

**UF IFAS COOPERATIVE FUNGICIDE EFFICACY PROGRAM
Report**

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Evaluation of fungicides for control of dollar spot of seashore paspalum, 2005.

The research was conducted at the Turfgrass America sod farm in Apollo Beach, FL. The experimental site was a stand of 'SeaIsle 1' seashore paspalum. Plots were maintained by the Turfgrass America sod farm staff with standard practices of mowing, insecticide application, herbicide application, and flood irrigation when appropriate. The plot area did not receive nitrogen fertilizer during the study. On 8 Apr fungicide treatments were initiated using a CO₂ backpack sprayer, calibrated to deliver 2 gal/1000 sq ft per treatment through two Teejet (8003) nozzles. Treatments were reapplied on 29 Apr, 6 May, and 20 May. Treatments were randomized within four replications of 3.3 ft by 6.6 ft plots. Disease was allowed to develop from natural inoculum. A disease sample was collected, and the dollar spot pathogen was isolated for diagnostic confirmation. Disease severity was recorded by counting the number of infection centers per plot. Data shown below are average number of infection centers per plot for each treatment. All untransformed data were subjected to statistical analysis, and significant differences among means were identified.

Applications began curatively on 8 Apr. April was cool (average temperature for April at test site was 67°F) and favored disease development over turfgrass growth and recovery. When warmer temperatures occurred later in the trial (average temperature for May was 75°F), the turfgrass began to recover with the fungicide applications. All fungicide products and programs tested provided excellent control of dollar spot on seashore paspalum during the trial. After the first week of June, the turfgrass in the control plots recovered from the dollar spot disease. No additional dollar spot symptoms were observed. No growth regulator effects or phytotoxicity were observed throughout the trial.

Fungicide and rate/1000 sq ft ^y	Interval (wk)	Number of dollar spot infection centers/plot ^z							
		8 Apr	18 Apr	22 Apr	28 Apr	6 May	20 May	25 May	7 Jun
Untreated control.....	-	8.0 a	7.8 a	7.3 a	14.3 a	80.0 a	52.0 a	10.0 a	2.3 a
Headway 1.39EC 1.5 fl oz.....	3	6.8 a	9.0 a	4.8 ab	1.5 b	0b	0b	0b	0b
Headway 1.39EC 3 fl oz.....	4	4.8 a	6.3 a	2.0 ab	0.3 b	1.0b	0b	0b	0b
Banner MAXX 1.3ME 1 fl oz.....	3	5.0 a	3.5 a	1.8 ab	0.8 b	0.3b	0b	0b	0b
Banner MAXX 1.3ME 2 fl oz.....	4	4.3 a	6.5 a	2.0 ab	0.3 b	1.0b	0b	0b	0b
Concert 4.3SE 4.2 fl oz.....	3	4.8 a	5.5 a	1.3 b	0.8 b	0b	0b	0b	0b
Emerald 70WG 0.18 oz.....	3	9.8 a	7.3 a	3.0 ab	1.0 b	0b	0b	0b	0b
Emerald 70WG 0.18 oz Propiconazole Pro 1.24ME 1 fl oz									
Curalan 50EG 1 oz.....	3	11.0 a	9.8 a	4.8 ab	1.8 b	0b	0b	0b	0b
Emerald 70WG 0.18 oz Propiconazole Pro 1.24ME 1 fl oz									
Curalan 50EG 1 oz.....	3	4.0 a	5.8 a	3.5 ab	0.8 b	0b	0b	0b	0b
Cleary's 3336F 4 fl oz.....	3	3.3 a	4.0 a	1.5 b	0.3 b	0b	0b	0b	0b

^z Means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio t-test ($k=100$, $P\leq 0.05$)

^y Where multiple products were applied per regime, each was applied separately and in the order listed at the interval given.

Evaluation of fungicides for control of large patch on St. Augustinegrass sod, 2004.

Fungicide trials were conducted on a 'Floritam' St. Augustinegrass area located at the G.C. Horn Turfgrass Field Laboratory, University of Florida, Gainesville, FL. Treatments were assigned to 6 by 6 ft plots in 4 replications of a randomized complete block design. On 18 October, fungicide treatments were initiated using a CO2 bicycle-wheel sprayer, calibrated to deliver 0.5, 2, or 4 gal/1000 sq ft volume per plot through four 8003 Teejet flat-fan nozzles (delivery volume adjusted with walking speed). Plots were mowed weekly at 3 in. Irrigation was applied as needed. Plots were inoculated with 0.61 in³ of wheat berries infested with an isolate of the pathogen collected from St. Augustinegrass. The infested grain was inserted into the thatch layer of each subplot center on 26 October 2004. Fungicide applications were made on 18 October, 2 November and 18 November for 14-day treatments and 18 October and 18 November for 28-day treatments. Disease severity was recorded on the Horsfall-Barratt scale. Turfgrass quality observations (scale of 1-10 with 10=dark green turf, 1=dead/brown turf, and 6=minimally acceptable turf) also were made. Means separations were determined with untransformed data and the Waller-Duncan k-ratio t-test. Horsfall-Barratt values were transformed into disease percentages for the table.

No disease was observed prior to the initial application of fungicide treatments. Large patch symptoms were observed approximately 21 days after inoculation. All fungicide treatments reduced large patch severity. By late November, disease pressure was high, but on 1 December the grass was dormant and disease was difficult to rate. Fungus Control for Lawns by Bayer Advanced provided some control in the fall. During spring green-up in mid-March, disease was first observed in the untreated control plots. Disease was more severe in untreated control plots than in fungicide-treated plots. Results suggest that preventive fall applications of the fungicides evaluated can reduce large patch severity. No statistical differences were detected between Insignia and similar Heritage treatments. Three, 14-day applications of Insignia did not result in significantly better control than two, 28-day applications. Delivery of Insignia in 0.5 and 2 gal/1000 sq ft resulted in equivalent levels of control. Delivery of product in 4 gal/1000 sq ft did not perform as well in this test as delivery in 0.5 and 2 gal/1000 sq ft. The granular product reduced the amount of disease observed compared to the non-treated plots on 15 November. All fungicide applications resulted in significantly less disease severity, and significantly greater turfgrass quality, in March 2005.

Treatment, interval, rate/1000 sq ft, and volume/1000 sq ft	Disease severity (%) ^z					Turfgrass Quality	
	15 Nov	22 Nov	1 Dec	8 Dec	14 Mar	15 Nov	14 Mar
Non-treated control	13.5 a	26.8 a	16.6 a	16.6 a	80.7 a	6.3 ab	3.3 b
Insignia 20WG, 14 d, 0.9 oz, 2 gal..	0.7 b	1.4 b	0.7 c	0.7 cd	7.8 b	6.5 ab	7.0 a
Insignia 20WG, 28 d, 0.9 oz, 2 gal..	0.9 b	2.5 b	0.7 c	0.5 d	9.8 b	6.8 a	6.3 a
Insignia 20WG 28 0.9 oz 0.5 gal.....	1.4 b	1.7 b	0.4 c	0.4 d	3.1 b	6.3 ab	7.0 a
Insignia 20WG 28 day 0.9 oz 4 gal.	0.9 b	1.7 b	3.1 b	3.1 b	13.5 b	6.5 ab	6.0 a
Heritage 50WG 28 day 0.4 oz 2 gal	0.9 b	1.7 b	0.4 c	0.4 d	3.1 b	6.8 a	6.8 a
Fungus Control for Lawns, single app, 48 oz granular.....	0.9 b	9.8 a	3.1 b	2.5 cb	13.5 b	6.0 b	6.3 a

^z Means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio t-test (k=100, P<0.05)

2005 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Evaluation of Fungicide Programs for the Control of Summer Diseases of Ultradwarf Bermudagrass

FINAL REPORT December 2005

INVESTIGATOR: Philip F. Harmon

OBJECTIVE: Evaluate fungicide products and programs for the control of summer diseases on an ultradwarf bermudagrass green in north central FL.

TREATMENTS:

Trt#	Fungicide	vol gal/M	interval	application dates
1	Untreated			
2	Syngenta A	2	14	6/29 7/13 7/27 8/19 9/2 9/15 9/29
3	Syngenta B	2	14	6/29 7/13 7/27 8/19 9/2 9/15 9/29
4	Syngenta C	2	14	6/29 7/13 7/27 8/19 9/2 9/15 9/29
5	BASF A	2	14	6/29 7/13 7/27 8/19 9/2 9/15 9/29
6	BASF B	2	14	6/29 7/13 7/27 8/19 9/2 9/15 9/29
7	BASF C	2	21	6/29 7/20 8/10 9/2 9/22 10/17

BASF A, B, C (5, 6, 7) explanation

1st spray

- 5. Curalan 1.0z/M
- 6. Insignia 0.9 oz/M
- 7. Insignia + Fore 0.9 oz + 8oz/M

2nd spray

- 5. Daconil 3.2 oz/M
- 6. Insignia 0.9 oz/M
- 7. Insignia + Fore 0.9 oz + 8oz/M

3rd spray

- 5. Insignia 0.9 oz/M
- 6. Insignia 0.9 oz/M
- 7. Insignia + Fore 0.9 oz + 8oz/M

4th spray

- 5. Cleary's 4 oz/M
- 6. Cleary's 4 oz/M
- 7. Daconil 3.2 oz/M

5th spray

- 5. Insignia + Fore 0.9 oz + 8oz/M
- 6. Daconil 3.2 oz/M

5th spray cont.

