Effects of Fungicides for Control of Spring Dead Spot Disease on Bermudagrass Turf in California

Spring Dead Spot can be a serious disease of bermudagrass turf. Although the fungus is active but unseen during the fall, symptoms (above) do not become evident until spring when circular areas of turf fail to green-up following winter dormancy. Photo taken of the 9th fairway (site of fungicide trial) at North Ridge Country Club, Fair Oaks, CA. 2 May 2016.

Research Report Brought To You By:

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Effects of Fungicides for Control of Spring Dead Spot Disease on Bermudagrass Turf in California

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The Bottom Line: Nineteen commercial and experimental fungicides were tested alone or in combination against an untreated control for management of spring dead spot (SDS) disease caused by *Ophiosphaerella spp.* on a bermudagrass fairway at North Ridge Country Club in Fair Oaks (suburb of Sacramento). All treatments were applied on 24 September and 22 October 2015, and one treatment (Banner Maxx) was applied a third time on 26 February 2016. Several treatments reduced SDS severity and improved bermudagrass quality compared to the untreated control; however, Mirage (tebuconazole) + Prostar (flutolanil) resulted in the lowest disease severity followed by Xzemplar (fluxapyroxad), Encartis (fluopyram), Lexicon (pyraclostrobin + fluxapyroxad), and Encartis + Prostar. Tank mixing of Mirage and Prostar provided better SDS control than either fungicide applied alone, and a third application of Banner Maxx (propiconazole) in the spring did not improve control compared to two applications in the fall.

Acknowledgments:

Thanks to Larry Johnson, North Ridge Country Club, Sierra Nevada GCSA, California Turfgrass & Landscape Foundation, Bayer, Syngenta, and BASF for supporting this research.

Introduction:

Bermudagrass (Cynodon spp.) is considered by many to be the “go to” turfgrass species for golf courses, athletic fields, and other turf areas throughout most of California because of it’s water use efficiency, tolerance to drought, salinity, and traffic, and recovery from wear. Bermudagrass is also tolerant to most pests, especially in California’s Mediterranean climate. However, bermudagrass can be susceptible to spring dead spot (SDS), a root disease caused by three primary species of fungi in the genus *Ophiosphaerella*. Typically, SDS occurs on intensively managed bermudagrass turf that is subject to freezing temperatures and winter dormancy. Although the disease is active in during the fall and, in some cases, early spring, symptoms of circular dead patches to not appear until green-up and active growth in spring. Then, turf recovery in affected areas can be very slow and often symptoms reappear in the same vicinity year after year.

Cultural and chemical management of SDS provides no guarantee of complete disease control. However, it is best to avoid late season nitrogen fertilization even though results are mixed. Winter hardy bermudagrass cultivars that are best adapted for the U.S. transition zone tend to be more tolerant to SDS; however, these cultivars are usually not well adapted for use in California. If there is a history of SDS on bermudagrass in California, usually it is best to apply a fungicide or fungicides beginning in September or October followed by a repeat application 30 days after. Historically, the DMI (e.g., propiconazole, tebuconazole, etc.) and QoI (e.g., azoxystrobin) fungicides have been most effective on SDS. The objective of this research was to test these along with newer or experimental fungicides, particularly the SDHI fungicides including flutolanil (Prostar), fluxapyroxad (Xzemplar), fluopyram (Exteris), and penthiopyrad (Velista).

Materials and Methods:

The study was conducted on the 9th fairway at North Ridge Country Club in Fair Oaks, a suburb of Sacramento. The fairways are a mix of common and hybrid bermudagrasses with a history of SDS caused by a species of *Ophiosphaerella* most closely resembling *narmari*. Experimental design was a randomized block with 5 replications. Plot size was 6-ft x 8-ft with 2-ft alleys. Fungicides were applied using a CO_2-powered backpack sprayer equipped with 8004VS nozzles to deliver 2 gal/M. Fungicide treatments were applied on 24 September and 22 October 2015, and one treatment was applied a third time on 26 February 2016. The fairway was irrigated with 0.15 inches of water immediately following each application. Soil temperatures averaged 70F from 0.5 to 4 inches into the profile on the day of initial treatment.

Results:

Spring dead spot distribution was sporadic as is usually typical of this disease, but severity reached as high as 36% visual disease cover (Table 1). Not surprisingly, turf quality was inversely related to disease severity (Table 2). Most of the treatments reduced SDS disease cover compared to the untreated control (Table 1). Interestingly, Prostar (flutolanil) and Mirage (tebuconazole) applied alone provided poor and fair disease control, respectively. However, when tank-mixed, these fungicides resulted in the lowest disease cover of all treatments in the study. Other effective treatments included: Xzemplar (fluxapyroxad), Exteris (fluopyram), Exteris + Prostar, and Lexicon (pyraclostrobin + fluxapyroxad). A third application of Banner Maxx in the spring did not reduce disease severity compared to either two applications in the fall or the untreated control. Overall, these results point to a possible synergistic effect of tank-mixing DMI (e.g., tebuconazole, propiconazole) and SDHI (e.g., flutolanil, fluopyram, penthiopyrad) fungicides for enhanced control of SDS. Another SDS fungicide trial is scheduled for 2016-17 at North Ridge CC.

