

Symposium Edition

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This special issue takes a look at the 50th Golf Turf Symposium.

"Anyone who stops learning is old, whether at twenty or eighty. Anyone who keeps learning stays young."

By American Industrialist Henry Ford, 1863-1947

This quote by Ford reminds us to continue our education with research and seminars similar to the Golf Turf Symposium.

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THE GRASS ROOTS

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Knowledge is Priceless

By Jim Van Herynen, Certified Golf Course Superintendent, South Hills Golf and Country Club


As we enter the "Off Season" it is time to reflect on the ending golf season in this part of the country and evaluate your programs, practices, projects, crews etc. It is a time to change gears and tweak the aforementioned to become better managers, more efficient with time and budgets and maybe do a self-examination to critique everything you have trained yourself for in this ever demanding profession. Are you keeping up with the latest trends, are you giving yourself credit for the commitment endured, giving your client a product to enjoy and be proud of, treating your crews with fairness and respect.

We all need a little "tweaking" once and awhile and the WGCSA, GCSAA and supporting vendors try extremely hard to offer you opportunities throughout

any given year to gain the knowledge one might need to become the best Superintendent, Assistant Superintendent, Technician whether Mechanical, Irrigation, Horticulturist, Arborist – and the list goes on. If you have not taken advantage of these offerings ask yourself why not and try to make an effort to do so in the future as knowledge is priceless.

This year in December the WGCSA along with Milorganite and the MMSD are celebrating the 50th Annual Turf Symposium. This year's event will be held at The American Club in Kohler Wisconsin once again. The topic is piggy backed on last year's topic. Last year the topic was "How Are You Doing as a Professional". It took a look at many issues that affect our profession on and off

the golf courses or properties you manage.

The 49th Annual Turf Symposium did have rave reviews and I quote from one of the surveys, "This has been one of the best Symposiums in many years!" In 2015 as we celebrate the 50th it takes a broader look, as it is entitled, "How Are We Doing as an Industry". The two day event is packed with phenomenal speakers and topics that will surely be one not too miss. I encourage you to attend, and understandably if you cannot, take a look at the upcoming calendar for 2016 and make a commitment to attend one of our monthly meetings, the GIS and the vendor sponsored events to "tweak" your knowledge and become the best you can be! I look forward to seeing you there. 

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Best Management Practices to Minimize Potential Impact on Pollinators

By Dr. R. Chris Williamson, Department of Entomology, University of Wisconsin-Madison

The ecological (and economic) services that pollinators (bees) provide are invaluable. Almost 85% of the world's flowering plants depend on pollinators to reproduce. Despite their widely recognized importance and value, bees and other pollinators are in decline across the country putting the ecological services they provide (pollination) at risk. Consequently, promoting and preserving pollinators is of utmost importance and necessity.

Comparable to other agricultural ecosystems, pollinators are also common in the turfgrass system, especially where flowering plants (broadleaf and grassy weeds) occur. Rarely are stands or swards turfgrass devoid of weeds. Flowering weeds can provide high quality forage for bees; two of the most common lawn forage plants are the common dandelion (*Taraxacum officinale*) and white clover (*Trifolium repens*). Dandelions are one of the earliest blooming flowers in the spring. This early source of pollen and nectar is essential to overwintering honeybee colonies as they begin the process of raising new workers. White clover is another spring bloomer (although not quite as early) that provides highly nutritious pollen throughout the year.

Insecticides can pose or have a large impact on bees; after all they are designed to control insects, and bees and other pollinators are insects. Much attention of the impact that insecticides have on pollinators has focused on a class of insecticides known as the neonicotinoids. Neonicotinoids (neonics) are the most widely used insecticide in turf to manage various insect pests, largely targeted on white grubs. Neonics are systemic insecticides that are readily absorbed by plant roots and moved upward (translocated) to plant leaves, nectar and pollen (especially flowering weeds). As result, they pose a risk to pollinators that forage on plants treated with neonicotinoids.

Although bees seldom have reason to feed or forage on pure stands of turfgrass, they commonly forage on numerous flowering weeds including dandelions and white clover. Research studies at the University of Kentucky found that turf (lawns) infested with white clover, and that were treated with a systemic insecticide (neonicotinoid) have negative effects on bumblebees. Additional research at the University of Kentucky revealed that simply mowing flowering plants (e.g., clover) prior to an insecticide application can significantly reduce the potential negative affect on pollinators. They discovered that the application of irrigation immediately following an application of a granular (spreadable) insecticide treatment poses little risk to pollinators. Their research also found that cloranthraniliprole (Acelepryn, an anthranilic diamide) appeared to have no adverse effects on bumble bees suggesting a promising alternative to neonicotinoids for insect control in turf.

More research (especially field realistic studies) is needed before we will have a more comprehensive understanding of the relationship between neonicotinoids and pollinators. To this end,




A honey bee on a clover flower reminds us to not to apply neonicotinoid insecticides to flowering plants and weeds. Risk can be reduced with mowing before application or watering the product in.

it is imperative that the turfgrass industry consider common-sense approaches in order to minimize the potential hazards to bees. Consequently, it is sensible to be proactive and implement simple best management and product stewardship practices that will safeguard and promote pollinator health and

The following are suggested best management practices that may minimize impacts on pollinators:

- Avoid treating weedy areas (flowering weeds) with neonicotinoids. This is consistent with many insecticide labels that advise not to treat blooming plants if bees may visit the treatment area
- Mow the turf area immediately before spraying an insecticide, mowing should remove more than 90% of the flowers and reduce bee foraging.
- Control weeds with an herbicide in the areas where you plan to treat with an insecticide. Turf areas that are largely devoid of weeds will likely pose little risk to pollinators, especially if a neonicotinoid is applied.
- Consider using granular (spreadable) formulations of insecticides; be sure to apply irrigation immediately following treatment application to minimize potential risk to pollinators.

The bottom line is that is our responsibility as a professional industry to make a conscientious and concerted effort to implement best management practices that will minimize potential negative impacts, preserve, promote and protect pollinators. 



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Snow Mold Fungicide Persistence

By **Dr. Paul Koch**, Department of Pathology, University of Wisconsin – Madison **Dr. John Stier**, University of Tennessee-Knoxville, **Dr. James Kerns**, North Carolina State University - Raleigh

How long do snow mold fungicides persist in variable winter conditions, and how does persistence affect disease control?

Author's Note: This article was previously published in the August 2015 issue of Golf Course Management on pages 89-93.

When do you apply fungicides to control snow mold? For many superintendents in temperate regions of the world, it can be a tricky question. Gayle Worf, Ph.D., former Wisconsin turf pathologist, always said to have the sprays complete “before climbing into the tree stand.” For most, however, that would mean having the course sprayed by mid-November. Warm temperatures, rainfall and/or a lack of snow cover can persist for weeks or even months following a November application depending on the location and the particular conditions that winter. When the snow finally does arrive, it is unclear whether protection remains against winter diseases such as gray snow mold (*Typhula incarnata*), speckled snow mold (*T. ishikariensis*) and *Microdochium* patch/pink snow mold (*Microdochium nivale*). (**Photo 1**)

Since little can be done to protect the turf once snow arrives, it is imperative for a superintendent to know before snow cover whether there was a significant loss of protection. In addition, if snow cover dissipates during a midwinter thaw, it is important to know whether fungicide protection has been depleted, leaving the turf susceptible to infection.

What determines whether pesticides will last?

Six primary physical and chemical processes affect the persistence of turfgrass pesticides in the environment: solubility-based movement in water; sorption and desorption to plant and soil surfaces; volatilization; plant uptake; biotic degradation



PHOTO 1: Microdochium patch on a golf course fairway following snowmelt. Photo courtesy of Kevin Ross, CGCS, Country Club of the Rockies.

through microbial metabolism; and abiotic degradation through sunlight (that is, photodegradation) or pH activity (3). Many of these processes have been studied extensively in typical spring or summer conditions (1), but remain poorly understood in a winter environment. On one hand, the presence of snow insulates the turf from the cold temperatures and may provide a relatively warm, moist environment that increases the rate of fungicide depletion. On the other hand, a lack of snow may also cause photodegradation, which can lead to increased rates of fungicide depletion. A precise knowledge of fungicide depletion during the winter will aid turfgrass managers in suppressing winter turfgrass diseases in a more predictable and efficient manner.

Study rationale

This study was implemented in direct response to a series of winters in Wisconsin from 2004-2005 to 2007-2008 that had well below-average snow cover. The primary objectives were to determine the impact of snow cover on the persistence of

iprodione and chlorothalonil on creeping bentgrass and to determine the minimum concentration of both fungicides required to maintain acceptable *Microdochium* patch (pink snow mold) suppression in a controlled environment. We hypothesized that the absence of snow would increase fungicide depletion compared to snow cover due to photodegradation and result in more rapid *Microdochium* patch development.

Materials and methods

The study was conducted for four consecutive winters beginning in 2009-2010 at the OJ Noer Turfgrass Research Facility in Madison, Wis., on a stand of Penncross creeping bentgrass maintained under fairway conditions. The experimental design was a split block with four replications and an individual plot size of 6 feet × 6 feet (1.8 meters × 1.8 meters). The main plot was the presence or absence of snow and the subplots were the fungicide treatments. (**Photo 2**)

WISCONSIN PATHOLOGY REPORT



PHOTO 2: The experimental area at the OJ Noer Turfgrass Research Facility in Madison, Wis., in January 2013. The snow-covered plots are on the right and left sides and the plots that were not covered with snow are in the middle.

The fungicide treatments consisted of a non-treated control, chlorothalonil, iprodione and a tank mixture of both chlorothalonil and iprodione. Chlorothalonil was applied as Daconil WeatherStik (Syngenta) at 5.5 fluid ounces/1,000 square feet (1.75 milliliters/square meter), and iprodione was applied as Chipco 26GT (Bayer) at 4.0 fluid ounces/1,000 square feet (1.27 milliliters/square meter). The tank mixture consisted of both Daconil WeatherStik and Chipco 26GT applied at 5.5 and 4.0 fluid ounces/1,000 square feet, respectively. The applications were made one day before the first significant snowfall of each year: Dec. 6, 2009; Dec. 3, 2010; Dec. 28, 2011; and Dec. 19, 2012. Within 24 hours of each snow event, snow was removed from the designated non-snow plots with a shovel and placed onto the adjacent snow-covered plots to ensure a minimum snow cover of 4 inches (~10 centimeters) for the duration of each winter.

Approximately one hour following the fungicide application, two 4-inch diameter cores were extracted from the center of each plot using a power drill with hole-saw attachment. (Photo3) On snow-covered plots, a small area of snow was cleared before sampling and immediately replaced following sample collection. One core from each plot was taken to the lab for fungicide analysis using a commercially available enzyme-linked immunosorbent assay (ELISA) kit, and the second core was taken to a growth chamber for incubation following inoculation with *M. nivale*. (Photo 4) Repeat samplings were conducted every one to three weeks based on winter conditions until snowmelt in the spring.

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Photo 3: Once the soil had frozen, cores were sampled using a power drill with 4-inch holesaw attachment.

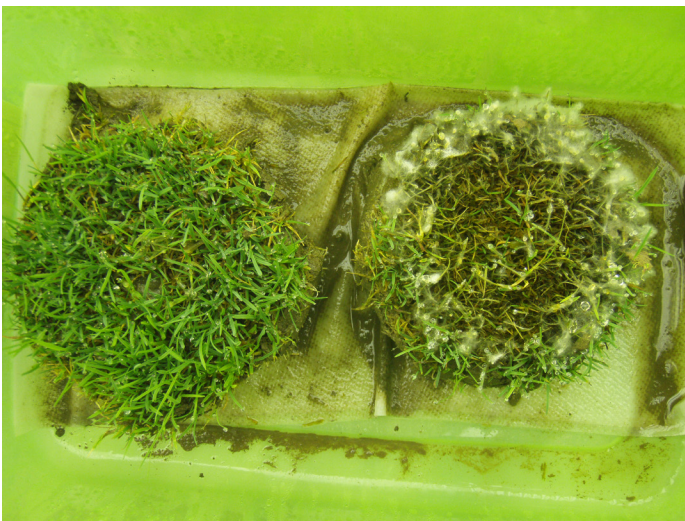


Photo 4: Microdochium patch 28 days after inoculation with *Microdochium nivale* in the controlled environment chamber. The core on the left was treated with a fungicide and the core on the right was not.

tion from *Microdochium* patch in the controlled environment lasted approximately 30 days before a rapid increase occurred in early January (**Figure 1**). This increase occurred less than one week after a 1-inch (2.5-centimeter) rainfall, suggesting that this rainfall significantly reduced the amount of disease protection present.

Winter 2010-2011

The following winter saw below-average temperatures, above-average snowfall, and no rain events throughout the entire season. Disease protection with both fungicides was extended relative to 2009-2010, with the initial development of disease in 2010-2011 occurring in mid-to-late January as opposed to the first week of January (**Figure 2**). A second and more significant increase in disease was observed with both fungicides on both snow treatments in the second half of February.

