Treatment <sup>c</sup>	Rate/1000 ft <sup>2b</sup>	Application Interval (Date)	I	11	ш	Avg	DMR <sup>a</sup>
Bayleton	l oz	65° + 30 days	25	15	25	21.7	AB
Control		-	15	25	35	25.0	А

<sup>a</sup>Treatments followed by same letter are not significantly different from each other at the 5% level. <sup>b</sup>Rates are formulation.

<sup>c</sup>Deleted treatments are proprietary.

<sup>d</sup>Applied initially on 6/11/93.

<sup>e</sup>Mild greening of turf observed, especially earlier in season.

## **DOLLAR SPOT FUNGICIDE TRIAL - 1993**

# Hancock Turfgrass Research Center, Michigan State University, East Lansing, Michigan

The 1993 dollar spot (*Sclerotinia homoeocarpa*) fungicide trial was conducted on an irrigated Emerald creeping bentgrass/annual bluegrass putting green at the Hancock Turfgrass Research Center on the Michigan State University campus in East Lansing, Michigan. The green was maintained at  $\frac{1}{4}$ " height of cut and was fertilized at  $\frac{1}{4}$  # N/mo. Treatments were applied curatively to 2' x 9' plots in three replications of a random block design on 7, 10, 14, 21, or 28 day schedule as indicated in the data tables (Table 5), beginning on  $\frac{8}{4}/93$ . By the date of the last rating ( $\frac{10}{11}/93$ ) the weekly treatments had been applied 10 times, the 10-day treatments had been applied 7 times, the 14-day treatments were applied 5 times, the 21-day treatments were applied 3 times, and the 28-day treatments were applied 3 times.

Disease pressure was moderate this year and developed somewhat unevenly in the study. As the data in Table 5 indicates, however, most treatments gave statistically significant control of dollar spot when compared to the untreated controls. The Anderson 373-376 treatments were initially applied curatively on 9/3 and failed to perform as well as expected due to the early onset of turf dormancy. The dollar spot strains in this plot area are benzimidazole-resistant and have also traditionally exhibited low-level resistance to the dicarboximide fungicides (Chipco 26019, Curalan, etc.)

#### Table 5. Dollar Spot Fungicide Study - 1993

10/11/93

Rating Scale: Rating Date: 0 = no disease, 10 = 100% of plot diseased

Hancock Turfgrass Research Center Michigan State University East Lansing, Michigan

Treatment <sup>c</sup>	Rate/1000 ft <sup>2b</sup>	Interval	Ι	Ш	III	Avg	DMR (.05) <sup>a</sup>
Fluazinam	1 fl oz	21 days	0	0	0	0	Ĥ
ASC 67098Z	6 oz	28 days	0	0	0	0	H
ASC 67098X	3 oz	14 days	0	0	0	0	H
D.2787 + ASC 67135	4  fl oz + 2  fl oz	21 days	0	0	0	0	Н
Rubigan	1.5 fl oz	14 days	0	0	0	0	Н
Thalonil	3 oz	10 days	0	0	0	0	н
TRA 0028	5.4 fl oz	10 days	0	0	0	0	Н

