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# 2010 A Summer of Challenges

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

No question that the summer of 2010 was a summer for the record books throughout the United States. Record heat spanned the entire nation and as a result creeping bentgrass and annual bluegrass died everywhere.

Although we did not experience 90 consecutive days over 90 like the Southeast or more days over 100 ever recorded like the Northeast, we still had our fair share of heat. Looking over the weather data from last year however can be a little misleading. The average temperatures for May, June, July and August were not much greater than the normal averages (Figure 1). Yet, the nighttime temperatures greatly exceeded the norm (Figure 1)!

Couple those high nighttime temperatures with moisture equals DISEASE. Surprisingly though we did not see as much disease as one might have anticipated. Upon examining the precipitation data from last summer we may have a clue as to why.

The rainfall we got last year was early in the growing season and we also had warm temperatures. However, many areas throughout the Midwest received too much rain in April and May sometimes-in excess of 5 inches when compared to the norm (Figure 2).

Although temperatures were conducive to root development and growth, the rootzones were not. They likely were anaerobic during the months of May, June and even into July. Consequently annual bluegrass root development was severely stunted and even creeping bentgrass root development was slightly stunted. When the hot temperatures moved in during July a lot of annual bluegrass began to die.

Luckily our temperatures did not reach the levels to kill creeping bentgrass like they did in other parts of the country. An-

nual bluegrass died throughout the Midwest due to the amount of early precipitation and warm temperatures later in the season. Moreover, the past two or three summers were very mild and did not kill the “weaker” annual bluegrass plants. Those weak plants lingered around for two or three years and were removed from the equation this year.

The only reason I say this is because courses with extensive, old annual bluegrass populations saw very little loss in 2010. Courses with 30 to 60 % annual bluegrass populations were hit pretty hard.

Diseases were also an issue last summer. Pythium blight was a major issue on creeping bentgrass fairways. Fairy ring was also a huge issue and not to mention all of the talk about bacterial wilt.

The weather last summer was perfect for Pythium blight because we had an abundance of warm, humid nights and days over 90. The problem with Pythium blight last year was how the disease expressed itself. The symptoms were not typical of Pythium blight, at least not how I am used to seeing the disease.

I think the reason for this is the newer cultivars used, better nitrogen, water management and cultivation techniques. The symptoms expressed themselves very similar to brown patch or even dollar spot during the early stages. We saw many cases of Pythium blight starting as small circular spots that enlarged into larger more irregular areas (Figure 3).

Occasionally we heard about or saw smoke rings, which lead golf course superintendents to diagnose the disease as brown patch. Smoke rings are a diagnostic feature of brown patch, but they can also form on low cut creeping bentgrass that is infected with Pythium as well.

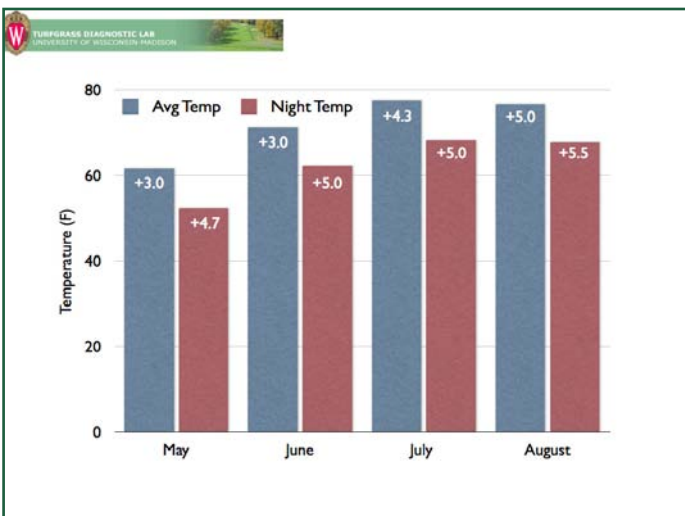


Figure 1. Average and nighttime temperatures for May, June, July and August for a National weather station in Madison, WI. Numbers in white indicate the difference from the normal temperatures.