Although chlorothalonil concentration was not measured in 2010-2011, iprodione concentration was, and it dropped initially in mid-January before a second and more significant drop in late-February. Though no significant rain events occurred during the winter of 2010-2011, but two significant warming events occurred at approximately the same times that disease severity increased and iprodione concentration decreased. The first event occurred in mid-January with a period of three to four days of average high temperatures at about 38 F (3.3 C). The second event in late February was more dramatic, with about one week of average high temperatures reaching into the mid-40 F (~7 C) range. This indicates that even in the absence of rain, temperatures above freezing can increase fungicide depletion regardless of snow cover.

Winter 2011-2012

The winter of 2011-2012 was among the warmest on record for Madison and led to depletion of both fungicides within 21 days of the initial application (data not shown). The inability to keep snow on the plots made the data difficult to interpret in 2011-2012, and those data are not presented here.

Winter 2012-2013

The winter of 2012-2013 had above-average temperatures, above-average snowfall, and several significant rainfall events during the month of January. Iprodione concentration under snow cover fell rapidly shortly after application, but remained consistent on bare turf until the end of January (**Figure 3**). Chlorothalonil concentration, regardless of snow cover, declined consistently throughout January and had reached nearly undetectable levels by the end of the month. Disease development mirrored the fungicide concentration results, although disease did develop more rapidly on turf treated with iprodione relative to turf treated with chlorothalonil. Three significant rainfalls during the month of January likely influenced the depletion of both fungicides regardless of snow cover. However, the rapid depletion of iprodione under snow cover in early January, when temperatures were warm enough to cause melting, indicated melting snow also contributed to faster depletion of iprodione.

Results and Discussion

Because of technical problems with the fungicide assay kits, fungicide concentration of iprodione was not measured during the first winter of the study and chlorothalonil was only measured in the final two winters. Each winter of the study offered unique weather conditions that likely led to the unique patterns of fungicide depletion in each year.

Winter 2009-2010

The winter of 2009-2010 was relatively average in terms of both snowfall and temperature for Madison. Regardless of whether the plots were sprayed with chlorothalonil or iprodione and whether they were covered in snow or not, protec-

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WISCONSIN PATHOLOGY REPORT

Snow cover	Fungicide	2009-2010	2010-2011	2012-2013
Snow	no fungicide	<7	<7	30
	iprodione	32	47	46
	chlorothalonil	42	60	37
	tank mixture	48	88	42
No snow	no fungicide	<7	<7	30
	iprodione	34	45	30
	chlorothalonil	34	53	40
	tank mixture	>115	76	38

Table 1. Approximate days to 50% snow mold on creeping bentgrass cores sampled in Madison, Wis., during the winters of 2009-2010, 2010-2011 and 2012-2013. Cores were treated with either chlorothalonil, iprodione or a tank mixture of both before the first significant snowfall of each winter and kept under snow cover or free of snow cover the entire winter.

The longest duration of *Microdochium* patch protection provided, regardless of fungicide or snow cover, was in 2010-2011 (Table 1). This was also the only winter without any significant rainfall events, again indicating that rainfall during the winter months increases fungicide depletion whether snow is on the ground or not. In addition, prolonged disease protection was often observed when both fungicides were applied as a tank-mixture as opposed to either fungicide applied individually (Table 1). This observation is well documented in the field, with two or three active ingredients often required for acceptable snow mold suppression in areas of high disease pressure (2). However, it is interesting to note that the increased protection provided by tank-mixing fungicides did not result in increased persistence of either fungicide, as the concentration of each fungicide decreased in a similar manner whether it was applied alone or as part of a tank mixture.

Lastly, it is important to note that the disease development noted above occurred in a controlled environment under constant conditions optimal for infection. The only year significant snow mold occurred in the field plots was in 2010-2011, when significant gray snow mold was observed under the snow-covered treatments. What this indicates is that even though we

measured rapid fungicide depletion in each year, in three of four years, the level of initial fungal inhibition and/or environmental conditions in the field were such that disease development was minimal. This suggests that even when it is clear that fungicides have depleted to a significant degree, it is not clear whether a reapplication is required to maintain acceptable disease control until spring.

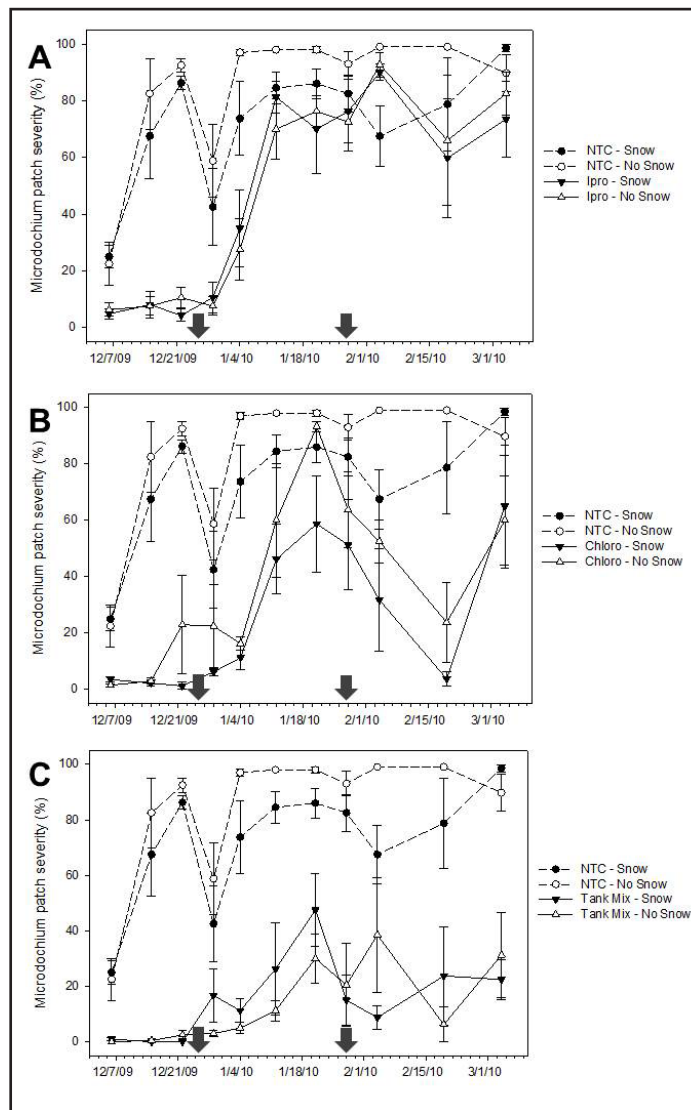


Figure 1. Growth chamber: Disease severity
Microdochium patch severity on creeping bentgrass in the growth chamber following treatment with iprodione (A) or chlorothalonil (B) during the winter of 2009-2010. Initial samplings occurred 1 hour following fungicide application on Dec. 6, 2009. Raindrops indicate rainfall events in excess of 0.1 inch (2.54 millimeters). Individual points represent average disease severity values of four replications at 7- to 21-day intervals following fungicide application until final snowmelt in spring.



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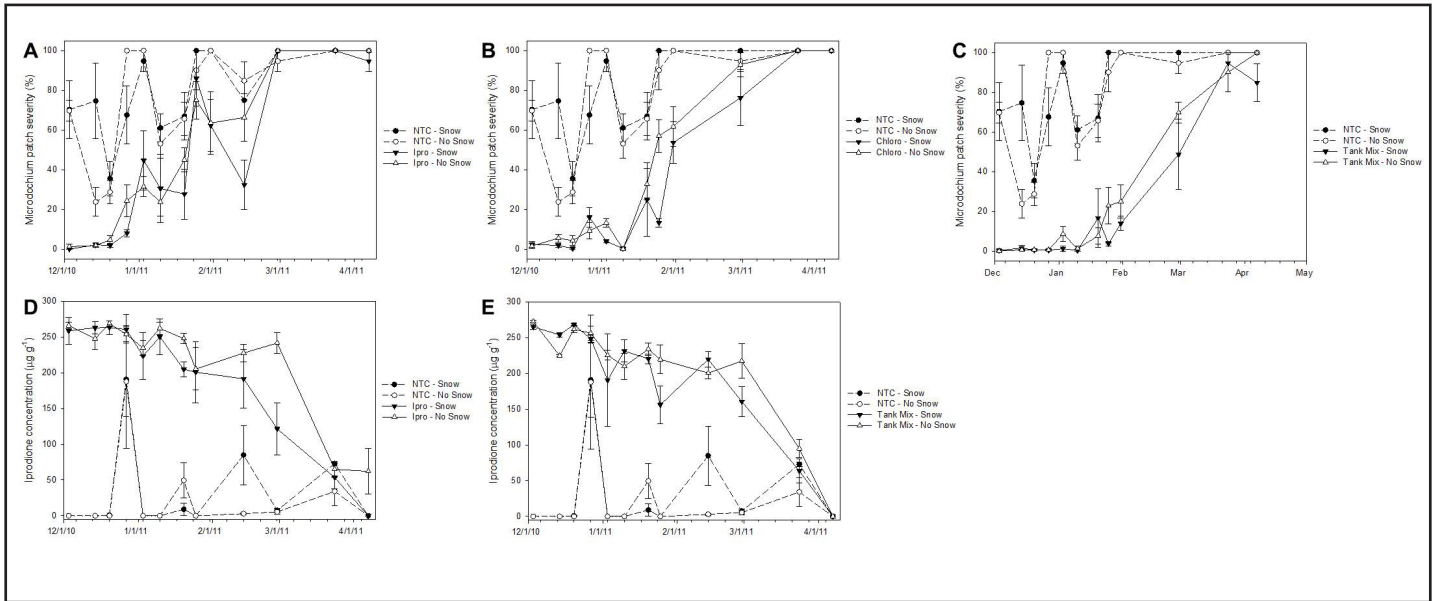


Figure 2. Disease severity and iprodione concentration, 2010-2011
 Microdochium patch severity (A, B) and iprodione concentration (C) as affected by snow cover on creeping bentgrass treated with iprodione (A, C) or chlorothalonil (B) during the winter of 2010-2011. Initial samplings occurred one hour following fungicide application on Dec. 3, 2010, in Madison, Wis. Gray boxes indicate periods of above-average temperatures.

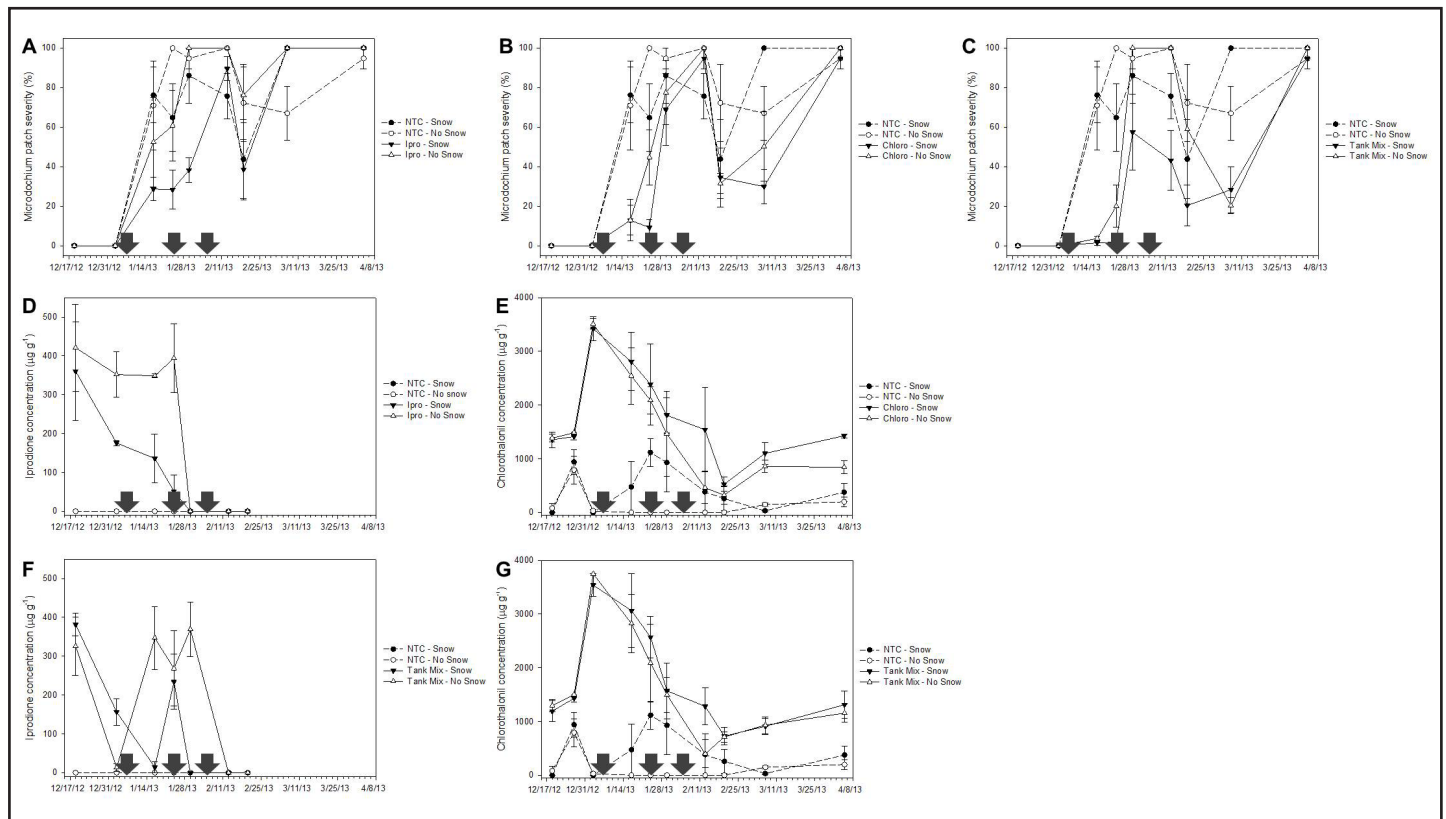


Figure 3. Disease severity and fungicide concentration, 2011-2012
 Microdochium patch severity (A, B) and fungicide concentration (C, D) as affected by snow cover on creeping bentgrass treated with iprodione (A, C) or chlorothalonil (B, D) during the winter of 2011-2012. Initial samplings occurred one hour after fungicide application on Dec. 28, 2011, in Madison, Wis. Raindrops signify rainfall in excess of 0.1 inch (2.54 millimeters).

