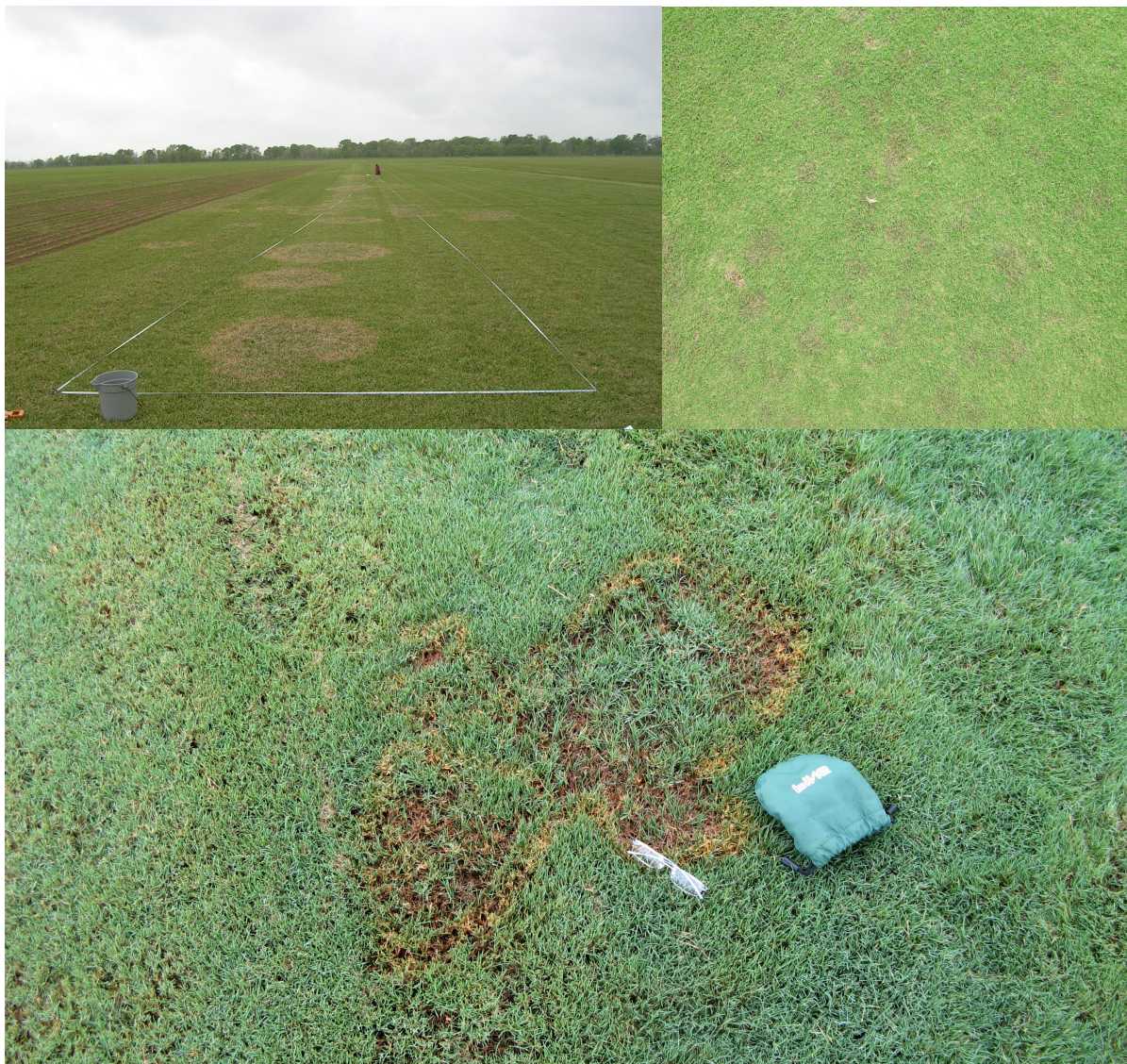
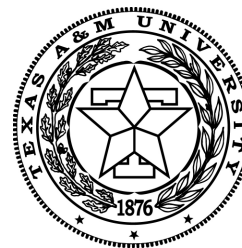


## 2008 Turfgrass Disease Clinic and Field Day



October 1<sup>st</sup>, 2008  
Texas AgriLife Extension Service – Harris County Office  
3033 Bear Creek Drive  
Houston Texas 77084



Welcome to the 2008 Turfgrass Disease Clinic and Field Day. At this event, Turfgrass Disease Specialists with Texas AgriLife Extension and Texas A&M University share the results of the fungicide evaluations and turfgrass disease research that has been performed in Southeast Texas over the past year. We hope to make this an annual event where we will share the results of an every growing turfgrass disease management research program with the turfgrass industry.

The new Turfgrass Pathology Program at Texas A&M University was launched on January 1, 2008. This event is the first opportunity to present our field data to the turfgrass industry and turfgrass professionals in Texas. In these field tests, we included six field plot sites established at three golf courses and two sod farms in Southeastern Texas. More than 1,500 miles were driven during the past eight months to set up plots, apply treatments and evaluate diseases. Working and interacting with county Extension agents, golf course superintendents and sod farmers has been an invaluable experience for me. I have learned much about the turfgrass industry and current turfgrass disease problems in Texas. I believe this is a small positive step toward establishing a successful turfgrass pathology research and Extension program in the state of Texas.