- 7. Iprodione Pro 3 oz/M

Syngenta A, B, C (2, 3, 4) explanation

1st spray

- 2. Daconil + Medallion 3.2 oz + 0.25oz/M
- 3. Daconil + Signature 3.2 oz + 4oz/M
- 4. Heritage TL 2oz/M

2nd spray

- 2. Daconil + Signature 3.2 oz + 4oz/M
- 3. Heritage TL 2oz/M
- 4. Daconil + Medallion 3.2 oz + 0.25oz/M

3rd spray

- 2. Heritage TL 2oz/M
- 3. Daconil + Signature 3.2 oz + 4oz/M
- 4. Daconil + Subdue 3.2 oz + 0.5 oz/M

4th spray

- 2. Daconil ZN + Subdue 6oz + 0.5 oz/M
- 3. Heritage TL 2oz/M
- 4. Heritage TL 2oz/M

5th spray

- 2. Cleary's 3336 WP 4 oz/M
- 3. Daconil + Signature 3.2 oz + 4oz/M

5th spray cont.

- 4. Daconil + Signature 3.2 oz + 4oz/M

6th spray

5. Daconil 3.2 oz/M
6. Insignia 0.9 oz/M
7. Cleary's 4 oz/M

7th spray

5. Curalan 1.0z/M
6. Insignia 0.9 oz/M

6th spray

2. Daconil + Signature 3.2 oz + 4oz/M
3. Heritage TL 2oz/M
4. Medallion + Daconil ZN 0.25 oz + 6oz/M

7th spray

2. Medallion + Daconil ZN 0.25 oz + 6oz/M
3. Daconil + Signature 3.2 oz + 4oz/M
4. Cleary's 3336 WP 4 oz/M

MATERIALS AND METHODS

The trial was initiated 29 Jun 2005 in a sward of 'Floradwarf' bermudagrass located on the Envirogreen, UF Gainesville campus. Treatments were applied as indicated above with a CO₂ backpack boom sprayer calibrated to deliver products in 2 gallons of water per 1000 sq ft (M) through two Teejet flat fan nozzles. Plots were divided into 4 blocks, and treatments were assigned haphazardly in a randomized complete block design. Plots were mowed every other day at a height of 0.165 in. The plots were fertilized monthly with 0.5 lb N. Irrigation was provided as needed to prevent stress. Turfgrass quality (TQ) ratings (scale of 1-10 with 10= dark green turf, 1= dead/brown turf, and 6= minimally acceptable turf) were taken for the duration of the test. Disease symptoms were quantified in each plot according to the Horsfall-Barrett scale. Late in the trial, fairy rings were observed in some of the plots. The area of the trial affected was rated on the Horsfall-Barrett scale or as not present (1), light symptoms (2), or moderate symptoms (3). Also, on 25 Oct, a slight chlorosis or bronze color was observed in some of the plots and was quantified on a 1 to 3 scale, where 1 represented no phyto observed, 2 was phyto questionable or barely visible, and 3 was phyto apparent. Symptoms of phyto were not permanent and did not appear to affect health or growth of the turf. All data were subjected to analysis of variance and means were separated according to the Waller-Duncan k-ratio T-test.

RESULTS AND DISSCUSSION

Fungicide programs resulted in better turfgrass quality and fewer disease symptoms. The quality of the bermudagrass coming out of dormancy was minimally acceptable to just below acceptable levels. Plots treated with some of the fungicide programs above resulted in excellent turfgrass quality as summer progressed. At initiation of the trial, the green showed symptoms similar to those produced by dollar spot, but affected patches were larger, more bleached-white in appearance, and affected turf had numerous black fungal structures embedded in leaf and stolon tissue. A fungus was isolated that produces these same structures in culture. The fungus is unknown and the subject of continuing research. Samples from untreated plots were processed by the UF IFAS plant disease clinic and in my lab. Additional pathogens isolated included *Rhizoctonia zeae* (from leaf, sheath and stolon tissue) and various *Pythium* spp. (from root tissue). Puffballs of a *Lycoperdon* sp. accompanying typical symptoms of fairy ring also were observed in some plots in Oct. Distribution of the disease was not uniform enough to be able to see any differences in any of the treatments applied. Interestingly, none of the treatments prevented all fairy ring symptoms in all replications. Phyto observed was believed to be caused by cold injury (minimum temperature was less than 9 C the night before).

Table 1. Turfgrass quality means for the fungicide program trial on bermudagrass greens 2005.

TRT NO.	6/30 TQ	7/7 TQ	7/26 TQ	8/2 TQ	8/9 TQ	8/16 TQ	8/31 TQ
1 Untreated	5.8a	5.8a	5.3c	5.5b	4.5b	4.8b	6.0b
2 Syngenta A	6.0a	6.3a	6.8ab	7.0a	6.8a	7.5a	7.3a
3 Syngenta B	6.0a	6.3a	6.5ab	7.3a	6.8a	6.0ab	7.3a
4 Syngenta C	5.8a	6.3a	7.3a	7.3a	6.8a	6.3ab	7.3a
5 BASF A	6.0a	6.0a	6.3b	6.8a	6.3a	6.5a	7.8a
6 BASF B	6.0a	6.0a	6.8ab	7.0a	6.3a	7.0a	7.8a
7 BASF C	5.8a	6.3a	6.5ab	7.5a	6.8a	7.3a	8.0a

means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio t-test (P=0.05).

Table 2. Turfgrass quality (TQ), disease severity (DR), and phytotoxicity (PT) means for the fungicide program trial on Floradwarf bermudagrass 2005.

TRT NO.	9/30 TQ	10/25 TQ	7/26 DR	8/2 DR	9/30 DR	10/25 FR	10/25 PT
1 Untreated	5.3c	5.5b	5.0a	3.8a	8.3a	1.3a	1.3b
2 Syngenta A	7.3ab	5.5b	2.0c	2.5bc	3.0bc	1.7a	2.0ab
3 Syngenta B	7.3ab	6.5a	3.3b	2.8bc	3.0bc	1.0a	2.5a
4 Syngenta C	6.8b	6.8a	2.3bc	2.3c	3.8b	1.0a	2.0ab
5 BASF A	8.0a	6.3ab	3.0bc	3.0b	1.3c	1.7a	1.8ab
6 BASF B	7.5ab	6.5a	2.3bc	2.5bc	2.3bc	1.0a	1.8ab
7 BASF C	8.0a	6.3ab	2.3bc	2.5bc	1.8c	2.0a	2.3ab

means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio t-test (P=0.05).

2005 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Chemical Fungicide Management of *Rhizoctonia zeae* leaf and sheath spot on St. Augustinegrass

FINAL REPORT

December 2005

INVESTIGATOR: Philip F. Harmon

OBJECTIVE: Evaluate fungicide products and programs for management of *Rhizoctonia zeae* leaf and sheath spot on St. Augustinegrass in north central FL.

TREATMENTS:

Trt #	Fungicide	Rate oz/M	vol gal/M	interval d
1	Untreated control			
2	INSIGNIA	0.5	2	28
3	INSIGNIA	0.9	2	28
4	HERITAGE TL	2.0	2	28
5	HERITAGE TL	1.0	2	28
6	HERITAGE WG	0.2	2	28
7	HERITAGE WG	0.4	2	28
8	ENDORSE	4.0	2	28

MATERIALS AND METHODS:

On July 25, 2005 the above treatments were initiated on 'Floritam' St. Augustinegrass at the G.C. Horn Turf Plots, UF Horticulture Unit using a CO₂ bicycle-wheel sprayer, calibrated to deliver 2 gallons per 1000 sq ft volume per treatment through three Teejet nozzles. Treatments were reapplied on Aug 31 and Sept 28. Treatments were randomized within 4 replications of 2 m x 2 m plots. Each subplot was inoculated using 100 ml infested seed. The inoculum was placed in the thatch layer in the center of the plot. The plot was mowed at a height of 3" and maintained as a St. Augustinegrass lawn. Turfgrass quality observations (scale of 1-10 with 10= dark green perfect turf, 1= dead/brown turf, and 5= unacceptable turf) were made. A disease rating (1 to 5 with 1= no disease and 5=75 to 100% of plot diseased) was also made. Data are shown below in the table. All untransformed data were subjected to statistical analysis, and significant differences among means were identified.

An incubator study was conducted with 'Floritam' St. Augustinegrass as well. Four 4 in pots were subjected to each of 4 treatments that included Uninoculated, Inoculated, Inoculated sprayed with 0.9 Insignia, Inoculated sprayed with 0.4 Heritage WG. After incubation at 30 C for two weeks, disease severity was rated on a linear 1 to 5 scale where 1 represented no disease and 5 represented 75 to 100% necrosis, blighting, and discoloration of leaf sheaths.

