

TURFGRASS DIAGNOSTIC LAB



Figure 1: The purple- or reddish-colored turf with healthy annual bluegrass was a common symptom on many area golf courses this spring.

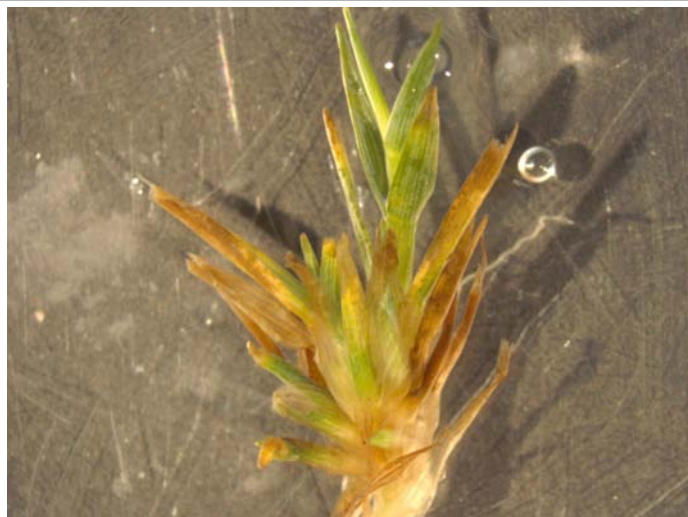


Figure 2: Another key characteristic of 'PGR patch' was the affliction of older (lower) leaves, while the newer leaves were green and healthy. The afflicted older leaves gave the stand the 'cast' of red or purple color.

Evidence in Support of PGR Damage

- No diseases or insect damage observed.
- PGRs recently applied in every case of purple/reddish-colored turf the past 5 springs where disease was not present.
- Frosts or cold temperatures frequently followed the PGR application, much more severe symptoms in 2011 with late season frosts.
- Symptoms more apparent in areas of PGR overlap.

Evidence Against PGR Damage

- Symptoms appear in roughly circular patches, but PGRs applied over entire putting surfaces.
- Not every course that has applied PGRs in spring has observed the discoloration.
- Few other reports of similar damage in other areas of the country.
- What type of growth regulator is causing the symptoms, and what is the mechanism?



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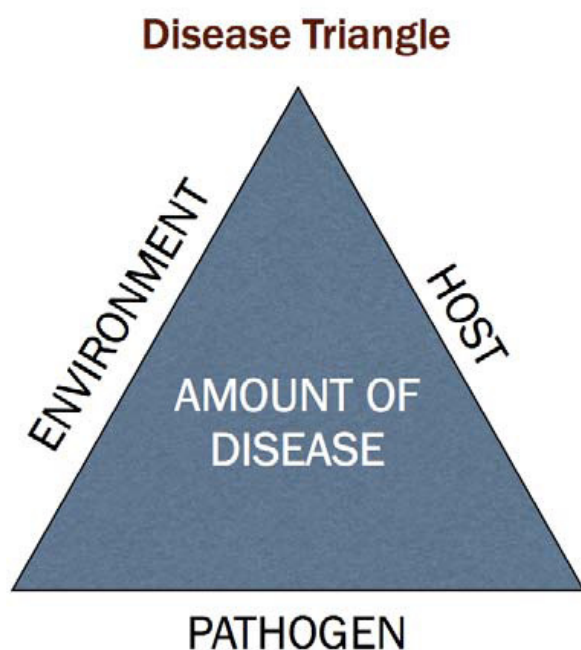
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Turfgrass Pathology 101

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

Throughout the summer there are many samples submitted to the Turfgrass Diagnostic Lab, yet the majority of the diagnoses we report are abiotic. Why? Plant diseases are actually a rare event in nature. Three very specific characters have to align at a certain time in order for a disease to develop—a virulent pathogen, a susceptible host and a favorable environment (2). Fortunately in turfgrass systems the plant pathogens are ubiquitous, turfgrass plants are susceptible to many pathogens, as are long-term perennial plants. Therefore the driving factor for turfgrass diseases is the environment. For some turfgrass diseases we know the specific requirements for infection and for others we know very little. However golf course superintendents can use the most basic fundamental of plant pathology, the disease triangle, to help them combat turf diseases.