Table 1. Effects of fungicide treatments on Spring Dead Spot (*Ophiosphaerella narmari*) disease severity (0-100%) on bermudagrass turf. 2015-16. North Ridge Country Club, Fair Oaks, CA.

No.	Product(s)	Company	Timing	Rate (oz/M)	4/5/2016	5/2/2016	6/8/2016
1	Untreated Control	--	--	--	26 ABC	26 AB	10 AB
2	Banner Maxx	Syngenta	AB	4.0	25 ABCD	21 ABCD	5 BCDE
3	UCR001		AB	1.0	15 CDEF	20 ABCD	3 CDE
4	Heritage Action	Syngenta	AB	0.4	19 BCDEF	15 BCDE	4 BCDE
5	Headway	Syngenta	AB	3.0	21 BCDE	24 ABC	8 BCD
6	Velista WG	Syngenta	AB	0.5	16 CDEF	14 BCDE	6 BCDE
7	Velista WG	Syngenta	AB	0.7	14 CDEF	11 BCDE	2 CDE
8	Lexicon Intrinsic	BASF	AB	0.47	19 BCDEF	5 DE	0 E
9	Xzemplar	BASF	AB	0.26	11 DEF	5 DE	2 DE
10	Mirage	Bayer	AB	2.0	21 BCDE	15 BCDE	3 CDE
11	Mirage	Bayer	AB	2.0	6 F	2 E	0 E
11	Prostar 70 WG	Bayer	AB	2.2			
12	Prostar 70 WG	Bayer	AB	2.2	36 A	36 A	15 A
13	Exteris	Bayer	AB	6.0	9 EF	7 CDE	2 CDE
14	Exteris	Bayer	AB	6.0	10 EF	10 BCDE	5 BCDE
14	Prostar 70 WG	Bayer	AB	2.2			
15	UCR002		AB	0.31	32 AB	23 ABC	9 ABC
16	UCR002		AB	0.31	15 CDEF	12 BCDE	3 BCDE
16	Adjuvant		AB	0.25% v/v			
17	UCR002		AB	0.31	21 BCDE	23 ABC	7 BCD
17	UCR003		AB	0.11			
18	UCR002		AB	0.31	16 CDEF	11 BCDE	2 CDE
18	Adjuvant		AB	0.25% v/v			
18	UCR003		AB	0.11			
18	UCR004		AB	0.25			
19	Banner Maxx	Syngenta	ABC	4.0	27 ABC	26 AB	7 BCD
20	Briskway	Syngenta	AB	0.7	17 CDEF	19 BCD	10 AB

Means followed by the same letter in a column are not significantly different (α = 0.05).

Application Dates:
A = 24 September 2015
B = 22 October 2015
C = 26 February 2016

Table 2. Effects of Spring Dead Spot fungicide treatments on bermudagrass turf quality (1-9, 9 = best). 2015-16. North Ridge Country Club, Fair Oaks, CA.

No.	Product(s)	Company	Timing	Rate (oz/M)	4/5/2016	5/2/2016	6/8/2016
1	Untreated Control	--	--	--	5 CDE	5.2 DE	6.6 AB
2	Banner Maxx	Syngenta	AB	4.0	5.4 ABCD	5.2 DE	7.4 A
3	UCR001		AB	1.0	5.8 ABC	6 BCDE	7.2 A
4	Heritage Action	Syngenta	AB	0.4	5.8 ABC	6 BCDE	7.2 A
5	Headway	Syngenta	AB	3.0	5.6 ABCD	5.8 BCDE	7 AB
6	Velista WG	Syngenta	AB	0.5	5.4 ABCD	6 BCDE	6.8 AB
7	Velista WG	Syngenta	AB	0.7	5.8 ABC	6.2 ABCDE	7.6 A
8	Lexicon Intrinsic	BASF	AB	0.47	5.6 ABCD	6.4 ABCD	7.6 A
9	Xzemplar	BASF	AB	0.26	6.2 A	6.8 ABC	7.2 A
10	Mirage	Bayer	AB	2.0	5.2 BCDE	6.2 ABCDE	7 AB
11	Mirage	Bayer	AB	2.0	6.2 A	7.6 A	7.4 A
11	Prostar 70 WG	Bayer	AB	2.2			
12	Prostar 70 WG	Bayer	AB	2.2	4.4 E	4.8 E	6 B
13	Exteris	Bayer	AB	6.0	6 AB	7 AB	7.2 A
14	Exteris	Bayer	AB	6.0	6.2 A	6.4 ABCD	7 AB
14	Prostar 70 WG	Bayer	AB	2.2			
15	UCR002		AB	0.31	5.2 BCDE	5 DE	6.6 AB
16	UCR002		AB	0.31	5.8 ABC	6.2 ABCD	7.2 A
16	Adjuvant		AB	0.25% v/v			
17	UCR002		AB	0.31	5.6 ABCD	5.2 DE	7 AB
17	UCR003		AB	0.11			
18	UCR002		AB	0.31	5.8 ABC	6.8 ABC	7.2 A
18	Adjuvant		AB	0.25% v/v			
18	UCR003		AB	0.11			
18	UCR004		AB	0.25			
19	Banner Maxx	Syngenta	ABC	4.0	4.8 DE	5.2 DE	6.8 AB
20	Briskway	Syngenta	AB	0.7	5.8 ABC	5.4 CDE	6.6 AB

Means followed by the same letter in a column are not significantly different (α = 0.05).

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