

# University of California, Riverside

## 2012 Turf Disease Trial: Management of Dollar Spot Disease on Creeping Bentgrass

Trial ID: Dollar spot 2012      Protocol ID:  
 Location: Riverside, CA      Study Director: Jim Baird  
 Project ID:                      Investigator: James H. Baird  
    Sponsor Contact:

### General Trial Information

**Study Director:** Jim Baird      **Title:** Turfgrass Specialist  
**Investigator:** Ryan Nichols      **Title:** Graduate Student Researcher

**Discipline:** F fungicide  
**Trial Status:** F one-year/final  
**Initiation Date:** Jun-12-2012      **Planned Completion Date:** Sep-18-2012

### Trial Location

**City:** Riverside      **Latitude of LL Corner** °: 33.96 N  
**State/Prov.:** CA      **Longitude of LL Corner** °: 117.33 W  
**Postal Code:** 92521      **Altitude of LL Corner, Unit:** 825.56 FT  
**Country:** USA United States

### Objectives:

Twenty fungicide treatments and one nitrogen treatment were evaluated for their ability to control dollar spot (*Sclerotinia homoeocarpa*) preventatively on a creeping bentgrass (*Agrostis stolonifera*) "tee". The plot is a 90/10 mix of creeping bentgrass and annual bluegrass, established in 2005 from sod. Beginning in May 2012, nitrogen was withheld from the turf followed by inoculation of the turfgrass on June 12, 2012. Inoculation was achieved by spreading dollar spot infested grain evenly across the study area. The inoculum was allowed one week to colonize on the turfgrass, and then all treatments were started on June 19, 2012.

### Conclusions:

- Overall, dollar spot disease pressure was good, reaching 41% by mid August on the untreated control, and 54% on the nitrogen control (0.2 lbs N/M/2 wks using sprayable NH<sub>4</sub>SO<sub>4</sub>) by early August.
- In July and August, there was significantly higher disease cover on the nitrogen control vs. the untreated control.
- Most all fungicides or fungicide programs provided effective control of dollar spot throughout the study period.
- Only one fungicide treatment, Disarm M, showed signs of mild phytotoxicity during the study period. Phytotoxicity is known to be an issue for most DMI fungicides, especially in high heat conditions present throughout the study period. Thus myclobutanil, an active ingredient in Disarm M, may have been responsible for the turf injury.

### Acknowledgements:

Special thanks to Dr. Peggy Mauk, Director of Agricultural Operations, for her help and support in preparing the inoculum, and to BASF, Syngenta, Valent, DuPont, Bayer, Cleary Chemical, Arysta and Crop Production Services for providing fungicides and support throughout the study.

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### Personnel

**Study Director:** Jim Baird      **Title:** Turfgrass Specialist  
**Affiliation:** University of California  
**Address:** 900 University Ave  
**Location:** Riverside, CA  
**Postal Code:** 92521    **E-mail:** james.baird@ucr.edu  
**Investigator:** Ryan Nichols      **Title:** Graduate Student Researcher  
**Affiliation:** University of California  
**Address:** 900 University Ave  
**Location:** Riverside, CA  
**Postal Code:** 92521    **E-mail:** ryan.nichols@ucr.edu

### Crop Description

**Crop 1:** AGSST Agrostis stolonifera    Creeping bentgrass  
**BBCH Scale:** BGRM      **Planting Date:** Apr-1-2005  
**Planting Method:** SOD

### Pest Description

**Pest 1 Type:** D      **Code:** SCLEHO Sclerotinia homoeocarpa  
**Common Name:** Dollar spot of grasses  
**Artificial Population:** X      **Establishment Date:** Jun-12-2012  
**Establishment Method/Description:** inoculum dollar spot infested grain

### Site and Design

**Plot Width, Unit:** 4 FT      **Site Type:** TURREE turf - research  
**Plot Length, Unit:** 6 FT  
**Plot Area, Unit:** 24 FT2      **Tillage Type:** NOTILL no-till  
**Replications:** 6      **Study Design:** RACOB� Randomized Complete Block (RCB)  
**Untreated Arrangement:** INCLUDED      single control randomized in each block



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### Pest Stage At Each Application

	A	B	C	D	E	F	G	H	I
<b>Pest 1 Code, Type, Scale:</b>	SCLEHO D	SCLEHO D	SCLEHO D	SCLEHO D	SCLEHO D	SCLEHO D	SCLEHO D	SCLEHO D	SCLEHO D

