The Efficacy of Spring Fungicide Applications Plus Organic Fertilizer for Controlling Spring Dead Spot of Bermudagrass

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Objectives:

1. Determine the efficacy of spring and fall fungicide applications for reduction of spring dead spot incidence and severity.
2. Determine the effect of organic fertilizer for the reduction of spring dead spot incidence and severity and overall improvement of turf quality.

Start Date: 2007
Project Duration: three years
Total Funding: $30,000

Spring dead spot (SDS) is a serious root-rot disease of bermudagrass and is the most important disease of hybrid bermudagrasses managed as putting green and fairway turf. Aesthetically undesirable necrotic patches ranging from a few inches to several feet in diameter are evident in the spring and early summer in bermudagrass swards that experience a dormant period. Three fungal species in the genus *Ophiosphaerella* (*O. korrae, O. herpotricha, and O. narmari*) have been identified as the causal organisms throughout the United States and Australia. In Mississippi, *O. korrae* is the most common species; however, *O. herpotricha* has also been identified.

Results of a previous study conducted at Mississippi State University suggests the frequency of *O. korrae* in bermudagrass roots was greatest during winter dormancy and spring transition compared to summer and fall transition periods. As a result of *O. korrae* colonization in bermudagrass roots during the winter and spring, this study was initiated in the spring of 2007 in a 'Tifway' bermudagrass fairway with a history of spring dead spot. Symptoms of SDS were observed throughout the current study area in the spring of 2007.

The treatment plots (15 ft × 10 ft) are arranged in a split-plot randomized complete block design replicated four times. Fungicide treatments are the whole plot factor and nitrogen (N) source is the sub-plot factor (7.5 × 10 ft sub-plots). Fungicide treatments are applied during the spring and fall. The N sources include 12-2-12 organic fertilizer and 12-2-12 blend of inorganic fertilizer including ammonium sulfate (21-0-0), triple super phosphate (0-46-0), and muriate of potash (0-0-60) applied at 1.0 lb N per 1000 ft^2 per month (May-October).

Spring dead spot severity (1 to 9; 9 = no disease) and incidence (% plot area) were determined in the spring of 2009. Spring green-up was quantified using an NDVI turf color meter, turfgrass quality (1 to 9; 9 = best) was rated each month, and SDS patch recovery was monitored.

Spring dead spot severity was moderate in 2009 across Mississippi and at the site of this fairway study despite persistent cold temperatures in late winter and early spring. Necrotic patches ranged in size from 4 to 15 inches in diameter. Three of the Rubigan treatments along with Eagle and Banner Maxx fungicides, applied in 2008, significantly reduced SDS severity and incidence in the spring of 2009. Rubigan treatments applied in the spring, fall, or spring and fall had less than 1.3 % SDS, while the control plots averaged 12% SDS. SDS severity ratings were also improved in those treatments compared to the control. Turfgrass quality in the Rubigan and Eagle treatments in May was improved (5.4 - 5.6) but not in the Banner Maxx plots (5.1) where turfgrass quality was similar to the control (4.6). Turfgrass quality was similar for all treatments the remaining months beginning in June 2009.

Neither the N source (organic vs inorganic) nor the interaction of fungicide and N source had an effect on SDS severity and incidence, turfgrass quality, or spring green-up. Soil pH in plots receiving organic N (pH=6.2) was significantly higher than the pH of plots receiving inorganic N (pH=6.0); however a pH difference of 0.2 is not likely to be biologically significant in this patho-system.

These results reflect the second year of this three-year study. Spring and fall fungicide treatments have been applied in 2009. The final SDS evaluations will be conducted in the spring of 2010. To date, Rubigan, applied in the spring, fall, or spring and fall and Banner Maxx applied in the fall have reduced SDS in the bermudagrass fairway study. Observations from the past two growing seasons indicate the N source applied at 1 lb N/1000 sq ft/month does not influence SDS the following spring.

Spring dead spot symptoms in a 'Tifway' bermudagrass fairway.

Summary Points

- Spring, fall or spring and fall applications (2008) of Rubigan and single fall applications of Eagle or Banner Maxx significantly reduced SDS severity and incidence in the spring 2009.
- N source did not affect SDS severity or incidence in 2009.
- Spring green-up and turfgrass quality were similar for all treatments except in May 2009.
- Turf recovery from spring dead spot symptoms was evident in mid-June 2009.