Conclusion

Fungicide persistence in a winter environment is complex and affected by a wide variety of factors. The results presented here have demonstrated that rainfall, snowmelt and temperature all potentially play significant roles in the depletion of snow mold fungicides during the winter months. Conversely, and contrary to our hypothesis, photodegradation did not appear to have any impact on fungicide persistence during any year of our study. These results indicate that a snow mold fungicide applied in late fall will likely deplete rapidly in the presence of melting snow or significant rainfall. However, fungicides applied in late fall will likely persist for months regardless of snow cover in the absence of melting snow, rainfall or prolonged periods with temperatures above 32°F (0°C). Armed with this information and weighing other factors such as additional expense, club expectations, and potential environmental exposure the superintendent can make an informed decision about whether a fungicide reapplication during the winter months should be made. On a more general level, this research provides crucial initial information on the overall behavior of certain fungicides in a winter environment. This is traditionally an area of limited research, but one that is important in developing more efficient and effective snow mold fungicide programs.

The research says

- Both iprodione and chlorothalonil depleted rapidly following winter rainfall or snowmelt events.
- Both fungicides depleted rapidly during a period of abnormal warmth in the absence of rainfall or melting snow in 2010-2011, possibly as a result of increased microbial or plant metabolic activity.
- Photodegradation on plots without snow cover did not affect fungicide persistence.
- Tank-mixing both fungicides provided prolonged disease suppression, although not because of increased persistence of either fungicide.

Acknowledgments

Partial funding for this research was provided by the Environmental Institute for Golf, the Wisconsin GCSA and the Northern Great Lakes GCSA. Special thanks to Chad Grimm of Blackhawk Country Club in Madison, Wis., and Dan Dinelli, CGCS, of North Shore Country Club in Glenview, Ill., for supplying the *Microdochium nivale* isolates used in the study.

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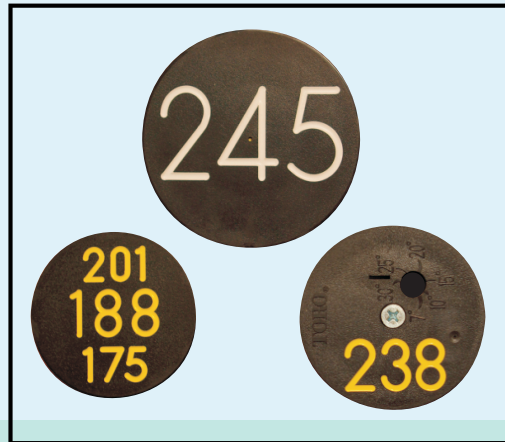
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Competitive Advantage

By Jake Schneider, LMD Production Manager, The Bruce Company

We have a lot of golf courses in Wisconsin. Because this isn't a scholarly article requiring precise facts, a quick Google search leads me to believe that we have around 600 courses throughout the state, but I suspect that this number is about as accurate as the bunker count at Whistling Straits. Potentially-correct data says that the land of cheese ranks 10th in number of courses per capita. In other words, the fight for the discretionary golfing dollars of our population is real and likely not surprising to any of you. So, what are you doing to set your course apart from the competition?

While I won't claim to have tremendous business acumen, the previously-posed question should be one that every facility asks themselves and then provides direction to achieve that goal. The set-you-apart options are many and varying in the golf world: outstanding course conditions from tee to green, designed by a renowned architect, it's the only place in town, the deals are too good to be true... You get the point and now that I'm no longer privy to as many free rounds, the cheaper the better.

Golf course superintendents are often at the mercy of their owners, general managers, board of directors, etc, but I would argue that the daily decisions that are made

by these keepers of the green have the greatest influence on their customers' experiences. Every course (and company for that matter) is going to have its strengths and weaknesses, the good should be made the best possible and the bad should be minimized.


Every course (and company for that matter) is going to have its strengths and weaknesses, the good should be made the best possible and the bad should be minimized.

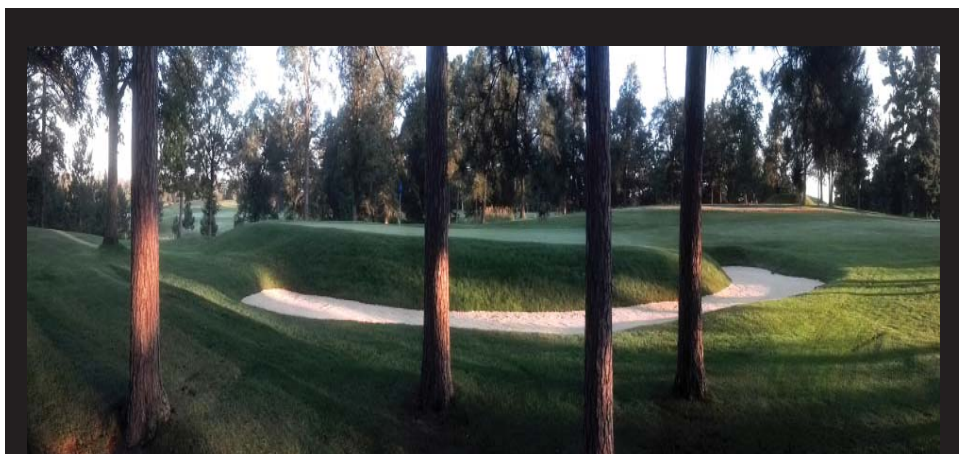
At Blackhawk, we were blessed with great topography and interesting, sloping greens. The glaciers took care of the hills and valleys, but the author, among others, would argue that selective tree removal would enhance these natural features. I digress. As I suppose is the case with many courses, the greens were our bread and butter. Blackhawk's longtime superintendent, Monroe Miller, used to say that we couldn't have the 'fastest' greens around due to heavy shading and severe undulations, but they were going to be the smoothest. Thus, a tremendous amount of effort was put into providing flawless putting surfaces that ran true. During my time at Blackhawk, I also

pushed to have the best detailing possible to compensate for the tight property confines, and I like to think that we succeeded much more often than not.

In my current role, smooth greens have been replaced by mowing, four-season displays, horticulture work, pesticide applications, and snow removal. The competition is fierce as anyone with a truck, trailer, mower, and half of a brain can start a landscaping business without the amount of overhead that a company of our size has. I can't put an accurate number on the amount of landscaping plus mow-and-blow operations in the Madison area, but since my career transition, I notice every mower that's driving down the road. At The Bruce Company, we attempt to distinguish ourselves by being a one stop shop for everything landscaping and by being the best in every season. We can design, build, install irrigation and water features, maintain, and plow from under one broad umbrella and that's what many of our long-time customers appreciate the most. This is our competitive advantage; being cheap is not.

We also realize where we don't excel. A few years ago, the decision was made to shift away from residential snow plowing because we simply weren't structured to succeed in this realm. In the landscape management department, holiday lighting used to be offered to customers that had little to no other business with the company, and after one season of overseeing lighting operations, I quickly realized that providing this service was taking the focus from our base customers with little return. In 2014, we partnered with a subcontractor who only does holiday lighting to take over these peripheral accounts, and the decision ended up being a home run for everyone involved.

In order to lure new customers and keep them coming back for more, focus on the bottom line is key. You need to create a competitive, profitable advantage whether you are a private or public, 9 or 36 holes, in the middle of a cornfield or Milwaukee, or designed by farmer Joe or Pete Dye. Assess, evaluate, make the necessary changes, and keep in mind that my degrees are in Soil Science and Horticulture. 



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Transitional Time of Early Fall

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

As I sit down to write this article we are in the midst of the late summer weather roller coaster ride. Two weeks ago it was in the 40's when I arrived at work and yesterday the temperature was in the low 80's. This time of year can be hard on the turfgrass plants. It is a transitional time and many of the summer disease issues seem to dissipate, but do they? The root pathogens Take-all-patch (*Gaeumannomyces graminis* var. *avenae*), Summer Patch (*Magnaporthe poae*) and Necrotic Ring Spot (*Ophiosphaerella korrae*) as we know are active in the spring. I remind you that they are also very active in the fall as the soil temperatures drop back down through the require temperature range for these pathogens to be active. Now can be a good time to begin and treatment program for control of these issues next year, especially if any of these were an issue this year. For more information on the soil temperature range for each disease can be found on the lab website, tdl.wisc.edu, then look under the tab in the middle of the Resources tab and click on Disease Key.

In another article I also discussed Basal Anthracnose (*Colletotrichum graminicola*) and the issues we had this year. You can also find more information on the tdl.wisc.edu website as above.

The reason I bring these diseases back is the many conversations I had this summer with turfgrass professionals trying to understand why their fungicide program may not have performed as designed. During many of these conversations I hear comment like, "I read all the labels and built a program that should have dealt with all these issues". This year we have to look back at the spring and the cool, wet, weather and extra disease pressure it put on the turf.

After that we discuss the fungicide program and examine the products used and their expected results.

First a very brief review of the fungicides we use in the turfgrass industry and they are comprised of three main groups: contacts, local systemic and acropetal system-



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ics. The contacts are simply that as the contact the turf and cover the tissue they can control pathogens they are labels for when they are in contact with them. They do not penetrate the tissue and only are topical treatments. The local penetrants work much like the contact except they will penetrate the tissue but not move very much within the plant. The acropetal systemics or as they are called "Systemic" enter the plant then are moved through the internal parts of the plant and the key issue is that these fungicides only move upward in the plant and do not move downward, with one exception, fosetyl-Al. If the fungicide is applied to the plant and enters the plant at the stem or leaves then it protect the plant from disease on all the tissue above the entry point.

So why might these plant protectant program be less than successful? For the diseases I mention above, Take-all-patch, Summer patch, Necrotic Ring Spot and Basal Anthracnose, the infection is in the roots and crown of the turfgrass plant. If these "Systemic" products are applied and not absorbed by the roots then the active ingredient is never in contact with the pathogen.


An example of where the label of many product lists control of "anthracnose" so when sprayed for leaf anthracnose (*Colletotrichum graminicola*) on *Poa annua* it can be very successful. If the same product is used for control or prevention of Basal Anthracnose, which is the same pathogen as "leaf anthracnose" we normally see on *Poa annua* plants, where as Basal Anthracnose is normally a crown infection of bentgrass. If the contact fungicide is applied to bentgrass, then the application is

unlikely to ever get to the crown, based on the normal water volumes that are used in the industry, and provide any protection or curative action. The old adage is then true "the right tool but for the wrong job".

This is very important because I have had many conversations where Turfgrass Managers are putting blame for their disease issues on the Manufacturer that their products may not work. The fungicides in question have been extensively tested for the disease that are listed on the label and have proven their success at controlling these listed diseases but only if they are applied and absorbed in the correct part of the plant.

The key issue is the make sure that our plant protectant programs deal not only what the product's label disease of control, but that we also make sure we apply them in such a way as to make sure we have the opportunity for success. At this very busy time of the year many of you are short staffed yet are in the middle of the industry EOP programs. If you take advantage of these programs make sure you and your representative have a long discussion of how you plan to use your products and the desired results. Plant protectant programs can be very extensive and not cheap, let's make sure we use these products the best way possible to provide you the best chance for an easy grass growing season in 2016.

A few reminders:

WTA Golf Outing at the Blue Mound Golf and Country Club, Monday October 5th
WTA Winter Conference and webinar Tuesday January 5th at the Pyle Center on the UW-Madison Campus. 

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Joint WGCSA / NGLGCSA Meeting at SentryWorld

By David Brandenburg, Editor, The Grass Roots

It was a full house of excited members to see the “renewed” Sentry World Golf Course for the WGCSA/NGLGCSA 2015 Joint Meeting.

The day started with a interesting talk by host Certified Golf Course Superintendent Gary Tanko on the history of the property and work done over the past 3 years. SentryWorld Golf Course was the vision of then Sentry Insurance CEO John Joanis. Sentry World was considered Wisconsin’s first destination golf course when it opened in 1982 with a Robert Trent Jones Jr. Design.

