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## Evaluation of fungicides for control of dollar spot and brown patch in creeping bentgrass, WOI green ISU, 2008

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### Introduction

Fungicide evaluations for control of dollar spot and brown spot in greens height creeping bentgrass were conducted at the the WOI green of Veenker Memorial Golf Course in Ames, Iowa

### Materials and Methods

Creeping bentgrass (cv. Washington) was maintained at 0.16-inch cutting height. Fungicides were applied using a backpack sprayer at 30 psi and a dilution rate of 5 gal per 1000 sq ft. The experimental design was a

randomized complete block with four replications. All plots measured 4 ft x 5 ft. Spray applications were initiated on 20 May, followed by re-applications at designated intervals until 20 Aug. Percent of plot with dollar spot symptoms were made periodically beginning June 22. Visual estimates of brown patch disease severity were also made with a qualitative scale of 0-5, where 0 = no disease; 1 = 1-5%; 2 = 6-10%; 3 = 11-25%; 4 = 26-50%; 5 = >50% plot symptomatic. A turf quality assessment of 1 to 10 (1=poorest, 10=best, 7=adequate) was also taken throughout the season. Data were analyzed using the GLM procedure in SAS and mean separations were determined using Fisher's protected LSD at  $P \leq 0.05$ .

**Table 1. Dollar spot on creeping bentgrass  
Products and rates per 1000 sq ft**

	Interval (days)	% plot with symptoms				
		22-Jun	7-Jul	31-Jul	14-Aug	21-Aug
Unsprayed check.....	---	25.8 a <sup>x</sup>	34.8 a	68.8 a	76.3 a	70.0 a
BioSafe ZeroTol 1% first spray; 0.33% later sprays.....	7	15.0 b	23.5 ab	8.8 cd	28.8 c	20.0 c
BioSafe STBX-013 0.2% first spray; 0.07% later sprays.....	7	11.8 cb	18.0 bc	20.0 b	35.0 c	20.8 c
Cleary 26/36 3 oz.....	14	8.3 b-e	5.0 c-e	0.5 d	0.0 d	0.3 d
Cleary Spectro 3.5 oz.....	14	6.8 b-e	5.5 c-e	0.0 d	0.0 d	0.0 d
Valent Tourney 50WD 0.18 oz.....	14	4.0 c-e	2.8 de	0.0 d	1.8 c	0.0 d
Valent Tourney 50WD 0.25 oz.....	14	1.3 c-e	0.5 de	0.5 d	0.3 d	0.8 d
Valent Tourney 50WD 0.37.....	14	1.8 c-e	6.3 c-e	0.0 d	2.0 d	0.0 d
BASF Insignia 0.5 oz.....	14	11.0 b-d	14.3 b-d	15.3 bc	61.3 b	43.8 b
BASF Trinity 1.0 oz.....	14	9.3 b-e	7.5 c-e	1.3 d	1.0 d	0.8 d
BASF Emerald 0.13 oz.....	14	4.3 c-e	9.0 c-e	0.3 d	1.3 d	1.3 d
Bayer Chipco Triton "Legacy B" 1.0 fl. oz + Signature Ultra 4.0 oz.....	14	0.3 e	0.0 e	0.0 d	0.0 d	0.0 d
Bayer Chipco Triton "Legacy B" 1.5 fl. oz.....	14	4.3 c-e	2.5 de	0.0 d	0.0 d	0.0 d
Bayer Chipco Triton "Legacy B" 2.0 fl. oz.....	14	0.5 de	0.0 e	0.0 d	0.0 d	0.0 d
1 <sup>st</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz.....						
2 <sup>nd</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz.....						
3 <sup>rd</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy A" 0.225 oz.....						
4 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz.....						
5 <sup>th</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz.....						
6 <sup>th</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz.....						
7 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy A" 0.225 oz.....						
8 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz + Daconil Ultrex 3.2 oz.....						
1 <sup>st</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz.....						
2 <sup>nd</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz.....						
3 <sup>rd</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy B" 0.225 oz.....						
4 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz.....						
5 <sup>th</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz.....	14	1.8 c-e	1.5 de	0.0 d	0.0 d	0.0 d
6 <sup>th</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz.....						
7 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy B" 0.225 oz.....						
8 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz + Daconil Ultrex 3.2 oz.....						
1 <sup>st</sup> spray Chipco Triton "Legacy B" 4.0 fl. oz.....						
2 <sup>nd</sup> spray Signature Ultra 4.0 oz.....						
3 <sup>rd</sup> spray Signature Ultra 4.0 oz.....						
4 <sup>th</sup> spray Daconil Ultrex 3.2 oz.....						
5 <sup>th</sup> spray Chipco Triton "Legacy B" 4.0 fl. oz.....	14	0.0 e	0.0 e	0.0 d	0.8 d	0.0 d
6 <sup>th</sup> spray Signature Ultra 4.0 oz.....						
7 <sup>th</sup> spray Signature Ultra 4.0 oz.....						
8 <sup>th</sup> spray Daconil Ultrex 3.2 oz.....						
Syngenta Concert 4.0 oz.....	14	1.8 c-e	0.5 de	0.0 d	0.0 d	0.0 d
LSD (0.05) <sup>x</sup>	---	10.5	14.0	10.0	11.7	14.0

<sup>x</sup> Means followed by the same letter are not significantly different within column according to Fisher's protected LSD at  $P \leq 0.05$ .