RESULTS AND DISCUSSION:

In the incubator study, both Insignia and Heritage provided preventative protection from the *R. zeae* infection. The inoculated but untreated pots showed two symptoms. The typical leaf and sheath lesions were observed, and a quantifiable reduction in plant vigor, measured as leaf tissue production, was observed. The field trial resulted in little statistically significant difference between treatments. Disease occurred, but differences in severity and impact on quality were minor. Although amended media trials indicated that Heritage may not be as active as Insignia on this pathogen, in incubator and field trials both products performed equally well to protect against infection and disease caused by this pathogen. Additional trial work is planned with this pathogen on seashore paspalum and bermudagrass.

Table 1. Results from the incubator inoculation trial with *R. zea* on St. Augustinegrass 2005 are shown. See above for disease severity scale.

TRT NO.	Growth (mm)	Severity
1 Inoculated	12c	4.8a
2 INSIGNIA	25a	1.5c
3 HERITAGE WG	23a	1.5c
4 Uninoculated	19b	2.5b

means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio T-test (P=0.05).

Table 2. Turfgrass quality means for *R. zea* field trial on St. Augustinegrass 2005.

TRT NO.	7/25	8/2	8/9	8/11
1 Untreated control	7.0	7.5	6.3ab	7.0
2 INSIGNIA	7.0	7.5	6.8ab	7.3
3 INSIGNIA	6.8	7.3	6.0ab	6.8
4 HERITAGE TL	7.0	7.8	6.5ab	6.8
5 HERITAGE TL	6.8	7.5	6.3ab	7.0
6 HERITAGE WG	7.0	7.5	6.8ab	7.0
7 HERITAGE WG	7.0	7.8	7.3a	7.5
8 ENDORSE	6.5	7.0	5.0b	6.0

means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio T-test (P=0.05).

Table 3. Turfgrass quality and disease severity means for *R. zea* field trial on St. Augustinegrass 2005.

TRT NO.	8/31	10/3	Disease severity 8/2
1 Untreated control	7.5	7.0	2.5
2 INSIGNIA	7.8	7.3	2.3
3 INSIGNIA	7.3	6.5	2.5
4 HERITAGE TL	7.8	7.0	2.5
5 HERITAGE TL	7.5	7.3	2.3
6 HERITAGE WG	7.8	7.3	2.0
7 HERITAGE WG	7.8	7.3	2.0
8 ENDORSE	7.0	6.0	2.0

means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio T-test (P=0.05).

2005 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Chemical Fungicide Management of Dollar Spot on Seashore Paspalum and Bermudagrass greens

FINAL REPORT December 2005

INVESTIGATOR: J Bryan Unruh and Philip F. Harmon

OBJECTIVE: Evaluate fungicide products and programs for management of dollar spot and safety on seashore paspalum and bermudagrass putting greens in north west FL

TREATMENTS:

Trt #	Fungicide	Rate oz/M	vol gal/M	interval
1	Untreated control			
2	HEADWAY 1.39 EC	1.5	2	21
3	HEADWAY 1.39 EC	3	2	28
4	BANNER MAXX 1.3 ME	1	2	21
5	BANNER MAXX 1.3 ME	2	2	28
6	A14472	0.5	2	21
7	A14472	1	2	28
8	CONCERT 4.3 SE	4.2	2	21
9	EMERALD	0.18	2	21
10	BASF PROG 1		2	21
11	BASF PROG 2		2	21
12	CLEARY'S 3336F	4	2	21
13	CHIPCO 26GT	4	2	21
14	DACONIL ULTREX	3.2	2	21

BASF PROG 1+2 (10. and 11.) explanation

1st spray

10. Emerald 0.18 oz/M

11. Emerald 0.18 oz/M+Daconil 3.2 oz/M

2nd spray

10. Propiconazole Pro 1 oz./M

11. Emerald 0.18 oz/M+ Curalan 1oz./M

3rd spray

10. Curalan 1oz./M

11. Daconil 3.2 oz/M

MATERIALS AND METHODS:

On 6 May, 2005 the above treatments were initiated on a SeaIsle 2000 seashore paspalum research green and on a TifEagle bermudagrass research green at the University of Florida, West

Florida Research and Education Center (WFREC), Jay Research Farm using a CO₂ backpack, sprayer set to deliver 2 gallons per 1000 sq ft volume per treatment through two Teejet nozzles. Treatments were reapplied on 20 May, 2 Jun, and 17 Jun. Treatments were randomized within 3 replications of 1 m x 1 m plots. Disease was allowed to develop from natural inoculum. A disease sample was taken and the dollar spot pathogen was isolated for diagnostic confirmation. Plots were maintained by the WFREC employees with standard practices of mowing, insecticide application, herbicide application, and irrigation when appropriate. Disease severity was recorded by counting the number of infection centers per plot. Data shown below are average infection centers per plot for each treatment. All untransformed data were subjected to statistical analysis, and significant differences among means were identified.

RESULTS AND DISCUSSION:

Treatments were applied curatively in early May. By mid-June all fungicide treatments resulted in acceptable dollar spot control statistically greater than recovery observed in untreated plots. Inoculum and disease distribution were not even across the seashore paspalum green. Means separations were only significant on 18 Jun and did not separate between fungicide products or programs applied. In August symptoms very similar to dollar spot were observed to occur on the seashore paspalum green. Statistically no difference was observed between treatments, but numerically fewer infection centers were observed in fungicide treated plots. Samples were taken at this time and processed for pathogen confirmation in Gainesville. No dollar spot pathogen was recovered. A *Nigrospora* sp. was consistently recovered from affected plant tissue. The symptoms rated on seashore paspalum on 15 Aug are believed to be *Nigrospora* blight and not dollar spot. No samples were processed from the bermudagrass greens at that time.

Table 1. Disease severity means for seashore paspalum dollar spot trial 2005.

TRT NO.	5/5	5/16	6/18	8/15
1 Untreated control	10.0	7.7	11.7a	7.0
2 HEADWAY 1.39 EC	7.0	2.0	0.3b	2.7
3 HEADWAY 1.39 EC	21.3	3.7	0.3b	1.3
4 BANNER MAXX 1.3 ME	12.7	5.3	0.7b	2.7
5 BANNER MAXX 1.3 ME	7.3	4.0	1.0b	3.3
6 A14472	5.3	2.0	0.7b	5.3
7 A14472	6.7	2.7	0.7b	5.0
8 CONCERT 4.3 SE	5.3	4.0	0.0b	3.7
9 EMERALD	5.3	3.3	0.7b	2.3
10 BASF PROG 1	5.7	3.3	1.0b	1.0
11 BASF PROG 2	4.7	3.3	0.7b	2.0
12 CLEARY'S 3336 F	5.0	1.7	0.0b	2.0
13 CHIPCO 26GT	5.3	3.7	0.7b	2.7
14 DACONIL ULTREX	5.7	2.0	1.0b	3.0

means within columns followed by the same letter are not significantly different according to Fisher's LSD (P=0.05).

Table 2. Disease severity means for bermudagrass dollar spot trial 2005.

TRT NO.	5/5	5/16	6/18	8/15
1 Untreated control	21.0	18.0 a	7.7 a	3.7
2 HEADWAY 1.39 EC	15.7	9.0 b-e	1.3 bc	2.0
3 HEADWAY 1.39 EC	16.0	10.0 bcd	0.7 bc	2.0
4 BANNER MAXX 1.3 ME	13.7	5.7 de	1.0 bc	2.7
5 BANNER MAXX 1.3 ME	10.7	6.3 de	1.0 bc	1.7
6 A14472	12.0	4.3 e	0.7 bc	2.0
7 A14472	15.7	8.0 b-e	2.3 b	0.3
8 CONCERT 4.3 SE	20.0	12.0 bc	0.7 bc	3.3
9 EMERALD	21.0	12.7 ab	1.0 bc	2.7
10 BASF PROG 1	17.7	13.0 ab	1.0 bc	0.7
11 BASF PROG 2	14.3	9.7 b-e	1.0 bc	3.7
12 CLEARY'S 3336 F	11.3	5.7 de	0.0 c	1.7
13 CHIPCO 26GT	12.7	10.7 bcd	1.3 cbc	4.7
14 DACONIL ULTREX	13.3	6.7 cde	0.3 c	3.3

means within columns followed by the same letter are not significantly different according to Fisher's LSD (P=0.05).