Pathogens are parasites that feed off of living organisms. The most important group of plant pathogens in turf is fungi. Within the fungal kingdom there are many different groups, but the groups of primary importance are the ascomycetes and basidiomycetes. The distinction between these two groups is very important because it is the underlying

reason for fungicide selection. Ascomycetes typically are controlled best with products like boscalid (Emerald), pen-thiopyrad (Velista), iprodione (26 GT), vincozolin (Curlan), chlorothalonil (Daconil), and the DMIs (Bayleton, Tourney, Triton FLO, Trinity, Torque, Banner MAXX, Eagle, Rubigan). Examples of common turfgrass diseases caused by ascomycetes are dollar spot, Microdochium patch, anthracnose, take all patch, summer patch and leaf spot diseases. I did not include the QoIs because I do not believe ascomycete fungi are their strength, although QoIs can be very effective against anthracnose, summer patch, and take all patch.

Basidiomycetes on the other hand, are controlled well with QoIs (Heritage, Insignia, Compass, and Disarm), flutolanil (Prostar), fludioxonil (Medallion) and the DMIs. Examples of common turfgrass diseases caused by basidiomycetes include brown patch, brown ring patch, gray and speckled snow mold, yellow patch and fairy ring. Those pesky *Pythium* diseases are caused by organisms that are no longer considered fungi, they were reclassified a number of years ago into a new kingdom that includes diatoms and brown algae. This is the reason why products that effectively control *Pythium* diseases rarely have efficacy against other diseases. Fungicides that are typically most effective against *Pythium* diseases include mefenoxam (Subdue MAXX), fosetyl-Al (Signature), ethazole (Terrazole), propamocarb (Banol) and Stellar (fluopicolide and propamocarb). Just a basic understanding of how plant pathogens are classified can dictate fungicide selection.

Going one step further, knowing how fungi move and infect plants also will help with fungicide selection. The dollar spot fungus does not produce a spore and is thought to infect neighboring plants with hyphae. But where does the initial source of inoculum come from? The origin of initial inoculum remains unknown for this fungus. We think the initial source of inoculum may come from the seed and the fungus can survive in or on plant tissue during the winter. More to come on this topic so stay tuned. Since the dollar spot fungus does not produce a spore, contact fungicides such as chlorothalonil only provide adequate protection if reapplied on a frequent basis. Yet applications of systemic products like Emerald and the DMIs tend to provide better more long lasting protection against dollar spot.

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Tank mixtures utilizing a contact fungicide and a systemic fungicide were believed to have synergistic effects against the dollar spot fungus. An article in Plant Disease published in 2008 by Dr. Lee Burpee and Dr. Rick Latin demonstrated that synergistic effects did not occur that any increase in efficacy was likely just an additive effect (1). However, the need to mix systemic and contact fungicides stems from the fact that we do not know fully understand the conditions that favor disease development for each turfgrass disease.

Host refers to the plant and turfgrasses such as Kentucky bluegrass, fine fescues and bentgrasses are susceptible to disease. I wrote specifically about this issue in a previous GrassRoots, but basically there are cultivars of each species that are more resistant to certain disease.

However, no cultivar to my knowledge is immune. Physiological stress is something that can predispose turfgrass plants to disease. Alternating mowing and rolling is an exceptional way to limit stress on turfgrass plants and thereby may limit disease development regardless of the cultivar used. Although some new creeping bentgrass cultivars are more resistant to the dollar spot fungus, these cultivars still can get the disease. Presently it does appear that planting dollar spot resistant cultivars results in few fungicide applications, but the durability of resistance remains to be seen.

Environment is the biggest factor driving disease development. Yet for many of the most important turfgrass diseases we do not have a clear understanding of how the environment affects disease development. This is why

my program has focused a lot of effort into understanding dollar spot. If we can pinpoint the factors that influence dollar spot development and survival, we maybe able to develop management strategies that do not solely rely on fungicides. Our goal is not to completely eliminate fungicide applications, but rather to use it as a tool one that is used precisely and accurately. From our research, in collaboration with Dr. Damon Smith, we know that the dollar spot fungus needs five days of relative humidity at 70% or higher to produce foci (spots). Based on this we have developed a forecasting tool that accurately predicts dollar spot development, which in turn also accurately forecasts fungicide applications. Using this tool we have been able to save up to two fungicide applications in a season. This is without utilizing other cultural management techniques such as rolling, dragging, or fertilization.

Although we do not have much control over the macro environment, there are ways to manipulate the microenvironment. Research conducted by Paul Giordano, a PhD student at Michigan State under the direction of Dr. Joe Vargas, has shown that rolling once a day, either morning or afternoon, significantly reduced dollar spot development. Since differences were not detected between morning and afternoon rolling treatments, Giordano et al.



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investigated volumetric water content (VWC) and microbial populations in the top 1-inch of soil. They found that VWC and microbial populations were elevated (3). Although more research is warranted on this topic, Giordano has demonstrated that simply rolling can modify the microclimate.