Over time the property aged and new designs entered the golf market so Sentry Insurance decided it was time for a “renewal” of the course. Not a complete re-design but definitely a major project.

In 2013 Robert Trent Jones Jr. returned in joint effort with Bruce Charlton and Jay Blasi to renovate the 200 acre property.

With any season long project weather is

sure to play a factor and the late spring of 2013 delayed construction followed by rain and regular washouts of newly seeded areas through the year.

Despite the delays all the golf holes were seeded in 2013 while the practice facility was seeded in 2014. The course opened in August of 2014 for limited play and full play in 2015.

Fairway turf was stripped rather than using Methyl Bromide and the material was used for mounding on the perimeter of the property. After grading, fairways were seeded to Memorial with some sod bought from East Coast Sod to prevent washouts on the steep green surrounds.

The irrigation was designed by Tom Emerich and the work was done by Leibold Irrigation. Roots and bedrock proved to be challenging to the installation but the new system allows pin point coverage to reduce water use and provide healthy turf.

The bunkers looked amazing, played

consistently and were built using the Better Billy Bunker system. After the bunker subgrade and drainage are ready 4” of gravel are carefully installed and then sprayed with a polymer to solidify the gravel but still allowing full drainage capability.

After the polymer dries white sand from Best Sand in Ohio was added with 4” on the bottom and 2-3” on the slopes. Gary has seen 2” rains with no washouts with the new bunker systems. The bunkers are hand raked normally but they do use a mechanical rake when short staffed.

Greens were rebuilt with the old greens-mix used for the new greens surrounds. The Sentry World staff seeded the greens with 007 Bentgrass and found dimpling the seed in with sand rake tires worked much better than rolling. Gary found the 15 gallon Hahn Spray Bug great for grow in as it was delicate on the new turf.



The Par4 8th hole plays 235 to 381 yards and its elevated green is well guarded by bunkers. The bunkers were made with white “Best Sand” to provide a great visual contrast with consistent playability.

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Along with the golf course the clubhouse was also “renewed” and given a new image as a wedding and banquet facility. The course regularly hosts two weddings a night with the Atrium and Grand Hall providing excellent venues.

We had our lunch, meeting and hors d'oeuvres in the Atrium Room.

Our host, Gary Tanko has been at Sentry-World prior to the courses opening in 1982 when he started as the irrigation specialist through construction for the superintendent Bill Roberts.

Most groups were able to get 9 holes in before the siren was blown to bring us in before heavy downpours washed the competition out. Gross and Net prizes were given by random drawing but the flag event winners were:

- Closest to Pin #1 Shawn Hilliard
- Long Drive #6 Rod Lesnick
- Closest to Pin #12 Kevin Henriksen
- Long Drive #15 Troy Newport
- Longest Put #18 Steve Tatro

After golf the group enjoyed camaraderie and networking along with some delicious

hors d'oeuvres.

Despite the weather all in attendance seemed to have a great time and appreciated the opportunity to see the “new” Sentry World layout. Turf conditions were incredible and the white bunkers not only provided a striking comparison to the green turf but also provided a consistent playing surface. The fairway height runoffs around the greens add a unique challenge to the game, while allowing putts from off the green.

Thank you to Gary Tanko and to Sentry for hosting our day. 



The Par 3 16th Hole is known throughout the golf industry as “The Flower Hole”.

The hole plays 97 to 176 yards and is well protected by bunkers and over 33,000 annual flowers.



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Our host Superintendent Gary Tanko (center) visits with Tim and Steve Schmidt.



Top Left: Steve Abler, Tom Emmerich and Bruce Worzella enjoy the hors d'oeuvres.

Top Right: Bruce Schweiger and Peter Meyer enjoy post round stories.

Bottom Left: The Par 5 5th Hole plays 370 to 526 yards and plays around the lake the entire left side.



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Soil and Plant Analysis Laboratory in Madison to be Consolidated with the Marshfield Soil and Forage Analysis Laboratory

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

Last fall, the College of Agricultural & Life Sciences announced that they would be closing the Madison-based Soil and Plant Analysis Lab in November 2015 and consolidating its services with the Soil and Forage Analysis Laboratory in Marshfield, WI. The College officials said the decision was difficult, but necessary for the laboratory operations to remain competitive. It is unfortunate to see the Madison lab close after such a long, productive run and this article will discuss some of the history of soil testing in Wisconsin with a look to the future and what the closing means to you.

Soil testing in Wisconsin has a rich history. Researchers at the University of Wisconsin have done much to advance the science of soil testing, and Wisconsin farmers have benefitted immensely. While it was well known that soil pH affected crop yields in the early 1900s, testing for soil pH was not as easy as it is today. That changed when Soils Professor Emil Troug developed a simple and accurate do-it-yourself test for soil acidity (pH) which was accompanied by research-based recommendations for how much lime to add based on the results. Farmers could now test their soil pH in their kitchen. Crop yields increased substantially all over Wisconsin as a result, and it was a few years before farmers in surrounding states caught on to the game.

In addition to his ground-breaking work on soil pH and lime, Troug developed many of the first methods for testing the available nutrients in soils, including phosphorus, potassium, manganese, magnesium, and boron. Quoting Professor Marvin Beatty in his book about the history of the Soil Science Department: “The pattern that Troug started early in his career of developing rapid chemical tests based on sound principles and giving meticulous attention to the apparatus and the details of the methodology has paid handsome dividends for farmers, trained many future leaders of the discipline of soil science and established the international



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reputation of the Soils Department.”

But the innovations of Troug and others needed a large laboratory space where they could be carried out rapidly and in large volumes for the farmers of Wisconsin. In 1913, the Soil Testing Laboratory was established through the action of the State Legislature. O.J. Noer was credited with helping to get the Lab established, and served as the State Soil Chemist (possibly Lab Director although records are unclear) beginning in 1914, at the age of 24.

The tradition of the laboratory employing the new methods and technologies developed by the research faculty has remained a constant over the years. Former CALS Dean and Soils Department Chair Leo Walsh helped the soil testing lab move to computer generated reporting in the early 1960s, years ahead of other labs. Dr. Walsh’s research also led to the adoption of tissue testing as a way to assess nutritional status of plants by the soil testing laboratory. Even more recently, Dr. Phillip Barak helped the laboratory to switch to the use of “micro” analytical methods which reduces the cost of the various solutions while increasing the number of samples that can be processed in a day. Also, the laboratory’s soil test interpretations for turfgrass are among the most accurate in the nation because they are based directly on the enormous research data collected and analyzed by Dr. Wayne Kussow.

In March, Dr. Robert Florence was hired as Soil Testing Lab Director to replace the retiring John Peters, who had served as Laboratory Director since 1985. Robert earned a Ph.D. in Agronomy from Kansas State University and was the Direc-

tor of the KSU Soil Testing Laboratory during his five year tenure there. Since March, I’ve come to know Dr. Florence as highly skilled and meticulous scientist who will be able to maintain the reputation and integrity of the Soil Testing Lab through this closure and consolidation process. Dr. Florence is committed to offering the same soil and plant analysis services in Marshfield that were available at the Madison lab. He knows the size and importance of the golf course industry in the state and will continue to provide and improve upon the services to our industry. Soil testing and plant analysis is an integral part of turfgrass nutrient management and we hope that you continue to benefit from the services of the University of Wisconsin Soil Testing Laboratory, despite the new location.

By press time, the Madison lab will be no longer accepting samples. All soil and plant samples should be sent to the Marshfield lab located at the address below.

**Soil and Forage Testing Laboratory
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If you have questions or concerns about sample submission, processing, report interpretation or anything else feel free to contact Dr. Florence directly using the contact information below.

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Univeristy Ridge Hosts Wisconsin State Open

By David Brandenburg, Editor, The Grass Roots

The work to build University Ridge Golf Course started thousands of years ago when glaciers formed the land and the “ridge” the course is named for. Since the 1800’s it was used as farmland with the front 9 being crop land and the back 9 pasture. The property was purchased by the University Foundation in 1978 and after many years of planning the course was designed by Robert Trent Jones Jr’s firm with lead architect Bruce Charlton.

University Ridge opened for play in 1991 and features great views and elevation changes. The front 9 is more open and routes through prairie land while the back 9 is carved through hardwood forest.

Although challenging from the back tees at over 7,259 yards the course offers 5 sets of tees with the shortest at 5,005 yards to offer a length all golfers can enjoy.

As host course for the UW-Madison Men’s and Women’s golf teams the course has hosted numerous Big Ten events and both Conference Championships along with a NCAA Women’s Championship. Since 1994 University Ridge has hosted the boys and girls WIAA State Golf Tournaments providing a real treat for those young golfers.

The links has been rated in *GolfWeek* Magazine as the 3rd best college campus course and best in the big ten for two years in a row. In 2012 the 11,000 sq ft. team practice facility opened with 3,000 sq. ft. indoor short game practice area, indoor hitting bays onto the range as well as swing analysis equipment.

It was announced this summer the course will host a Champions Tour event in June of 2016 with American Family Insurance as the title sponsor.

In August of 2012 the course killed off the greens and re-seeded them with 007 creeping bentgrass to provide more consistent playing conditions with less input. At the same time select trees and underbrush were removed to increase air movement to increase turf health.



Top: University Ridge Superintendent Phil Davidson takes a moment during the busy preparation to talk about the course.

Bottom: The par three 8th hole plays 144 - 207 yards and is named “On The Rocks”.

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Washington County GC – David Jahnke, CGCS

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Member 9 With Phil Davdison

1. **First Vehicle?** *Toyota Corolla*
2. **Favorite Piece of Golf Course Equipment?** *As just a favorite, my electric Carryall II, as a favorite that actually has a maintenance function, it's a toss-up between the three aerification pieces we use, the Planet Air, Toro Procore 648, and the Toro Procore SR72 deep tine unit.*
3. **18 Hole Handicap?** *3*
4. **Current Vehicle?** *We have two Subarus – a Legacy and an Outback.*
5. **Favorite TV Show?** *Mostly watch sports (golf, soccer, and football), but one show I am into right now is Orphan Black on Amazon.*
6. **Favorite Pro Sports Team?** *Packers*
7. **Favorite Main Course Meal?** *No way I could decide that. There aren't too many things I don't eat.*
8. **Pets?** *Four cats. Three sisters, Lucy, Sally, and Abby and a boy named Momo after the Lemur on Avatar the Last Air Bender. A show the kids watched when we got him, because of his long tail and big ears. He has since grown to the size of a Lemur and weighs just over 20 lbs..*
9. **Favorite Thing About Working In Golf Industry?** *There are certainly a lot of things I like about being a superintendent, including the usual stuff: working outdoors, teaching, coaching, and the teamwork that goes with working with a group of employees, the great people in the industry who are always willing to share knowledge and help each other, and the fact that no two days are ever the same, but the thing I probably enjoy the most is just getting to be out on a golf course all day.*



Top Left: Mowing on the par-4 14th hole. Called "Hickory Hill" it plays 322 to 398 yards.

Top Right: Rolling on the par-3 12th hole. The downhill "Dropshot" hole plays 124 to 200 yards.

Right: Wisconsin PGA Section staff members Joe Stadler and Andy Landenberger test pin placements for round 2.



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MISCELLANY

Phil Davidson joined the staff at University Ridge as Assistant Superintendent in 2006 and took over as Superintendent in 2014. Phil has a Bachelor of Arts Degree in Biology from Lawrence University in Appleton. During college he started playing golf and became obsessed with the game. After college he moved to Minneapolis to search for a job in a tight market and ended up working at the Minikhada Club on the grounds crew while looking for that "real job".

As many of us Davidson was hooked by the physical work and being outside. After moving to Florida for a "real job" that had him in an office Phil decided golf course maintenance was for him and he enrolled at Horry-Georgetown Technical College in Conway, SC where he received a Associates Degree in Golf Course Management.

Phil had a summer internship at Valhalla Golf Club in KY, and a work study position at Wild Wing Plantation in Myrtle Beach. He served as assistant superintendent at Hawks Landing Golf Club, Lake Geneva Country Club, Mount Vernon Country Club in VA.

Phil and his staff are working to fix some layering issues in the greens that are more troubling on the greens that lack air movement due to underbrush and trees.

I had attended day two of the tournament which due to 1.5" of rain on day one resulted in the staff preparing for the finish of round 1, followed by a rush to get ready for round 2. Round 2 was also delayed by rain so the event was cut to 54 holes to get it in on time.

The normal format is 72 holes of stroke play with 18 played on day one and 2 with a field of 156. After 36 holes the field is cut to the top 60 players and ties for a 36 hole finish on day 3.

This years event had 74 professionals 78 amateurs and 4 players who were in the process of obtaining their amateur status back. The professionals were playing for first prize money of 7,000.

Kyle Henning of Brookfield took 1st place after trailing by 3 shots with 3 holes to play thanks to a eagle on the par-5 15th and a little help from second place finisher Andy Buege from Abrams who bogeyed the last two holes.

