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WISCONSIN PATHOLOGY REPORT

After the first year, we immediately discovered that snow mold was most severe in the absence of fungicides under the Green Jacket covers with insulation (Figure 1 and 2). We did not observe significant differences between fungicide timings under any winter cover treatment. However, it was apparent that snow mold development was more severe when applications were only performed in early October. This is important because I heard many claims that systemic products need to get into the plant early in order to be effective. This is not true and I may have caused some of the confusion. We observe excellent suppression of snow mold when fungicides are applied well before snow cover, but after the last mowing of the year. We also did not observe a difference between split applications and a single late application, but keep in mind that we only treated a 120 ft² with our tanks! It remains to be seen if coverage is better when ap-

plications are split when treating large acreage.

It is interesting to note, that we did not see differences among application timings within the Green Jacket treatment despite increased development in the non-treated control. We used an exceptional fungicide mixture that has performed well at our site in the Upper Peninsula of Michigan, which may have confounded our results. However, if you notice the early applications averaged about 18% disease and the late application had some disease development as well. It will be interesting to see how this changes when we repeat the study this year because the plot locations will remain the same. Thus, inoculum density in plots with some breakthrough maybe higher and may allow for more differences this year.

Throughout the study we monitored environmental conditions. Although nothing immediately stood out, we did notice

the insulating green jacket covers tempered the extremities of winter better than snow and snow plus the permeable Evergreen cover. Essentially, we may see more striking differences in regions with less persistent snow cover. Snow cover itself is an excellent insulator for environmental extremes and covers are only needed to protect against desiccation and ice damage. We hope this study and potentially another study with the NGLGCA will help us determine if covers are truly needed in environments with persistent snow cover during the winter months.

This study was very exciting and our co-operator, Dave Van Auken, was an absolute pleasure to work with. We look forward to collecting another year's worth of data and reporting the findings. If you have any questions or comments please feel free to contact Paul or I about the study. Looking forward to this year!! 🌱



Figure 2. Images of the impact of winter covers on snow mold severity in the absence of fungicides. The far left image was not under any winter cover, the middle was under a permeable Evergreen cover and the right was under a Green Jacket cover with insulation.

2012 WGCSA
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Paul Koch Completes PhD in July 2012

By Dr. Jim Kerns, Department of Pathology, University of Wisconsin - Madison

I am pleased to announce that Paul Koch completed requirements for a PhD in Plant Pathology at UW-Madison. I remember when I was hired five years ago, Paul asked if he could work on his PhD while still maintaining his responsibilities with the TDL and fungicide program. Some in my department thought this was not a great idea, but John Stier, who worked closely with Paul, said he had the work ethic to handle both duties. Based on my initial meetings with Paul and John's comments, I was confident that Paul could do this. So off we went! Before I arrived, Paul submitted a GC-SAA Environmental Institute for Golf grant to study fungicide persistence in a winter environment. The grant was funded and we quickly embarked on a marvelous adventure. Paul found commercially available enzyme linked immunosorbant (ELISA) assay kits for chlorothalonil and iprodione. Basically these kits are like home pregnancy kits for fungicides. He thought this would

be the best way to monitor chlorothalonil and iprodione concentrations without relying on a cooperator that possess a sophisticated gas chromatograph mass spec unit.

Now these kits, of course, sounded too good to be true. And they were. When we received the kits, we quickly realized that we were the first researchers in the US to purchase these kits because the instructions were in Japanese! So Paul quickly learned Japanese and away he went, kidding of course. We asked the company to provide instructions in English. All kidding aside, the first problem we faced was adopting these kits for a turfgrass system. These kits were originally intended to detect minute quantities of pesticides on produce, so we had to determine a way to detect concentrations typical of field application rates. Paul spent a significant amount of time developing the methods to use these kits in his project. Consequently he will get a paper just from validating these kits in a turf system.

