

DOLLAR SPOT CONTROL ON A CREEPING BENTGRASS AND ANNUAL BLUEGRASS FAIRWAY WITH VARIOUS FUNGICIDES, 2009

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INTRODUCTION

Dollar spot, caused by the foliar pathogen *Sclerotinia homoeocarpa*, is continuing to emerge as a persistent and chronic turfgrass disease of golf course turf. To manage the disease, turfgrass managers often implement a series of cultural and chemical management strategies specifically designed to reduce its severity. To suppress the disease to commercially acceptable levels, fungicides are often applied throughout the season. Factors that complicate disease control include application strategies, resistance, application timing and various other factors. For this reason, continuous evaluation of commercially available and experimental fungicides is necessary at various locations throughout the country. The objective of this study was to assess the ability of various commercially available and experimental fungicides to suppress the disease following repeated sequential applications on a golf course fairway.

MATERIALS & METHODS

This study was initiated at the Valentine Turfgrass Research Center located in University Park, PA. Soil was a sandy loam with a pH 7.3 and 3.2% organic matter. Turfgrass used for the fungicide evaluation is a stand of creeping bentgrass (*Agrostis stolonifera*) / annual bluegrass (*Poa annua*). The area was maintained as a bentgrass fairway and mowed three times per week to a height of 0.5 in. All fungicide treatments were applied with a CO₂ pressurized (40 psi) sprayer equipped with an air-induction flat fan nozzle, and calibrated to deliver 1.0 gal water per 1000 ft². Five treatments were initiated on 25 June and applied on a 14-d interval.

Plots measured 3 ft x 6 ft and were arranged in a randomized complete block with four replications. Dollar spot severity was assessed by counting the number of infection centers within each plot. Dollar spot data were subjected to analysis of variance and means were separated at $P \leq 0.05$ according to Fisher's Protected Least Significant Difference Test.

RESULTS

Treatments were initiated on 25 June and a total of two applications were made prior to the initial appearance of dollar spot symptoms. Disease incidence (dollar spot infection centers per plot) were evaluated on 24 Jul, with an average of 7.3 to 7.5 infection centers within the untreated control plots just prior to the third application (13 days after last treated) (Table 1). When disease pressure began to increase in mid to late August, differences among treatments became evident. On 10 Aug, all plots treated with fungicides had reduced numbers of dollar spot infection centers when compared to the untreated control plots. The greatest level of control was provided by Confidential (0.6 fl oz), Tourney, and Emerald. No differences in dollar spot incidence, however, were observed among the aforementioned treatments and Confidential (0.4 and 0.5 fl oz), Banner MAXX, Propiconazole Pro, Bayleton, Daconil Ultrex, and Chipco 26GT. Moderate, but unacceptable (≥ 5.0 infection centers per plot) levels of control were observed within plots treated with the low rate of Confidential, Eagle, Trinity and Triton FLO. Dollar spot pressure increased drastically between 10 and 24 Aug, with the untreated plots exhibiting an average of 17 and 80 infection centers on these dates, respectively. Although all treatments reduced diseases symptoms when compared to the untreated control on 24 Aug (17 days after the last treatment [DAT]), none were considered commercially acceptable at this time. Plots with the fewest number of dollar spot infection centers (7.8 to 15) on 24 Aug included those treated with Confidential (0.6 fl oz), Tourney, Banner MAXX, Propiconazole PRO, Daconil Ultrex, and Emerald. Poor disease control was observed within plots treated with Confidential (0.3 fl oz), Eagle, Trinity, Triton FLO, and Chipco 26GT.

In September, disease pressure continued to increase. Therefore, dollar spot severity ratings were visually assessed on a percent scale where percent dollar spot ≤ 0.5 was considered commercially acceptable. On 8 Sep (14 DAT), plots treated with Emerald and Daconil continued to provide the greatest level of disease suppression and were the only two treatments considered acceptable ($\leq 0.5\%$). No differences, however, were observed in the level of control among those treatments providing acceptable control and Confidential (0.5 and 0.6 fl oz), Tourney, Banner MAXX, Propiconazole PRO, and Bayleton. Moderate to poor control of dollar spot was exhibited within plots treated with the lowest two rates of Confidential; the sterol inhibiting fungicides Eagle, Trinity, and Triton FLO; and the dicarboximide Chipco 26GT. On the final rating date (21 Sep; 14 DAT), acceptable suppression of dollar spot symptoms was achieved

within plots treated with the 0.6 fl oz rate of Confidential and Emerald. All other treatments provided good to moderate (0.8 to 5.1%) suppression of dollar spot when compared to the untreated control plots (25 to 29%).