2005 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Chemical Fungicide Management of Persistent Ring Symptoms on a Bermudagrass green

FINAL REPORT December 2005

INVESTIGATOR: J Bryan Unruh and Philip F. Harmon

OBJECTIVE: Evaluate fungicide products and adjuvants for management of a persistent ring disease of ultradwarf bermudagrass putting greens in the Gulf-Coast region

TREATMENTS:

Trt #	Products applied	Rate oz/M	Interval
1	Untreated Control		
2	Insignia	0.9	14 d
3	Insignia	0.9	14 d
	Revolution	6	14 d
4	Insignia	0.9	14 d
	Magnus	4	14 d
5	Insignia	0.9	14 d
	Tournament Ready	8	14 d
6	Revolution	6	14 d
7	Magnus	4	14 d
8	Tournament Ready	8	14 d
9	Heritage TL	2	14 d
10	Headway	1.5	14 d
11	BannerMAXX	1	14 d

MATERIALS AND METHODS:

On 3 Jun, 2005 the above treatments were initiated on a Tifdwarf bermudagrass green at Gulf State Park Golf Course, 20115 State Hwy. 135, Gulf Shores, AL 36542, using a CO₂ backpack, sprayer set to deliver 2 gallons per 1000 sq ft volume per treatment through two Teejet nozzles. Treatments were reapplied on 16 Jun, and 1 Jul. Treatments were randomized within 4 replications of 1 m x 2 m plots. Ring symptoms were present at the trial initiation. Disease samples were taken, but no known pathogens were found. Plots were maintained by Gulf State Park employees with standard practices of mowing, insecticide application, herbicide application, and irrigation when appropriate. Disease severity in percent necrosis was recorded. Ratings of turf quality, density, and color were recorded on a 1 to 9 scale. All untransformed data were subjected to statistical analysis, and significant differences among means were identified.

RESULTS AND DISCUSSION:

Symptoms observed on this bermudagrass green have not been attributed to any known pathogen. One hypothesis was that *Rhizoctonia zeae* was the causal agent. However, no *R. zeae*

has been isolated from disease samples taken on this green. This trial was initiated to investigate whether fungicides, wetting agents, or Insignia tank-mixed with wetting agents could speed recovery of affected turf. Curative applications of neither fungicides, Insignia tank-mixed with wetting agents, nor wetting agents alone significantly sped recovery of the ring symptoms on the green compared to the untreated control.

These symptoms have been observed on two additional golf courses to date including Country Club of Mobile, AL and Dothan Country Club, Dothan, AL. Fungicide products were not effective in any of these cases when applied by superintendents; however, this is the first time fungicide products have been applied, and shown not to be effective, in a research trial. These data suggest that this disease is not *Rhizoctonia* leaf and sheath spot caused by *R. zeae*.

Table 1. Disease severity means (%)

TRT NO.		6/3	6/16	7/1	7/18
1	Untreated Control	31.3 bcd	33.8 a	26.3 a	35.0 a
2	Insignia	23.8 cd	15.0 a	13.8 a	22.5 a
3	Insignia Revolution	22.5 cd	26.3 a	17.5 a	21.3 a
4	Insignia Magnus	31.3 bcd	30.0 a	12.5 a	20.0 a
5	Insignia Tournament Ready	36.3 abc	27.5 a	20.0 a	17.5 a
6	Revolution	40.0 ab	42.5 a	26.3 a	36.3 a
7	Magnus	50.0 a	33.8 a	22.5 a	28.8 a
8	Tournament Ready	31.3 bcd	33.8 a	22.5 a	42.5 a
9	Heritage TL	28.8 bcd	17.5 a	10.0 a	26.3 a
10	Headway	22.5 cd	26.3 a	21.3 a	22.5 a
11	BannerMAXX	18.8 d	21.3 a	26.3 a	33.8 a

means within columns followed by the same letter are not significantly different according to Fisher's LSD (P=0.05).

Table 2. Color (1 to 9)

TRT NO.		6/3	6/16	7/1	7/18
1	Untreated Control	6.3 a	5.8 a	6.5 a	5.8 abc
2	Insignia	6.0 a	6.5 a	7.5 a	6.3 ab
3	Insignia Revolution	6.0 a	6.3 a	7.3 a	6.3 ab
4	Insignia Magnus	6.0 a	7.3 a	7.5 a	6.3 ab
5	Insignia Tournament Ready	5.8 a	6.0 a	7.0 a	6.3 ab
6	Revolution	5.8 a	5.0 a	6.5 a	4.5 d
7	Magnus	5.3 a	5.8 a	6.3 a	5.3 bcd
8	Tournament Ready	5.8 a	5.5 a	6.3 a	5.0 cd
9	Heritage TL	6.3 a	6.8 a	7.0 a	6.3 ab
10	Headway	6.3 a	5.8 a	6.5 a	6.5 a
11	BannerMAXX	6.0 a	6.0 a	6.3 a	5.8 abc

means within columns followed by the same letter are not significantly different according to Fisher's LSD (P=0.05).

Table 3. Quality (1 to 9)

TRT NO.	6/3	6/16	7/1	7/18
1 Untreated Control	4.5 abc	4.0 a	4.8 a	5.3 a-d
2 Insignia	5.3 a	5.0 a	5.8 a	6.3 a
3 Insignia Revolution	5.0 ab	4.3 a	5.5 a	5.8 abc
4 Insignia Magnus	4.3 abc	4.8 a	5.8 a	5.8 abc
5 Insignia Tournament Ready	4.0 bc	4.3 a	5.3 a	6.3 a
6 Revolution	3.5 c	3.8 a	4.8 a	4.5 d
7 Magnus	3.5 c	4.5 a	5.3 a	5.0 bcd
8 Tournament Ready	4.0 bc	3.8 a	5.0 a	5.0 bcd
9 Heritage TL	4.5 abc	5.3 a	5.8 a	5.8 abc
10 Headway	5.0 ab	4.8 a	5.3 a	6.0 ab
11 BannerMAXX	5.3 a	5.3 a	4.8 a	4.8 cd

means within columns followed by the same letter are not significantly different according to Fisher's LSD (P=0.05).

Table 4. Density (1 to 9)

TRT NO.	6/3	6/16	7/1	7/18
1 Untreated Control	5.8 a	6.0 a	6.0 a	6.3 a
2 Insignia	6.3 a	6.3 a	6.8 a	6.8 a
3 Insignia Revolution	6.0 a	5.8 a	7.0 a	6.3 a
4 Insignia Magnus	5.8 a	7.3 a	7.3 a	6.5 a
5 Insignia Tournament Ready	5.8 a	6.3 a	6.8 a	6.8 a
6 Revolution	5.5 a	4.8 a	6.0 a	5.5 a
7 Magnus	4.3 a	5.5 a	6.5 a	5.3 a
8 Tournament Ready	5.3 a	5.8 a	6.3 a	5.5 a
9 Heritage TL	5.8 a	6.5 a	6.8 a	6.8 a
10 Headway	6.0 a	5.8 a	6.3 a	6.0 a
11 BannerMAXX	5.5 a	6.0 a	5.8 a	6.3 a

means within columns followed by the same letter are not significantly different according to Fisher's LSD (P=0.05).



Figure 1. Image of fungicide efficacy trial for ring disease on Tifdwarf green was taken June 8, 2005. Wetting agent products (where used) were tank-mixed with fungicides and applied to ring-affected plots.

2005 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Chemical Fungicide Management of Persistent Ring Symptoms on a Bermudagrass green

FINAL REPORT December 2005

INVESTIGATOR: J Bryan Unruh and Philip F. Harmon

OBJECTIVE: Evaluate fungicide products and adjuvants for management of a persistent ring disease of tifdwarf bermudagrass putting greens in the Gulf-Coast region

TREATMENTS:

Wetting agent treatments			
fact #	Products applied	Rate oz/M	Interval
1	No wetting agent		
2	Revolution	6	14 d
3	Magnus	4	14 d
4	Tournament Ready	8	14 d
Fungicide treatments			
fact #	Fungicide treatments		
1	Insignia	0.9	14 d
2	Heritage TL	2	14 d
3	Headway	1.5	14 d
4	BannerMAXX	1	14 d
5	No Fungicide		

MATERIALS AND METHODS:

On 3 Jun, 2005 the above treatments were initiated on a Tifdwarf bermudagrass green at Gulf State Park Golf Course, 20115 State Hwy. 135, Gulf Shores, AL 36542, using a CO₂ backpack, sprayer set to deliver 2 gallons per 1000 sq ft volume per treatment through two Teejet nozzles. Treatments were reapplied on 16 Jun, and 1 Jul. Fungicides and wetting agents were applied separately to plots in all of the various combinations. The Experimental design was a complete factorial arrangement of 4 replications of 1 m x 1 m plots. Ring symptoms were present at the trial initiation. Disease samples were taken, but no known pathogens were found. Plots were maintained by Gulf State Park employees with standard practices of mowing, insecticide application, herbicide application, and irrigation when appropriate. Disease severity in percent necrosis was recorded. Ratings of turf quality, density, and color were recorded on a 1 to 9 scale. All untransformed data were subjected to statistical analysis, and significant differences among means were identified.

RESULTS AND DISCUSSION:

Symptoms observed on this bermudagrass green have not been attributed to any known pathogen. One hypothesis was that *Rhizoctonia zeae* was the causal agent. However, no *R. zeae*

has been isolated from disease samples taken on this green. This trial was initiated to investigate whether fungicides and/or wetting agents could speed recovery of affected turf.