### Application Equipment

	A	B	C	D	E	F	G
<b>Appl. Equipment:</b>	HANDBOOM	HANDBOOM	HANDBOOM	HANDBOOM	HANDBOOM	HANDBOOM	HANDBOOM
<b>Equipment Type:</b>	BACCAI	BACCAI	BACCAI	BACCAI	BACCAI	BACCAI	BACCAI
<b>Operation Pressure, Unit:</b>	32 PSI	32 PSI	32 PSI	32 PSI	32 PSI	32 PSI	32 PSI
<b>Nozzle Type:</b>	TJ8004VS	TJ8004VS	TJ8004VS	TJ8004VS	TJ8004VS	TJ8004VS	TJ8004VS
<b>Nozzle Size:</b>	8004	8004	8004	8004	8004	8004	8004
<b>Nozzle Spacing, Unit:</b>	9 IN	9 IN	9 IN	9 IN	9 IN	9 IN	9 IN
<b>Nozzles/Row:</b>	4	4	4	4	4	4	4
<b>Band Width, Unit:</b>	4 FT	4 FT	4 FT	4 FT	4 FT	4 FT	4 FT
<b>Boom Length, Unit:</b>	36 IN	36 IN	36 IN	36 IN	36 IN	36 IN	36 IN
<b>Boom Height, Unit:</b>	12 IN	12 IN	12 IN	12 IN	12 IN	12 IN	12 IN
<b>Ground Speed, Unit:</b>	2 MPH	2 MPH	2 MPH	2 MPH	2 MPH	2 MPH	2 MPH
<b>Spray Volume, Unit:</b>	2 GAL/1000 FT2	2 GAL/1000 FT2	2 GAL/1000 FT2	2 GAL/1000 FT2	2 GAL/1000 FT2	2 GAL/1000 FT2	2 GAL/1000 FT2
<b>Mix Size, Unit:</b>	1.5 liters	1.5 liters	1.5 liters	1.5 liters	1.5 liters	1.5 liters	1.5 liters
<b>Propellant:</b>	COMCO2	COMCO2	COMCO2	COMCO2	COMCO2	COMCO2	COMCO2

	H	I
<b>Appl. Equipment:</b>	HANDBOOM	HANDBOOM
<b>Equipment Type:</b>	BACCAI	BACCAI
<b>Operation Pressure, Unit:</b>	32 PSI	32 PSI
<b>Nozzle Type:</b>	TJ8004VS	TJ8004VS
<b>Nozzle Size:</b>	8004	8004
<b>Nozzle Spacing, Unit:</b>	9 IN	9 IN
<b>Nozzles/Row:</b>	4	4
<b>Band Width, Unit:</b>	4 FT	4 FT
<b>Boom Length, Unit:</b>	36 IN	36 IN
<b>Boom Height, Unit:</b>	12 IN	12 IN
<b>Ground Speed, Unit:</b>	2 MPH	2 MPH
<b>Spray Volume, Unit:</b>	2 GAL/1000 FT2	2 GAL/1000 FT2
<b>Mix Size, Unit:</b>	1.5 liters	1.5 liters
<b>Propellant:</b>	COMCO2	COMCO2

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Trt No	Treatment	Application	Comment
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13			On the 4th application date (application code E) no 26 GT was available, so it was left out of the treatment. The other two fungicides involved on that date were put down together without the 26 GT.
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Date	By	Notes
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Aug-29-2012	Nichols, R.	Please note that low Turf Quality and NDVI ratings were due to scalping, routine verticutting, and topdressing. Turf Quality and NDVI ratings do not adequately reflect the efficacy of the fungicide treatments for disease management from August 8-29, 2012.
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Description			PHYTOTOXICITY	PHYTOTOXICITY	PHYTOTOXICITY	PHYTOTOXICITY	PHYTOTOXICITY	PHYTOTOXICITY	PHYTOTOXICITY	
Rating Date			Jun-19-2012	Jul-3-2012	Jul-10-2012	Jul-17-2012	Jul-25-2012	Aug-1-2012	Aug-8-2012	
Rating Type			PHYCHL	PHYCHL	PHYCHL	PHYCHL	PHYCHL	PHYCHL	PHYCHL	
Rating Unit			%	%	%	%	%	%	%	
Number of Subsamples			1	1	1	1	1	1	1	
Days After First/Last Applic.			0 0	14 14	21 7	28 7	36 8	43 1	50 8	
Trt-Eval Interval			0 DA-A	14 DA-A	21 DA-A	28 DA-A	36 DA-A	43 DA-A	50 DA-A	
Plant-Eval Interval			2636 DP-1	2650 DP-1	2657 DP-1	2664 DP-1	2672 DP-1	2679 DP-1	2686 DP-1	
Trt No.	Treatment Name	Rate	Appl Code	1	2	3	4	5	6	7
1	CONTROL			0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
2	INTERFACE	4.0 fl oz/1000 ft2	ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
3	VELISTA DACONIL ULTREX	0.3 oz wt/1000 ft2 3.25 oz wt/1000 ft2	ABDEFH ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
4	VELISTA CURALAN	0.3 oz wt/1000 ft2 1.0 oz wt/1000 ft2	ABDEFH ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
5	XZEMPLAR	0.157 fl oz/1000 ft2	ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
6	XZEMPLAR	0.211 fl oz/1000 ft2	ACEGI	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
7	EMERALD	0.18 oz wt/1000 ft2	ACEGI	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
8	XZEMPLAR	0.262 fl oz/1000 ft2	ADFI	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
9	LEXICON	0.34 fl oz/1000 ft2	ACEGI	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
10	HONOR	0.84 oz wt/1000 ft2	ACEGI	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
11	LEXICON	0.472 fl oz/1000 ft2	ADFI	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
12	ENCARTIS	3.0 fl oz/1000 ft2	ADFI	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
13	LEXICON CHIPCO SIGNATURE ENCARTIS INSIGNIA SEGWAY 26GT FORE RAINSHIELD DACONIL WEATHERSTIK	0.472 fl oz/1000 ft2 4.0 oz wt/1000 ft2 4.0 fl oz/1000 ft2 0.7 fl oz/1000 ft2 0.9 fl oz/1000 ft2 4.0 fl oz/1000 ft2 8.0 oz wt/1000 ft2 4.0 fl oz/1000 ft2	AI BF B DF EH EH E H	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b
14	ENCARTIS TRINITY HONOR INSIGNIA	2.85 fl oz/1000 ft2 1.0 fl oz/1000 ft2 1.1 oz wt/1000 ft2 0.7 fl oz/1000 ft2	AG C E I	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b