Rain delays are part of tournament golf and despite the wet weather the course was well received and provided a challenge for the players.

For Davidson and the rest of the staff the 95th State Open served as a warm up for hosting the 2016 American Family Senior Tour event. ✓



Shoutout to the bunker crew working hard to get ready for the finish of Round 1.

Left: Hole 7 is taking some real hand work to get things back in shape.

Below: Hole 14 is going to require some hand work to get ready for the golfers.



Future Wisconsin State Open Sites

2016 Blackwolf Run, Kohler
2017 North Shore CC, Mequon
2018 North Shore GC, Menasha
2020 Blue Mound G&CC, Wauwatosa

MISCELLANY



Top: Twin signs greet golfers and guests at the entry way to the course.

Top Right: Greens Rolling on the Par-4 13th hole. "Halfpipe" plays 294-336 yards.

Bottom: Test plots on hole 14 along with a weather station to plot the unique microclimate.



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Brian Bonlender and Scott Sann

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

NOTE: As a WGCSA Board member, I want to thank everyone who participated in the Membership survey this past fall. The information and feedback obtained was invaluable. The requests for more member spotlight stories inspired me to start this column. I hope to randomly highlight a few members each edition from all geographic areas, facility types and membership classifications. It may take me 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: **Brian Bonlender**

Company Position: **Superintendent, West Bend Country Club**

Years as WGCSA Member: **10**

Membership Classification: **SM**

18 holes with Brian Bonlender:

1. How did you get started in the turfgrass industry? I started as summer help going to school for horticulture and expected to go into landscaping until I realized that I could combine both my love for sports and horticulture. The rest was a perfect fit.

2. What is the most rewarding part of your career? The Ability to be outside each and every day and are able to call it "My Office", there is nothing better than a career that allows you to go to work and it does not feel like work at all.

3. What would you consider to be your greatest career challenge? My greatest career challenge is how to say thank you to my mentor and predecessor for all the different ways he had prepared me for being a Superintendent. Thanks Bruce.

4. Which three adjectives describes you the best? Dedicated, Understanding and Rational.

5. Tell us about your family. I have been married for 8 years to my amazing wife Joanna. We have four kids 2 girls and 2 boys all between the ages of 7 and 2, Rowan (7), Harric (6) Zander (4) and Vera(2) so to say the least we are busy, but loving every minute of it.

6. Any pets? No Pets

7. What drives/motivates you every day? I am never satisfied; there is always something to improve on, a way to make things go more smoothly and something to learn. These things put together are to ensure that I can always say I gave whatever it is I am doing everything I have, be it at home with my family at work or play.



Top: Harric and Rowan join dad for a early spring tour of the course.

Bottom: Rowan, Harric and Zander are excited and ready for the first day of school.



MEMBER SPOTLIGHT

8. Who do you admire? My Parents, they always challenged my sisters and I as kids to be the best we could be at whatever we did without pushing us in any one direction and making sure that we never gave up. They made sure we knew the meaning of work and discipline and at the end of the day you are always there for your family. I hope that I am teaching that life lesson to my kids as well as I was taught.

9. Who is the person in history you'd most like to meet? Albert Einstein

10. What's a fun fact that people don't know about you? I am a current event news junkie and I love to cook .

11. What do you do in your spare time, favorite hobbies? I have 4 kids what's that? Fish, Hunt, Golf and watch Sports.

12. If you could go anywhere in the world on vacation, where would you go? Canada Fishing for a week with my family.

13. What is the one thing you would like to learn/accomplish someday? I would like to go back to school and get my bachelor's degree in business , something that I have always wanted to do for my own knowledge but now it has an even more practical use as a Superintendent.

14. What is your favorite turf management related tool or technique? Toro Lynx Turf Guard being able to see live date on soil temp and moisture, incredible tool.

15. Favorites:

TV Show: Big Bang Theory

Movie: Major League

Food: Steak and eggs whether it is breakfast, lunch or dinner.

Sports Teams: I am Packer fan, Badger Fan (basketball and foot fall) and I am also a Huge fan of the MLB grew up a Cubs and Brewers fan, this was much easier and with a lot less harassment when the teams where in separate divisions.

16. Do you golf? Handicap? Best shot or golf story? I love to golf, my current handicap is my game in general and I am still waiting for that best shot or golf story to happen. At some point I will chip it in from the wood line, I am over there enough.

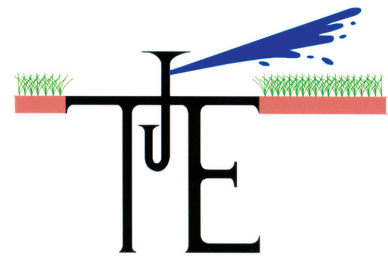
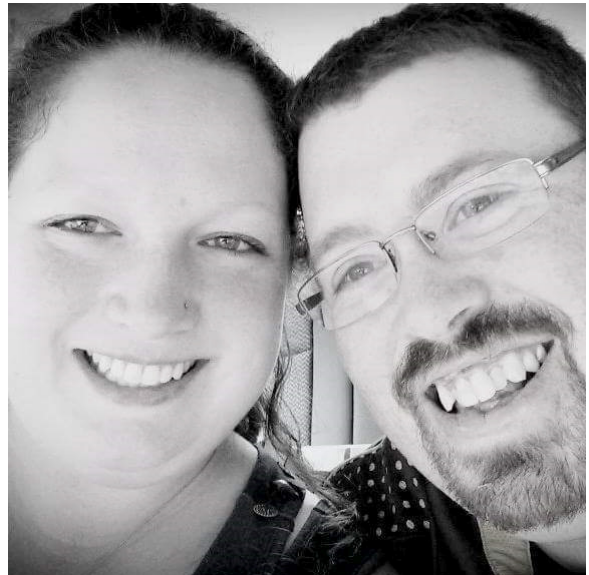
17. Top Bucket List Item? Travel to every single MLB stadium; go to the home of golf and a European vacation.

18. If you could provide one piece of professional advice, what would it be? You cannot take care of these amazing properties by yourself, you always need a team. This team will be a reflection of you. Do not be afraid to work along with your team and get to know who your team is. This will allow you to know some strengths and weaknesses of each team member. By knowing some of these things about your team you can now put them in positions that are more suited for the individual and the team allowing them and you to succeed.



Top: The ladies of Brian's life - Rowan, Vera and Joanna

Bottom: Joanna and Brian



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MEMBER SPOTLIGHT

Name: **Scott Sann**

Company Position: **Club Manager / Certified Golf Course Superintendent, Greenwood Hills Country Club**

Years as WGCSA Member: **17**

Membership Classification: **A**

18 holes with Scott Sann:

1. How did you get started in the turfgrass industry? I started as a bag boy at Tusculumbia CC 30 years ago. I enjoyed the energy of the members and participating in a sport I fell in love with.

2. What is the most rewarding part of your career? The most rewarding part of my career is watching the young grounds workers connect with the older retired grounds workers. I enjoy seeing the age barrier broken and the older guys encouraging the young guys. Seeing the real life education of communication, confidence and respect. I believe it's the best experience a young person can get from a job.

3. What would you consider to be your greatest career challenge? Being asked to step into the Club Manager role. It was difficult at first, but it has been a rewarding experience.

4. Which three adjectives describes you the best? Loyal, Determined, and Silly.

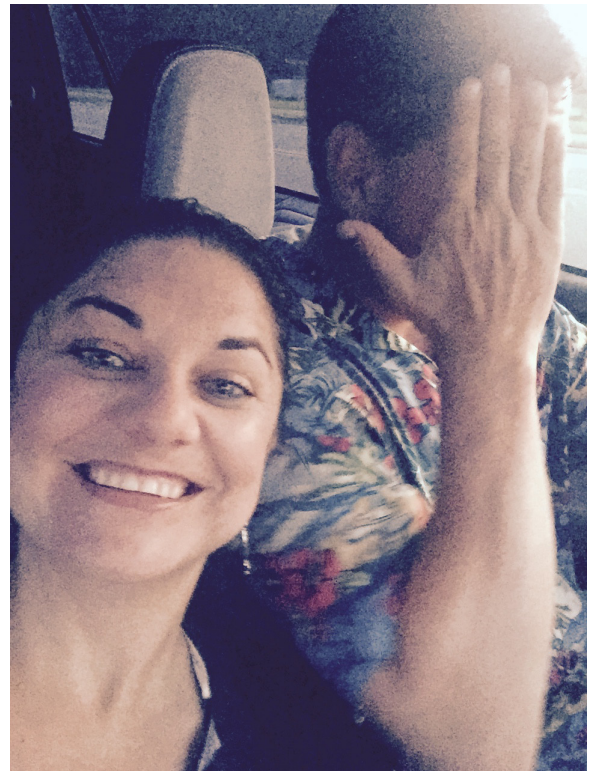
5. Tell us about your family. My wife Sara is an attorney practicing family law. She owns her own practice. I am proud that she has her own business, but I would never like to deal with the things she has to. My oldest daughter Abby is a senior at Wausau East. She is an excellent student and I enjoy debating many topics with her. She is also a server in the restaurant at the club. My son Jackson is a freshman at Wausau East. He loves LAX and working out. He has been super helpful in working for my business. My youngest daughter Lily is in 5th grade. She is known as the "life of the party". She is extremely confident and able to talk with adults about almost anything. She continues to press me to be able to work at the club as a hostess or bartender. Darn child labor laws!

6. Any pets? Mary a black lab. At the door every morning ready to go to work. The members love her and feed her all day. I think I buy one bag of dog food a year?

7. What drives/motivates you every day? I enjoy what I do. I enjoy playing a nicely maintained course so I care for GHCC as if I was playing that day.

8. Who do you admire? Those that are brave enough to start their own business.

9. Who is the person in history you'd most like to meet? Hard to say? Most people have great stories and great experiences to learn from.



Top: I despise social media and selfies. My wife and I heading out for dinner. Why does everyone need to know this?

Bottom: Scott and Lily with Santa.



MEMBER SPOTLIGHT

10. What's a fun fact that people don't know about you? I started a business called Turf MD's. We do lawn applications and general landscaping in Wausau.

11. What do you do in your spare time, favorite hobbies? My family and I have a pass to snow board at Granite Peak. I go 2-3 times a week. I also go on a week long motorcycle trip with friends every summer. I don't hunt, so it's my week to just be a guy.

12. If you could go anywhere in the world on vacation, where would you go? I've been fortunate to board and ride my bike in many places. Europe and Alaska are on the list.

13. What is the one thing you would like to learn/accomplish someday? Fly fishing well enough to not scare a trout. Making my own maple syrup and my own beer.

14. What is your favorite turf management related tool or technique? Gotta love the core aerifier.

15. Favorites:

TV Show: Parks and Recreation.

Movie: Anything Star Wars or Marvel Super Hero.

Food: A really good IPA.

Sports Teams: Packers, Badgers, Brewers.

16. Do you golf? Handicap? Best shot or golf story? I Golf, handicap is 14. Made a hole in one when I was 17 years old on Number 4 at Tuscumbia playing in men's league.

17. Top Bucket List Item? Fish more.

18. If you could provide one piece of professional advice, what would it be? I think there is always a way to do something better and less expensive. I believe that thinking has helped me succeed where I am at. ✓



Top: Abby Lily and Sara on the way to the game.

Middle: Jackson and I in the UP boarding.

Bottom: First day of school. Left to right. Abby, Lily, and Jackson. Mary on floor.

Whistling Straits Hosts Third PGA Championship

By David Brandenburg, Editor, The Grass Roots

The badger state hosted its fourth PGA Championship when the pros returned to Whistling Straits in Haven or Kohler or Sheboygan depending on who you listen to. Technically the links are in the unincorporated community of Haven but the course has a Sheboygan address. Kohler comes in because it is a Kohler owned property and the other properties are in Kohler.

The first PGA Championship held in Wisconsin was won by Gene Sarazen at

Blue Mound Golf and Country Club in Wauwatosa. In the 1933 event the entire purse was \$7,200 and Sarazen won \$1,000.

In 2004 Vijay Singh won over one million dollars with a 6.25 million dollar total purse at Whistling Straits when he beat out Justin Leonard and Chris DiMarco in a three hole aggregate playoff.

In 2010 Martin Kaymer beat Bubba Watson in another playoff to win 1.35 million of the 7.5 million dollar total purse.

For this years event the purse grew to

\$10 million with winner Jason Day taking home \$1.8 million and having his name inscribed on the Wanamaker Trophy.

Whistling Straits was established in 1998 on a abandoned airfield called Camp Haven that was in use from 1949-1959. Pete Dye was brought in to design a masterpiece on the shores of Lake Michigan. To give the course the look they wanted 13,126 truckloads or 800,000 cubic yards of sand were hauled in to create dunes and give the course a coastal Irish look.

Greens and collar mowing on hole 14 greensite.



It takes a army! This photo shared by Whistling Straits shows some of the grounds staff and grounds volunteers during the championship.

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Top Left: Rolling The 18th Green

Middle Left: A lone blower cleans up clippings on the 16th.

Middle Right: Phil Mickelson tries to hit the fairway on the 2nd hole long drive contest.