The experimental design allows evaluation of interaction between wetting agent and fungicide selection. No statistically significant interaction was observed on any date with any variable recorded (Table 1). Fungicide treatment was significant at $P=0.5$ for disease severity and turfgrass quality variables on 6/16, 7/1, and 7/18. Wetting agent treatment was significant for disease severity and turfgrass quality on only one date, 7/18.

Insignia and Heritage reduced disease severity and provided improved turfgrass quality over the untreated control (Table 2 and 3). However, on average plots treated with these fungicides still had between 8 and 10 percent disease symptoms when the last ratings were taken in mid-July. Banner MAXX and Headway did not reduce disease severity over the control and did not improve turfgrass quality. In fact, numerically (though not statistically significant) Banner MAXX reduced turfgrass quality compared to the control, as was expected for a DMI fungicide. Insignia did improve turf quality when compared to the untreated control (Table 4).

No wetting agent treatment significantly reduced disease severity. Turfgrass quality was adversely affected by wetting agent application when rated on 7/18. Revolution and Magnus reduced turfgrass quality compared to plots that did not receive wetting agent. Tournament Ready did not affect turf quality. (Table 5).

These symptoms have been observed on two additional golf courses to date including Country Club of Mobile, AL and Dothan Country Club, Dothan, AL. Superintendents reported that fungicide applications were not effective in these cases; however, this is the first time fungicide products have been applied, and shown not to be effective, in a research trial. These data suggest that this disease is not *Rhizoctonia* leaf and sheath spot caused by *R. zea*. Diagnostic samples from several other courses in Florida, Alabama, and Texas have produced *R. zea*, *Lycoperdon* spp., or other unidentified basidiomycetes from turf exhibiting nearly identical symptoms (mini rings). The difference being that symptoms at other courses have 1) not been as severe 2) have not occurred in such a high incidence, and 3) have been alleviated within a growing season over time and in some cases with fungicide treatments (Insignia, Heritage, and Prostar).

Table 1. Summary of statistically significant factors for percent disease severity LSD given ($P=0.05$)

TRT NO.	6/3	6/16	7/1	7/18
1 Replication	7.1	7.5	6.8	4.7
2 Wetting agent				4.7
3 Fungicide		8.4	7.6	5.2
4 Interaction Wa X Fn				

Table 2. Summary of statistically significant factors for quality LSD given ($P=0.05$)

TRT NO.	6/3	6/16	7/1	7/18
1 Replication	0.6	0.6	0.7	0.4
2 Wetting agent	ns	ns	ns	0.4
3 Fungicide	ns	0.7	0.7	0.5
4 Fn	ns	ns	ns	ns

Table 3. Mean percent disease severity across fungicide treatments

TRT NO.	6/3	6/16	7/1	7/18
1 Insignia	ns	15.3 b	8.4 b	8.4 c
2 Heritage TL	ns	12.5 b	8.7 b	9.7 bc
3 Headway	ns	17.5 b	14.6 ab	11.9 abc
4 Banner Maxx	ns	26.6 a	21.3 a	15.3 ab
5 Untreated	ns	25.9 a	15.1 ab	14.1 a

means within columns followed by the same letter are not significantly different according to Fisher's LSD (P=0.05).

Table 4. Mean turf quality ratings across fungicide treatments (LSD= 0.7, 0.7, 0.5)

TRT NO.	6/3	6/16	7/1	7/18
1 Insignia	ns	5.9	6.9	6.8
2 Heritage TL	ns	6.0	6.6	6.3
3 Headway	ns	5.5	6.1	6.2
4 Banner Maxx	ns	5.0	5.6	5.9
5 Untreated	ns	5.3	6.1	5.9

Table 5. Mean turf quality ratings across wetting agent treatments

TRT NO.	6/3	6/16	7/1	7/18
1 No wetting agent	5.0	5.8	6.6	6.5
2 Revolution	5.0	5.7	6.3	5.9
3 Magnus	4.6	5.3	6.0	5.9
4 Tournament Ready	4.9	5.5	6.1	6.5
LSD (P=0.05)	--	--	--	0.4

means within columns followed by the same letter are not significantly different according to Fisher's LSD (P=0.05).

2006 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Evaluation of Summer Fungicide Programs for Disease Control and Improved Turfgrass Quality on Ultradwarf Bermudagrass

FINAL REPORT October 2006

INVESTIGATOR: Philip F. Harmon

OBJECTIVE: Evaluate fungicide programs for control of diseases and improvement of turfgrass quality in a TifEagle ultradwarf bermudagrass green in north-central FL

TREATMENTS:

Trt#	Fungicide	Interval
1	Untreated	
2	Syngenta 1	14 day
3	Syngenta 2	14 day
4	Syngenta 1 flood nozzle	14 day
5	Syngenta 2 flood nozzle	14 day
6	Bayer 1	14 day
7	Bayer 2	14 day
8	Bayer 3	14 day
9	BASF 1	14 day
10	BASF 2	14 day
11	BASF 3	14 day
12	UF 1	14 day
13	Cleary's 1	14 day

2	Syngenta 1	Product	Rate oz.
		a. Cleary's 3336	4
		b. Daconil Ultrex + Signature	3.2 + 4
		c. Heritage TL	2
		d. Medallion + Daconil Ultrex	0.25 + 3.2
		e. Daconil Ultrex + Subdue Maxx	3.2 + 0.5
		f. Heritage TL	2
		g. Daconil Ultrex + Signature	3.2 + 4
		h. Medallion + Daconil ZN	0.25 + 6
3	Syngenta 2		
		a. Cleary's 3336 + Primo Maxx	4 + 0.069
		b. Daconil Ultrex + Signature +	3.2 + 4 +
		Primo Maxx	0.069

	c.	Heritage TL + Primo Maxx	2 + 0.069
	d.	Medallion + Daconil Ultrex + Primo Maxx	0.25 + 3.2 + 0.069
	e.	Daconil Ultrex + Subdue Maxx + Primo Maxx	3.2 + 0.5 + 0.069
	f.	Heritage TL + Primo Maxx	2 + 0.069
	g.	Daconil Ultrex + Signature + Primo Maxx	3.2 + 4 + 0.069
	h.	Medallion + Daconil ZN + Primo Maxx	0.25 + 6 + 0.069
4	Syng. 1 - fl noz.		
	a.	Cleary's 3336	4
	b.	Daconil Ultrex + Signature	3.2 + 4
	c.	Heritage TL	2
	d.	Medallion + Daconil Ultrex	0.25 + 3.2
	e.	Daconil Ultrex + Subdue Maxx	3.2 + 0.5
	f.	Heritage TL	2
	g.	Daconil Ultrex + Signature	3.2 + 4
	h.	Medallion + Daconil ZN	0.25 + 6
5	Syng. 2 - fl noz.		
	a.	Cleary's 3336 + Primo Maxx	4 + 0.069
	b.	Daconil Ultrex + Signature + Primo Maxx	3.2 + 4 0.069
	c.	Heritage TL + Primo Maxx	2 + 0.069
	d.	Medallion + Daconil Ultrex + Primo Maxx	0.25 + 3.2 0.069
	e.	Daconil Ultrex + Subdue Maxx + Primo Maxx	3.2 + 0.5 0.069
	f.	Heritage TL + Primo Maxx	2 + 0.069
	g.	Daconil Ultrex + Signature Primo Maxx	3.2 + 4 0.069
	h.	Medallion + Daconil ZN Primo Maxx	0.25 + 6 0.069
6	Bayer 1	Signature tank Daconil	
7	Bayer 2	Signature tank Prostar	
8	Bayer 3	Prostar	2.2
9	BASF 1		
	a.	Insignia 20 WG	0.5
	b.	Iprodione Pro 2 SE	4
	c.	Insignia + Fore Rainshield 80 WSP	0.5 + 8
	d.	Cleary's 3336	4
	e.	Fore Rainshield	8
	f.	Insignia 20 WG	0.5
10	BASF 2		
	a.	Insignia 20 WG	0.5
	b.	Signature + Fore	4 + 8

		c.	Cleary's 3336	4
		d.	Signature + Iprodione Pro	4 + 4
		e.	Insignia + Fore Rainshield 80 WSP	0.5 + 8
		f.	Insignia 20 WG	0.5
11	BASF 3			
		a.	Insignia 20 WG	0.5
		b.	Daconil 82.5	3.2
		c.	Insignia 20 WG	0.5
		d.	Cleary's 3336	4
		e.	Insignia + Fore Rainshield 80 WSP	0.5 + 8
		f.	Insignia + Daconil 82.5	0.5 + 3.2
12	UF 1			
		a.	Insignia + Fore Rainshield 80 WSP	0.5 + 8
		b.	Daconil Ultrex + Signature	3.2 + 4
		c.	Prostar + Subdue Maxx	2.2 + 0.5
		d.	Heritage TL + Fore	2 + 8
		e.	Cleary's 3336	4
13	Cleary's 1		Cleary's 3336+ + Alude	4 + 5.5

MATERIALS AND METHODS:

The trial was initiated 6 Jun 2006 on the # 3 Green- 'TifEagle' Bermudagrass located on the Plant Research Farm, Citra, FL. Treatments were applied as indicated above, with a CO₂ backpack boom sprayer calibrated to deliver products in 2 gallons of water per 1000 sq ft (M) through two Teejet flat fan nozzles. Plots were divided into 4 blocks and trt. numbers assigned in a randomized complete block design, subplots being 1m x 2m. Plots were maintained as a Green; mowed 3 – 5 times per week at a height of 0.140 - 0.150" and verticut weekly. The plot was fertilized with ½ - 3/4 lb N/month. Insecticides, herbicides, and irrigation were applied when appropriate. The green was aerified and topdressed on 9 Aug, and the green was scalped 21 Sep. The whole plot was sprayed with Primo Maxx after by accident. After the second application, additional Primo was not added to treatment 2 and 5. No disease developed on the plot. Turfgrass quality observations (scale of 1-10 with 10= dark green perfect turf, 1= dead/brown turf, and 6= minimally acceptable turf) also were made. All data were subjected to analysis of variance and means were separated according to Fisher's LSD.