Means followed by same letter do not significantly differ (P=.05, LSD)  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Description	PHYTOTOXICITY		PHYTOTOXICITY		PHYTOTOXICITY		PHYTOTOXICITY		PHYTOTOXICITY		PHYTOTOXICITY	
Rating Date	Jun-19-2012		Jul-3-2012		Jul-10-2012		Jul-17-2012		Jul-25-2012		Aug-1-2012	
Rating Type	PHYCHL		PHYCHL		PHYCHL		PHYCHL		PHYCHL		PHYCHL	
Rating Unit	%		%		%		%		%		%	
Number of Subsamples	1		1		1		1		1		1	
Days After First/Last Applic.	0 0		14 14		21 7		28 7		36 8		43 1	
Trt-Eval Interval	0 DA-A		14 DA-A		21 DA-A		28 DA-A		36 DA-A		43 DA-A	
Plant-Eval Interval	2636 DP-1		2650 DP-1		2657 DP-1		2664 DP-1		2672 DP-1		2679 DP-1	
Trt Treatment No. Name	Rate	Appl Code	1	2	3	4	5	6	7			
15 HONOR	1.1 oz wt/1000 ft2	A	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b			
TRINITY	1.0 fl oz/1000 ft2	B										
CHIPCO SIGNATURE	4.0 oz wt/1000 ft2	DF										
DACONIL ULTREX	3.2 oz wt/1000 ft2	DFH										
INSIGNIA	0.7 fl oz/1000 ft2	E										
TRINITY	2.0 fl oz/1000 ft2	H										
INSIGNIA	0.9 fl oz/1000 ft2	I										
16 SECURE	0.5 fl oz/1000 ft2	ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b			
17 SECURE	0.5 fl oz/1000 ft2	ADF	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b			
APPEAR	6.0 fl oz/1000 ft2	ABDEFH										
DACONIL ACTION	3.5 fl oz/1000 ft2	BEH										
18 A8574D	0.34 fl oz/1000 ft2	ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b			
DACONIL ACTION	3.5 fl oz/1000 ft2	ABDEFH										
19 A8574D	0.34 fl oz/1000 ft2	ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b			
APPEAR	6.0 fl oz/1000 ft2	ABDEFH										
20 DISARM M	1.0 fl oz/1000 ft2	ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	8.3 a	5.8 a	5.8 a			
21 TOURNEY	0.37 oz wt/1000 ft2	ADH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b			
INSIGNIA	0.9 fl oz/1000 ft2	BE										
CHIPCO SIGNATURE	4.0 oz wt/1000 ft2	FI										
DACONIL ULTREX	3.2 oz wt/1000 ft2	FI										
22 NITROGEN	0.2 lb/1000 ft2	ABDEFH	0.0 a	0.0 a	0.0 a	0.0 a	0.0 b	0.0 b	0.0 b			
LSD (P=.05)			0.00	0.00	0.00	0.00	1.26	1.20	1.20			
Standard Deviation			0.00	0.00	0.00	0.00	1.10	1.05	1.05			
CV			0.0	0.0	0.0	0.0	290.65	395.28	395.28			
Replicate F			0.000	0.000	0.000	0.000	1.000	1.000	1.000			
Replicate Prob(F)			1.0000	1.0000	1.0000	1.0000	0.4216	0.4216	0.4216			
Treatment F			0.000	0.000	0.000	0.000	15.625	8.448	8.448			
Treatment Prob(F)			1.0000	1.0000	1.0000	1.0000	0.0001	0.0001	0.0001			