I am sincerely grateful for the tremendous industry support shown for the Texas A&M Turfgrass Pathology Program by BASF Corporation, Bayer Environmental Science, Cleary Chemical Corporation, Dupont Crop Protection, Precision Laboratories, Syngenta Professional Products and Quali-Pro. I also would like to acknowledge and give special thanks to the golf course superintendents, golf club owners, and sod producers for participating in our research projects and providing us field research sites. Some of the great people that have help include Bud Graves and Rusty Graves of VGT Sod, Boston Brown and Greg Deaton of Quality Turf Farms, Dannis Wilganowski of Bryan Golf Course, Clay Hillegeist of Bear Creek Golf World, and John Maloney and Mike Ussery of Wind Rose Golf Club. Without the help of industry members like you, the turfgrass pathology research and Extension program cannot be a success. I look forward to your continued support and collaborative work.

Sincerely yours,

Dr. Young-Ki Jo  
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## **Disclaimer**

The research results in this document are not intended to be management recommendations. Products, application procedures and other research methods used in this study may not be registered, legal for public use or beneficial for use in some situations. No endorsement of products is implied or intended. This publication was prepared and distributed by the Turfgrass Pathology Laboratory, Department of Plant Pathology and Microbiology, Texas A&M University as a service to the turfgrass industry and turfgrass professionals in Texas.

## **Fungicide evaluation for control of patch disease on bermudagrass at the Bear Creek Golf World, Houston in 2008**

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### **Objective**

To evaluate fungicides for management of patch disease caused by *Rhizoctonia* species on bermudagrass.

### **Materials and Methods**

This field trial was conducted at the Bear Creek Golf World in Houston. Plots were established on two bermudagrass fairways (Presidents Course #7 hole and Challenger Course #8 hole), maintained at 0.5-inch mowing height. Individual plots measured 3 by 4 feet, and were arranged in a randomized complete block design with four replicates.

A total of 23 different fungicide treatments along with water and fertilizer controls were applied based at labeled or suggested rates. Individual treatments were applied at a pressure of 40 p.s.i using a CO<sub>2</sub> pressurized boom sprayer equipped with two Teejet 8002 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1,000 ft<sup>2</sup>. Spring applications were performed on March 25 and April 30, 2008. Treatments 26 and 27 were applied once on April 30.

Percent diseased area and turfgrass quality of each plot were recorded weekly throughout experiment. Data obtained was subjected to an analysis of variance to determine significant differences between treatments using the SAS software program. The mean percent disease and mean turfgrass quality for each treatment are presented in the tables below.

### **Results and Discussion**

As daily average temperature increased above 70F after April, bermudagrass became greener and recovered from disease symptoms. Statistically, there was no significant improvement with fungicide treatments compared to water control. However, there was an adverse effect of propiconazole on recovering bermudagrass.

Table 1. Patch disease severity (percent diseased area) on the bermudagrass fairway plots established on Presidents Course #7 hole at Bear Creek Golf World, Houston

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Apr 21	Apr 30	May 8	May 14
1	Quali-Pro Ipro 2SE	4	15.0	10.0	30.0	10.0
2	Quali-Pro TM 4.5	2	8.8	7.5	11.3	4.3
3	Quali-Pro Chlorothalonil 720 SFT	3.5	7.5	5.5	13.8	3.0
4	Quali-Pro TM/C	4	6.3	10.0	22.5	5.0
5	Quali-Pro Propiconazole 14.3	4	7.5	21.3	37.5	20.0
6	26 GT	4	8.8	7.3	13.8	3.0
7	3336 PLUS	5	5.0	6.3	8.8	3.8
8	3336 PLUS Daconil Ultrex	2.5 5	5.0	5.5	9.5	2.3
9	Banner MAXX	4	15.0	8.8	31.3	8.8
10	Banner MAXX Duplex	4 1	5.0	7.5	20.0	6.3
11	Heritage Duplex	2 1	5.0	5.0	12.5	3.0
12	3336 PLUS Duplex	5 1	5.0	11.3	11.3	3.0
13	26 GT Duplex	4 1	3.8	6.8	7.5	4.3
14	Duplex	1	7.5	8.8	16.3	5.5
17	Headway	1.5	7.5	10.0	20.0	10.5
18	Heritage	2	7.5	4.3	11.3	5.5
19	Daconil Ultrex	2.5	6.3	7.5	13.8	4.8
20	Insignia	0.9	3.8	11.3	16.3	10.5
21	Trinity	2	5.0	10.0	21.3	5.5
22	Ammonium sulfate	16	10.0	11.3	11.3	3.0
23	Water Control		3.8	5.5	11.3	3.5
24	LEM17	0.3	3.8	8.8	13.8	6.0
25	LEM17	0.5	6.3	6.3	8.3	5.0
26	3336 PLUS Protect DF	4 8			22.5	6.8
27	CX-09	2.5			17.5	16.8
	*LSD (P=0.05)		6.2	9.9	11.6	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

Table 2. Turfgrass quality of the bermudagrass fairway plots established on Presidents Course #7 hole at Bear Creek Golf World, Houston. Quality scale on a 1 to 9, where 9 = highest quality, and 5 = acceptable.