RESULTS:

Turfgrass quality ratings in early summer (Jun and Jul) showed no statistical differences in turfgrass quality between treatments. Later in the summer, statistically significant differences were noted between some fungicide treatments. The untreated control plots were consistently of poorest turfgrass quality except where some phytotoxicity occurred with treatment 13 on 6 Sep. Disease pressure was light on this newly established ultradwarf green, but fungicide programs that included rotations of products with activity on *Rhizoctonia* and *Pythium* spp. produced

consistently acceptable turfgrass quality. Overall fluctuations in turfgrass quality were largely attributed to cultivation activities.

TRT	TQ060606	TQ070606	TQ200706	TQ100806	TQ210806
1	4 A	5.25 A	6 A	6 BA	6.25 A
2	4.25 A	5.25 A	6.25 A	5.75 B	6.25 A
3	4.75 A	5.75 A	6.25 A	6.75 BA	7.25 A
4	3.75 A	5.75 A	6 A	6.5 BA	7 A
5	4.75 A	5.25 A	6.5 A	6 BA	6.5 A
6	4.75 A	5.25 A	6.25 A	6.5 BA	6.25 A
7	4.5 A	5.75 A	6 A	6.5 BA	6.75 A
8	3.25 A	5.5 A	5.5 A	6 BA	6.25 A
9	5 A	6 A	6.75 A	7 A	7.25 A
10	4.5 A	6 A	6.5 A	6.75 BA	7.25 A
11	4.25 A	5.75 A	6 A	6.75 BA	7 A
12	4.25 A	6 A	6.75 A	6.5 BA	7.25 A
13			7 A	6.25 BA	6.75 A

Treatment numbers are explained above. TQ is turfgrass quality on a 1 to 10 scale with 6 being minimally acceptable and 10 being near perfect turfgrass. TQ is followed by two-digit day-month-year date of rating.

TRT	TQ310806	TQ060906	TQ210906
1	5.5 C	7 D	6.75 BC
2	6 BAC	8.25 BAC	6.5 C
3	6.5 BAC	9 A	7.25 BA
4	6 BAC	9 A	7 BC
5	6 BAC	7.7 BDC	7 BC
6	6.25 BAC	7.7 BDC	6.5 C
7	7.25 A	7.5 DC	7 BC
8	5.5 C	7.5 DC	7.75 A
9	7.25 A	8 BDAC	7.25 BA
10	6.5 BAC	8.5 BAC	7.25 BA
11	6.75 BAC	8 BDAC	7 BC
12	7 BA	8.7 BA	7.25 BA
13	5.75 BC	5.7 E	6.75 BC

Treatment numbers are explained above. TQ is turfgrass quality on a 1 to 10 scale with 6 being minimally acceptable and 10 being near perfect turfgrass. TQ is followed by two-digit day-month-year date of rating.

2006 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Evaluation of fungicides for the control of Large Patch on Seashore Paspalum

PRELIMINARY REPORT

January 2007

INVESTIGATOR: Philip F. Harmon

OBJECTIVE: Evaluate fungicides for the preventative control of Large Patch on a Seashore Paspalum tee in north FL.

TREATMENTS:

Trt#	Fungicide	Rate	Interval
1	Untreated		
2	Tartan SC	2.0 oz	28 day
3	Lynx Green SC	1.5 oz	28 day
4	TBZ + TFS Green	1.0 oz	28 day
5	TBZ + TFS Green	2.0 oz	28 day
6	Prostar 70 WG	2.2 oz	28 day
7	Bayleton SC	2.0 oz	28 day
8	Heritage TL	1.5 oz	28 day
9	Insignia 20 WG	0.9 oz	28 day
10	UF CEP -1		28 day

MATERIALS AND METHODS:

The trial was initiated 12 Oct 2006 in a sward of 'Aloha' Seashore Paspalum located on the Plant Research Farm, Citra, FL. Treatments were applied as indicated above, with a CO₂ backpack boom sprayer calibrated to deliver products in 2 gallons of water per 1000 sq ft (M) through two Teejet flat fan nozzles. The treatments were applied twice- 12 Oct and 9 Nov. Plots were divided into 4 blocks and trt numbers assigned in a randomized complete block design, subplots being 2m x 2m. Plots were maintained as a Tee; mowed 3 times per week at a height of 1/2"- 5/8". The plot was fertilized with 1 lb N every 3 months. Insecticides, herbicides, and irrigation were applied when appropriate. The plot was inoculated with *Rhizoctonia solani* AG 2-2 LP. (isolate 0508B) infested wheat seed 17 Oct 2006. Dollar spot symptoms were observed 16 Oct. Disease severity was recorded by counting the number of infection centers per plot. Large patch symptoms were observed 27 Oct. Disease ratings were taken using the Horsfall – Barrett scale. Turfgrass quality observations (scale of 1-10 with 10= dark green perfect turf, 1= dead/brown turf, and 6= minimally acceptable turf) also were made. All data were subjected to analysis of variance and means were separated according to Fisher's LSD.

RESULTS:

Dollar spot and large patch disease severity were heavy. Strobilurin products had little to no efficacy for dollar spot as has been shown in past trials. Prostar appeared to provide some dollar spot suppression early in the trial, but DMI applications provided the best control. All treatments except Tartan at 2 oz and Bayleton at 2 oz had failed by the January reading, but UF CEP-1 also showed suppression statistically not different than these two.

All treatments evaluated gave good large patch preventative control through fall. Disease did not develop as uniformly as hoped in reps 2 and 3. Insignia did not hold 28 days after the first application.

In mid Dec and early Jan, large patch and dollar spot both became active again. Treatment 2 and 7 with triadimefon prevented dollar spot from occurring during the winter outbreak. Treatments with tebuconazole, tebuconazole+trifloxystrobin, and Prostar were still protected in the winter outbreak. Other fungicide treatments except Tartan provided good suppression, but some large patch developed in the winter outbreak.

TRT	TQ161006	TQ230107	DS161006	DS271006	DS011106	DS061106
1	5.25 D	3 BC	2.75 A	11.25 A	29 B	19.5 B
2	6.25 A	3.25 BA	0 A	0 B	0 B	0 B
3	6.25 A	3.5 BA	0 A	0 B	2.25 B	3 B
4	6.25 A	3.5 BA	0 A	0 B	20 B	13 B
5	6 BA	4.25 A	0 A	0 B	0 B	0 B
6	5.5 DC	3.5 BA	0 A	0 B	19.75 B	10.75 B
7	5.5 DC	3 BC	1.25 A	0 B	0 B	0 B
8	5.25 D	2.75 BC	1.5 A	12.25 A	77 A	57.75 A
9	5.5 DC	2 C	1 A	0 B	5.5 B	5.25 B
10	5.75 BC	4.25 A	0 A	0 B	0 B	0 B

TRT	DS050107	LP271006	LP011106	LP061106	LP050107
1	137.5 BA	4.5 A	4.75 A	4.5 BA	12 A
2	5 E	1 B	0 B	0 C	7.25 B
3	81.25 C	1 B	1.25 BA	0 C	1 D
4	106.25 BC	1 B	0 B	1.5 BAC	1 D
5	67.5 DC	1 B	0 B	0 C	1 D
6	96.25 BC	1 B	2 BA	0 C	1 D
7	0 E	1 B	0 B	0.5 BC	4.5 CB
8	181.25 A	2 BA	0 B	0 C	5.25 CB
9	115 BC	1 B	0 B	4.75 A	3.25 CD
10	22.5 DE	1 B	0 B	0 C	3 CD

TQ is turf quality, DS is dollar spot infection centers, LP is large patch in HB scale. Date follows the two letter abbreviations in two-digit day-month-year format.

2006 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Evaluation of various fungicide products for the control of dollar spot on seashore paspalum

FINAL REPORT October 2006

INVESTIGATOR: Philip F. Harmon and Patricia E. Hill

OBJECTIVE: Evaluate fungicide products for the control of dollar spot on a seashore paspalum tee in north central FL.