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Description			PHYTOTOXICITY	PHYTOTOXICITY	DISEASE COVER	DISEASE COVER	DISEASE COVER	DISEASE COVER	
Rating Date			Aug-15-2012	Aug-29-2012	Jun-19-2012	Jul-3-2012	Jul-10-2012	Jul-17-2012	
Rating Type			PHYCHL	PHYCHL	COVER	COVER	COVER	COVER	
Rating Unit			%	%	%	%	%	%	
Number of Subsamples			1	1	1	1	1	1	
Days After First/Last Applic.			57	71	0	14	21	28	
Trt-Eval Interval			57 DA-A	71 DA-A	0 DA-A	14 DA-A	21 DA-A	28 DA-A	
Plant-Eval Interval			2693 DP-1	2707 DP-1	2636 DP-1	2650 DP-1	2657 DP-1	2664 DP-1	
Trt No.	Treatment Name	Rate	Appl Code						
		Rate Unit		8	9	11	12	13	
								14	
1	CONTROL			0.0 b	0.0 b	5.0 a	6.7 b	14.2 a	20.0 b
2	INTERFACE	4.0 fl oz/1000 ft2	ABDEFH	0.0 b	0.0 b	5.0 a	0.0 c	0.0 b	0.0 c
3	VELISTA DACONIL ULTREX	0.3 oz wt/1000 ft2 3.25 oz wt/1000 ft2	ABDEFH ABDEFH	0.0 b	0.0 b	2.5 a	0.0 c	0.0 b	0.0 c
4	VELISTA CURALAN	0.3 oz wt/1000 ft2 1.0 oz wt/1000 ft2	ABDEFH ABDEFH	0.0 b	0.0 b	4.2 a	0.8 c	0.0 b	0.0 c
5	XZEMPLAR	0.157 fl oz/1000 ft2	ABDEFH	0.0 b	0.0 b	3.3 a	0.0 c	0.0 b	0.0 c
6	XZEMPLAR	0.211 fl oz/1000 ft2	ACEGI	0.0 b	0.0 b	4.2 a	0.8 c	0.0 b	0.0 c
7	EMERALD	0.18 oz wt/1000 ft2	ACEGI	0.0 b	0.0 b	3.3 a	0.0 c	0.0 b	0.0 c
8	XZEMPLAR	0.262 fl oz/1000 ft2	ADFI	0.0 b	0.0 b	3.3 a	0.0 c	0.0 b	0.0 c
9	LEXICON	0.34 fl oz/1000 ft2	ACEGI	0.0 b	0.0 b	3.3 a	0.0 c	0.0 b	0.0 c
10	HONOR	0.84 oz wt/1000 ft2	ACEGI	0.0 b	0.0 b	6.7 a	0.0 c	0.0 b	0.0 c
11	LEXICON	0.472 fl oz/1000 ft2	ADFI	0.0 b	0.0 b	2.5 a	0.0 c	0.0 b	0.0 c
12	ENCARTIS	3.0 fl oz/1000 ft2	ADFI	0.0 b	0.0 b	2.5 a	0.0 c	0.0 b	0.8 c
13	LEXICON CHIPCO SIGNATURE ENCARTIS INSIGNIA SEGWAY 26GT FORE RAINSHIELD DACONIL WEATHERSTIK	0.472 fl oz/1000 ft2 4.0 oz wt/1000 ft2 4.0 fl oz/1000 ft2 0.7 fl oz/1000 ft2 0.9 fl oz/1000 ft2 4.0 fl oz/1000 ft2 8.0 oz wt/1000 ft2 4.0 fl oz/1000 ft2	AI BF B DF EH EH E H	0.0 b	0.0 b	4.2 a	0.0 c	0.0 b	0.0 c
14	ENCARTIS TRINITY HONOR INSIGNIA	2.85 fl oz/1000 ft2 1.0 fl oz/1000 ft2 1.1 oz wt/1000 ft2 0.7 fl oz/1000 ft2	AG C E I	0.0 b	0.0 b	5.0 a	0.0 c	0.0 b	0.0 c