Bottom Left: Fairway mowers prepare the 13th Hole for play.



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Top: Hole 18 Played 520 yards for the championship. It is 300 yards to clear the left bunkers for a shorter route to the green.

Middle Left: Squeegeeing the tee on Hole 17 with the Sarazen Suites in the background.

Bottom Left: From behind the par3 17th Hole.

Bottom Right: Bunker rake staff working on hole 15



MISCELLANY

The course management staff at Whistling Straits is led by Certified Golf Course Superintendent Mike Lee who is the Manager of Golf Course Maintenance for all 4 Kohler Courses. Mike received his B.S. in Agriculture from the University of Wisconsin Madison and has been with Kohler Company for 22 years after serving as assistant superintendent at Blue Mound Golf and Country Club in Wauwatosa. Mike has years of major tournament experience and leads his team well.

Christopher Zugel, is the Certified Golf Course Superintendent at the Straits Course for 9 years. Chris started as an assistant superintendent from 2002 to 2008 when he left to become the grounds manager for the Milwaukee Brewers only to return to the Straits Course in 2009.

Zugel has his B.S. in Landscape Horticulture and Turf Management from Colorado State University.

Also on the team is Joe Sell, Senior Assistant Superintendent at the Straits Course. Joe has been with Kohler for 10 years so this is his second PGA Championships. Prior to that Joe was a crew leader at North Shore Golf Club in Menasha. Sell has a Associates Degree in Turf and Turfgrass Management from Penn State University. Sell has a long history with the WGC-SA as his grandfather Bill Sell served as President in 1968 and 1969. Joe helped lead a team of volunteers to build a 6,650 chipping green for the First Tee of South Central Wisconsin in fall of 2013.

Maintaining a unique links course in the Midwest has its challenges and the property demands a fair amount of hand work to maintain the look customers expect. On staff the course has about 15 employees in the shoulder seasons and up to 25 once school is out for the summer.

For the PGA Championship the staff will balloon with upwards of 70 volunteers joining the team to greet the worlds best players with great conditions.

Overall despite a wind storm and a little rain the course received rave reviews from the players and spectators for its third hosting of the PGA Championship.

Next on the docket will be the 202 Ryder Cup. I am sure Mike, Chris and Joe have preparations underway. 🌱



Chris Zugel, Golf Course Superintendent and Joe Sell, Assistant Golf Course Superintendent take in a job well done during Wednesday's practice round.



Above: Monroe Miller led the maintenance parade with a 1955 Toro General tractor that was used at Blackhawk Country Club where Mike Lee had once worked. Blackhawk was looking to free up some storage space so the tractor found a new home.

One of Joe Sell's hobbies is auto restoration so this old tractor was a perfect fit for him. (Photo from Scott Hollister, Editor, *Golf Course Maintenance*)

Left: Greensmowers prepare the Par 5 16th Hole for play.



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Left: The often pictured par-3 17th Hole.

Above: The bunkering on the 11th hole really shows the challenge of the course.

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50th Golf Turf Symposium

By David Brandenburg, Editor, The Grass Roots

50 years... it is impressive to say it; 50 years is a long time for anything to run much less an educational program to not only exist but to stay in the same format is amazing.

I have been fortunate to be on the Golf Turf Symposium committee for 12 years and was lucky to learn the history of this great program from experienced volunteers.

Bruce Worzella, Rod Johnson, Wayne Otto, Danny Quast and Bob Vavrek were all long time committee members that I have tried to match their commitment and ability. It is not easy, but as committee members have come and gone we have all been guided by long time Milorganite staff such as Shelly Biro (Mazurek) and her young but qualified replacement Jaime Staufenbeil. Before Shelly and Jaime names such as Bob Welch, Jim Spindler, Terry Ward, Al Nees, Jim Latham and of course Charlie Wilson, the father of the symposium.

The Golf Turf Symposium as it is properly called is a mix of great education, com-

meraderi and tradition.

The tradition is taking a general area of study and dissecting it for a day and a half with a mix of superintendents giving real life examples and professors showing the latest in research.

The tradition has also been a quality venue; The Pfister, The Hyatt and now The American Club.

It would not be fair for me to write the history in my words; I would just be copying the words I have read from Latham and Wilson. Instead in the next few pages you can read their words as originally printed in The Grass Roots.

I will quickly cover the important basics. Milorganite is our nearly silent sponsor and partner in providing this opportunity for golf course superintendents.

Since the beginning 50 years ago your entry fee pays for meals and part of the facility fee. Milorganite pays for all speaker travel and costs, part of the facility fees while the WGCSA pays for small speaker gifts. Any money left over is donated by the WGCSA to The O.J. Noer Research

Foundation to be used in their support of turfgrass research.

The amount the WGCSA has been able to donate to the Noer Foundation has reduced in recent years due to increased meal and facility costs. However through hard work by first Shelly and now Jaime at Milorganite and WGCSA Chapter Manager Brett Grams we have found savings and negotiated the best deals possible to provide a low cost educational event at a top notch venue while continuing our donation to the foundation.

Our goal of great education at a great venue should continue for another 50 years.

I have picked a few pictures of the hundreds we have in a effort to showcase the long and excellent line of speakers we have had. The people that have been involved in our program is a real who's who of the golf course industry.

Enjoy the history of our Golf Turf Symposium, and I look forward to seeing you at The American Club December 2 and 3 for another great program. ✓



Milorganite's Recent and Current Leaders

Left: Jaime Staufenbeil, Agronomist took over Symposium organization from 34 year Customer Service Specialist Shelly Biro (Mazurek) in 2013.

Right: Jeff Spence, Director of Marketing

COVER STORY



Some of Milorganites Past Leaders
Top Left: Terry Ward, former Advertising Manager at the 1997 Symposium
Top Right: Former Agonomists Jim Latham, Jim Spindler and Bob Welch at the GCSAA Conference
Bottom Left: Alan Nees, former Director of Marketing at the 1993 Symposium.

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WISCONSIN GOLF TURF SYMPOSIUM How it All began.....

By Charles G Wilson
Reprinted from the September 1984 Issue of *The Grass Roots*

*Editor's Note: There is no better way to hear about the history and formation of the symposium than to go back to the words of the men that were there. In this 1984 article from *The Grass Roots*, Charles Wilson, Agronomist, WGCSA Distinguished Service Award Winner tells us how it all began.*

Grand things sometimes result from the smallest of happenings. Such was the case with the Wisconsin Golf Turf Symposium. The idea of a turfgrass conference devoted to a single subject had been incubating in the minds of (Charlie) Wilson, (James) Latham, and (Bob) Welch for some time, but it took a huge bar bill to precipitate the matter.

The GCSAA Turfgrass Conference and Show was held in San Diego in 1962. At the show as had long been the custom, the Milorganite folks sponsored a dinner for golf course superintendents from the greater Milwaukee area, where there were distributors of Milorganite. Dinner at the hotel was delayed from the appointed hour. Drinks were being served in the public bar adjacent to the dining room, and as it later turned out, to a great many people who were not even associated with our party.

Concurrently, Wisconsin attendance at the GCSAA annual meeting was changing. Instead of only three or four clubs from Metro Milwaukee, other cities superintendents were attending, and it was becoming a family affair. It was embarrassing to invite only Milwaukee area superintendents when other good Milorganite customers were there, yet, we were constrained by budget limitations to do so.

Another factor influenced our thinking. In the late 1950's the WGCSA and ourselves approached the University of Wisconsin with a request to reactivate the long dormant annual Wisconsin Turfgrass Conference. At that time Dr. Jim Love of the Soils Department seemed to be the only university professor involved in turfgrass research. Thus we requested that Jim's department chair the event. This



Author Charlie Wilson was the first USGA Green Section Agronomist and one of the founders of the Symposium is shown with Bob Vavrek, current USGA Agronomist at the 2012 Symposium. Mr. Wilson is was honored with the WGCSA Distinguished Service Award. Charlie passed away in September of 2013 at the age of 93.

happened, and the following year Horticulture and Agronomy decided to get into the act with sponsorship on a rotating basis. Only on other conference was held at Madison, and then the UW Extension took on the responsibility and put the conference on the road with regional on day sessions that continue to be held each year. Attendance at these has come mainly from non-golf interests.

With this as background, plus with the aforementioned "bar bill" Wilson approached his boss, the late Ray Leary, with a proposal to hold a one day educational conference in Milwaukee and dispense

with the historic dinner for Milwaukee area superintendents at the national meeting. At this educational conference we could invite all of our local (as distributor) customers, and since we would handle the program could keep under the San Diego expense and still throw in a free lunch for the attendees.

These Milorganite Sessions were so successful that the old embarrassing question of "why wasn't I invited?" again came up. Interestingly it was posed by WGCSA officials from Milwaukee on behalf of their fellow superintendents out in the state.

To continue the history, Wilson, Latham and Welch met with Charlie Shiley, Les and Ron Verhaalen, Joe Deschler, Al Kress and John Stampful at Ozaukee Country Club to discuss the possibility of enlarging the attendance and format of what was to become the Wisconsin Golf Turf Symposium. It was there decided that with the Sewerage Commission approval the Milorganite Sales Department would change their financial participation to paying travel and living expenses of the invited speakers, and that a registration fee would be charged to cover meals and incidental expenses. The format was also changed to a one and one half day symposium because of anticipated attendance from outside the state.

And, possibly most important of all, any monies collected in excess of expenses would be donated to the O.J. Noer Research Foundation, Inc. by the WGCSA who would be responsible for collecting the registration fees.

The Golf Turf Symposium has attracted international recognition. Several Canadian superintendents attend each year. George Kendall, a regular attendee from Winnipeg until he retired, came by bus each year, and at his own expense.

Overall attendance has fluctuated depending on theme subject popularity, but not that much. In only one year did we fall short of funds to meet expenses, and the weather was thought to be responsible, at least in part.

The Wisconsin Golf Course Superintendents Association has donated over \$12,000 to the O.J. Noer Research Foundation, Inc., mainly from symposia income. A wide and interesting array of subject matter has been covered over the years.

All but two of the Symposia have been held at the Hotel Pfister in Milwaukee. Their facilities are outstanding, and the meeting room is the perfect size for the av-



Dedicated to the Memory of O.J. Noer

erage attendance. In 1966 the symposium was held at the Hilton Inn and the Marc Plaza Hotel was used in 1979.

Not included in the "official" Symposia were meetings held in 1964 and 1965. These were invitational for the Milwaukee area golf course superintendents. The topic of the 1964 gathering was "Irrigation – Methods & Material." "Soil Fertility Programming" was covered in 1965.

A roster of Symposium speakers is included in this issue of *The Grass Roots*. A few other notes about this group are in order. The USGA has been extremely supportive of the Symposium. They have been on the speaking platform every year of the Symposium except 1972, 1974 and 1975; and during those years they were in the audience. We have almost fifty Golf Course Superintendents on the program. The program has included the National Golf Foundation, golf professionals, club general managers, golf course builders and golf course architects (Robert Trent Jones and Pete Dye included). We have heard from the leaders of golf course equipment manufacturers, pesticide companies and distributors. We have listened to the remarks of Green Committee chairmen, GCSAA Officers and Directors and GC-

SAA Headquarters Staff members. We have been addressed by industry writers, editors and publishers. Educators and researchers in the turfgrass industry have always welcomed the opportunity to speak from the Symposium, and the following colleges and universities have been represented:

University of Wisconsin – Madison
 University of Wisconsin – Milwaukee
 Purdue University
 Michigan State University
 University of Minnesota
 Ohio State University
 University of Illinois
 Iowa State University
 University of Missouri
 Kansas State University
 Cornell University
 University of Massachusetts
 University of Connecticut
 University of Rhode Island
 University of Maine
 Rutgers University
 Pennsylvania State University
 Mississippi State University
 University of Georgia
 Virginia Polytechnic Institute and State University
 Texas A&M University
 University of Florida
 University of California – Davis

Over thirty states and four Canadian provinces have been represented at these Symposia. The all time favorite subject has dealt with "Sand Topdressing"

A lot of hard work on the part of Wisconsin Golf Course Superintendents and the Milorganite Sales Department has gone into making the Symposium successful. Obviously, none of the success could have been possible without the multi-varied expertise of our speakers. Attendance continues to be good, so although on can never be certain of the future, it is expected that the Wisconsin Golf Turf Symposium will continue for many years to come. ✓



A Symposium Visit With Ray Knapp

By Monroe Miller, Retired Editor and Golf Course Superintendent

Reprinted from the November/December 2005 Issue of *The Grass Roots*

Back in the days when the Symposium was held in the Pfister Hotel in downtown Milwaukee, I frequently ate breakfast in the Green House Restaurant in the Pfister with Ray Knapp. Ray loved their breakfast hash, which he always ordered (tradition, he said) and which came with an egg cooked on the top of the hash. I couldn't see what he liked about the stuff, but Ray always cleaned his plate! I ate breakfast with Ray again this year at the Symposium.

I knew that he had attended all 40 of the meetings, so naturally I wanted to know which was his favorite. He didn't hesitate when he answered, "The first one that featured sand topdressing."

