Dealing With Dreaded Dollar Spot

Where is the industry going in fighting this ever-present fungal disease?

BY PAUL VINCELLI

If you were to ask superintendents to list the problems they would most like to see go away, you can bet that dollar spot would be near the top. Although a number of diseases plague turf across the country, dollar spot remains the most troublesome and persistent nationwide.

As long as there has been turfgrass management, dollar spot has been a problem. Yet even today, more fungicides are used each year to prevent or treat dollar spot problems than for any other turf disease. Unfortunately, when you look at what promotes dollar spot, the answers usually involve the cultural, biological and chemical trends that make up current turfgrass management practices.

Cultural influences

As the popularity of golf has grown, mowing heights have gone down to accommodate players' demands. The closer you mow, the more manicured the appearance of the turf and the faster the putting surface. The tighter the fairway, the easier it is to play. But there are downsides to this practice.

Lower mowing heights increase the stress on any turfgrass and the susceptibility to numerous diseases. So while changing standards improve course conditions, they also increase the potential for disease — especially dollar spot.

The same is true for other trends for putting-green management, such as maintaining low soil moistures and minimal nitrogen content during the summer. Lower nitrogen content slows turf growth rates, which helps keep the playing conditions more consistent throughout the day. Importantly, it also helps reduce the potential for diseases like pythium cottony blight and brown patch. But lower nitrogen fertility also makes the turf more susceptible to dollar spot.

Reduced irrigation frequency and lower soil moisture have the same effect. These factors manage *Poa annua* infestation, but turf growing in soil with low moisture is more prone to dollar spot. In many ways, it's a trade off each superintendent needs to consider.

Dollar spot remains one of the most troublesome and persistent disease problems nationwide, despite new chemistries developed to fight it.

Soil compaction is another factor in disease development that is caused by heavy play. Compacted soil does not allow the turf to become as well-rooted, causing it to suffer a stress level similar to dry turf. The foot and golf car traffic associated with heavy play may also increase the turf's susceptibility to dollar spot.

Biological factors

In recent years, we have also seen changes in biological factors in turf that influence dollar spot. Penncross creeping bentgrass is a popular variety that I used to consider rather susceptible to dollar spot. However, a number of new varieties have been introduced in the past decade or so that are hypersusceptible, even more so than Penncross. Some of these include Backspin, Century, Crenshaw, SR 1020 and 18th Hole.

Naturally, these newer varieties brought benefits. Crenshaw, for example, with its high tolerance to hot, arid climates, helps superintendents maintain creeping bentgrass on greens and fairways under harsh conditions where other varieties of creeping bentgrass would perform poorly. Unfortunately, when planted in sites where dollar spot pressure is moderate to severe, these varieties suffer extensive damage unless treated heavily with fungicides.

One can control dollar spot on these varieties with fungicides, at least for a time. However, the use of hypersusceptible varieties increases the potential for the development of fungicide-resistant strains of dollar spot. So fungicides are at best a short-term solution. The key to selecting a variety is to weigh these and all other pertinent factors, and to select the variety that represents the best balance of strengths and limitations for your conditions.

Another biological factor is a golf course's recent history of dollar spot infestation. Any location that has experienced several years of repeated dollar spot appearance will have accumulated higher levels of fungal biomass in the turfgrass ecosystem. This situation increases the likelihood and severity of disease appearance each spring, which creates a scenario of ever-worsening conditions. More disease appears, and more efforts are needed more often to keep it under control.

Chemical factors

Industry statistics consistently show that fungicide treatments alone represent 50 percent of a typical golf course chemical budget. This high expense is because of the low tolerance for disease damage in golf course settings. Disease management is often a complicated challenge because there are numerous diseases and many treatment options.

With regard to dollar spot, there is no question that many golf courses have strains of the dollar spot fungus with reduced sensitivity to several of the available treatments. Reduced sensitivity to demethylation inhibitors (DMIs), which are also called sterol inhibitors, has been found in many situations across the Midwest and beyond. Examples of the DMI fungicides are propiconazole, triadimefon, myclobutanil and fenarimol. Other fungicides to which the dollar spot fungus has developed resistance in many locations are thiophanate-methyl products and fungicides in the dicarboximide class, such as iprodione and vinclozolin.

Foot and golf car traffic may also increase the turf's susceptibility.

Although the emergence of fungicide resistance on a particular site can neither be predicted nor prevented, it is possible to reduce the risk of resistance. Superintendents can benefit from

Continued on page 72

Continued from page 71

understanding the difference between a multisite inhibitor and a fungicide with a single target site. Fungicides that have multiple biochemical targets in the fungal cell, such as mancozeb and chlorothalonil, have little risk of resistance. In contrast, fungicides that poison a single biochemical target in the fungal cell, such as the DMI fungicides and thiophanate-methyl, are vulnerable. All a fungus has to do is mutate to a form that can overcome the poisoning of that one biochemical step, and it's able to infect and cause disease despite fungicide applications.

With fungicides that are at risk for resistance, such as many of the best dollar spot materials, it is important to avoid applying the same fungicide over and over because this runs the risk of selecting a resistant strain. Thus, it's highly recommended the superintendents rotate and tank-mix fungicides in different chemical classes that have different biochemical modes of action.

University of Kentucky turf professor Paul Vincelli recommends rotating and tank mixing fungicides from different chemical classes that have different biochemical modes of action.

The following is an example of a strategy that shows how a varied combination of products can work best to reduce the risk of fungicide resistance in the dollar spot fungus:

- First application: multisite inhibitor A with single site inhibitor X.

- Second application: multisite inhibitor A with single site inhibitor Y.
- Third application: multisite inhibitor A with single site inhibitor Z.

This principle of rotating among fungicides extends to other fungicides in the same chemical class. For example, a superintendent may spray, at two-week intervals, three very effective products: myclobutanil, propiconazole and triadimefon. On the surface, this rotation may appear to include different fungicides, but consider this: They are all DMI fungicides that poison the fungal cell in exactly the same way.

Therefore, on the biochemical level, these fungicides are all identical — one might as well have sprayed the same fungicide. Thus, when planning a dollar spot spray program, pay attention to selecting products from different fungicide classes.

The future

Considering the potential for resistance to current dollar spot treatments, it's important to use the available treatments as wisely as possible. Use cultural practices to reduce dollar spot to the extent possible. Reduce morning leaf wetness by dragging fairways on the days that you don't mow. When establishing a new sward, give serious thought to the dollar spot susceptibility of the varieties under consideration.

Because of the continuing importance of dollar spot, chemical manufacturers continue to search for new fungicides with entirely new biochemical modes of action. This is a welcome trend. If you have a greater selection of fungicides with differing modes of action, you have a wider selection of weapons at your disposal for your rotations and tank-mixes.

The combination of new product options and cautious planning can be the key to improving dollar spot control in the long run.

Vincelli is a professor of turfgrass pathology at the University of Kentucky.