



Applying a DMI fungicide after the second true mowing of the year can delay the onset of dollar spot anywhere from 8 to 12 weeks into early summer.

"A lot of superintendents treat for fairy ring and waitea patch in that 55- to 60-degree soil temperature range at a 2-inch depth. Generally we're recommending a

DMI for those diseases, so if you're treating for fairy ring or waitea patch with a DMI, you're likely to get dollar spot control as well. You're really targeting multiple dis-

eases with that early spring application."

Golembiewski advises that, instead of relying on calendar dates or time periods, superintendents should look at predictive models and evaluate environmental conditions.

"You really should be looking at soil temperatures and growing degree day models and environmental conditions as guides versus a calendar-based approach, and I think most superintendents are doing that," Golembiewski says.

"Using those predictive models, we see a lot of folks targeting that early season application to get that eight- to 12-week delay as far as the onset of dollar spot – but also targeting multiple diseases in that time period," he adds. **GCI**

Jason Stahl is a Cleveland-based writer and frequent GCI contributor.

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BY ADAM MOELLER

Dollar Spot – An appropriate name for a costly nuisance disease

Dollar spot is expensive to control on fairways, but a little tolerance for this nuisance disease can result in significant cost savings at your golf facility.

Dollar spot (caused by the fungus *Sclerotinia homoeocarpa* F. T. Bennett) is a very common disease on golf courses, especially those with creeping bentgrass or *Poa annua* (annual bluegrass). It was originally named more than 70 years ago because infected turf resembled silver dollars. At present, dollar spot is a perfect name because it is expensive to control on fairways. Budget constraints are an increasing concern for many golf facilities, and fewer fungicide inputs to control dollar spot present a great cost

fairways depends on many factors; however, the amount of disease occurrence that is acceptable at your golf facility is the driving force in most cases. Dollar spot control with cultural and chemical inputs is never perfect, and some amount of disease breakthrough on fairways is likely each year despite regular use of preventative inputs. How much dollar spot is acceptable at your golf facility? This is a question that should be asked.

Before this question can be answered, the impacts on playability must be understood. The dollar spot pathogen blights

be slightly sunken, but it is unlikely to be sitting on bare soil. The infected turf will be discolored, matted down, and sparse, but very playable. Remember, there are no guarantees for perfect lies, even in fairways. Is it ideal to play shots from turf with symptoms of dollar spot? Probably not, but an increased tolerance of dollar spot creates a significant cost saving opportunity for golf facilities looking to reduce maintenance costs.

Many golf facilities with low budgets simply cannot afford to treat fairways for dollar spot control, yet golfers still enjoy the course. Play the ball as it lies and play the course as you find it are fundamental principles of golf, and this includes turf affected by dollar spot. If golfers become more tolerant of dollar spot incidence, fungicide use can be reduced. This allows turf managers to make fewer fungicide applications each year and save money in the process. The cost of making a single preventative fungicide application can vary greatly, but a conservative estimate is \$2,000 to \$5,000 for an 18-hole golf course with 25 to 30 acres of fairways. Forgoing just one or two fungicide applications each year could help pay for many important golf course maintenance items, such as labor, materials like top-dressing sand, or even allow for a small budget reduction. Regardless, fewer pesticide applications for dollar spot control results in a more economically and environmentally sustainable golf facility. Spending large amounts of money on cos-

“A dollar spot outbreak can severely compromise ball roll on a putting green because it creates small depressions, often referred to as pitting, in the turf canopy.”

saving opportunity for golf courses without significantly impacting playability.

Dollar spot can develop on golf courses in the Midwestern and Northeastern U.S. for most of the growing season, while many other diseases are found under more specific environmental conditions as illustrated by Figure 1. The long duration of seasonal activity requires superintendents to budget dollar spot prevention programs accordingly, with many making 5 to 10 (or even more) applications per year on fairways. The number of applications made to prevent this disease on

turf leaves, creating 1- to 2-inch-diameter spots of tan, matted grass. Because the disease does not infect turfgrass roots or crowns, it is primarily a cosmetic problem and not usually lethal to the turf.

A dollar spot outbreak can severely compromise ball roll on a putting green because it creates small depressions, often referred to as pitting, in the turf canopy. On fairways, playability can be affected by the disease also, but it is almost always more of an aesthetics nuisance than a major problem with ball lie. For instance, a ball lying on infected turf may

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metic problems is not money well spent, and fewer fungicide inputs targeting a disease that is rarely lethal to the turf will serve to make the game of golf more affordable for everyone.

