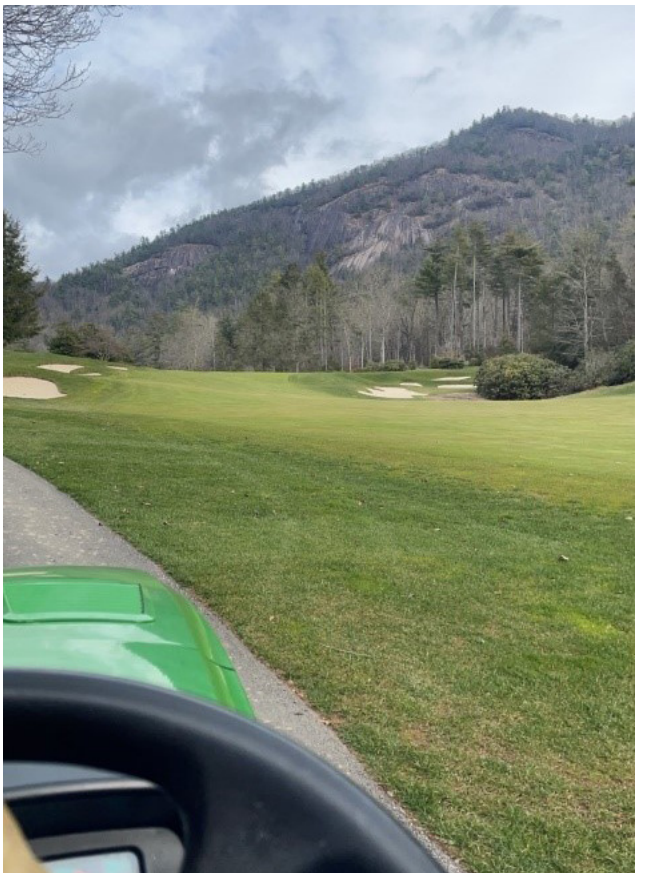
We had begun on number 14 fairway/ primary rough, spoiler alert this was about 20-25,000 sq ft of turf that we were about to remove. Our general process was removing the sod, dig out about 6 inches of native soil, trench for the drainage lines, gravel and place 4-inch drainage laterals, cap with about 6 inches of 90/10 sand and then sod the top. We completed this on many different holes, with 14, 13 and 10 being the primary ones.

This was an interesting process to me because there was a lot of repetitive work as well as the use of more heavy equipment than I had ever been a part of, I even got to use a mini excavator! I learned to operate a lot of new equipment and got to see some very skilled operators who were the best of the best at their craft.

Seeing the planning and preparation of the lines was a valuable skill as wasvreading about what we are supposed to do when designing drainage is nothing without being able to implement it in the field. This was all very tedious work as moving sod, leveling sand, and laying sod are all long processes that are essential for a quality play surface at the end of the project.

Trenching is another tedious but essential part of construction, without grade or fall there is no water movement. This is where one of the new pieces of equipment, the laser level, came into play with being able to see if there was fall between two points to make sure that what we're installing would work. This is meticulous but important work that people in this field must be familiar with since doing it right the first time prevents us from having to do it again and how a quarter of an inch of discrepancy can make all the difference.

This is an important lesson that is lost in the season as there isn't time or the equipment to make these large-scale improvements. Seeing what is under the course is an invaluable experience for aspiring supers, as being able to visualize problems regarding the systems is something that simply does not happen during the regular season. Another interesting thing about doing this kind of work, is that there is a lot more hand tool use rather than equipment operation which is sweet since getting down and dirty is something we may not see with only spraying and topdressing. Finally, there are always problems, whether it be weather, clipped wires, broken heads, or even a busted main line.



Chimney Top Mountain from the left side of hole number 12.

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All were important things to see in order to plan better for the future and learning how to fix it for when accidents happen.

Number 17 tee was our next big project that is still in progress at the time of me writing this. Moving tees on the signature hole is an incredible undertaking and not one that comes without all sorts of planning and red tape. There were many opportunities to see the director, GM, construction company and Tom Fazio's right-hand man working together to plan the change, which was different than anything that I had ever seen.