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Rating Date				Aug-15-2012	Aug-29-2012	Jun-19-2012	Jul-3-2012	Jul-10-2012	Jul-17-2012
Rating Type				PHYCHL	PHYCHL	COVER	COVER	COVER	COVER
Rating Unit				%	%	%	%	%	%
Number of Subsamples				1	1	1	1	1	1
Days After First/Last Applic.				57	71	0	14	21	28
Trt-Eval Interval				57 DA-A	71 DA-A	0 DA-A	14 DA-A	21 DA-A	28 DA-A
Plant-Eval Interval				2693 DP-1	2707 DP-1	2636 DP-1	2650 DP-1	2657 DP-1	2664 DP-1
Trt No.	Treatment Name	Rate	Appl Code	8	9	11	12	13	14
15	HONOR	1.1 oz wt/1000 ft2	A	0.0 b	0.0 b	2.5 a	0.0 c	0.0 b	0.0 c
	TRINITY	1.0 fl oz/1000 ft2	B						
	CHIPCO SIGNATURE	4.0 oz wt/1000 ft2	DF						
	DACONIL ULTREX	3.2 oz wt/1000 ft2	DFH						
	INSIGNIA	0.7 fl oz/1000 ft2	E						
	TRINITY	2.0 fl oz/1000 ft2	H						
	INSIGNIA	0.9 fl oz/1000 ft2	I						
16	SECURE	0.5 fl oz/1000 ft2	ABDEFH	0.0 b	0.0 b	4.2 a	0.8 c	0.0 b	0.0 c
17	SECURE	0.5 fl oz/1000 ft2	ADF	0.0 b	0.0 b	2.5 a	0.0 c	0.0 b	0.0 c
	APPEAR	6.0 fl oz/1000 ft2	ABDEFH						
	DACONIL ACTION	3.5 fl oz/1000 ft2	BEH						
18	A8574D	0.34 fl oz/1000 ft2	ABDEFH	0.0 b	0.0 b	3.3 a	0.0 c	0.0 b	0.0 c
	DACONIL ACTION	3.5 fl oz/1000 ft2	ABDEFH						
19	A8574D	0.34 fl oz/1000 ft2	ABDEFH	0.0 b	0.0 b	2.5 a	0.0 c	0.0 b	0.0 c
	APPEAR	6.0 fl oz/1000 ft2	ABDEFH						
20	DISARM M	1.0 fl oz/1000 ft2	ABDEFH	7.5 a	11.7 a	5.8 a	0.0 c	0.0 b	1.7 c
21	TOURNEY	0.37 oz wt/1000 ft2	ADH	0.0 b	0.0 b	4.2 a	0.8 c	0.0 b	0.0 c
	INSIGNIA	0.9 fl oz/1000 ft2	BE						
	CHIPCO SIGNATURE	4.0 oz wt/1000 ft2	FI						
	DACONIL ULTREX	3.2 oz wt/1000 ft2	FI						
22	NITROGEN	0.2 lb/1000 ft2	ABDEFH	0.0 b	0.0 b	3.3 a	10.0 a	15.8 a	50.0 a
LSD (P=.05)				0.67	2.13	3.94	1.93	2.26	3.07
Standard Deviation				0.58	1.87	3.45	1.69	1.98	2.69
CV				171.27	352.02	91.01	186.17	145.28	81.48
Replicate F				1.000	1.000	1.441	1.111	1.506	1.308
Replicate Prob(F)				0.4216	0.4216	0.2158	0.3592	0.1944	0.2661
Treatment F				45.000	10.652	0.692	12.872	29.881	105.595
Treatment Prob(F)				0.0001	0.0001	0.8323	0.0001	0.0001	0.0001