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Apr 21	Apr 30	May 8	May 14
1	Quali-Pro Ipro 2SE	4	5.5	5.5	5.8	4.8
2	Quali-Pro TM 4.5	2	5.8	5.8	6.3	6.0
3	Quali-Pro Chlorothalonil 720 SFT	3.5	5.8	5.8	6.3	5.8
4	Quali-Pro TM/C	4	5.5	5.5	6.0	5.3
5	Quali-Pro Propiconazole 14.3	4	5.3	5.3	4.8	4.5
6	26 GT	4	5.5	5.8	6.5	5.3
7	3336 PLUS	5	6.0	6.0	6.5	6.0
8	3336 PLUS Daconil Ultrex	2.5 5	6.5	6.0	6.8	6.5
9	Banner MAXX	4	5.3	5.5	5.5	5.3
10	Banner MAXX Duplex	4 1	5.8	6.0	5.3	5.5
11	Heritage Duplex	2 1	5.5	6.3	6.0	5.3
12	3336 PLUS Duplex	5 1	6.0	5.3	6.5	6.0
13	26 GT Duplex	4 1	6.5	6.3	6.0	6.0
14	Duplex	1	5.3	5.5	5.5	5.3
17	Headway	1.5	5.8	6.0	5.8	5.8
18	Heritage	2	6.0	6.0	6.0	6.0
19	Daconil Ultrex	2.5	5.8	5.5	6.0	6.0
20	Insignia	0.9	6.5	5.8	5.5	6.3
21	Trinity	2	5.8	5.8	5.8	5.0
22	Ammonium sulfate	16	5.8	5.5	6.8	5.8
23	Water Control		6.3	6.0	6.5	6.3
24	LEM17	0.3	5.8	5.8	5.5	5.8
25	LEM17	0.5	5.8	6.3	5.8	5.8
26	3336 PLUS Protect DF	4 8			5.8	5.3
27	CX-09	2.5			5.8	5.5
*LSD (P=0.05)			NS	NS	1	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

Table 3. Patch disease severity (percent diseased area) on the bermudagrass fairway plots established on Challenger Course #8 hole at the Bear Creek Golf World, Houston

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Apr 21	Apr 30	May 8	May 14
1	Quali-Pro Ipro 2SE	4	12.5	11.3	7.5	2.5
2	Quali-Pro TM 4.5	2	11.3	23.8	13.8	7.5
3	Quali-Pro Chlorothalonil 720 SFT	3.5	15.0	13.0	9.5	1.3
4	Quali-Pro TM/C	4	8.8	7.5	7.5	1.0
5	Quali-Pro Propiconazole 14.3	4	18.8	10.0	15.0	4.3
6	26 GT	4	11.3	16.8	11.3	3.0
7	3336 PLUS	5	6.3	16.3	13.8	3.0
8	3336 PLUS Daconil Ultrex	2.5 5	6.3	9.3	10.0	3.0
9	Banner MAXX	4	7.5	13.0	11.3	2.5
10	Banner MAXX Duplex	4 1	6.3	12.5	12.5	5.0
11	Heritage Duplex	2 1	5.0	3.5	9.5	1.8
12	3336 PLUS Duplex	5 1	7.5	7.5	8.3	0.5
13	26 GT Duplex	4 1	7.5	6.8	10.0	2.3
14	Duplex	1	7.5	5.5	6.3	0.5
17	Headway	1.5	11.3	10.5	8.8	1.8
18	Heritage	2	5.0	4.8	4.5	0.0
19	Daconil Ultrex	2.5	5.0	4.8	8.8	0.5
20	Insignia	0.9	7.5	16.3	12.5	5.0
21	Trinity	2	8.8	11.3	14.5	2.5
22	Ammonium sulfate	16	8.8	23.8	11.3	3.8
23	Water Control		5.0	10.5	8.8	2.3
24	LEM17	0.3	5.0	6.3	7.5	3.0
25	LEM17	0.5	7.5	12.5	10.0	3.8
26	3336 PLUS Protect DF	4 8			10.0	3.5
27	CX-09	2.5			7.5	1.8
	*LSD (P=0.05)		NS	NS	NS	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

Table 4. Turfgrass quality of the bermudagrass fairway plots established on Challenger Course #8 hole at the Bear Creek Golf World, Houston. Quality scale on a 1 to 9, where 9 = highest quality, and 5 = acceptable.