Dr. John Madison, long deceased, was gaining a lot of interest around the country with his program of sand topdressing. John was from California and had authored a couple of excellent textbooks on turfgrass. He had seen the positive results from sand topdressing in California and did his homework and realized he was promoting a practice the old Scots had used for hundreds of years.

Ray was interested in topdressing because he had seen Leon Teters, owner of the Ray was interested in topdressing because he had seen Leon Teters, owner of the Wisconsin River Country Club in Wisconsin Rapids, topdress greens when Ray was at Stevens Point Country Club.


Ray earned his undergraduate degree



Ray Knapp retired golf course superintendent and salesman with Spring Valley Turf Products is believed to be the only person to attend the first 40 Symposiums. Ray was one of the early pioneers in using straight sand topdressing for putting greens.

from Purdue, and Dr. Bill Daniels was his advisor. Dr. Daniels was known as "The Sandman" to his students because of his interest in sand as a medium for the culture of turf. The Symposium was the catalyst for Ray's leadership nationally in sand topdressing of putting greens.

That meeting also inspired Wayne Otto to do the same at Ozaukee Co. Ray loves

The American Club as the site for the Symposium, far and away better than any of the other venues. He was a speaker at least once, giving a lecture about *Poa annua*, as he recalls. One of the most knowledgeable turf men I have ever visited with, I hope the Symposium gives me many more opportunities to visit with Ray Knapp, especially if it's over breakfast. 



Session Chairmen from the 1987 Symposium: Bruce Schweiger, Bill Knight and Tom Schwab.

At the time Schweiger was superintendent at Janesville Riverside, Knight at Dretska and Schwab at Monroe Country Club.

COVER STORY



Some of the architects

Top Left: Ron Forse

Top Left Center: Brian Silva

Top Right Center: Bob Lohmann

Top Right: Tom Doak

Left: Geoff Schackelford

Right: Dr. Michael Hurdzdan



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Wisconsin Golf Turf Symposium Speakers - 1966-2015

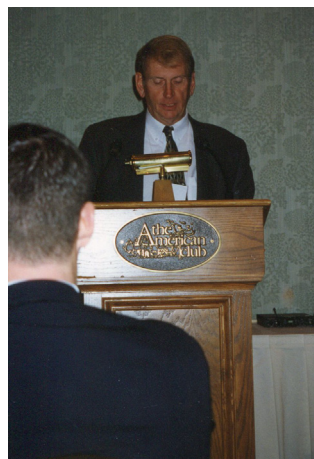
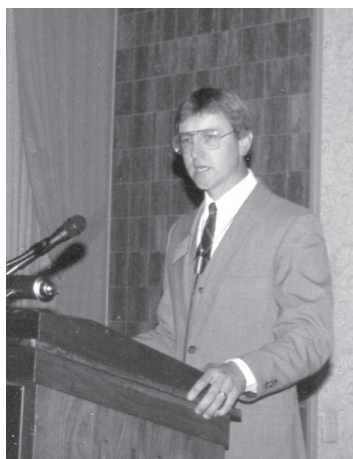
- Agnew, Dr. Michael – 1987
 Allis, John W. – 1975
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 Auxer, Guy – 1989
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Younts, Dr. S. Eugene – 1979
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Zastrow, Dr. Michael – 2014
Zontek, Stanley J. – 1980, 1981, 1982, 1983, 1984, 2001

Roster Compiled by Al Nees, Monroe Miller and David Brandenburg

COVER STORY



Some Of The Many Superintendent Speakers

Top Left: Ted Horton (Pebble Beach) in 1988

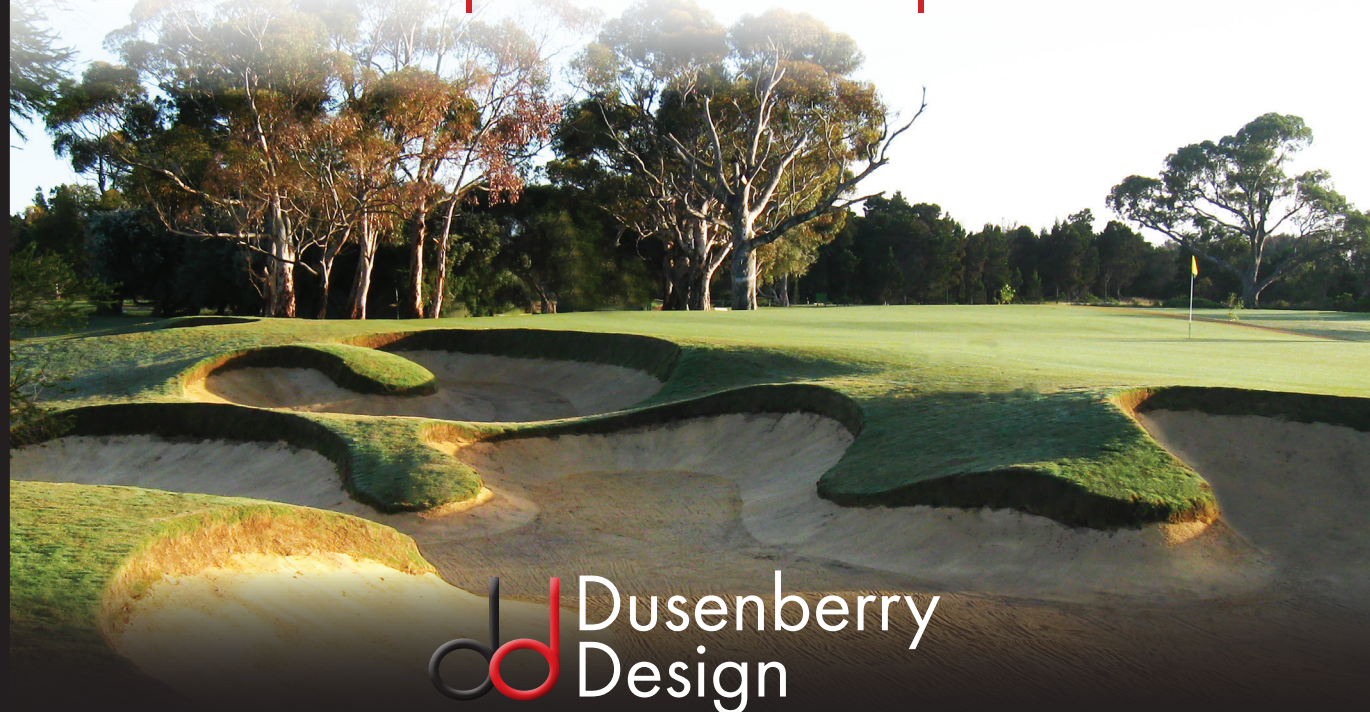
Top Center: Oscar Miles (The Merit Club) in 1999

Top Right: Bruce Williams (Los Angeles CC) in 2002

Left: Mark Kienert (Bulls Eye CC) in 1988

Left Center: Danny Quast (DHD Turf Products, Previously at Medina CC) in 2002

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1990 - 25th Symposium

Top Left: Jim Latham and piano player Fugiasco are two of the few attendees at all 25 Symposiums.

Top Right: The crowd at the Pfister Grand Ballroom.

Below: The marquee at the Pfister welcomes us.

Bottom: A ice sculpture for the 25th Anniversary.



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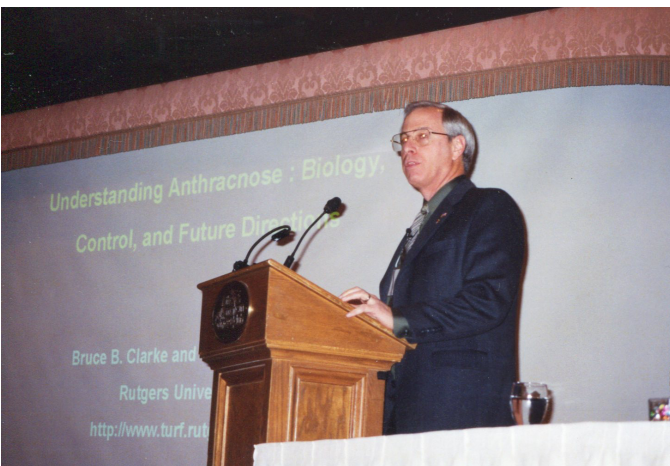
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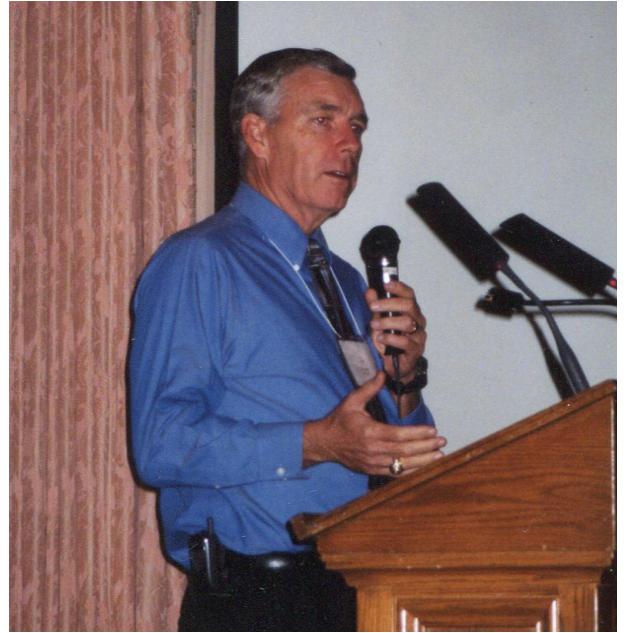


Some Of The Many University Professors

Clockwise From Top Left: Dr. Frank Rossi, Dr. John Stier, Dr. Wayne Kusow, Dr. Doug Soldat, Dr. Chris Williamson, Dr. Ron Calhoun, Dr. Bruce Clarke and Dr. Nick Christians.



COVER STORY



**Top: USGA Agronomists serve as popular and informative speakers. Left: The late Stan Zontek
Right: James Moore**

Middle: 1987 Head Table Guests: Gene Haas, Ted Woerhle, Bill Roberts, Jim Spindler and Joe Luigs

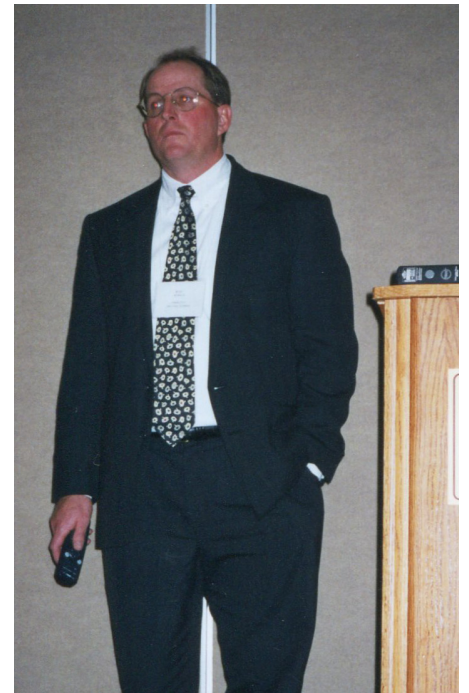
Bottom: 1998 Head Table Guest: Rod Johnson, Al Nees, Bruce Worzella, Bob Vavrek, Mark Kienert, Wayne Otto, Gordon Waddington and Terry Ward.



Wisconsin Golf Turf Symposia

First	1966	Winter Injury (Bulletin No. 5)
Second	1967	The Physical Nature of Soils
Third	1968	POA ANNUA
Fourth	1969	Satisfying the Golfer
Fifth	1970	The Chemical Nature of Soil
Sixth	1971	Where are We Going in Golf Course Management?
Seventh	1972	Recycling Golf Course Wastes
Eighth	1973	Thatch
Ninth	1974	Water Movement in Soils
Tenth	1975	A New Deal for an Old Course
Eleventh	1976	Living with POA ANNUA Species
Twelfth	1977	Keeping Your Head on Straight
Thirteenth	1978	Fast Grass
Fourteenth	1979	Research
Fifteenth	1980	Sand - On and In Golf Greens
Sixteenth	1981	Management Requirements for Sand Greens and Sand Top-Dressed Greens
Seventeenth	1982	Getting to the Roots of the Matter
Eighteenth	1983	The Facts and Fallacies of POA ANNUA Management
Nineteenth	1984	Directions in Golf Course Management
Twentieth	1985	Grooming - The State of The Art - New Problems for New Times
Twenty-First	1986	The Micronutrients - Who Needs Them?
Twenty-Second	1987	Impressions - A Memorable Golf Course (First to Lasting)
Twenty-Third	1988	Water Management - A Cultural Practice for all Conditions
Twenty-Fourth	1989	Optimizing Pest Management - Strategies to Maximize Results
Twenty-Fifth	1990	Bentgrasses - New Old Right or Wrong
Twenty-Sixth	1991	Traffic - How much can you bare?
Twenty-Seventh	1992	The Green and Tee Complex - Renovating the Surrounds
Twenty-Eighth	1993	Winterkill - The Causes And Solutions?
Twenty-Ninth	1994	Golf In The Year 2010 The Game, The Job, The Challenge
Thirtieth	1995	Earth, Soil, H ₂ O
Thirty-First	1996	You Can't See The Trees For The Turf
Thirty-Second	1997	"If You Build It They Will Come" Putting Green Construction
Thirty-Third	1998	"What You Seed Is What You Get" Putting Green Establishment
Thirty-Fourth	1999	Showtime! Developing the Playing Surface
Thirty-Fifth	2000	The Ins and Outs of Bunkers
Thirty-Sixth	2001	Emerging Problems and Pests
Thirty-Seventh	2002	Doing More With Less - Resource, Time and Money Management
Thirty-Eighth	2003	POA - Twenty Years Later
Thirty-Ninth	2004	Soils - Managing the Pressures
Fortieth	2005	Grasses - So Many Choices, It's a Pain in the Grass
Forty-First	2006	Getting Down to the Roots
Forty-Second	2007	Why Close At All?
Forty-Third	2008	All Water is NOT Created Equal
Forty-Fourth	2009	Fewer Dollars Requires More Sense
Forty-Fifth	2010	Golf In The Year 2010 - Did We Predict The Future?
Forty-Sixth	2011	New Tools For Old Challenges
Forty-Seventh	2012	What's In Your Tank?
Forty-Eighth	2013	Extreme Turf Management
Forty-Ninth	2014	How Are You Doing As A Professional?
Fiftieth	2015	How Are We Doing As A Industry?