Other ways to modify the microclimate is to remove trees to improve light and air penetration. This could help with summer stress and winter damage. Light frequent topdressing was shown to minimize anthracnose severity. The thought behind this was protection and insulation of the crowns. Removal of dew by dragging or mowing significantly limited dollar spot development and could be another way to manipulate the microclimate in order to reduce fungicide inputs. Of course aerification is one of the best tools for microclimate manipulation and typically promotes vigorous turf growth. Understandably many of the strategies we discussed may not be feasible at your course, but maybe there are

a few techniques outlined in this article worth trying. After all isn't limiting pesticide usage a good thing, one that could be marketed to golfers???

References:

1. Burpee, L., and R. Latin. 2008. Reassessment of fungicide synergism for control of dollar spot. Plant Dis. 92: 601-606.
2. Couch, H.B. 1995. Diseases of Turfgrasses. Krieger Publishing Co. Malabar, FL. pgs. 13-17.
3. Giordano, P., J. Vargas, T. Nikolai, and R. Hamerschmidt. 2010. Investigating mechanisms of dollar spot reduction through light-weight rolling on creeping bentgrass putting greens. ASA-CSSA-SSSA Annual Meeting Abstracts. Long Beach, CA.

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Technology For Your Game

By Jeremiah Hoffmann, PGA Professional, Rolling Meadows Golf Course

Turf managers have used science for years, with soil temps, soil pH, fertilizers and many other areas that I am sure to overlook. Recently golf professionals are getting in on the act when fitting customers with clubs to improve their game. Gone are the days where you simply walk into a golf shop and purchase a club off the shelf or after hitting a couple balls on the range.

Adult golfers develop swings with unique characteristics so in theory their clubs should have unique characteristics beyond loft and shaft flex. In years past golfers could spend years trying new clubs with different characteristics to try and find clubs that match their swing. Launch Monitors use Doppler radar technology to make measurements immediately after the ball leaves the club.

Spin rates, launch angle, angle of decent, club head speed, ball speed are measured and should be taken into consideration when investing in new clubs.

Spin rate is measured in revolutions per minute (RPM) and determines how far and how straight you can hit a golf ball. Generally, players with higher ball speed will want to keep their spin down, while slower ball speeds will dictate that you increase spin to maximize trajectory and distance.

Launch angle is Measured in degrees above horizontal and determines how high you hit the golf ball. Generally, most golfers would hit it further if they launched the ball higher

Ball speed is measured in miles per hour (MPH) and is how fast the golf ball is traveling after it's been struck. Faster ball speeds lead to greater distance (as long as spin and launch are also optimized).

All three factor determine distance and although for

most players High launch + low spin = greater distance, there are exceptions to that rule. If your ball speed isn't high enough, you actually will need MORE spin in order to maximize distance.

Launch monitors used to be reserved for club manufacturers due to cost and the challenge of calibration. Recent improvements in the technology have reduced the price and allowed the units to be portable so most golf shops and club fitters can afford to offer the service to their customers.

As a player you need to consider the following questions about your driver: Do you know if the driver you are playing is best for you? Did you know that the weight can affect trajectory? How about if you are playing a shaft that is too stiff? What will the consequences be? Lower lofts don't necessarily equal lower, longer shots. Is the loft of your driver helping you launch the ball at the most effective angle?

So what should you do to improve your golf game? Evaluate your recent rounds and decide which part of your game needs the most help. That might be driving the ball, iron play, short game or putting. Once you have decided what needs the most help, start with that and talk to your professional about your options. A simple change in equipment can help you cut down on a slice with the driver allowing you to put the ball in play so you can play that next shot to the green.

If your club does not offer a launch monitor it may be something the golf shop will want to invest in for the benefit of your customers.

Until next time, here's to rain at night and golfers that don't complain!

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May Meeting at Royal St. Patricks

By Brett Grams, WGCSA Chapter Manager

Attendees of the May 17th golf meeting at Royal St. Patrick's GC in Wrightstown, WI were greeted with windy but sunny weather. Although not ideal golf conditions it was much better than the snow that caused our first golf event to be canceled just a month earlier. The lousy spring golfing weather in WI was a common topic of discussion as our educational topic got underway. Our own Dr. Jim Kerns of the University of Wisconsin – Madison was our featured speaker. His presentation was titled "Hit'em Hard and Hit'em Early" referring that preventing out breaks of Dollar Spot, Take-All Patch, and Fairy Ring is best done by the proper timing of fungicide applications before symptoms are seen. The informative session was a review of each of these diseases and centered on identifying timing the preventative applications to control symptoms as the turf goes into stressful periods later in the season. As always Dr. Kerns had a great presentation and answered questions as we had a great burger and brat lunch prior to heading out on the course.