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Apr 21	Apr 30	May 8	May 14
1	Quali-Pro Ipro 2SE	4	5.5	6.0	6.3	6.3
2	Quali-Pro TM 4.5	2	5.8	5.3	5.8	5.3
3	Quali-Pro Chlorothalonil 720 SFT	3.5	5.8	6.3	6.0	6.8
4	Quali-Pro TM/C	4	5.3	6.3	6.0	6.5
5	Quali-Pro Propiconazole 14.3	4	4.8	6.0	5.5	5.5
6	26 GT	4	6.3	6.0	5.8	6.0
7	3336 PLUS	5	5.8	5.8	6.0	5.8
8	3336 PLUS Daconil Ultrex	2.5 5	5.8	6.0	6.0	6.0
9	Banner MAXX	4	5.5	5.8	5.5	5.3
10	Banner MAXX Duplex	4 1	5.3	5.5	5.8	5.5
11	Heritage Duplex	2 1	6.3	6.8	6.0	6.3
12	3336 PLUS Duplex	5 1	5.3	5.8	5.8	6.0
13	26 GT Duplex	4 1	5.8	6.3	6.0	6.3
14	Duplex	1	5.3	6.3	6.3	6.5
17	Headway	1.5	5.0	5.8	5.8	6.0
18	Heritage	2	5.5	6.3	6.5	6.3
19	Daconil Ultrex	2.5	6.0	7.0	6.0	6.3
20	Insignia	0.9	5.5	5.0	6.0	5.5
21	Trinity	2	5.3	5.8	6.0	6.0
22	Ammonium sulfate	16	4.5	5.0	5.8	5.5
23	Water Control		5.0	5.8	6.0	5.8
24	LEM17	0.3	5.8	6.0	5.8	5.5
25	LEM17	0.5	5.8	5.5	6.3	6.0
26	3336 PLUS Protect DF	4 8			5.8	5.5
27	CX-09	2.5			6.3	6.0
*LSD (P=0.05)			NS	NS	NS	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

## **Fungicide evaluation for control of patch disease on bermudagrass at the Bryan Golf Course, Bryan in 2008**

Young-Ki Jo, Saradha Erattaimuthu, and Rick Henry

Department of Plant Pathology & Microbiology, Texas A&M University, College Station

### **Objective**

To evaluate fungicides for management of patch disease caused by *Rhizoctonia cerealis* and *Gaeumannomyces* species on bermudagrass.

### **Materials and Methods**

This field trial was conducted at the Bryan Golf Course in Bryan. Plots were established on one bermudagrass putting green (#11 hole), maintained at 0.125-inch mowing height. Individual plots measured 3 by 4 feet, and were arranged in a randomized complete block design with four replicates.

A total of 21 different fungicide treatments along with water and fertilizer controls were applied based at labeled or suggested rates. Individual treatments were applied at a pressure of 40 p.s.i using a CO<sub>2</sub> pressurized boom sprayer equipped with two Teejet 8002 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1,000 ft<sup>2</sup>. A spring application was performed on March 28.

Percent diseased area of each plot was recorded at 10 days after treatment. Data obtained was subjected to an analysis of variance to determine significant differences between treatments using the SAS software program. The mean percent disease for each treatment is presented in the table below.

### **Results and Discussion**

As daily average temperature increased above 70F after April, bermudagrass became greener and recovered from disease symptoms. Statistically, there was no significant improvement with fungicide treatments compared to water control. However, there was an adverse effect of propiconazole on recovering bermudagrass.

Table 1. Patch disease severity (percent diseased area) on the bermudagrass putting green plots established at the Bryan Golf Course, Bryan

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Mar28 (before)**	Apr 8
1	Quali-Pro Ipro 2SE	4	50.0	22.5
2	Quali-Pro TM 4.5	2	55.0	15.0
3	Quali-Pro Chlorothalonil 720 SFT	3.5	62.5	22.5
4	Quali-Pro TM/C	4	53.8	20.0
5	Quali-Pro Propiconazole 14.3	4	55.0	31.3
6	26 GT	4	67.5	17.5
7	3336 PLUS	5	57.5	13.8
8	3336 PLUS Daconil Ultrex	2.5 5	67.5	28.8
9	Banner MAXX	4	52.5	23.8
10	Banner MAXX Duplex	4 1	57.5	15.0
11	Heritage Duplex	2 1	60.0	23.8
12	3336 PLUS Duplex	5 1	40.0	10.0
13	26 GT Duplex	4 1	41.3	20.0
14	Duplex	1	61.3	32.5
17	Headway	1.5	55.0	30.0
18	Heritage	2	57.5	23.8
19	Daconil Ultrex	2.5	67.5	17.5
20	Insignia	0.9	65.0	20.0
21	Trinity	2	70.0	27.5
22	Ammonium sulfate	16	52.5	20.0
23	Water Control		56.3	17.5
24	LEM17	0.3	46.3	15.0
25	LEM17	0.5	50.0	20.0
	*LSD (P=0.05)		NS	17.8

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

\*\*Disease severity rated before the treatments were applied.

## **Fungicide evaluation for control of patch disease on St. Augustinegrass sod at the Quality Turf Farms, Brookshire in 2008**

Young-Ki Jo, Saradha Erattaimuthu, and Rick Henry

Department of Plant Pathology & Microbiology, Texas A&M University, College Station

### **Objective**

To evaluate fungicides for management of patch disease caused by *Rhizoctonia solani* on St. Augustinegrass.