It was crazy to see all the sod and soil being trucked away and trees being removed in order to add a new back tee and reposition the front tees. Seeing the work of the construction company was one of the most ridiculous things ever, the way the bulldozer operator was able to sculpt the tee boxes out of the hillside was mesmerizing. After than point it was time for us to step in with installing a new main drain line as well as laterals in the same method as above and shown in the pictures. This drainage install will probably last me to the end of my time here but what I have seen so far is incredible, especially installing catch basins and main lines and being able to see how it all comes together under the turf.

New tees on number 17, the signature hole with its towering eastern hemlocks and Chimney Top Mountain in the distance, with the trenches dug for drainage to be installed later that day.

Planning and working with upper management are probably the most important aspect of management that I was able to experience while I was here. Being included in weekly meetings as well as daily meetings in the morning with the assistants, supers and director waere important to see.

Being in the know about what was being submitted to members and budgets is something that I never thought I would get to see in an internship and would have to pick-up once I got into the workforce. Member and management relationship is something that I had never seen before and knew would become increasingly important especially if I worked for a private club.

Additionally, I was part of the planning for the club's 2021 calendar. Seeing the process of laying out cultivation and spraying schedules is something that is the core of a management operation but is not seen if you only work in the summer. This winter was an incredible experience for me to get out of my comfort zone and experience something I had never done before, far away from home. I would recommend doing something like this, even for just winter break, to anyone who is trying to get into the turf industry. Seeing operations and planning under the hood is something that cannot be taught in a classroom and should be in consideration for any turf student.

Snow Mold Strikes Again

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

Author's Note: This article originally appeared in the August 2020 issue of Golfdom magazine (https://www.golfdom.com/snow-mold-strikes-again/) and is being reprinted here with their permission.

By my count, this is the 8th consecutive year I've written a snow mold article for Golfdom. Over these eight years, some things have been constants, such as the need to mix multiple active ingredients for acceptable disease control in heavy pressure environments. Other things are specific to each year, such as how minor environmental changes over a small area can lead to large changes in disease development.

This article will be much the same, certain things you've heard me say before (you need multiple actives if you're in a high-pressure area!) and others you haven't because I haven't mentioned them. Let's take a look back at the 2019-2020 winter to help us prepare for 2020-2021.

Turf hardening impacts snow mold resistance…a lot

From an environmental standpoint, last fall and winter in the Midwest were drunk. An early and prolonged cold snap in October and November caused early course closures and a mad rush to blow out irrigation systems and get out snow mold applications.

In Madison, we got almost 6 inches of snow on Halloween, which made for some difficult trick-or-treating. Fast-forward to December, and the weather felt more like September. Multiple weeks with high temperatures in the 40's and 50's culminated in a 54°F Christmas Day and a Koch household Christmas party that moved to the back patio. Winter returned on January 1st when snow fell, and it stuck until mid-March.

Discussion among superintendents in Wisconsin centered around how much snow mold would develop, and whether breakthrough would occur in treated areas. I was unsure, torn between conflicting indicators. On the one hand, there was snow on the unfrozen ground, which generally leads to lots of snow mold. On the other hand, the snow fell late, was never that deep, and barely lasted 60 days.

In the end, snow mold pressure was very high across most of Wisconsin and the upper Midwest **(Figure 1).** This indicated that even with a short window of snow cover, the lack of turf hardening allowed for widespread snow mold to develop on non-treated turf. Turf hardening is a complex process that allows the turf to be ready for the winter ahead and is a critical component for snow mold resistance.

Figure 1. Snow mold pressure at our research station in Madison, WI was very high despite a relatively short window of snow cover.

Fortunately, snow mold breakthrough on treated turf was very rare, suggesting that snow mold applications made in October and November knocked back the fungal population enough so that it couldn't recover and cause disease before the snow melted in spring.