TREATMENTS:

Trt#	Fungicide	Rate	Interval
1	Untreated		
2	Emerald 70 WG alternated w/ Curalan 50 EG	0.18 oz 1.0 oz	14 day 21 day
3	Emerald 70WG + Chlorothalonil, then alternated w/ Emerald 70WG and Curalan 50 EG	0.13 oz 3.2oz 0.13 oz 1.0 oz	14 day 14 day 14 day
4	Chlorothalonil 82.5 WDG alternated w/ Emerald 70WG and Curalan 50 EG	3.2 oz 0.18 oz 1.0 oz	14 day 14 day 14 day
5	UF CEP 2		
6	UF CEP 1		
7	Chipco 26 GT	1.2 oz	14 day

MATERIALS AND METHODS:

The trial was initiated 20 Jun 2006 in a sward of 'Aloha' Seashore Paspalum located on the Plant Science Research and Education Unit, Citra, FL. Treatments were applied as indicated above, with a CO₂ backpack boom sprayer calibrated to deliver products in 2 gallons of water per 1000 sq ft (M) through two Teejet flat fan nozzles. Plots were divided into 4 blocks and trt numbers assigned in a randomized complete block design, subplots being 1m x 2m. Plots were maintained as a tee; mowed 3 times per week at a height of 1/2" to 5/8". The plot was fertilized with 1 lb N every 3 months. The plot area did not receive nitrogen fertilizer during the study. Insecticides, herbicides, and irrigation were applied when appropriate. Disease was allowed to develop from natural inoculum. A disease sample was taken and the dollar spot pathogen was isolated for diagnostic confirmation. Disease severity was recorded by counting the number of infection centers per plot. Turfgrass quality observations (scale of 1-10 with 10= dark green

perfect turf, 1= dead/brown turf, and 6= minimally acceptable turf) also were made. All data were subjected to analysis of variance and means were separated according to Fisher's LSD.

RESULTS:

Treatments were made curatively starting 6 Jun. By 29 Jun, all fungicide treatments had significantly reduced dollar spot severity compared to the non-treated control. Fungicide treated plots recovered more quickly from the initial disease outbreak, had fewer dollar spots develop during disease favorable conditions in Jun and early Jul, and had significantly higher turfgrass quality than untreated plots. All of the products evaluated were efficacious when used curatively. Growing conditions at the end of July favored turfgrass growth and recovery over dollar spot development. Disease severity in check plots was reduced to levels not significantly different than fungicide treated plots by the end of the trial.

Table 1.

TRT	DS200606	DS290606	DS060706	DS140706	DS200706	DS270706	TQ060706
1	23.8 C	40.8 A	22.8 A	59.5 A	26.5 A	4.5 A	3.8 B
2	30.0 BC	6.0 B	4.8 B	2.0 B	2.8 B	0.0 A	5.8 A
3	51.0 A	5.0 B	5.3 B	4.0 B	3.8 B	0.0 A	6.0 A
4	31.5 BC	7.3 B	5.8 B	8.0 B	3.5 B	0.0 A	5.5 A
5	45.8 BA	17.5 B	1.8 B	1.0 B	1.0 B	0.0 A	6.3 A
6	40.0 BAC	3.8 B	3.0 B	1.0 B	1.3 B	0.0 A	6.3 A
7	38.3 BAC	5.5 B	4.0 B	3.5 B	3.3 B	0.5 A	6.3 A

DS is dollar spot infection centers per plot. TQ is turfgrass quality. Two-digit day-month-year follows rating type (DS or TQ)

2006 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Evaluation of fungicide programs for the preventative control of summer diseases on seashore paspalum

FINAL REPORT October 2006

INVESTIGATOR: Philip F. Harmon and Patricia E. Hill

OBJECTIVE: Evaluate fungicide programs for the preventative control of summer diseases on a seashore paspalum green in north-central FL.

TREATMENTS:

Trt#	Fungicide	vol gal/M	interval
1	Untreated	2	14 day
2	BASF 1	2	14 day
3	BASF 2	2	21 day
4	Bayer 1	2	14 day
5	Bayer 2	2	14 day
6	Bayleton	2	14 day
7	Syngenta 1	2	14 day
8	Instrata	2	14 day
9	Instrata	2	21 day
10	Chipco 26GT	2	14 day

		Different products each spray		Product	Rate oz.
2	BASF 1				
	a.	Emerald		Emerald	0.18
	b.	Daconil Ultrex		Daconil	3.2
	c.	Emerald		Insignia	0.9
	d.	Insignia + Curalan		Curalan	1
3	BASF 2				
	a.	Emerald + Daconil		Emerald	0.18
	b.	Emerald		Daconil	3.2
	c.	Curalan		Curalan	1
	d.	Insignia		Insignia	0.9
4	Bayer 1				

		Signature + Daconil		Signature	4
				Daconil	3.2
5	Bayer 2	Signature + Medallion		Signature	4
				Medallion	0.5
7	Syngenta 1				
	a.	Headway		Headway	3
	b.	Signature + Daconil		Signature	4
	c.	Heritage TL		Daconil	3.2
	d.	DacZN + Medallion		Heritage TL	2
	e.	Headway		Daconil ZN	6
				Medallion	0.25

MATERIALS AND METHODS:

The trial was initiated 3 May 2006 on a ‘Sea Dwarf’ Seashore Paspalum green located on the Plant Science Research and Education Unit, Citra, FL. Treatments were applied as indicated above, with a CO₂ backpack boom sprayer calibrated to deliver products in 2 gallons of water per 1000 sq ft (M) through two Teejet flat fan nozzles. Plots were divided into 4 blocks and trt numbers assigned in a randomized complete block design, subplots being 1m x 2m. Plots were maintained as a green; mowed 3 - 5 times per week at a height of .140 - .150”. The plot was lightly verticut weekly and fertilized with ½ - ¾ lb N/ month. Insecticides, herbicides, and irrigation were applied when appropriate. Turfgrass quality observations (scale of 1-10 with 10= dark green perfect turf, 1= dead/brown turf, and 6= minimally acceptable turf) were made. Disease ratings were taken 15 Jun using the Horsfall- Barrett scale. Also, phytotoxicity was noted on some subplots 31 Aug. All data were subjected to analysis of variance and means were separated according to Fisher’s LSD.

RESULTS:

Fungicide programs resulted in higher turfgrass quality compared to the non-treated plots. Diseases observed in plots included dollar spot, Fusarium blight, and Rhizoctonia leaf and sheath spot. Programs that include Signature fungicide were among the best plots. The disease rating on 15 Jun was largely Fusarium blight. Phytotoxicity was noted on plots repeatedly treated with Bayleton, Instrata, and Headway.

Tables contain treatment means of data collected throughout the trial.

TRT	TQ030506		TQ170506		TQ250506		TQ310506		TQ150606		TQ290606		TQ110706		TQ140706	
1	5.8	B	6.0	BC	6.8	A	6.0	DC	4.8	C	5.5	A	7.0	BA	7.0	BC
2	6.0	BA	6.0	BC	6.8	A	5.8	D	6.0	BAC	6.3	A	6.8	BAC	7.0	BC
3	6.8	A	6.5	BAC	7.0	A	6.8	BA	5.5	BC	6.3	A	7.3	BA	7.5	BA
4	6.3	BA	7.0	A	6.8	A	6.8	BA	6.8	BA	6.5	A	7.5	A	7.8	A
5	6.3	BA	6.8	BA	7.0	A	7.0	A	7.0	A	6.5	A	7.0	BA	8.0	A
6	6.3	BA	6.3	BAC	6.8	A	5.8	D	5.3	C	5.5	A	6.8	BAC	6.0	E
7	6.3	BA	6.8	BA	6.8	A	6.8	BA	7.0	A	5.8	A	6.8	BAC	7.0	BC
8	6.3	BA	6.3	BAC	7.0	A	6.3	BDC	7.0	A	6.3	A	5.8	C	6.3	DE
9	6.3	BA	5.8	C	6.5	A	5.8	D	5.0	C	5.8	A	6.3	BC	6.5	DCE
10	6.8	A	6.3	BAC	7.0	A	6.5	BAC	7.0	A	6.5	A	7.5	A	6.8	DC

TRT	TQ200706		TQ270706		TQ090806		TQ210806		TQ310806		DR150606		Phy310806	
1	6.8	BC	6.3	BA	5.3	BC	6.3	BC	5.3	DC	3.5	A	0.0	B
2	7.5	BA	6.3	BA	5.3	BC	7.0	A	5.5	C	1.0	C	0.8	A
3	7.5	BA	6.5	A	5.8	BA	6.5	BAC	5.8	BC	2.5	B	0.3	B
4	8.0	A	6.8	A	6.3	A	7.0	A	6.8	A	0.0	D	0.3	B
5	7.5	BA	6.5	A	5.5	BA	7.0	A	6.5	BA	0.0	D	0.0	B
6	5.3	D	5.3	DC	4.5	DC	5.3	D	4.5	DE	0.3	D	1.0	A
7	6.8	BC	6.3	BA	4.3	D	6.0	C	4.5	DE	0.0	D	1.0	A
8	6.5	C	5.8	BC	4.3	D	5.3	D	4.3	E	0.3	D	1.0	A
9	5.5	D	5.0	D	4.3	D	5.3	D	3.8	E	0.3	D	1.0	A
10	6.8	BC	5.8	BC	5.5	BA	6.8	BA	5.5	C	0.0	D	0.0	B

TQ is turfgrass quality, DR is disease rating, and Phy is phytotoxicity. Rating type is followed by two-digit day, month, year. Means followed by the same letter are not significantly different according to Fisher's LSD.