### **Materials and Methods**

This field trial was conducted at the Quality Turf Farms in Brookshire. Plots were established on St. Augustinegrass cultivar 'Raleigh', maintained at 3-inch mowing height. Individual plots measured 3 by 6 feet, and were arranged in a randomized complete block design with four replicates.

A total of 23 different fungicide treatments along with water and fertilizer controls were applied based at labeled or suggested rates. Individual treatments were applied at a pressure of 40 p.s.i using a CO<sub>2</sub> pressurized boom sprayer equipped with two Teejet 8002 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1,000 ft<sup>2</sup>. Spring applications were performed on March 27 and May 1, 2008. Treatments 26 and 27 were applied once on May 1.

Percent diseased area and turfgrass quality of each plot were recorded bimonthly throughout experiment. Data obtained was subjected to an analysis of variance to determine significant differences between treatments using the SAS software program. The mean percent disease and mean turfgrass quality for each treatment are presented in the tables below.

### **Results and Discussion**

As daily average temperature increased above 70F after April, St. Augustinegrass became greener and recovered from disease symptoms. Statistically, there was no significant improvement with fungicide treatments compared to water control. However, there was an adverse effect of propiconazole on recovering St. Augustinegrass.

Table 1. Patch disease severity (percent diseased area) on St. Augustinegrass sod established at the Quality Turf Farms, Brookshire

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Apr 3	May 1	May 14	Jun 5
1	Quali-Pro Ipro 2SE	4	22.5	12.5	11.3	8.8
2	Quali-Pro TM 4.5	2	23.8	15.0	11.8	10.0
3	Quali-Pro Chlorothalonil 720 SFT	3.5	21.3	17.5	6.8	10.0
4	Quali-Pro TM/C	4	27.5	23.8	11.3	13.8
5	Quali-Pro Propiconazole 14.3	4	37.5	23.8	22.5	15.0
6	26 GT	4	51.3	28.8	16.8	25.0
7	3336 PLUS	5	23.8	17.5	5.3	8.8
8	3336 PLUS Daconil Ultrex	2.5 5	38.8	28.8	16.3	20.0
9	Banner MAXX	4	62.5	45.0	37.5	28.8
10	Banner MAXX Duplex	4 1	23.8	27.5	32.5	13.8
11	Heritage Duplex	2 1	16.3	12.5	8.8	7.5
12	3336 PLUS Duplex	5 1	26.3	22.5	8.0	11.3
13	26 GT Duplex	4 1	30.0	22.5	17.5	11.3
14	Duplex	1	46.3	33.8	18.8	23.8
17	Headway	1.5	21.3	11.3	5.5	5.0
18	Heritage	2	17.5	10.0	8.8	6.3
19	Daconil Ultrex	2.5	30.0	18.8	18.0	13.8
20	Insignia	0.9	30.0	21.3	14.3	13.8
21	Trinity	2	37.5	18.8	11.3	12.5
22	Ammonium sulfate	16	48.8	28.8	15.0	20.0
24	LEM17	0.3	31.3	18.8	12.8	12.5
25	LEM17	0.5	43.8	26.3	17.8	20.0
26	3336 PLUS Protect DF	4 8	36.3	23.8	7.5	16.3
27	CX-09	2.5			18.8	21.3
28	Water Control				17.5	23.8
	*LSD (P=0.05)		NS	NS	17.3	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

Table 2. Turfgrass quality of the St. Augustinegrass sod established at the Quality Turf Farms, Brookshire. Quality scale on a 1 to 9, where 9 = highest quality, and 5 = acceptable.

Treatment No.	Treatment	Appl. Rate (fl oz/M)	May 1	May 14	Jun 5
1	Quali-Pro Ipro 2SE	4	5.5	6.0	6.8
2	Quali-Pro TM 4.5	2	5.3	6.0	6.3
3	Quali-Pro Chlorothalonil 720 SFT	3.5	5.0	6.3	6.0
4	Quali-Pro TM/C	4	4.8	5.8	6.0
5	Quali-Pro Propiconazole 14.3	4	4.3	4.3	5.5
6	26 GT	4	4.8	5.0	6.0
7	3336 PLUS	5	5.3	5.5	7.0
8	3336 PLUS Daconil Ultrex	2.5 5	4.3	5.0	5.5
9	Banner MAXX	4	3.5	4.0	4.5
10	Banner MAXX Duplex	4 1	5.0	4.0	5.8
11	Heritage Duplex	2 1	5.3	5.3	7.0
12	3336 PLUS Duplex	5 1	5.0	5.3	6.0
13	26 GT Duplex	4 1	4.8	4.8	6.3
14	Duplex	1	4.5	5.5	5.3
17	Headway	1.5	5.5	6.0	6.8
18	Heritage	2	5.3	5.3	6.5
19	Daconil Ultrex	2.5	5.3	5.3	5.8
20	Insignia	0.9	4.8	5.5	5.8
21	Trinity	2	5.3	5.5	6.5
22	Ammonium sulfate	16	4.8	6.0	5.8
24	LEM17	0.3	4.8	5.3	6.0
25	LEM17	0.5	4.5	5.8	5.3
26	3336 PLUS Protect DF	4 8		5.3	5.3
27	CX-09	2.5		5.0	5.8
28	Water Control		4.0	4.8	5.0
	*LSD (P=0.05)		NS	1.3	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

## **Fungicide evaluation for control of patch disease on St. Augustinegrass sod at the VGT Sod, Wharton in 2008**

Young-Ki Jo, Saradha Erattaimuthu, and Rick Henry

Department of Plant Pathology & Microbiology, Texas A&M University, College Station

### **Objective**

To evaluate fungicides for management of patch disease caused by *Rhizoctonia solani* on St. Augustinegrass.