### Results and Discussion

Although natural inocula were used, disease pressure was heavy due to exceptionally wet weather in June and July. All of the tested products suppressed dollar spot significantly ( $P \leq 0.05$ ) in comparison to the unsprayed check (Table 1). No phytotoxicity symptoms were observed during the trial.

At the wet end period, July 31, all of the tested products suppressed brown patch significantly ( $P \leq 0.05$ ) in comparison to the unsprayed check, with several products

with less the 5% disease severity (Table 2). However, by late August, a dry month, differences among treatments were not observed.

All, except, for the first turf quality assessments indicated a significant difference from the unsprayed control (Table 3). Many of the assessment values indicated an acceptable level of turf quality.

**Table 2. Brown patch on creeping bentgrass Products and rates per 1000 sq ft**

Products and rates per 1000 sq ft	Interval (days)	Brown patch (0-5 rating) <sup>z</sup>				
		22-Jun	7-Jul	31-Jul	14-Aug	21-Aug
Unsprayed check.....	---	0.5a <sup>x</sup>	1.8 a-d	4.5 a	2.0 a-d	1.8 a-c
BioSafe ZeroTol 1% first spray; 0.33% later sprays.....	7	0.3 a	1.3 a-d	1.5 c-d	1.5 a-e	1.0 bc
BioSafe STBX-013 0.2% first spray; 0.07% later sprays.....	7	0.3 a	2.3 ab	2.3 b	2.0 a-d	2.0 a-c
Cleary 26/36 3 oz.....	14	0.3 a	2.5 ab	0.5 ed	2.8 a	2.8 ab
Cleary Spectro 3.5 oz.....	14	0.5 a	1.8 a-d	0.8 c-e	1.0 c-f	1.5 bc
Valent Tourney 50WD 0.18 oz.....	14	0.3 a	1.5 a-d	0.0 e	2.3 a-c	2.3 a-c
Valent Tourney 50WD 0.25 oz.....	14	0.3 a	3.0 a	0.0 e	2.3 a-c	2.3 a-c
Valent Tourney 50WD 0.37.....	14	0.0 a	1.8 a-d	0.0 e	2.0 a-d	1.3 bc
BASF Insignia 0.5 oz.....	14	0.0 a	1.5 a-d	1.8 bc	0.0 f	1.5 bc
BASF Trinity 1.0 oz.....	14	0.0 a	1.8 a-d	1.0 c-e	2.5 ab	3.5 a
BASF Emerald 0.13 oz.....	14	0.5 a	2.3 ab	1.0 c-e	2.0 a-d	2.8 ab
Bayer Chipco Triton "Legacy B" 1.0 fl. oz + Signature Ultra 4.0 oz .....	14	0.0 a	0.8 b-d	0.0 e	0.8 d-f	1.8 a-c
Bayer Chipco Triton "Legacy B" 1.5 fl. oz.....	14	0.3 a	2.0 a-c	0.0 e	0.8 d-f	2.0 a-c
Bayer Chipco Triton "Legacy B" 2.0 fl. oz.....	14	0.0 a	1.0 b-d	0.0 e	0.3 ef	1.8 a-c
1 <sup>st</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz .....						
2 <sup>nd</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz .....						
3 <sup>rd</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy A" 0.225 oz .....						
4 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz .....						
5 <sup>th</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz .....	14	0.0 a	0.8 b-d	0.0 e	0.0 f	0.5 c
6 <sup>th</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz .....						
7 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy A" 0.225 oz .....						
8 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz + Daconil Ultrex 3.2 oz .....						
1 <sup>st</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz .....						
2 <sup>nd</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz .....						
3 <sup>rd</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy B" 0.225 oz .....						
4 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz .....	14	0.0 a	0.3 cd	0.3 e	0.3 ef	1.0 bc
5 <sup>th</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz .....						
6 <sup>th</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz .....						
7 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy B" 0.225 oz .....						
8 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz + Daconil Ultrex 3.2 oz .....						
1 <sup>st</sup> spray Chipco Triton "Legacy B" 4.0 fl. oz .....						
2 <sup>nd</sup> spray Signature Ultra 4.0 oz .....						
3 <sup>rd</sup> spray Signature Ultra 4.0 oz .....						
4 <sup>th</sup> spray Daconil Ultrex 3.2 oz .....	14	0.0 a	0.0 d	0.0 e	0.3 ef	0.8 c
5 <sup>th</sup> spray Chipco Triton "Legacy B" 4.0 fl. oz .....						
6 <sup>th</sup> spray Signature Ultra 4.0 oz .....						
7 <sup>th</sup> spray Signature Ultra 4.0 oz .....						
8 <sup>th</sup> spray Daconil Ultrex 3.2 oz .....						
Syngenta Concert 4.0 oz.....	14	0.0 a	1.5 a-d	0.3 e	1.3 b-f	1.8 a-c
LSD (0.05) <sup>x</sup>	---	0.6	1.8	1.1	1.5	1.8

<sup>z</sup>Disease rating scale 0 = no disease; 1 = 1-5%; 2 = 6-10%; 3 = 11-25%; 4 = 26-50%; 5 = >50% plot symptomatic.