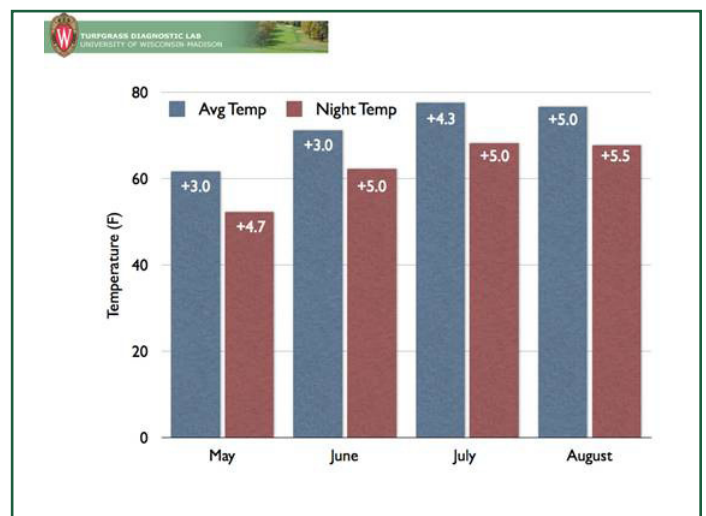


Figure 2. Precipitation amounts for May, June, July and August for Madison, WI. Numbers in white indicate the difference from the 30 year normals.

The key to controlling Pythium blight is to get the fungicides out before the symptoms develop if you want to use lower rates. Once the disease has developed, only the full label rates will provide the level of control expected on a golf course. Many products control Pythium blight quite well, however things like QoI's and the phosphonate products fail under intense disease pressures (Figure 4). Subdue MAXX is always a good choice for Pythium blight control and can be used preventatively or curatively. Another option that is fairly new is Stellar from Valent. This is a product that utilizes two active ingredients, fluopicolide and propamocarb (Banol). This product works very well against Pythium blight and I believe is competitively priced.

Last summer fairy ring was problematic throughout the Midwest because there was plenty of moisture for those fungi to thrive. When the heat descended in late summer some superintendents reported type I symptoms (necrosis/death). The key with fairy ring control is to get the fungicides out on a preventative basis. Fungicides should be applied when soil temperatures are between 60 and 70 F and two applications should be made about a month apart. The fungicides should be irrigated in 1/8 to 1/4 inch of water. A wetting agent should not be tank mixed in. The wetting agent could facilitate movement past the area where the fungi reside. Most of the DMI fungicides work very well as do the QoI fungicides (Figure 5). The key is to pick the fungicide that fits in your budget and try it. Remember that there are over 60 different fungi that cause fairy ring and we do not know if a particular fungicide will work at your property until you try it.



**Figure 3. Pythium blight stand symptoms observed on a creeping bentgrass teebox in the Chicagoland area. Note how the symptoms started in the upper right hand corner as small circular spots. Images courtesy of Dr. Derek Settle of the CDGA.**

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Finally there was a lot of talk about bacterial wilt this summer—most likely because so much turf died due to the extreme heat. However, this disease spread like wildfire through the US by word of mouth. I find it interesting that bacterial wilt was not diagnosed in Minnesota, Iowa and Wisconsin, but was diagnosed in almost every other state in the Midwest. I think one reason is I refused to call anything bacterial wilt this summer because we still do not know enough to make official bacterial wilt diagnoses. Here's why: A golf course in North Carolina submitted a sample in July to the Michigan State Turfgrass Diagnostic lab with necrosis and etiolation. After 4 months of work, researchers at MSU discovered a bacterium associated with the dying tissue that had not been reported on turfgrass before. The researchers contacted Dr. Lane Tredway at NCSU in an effort to set-up collaboration to figure out this anomaly. No collaboration was established and a first report of a bacterium (*Acidovorax* spp) causing a bacterial disease of creeping bentgrass was published. This caused quite a controversy amongst the turf pathology community, which was probably evident on the turf disease blog.

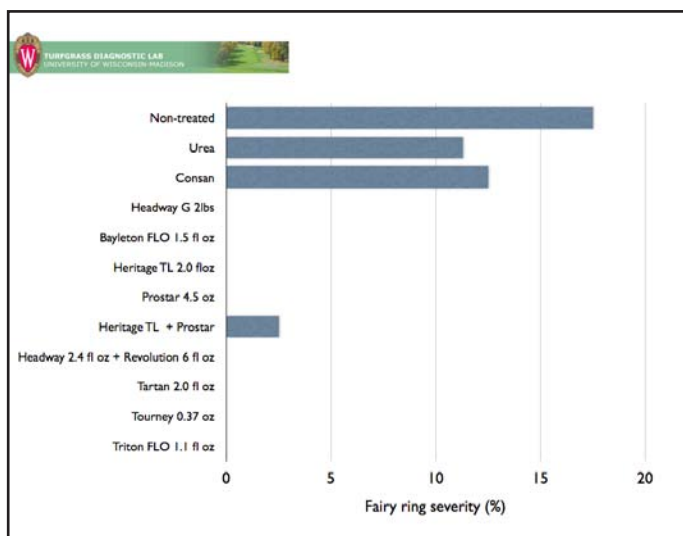
This particular report outlined a disease caused by a bacterium that had never been associated with creeping bentgrass in the US. As a result, the word spread rapidly and it seemed that everyone with dead turf had this bacterial disease. Yet there are some problems with the report. Only a few isolates were collected from a single sample submitted to MSU. In order to establish causality we have to conduct Koch's postulates, which is the only way to identify a new pathogen. Researchers at MSU were successful in causing symptoms on creeping bentgrass plants in controlled conditions, but the symptoms reported were only a mild necrosis of the leaf tips (Figure 6). While I do admit that it can be very difficult to reproduce symptoms exactly like those seen in the field, if this bacterium was responsible for such widespread destruction it should be more aggressive than it is in this report. The symptoms reported from the golf course in North Carolina were fairly large necrotic or