### **Materials and Methods**

This field trial was conducted at the VGT Sod in Wharton. Plots were established on St. Augustinegrass cultivar 'Raleigh', maintained at 4-inch mowing height. Individual plots measured 6 by 9 feet, and were arranged in a randomized complete block design with four replicates.

A total of 21 different fungicide treatments along with water and fertilizer controls were applied based at labeled or suggested rates. Individual treatments were applied at a pressure of 40 p.s.i using a CO<sub>2</sub> pressurized boom sprayer equipped with two Teejet 8002 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1,000 ft<sup>2</sup>. A spring application was performed on March 21, 2008.

Percent diseased area and turfgrass quality of each plot were recorded bimonthly throughout experiment. Data obtained was subjected to an analysis of variance to determine significant differences between treatments using the SAS software program. The mean percent disease and mean turfgrass quality for each treatment are presented in the table below.

### **Results and Discussion**

As daily average temperature increased above 70F after April, St. Augustinegrass became greener and recovered from disease symptoms. Statistically, there was no significant improvement with fungicide treatments compared to water control.

Table 1. Patch disease severity (percent diseased area) and turfgrass quality of St. Augustinegrass sod established at the VGT Sod, Wharton.

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Mar 21 (Before)**	Apr 3	May 1	May 1 (Qual)***
1	Quali-Pro Ipro 2SE	4	41.3	31.3	12.5	6.0
2	Quali-Pro TM 4.5	2	53.8	36.3	11.3	5.5
3	Quali-Pro Chlorothalonil 720 SFT	3.5	56.3	42.5	13.8	5.3
4	Quali-Pro TM/C	4	47.5	33.8	12.5	5.3
5	Quali-Pro Propiconazole 14.3	4	50.0	32.5	17.5	5.3
6	26 GT	4	46.3	26.3	12.5	5.5
7	3336 PLUS	5	42.5	18.8	8.8	5.8
8	3336 PLUS Daconil Ultrex	2.5 5	56.3	18.8	10.0	5.8
9	Banner MAXX	4	53.8	41.3	11.3	5.5
10	Banner MAXX Duplex	4 1	47.5	32.5	15.0	5.5
11	Heritage Duplex	2 1	55.0	28.8	8.8	5.8
12	3336 PLUS Duplex	5 1	67.5	31.3	17.5	5.5
13	26 GT Duplex	4 1	65.0	36.3	11.3	5.8
14	Duplex	1	63.8	36.3	12.5	5.8
17	Headway	1.5	57.5	27.5	13.8	5.3
18	Heritage	2	46.3	20.0	8.8	5.5
19	Daconil Ultrex	2.5	47.5	21.3	11.3	5.0
20	Insignia	0.9	48.8	33.8	12.5	5.5
21	Trinity	2	71.3	43.8	11.3	5.3
22	Ammonium sulfate	16	60.0	28.8	16.3	5.3
23	Water Control		60.0	24.3	11.3	5.8
24	LEM17	0.3	55.0	28.8	12.5	5.8
25	LEM17	0.5	73.8	38.8	13.8	5.5
*LSD (P=0.05)			NS	NS	NS	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

\*\*Disease severity rated before the treatments were applied.

\*\*\*Turfgrass quality. Quality scale on a 1 to 9, where 9 = highest quality, and 5 = acceptable.

## **Fungicide evaluation for control of foliar disease on bermudagrass at the Wind Rose Golf Club, Spring in 2008**

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### **Objective**

To evaluate fungicides for management of foliar disease, tentatively called as “inky spot,” caused by unknown fungal species on bermudagrass.

### **Materials and Methods**

This field trial was conducted at the Wind Rose Golf Club in Spring. Plots were established on one bermudagrass fairway (#9 hole), maintained at 0.5-inch mowing height. Individual plots measured 3 by 6 feet, and were arranged in a randomized complete block design with four replicates.

A total of 24 different fungicide treatments along with water and fertilizer controls were applied based at labeled or suggested rates. Individual treatments were applied at a pressure of 40 p.s.i using a CO<sub>2</sub> pressurized boom sprayer equipped with two Teejet 8002 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1,000 ft<sup>2</sup>. Fungicide applications were performed on August 4.

Percent diseased area and turfgrass quality of each plot were recorded weekly for one month. Data obtained was subjected to an analysis of variance to determine significant differences between treatments using the SAS software program. The mean percent disease and mean turfgrass quality for each treatment are presented in the tables below.