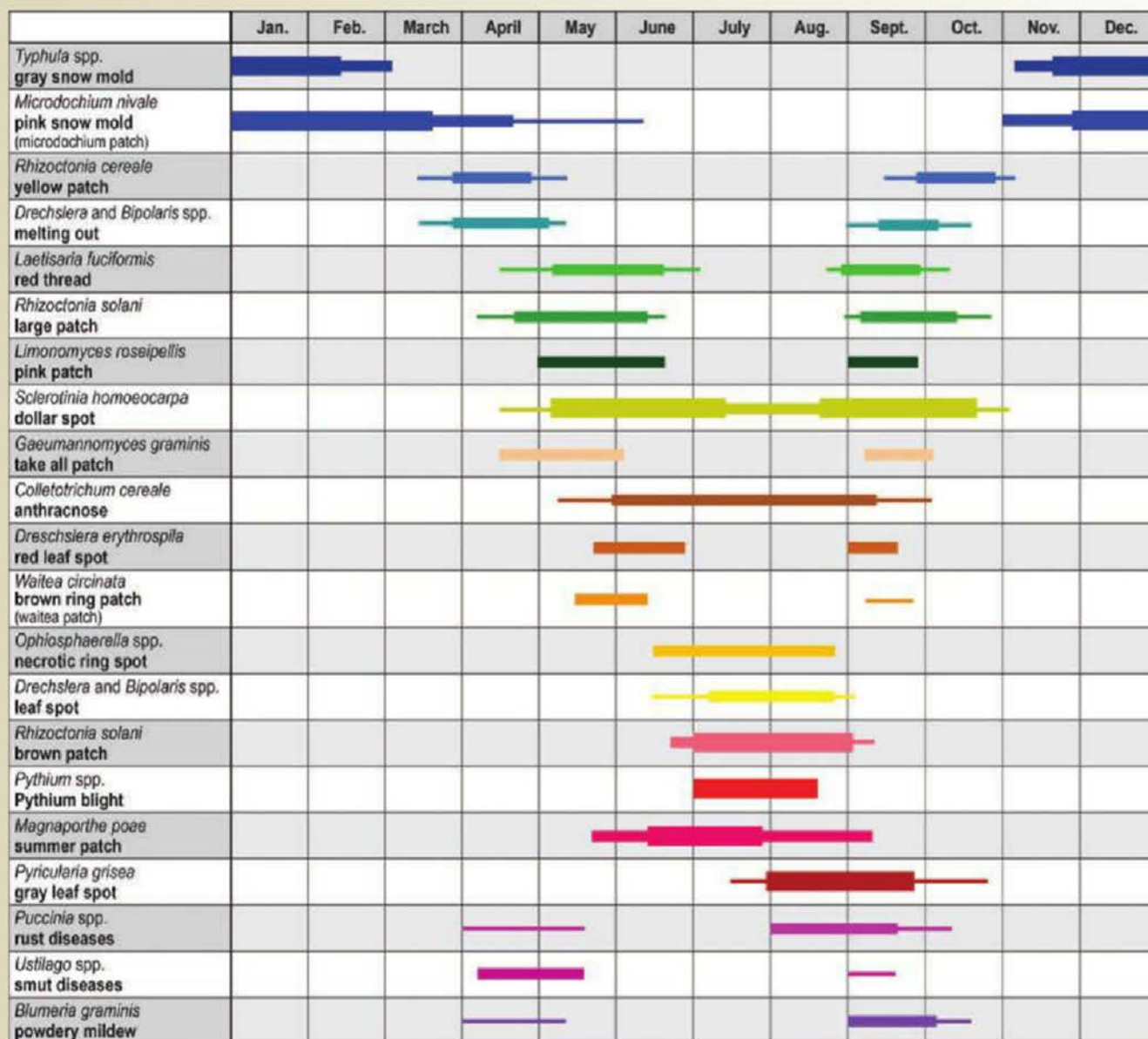
Reduced fungicide use for dollar spot does come with some challenges beyond golfer acceptance. Mainly, what happens if dollar spot outbreaks get really bad? The amount of disease breakthrough is not a linear relationship with fungicide use. Sometimes a curative program will result in very little disease, while at other

times moderate disease could occur. New fungicides with good curative efficacy against dollar spot and long residual activity will allow for this type of program to be utilized more successfully than ever before, even if severe outbreaks occur. With appropriate rotation of systemic active ingredients and tank-mix combinations with contact active ingredients, fungicide resistance concerns can be minimized as well.