Once the kits effectively measured fungicide concentration, he embarked on answering the question: "How long to fungicides persist in a winter environment?" With little guidance from Stier or myself, Paul developed a field experiment to answer this question. His plots consisted of strips of snow and non-snow covered plots. Within these strips were fungicide treatments consisting of iprodione, chlorothalonil and a tank-mixture of iprodione and chlorothalonil. From each individual plot, Paul and his team of undergraduates, collected two cup cutter sized cores using an extremely powerful hand drill equipped with a hole-saw attachment. In order to get the cores out of the ground, the team typically needed the assistance of a crow bar to pop the cores out. Keep in mind that this was all done with snow on the

ground. There were many funny instances of getting vehicles stuck, choice words deployed judiciously and even the use of a sled! I think one lesson Paul learned was to NEVER conduct winter research again! He then would bring the two cores to the lab to analyze for fungicide concentration using the ELISA kits and the other was used in a bioassay where he inoculated cores during each sampling date with *Microdochium nivale*, the causal agent of pink snow mold.

From this research we quickly learned that fungicide persistence was tied to temperature. In other words, if soil temperatures remain below freezing the fungicides would persist regardless of our snow cover treatments. Thus if we experience an open and cold winter, fungicides applied for snow mold control in the fall will persist for as long as freezing temperatures persist. However once temperatures consistently eclipse 32oF, fungicide concentrations decline readily. We also learned that the pink snow mold fungus has a hard time infecting grass that has experienced extremely cold temperatures. Therefore, we now know that re-applications during January and February are not necessary during "normal" winters. Last winter was the exception; Paul observed a steady decline in fungicide concentrations most likely due to the abnormally warm winter we experienced. Thankfully this spring was not conducive for pink snow mold!

Paul then decided to examine the effect of temperature on fungicide persistence a bit further. He laid out another field trial, applied the same fungicide treatments, collected cores and incubated them at 50oF, 68oF and 86oF. Samples were removed immediately after the initial fungicide applications and subsequent samples were collected every 7 days until 35 days after application.



Dr. Paul Koch examining a turfgrass plant.

(Photo from University of Wisconsin - Madison, Turfgrass Diagnostic Lab Website)

WISCONSIN PATHOLOGY REPORT


From this Paul discovered that iprodione degrades more readily at 86 than at 68 or 50oF. This provides evidence that fungicides may need to be re-applied at shorter intervals during the summer months to achieve acceptable suppression of turfgrass diseases. It has been extremely rewarding to work with Paul on these two fungicide studies. It is an area that no one in the country is investigating and it is of paramount importance to turfgrass managers. Thus we used an extremely novel research technique and approach to answer a fundamental question from our industry.

Paul had two other chapters of his dissertation that I did not discuss, but each one of Paul's chapters will be published in peer-reviewed journals. While Paul was conducting his PhD research, he also continued to successfully run my fungicide program and the TDL. During his tenure as TDL manager, Paul

was responsible for a program that has generated over a million dollars in outside revenue!! Paul handled the day to day operations of my lab, my fungicide program, supervised three undergraduates AND received and examined about 100 to 200 turf samples a year!! Plus he did all of this without ever complaining, I don't think I ever heard him complain about his job. Thanks to Paul's extreme dedication and talent, I was afforded the time to recruit students, secure grants, and perform extension activities to ensure an excellent tenure case. For that, I will always be indebted to him!

Paul is also extremely dedicated to the turfgrass industry of Wisconsin. His reasoning for pursuing a PhD was to continue to conduct research to aid turfgrass managers. He thoroughly enjoys helping anyone in the turfgrass industry and will work tirelessly to do so. One of Paul's best attributes is the ability to ac-

cept constructive criticism with grace. I think a motivating factor to accept criticism so well is so he can better serve the turfgrass industry. He understands that he is not all-knowing and criticism will only make him better.

Paul has been an invaluable member of my program and UW turf team. I am extremely proud of his accomplishments as my employee and student, but I also understand that Paul must also move on to run his own program. He has applied to three excellent turfgrass positions at Ohio State, NC State and Oregon State. Any of these departments would be lucky to have Paul, as he would develop a nationally recognized program very quickly. I look forward to watching Paul develop his own program when he leaves UW and understand that I will have to live in his shadow in the future! Congratulations Paul, we are all very proud of you!! 