Our changing winters make it difficult to consistently predict how climate change will impact future snow mold development. Prior to this year, most of the evidence I observed suggested that climate change was resulting in later and less snow cover and less disease development **(Figure 2).** But 2019-2020 showed that warmer temperatures in late fall could lead to 'dehardening' of the turf, which results in widespread snow mold development on turf that is, for lack of a better phrase, 'unprepared for winter.' How this plays out with further climate change in the years ahead will be interesting (and essential) to watch.

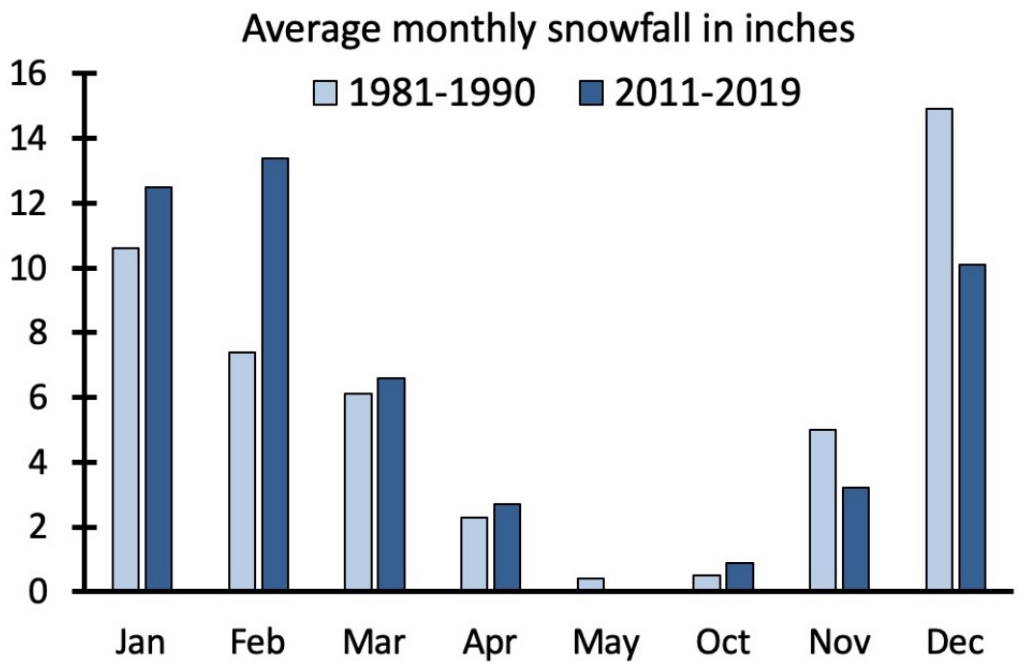

Figure 2. Average monthly snowfall in Madison, WI has increased over the last ten years in January and February but fallen significantly in November and December. December is usually a critical time for snow mold development. The figure is taken from the website https://news.wisc.edu/new-weather-normals-show-how-madisons-climate-has-changed-over-40-years/

Fungicide timing matters.

Timing of snow mold fungicide applications is something I have talked about before, but the 2019-2020 winter provided a great example of just how important it is. Applying snow mold fungicides too late (i.e., when snow is already on the ground) is bad. However, applying them too early is also bad, most likely due to a combination of product breakdown before snow cover AND the snow mold fungi not actively growing (and not taking up) the fungicide at the time of application.

But what is too early, and how do you determine the optimal time to apply when the conditions fluctuate so much from year to year?

To investigate this, we have researched optimal snow mold fungicide timing for the past five years. The study is straightforward; we apply Instrata once at various times prior to 'expected' snow cover for that particular site and then rate how much snow mold developed on the site the following spring. The application timings are 8, 6, 4, 2, and 0 weeks before the expected snow cover.

At our research site in Minocqua, WI, in 2019-2020, the cutoff from almost no control (applied October 14th) to excellent control (applied October 26th) was only 12 days **(Figure 3)**. The control increased dramatically over the same two application dates at research sites in Wausau in central Wisconsin and Madison in southern WI.