COVER STORY



Top Left: Dr. Peter Dernoeden, University of Maryland discussed diseases.

Top Center: Dr. Clark Throssell, formerly of Purdue University and then GC-SAA Director of Resarch discused water quality issues in 2001.

Top Right: In 2000 Mike Morris discussed his complete bunker renovation at Crystal Downs.

Right: Seed and turf guru Mark Grundman discussed seed selection.

Bottom Left: Lee Bruce discusses construction in 1998

Bottom Right: Jeff Carlson discusses organic golf and Widows Walk Golf Course.



Late Summer 2015 Is Good For The Game

By David Brandenburg, Editor, The Grass Roots

For the most part August and September provided with golfers and management teams with some great weather to enjoy the game and get some valuable work done. From the charts from the Wisconsin State Climatology Office you can see it was a bit dry in the south west but wet in the north west. Temperatures were near normal in the south and 1 degree above normal in the north.

Irrigation systems got a break in the Fond du Lac area as rains were timely. The only downfall I noticed was relentless dollar spot pressure from humid mornings and lush turf from the rain.

Fungicides that normally give 21 to 28 days were lasting 7 to 10 at best and untreated roughs were loaded with off color turf.

The mid fall forecast looks great right now and many forecasters are predicting a warm winter due to a strong El Nino pattern off the west coast.

HELP WANTED

The Grass Roots needs a fun loving member to write our member news and gossip column each issue. Most recently the feature was called "Clippings" but it has been penned under the "Back Page", "On The Move", "The Surrounds", "Spreading The News" and "Poa Trivia".

Many WGCSA superintendent and affiliate members have penned this column and we need a new person to sit down at the typewriter and keep members informed.

No, you do not need to travel the state seeing who is getting married or having kids. The best way to gather information is to get your name out there and the information will funnel to you by the superintendents or salesman who call on them.

Contact me and we can discuss it. We are willing to double the pay over the last 15 people who have done it for free.

We could also use an article and some pictures from some of you members who have done projects in the past couple years. It down not have to be a long article but show us what you are doing for irrigation installation, tree removal, bunkers, new greens and tees or any work on your course the membership may find valuable. Contact me and I will be glad to help you get started.


Over Labor Day weekend I got to serve as the Father of The Bride and all the fun that goes with a wedding. To make stress levels a bit higher the ceremony and the reception were at Rolling Meadows. The weather was great and warm, ceremony went off without a hitch besides the wedding party walking across our putting green. High heel are much like a solid tine aerifier so it all worked out.

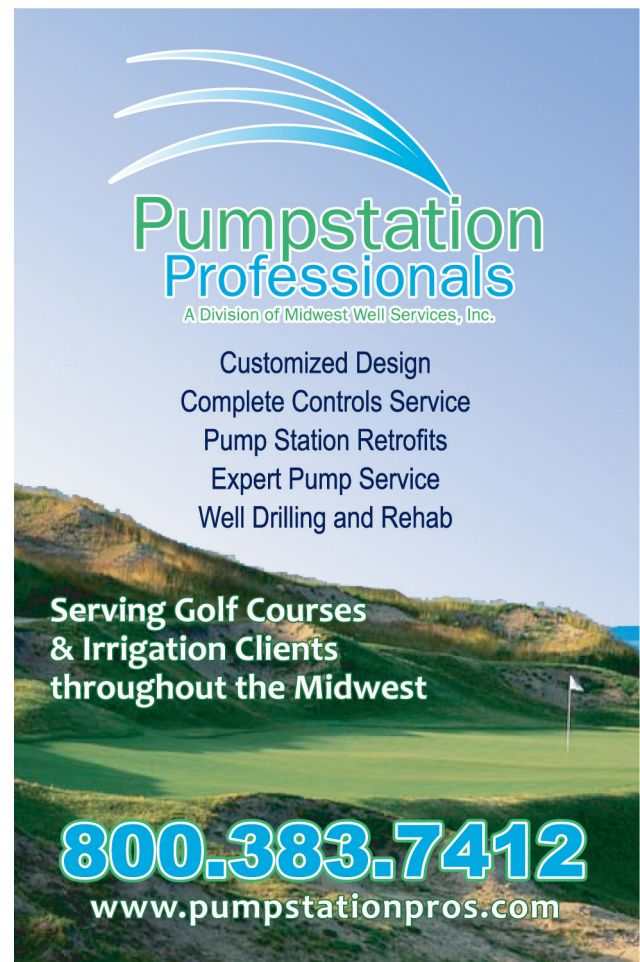
Your daughters wedding is one of those days dads and moms

need to slow down and just enjoy the special moments with not only the bride and groom but also family and friends. If you do not, the day may go by in a blur and you will be left wondering what happened.

If you haven't figured it out yet, this year will be the 50th Golf Turf Symposium. The committee is hoping for a great turnout not only because it is the 50th but because the symposium offers a great educational program at Wisconsin's only 5 star facility.

With Milorganite's support we are able to offer a low cost event that I guarantee will allow you to take valuable information back to your club. I hope you enjoyed this special anniversary edition.

If you are a member of the Northern Great Lakes Golf Course Superintendents you received a issue of The Grass Roots for the first time. It is not a member drive, we just want you to feel free to attend the Golf Turf Symposium. I hope to see many of you at the American Club on December 2nd and 3rd. 



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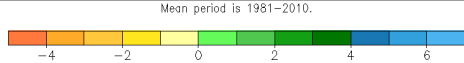
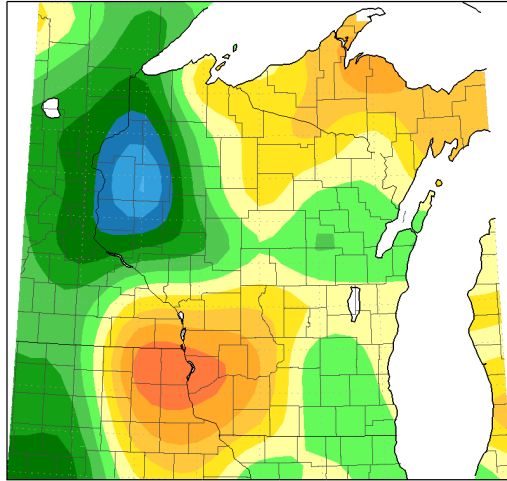
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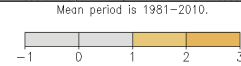
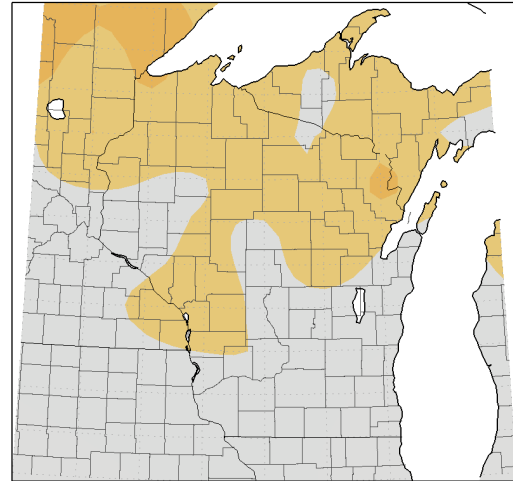
EDITOR'S NOTEBOOK

Accumulated Precipitation (in): Departure from Mean
June 30, 2015 to September 27, 2015

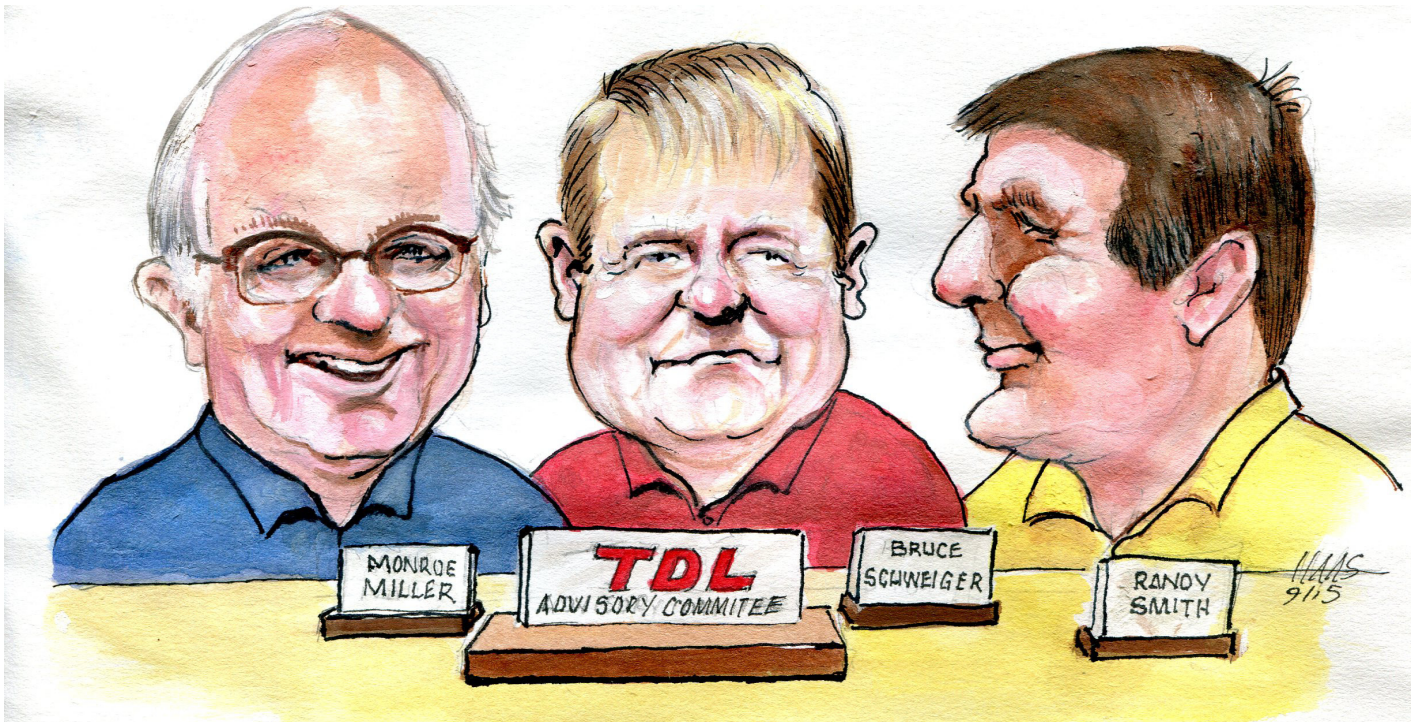


Wisconsin State Climatology Office www.aos.wisc.edu/~sco
University of Wisconsin-Madison stclim@aos.wisc.edu

Average Temperature (°F): Departure from Mean
June 30, 2015 to September 27, 2015



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University of Wisconsin-Madison stclim@aos.wisc.edu



Gene Haas, Retired Executive Director of the WSGA provided the above drawing based on a photo in the last issue. Gene pointed out “These ledgends are worth drawing”. Thank you for sharing your talents with us Gene!

Event Schedule!

Monday October 5 - WTA Fundraiser - Blue Mound Golf and Country Club, Wauwatosa

November 7th - Couples Dinner, Lombardi's Steakhouse, Appleton

Wed & Thur December 2-3 - Golf Turf Symposium, American Club, Kohler

Tuesday January 5 - WTA Research Conference and Webinar

February 6-11, 2016 - Golf Industry Show, San Diego, CA



How are we doing as an industry?

WHEN December 2nd and 3rd

WHERE The American Club
Kohler, WI

Registration forms included in this Grass Roots Symposium issue. You can also register for the symposium at www.wgcsa.com



Questions? Contact Jaime Staufenbeil
1-800-287-9645 or jstaufenbeil@milorganite.com