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Droughty Optimism

By Jake Schneider, Assistant Golf Course Superintendent, Blackhawk Country Club

Greetings from the Sahara Desert! My apologies to my fans (Mom, Dad, and occasionally my wife) for my absence from the last issue. From June until present time, I have been busy finding water for my camel. And, in my time away from my two-humped friend, a few hours were also spent battling Mother Nature and her very, very, very dry humor.

Indeed, 2012 will be a year that is referenced for decades, and it's making 1988 seem like a tame, little pussy cat. Personally, this is especially true since I wasn't quite so concerned with the weather at 5 years old. As of mid-September, Madison has received approximately 1.2 less inches of rain in 2012 when compared to 1988, and if the forecast holds true, this discrepancy will likely increase substantially. To make things even more interesting, we've hit the 90-degree mark 39 times this year. It got to the point that I was actually hoping for two more 90-degree days because the Madison-area record stands at 40 days. But, alas, the cool temperatures have arrived, and the painful memories of the summer that was are already beginning to fade.

Aside from substantially increasing my heat tolerance (85 degrees started to feel cool), I was able to glean a few positives from the year, and they are as follows:

Disease? What Disease?

Never would I have imagined that pythium would hardly be a concern with the conditions that we experienced, but despite relatively little protection, we saw approximately four individual infection centers throughout the year. Yes, it does turn out that diseases do in fact need moisture to develop, and aside from the obvious lack of precipitation, we very rarely had any dew. Looking back on it, we were undoubtedly more fortunate than those in the northern half of the state who had to deal with the heat, rain, and the associated diseases.

No Footprints

Oh, there was enough moisture-deficient footprinting to go around, but those nice, green footprints that are surrounded by burnt leaf blades were conspicuously missing from the tees and fairways. Wisconsin's unofficial state bird, the mosquito, very rarely took flight in the


southern part of the state, and it was unusual to spend evenings outside without serving as a buffet for the blood-sucking pests. I almost started to miss the little guys and may come to appreciate the green footprints if and when they return in 2013. They will return in 2013...

Putting the Work in Workout

This was the year that I was going to sustain my running regimen throughout the summer. Then, July arrived, and it didn't leave until the middle of August. Despite a steady stream of member-supplied Gatorades and ice cream, my dainty frame dropped a few pounds during my exercise hiatus. Why the Biggest Loser doesn't have contestants handwatering fairways in 95-degree heat is beyond me.

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I hope that you, your staff, and your course survived the golf season to forget and enjoying the much cooler offseason shouldn't be an issue. 



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News and Notes From WGCSA Members

By Matt Kinnard and the DHD Team

2012 is winding down and what a year it was. I've seen and heard many stories of success and struggles this year, but course conditions throughout Wisconsin were excellent given the difficult weather everyone endured. It's a testament to the talented professionals here in this state.

Given the difficult conditions this year, superintendents were looking for any way they could to communicate with each other about what they were going through. This year more than ever superintendents took to Twitter to vent their frustrations, joke about the absurdity of this year, and even gloat a little about what they were able to do. So I thought, what better way to review 2012 than with tweets from some of Wisconsin's most prolific superintendent tweeters?

The mild winter didn't go unnoticed at Hawks Landing @hawksnr (Neil Radatz) tweeted '40+ PLAYERS TODAY' on Jan. 10. @ogcsuper (Dustin Riley) agreed a couple days later 'Got more snow over the last 5 hours than all of Nov & Dec. And it's only 2 inches so far. Some kind of winter in WI.'

I hate to bring this up but I think @trapking9 (David Brandenburg) hit it on the head during the Packers playoff loss when he tweeted 'The State Farm discount double check commercials are not as funny when your losing.'

On Feb. 10 @creeksupt (Matt Kregel) tweeted 'Wind is picking up and the snow has begun to stick to the pavement. Winter has appeared???'

@asgcturf (David Smith) had a typical thought when doing winter equipment maintenance... 'If turf equipment designers had to spend a week working on the machines they designed they wouldn't do dumb things! #whohashandsthatismall'

Then there was the 2012 GIS. 'First night in Vegas for #GIS12. Is there anything to do in this town at night? Class tomorrow at 8am.' from @creeksupt.

