KEEPING UP TO DATE ON

Dollar Spot

Sclerotinia homoeocarpa

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A major objective of the ITM Program is to disseminate up-to-date research to the turfgrass industry of Wisconsin. In too many cases, research that is published across the country never reaches the end-user. This is knowledge that may, or may not, be utilized by turfgrass managers, but we must first be aware of this information before we can make the decision to utilize it, or toss it. The objective of the following article is intended to add to the already extensive body of knowledge on dollar spot (*Sclerotinia homoeocarpa*)

Dollar spot is a frequent and widespread turfgrass disease with the potential to be devastatingly destructive to utilitarian turfgrass sites, and is common to all cool-season grass species utilized as turfgrass in Wisconsin.

Developing a management plan targeted specifically at the dollar spot pathogen should utilize a multi-dimensional approach. Because it is such a common disease in Wisconsin, a wide variety of strategies should be employed utilizing biological, chemical, and cultural management options.

This article summarizes recently published research on dollar spot control. I would consider none of these to be benchmark works, but that is not what is needed. The industry already has a foundation of understanding accumulated over years of experiences, observations, and research. The knowledge presented here can be utilized to fine tune our present strategies to control dollar spot.

Composting

An alternative disease management strategy is the use of composts and organic fertilizers for disease suppression. Several bacterial and fungal species antagonistic to dollar spot have been found in composts, and high levels of microbial activity in the composts have been suspected to be the primary factor in their disease inhibiting properties. Others attribute these properties, wholly or partially, to a slow release of the organic nitrogen component of the compost.

Whatever the source of control, these organic amendments have the potential to reduce fungicide use, and the inherent risk of developing fungicide resistant strains of *S. homoeocarpa*. Research conducted at the University of Guelph in Ontario, Canada, investigated the effectiveness of compost as a suppression for the dollar spot pathogen.

J. I. Boulter and friends (2002) evaluated five commercially available composts applied as a topdressing to a creeping bentgrass putting green. They also looked at application frequencies.

They found that multiple applications (every three weeks) of compost provided disease control equal to that of the chlorothalonil regime, and significantly superior to the untreated plots, throughout the growing season. This group successfully showed that multiple applications of compost were effective in suppressing dollar spot. Results of this work supported previous findings that composted materials and organic fertilizers can suppress dollar spot development on established turf.

The utilization of compost-amended topdressings as part of your disease management program would not necessarily introduce additional practices or labor into a turfgrass management program (Boulter, et al., 2002). Most golf courses and many athletic field managers already incorporate routine topdressing applications throughout the growing season. The benefits of adding compost to the topdressing mix would be a reduction in frequency and/or application rates of fungicides, and depending on the acceptable damage threshold, fungicide use may be eliminated altogether.

Nitrogen Source

Utilizing the same thoughts concerning composts as Boulter and

friends, organic fertilizers, and their impact on dollar spot damage, Davis and Dernoeden of the University of Maryland evaluated nine nitrogen sources and composts for their effects on dollar spot severity.

They evaluated two synthetic fertilizers (urea and sulfur-coated urea), an activated sewage sludge (Milorganite), a composted sewage sludge (Com-Pro), and five organic materials composed primarily of poultry waste materials (Sustane Medium, Earthgro 1881 Select, Earthgro Dehydrated Manure, Ringer Lawn Restore, and Scotts All Natural Turf Builder). The materials were applied to an established stand of Southshore creeping bentgrass maintained at fairway height.

Contrary to the findings at Guelph University, Davis and Dernoeden found no nitrogen source, synthetic or organic, reduced dollar spot over the entire season. They did find that a variety of nitrogen sources (urea, sulfur-coated urea, Milorganite, Sustane Medium, and Ringer Lawn Restore) suppressed dollar spot to within acceptable thresholds into mid-summer, when disease pressure was low to moderately severe. Several materials (sulfur-coated urea, Sustane Medium, and Ringer Lawn Restore) even reduced dollar spot occurrence into periods of moderately high disease pressure, though inconsistently. But beware! Again, contrary to findings by the Guelph group, several of the organic materials (Com-Pro and Earthgro Dehydrated Manure) actually intensified dollar spot during the same period. In fact, none of the natural organic products evaluated in this research significantly reduced dollar spot when compared with synthetic nitrogen sources (urea or sulfur-coated urea).

These researchers speculated that dollar spot suppression was a consequence of nitrogen availability, rather than enhanced microbial activity. This conclusion was based on a correlation between foliar nitrogen and the presence of dollar spot. As foliar nitrogen increased, dollar spot suppression increased as well. At the same time, there was no correlation between general soil microbial activity and nitrogen source. No nitrogen source was consistently associated with higher levels of soil microbial activity, refuting the premise of many that natural organic fertilizers suppress dollar spot by enhancing soil microbial activity.