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Description	DISEASE COVER		DISEASE COVER		DISEASE COVER		DISEASE COVER		DISEASE COVER		TURF QUALITY	TURF QUALITY	
Rating Date	Jul-25-2012		Aug-1-2012		Aug-8-2012		Aug-15-2012		Aug-29-2012		Aug-8-2012	Aug-15-2012	
Rating Type	COVER		COVER		COVER		COVER		COVER		QUALIT	QUALIT	
Rating Unit	%		%		%		%		%		0-9	0-9	
Number of Subsamples	1		1		1		1		1		1	1	
Days After First/Last Applic.	36 8		43 1		50 8		57 1		71 1		50 8	57 1	
Trt-Eval Interval	36 DA-A		43 DA-A		50 DA-A		57 DA-A		71 DA-A		50 DA-A	57 DA-A	
Plant-Eval Interval	2672 DP-1		2679 DP-1		2686 DP-1		2693 DP-1		2707 DP-1		2686 DP-1	2693 DP-1	
Trt No.	Treatment Name	Rate	Appl Code										
		Rate Unit		15	16	17	18	19	21	22			
1	CONTROL			25.8 b	30.0 b	27.5 b	41.7 b	5.8 b	4.7 e	4.3 e			
2	INTERFACE	4.0 fl oz/1000 ft2	ABDEFH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.3 a-d	7.0 abc			
3	VELISTA DACONIL ULTREX	0.3 oz wt/1000 ft2 3.25 oz wt/1000 ft2	ABDEFH ABDEFH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	5.8 b-e	6.7 a-d			
4	VELISTA CURALAN	0.3 oz wt/1000 ft2 1.0 oz wt/1000 ft2	ABDEFH ABDEFH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	5.5 cde	6.3 bcd			
5	XZEMPLAR	0.157 fl oz/1000 ft2	ABDEFH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	5.8 b-e	6.2 cd			
6	XZEMPLAR	0.211 fl oz/1000 ft2	ACEGI	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	5.7 b-e	6.3 bcd			
7	EMERALD	0.18 oz wt/1000 ft2	ACEGI	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	5.8 b-e	6.5 a-d			
8	XZEMPLAR	0.262 fl oz/1000 ft2	ADFI	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.2 a-d	6.5 a-d			
9	LEXICON	0.34 fl oz/1000 ft2	ACEGI	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	4.7 e	6.8 a-d			
10	HONOR	0.84 oz wt/1000 ft2	ACEGI	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.3 a-d	6.7 a-d			
11	LEXICON	0.472 fl oz/1000 ft2	ADFI	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.0 a-e	6.7 a-d			
12	ENCARTIS	3.0 fl oz/1000 ft2	ADFI	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.0 a-e	6.5 a-d			
13	LEXICON CHIPCO SIGNATURE ENCARTIS INSIGNIA SEGWAY 26GT FORE RAINSHIELD DACONIL WEATHERSTIK	0.472 fl oz/1000 ft2 4.0 oz wt/1000 ft2 4.0 fl oz/1000 ft2 0.7 fl oz/1000 ft2 0.9 fl oz/1000 ft2 4.0 fl oz/1000 ft2 8.0 oz wt/1000 ft2 4.0 fl oz/1000 ft2	AI BF B DF EH EH E H	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	5.8 b-e	6.8 a-d			
14	ENCARTIS TRINITY HONOR INSIGNIA	2.85 fl oz/1000 ft2 1.0 fl oz/1000 ft2 1.1 oz wt/1000 ft2 0.7 fl oz/1000 ft2	AG C E I	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	7.3 a	7.0 abc			

# University of California, Riverside

## 2012 Turf Disease Trial: Management of Dollar Spot Disease on Creeping Bentgrass

Trial ID: Dollar spot 2012      Protocol ID:  
 Location: Riverside, CA      Study Director: Jim Baird  
 Project ID:                      Investigator: James H. Baird  
    Sponsor Contact:

Description	DISEASE COVER		DISEASE COVER		DISEASE COVER		DISEASE COVER		DISEASE COVER		TURF QUALITY		TURF QUALITY	
Rating Date	Jul-25-2012		Aug-1-2012		Aug-8-2012		Aug-15-2012		Aug-29-2012		Aug-8-2012		Aug-15-2012	
Rating Type	COVER		COVER		COVER		COVER		COVER		QUALIT		QUALIT	
Rating Unit	%		%		%		%		%		0-9		0-9	
Number of Subsamples	1		1		1		1		1		1		1	
Days After First/Last Applic.	36 8		43 1		50 8		57 1		71 1		50 8		57 1	
Trt-Eval Interval	36 DA-A		43 DA-A		50 DA-A		57 DA-A		71 DA-A		50 DA-A		57 DA-A	
Plant-Eval Interval	2672 DP-1		2679 DP-1		2686 DP-1		2693 DP-1		2707 DP-1		2686 DP-1		2693 DP-1	
Trt Treatment No. Name	Rate	Unit	Appl Code	15	16	17	18	19	21	22				
15 HONOR TRINITY	1.1 oz wt/1000 ft2	A		0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	7.0 ab	7.0 abc				
CHIPCO SIGNATURE	4.0 oz wt/1000 ft2	DF												
DACONIL ULTREX	3.2 oz wt/1000 ft2	DFH												
INSIGNIA	0.7 fl oz/1000 ft2	E												
TRINITY	2.0 fl oz/1000 ft2	H												
INSIGNIA	0.9 fl oz/1000 ft2	I												
16 SECURE	0.5 fl oz/1000 ft2		ABDEFH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.7 abc	6.5 a-d				
17 SECURE	0.5 fl oz/1000 ft2		ADF	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.3 a-d	7.2 ab				
APPEAR	6.0 fl oz/1000 ft2		ABDEFH											
DACONIL ACTION	3.5 fl oz/1000 ft2		BEH											
18 A8574D	0.34 fl oz/1000 ft2		ABDEFH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.8 abc	7.3 a				
DACONIL ACTION	3.5 fl oz/1000 ft2		ABDEFH											
19 A8574D	0.34 fl oz/1000 ft2		ABDEFH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.8 abc	6.7 a-d				
APPEAR	6.0 fl oz/1000 ft2		ABDEFH											
20 DISARM M	1.0 fl oz/1000 ft2		ABDEFH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.5 abc	6.0 d				
21 TOURNEY	0.37 oz wt/1000 ft2		ADH	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	6.7 abc	6.7 a-d				
INSIGNIA	0.9 fl oz/1000 ft2		BE											
CHIPCO SIGNATURE	4.0 oz wt/1000 ft2		FI											
DACONIL ULTREX	3.2 oz wt/1000 ft2		FI											
22 NITROGEN	0.2 lb/1000 ft2		ABDEFH	47.5 a	54.2 a	38.3 a	46.7 a	25.0 a	5.0 de	4.7 e				
LSD (P=.05)				4.02	4.61	4.37	4.89	3.81	1.34	0.85				
Standard Deviation				3.51	4.04	3.82	4.28	3.33	1.17	0.75				
CV				105.38	105.51	127.62	106.56	237.93	19.3	11.55				
Replicate F				1.019	1.351	0.543	1.035	0.957	3.502	1.455				
Replicate Prob(F)				0.4102	0.2490	0.7434	0.4012	0.4476	0.0057	0.2109				
Treatment F				62.044	61.586	39.746	55.556	15.822	2.185	5.478				
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001	0.0001	0.0051	0.0001				