@wgcsa (Brett Grams) tweeted 'Just

checked out El Segundo Sol site of WI Room Wed evening should be great all WGCSA members welcome!' The WI room in Vegas was excellent, hope everyone can attend next year in San Diego.

@disoldat (Doug Soldat) was proud of his students at the GIS 'Wow! Congrats to the UW-Madison turf bowl team on a school-record 4th place finish!!'

@ogcsuper had his crystal ball out in mid-March 'Course is opening 2 weeks earlier than ave. Apparently, June is arriving 2 months earlier than ave. Here's to a Long Season.' The early start brought hot temperatures in March. On Mar. 21 @hawksnr tweeted 'First day for full staff.'



Some new faces going to spend most of the day training and its going to be 83 today.'

Not a great day for @creeksupt at the end of May 'Happy to see rain finally but does it really need to rain and lightning right when the crew is ready to start? #neverhappysuperintendent' or for sod web worms at Abbey Springs @asgcturf 'It is a great day to be a bird on the golf course but a bad day 2 be a sod web worm!' or at Edgewood Golf Course @jmillies1 (Jeff Millies) 'This afternoon was a first, a golfer was so drunk and disorderly I needed to call the cops. The cops ended up having to taser him.'

Then it got hot, dry and windy in June and July and tweets were abounding. @hawksnr '94 and 30 mph winds. Not

a good combo. No rain and continued high temp. Even the weeds are wilting' @creeksupt 'Raising the white flag for today. Washing the truck tonight in hopes of rain. #dryasapopcornfart' @kccscott (Scott Verdun) 'Only 99 here so far today #coolernearthelake' @andys_turf (Andy Kronwall) tweeted from Lake Geneva CC 'The heat has forced us to raise the height of cut on the greens have to do all we can to keep them alive. Greens will be slower for awhile.'

Still, the Womens US Open went on. @trapking9 tweeted 'A little sticky but a great day Womens US Open at Blackwolf Run. Course looks awesome!'

I heard this a lot this year. @hawksnr 'All around us but no rain here.' Who got this rain that everybody missed? @hawksnr also summed up the summer well on July 25 '62 days over 80 30 days over 90 4 days over 100. Fun year'

The last day of July brought the WTA Field Day. @wgcsa tweeted '@WTA Field Day. Great weather, great research...'

In August everyone finally caught a break. @asgcturf 'High of 82 today Finally rain predicted for tonight Starting to review the damage to shrubs, trees, and turf from the drought this summer'

When the Wee One Outing at Pine Hills comes around, fall is in the air. @wee1foundation tweeted 'Pine Hills event approaching another sell out. Can you afford to miss the brat and taco stands?' @kccscott agreed 'Great day at @wee1foundation outing Pine Hills CC. Witnessed @scc1897 hit a hole in one. Great shot Don!'

It has been an interesting year and all your tweets have been equally as interesting. So, I've decided to give out some awards. Best in Tweeting goes to @creeksupt. @creeksupt created timely and accurate tweets with humor and lots of hash tagging. In a close second was @hawksnr for his insightful tweets. Honorable mention goes to @asgcturf for his frequent weather updates. Keep up the good work #wiscsuptweeters.

BADGER STATE TURF CLIPPINGS

Career Moves

Jerry Kershasky couldn't stay away from managing turf for too long. Jerry accepted the position of golf course superintendent at University Ridge Golf Course in Madison late this summer. After spending the majority of his career at Westmoor Country Club, Jerry took a shot at sales, where he worked in the Chicago area for Reinders. Congratulations Jerry!

After a short stint at Branch River Country Club, Brian Holz has moved back near his hometown of Seymour and taken the job as superintendent at Crystal Springs Golf Course. Congratulations Brian!

Joe Friess has filled that position at Branch River Country Club in Cato, WI. Joe has held the position of superintendent at The Woods in Green Bay and most recently at Emerald Hills Golf Course in Two Rivers, WI. Congratulations Joe!