As part of this project, we have also researched various environmental measurements that can effectively predict the optimal timing. To date, the most effective has been 'heating degree days.' Heating degree days are the opposite of growing degree days because you set a base temperature (we use 50°F) and beginning on July 1st of each year, record how much BELOW 50°F the average daily temperature was.

Figure 3. There can be a sharp cutoff in effective snow mold control. At our research site on Timber Ridge GC in Minocqua, WI, the difference between no control and great control was just 12 days.

From our past research, we know that increases in snow mold control are seen when fungicide applications are made at heating degree day accumulations right around 100, and that is precisely what we saw at these three sites in 2019-2020. More research is needed across more locations. Still, we know that fungicide timing is essential for snow mold control, and we're making progress on ways to predict when that optimal timing will be.

Effective alternative snow mold products don't yet exist

There are a host of alternatives to traditional fungicides that have provided some level of efficacy against certain turf diseases. For example, iron sulfate can reduce dollar spot and phosphites are effective against Pythium blight. Even Microdochium patch that occurs in snowless areas of the Pacific Northwest and northern Europe can be controlled using combinations of iron sulfate, Civitas mineral oil, and phosphites. However, we haven't yet found an alternative product that is effective against traditional snow molds.

We have tested Civitas many times with poor results. This past winter, we tested a potential new biocontrol agent with poor results. We even tested applications of iron sulfate and phosphite applied six times on a 2-week interval throughout the fall leading up to snow cover and still had poor results **(Figure 4).**

The bottom line is that there remains considerable interest in developing alternative methods to control snow mold in areas where snow cover persists, but right now, those options don't exist.

Figure 4. I thought that repeatedly applying iron sulfate (Extreme Green) and potassium phosphite (Duraphite) throughout the fall would knock back the snow mold fungal population and provide significant disease control. As this photo from Timber Ridge GC in Minocqua, WI shows…I was wrong.

Mix those active ingredients!

Every year I talk about mixing multiple active ingredients for successful snow mold control, and our research this year once again showed how important that is. We conducted snow mold research at four sites in 2019-2020: Marquette GC in Marquette, MI; Timber Ridge GC in Minocqua, WI; Wausau CC in Wausau, WI; and the OJ Noer Turfgrass Research Facility in Madison, WI.

Snow mold pressure was high at all four sites, and in all of them, the only products that performed well were those that had mixtures of three or more active ingredients. In Marquette, the main snow mold present was speckled snow mold (Typhula ishikariensis), and the amount of disease in the non-treated control was a whopping 87.5%. In Wausau, the main snow mold present was Microdochium patch (Microdochium nivale), and the amount of disease in the non-treated control was high at 71%.

Even under these heavy disease pressures, there were plenty of treatments that provided highly effective control **(Figure 5)**. At Marquette, there were 16 of 63 treatments that allowed less than 5% disease, and at Wausau, 28 of the 63 treatments allowed less than 1% disease to occur.

The common theme among ALL of these successful treatments is that they contained three or more active ingredients. While the specific mixtures varied, almost all of them included a DMI fungicide such as tebuconazole or propiconazole, a contact fungicide such as chlorothalonil or PCNB, and an additional active ingredient such as pyraclostrobin, azoxystrobin, or iprodione.

I strongly encourage you to view the full research results at the University of Wisconsin's Turfgrass Diagnostic Lab Fungicide Results page (https://tdl.wisc.edu/results/) and contact me with any questions you have.

Figure 5. Many treatments provide highly effective snow mold control despite really high disease pressure at our research site on Marquette GC in Marquette, MI.

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Acknowledgments

I want to acknowledge and thank my Field Research Manager, Kurt Hockemeyer, for organizing and implementing our research trials. Also, a huge thank you to the host superintendents that allow us to conduct this research and provide this great information to all of you: Craig Moore at Marquette GC, Jay Pritzl at Timber Ridge GC, and Randy Slavik and Aaron Hansen at Wausau CC. Lastly, thank you to Adjuvants Plus, AMVAC, BASF, Bayer, Belchim, FMC, Nufarm, PBI Gordon, Precision, PrimeSource, SePro, Simplot, Quali-Pro, and Syngenta for supporting this research.