What to do? While organic amendments obviously have impact on dollar spot severity, the jury is still out on whether they provide suppression by increasing microbial activity or providing a slow-release form of nitrogen. While these studies can be interpreted as refuting each other, what we already know remains as obvious as before - the timely application of nitrogen can minimize the severity of dollar spot on your turfgrass.

Cultural Practices

Cultivar Selection

Dollar spot management can be highly dependent on chemical fungicide applications. The causal fungus has proven the ability to develop resistance to several important classes of fungicides. This has stimulated research into alternative disease management strategies such as development of cultivars that show resistance/tolerance to the dollar spot pathogen.

Chakraborty and friends (2001) at UW-Madison are working on identifying dollar spot resistant bentgrass germplasm. They observed a general trend indicating that dryland, colonial, and velvet bentgrasses were more resistant than the creeping bentgrasses cultivars they were working with. Gregos and Jung (2001) also observed that colonial bentgrasses show an increased tolerance to dollar spot, but also noted that they tended to be more susceptible to brown patch. *For information on cool-season species and cultivar susceptibility to dollar spot in Wisconsin, see NTEP Progress Report 2000 @ http://www.ntep.org*

Seeding Blends

Turfgrass blends are often recommended to improve disease resistance, the general theory being that blends will dilute susceptibility and spread the risk of succumbing to a greater variety of pests than a single cultivar could. Abernathy and friends (2001) at Texas A&M evaluated monostands, two-way and three-way blends of creeping bentgrass maintained at putting green height. Cultivars evaluated were Crenshaw (most susceptible), Mariner, Penn A-4, Penncross, (all moderately susceptible) and L-93 (most resistant).

As common sense would dictate, blends containing L-93 reduced the level of dollar spot severity, whereas blends containing Crenshaw exhibited an increased incidence of dollar spot. The moderately resistant cultivars did not affect dollar spot severity, and tended to act as a neutral partner, allowing the blends to exhibit the attributes of the tolerant or susceptible component(s). Thus, the susceptibility of individual cultivar components provided a positive indication of how a blend would perform when dollar spot activity was present.

The blends containing Crenshaw showed an ability to reduce dollar spot infections compared to stands of Crenshaw alone. At the same time, three of the four varieties of moderate susceptibility showed an increase in disease when blended with Crenshaw compared to monostands. The message here is that a blending strategy should be used to reduce overall disease incidence of susceptible cultivars, like Crenshaw, **only** when they exhibit traits that no other cultivars possess.

Rolling

Am I going to tell you that rolling decreases dollar spot on your putting greens? That three - times-

weekly rolling, every week for five continuous years will actually reduce the incidence of dollar spot? That a disease that can be spread by maintenance equipment carrying fungal mycelium and infected plant tissue carryed from site to site can be reduced by using equipment that does just that? Yep!

Research reported by Thomas Nikolai at Michigan State has shown that rolling greens reduced the number of dollar spot infections by up to 70%. He speculates that rolling one hour after mowing dispersed guttation droplets forming at the tips of cut leaf blades. These guttation droplets are used as a nutrient source by fungal pathogens, and their dispersal reduces the pathogens ability to infect other plants.

Chemical

Curative vs Preventive

The group at Kansas State (Settle, et al., 2001) conducted research evaluating dollar spot severity of four creeping bentgrass cultivars comparing curative and preventive fungicide application strategies.

Historically, several fungicide application strategies have been used for controlling dollar spot in creeping bentgrass putting greens. These include applying fungicides at routine intervals to prevent disease development, applying fungicides only when disease symptoms reach some predetermined action threshold, or making applications on a weather-based disease forecasting system. Settle's group found that the efficacy of each strategy was dependent on the disease susceptibility of the creeping bentgrass cultivar. Greater flexibility in imposing a disease control strategy was afforded by using a disease- resistant (i.e., L-93), rather than a disease-susceptible (i.e., Crenshaw) cultivar.

Curative applications of ipriodine and chlorothalonil provided equivalent levels of dollar spot control as preventive treatments, and resulted in acceptable turf quality in the resistant 'L-93' during dollar spot outbreaks, but with fewer fungicide applications. Considering all cultivars across the three year study period, fewer fungicide applications were made using a curative than a preventive strategy.

Editor's note: The author has worked in the turfgrass industry for over 25 years, in a wide range of a capacities. His current position as ITM Specialist requires the development of a broad-based programming effort emphasizing the total approach to managing turfgrass systems. The ITM philosophy emphasizes an effective, economical, and environmentally responsible management approach to plant health and protection. For more information on the ITM Program, contact Kevin at hensler@entomology.wisc.edu, or (608) 845-2545.

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