Dr. Jim Kerns, Assistant Professor and Extension Specialist for the Dept. of Plant Pathology at UW-Madison has accepted the position of Turf Pathologist and Extension Specialist at North Carolina State University. Jim began his tenure at UW-Madison in 2008. Congratulations Dr. Kerns on your new endeavor.

Wedded Bliss


Mike Devore, Assistant Superintendent at North Hills Country Club in Milwaukee, was married to his bride, Farrie, August 25. Congratulations to the newlyweds!

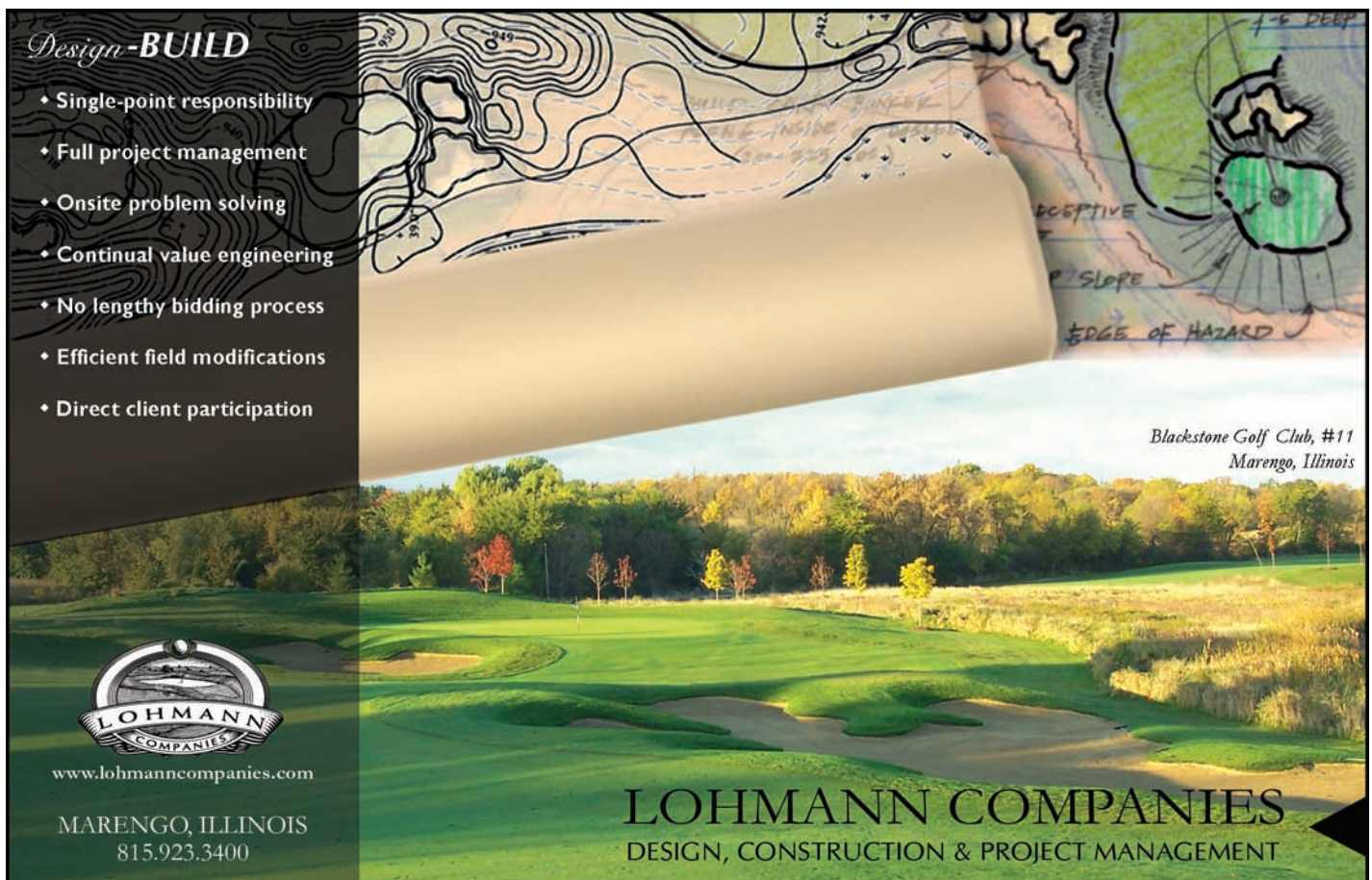
Wee One

The Wee One Foundation hosted another successful event at Pine Hills Country Club in Sheboygan on September 17. Once again it was a full field that also included the GCSAA Board of Di-

rectors. Players also witnessed not one, but two aces on #9 worth \$10,000 each. Congratulations Brian Racette and Don Cross!