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EDITOR'S NOTEBOOK

Pandemic Continues To Affect Golf

By David Brandenburg, Editor

Golf courses around the globe are still being affected by the Covid 19 Virus as some areas of the country are still being asked to shelter in place or have activity with severe restrictions.

Luckily for us in the Badger State the act of golfing is pretty close to normal. Masks should be worn and many courses offer some sort of single rider cart policy. And a few counties severely restrict indoor activities while others only somewhat limit indoor activities.

Courses that rely on large banquets are at most risk of losing a substantial revenue source.

I am sure most courses have those customers who do, or at least try to, take advantage of the single rider cart rules just to play faster or not have to ride with that annoying playing partner.

There are many stories of golfers riding together for miles in the same car with no masks but then claim they need their own cart.

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EDITOR'S NOTEBOOK

For our course we brought in 20 extra carts at a decent price back in May and kept them through the season. It helped, but between the single riders and the covid golf boom, we still had to track carts just about every day. As a general rule, the covid boom customers seemed willing to spend their money and liked to ride carts.

I recommended to our committee to add a surcharge to those requesting single rider carts as a way to discourage the abuse and to recover some of our costs. However, being a county owned facility, I was told it would look bad to have the health department telling residents to keep 6' away while we were charging them extra to do so. It is a valid reason based on optics more than trying to fix a problem with common sense. I would prefer to charge something, as many courses saw a decrease in the single rider abuse with a small fee. However, it is not a topic I am not going to take a strong stand on and we will just make it work.

We never had to tell a customer they couldn't have a cart but we did have golfers standing in line watching us clean the cart and turn it back over so they could use it right away.

Some courses have had to make due with very limited staffing levels. Luckily for us we have some high school employees who either do not take school as seriously as they should or are very good at time managment and they were able to work nearly full time in spring and fall. It allowed us to let some of our retirees relax a little more and work a shorter season for a change. With the extra help we were able to keep up with the mowing and a few extra projects. Hopefully we are not holding remedial math classes in the lunchroom next summer.

Until next time, best wishes of health and happiness to you and yours.

MAY 4th - SAVE THE DATE

Assistant Superintendent and Equipment Manager Joint Meeting

Sand Vally's Sandbox Golf Course will host a Class C / EM two person scramble follwed by lunch and a optional shop/facility tour.

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SANDBOX

A formal registration form will come out in early 2021. The field will be limited to the first 68 spots.

2021 Event Schedule!

February 2-4 - GCSAA Virtual Golf Industry Show
March 2 - (Tuesday) WGCSA Virtual Spring Business Meeting
April 28 - (Wednesday) WPGA/WGCSA Super Pro - Wild Rock GC, WI Dells, WI
May 4 - (Tuesday) Class EM, Class C Meeting - Sand Box Par 3 Course at Sand Valley Resort, Neekosa, WI
May 11 - (Monday) WGCSA May Meeting - Abbey Springs, Fontana, WI
June 14 - (Monday) WGCSA June Meeting - Lawsonia, The Links, Green Lake, WI
July 27 - (Tuesday) WTA Summer Field Day - O.J. Noer Research Facility, Madison, WI
August TBD - Joint NGLGCSA/WGCSA Member Guest - HOST NEEDED
September 13 - (Monday) Wee One Fundraiser - Pine Hills CC, Sheboygan, WI
September 21 - (Tuesday) NGLGCSA Superintendent and Crew Outing @ Greywalls Course, Marqette, MI
September TBD - Equipment Managers Meeting - Location TBD
TBD - WTA Golf Classic - Location TBD
TBD - Couples and Guest Evening - Location TBD
Dec 1 and 2 (Wednesday/Thursday) 55th Golf Turf Symposium - American Club, Kohler , WI
Feb 5-10, 2022 - Golf Industry Show, San Diego Convention Center, San Diego, CA
Feb 4-9 2023 - Golf Industry Show, Orange County Convention Center, Orlando, FL
Visit our website at www.WGCSA.com for the most up to date calendar and registration forms.

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