yellow areas (Figure 6). Looking at those two pictures side by side makes it very difficult for me to believe that this new bacterium is solely responsible. I do admit that the bacterium probably does facilitate decay of the tissue, but I think it got a lot of press last year because it was extremely hot!

The jury is still out on this new bacterial disease and the USGA did fund a research project to help shed some light on the picture. Basically the main thing we do not understand is what bacteria are associated with healthy and injured turfgrasses. Once we have a better understanding of the natural bacterial community, we can begin to work out this bacterial problem from last summer.



**Figure 6.** Image of stand symptoms from the golf course where the bacterial disease was first reported. Note the widespread necrosis and chlorosis on this creeping bentgrass putting green. Do these symptoms even partially resemble those depicted in the previous figure?



**Figure 4.** Fairy ring control data from a study conducted by Dr. Derek Settle at the CDGA. All applications were applied in May once soil temperatures reached 60°F and a subsequent application was made 28 days later.



**Figure 5.** Image of symptoms on creeping bentgrass induced by *Acidovorax avenae* in growth chamber experiments at MSU. Necrosis of the leaf tip was observed in a few of plants that were inoculated.

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## Keystone Diseases for Wisconsin Golf Courses

By **Paul Koch**, Turfgrass Diagnostic Lab Manager & **Dr. Jim Kerns**, Department of Pathology, University of Wisconsin - Madison

According to one Dr. R. T. Paine from the University of Washington, a keystone species is one that “exerts(s) influences on the associated assemblage, often including numerous indirect effects, out of proportion to the keystone’s abundance or biomass.” In simpler terms, these keystone species have a much larger effect on their ecosystem than their population level or size suggests they should. Examples abound in the natural world. Sea otters act as a keystone species by feeding on sea urchins, which feed on kelp and when unchecked can decimate the kelp forests that provide shelter and nutrients to hundreds of organisms. Similarly, grizzly bears act as a keystone species by transferring nutrients from their salmon catch into nutrients on the forest floor. Removal of these keystone species from the ecosystem wreaks havoc and oftentimes leads to local extinction of several other species that would have been difficult to predict.

Conservation biologists would likely cringe at my extrapolation of this term for use in turfgrass pathology, but there are keystone diseases on golf course turfgrass. Removal of these diseases from the “ecosystem” through proper control results in great upheaval in the golf course maintenance operation. The direct financial costs and benefits of proper control are usually clearly evident and easy to define. What about indirect benefits and savings to the superintendent? How are they defined and more importantly how are they affected by the removal of these important diseases?

These so called keystone diseases will differ depending on your geographical location. In Wisconsin and the Upper Midwest I would argue the keystone diseases are Typhula snow molds and dollar spot. While this may seem obvious because they are the two most common diseases in most years, it is the hidden costs and lost opportunities that are often overlooked that cement their status as Wisconsin’s keystone turfgrass diseases.

Both dollar spot (*Sclerotinia homoeocarpa*) and snow molds (*Typhula incarnata*, *Typhula ishikariensis*) are turfgrass diseases in Wisconsin that require chemical applications for effective control. Cultural control options such as fertility management, cultivar selection, and irrigation play an important role in disease control but do not reduce the disease to acceptable levels. Fungicides are applied once or twice in the fall for control of snow molds, and 6-10 times throughout the growing season to control dollar spot.

The direct cost of these applications to the golf facility is the substantial sum of money they cost to purchase and apply. Indirect costs to the facility are harder to define, but may include environmental effects of misapplied fungicides and use of resources that could be directed elsewhere such as labor and fuel. The direct benefit of these fungicide ap-

plications are the acceptable control of dollar spot and snow molds that can devastate a golf course when left unchecked.