Following golf, attendees were given an update on the incredible progress the Wee One Foundation has made up to this point. So far, the foundation has gifted over \$500,000 and has recently started a new initiative to create an endowment that will raise 10 million dollars in ten years to ensure the longevity of the foundation. To learn more about how you can get involved visit weeone.org.

Please pass along any significant news or happenings around the state to Danny, Mike or me. We want to spread the good news. You can also email me at m.kinnard@sbcglobal.net or call at 920-210-9059. 



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Not So Fast

By Bob Vavrek, Senior Agronomist, North Central Region, USGA Green Section

Editors Note: This regional update article originally appeared on the USGA Green Section website September 18, 2012, 2012 and is reprinted here with permission.

Golfers tend to have very short memories regarding certain aspects of the golf course yet possess the recall abilities of an elephant about others. For example, a considerable number of longtime members clearly recollect the golden era of the golf facility 30 years ago when the greens were always fast and true, and much faster than today. Yet, we all know this simply is not true as green speeds have increased by at least a foot and likely closer to two feet over the last three decades.

On the other hand, players have very short memories about the record-breaking heat and drought stress that occurred just a short month or so ago, now that milder days and cool nights dominate the weather patterns. Forgotten are the reasons why the old *Poa annua* greens were a bit slower than usual when mowing heights were raised to keep turf alive during extremely hot weather. Everyone seems to have become desensitized to the brown, dead spots along the perimeter of the greens and the thin turf along the entrance and exit points to the putting surfaces.

Golfers found it easy to be reasonable and patient about turf recovery when it was too unbearably hot to play. The moment the weather turns favorable, golfers immediately have an opportunity to play the course and make up for rounds lost to summer heat. Unfortunately, turf recovery only begins once weather turns favorable. It takes time and gains in turf recovery are never immediate. Golfer expectations for fast greens now will only place pressure on turf that has not fully recovered.

High soil temperatures and cooler nights provide ideal conditions for bentgrass seed germination. The green fuzz of seedlings emerging from the soil can be seen on seeded bare areas of greens within a week. However, the “need for speed” will



It's easy to forget about the losses of turf that occurred on greens during the heat of summer, now that the weather has turned much more mild. Pushing the greens for speed with low mowing heights now can jeopardize any recent efforts made to seed bentgrass into thin and bare areas of the damaged putting surface.

jeopardize any hope of increasing the amount of bentgrass in damaged putting surfaces. Lowering the height of cut to produce peak season conditions on greens will take its toll on weak and highly vulnerable bentgrass seedlings.

No doubt, there will eventually be recovery across thin and bare spots on greens even if the height of cut is dropped back down to 0.125 inch or less to satisfy green speed expectations, but most of the recovery will be from new *Poa annua* that germinates from a seed bank already in the soil. Golfers could not care less whether or not the new turf in bare spots is bentgrass or *Poa annua*. Unfortunately, the new *Poa annua* that germinates will be dominated by plants that are annual biotypes. Annual biotypes of *Poa annua* are least desirable because they are highly susceptible to

winter injury. And what survives the winter will only then be more susceptible to heat and drought stress compared to either bentgrass or perennial biotypes of *Poa annua*. Lastly, annual biotypes of *Poa annua* are most problematic because of heavy seedhead production each spring.

The take-home message is to keep mowing heights as high as possible as the season winds down to allow damaged areas to recover. Give bentgrass a chance to mature beyond the seedling stage and you may be rewarded with a significant increase in the percentage of bentgrass in the putting surfaces. Patience now can pay dividends by making the turf on greens more dependable in the future. After three consecutive hot summers across the upper Midwest, are you betting against a fourth? 