DISCUSSION

Dollar spot pressure was slow to develop in this study, but increased to moderate to severe levels by mid-August and throughout September. When dollar spot pressure began to increase, differences in control were observed among the various treatments. The Confidential fungicide did provide acceptable control at the highest rate throughout much of the study, with disease pressure appearing to be negatively correlated with decreasing fungicide rates. Variable control of dollar spot was achieved among and within the various chemical classes evaluated. For the sterol inhibiting fungicides, Tourney, Banner MAXX, Propiconazole PRO, and Bayleton generally provided the greatest level of control over the course of the study. On the other hand, Eagle, Trinity and Triton FLO were generally less effective against the disease. Resistance to the sterol inhibiting fungicides is suspected at the Valentine Turfgrass Research Facility due to numerous years of repeated use for dollar spot control. Differences in dollar spot suppression among the varying fungicides within this chemical class may have been due more to differences in product application rates.

While many of the fungicides evaluated in this study provided excellent to moderate control of dollar spot, none of them were able to maintain acceptable levels of disease when the application interval was inadvertently stretched to 17 days during periods of high disease pressure in late Aug. For this and various other reasons including resistance, turfgrass managers should utilize local knowledge of their course when selecting fungicides for the control of dollar spot. In addition to the utilization of varying chemical classes as was evaluated in this study, the rotation and tank-mixing of chemicals with varying modes of activity (e.g, contact + acropetal penetrant) may also help to extend the duration of disease suppression.

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Table 1. Dollar incidence on a creeping bentgrass/annual bluegrass fairway following the application of various fungicides for the control of dollar spot, 2009.

Treatments and rate per 1000 sq ft ^w	Dollar Spot					
	No. infection centers per plot ^z				Percent ^y	
	10 Jul	24 Jul	10 Aug	24 Aug	8 Sep	21 Sep
Confidential 2.5SC 0.3 fl oz.....	0.0 a ^x	5.5 ab	6.5 bcd	33.5 de	5.8 c	5.1 bc
Confidential 2.5SC 0.4 fl oz.....	0.0 a	3.5 bcd	3.5 cde	20.3 efg	2.8 d	2.0 cd
Confidential 2.5SC 0.5 fl oz.....	0.0 a	2.8 b-e	2.5 cde	19.0 fg	2.3 de	1.4 cd
Confidential 2.5SC 0.6 fl oz.....	0.0 a	0.0 e	1.3 e	11.3 g	1.0 de	0.3 d
Tourney 50WDG 0.37 oz	0.0 a	0.5 de	1.0 e	15.0 g	1.5 de	0.8 cd
Eagle 20EW 1.0 fl oz.....	0.0 a	4.5 abc	9.0 b	38.0 cd	5.8 c	9.5 b
Trinity 1.0 fl oz	0.0 a	5.8 ab	8.5 b	48.5 c	6.8 c	8.8 b
Triton FLO 0.55 fl oz	0.0 a	3.0 b-e	7.0 bc	41.3 cd	5.5 c	8.5 b
Banner MAXX 1.24MEC 1.0 fl oz.....	0.0 a	3.5 bcd	3.3 cde	11.0 g	1.6 de	1.6 cd
Propiconazole Pro 1.3MEC 1.0 fl oz	0.0 a	2.0 cde	2.8 cde	10.5 g	0.9 de	0.6 cd
Bayleton 50WDG 1.0 oz.....	0.0 a	4.3 abc	4.3 b-e	20.8 efg	2.3 de	1.7 cd
Daconil Ultrex 82.5WDG 3.2 oz	0.0 a	0.8 de	2.0 de	9.3 g	0.4 e	0.7 cd
Chipco 26GT 2SC 2.0 fl oz	0.0 a	1.5 cde	1.8 de	29.8 def	2.8 d	3.0 cd
Emerald 70WDG 0.13 oz	0.0 a	1.8 cde	1.3 e	7.8 g	0.3 e	0.4 d
Untreated.....	0.0 a	7.3 a	16.3 a	71.8 b	10.5 b	24.5 a
Untreated.....	0.0 a	7.5 a	17.5 a	88.0 a	14.5 a	29.0 a

^z The number of dollar spot infection centers were counted and numbers represent the average number of infection centers per plot.

^y Percent of plot area infected with dollar spot was assessed visually on a linear 0 to 100% scale, where 0 = entire plot area healthy; 100 = entire plot area infected by dollar spot.

^w Treatments were applied on 25 Jun; 9 and 25 Jul; 7 and 24 Aug; and 8 Sep.

^x Means in a column followed by the same letter are not significantly different at $P \leq 0.05$ level according to the Fisher's protected least significant difference t-test.