### **Results and Discussion**

Symptoms that inky spot disease produced included distinctive black spots (~ 2 inches in diameter) on bermudagrass fairways and roughs. As the disease progressed, individual spots were merged to bigger and irregular patches ranging up to 1 foot in diameter. Dark green to black lesions were irregularly shaped on leaf blades. Severely infected leaves died and appeared light tan to straw in color. Identification of the causal pathogen is under investigation. We think it may be a previously-undocumented fungal pathogen on turfgrass.

Most treatments significantly reduced the disease symptoms in 2 weeks after application except thiophanate-methyl and chlorothalonil. As daily temperature decreased during September and rainfall amounts decreased, bermudagrass recovered from disease symptoms.

Table 1. Foliar disease severity (number of infection centers) on the bermudagrass fairway plots established at the Wind Rose Golf Club, Spring

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Aug 11	Aug 18	Aug 26	Sep 2
1	Quali-Pro Ipro 2SE	4	2.3	0.8	0.6	0.8
2	Quali-Pro TM 4.5	2	5.8	3.5	7.0	0.5
3	Quali-Pro Chlorothalonil 720 SFT	3.5	2.3	2.0	6.0	1.3
4	Quali-Pro TM/C	4	3.5	4.8	7.5	2.0
5	Quali-Pro Propiconazole 14.3	4	1.5	0.0	0.8	0.3
6	26 GT	4	1.5	0.5	0.3	0.0
7	3336 PLUS	5	2.3	1.8	3.8	1.3
8	3336 PLUS Daconil Ultrex	2.5 5	2.5	3.8	6.0	0.3
9	Banner MAXX	4	3.0	0.5	0.5	0.5
10	Banner MAXX Duplex	4 1	3.3	0.8	0.3	1.3
11	Heritage Duplex	2 1	2.0	1.3	1.0	0.5
12	3336 PLUS Duplex	5 1	2.5	2.8	4.0	0.5
13	26 GT Duplex	4 1	2.5	1.0	0.3	0.3
14	Duplex	1	2.3	0.5	3.3	0.0
15	Headway	3	1.8	0.8	0.0	0.5
16	Headway	1.5	3.3	0.5	0.8	0.5
17	Heritage	2	1.5	0.5	0.5	0.0
19	Daconil Ultrex	2.5	4.0	3.3	6.0	0.8
20	Insignia	0.9	4.3	2.0	1.0	0.0
21	Trinity	2	2.5	2.8	2.3	0.8
22	Ammonium sulfate	16	4.5	4.0	5.5	0.5
23	Water Control		5.0	8.0	9.8	1.3
24	LEM17	0.3	1.3	0.5	0.8	0.5
25	LEM17	0.5	1.8	0.8	0.0	0.0
26	3336 PLUS Protect DF	4 8	2.3	1.3	5.0	0.8
27	CX-09	2.5	2.3	0.3	2.5	0.3
	*LSD (P=0.05)		NS	4.7	5.4	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

Table 2. Turfgrass quality of the bermudagrass fairway plots established at the Wind Rose Golf Club, Spring. Quality scale on a 1 to 9, where 9 = highest quality, and 5 = acceptable.

Treatment No.	Treatment	Appl. Rate (fl oz/M)	Aug 11	Aug 18	Aug 26	Sep 2
1	Quali-Pro Ipro 2SE	4	5.0	5.8	6.3	6.0
2	Quali-Pro TM 4.5	2	5.8	6.0	5.3	6.0
3	Quali-Pro Chlorothalonil 720 SFT	3.5	5.5	5.8	5.5	6.5
4	Quali-Pro TM/C	4	5.5	5.8	5.3	6.0
5	Quali-Pro Propiconazole 14.3	4	5.8	5.8	6.0	6.5
6	26 GT	4	5.3	5.8	7.0	6.8
7	3336 PLUS	5	6.0	6.3	5.3	5.8
8	3336 PLUS Daconil Ultrex	2.5 5	5.5	5.8	5.0	5.5
9	Banner MAXX	4	5.5	5.8	6.0	6.5
10	Banner MAXX Duplex	4 1	4.5	5.5	6.3	6.5
11	Heritage Duplex	2 1	5.5	6.0	6.3	6.8
12	3336 PLUS Duplex	5 1	6.0	6.0	5.8	6.5
13	26 GT Duplex	4 1	5.8	6.3	5.8	6.5
14	Duplex	1	5.5	6.0	5.5	6.3
15	Headway	3	6.3	5.8	6.5	6.3
16	Headway	1.5	6.0	5.8	6.3	6.8
17	Heritage	2	5.0	5.8	6.0	6.5
19	Daconil Ultrex	2.5	5.0	5.8	5.8	6.8
20	Insignia	0.9	6.0	6.0	6.0	6.3
21	Trinity	2	6.0	5.5	6.8	6.8
22	Ammonium sulfate	16	5.8	6.0	6.0	6.8
23	Water Control		5.3	5.3	5.0	5.8
24	LEM17	0.3	5.5	5.8	6.8	6.8
25	LEM17	0.5	6.3	6.0	6.8	6.8
26	3336 PLUS Protect DF	4 8	5.8	6.5	5.5	6.3
27	CX-09	2.5	6.3	6.0	6.5	5.8
	*LSD (P=0.05)		NS	NS	1.2	NS

\*The differences greater than or equal to the LSD value are significant. NS = statistically no significant difference between treatments.