2006 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Evaluation of fungicides for the control of Gray Leaf Spot on St. Augustinegrass

FINAL REPORT

April 2007

INVESTIGATOR: Philip F. Harmon

OBJECTIVE: Evaluate fungicides for the preventative control of gray leaf spot on ‘Seville’ St. Augustinegrass in north FL.

TREATMENTS:

Trt#	Fungicide	Rate	Interval
1	Untreated		
2	Insignia 20 WG	0.5 oz	14 day
3	Insignia 20 WG	0.9 oz	28 day
4	UFCEP2	0.53 oz	14 day
5	UFCEP3	0.88 oz	14 day
6	UFCEP1	0.55 oz	14 day
7	UFCEP1	1.1 oz	28 day
8	Cleary’s 3336 +	6.0 oz	21 day
9	Heritage TL	2.0 oz	14 day

Note: UF CEP series are confidential products from confidential companies

MATERIALS AND METHODS:

The trial was initiated 17 July 2006 in a plot of ‘Seville’ St. Augustinegrass located on the Plant Research Farm, Citra, FL. Twelve inch strips of St. Augustinegrass sod with 1m-wide bare soil between made up the treatments areas. Treatments were initiated on 20 July and applied as indicated above, with a CO₂ backpack boom sprayer calibrated to deliver products in 2 gallons of water per 1000 sq ft (M) through two Teejet flat fan nozzles. The treatments were applied 4 times for the 14-d and 2 times for the 28-d applications. Plots were divided into 4 blocks and trt numbers assigned in a randomized complete block design, subplots being 1m x 2m. Plots were mowed once per week at a height of 3 inches. The plot was fertilized with 1 lb N/month. Atrazine was also applied monthly. The perimeter of the plot was inoculated with gray leaf spot infested grass clippings on 9Aug 2006. Gray leaf spot symptoms were observed in the plot borders 6 Sept 2006. Disease ratings for gray leaf spot (GLS in table below) were counts of lesions per unit area and the unknown disease rating of 8/21 (DR in table below) was taken using the Horsfall – Barrett scale. Turfgrass quality observations (scale of 1-10 with 10= dark green perfect turf, 1= dead/brown turf, and 6= minimally acceptable turf) also were made. Sprig grow-

in length was measured at ¼, ½ and ¾ the length of each subplot. All data were subjected to analysis of variance and means were separated according to Waller Duncan k-ratio t-test.

RESULTS:

Disease pressure was light in the plot despite evening irrigations, atrazine use, nitrogen applications, and inoculation. Gray leaf spot severity was reduced to near-zero by all fungicide treatments used. In addition to gray leaf spot severity, sprig production was measured to test for differences in grow-in times due to treatments. No significant differences in average grow-in rates were observed. This is likely due to the relatively mild epidemic of gray leaf spot on untreated control plots. On 8/21/06 foliar symptoms were observed, but it was unclear what the cause was. Plots were rated for this damage, but no differences were detected due to fungicide treatment. It is suspected that this damage was due to an environmental stress, atrazine burn, or possibly symptoms of Marasmius infection.

Table of select data where the coded column header indicates the type of rating (GLS=gray leaf spot severity, SL=sprig length, TQ=turfgrass quality) and two-digit ddmmyy date (i.e. 050107 is January 5, 2007)

TRT	GLS060906	GLS210906	SL061106	SL140307	TQ090806	TQ310806	DR210806
1	6.8 A	4.0 A	23.3 A	17.0 A	6.3 AB	6.5 B	1.5 AB
2	0.3 B	0.0 B	22.6 A	17.5 A	6.8 AB	7.0 AB	1.3 B
3	0.3 B	1.5 B	21.2 A	14.9 A	6.3 AB	6.5 B	1.5 AB
4	0.0 B	0.0 B	23.5 A	18.3 A	6.5 AB	6.8 AB	1.8 AB
5	0.3 B	0.0 B	26.1 A	19.8 A	7.0 A	7.5 A	1.3 B
6	0.0 B	0.0 B	24.9 A	16.9 A	6.5 AB	7.0 AB	1.3 B
7	0.3 B	0.3 B	20.2 A	17.6 A	6.0 B	6.5 B	1.8 AB
8	1.0 B	0.8 B	23.4 A	18.6 A	6.8 AB	6.5 B	2.5 A
9	0.5 B	0.0 B	24.8 A	18.7 A	6.8 AB	7.0 AB	1.8 AB

TRT explanations above. Separations according to Waller-Duncan k-ratio t-test

2006 COOPERATIVE FUNGICIDE EFFICACY PROJECT

Evaluation of fungicides for the control of large patch on Zoysiagrass

FINAL REPORT

April 2007

INVESTIGATOR: Philip F. Harmon

OBJECTIVE: Evaluate fungicides for the preventative control of Large Patch on Zoysiagrass in north-central FL.

TREATMENTS:

Trt#	Fungicide	Rate	Interval	
1	Untreated			
2	Insignia 20 WG	(0.5 gal)	0.9 oz	28 day
3	Insignia 20 WG		0.9 oz	28 day
4	UF CEP – 1		1.1 oz	28 day
5	Heritage TL		2.0 oz	28 day
6	Heritage TL		1.0 oz	28 day
7	Heritage 50 WG		0.2 oz	28 day
8	Heritage 50 WG		0.4 oz	28 day
9	Endorse		4.0 oz	14 day
10	Cleary's 3336 +		4.0 oz	21 day

Note: UF CEP series are confidential products from confidential companies

MATERIALS AND METHODS:

The trial was initiated 12 Oct 2006 in a sward of 'Empire' Zoysiagrass located on the Plant Research Farm, Citra, FL. Treatments were applied as indicated above, with a CO₂ bicycle sprayer calibrated to deliver products in 2 gallons of water per 1000 sq ft (M) through two Teejet flat fan nozzles. The #2 (Insignia 20 WG) treatments were applied at a rate of 0.5gal/M. The treatments were applied twice- 12 Oct and 9 Nov. Plots were divided into 4 blocks and treatment numbers assigned in a randomized complete block design, subplots being 2m x 2m. Plots were mowed 2 times per week at a height of 2- 3". The plot was fertilized with 1 lb N every 3 months. Insecticides, herbicides, and irrigation were applied when appropriate. The plot was inoculated with *Rhizoctonia* sp. (isolate 0502) infested wheat seed 17 Oct 2006. Large patch symptoms were observed 5 Jan. Disease ratings were taken using the Horsfall – Barrett scale. Turfgrass quality observations (scale of 1-10 with 10= dark green perfect turf, 1= dead/brown turf, and 6= minimally acceptable turf) also were made. All data were subjected to analysis of variance and means were separated according to Waller Duncan k-ration t-test.

RESULTS:

Although large patch was active on several turfgrasses on the research facility in fall 2006 (see seashore paspalum large patch trial 06 07), little disease developed on this particular Empire plot. Ratings taken from the time of initiation through the end of 2006 indicated no large patch disease in any plot (all 0's) and no differences in turfgrass quality were observed. The first disease rating where large patch was apparent was January 5, 2007. This rating was taken nearly 60 days after the last scheduled application. Fungicide trt effects were still apparent, although between-rep variations were quite significant resulting in little separation. Insignia at the high rate delivered in 0.5 gal of water/M (trt 2) was significantly different than the control (trt 1) and was numerically better than the same rate delivered at 2 gal of water/M (trt 3) (this is the second year of this result-yr1 was St. Augustinegrass). The high rate of Heritage TL (trt 5) also was significantly better than the control (trt 1) and numerically was better than the low rate (trt 6). Heritage WG at both rates (trt 8, 9) was better than the control (trt 1). Cleary's 3336 and Endorse treatments resulted in the most disease 60 days after the last application.

These results indicate that two fall applications of strobilurin products used at high rates and delivered effectively are options for large patch management through winter and into spring. The Endorse and 3336 products may have provided control in the fall, but plots apparently were not challenged. These products do not appear to be viable options for winter control of large patch without repeat applications throughout disease favorable conditions. No delayed green-up or phytotoxic effects were noted.

Table of select data where the coded column header indicates the type of rating (LP=large patch severity, TQ=turfgrass quality) and two-digit ddmmy date (i.e. 050107 is January 5, 2007)

TRT	LP050107	TQ161006
1	6 A	5 A
2	1.75 BC	5.5 A
3	3 BAC	5.75 A
4	3 BAC	5.25 A
5	1.25 BC	4.75 A
6	3.75 BAC	5.25 A
7	1 C	5.25 A
8	1.5 BC	5.5 A
9	4 BAC	5 A
10	4.25 BA	5.25 A

TRT explanations above. Separations according to Waller-Duncan k-ratio t-test