The shotgun start of the event found 44 golfers ready to get a chance to play the links style golf course. Our host Superintendent Hank Koss was able to have the course groomed to summer like conditions and the links style course was certainly challenging with the stronger winds. The course was opened in 2003 and features many links style features most noticeably the fescue swept rolling terrain. The course also combines water carries over and

around numerous ponds. The course is spread out and meanders through the large property which is also being developed for real estate. The course is just off busy highway 41 and halfway between Green Bay and Appleton. The modern clubhouse was a great place for our meeting and the course also has a large practice facility with driving range and short game area that is used extensively.

The golf event was a two-person best ball format. In the net division Randy Dupont and Todd Fregein were our champions with a 62. Second place went to Ryan Knick and Kenton Rhoades with a 63 while Phil Spitz and Cubby O'Brien finished 3rd with a 64. The gross division saw the low score of 75 by Gene and Chris Hogden take top prize. Trailing just behind in second place was Scott Bushman and Peter Meyer with a 76. Ed Witkowski and Rod Johnson were just one shot back in 3rd with a 77. The flag events were won by Scott Bushman (closest to pin #4), Tim Schmidt (long drive #7), Joe Sell (long putt #9), Jim Kerns (long drive #14), and Jack Schwichtenberg (closest second shot). Congratulations go to Greg Kallenberg who won the closest to the pin prize on the 12th hole with his first ever Hole-In-One! The WGCSA, members, and guest of the event would like to thank the Event Sponsors. This support and generosity provides the funding for the great prizes and awards at all of our events. THANK YOU SPONSORS!

Coming Events!

Monday September 19th - Wee One Fundraiser @ Pine Hills C.C. Sheboygan

Fri Oct 7th and Sat Oct 8th - WGCSA Couples Weekend @ Minocqua CC, Minocqua, WI (w/NGLGCSA)

Monday October 3rd - WTA Fundraiser @ Oconomowoc GC, Oconomowoc, WI

Tues Nov 15th & Wed Nov 16th - WGCSA Golf Turf Symposium @ American Club, Kohler

Feb 27 to March 2 - GCSAA Educational Conference and Golf Industry Show - Las Vegas, NV

5/17 MEETING AT ROYAL ST. PATRICK'S GC



EDUCATIONAL SPEAKER:
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TOPIC:
HIT'EM HARD & HIT'EM EARLY
TIMING PREVENTATIVE DISEASE APPLICATIONS



Greg Kallenberg (L) being congratulated by
Scott Bushman (R) for his first ACE!



Gross Champions Chris (L) and Gene (R) Hogden



HOSTS:
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Phila Spitz (L) and Cubby O'Brien proving that is fun coming in 3rd!

How I Would Manage Potassium on Cool-Season Turf: Part II

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

In Part I (last issue), I outlined the reasons (and science of) why I feel potassium is not a good choice as a winterizer, but instead makes more sense as a late spring, early summer treatment when soil test levels are low. In this article, I will just present my potassium management strategy if I were managing a golf course. I'll start with fairways.

Fairways

I'd apply potassium only according to soil test levels. I'd use modern interpretations of optimum (i.e. 50-100 ppm, depending on soil test) instead of the more common values of 200-400 ppm still used by most soil testing labs. I expect even the 50-100 ppm levels will be adjusted downward as more soil test calibration studies are conducted, but for now 50-100 is fine.

If/when potassium dips below that soil test threshold, I'd make a 1 lb/M application in May. I'd re-test the soil in fall to determine if another application is warranted the fol-

lowing spring. Why May? The evidence for potassium improving drought tolerance is much more convincing than the evidence that potassium increases winter hardiness (although, I believe the opposite is true for warm season grasses). Also, Dave Moody and Frank Rossi's work at Cornell University has clearly linked increased potassium in the leaf to increased severity of gray snow mold. Similarly, researchers at UMass (Webster and Ebdon, 2005) reported more severe gray snow mold at higher K application rates on ryegrass. In summary: there is only weak evidence that K increases cold tolerance for cool season-grasses, strong evidence that it increases snow mold, decent evidence that it improves drought tolerance.

If my fairways were something other than sand, I'd apply muriate of potash (0-0-60), if they were sandy, I'd consider using a polymer coated K source or spoon feeding in 0.25 lb/M increments if practical.



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