TURFGRASS TRENDS

DOLLAR SPOT

Dollar Spot 101

An overview of the common and costly turfgrass disease

By J.B. Workman and C. Waltz

A turfgrass disease is caused by four factors occurring simultaneously: a susceptible host; a pathogen capable of infecting the host; environmental conditions that favor the development of disease; and sufficient time for infection to occur. Disease can play a role in determining the success or failure of a turfgrass stand. Most turfgrass diseases occur on a seasonal basis but can reoccur within a growing season.

The majority of turfgrass diseases are caused by fungi — simple organisms that do not have the ability to produce food photosynthetically because they lack chlorophyll. Consequently, they satisfy nutritional needs from living hosts, while some feed solely on organic residue. Parasitic fungi are those that live as saprophytes until environmental conditions become favorable for infecting host plants. Facultative saprophytes function primarily as parasites but can subsist temporarily on decaying organic residue.

Dollar spot, among the most common and costly fungal diseases on golf courses, athletic fields and home lawns, is caused by the facultative saprophyte *Sclerotinia homoeocarpa*. Dollar spot was initially described as a disease in the 1920s, when the causal agent was thought to be a *Rhizoctonia* species. It was not until the 1930s that the pathogen was reclassified as *S. homoeocarpa*.

The classification remains controversial because DNA studies indicate that the fungus is more closely related to members of the genus *Rutstroemia*, *Lanzia*, or *Moellerodiscus* rather than *Sclerotinia*. Classifying dollar spot in its proper taxonomic standing allows for better control of the disease with fewer resistance issues from fungicide applications. Proper classification would also give turfgrass managers considering biocontrol an opportunity to introduce natural enemies that are known to suppress fungi more closely related to members of the correct genus.

The fungus survives during the winter as mycelium in infected thatch just below the soil surface living off dead organic materials. The disease has an unusual cycle of development in that it remains inactive for most of the year. When environmental conditions become favorable, it can rapidly develop into an epidemic growth phase. Epidemics typically occur when temperatures rise above 50° F, and they can persist until temperatures exceed 90° F. There are potentially two strains of the fungus: one that occurs during cool weather, when the temperature is below 75° F; and a second that is favored by high humidity, warm days and cool nights. When either of those conditions is met, the fungus will grow on the turf's surface and infect leaf blades via direct penetration, wounds and natural openings.

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FIGURE 1

FIGURE 2

Dollar spot on greens and fairways (Figure 1) can range in size from a quarter to a silver dollar. A certain diagnosis of dollar spot can be made by examining the grayish-white, fluffy mycelium (Figure 2) in the early morning hours before the turf has been mowed.

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Dollar spot can infect both warm- and cool-season turfgrass species. Primary species affected are Kentucky bluegrass, bentgrass, tall fescues, zoysiagrass, bermudagrass and seashore paspalum. Disease severity is most commonly seen in the spring and fall on warm- and cool-season species, while warm-season species can remain susceptible throughout the summer months. On fine textured and closely mown turf, such as golf course putting greens and fairways, the disease symptoms are characterized by round, straw-colored, sunken patches ranging from the size of a U.S. quarter to the size of a U.S. silver dollar (about 1 to 2 inches in diameter) (Figure 1).

If the disease becomes severe, individual patches may coalesce, forming larger, irregular patches of blighted turfgrass that can die back to the soil surface. On residential lawns, where turf is maintained at higher mowing heights, the dead spots appear larger and more diffuse (2 to 3 inches in diameter). Under those conditions, dollar spot can be distinguished by characteristic lesions that are light tan with a reddish-brown border, usually radiating from the margins of the leaf blades. Leaf lesions can expand extending across the entire leaf, resulting in girdling of blades and dieback from leaf tips. Individual leaf blades may have a single lesion, many small lesions or be entirely blighted.

A more certain diagnosis of the disease can be made by examining the grayish-white, fluffy mycelium in the early morning before the turf has been mowed. The mycelium of the fungus can usually be seen spreading outward from the infected lesions to adjacent host tissues (Figure 2).

To meet the high expectation of aesthetic quality and playability, golf course superintendents and athletic field managers have relied on fungicide applications, cultural practices and the use of nitrogen fertilizers to obtain acceptable control.

Fungicides must be applied at labeled rates when environmental conditions are favorable for disease development. To limit the possibility of fungicide resistance, it is important to alternate the use of fungicides that have different modes of action. The Fungicide Resistance Action Committee (FRAC) coding is a tool turfgrass managers can use to know which fungicides have similar modes of action. FRAC gives fungicides a certain number or letter code (e.g. 4, M2 or U) based on their chemistry. The practical application of FRAC is it gives turfgrass managers an easy method for determining which fungicides to alternate. For example, Banner Maxx and Eagle have a FRAC code of 3. They both inhibit cell membrane synthesis. Therefore, the possibility of resistance would be greater if they were only alternated with each other in a season-long disease control program.

Accordingly, the development of resistance to dollar spot would be less likely if fungicides like Heritage (11) and Daconil Ultrex (M4) were alternated during a grow-

PHOTOS COURTESY: J.B. WORKMAN

ing season. Heritage is a broad spectrum, systemic fungicide, while Daconil Ultrex is a protectant fungicide that affects cell membranes. FRAC coding is published annually in *Turfgrass Pest Control Recommendations for Professionals* and can be seen online at **www.GeorgiaTurf.com** and Smartphone application "Turfgrass Management."

Turfgrass cultural practices, including dew removal and thatch build-up reduction, have suppressed the disease by promoting a less favorable environment for infection. It is well documented that removing dew from turfgrass by mowing or dew whipping in the morning can significantly reduce dollar spot infection. Research has shown that dollar spot is more likely to develop if moisture remains on the surface of the turfgrass for more than 12 hours.

Spring and fall nitrogen applications can potentially allow susceptible turfgrass to outgrow the pathogen and promote quicker recovery.

Therefore, reducing the window for infection by watering less in the evening and removing dew first thing in the morning is an important management practice. Thatch accumulation can increase disease incidence by allowing more fungal populations to become available. Dethatching during optimal growing conditions encourages aggressive growth and promotes a healthier disease free turf.

Monitoring fertility is also an important step in control. Turfgrasses that are maintained under low nitrogen fertility are more susceptible to infection, and they are slow to recover from dollar spot injury. Nitrogen fertilization can be an important management tool if applied to coincide with disease outbreaks. Spring and fall applications can potentially allow susceptible turfgrass to outgrow the pathogen and promote quicker recovery from disease injury.

Dollar spot has been an important turfgrass disease for many years, and epidemics continue to create challenges for turfgrass managers. Its unsightly appearance and ability to cause plant death has enabled dollar spot to become one of the most expensive to manage. Without proper management and knowledge, the disease can become a serious problem on golf courses, athletic fields and home lawns.

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