

# INFLUENCE OF VARIOUS EARLY SEASON PROGRAMS ON THE SUPPRESSION OF DOLLAR SPOT

## MAY-AUGUST

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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. In severe cases, however, dollar spot can continue to persist to levels that are considered commercially unacceptable in spite of these fungicide applications. Recently, research into the ability of single, early-season fungicide applications to reduce the levels of initial inoculum has shown promise. The objective of this study was to assess the ability of various commercially available and experimental fungicides to suppress the disease following a single application. A secondary objective was to compare the suppressive properties of Tourney when applied early as compared to an application just prior to anticipated symptom development.

## 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 an OM of 3.21%. 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 CO<sub>2</sub> pressurized (40 psi) sprayer equipped with an air-induction flat fan nozzle, and calibrated to deliver 1.0 gal water per 1000 ft<sup>2</sup>. Early-season treatments were applied on 9 May and a traditionally-timed preventive application of Tourney was applied on 30 May. Dollar spot symptoms were not present prior to either application timing.

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

Dollar spot symptoms were not present at the time treatments were applied, regardless of application timing. Disease symptoms were present when plots were initially rated on 12 Jun (Table 1). Except for Disarm and the low rate of Bayleton (0.5 oz), all fungicide-treated plots had fewer dollar spot infection centers when compared to the untreated control plots on 12 Jun. Except for the 1.0 oz rate of Bayleton, all plots receiving sterol inhibiting fungicides had dollar spot infection centers similar to the untreated control plots on 26 Jun (~4 or 7 weeks after treatments were applied [WAT]). Plots treated with the half-label rate of Curalan also had dollar spot levels similar to the untreated control. Plots treated with Confidential (all rates), Emerald (both rates), Bayleton (1.0 oz), and Curalan (1.0 oz) continued to suppress dollar spot symptoms through the 10 Jul rating when compared to the untreated control. Plots treated with Emerald (0.18 oz) and Curalan (1.0 oz) suppressed dollar spot when compared to the untreated control until 24 Jul (~8 WAT) and 10 Aug (~10 WAT), respectively. Despite the improved suppression of dollar spot afforded by the high rate of Curalan, disease levels on 10 Aug would generally be considered unacceptable for a golf course fairway. During this study, there were no differences in dollar spot suppression between application timings (9 or 30 May) in plots treated with Tourney.

## DISCUSSION

Based on the results of this study, various fungicides were able to effectively suppress dollar spot symptoms when applied early in the season and before typical dollar spot symptoms appeared. Treatments that provided the greatest length of control in this study year included the 0.18 oz rate of Emerald and the label rate (1.0 oz) of Curalan. A moderate length of suppression was attained within plots treated with all rates of the experimental fungicide Confidential, the low rate of Emerald, and the high rate of Bayleton. Disarm and Bayleton at 0.5 oz did not suppress dollar spot when compared to the untreated control plots on any rating dates in the study.

These trials were conducted at the Valentine Turfgrass Research Facility located at Penn State. This facility has a long history of fungicide efficacy trials and the potential for dollar spot resistance to certain fungicides is high. Dollar spot suppression with fungicides within the sterol inhibiting class has been met in the past with reduced or inconsistent efficacy when compared to the use of other fungicides such as chlorothalonil or those in the dicarboximide class. This may explain why moderate to poor dollar spot suppression was observed within plots treated with Tourney and Banner MAXX. Additionally, the impact of fungicide rate appeared to influence the ability of several commercial fungicides to suppress the disease for an extended period of time.

These mixed-finding and special circumstances indicate that future evaluations at multiple locations are warranted. Differences in dollar spot suppression among varying fungicide classes and the potential influence of resistant *S. homoeocarpa* strains at select locations may impact future recommendations to turfgrass practitioners. Based on the results of this one-year study, high label rates of Emerald and the label rate of Curalan provide the greatest suppression of dollar spot when applied well in advance of symptoms development. Based on previous years' results, the aforementioned fungicides in addition to those within the sterol inhibiting class can be used to effectively suppress dollar spot when applied early in the season, but turfgrass managers should evaluate the potential for resistance on a case by case basis and make adjustments in fungicide selection where appropriate.

### ACKNOWLEDGEMENTS

The Pennsylvania State University Turfgrass Science Program would like to thank the students and staff of the Valentine Turfgrass Research Facility for assisting in the maintenance and upkeep of these plots and Valent for their financial support.

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

Treatment and rate per 1000 sq ft	App. Timing <sup>y</sup>	No. infection centers per plot <sup>z</sup>				
		12 Jun	26 Jun	10 Jul	24 Jul	10 Aug
Confidential 2.5 SC 0.3 fl oz.....	A	0.8 cd <sup>x</sup>	1.8 cde	4.0 efg	17 bc	56 a-e
Confidential 2.5 SC 0.4 fl oz.....	A	1.0 bcd	2.0 cde	5.5 c-g	20 abc	55 b-e
Confidential 2.5 SC 0.5 fl oz.....	A	1.0 bcd	1.5 de	3.5 fg	17 bc	48 de
Confidential 2.5 SC 0.6 fl oz.....	A	1.0 bcd	1.5 de	4.5 d-g	19 abc	47 de
Tourney 50 WDG 0.37 oz.....	A	1.3 bcd	4.8 a-d	7.0 b-f	21 abc	70 abc
Tourney 50 WDG 0.37 oz.....	B	0.5 cd	4.3 a-e	11.0 abc	21 abc	73 ab
Disarm 4SC 1.0 oz.....	A	3.8 ab	6.0 abc	13.0 a	30 a	74 a
Emerald 70WDG 0.13 oz.....	A	1.5 bcd	3.5 b-e	5.0 d-g	16 bc	58 a-d
Emerald 70WDG 0.18 oz.....	A	0.0 d	1.5 de	3.0 fg	12 cf	48 d-e
Banner MAXX 1.24MEC 0.5 fl oz.....	A	3.0 bc	7.3 ab	10.3 a-d	25 ab	57 a-d
Banner MAXX 1.24MEC 1.0 fl oz.....	A	2.3 bcd	5.0 a-d	8.8 a-f	23 abc	65 a-d
Bayleton 50DF 0.5 oz.....	A	3.8 ab	7.5 ab	9.8 a-e	22 abc	56 a-d
Bayleton 50DF 1.0 oz.....	A	1.3 bcd	3.5 b-e	5.5 c-g	22 abc	61 a-d
Curalan 50EG 0.5 oz.....	A	2.3 bcd	4.3 a-e	6.8 b-g	23 abc	52 cde
Curalan 50EG 1.0 oz.....	A	0.3 cd	0.3 e	1.0 g	4 d	36 e
Untreated.....	-	6.0 a	8.0 a	11.5 ab	26 ab	63 a-d

<sup>z</sup> The number of dollar spot infection centers were counted and numbers represent the average number of infection centers per plot.

<sup>y</sup> Treatments were applied as follows: A = 9 May and B = 30 May.

<sup>x</sup> 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.