# University of California, Riverside

## 2012 Turf Disease Trial: Management of Dollar Spot Disease on Creeping Bentgrass

Trial ID: Dollar spot 2012      Protocol ID:  
 Location: Riverside, CA      Study Director: Jim Baird  
 Project ID:                      Investigator: James H. Baird  
    Sponsor Contact:

Description	TURF QUALITY		NDVI	NDVI	NDVI		
Rating Date	Aug-29-2012	Aug-29-2012	Aug-8-2012	Aug-15-2012	Aug-29-2012		
Rating Type	QUALIT	QUALIT	NDVI	NDVI	NDVI		
Rating Unit	0-9	0-9	0-1	0-1	0-1		
Number of Subsamples	1	1	1	1	1		
Days After First/Last Applic.	71	71	50	57	71		
Trt-Eval Interval	71 DA-A	71 DA-A	50 DA-A	57 DA-A	71 DA-A		
Plant-Eval Interval	2707 DP-1	2707 DP-1	2686 DP-1	2693 DP-1	2707 DP-1		
Trt No.	Treatment Name	Rate	Appl Code	23	25	26	27
1	CONTROL			4.2 a	0.822 f	0.812 f	0.778 a
2	INTERFACE	4.0 fl oz/1000 ft2	ABDEFH	4.7 a	0.867 ab	0.845 a-e	0.793 a
3	VELISTA DACONIL ULTREX	0.3 oz wt/1000 ft2 3.25 oz wt/1000 ft2	ABDEFH ABDEFH	5.0 a	0.875 a	0.867 a	0.802 a
4	VELISTA CURALAN	0.3 oz wt/1000 ft2 1.0 oz wt/1000 ft2	ABDEFH ABDEFH	4.2 a	0.862 a-d	0.855 a-d	0.808 a
5	XZEMPLAR	0.157 fl oz/1000 ft2	ABDEFH	4.5 a	0.858 a-d	0.848 a-e	0.790 a
6	XZEMPLAR	0.211 fl oz/1000 ft2	ACEGI	5.0 a	0.833 ef	0.847 a-e	0.793 a
7	EMERALD	0.18 oz wt/1000 ft2	ACEGI	4.7 a	0.850 b-e	0.840 b-e	0.805 a
8	XZEMPLAR	0.262 fl oz/1000 ft2	ADFI	5.2 a	0.852 b-e	0.835 def	0.790 a
9	LEXICON	0.34 fl oz/1000 ft2	ACEGI	4.3 a	0.847 b-e	0.840 b-e	0.792 a
10	HONOR	0.84 oz wt/1000 ft2	ACEGI	5.2 a	0.863 abc	0.855 a-d	0.817 a
11	LEXICON	0.472 fl oz/1000 ft2	ADFI	4.5 a	0.848 b-e	0.842 b-e	0.820 a
12	ENCARTIS	3.0 fl oz/1000 ft2	ADFI	5.0 a	0.867 ab	0.853 a-e	0.825 a
13	LEXICON CHIPCO SIGNATURE ENCARTIS INSIGNIA SEGWAY 26GT FORE RAINSHIELD DACONIL WEATHERSTIK	0.472 fl oz/1000 ft2 4.0 oz wt/1000 ft2 4.0 fl oz/1000 ft2 0.7 fl oz/1000 ft2 0.9 fl oz/1000 ft2 4.0 fl oz/1000 ft2 8.0 oz wt/1000 ft2 4.0 fl oz/1000 ft2	AI BF B DF EH EH E H	4.8 a	0.850 b-e	0.863 ab	0.808 a
14	ENCARTIS TRINITY HONOR INSIGNIA	2.85 fl oz/1000 ft2 1.0 fl oz/1000 ft2 1.1 oz wt/1000 ft2 0.7 fl oz/1000 ft2	AG C E I	5.0 a	0.865 abc	0.848 a-e	0.790 a