Curative fungicide treatments require full application rates, while preventative

applications usually are half the curative rate. Thus, one could argue that two preventative applications will cost the same as one curative application and probably result in less disease. But if the disease does not occur or if the outbreak is small to moderate because of a favorable change in the weather, the money spent to prevent dollar spot could be wasted. Budgeting for preventative versus curative control strategies against dollar spot is difficult, but the costs of curative fungicide programs will not exceed the

Figure 1: Seasonal activity of turfgrass pathogens in the Midwestern and Northeastern U.S. Figure courtesy of Dr. Richard Latin, Purdue University. Originally published in Seasonal Activity of Turfgrass Pathogens (BP-125-W). bit.ly/1E1F8q



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costs of preventative programs if golfers are more tolerant of the disease

Researchers from Oklahoma State University, Pennsylvania State University, Mississippi State University, the University of Wisconsin, and the University of Tennessee have developed an accurate model for predicting dollar spot activity and outbreaks. This model, which uses site-specific weather data as the driving force, is a great tool that will allow superintendents to make more informed decisions on when to apply fungicides for dollar spot, and it will aid in reducing costs associated with controlling this disease. Accurate predictions of dollar spot activity will allow fungicide appli-

cation intervals to be stretched and may even eliminate preventative applications altogether. If all goes well, turf managers will have access to this model by 2014.

The USGA Turfgrass and Environmental Research Program has funded plant breeders for many years to develop turfgrasses that are more resistant to dollar spot. To date, dozens of varieties of creeping bentgrass have been released with superior resistance to dollar spot. Unfortunately, many of these varieties have been underutilized because new golf courses are not being built frequently and fairway regrassing has remained limited because of the associated disruption. The combination of a superior grass

and the soon-to-be-available dollar spot prediction model should make adopting a curative-only fungicide program easier for golf facilities trying to reduce expenses.

Every golf facility is encouraged to examine its dollar spot program and identify the potential to save budget dollars. Consider the financial reward of tolerating more dollar spot, and remember that this approach, while aesthetically noticeable, will have minimal impact on playability. With increased golfer tolerance of dollar spot and a committed golf facility, reduced fungicide applications and costs savings are possible. This is a great way to make golf more affordable. I hope you agree. GCI

Adam Moeller is an agronomist in the USGA Green Section's Northeast Region.

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LOWERING THE CHEMICAL BOOM

How aquatic dyes are helping superintendents to better manage and manicure their water.



By William Olmstead

Dan Cremins knows what's wrong with his water. A few years ago, during the middle of the playing season, the superintendent at Sterling Mountain in Woodland Creek, Colo. watched helplessly as three of his water hazards began to stagnate and overgrow with weeds and algae.

"There was really no way to solve the problem. We got such a late jump on the season that even herbicides and algacides weren't doing the trick," he says.

Since then, Cremins has taken the time to properly plan for his hazards, using some chemical assistance to save hard work and money throughout the year.

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WATER DUTY. Properly caring for lakes, ponds, and streams adds to both a course's beauty and its playing difficulty. A well placed lateral hazard can create a stunning fairway view for players while simultaneously demanding meticulous approach shots. As a result, understanding these hazards is important to establishing and enhancing course value. Without proper planning and execution they can become a nightmare for superintendents.

THE PROBLEM. From the Barry Burn at Carnoustie to Ike's Pond at Augusta, hazards have always been a huge part of courses and course management. Not surprisingly, superintendents are constantly seeking unique and cost-effective ways to understand and manage them.

"It can be intimidating for many managers who are, naturally, mostly focused on turf," says Shaun Hyde, water quality and technology leader at SePro Corp. "Sometimes, they fail to establish a proper water treatment program, or they get behind and the problem worsens. The solutions don't immediately present themselves."