What about the indirect, or hidden, benefits of not allowing these diseases to reenter the ecosystem? First the indirect financial benefits. Dollar spot and snow molds can be unsightly and even disrupt the play of the golf course. Discerning golfers will hence take their business elsewhere, and likely tell their friends as well. What about the indirect agronomic benefits?

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Turf that is heavily affected by snow molds or dollar spot often result in small or large patches of dead turf, which in Wisconsin is often then colonized by annual bluegrass (*Poa annua*). This separates snow mold and dollar spot from other turfgrass diseases in Wisconsin, which rarely result in widespread turf death. The continued failure to control these two diseases will result in a much more rapid conversion from bentgrass to bluegrass than would naturally happen, and at older, established courses can convert the perennial annual bluegrass types to the more susceptible annual annual bluegrass types.

Those that managed annual bluegrass in the summer of 2010 can recite the increased care and finances required to manage it during a hot, stressful period when compared to creeping bentgrass. Increased nitrogen fertility is required to keep it growing effectively. Increased irrigation frequency is required because of its shallow root system. Growth regulators are required in the spring to prevent seed head formation, and they also help in the summer to mitigate some stress on the plants. Replacing annual bluegrass that is inevitably lost to summer or winter stresses can exponentially increase costs depending on the severity of the damage.

There are certainly many other ways that annual bluegrass can move in to a creeping bentgrass stand, but dollar spot and snow mold remain one of the most important. When snow mold and dollar spot are removed from the equation in Wisconsin the landscape for managing high quality turfgrass becomes vastly different. So when the board approaches you to ask if we can really afford to

continue or implement an effective snow mold or dollar spot control program, the most viable answer might just be "can we afford not to?"

References:

**Paine, R. T.** 1995. A conversation on refining the concept of keystone species. *Conservation Biology* 9 (4): 962-964.



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By John Jensen and the Reinders Team

“Spring! I can’t wait!” It makes me smile when I think of the different mood swings we have throughout each and every year. For example, right now it’s 7 degrees outside, the sun sets at 4:00 PM and I want nothing more than for spring to hurry up and get here. Then it finally arrives and we all take the first opportunities to get outside and assess the condition of the course or of the industry, revenue starts to flow, people start to buy and we are off to the races. But wait, we are not totally happy yet because it will be much better for us once summer arrives. “I can’t wait!” With summer comes irrigation systems all fired up, courses at full staff to help ease the workload and steady temperatures that make that course oh, so green. All is right with the world and then.....

Welcome to superintendent “burn out”, somewhere around July 4th. I see it every year, just like clockwork. “I can’t wait until fall”, becomes the daily comments. Cooler temperatures, no more part time help, shorter days, some weekends off, less disease pressure, relief is right around the corner if only fall would get here.

Finally fall has arrived and we are all happy for a moment, but what about Labor Day? Aerification? Projects that either need completion before it snows or ones that are just starting? “I can’t wait for winter, I can’t wait for winter!” Then it arrives and it’s 7 degrees outside, the sun sets at 4:00 PM, and I’m back to wishing that spring would just get here. It always makes me smile.

### Great News!

Don Shaffer who is part of The Golf Club at Camelot and West Bend Lakes team has been battling esophagus cancer since August of 2009. (Esophageal cancer is cancer that occurs in the esophagus — a long hollow tube that runs from your throat to your stomach) A month after Don was diagnosed with cancer, he underwent surgery to remove part of the esophagus. Afterwards he was put on treatments of radiation and chemo. During this time, Don lost over 100 lbs but kept on fighting. More than a year later, he has been given a clean bill of health and is on his way to leading a normal life again.

In Don’s spare time, he can be found at a racetrack or other sporting events, always with camera in hand as his one true passion is photography. Good to hear you are doing well, Don. Keep on clicking that camera.

### GCOW Awards:

The Golf Course Owners of Wisconsin recently presented awards to Fairfield Hills and Mid Vallee Golf Course as Wisconsin’s 2010 appearance and maintenance courses of the year for a 9 hole and 18 hole course. Riverview Golf and Whistling Straits were both presented with 2010 course of the year in the 9 hole and 18 hole category. All of these are voted on by the public throughout the year on the GCOW web site. Congratulations to each course.

### Happy Retirement:

Bob Knutter, superintendent at Petrifying Springs Golf Course in Kenosha officially retired December 17th. Bob started at Pet’s on Jan 2, 1979 and prior to working at Petrify Springs held positions in the Chicago area at courses such as Knollwood CC, Bob-O-Link GC and Fort Sheridan GC. He won’t be totally retired as the plan calls for him to be back at Pet’s next year as a part-timer to help in the transition of the yet to be determined replacement. In retirement he plans on doing a lot of hunting, fishing, gardening and spending time with his wife Cheryl. One item he mentioned about his time at Pet’s is he will have worked with 4 different irrigation systems, as he calls it “Moody” (which describes the system well), a Rainbird MC-3S mechanical, a Rainbird Stratus2 and currently the installing of a Toro Lynx system.