## University of California, Riverside

### 2012 Turf Disease Trial: Management of Dollar Spot Disease on Creeping Bentgrass

Trial ID: Dollar spot 2012      Protocol ID:  
 Location: Riverside, CA      Study Director: Jim Baird  
 Project ID:                      Investigator: James H. Baird  
    Sponsor Contact:

Description	TURF QUALITY	NDVI	NDVI	NDVI
Rating Date	Aug-29-2012	Aug-8-2012	Aug-15-2012	Aug-29-2012
Rating Type	QUALIT	NDVI	NDVI	NDVI
Rating Unit	0-9	0-1	0-1	0-1
Number of Subsamples	1	1	1	1
Days After First/Last Applic.	71 1	50 8	57 1	71 1
Trt-Eval Interval	71 DA-A	50 DA-A	57 DA-A	71 DA-A
Plant-Eval Interval	2707 DP-1	2686 DP-1	2693 DP-1	2707 DP-1
Trt Treatment	Rate	Appl Code		
No. Name	Unit	Code	23	25
15 HONOR	1.1 oz wt/1000 ft2 A		4.8 a	0.865 abc
TRINITY	1.0 fl oz/1000 ft2 B			0.847 a-e
CHIPCO SIGNATURE	4.0 oz wt/1000 ft2 DF			0.778 a
DACONIL ULTREX	3.2 oz wt/1000 ft2 DFH			
INSIGNIA	0.7 fl oz/1000 ft2 E			
TRINITY	2.0 fl oz/1000 ft2 H			
INSIGNIA	0.9 fl oz/1000 ft2 I			
16 SECURE	0.5 fl oz/1000 ft2 ABDEFH		4.8 a	0.858 a-d
17 SECURE	0.5 fl oz/1000 ft2 ADF		4.8 a	0.858 a-d
APPEAR	6.0 fl oz/1000 ft2 ABDEFH			0.812 a
DACONIL ACTION	3.5 fl oz/1000 ft2 BEH			
18 A8574D	0.34 fl oz/1000 ft2 ABDEFH		5.2 a	0.867 ab
DACONIL ACTION	3.5 fl oz/1000 ft2 ABDEFH			0.867 a
19 A8574D	0.34 fl oz/1000 ft2 ABDEFH		5.3 a	0.873 a
APPEAR	6.0 fl oz/1000 ft2 ABDEFH			0.862 abc
20 DISARM M	1.0 fl oz/1000 ft2 ABDEFH		4.5 a	0.845 cde
21 TOURNEY	0.37 oz wt/1000 ft2 ADH		4.8 a	0.858 a-d
INSIGNIA	0.9 fl oz/1000 ft2 BE			0.852 a-e
CHIPCO SIGNATURE	4.0 oz wt/1000 ft2 FI			0.807 a
DACONIL ULTREX	3.2 oz wt/1000 ft2 FI			
22 NITROGEN	0.2 lb/1000 ft2 ABDEFH		5.0 a	0.842 def
LSD (P=.05)		1.09	0.0203	0.0243
Standard Deviation		0.95	0.0178	0.0212
CV		19.81	2.08	2.5
Replicate F		6.524	0.759	2.686
Replicate Prob(F)		0.0001	0.5813	0.0252
Treatment F		0.703	3.292	2.216
Treatment Prob(F)		0.8220	0.0001	0.0044

# University of California, Riverside

## 2012 Turf Disease Trial: Management of Dollar Spot Disease on Creeping Bentgrass

Trial ID: Dollar spot 2012      Protocol ID:  
Location: Riverside, CA      Study Director: Jim Baird  
Project ID:                      Investigator: James H. Baird  
   Sponsor Contact:

Rating Type

PHYCHL = phytotoxicity - chlorosis  
QUALIT = quality  
NDVI = normalized difference vegetation index

Rating Unit

% = percent  
0-9 = 0-9 index/scale  
0-1 = 0-1 index/scale

Plant-Eval Interval

2636 DP-1 = 1 AGSST Apr-1-2005  
2650 DP-1 = 1 AGSST Apr-1-2005  
2657 DP-1 = 1 AGSST Apr-1-2005  
2664 DP-1 = 1 AGSST Apr-1-2005  
2672 DP-1 = 1 AGSST Apr-1-2005  
2679 DP-1 = 1 AGSST Apr-1-2005  
2686 DP-1 = 1 AGSST Apr-1-2005  
2693 DP-1 = 1 AGSST Apr-1-2005  
2707 DP-1 = 1 AGSST Apr-1-2005

Trial Comments