Submerged aquatic weeds and algae, like all plants, require nutrients to grow and flourish. In untreated water, ultraviolet light reaches the pond floor, allowing these plants to photosynthesize, growing larger and taller as a result. The area in which this occurs is called the photic zone. If unmitigated, this plant growth can overrun the surface and become unsightly, detracting from course beauty and giving off unpleasant odors as the natural result of biochemical breakdown. Understandably, no golfer wants to play on a course dotted with stagnant ponds and silt-laden lateral hazards. Simultaneously, beautifully managed ponds are an indicator of a well-kept course and a capable staff.

THE SOLUTION. Aquatic dyes allow superintendents to control plant growth and establish consistent water coloration through the year. These dark dyes, properly diluted throughout the water, filter out ultraviolet light and prevent plants and weeds from accessing the energy they need to grow. The dye also allows

start on the season."

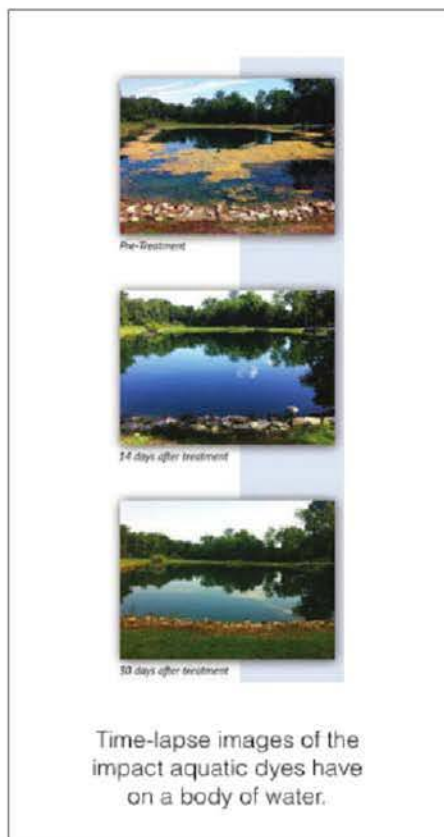
But, he notes, when the plants break through, you need to bring in other tools, like an algaecide or an herbicide.

The dyes are easy to use but require some advanced planning. A recent study at the Ohio State University found them to be most effective when applied in March or early April, depending on regional climate. If the dye is applied late in the season, plants will have already grown to the surface, making the dye ineffective.

"Dyes can be proactive or reactive, depending on the time of year when they are applied" says Troy Bettner, turf and ornamental director at SePro.

Once applied, the dye will naturally dilute in just a few hours. No spray application is needed. The Ohio State study recommends measuring the dye dilution within 48 hours of the initial application. To do so, take a white, weighted object (such as a painted 5-pound free weight) on a length of twine or string and carefully lower it into the water, measuring the exact depth at which the object is no longer visible. Use the initial depth measurement as your baseline level to maintain throughout the season. Every two or three weeks, continue to measure the visibility depth. The study recommends that once the measurement increases by 25 percent (i.e. the baseline measurement was 24 inches, the visibility depth is now 30 inches,) more dye should be applied. To eliminate variables, it's best to conduct the visibility test in the same area of the pond at the same time of day throughout the season. Maintain dye levels through the end of August, or until temperatures drop and growth slows. **GCI**

William Olmstead is GCI's assistant editor.



superintendents to color their ponds to their specific preference. Dark black dyes are the most popular, giving ponds a shiny, mirror-like surface.

"It gives a sense that the water is naturally colored, and that's the key," says Joe Lara, chief product manager at BASF. "It's also a great foundational product to start a management program at the beginning of the year, a nice soft tool to get a jump

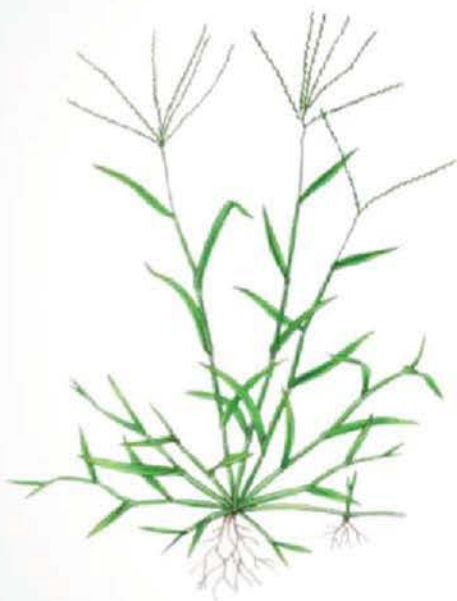
More online

For more information on aquatic dyes, check out an Ohio State University Extension Factsheet by entering bit.ly/1fWwpMR into your browser.