I have personally known Bob for almost 20+ years now and he has always been a great guy to sit down and talk with. His long beard is his trade mark and it fits his personality. I couldn’t imagine him without it. If you are talking work, hunting or fishing a smile is always on his face. Have a great retirement, Bob. You deserve it.



Don Shaffer from The Golf Club at Camelot and West Bend Lakes Golf Course.



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### Industry News:

Lee Suwalski, Jr. has been promoted to superintendent of Kettle Hills Golf Course located in Richfield, WI. Lee earned a bachelor's degree in Environmental Sciences with an emphasis on Turfgrass Management at the University of Minnesota-Twin Cities in December 2008. Prior to his graduation, Lee interned for one season at Lake Geneva Country Club and two seasons at TPC-Twin Cities. Lee began his interest in the golf industry with his first job at Rainbow Springs in Mukwonago.

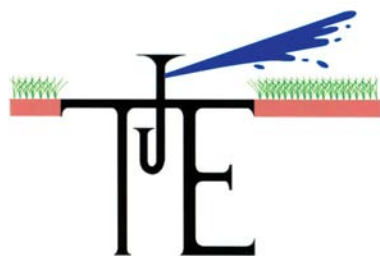
Tom Speltz has accepted the superintendent position at Trempealeau Mountain Golf Club. Before joining Trempealeau Mountain, Tom worked a few seasons for Joe Kuta at Hartford Country Club and most recently served as assistant superintendent for Randy Du Pont at North Hills Country Club in Menomonee Falls, WI. Tom is an avid hunter and outdoorsman as well as a die hard Brewers fan. Congratulations and see you on opening day!

### Trophies:

Kris Pinkerton of Oshkosh Country Club and his son had a great deer season as they both harvested some nice deer. Kris took his 11 point buck on opening morning of the deer gun season. This deer had an inside spread of 15 5/8". His son took a nice doe on the same morning which is always a great way to start a day. Congratulations!

Glenn Miller of Paganica Golf Course took a nice 10 point buck during the 2010 deer season. I have known Glen for over 20 years and his ability to find big bucks never ceases to amaze me. This is sure to be another wall hanger to add to his already awesome trophy room. Great job!

Please be sure to email me with any updates that we can add to the next issue. [jjensen@reinders.com](mailto:jjensen@reinders.com)



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# Great Way to Start the New Year

By Tom Schwab, O.J. Noer Turfgrass Research and Education Facility, University of Wisconsin-Madison

The WTA went all out to present an exciting and informative Winter EXPO to start out the New Year. The annual conference was held on January 18th at the Kalahari Resort in Wisconsin Dells. The Kalahari, a new location for 2011, received unanimous positive reviews from attendees for its location, great accommodations, and options for activities to do before and after the show.

The education and informative trade show were the other big reasons for EXPO's high marks. Many of the educational presentations looked back a year or two in the business of turf management to see what worked and what didn't. After the challenging summer of 2010 there were many aspects of turf care to examine what, if anything, could be done differently. And EXPO answered many of those questions.

EXPO started out in the main hall with presentations from our UW-Madison Turf Team of professors, including Drs. John Stier, Chris Williamson, Jim Kerns, and Doug Soldat. This is the group of experts that conduct the research on the very problems that occurred at many turf facilities in 2010. They concluded that much of the turf decline this past season was caused by excess rain in early and mid summer. The excess moisture, especially in poorly drained soils, held more heat in the rootzones than turf could tolerate. More aerification was recommended along with syringing at the proper time of day to cool grass. Aerification introduces more air to the soil which holds less heat than water soaked soils.

Dr. Soldat introduced new UW-Madison turf fertilization recommendations to main-

tain turf and help it recover from severe years like 2010. Research has shown the greatest amount of nitrogen is taken up by the plant when applied close to mid-September while the grass is still actively growing. Nitrogen take-up reduces the later in the season due to the plant slowing down and the plant taking up less water.

Dr. Stier showed current research and research from Dr. James Beard in 1973 that for cooling it is more effective to syringe the turf in late morning before the turf has a chance to heat up. This syringe does not particularly cool the turf down but it keeps it from heating up to unhealthy levels. John re-enforced how difficult the night time temperatures were for plants to overcome.

Dr. Kerns talked about what diseases plagued turf in 2010.

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