## Fungicides registered for use on golf courses and sod production

Common Name	Trade Name(s) <sup>a</sup>	Mode of Action
<b>Anilene</b> Boscalid	Emerald 70EG (WDG)	Acropetal Penetrant
<b>Aromatic Hydrocarbons</b> chloroneb etridiazol (ethazole) PCNB	Terraneb SP, Teremec SP Terrazole, Koban Turficide 400, Turficide 10G, PCNB 12.5G, Revere 10G Revere 4000, FF II, Terrachlor 400, Terrachlor 75WP	Contact Contact Contact
<b>Benzimidazole</b> thiophanate-methyl	Fungo 50, Fungo Flo, 3336 WP, 3336 Flo, Caviler 2G Caviler 4.5F, Caviler 50WSB	Acropetal Penetrant
<b>Carbamates</b> Maneb  Thiram Mancozeb propamocarb hydrochloride	Maneb Plus Zinc F4, Maneb 75DF, Pentathlon 4F, Pentathlon 75DG Spotrete, Thiram Fore, Fore Flo, Dithane T/O, Dithane WF, Pentathalon Banol	Contact  Contact Contact Contact
<b>Carboximides</b> Flutolanil	ProStar 70WP	Acropetal Penetrant
<b>Demethylation Inhibitors</b> Fenarimol myclobutanil propiconazole triadimefon*	Rubigan A.S. Eagle, Golden Eagle Banner, Banner MAXX, Spectator, Propiconazole Pro Bayleton 25, Bayleton 50, Accost 1G	Acropetal Penetrant Acropetal Penetrant Acropetal Penetrant Acropetal Penetrant
<b>Dicarboximides</b> iprodione* Vinclozolin*	Chipco 26 GT, Chipco 26019, Iprodione Pro Curalan, Curalan DF, Touché, Touché Flowable, Vorlan	Localized Penetrant Localized Penetrant
<b>Nitriles</b> chlorothalonil*	Daconil WeatherStik, Daconil Ultrex, Daconil 2787 Daconil Zn, Manicure 6 Flowable, Manicure Ultrex, Concorde, Thalonil 4L, Thalonil 90DF, Echo 720, Echo 75	Contact
<b>Phenylamides</b> mefenoxam	Subdue, Subdue MAXX, Ridomil	Acropetal Penetrant
<b>Phenylpyrroles</b> Fludioxonil	Medallion	Contact
<b>Phosphonate</b> fosetyl-aluminum phosphite (salts)	Aliette, Aliette T&O, Chipco Signature, Prodigy Signature Magellan, Fosphite, Resyst, Alude, Reliant	Systemic Penetrant Systemic Penetrant
<b>Polyoxins</b> polyoxin D Zinc	Endorse	Localized Penetrant
<b>Strobilurins</b> azoxystrobin fluoxastrobin pyraclostrobin trifloxystrobin	Heritage Disarm Insignia Compass	Acropetal Penetrant Localized Penetrant Localized Penetrant Localized Penetrant
<sup>a</sup> This list is not all-inclusive		
*The use for residential turf is prohibited		

### Pre-packed products with more than one fungicide

ACTIVE INGREDIENTS	PRODUCT NAMES
azoxystrobin + propiconazole	Headway
chlorothalonil + fenarimol	Lesco Twosome
chlorothalonil + propamocarb	Lesco Par
chlorothalonil + propiconazole	Echo Propiconazole Turf Fungicide
chlorothalonil + thiophanate-methyl	ConSyst, Spectro, Broadside
chlorothalonil + fludioxonil + propiconazole	Instrata
mancozeb + copper hydroxide	Junction
mancozeb + myclobutanil	MANhandle
thiophanate-methyl + chloroneb	Proturf Fungicide IX
thiophanate-methyl + flutalonil	SysStar
thiophanate-methyl + iprodione	26/36 Fungicide, Proturf Fluid Fungicide
thiophanate-methyl + mancozeb	Duosan
thiophanate-methyl + thiram	Bromosan
triadimefon + flutolanil	Prostar Plus
triadimefon + metalaxyl	Proturf Fluid Fungicide II
triadimefon + thiram	Proturf Fluid Fungicide III
triadimefon + trifloxystrobin	Armada
triadimefon + trifloxystrobin + stress guard	Tartan

### Plot map used in this field trial

Rep 4	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	Plot #
	16	28	30	4	18	11	19	13	24	7	3	8	25	2	20	Treatment #
	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	
	9	22	26	23	27	15	12	17	10	1	5	14	21	6	29	
Rep 3	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	
	5	14	27	18	7	12	28	6	19	16	24	9	25	15	21	
	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	
	26	17	22	13	20	4	8	23	10	2	1	29	3	11	30	
Rep 2	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	
	3	19	18	1	9	8	23	15	7	30	11	21	17	22	25	
	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	
	4	14	6	28	26	10	24	2	16	13	20	5	29	12	27	
Rep 1	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

**The End**