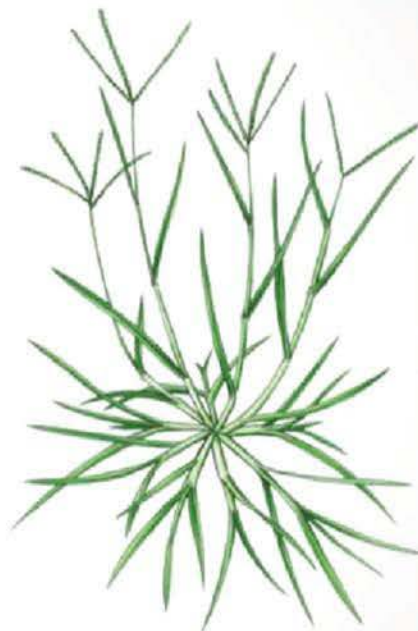




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[fig. w-42]
Digitaria sanguinalis



[fig. w-76]
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Brian Vinchesi, the 2009 EPA WaterSense Irrigation Partner of the Year, is president of Irrigation Consulting Inc., a golf course irrigation design and consulting firm headquartered in Pepperell, Mass., that designs irrigation systems throughout the world. He can be reached at bvinchesi@irrigationconsulting.com or 978/433-8972.

GIS RECAP

Some of the industry's irrigation innovations from this year's big show.

Over the last decade, irrigation equipment manufacturers with new products to debut wait for the Golf Industry Show (GIS) show to unveil them. This year was no different in Orlando.

Toro had the biggest irrigation product/enhancement announcement with its **Infiniti Series** of sprinklers. This new series takes the internal parts of the 835S and 855S models and encloses them in a new case that is 100 percent top serviceable – no digging necessary. The cool thing is you can work on almost all of the sprinklers without turning off the water. It's not the first top-serviceable golf sprinkler – Hunter has had one for several years – but it is the first where the water can stay on.

Viewed from the side, the sprinkler looks big and ugly, but in the ground the case has the exact same surface area as the 850 series. The 835 has a slightly larger surface area than its older sibling. I like that the actuator switch is no longer on the side where it gets clogged with grass clippings and dirt, or has grass growing in the hole and getting in the way. The wire connections are located in the sprinkler case, although they may be smaller than you're used to, they are easy to get to and not in the soil. The pilot valve is readily accessible from the top of the case. And if you select a decoder control system, there is also room for the decoder... although things get a little tight.

Lastly, the Infiniti Series has a large blank area to engrave yardages, and it

has room for your golf course logo. Of course, you pay a premium for these sprinklers compared to Toro's existing product line, so you need to decide whether you can justify the added expense.

New pump station technologies were on display, as well. Flowtronex unveiled an upgrade to its Oasis con-

trol system, which is mostly used for control panel retrofits. The new Oasis EX has additional features, such as remote and web monitoring that are more consistent with the technology you see in Flowtronex's new pump station control panels.

“Given the experience of their staff, the pump station included all of the necessary features that you want to see on a golf pump station. It will be interesting to see how quickly they make an impact, if at all.”

Watertronics displayed a new larger, touch screen interface that is really a computer on the front of its panel. Watertronic's Watervision 6 monitoring software, which came out two years ago, is very good graphical monitoring software. On the new panel it is included right on the touch screen with the operator interface.

Similar to the monitoring screen on your computer or smart device, when you go down to the pump station you can use the monitoring screen as your user interface or use the standard pump station touch pad/screen that is running at all times.

There was also a new golf course

golf market. Given the experience of their staff, the pump station included all of the necessary features that you want to see on a golf pump station. It will be interesting to see how quickly they make an impact, if at all. Yet to be seen is whether the MCI station will be able to communicate with any irrigation central control system software on the market.

Harco introduced an enhancement to their epoxy-coated, angle globe isolation valves by adding a stainless-steel seat. Regardless of the manufacturer, all of these valve types on the market have a stainless-steel seat.

Lastly, and to no surprise, a number of new or enhanced apps were unveiled, mostly to do with remote control or monitoring of the irrigation system. While some are completely new, others are primarily enhancements to existing apps or software. **GCI**



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