<sup>x</sup> Means followed by the same letter are not significantly different within column according to Fisher's protected LSD at  $P \leq 0.05$ .

**Table 3. Turf quality of creeping bentgrass  
Products and rates per 1000 sq ft**

	Interval (days)	Turf quality assessment of 1 to 10 <sup>z</sup>			
		7-Jul	31-Jul	14-Aug	21-Aug
Unsprayed check.....	---	4.5 c-g	1.5 h	1.8 i	2.5 h
BioSafe ZeroTol 1% first spray; 0.33% later sprays.....	7	3.5 e-g	5.0 fg	4.3 gh	4.8 ef
BioSafe STBX-013 0.2% first spray; 0.07% later sprays.....	7	3.0 fg	4.3 g	4.3 gh	4.5 fg
Cleary 26/36 3 oz.....	14	3.3 fg	6.5 c-e	5.5 e-g	5.3 c-f
Cleary Spectro 3.5 oz.....	14	4.3 d-g	6.3 c-e	6.3 d-f	6.3 a-e
Valent Tourney 50WD 0.18 oz.....	14	5.5 a-d	6.8 b-d	5.5 e-g	5.5 b-f
Valent Tourney 50WD 0.25 oz.....	14	4.5 c-g	6.8 b-d	6.5 c-f	6.5 a-d
Valent Tourney 50WD 0.37.....	14	5.0 b-f	7.0 a-d	6.3 d-f	6.5 a-d
BASF Insignia 0.5 oz.....	14	3.5 e-g	4.0 g	3.0 hi	3.0 gh
BASF Trinity 1.0 oz.....	14	3.5 e-g	5.5 ef	5.3 fg	5.0 d-f
BASF Emerald 0.13 oz.....	14	3.3 fg	6.3 c-e	6.0 d-e	5.5 b-f
Bayer Chipco Triton "Legacy B" 1.0 fl. oz + Signature Ultra 4.0 oz .....	14	5.8 a-d	7.3 a-c	7.0 a-d	6.0 a-f
Bayer Chipco Triton "Legacy B" 1.5 fl. oz.....	14	5.3 b-e	6.8 b-d	6.8 b-e	6.0 a-f
Bayer Chipco Triton "Legacy B" 2.0 fl. oz.....	14	6.3 a-c	8.0 a	8.0 ab	6.3 a-e
1 <sup>st</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz .....					
2 <sup>nd</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz					
3 <sup>rd</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy A" 0.225 oz					
4 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz					
5 <sup>th</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz	14	6.3 a-c	7.8 ab	8.3 a	7.5 a
6 <sup>th</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz					
7 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy A" 0.225 oz					
8 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz + Daconil Ultrex 3.2 oz					
1 <sup>st</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz .....					
2 <sup>nd</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz					
3 <sup>rd</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy B" 0.225 oz					
4 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz					
5 <sup>th</sup> spray Signature Ultra 4.0 fl. oz + Tartan 1.5 oz	14	6.8 ab	7.0 a-d	7.3 a-d	6.8 a-c
6 <sup>th</sup> spray Signature Ultra 4.0 oz + Daconil Ultrex 3.2 oz					
7 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco Triton "Legacy B" 0.225 oz					
8 <sup>th</sup> spray Signature Ultra 4.0 oz + Chipco26GT 4.0 oz + Daconil Ultrex 3.2 oz					
1 <sup>st</sup> spray Chipco Triton "Legacy B" 4.0 fl. oz .....					
2 <sup>nd</sup> spray Signature Ultra 4.0 oz					
3 <sup>rd</sup> spray Signature Ultra 4.0 oz					
4 <sup>th</sup> spray Daconil Ultrex 3.2 oz					
5 <sup>th</sup> spray Chipco Triton "Legacy B" 4.0 fl. oz	14	7.3 a	7.3 a-c	7.8 a-c	7.0 ab
6 <sup>th</sup> spray Signature Ultra 4.0 oz					
7 <sup>th</sup> spray Signature Ultra 4.0 oz					
8 <sup>th</sup> spray Daconil Ultrex 3.2 oz					
Syngenta Concert 4.0 oz.....	14	4.8 c-g	6.3 c-e	6.0 d-e	6.3 a-e
LSD (0.05) <sup>x</sup>	---	1.8	1.0	1.5	1.6

<sup>z</sup> A turf quality assessment of 1 to 10 (1=poorest, 10=best, 6=acceptable)