anner         0.13% oz ai         14 days         0         0         0         0         H           anner + ICIA 5504         0.2752 oz ai + 0.1764 oz         28 days         0         0         0         0         H           anner + ICIA 5504         0.2752 oz ai + 0.1764 oz         14 days         0         0         0         0         H           ai         0.2752 oz ai + 0.1764 oz         14 days         0         0         0         H           ajtein + D.2787         0.5 oz + 0.5 fl oz         21 days         0         0         0         H           ayleton + Curalan         0.75 oz + 0.75 fl oz         28 days         0         0         0         H           ayleton + Curalan         0.75 oz + 0.75 fl oz         28 days         0         0         0         H           ayleton         2 oz         28 days         1         0         0.3         GH           22877         6 fl oz         1.5 fl oz + 1.5 fl oz         28 days         1         0         0.3         GH           2164B         2.02         28 days         1         0         0.7         F-H           XP 10054C         1 foz         28 days         1 <td< th=""><th>Treatment<sup>c</sup></th><th>Rate/1000 ft<sup>2b</sup></th><th>Interval</th><th>I</th><th>п</th><th>m</th><th>Avg</th><th>DMR (.05)<sup>a</sup></th></td<>	Treatment <sup>c</sup>	Rate/1000 ft <sup>2b</sup>	Interval	I	п	m	Avg	DMR (.05) <sup>a</sup>
anner + ICIA 5504       0.2752 oz ai + 0.1764 oz       28 days       0       0       0       0       H         anner + ICIA 5504       0.2752 oz ai + 0.1764 oz       14 days       0       0       0       0       H         ai       0.2752 oz ai + 0.1764 oz       14 days       0       0       0       0       H         ai       0.25 oz + 3 fl oz       14 days       0       0       0       0       H         ayleton + D2787       0.5 oz + 4 fl oz       21 days       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       21 days       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       28 days       0       0       0       H         ayleton       2 oz       28 days       1       0       0       0.3       GH         XP 10307A + EXP       1.5 fl oz + 1.5 fl oz       28 days       1       1       0       0.7       F+H         XP 10307A       2 oz       28 days       1       1       0       0.7       F+H         XP 10307A       2 oz       28 days       1       1       0       0.7       F+H	Banner	0.1376 oz ai	14 days	0	0	0	0	Н
anner + ICIA 5504 $0.2752 \text{ oz}$ ai + 0.1764 oz $14 \text{ days}$ $0$ $0$ $0$ $0$ $H$ uralan (DF) $1 \text{ oz}$ ai $21 \text{ days}$ $0$ <	Banner + ICIA 5504	0.2752 oz ai + 0.1764 oz ai	28 days	0	0	0	0	Н
uralan (DF)I oz ai21 days00000Hayleton + D.27870.5 oz + 4 fl oz21 days0000Hayleton + D.27870.5 oz + 4.0 r.221 days0000Hayleton + Curalan0.5 oz + 0.5 fl oz21 days0000Hayleton + Curalan0.75 oz + 0.75 fl oz28 days0000Hazor28 days00000Haconil SDG3.8 oz14 days00000Haconil SDG3.8 oz14 days0000.3GHXP 1004041 oz28 days1000.3GHXP 10307A2 oz28 days1100.7F-HXP 10307A2 oz28 days1100.7F-HActidag0 oz2.8days1100.7F-HXP 10512A1.6 fl oz1.6 fl oz2.8 days1110E-Hcli6445 oz ai2.8days<	Banner + ICIA 5504	0.2752 oz ai + 0.1764 oz ai	14 days	0	0	0	0	Н
ayleton + D.2787       0.25 oz + 3 fl oz       14 days       0       0       0       H         ayleton + D.2787       0.5 oz + 0.5 fl oz       21 days       0       0       0       0       H         ayleton + Curalan       0.5 oz + 0.5 fl oz       21 days       0       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       28 days       0       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       28 days       0       0       0       0       H         ayleton + Curalan       0.75 oz + 0.5 fl oz       28 days       0       0       0       0       H         ayleton + Curalan       0.75 oz + 0.5 fl oz       28 days       1       0       0.3       GH         x287       1.6 fl oz       1.8 days       1       0       0.7       F-H         XP 10307A       2.02       28 days       1       1       0       0.7       F-H         XP 10512A       1.6 fl oz       2.8 days       1       1       0       0.7       F-H         XP 10512A       1.6 fl oz       2.8 days       1       1       1.0       E-H         1	Curalan (DF)	1 oz ai	21 days	0	0	0	0	н
ayleton + D.2787       0.5 oz + 4.1 foz       21 days       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       28 days       0       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       28 days       0       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       28 days       0       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       28 days       0       0       0       0       H         ayleton + Curalan       0.75 oz + 0.75 fl oz       28 days       1       0       0       0.4       H         acconil SDG       3.8 oz       14 days       0       0       0.3       GH         XP 10307A       EXP       1.5 fl oz       2.8 days       1       0       0.7       F-H         XP 10307A       2.02       2.8 days       1       1       0       0.7       F-H         XP 10307A       2.02       2.8 days       1       1       0       0.7       F-H         Z164B       1.6 fl oz       2.8 days       1       1       1       0.6       F-H	Bayleton + D.2787	0.25 oz + 3 fl oz	14 days	0	0	0	0	Н
ayleton + Curalan $0.5 \text{ oz} + 0.5 \text{ fl oz}$ $21 \text{ days}$ $0$ $0$ $0$ $0$ $H$ $12787$ $6 \text{ fl oz}$ $14 \text{ days}$ $0$ $0$ $0$ $0$ $H$ $12787$ $6 \text{ fl oz}$ $28 \text{ days}$ $0$ $0$ $0$ $0$ $H$ $aconil \text{ SDG}$ $3.8 \text{ oz}$ $14 \text{ days}$ $0$ $0$ $0.3$ $GH$ $XP 10307A + \text{EXP}$ $1.5 \text{ fl oz + 1.5 \text{ fl oz}$ $28 \text{ days}$ $1$ $0$ $0.3$ $GH$ $XP 10307A$ $2xc$ $28 \text{ days}$ $1$ $0$ $0.7$ $F-H$ $XP 10307A$ $2xc$ $28 \text{ days}$ $1$ $0$ $0.7$ $F-H$ $XP 10307A$ $2xc$ $28 \text{ days}$ $1$ $1$ $0$ $0.7$ $F-H$ $XP 10307A$ $2xc$ $28 \text{ days}$ $1$ $1$ $0$ $0.7$ $F-H$ $XP 10512A$ $1.6 \text{ fl oz$ $28 \text{ days}$ $1$ $1$ $1.0$ $E-H$ $anner$ $2 \text{ gm ai}$ $2 \text{ gm ai}$	Bayleton + D.2787	0.5  oz + 4  fl oz	21 days	0	0	0	0	Н
ayleton + Curalan $0.75 \text{ oz} + 0.75 \text{ fl oz}$ $28 \text{ days}$ $0$ $0$ $0$ $0$ $H$ $2787$ $6 \text{ fl oz}$ $28 \text{ days}$ $0$ $0$ $0$ $0$ $H$ $ayleton$ $2 \text{ oz}$ $28 \text{ days}$ $0$ $0$ $0$ $0$ $H$ $ayleton$ $2 \text{ oz}$ $28 \text{ days}$ $1$ $0$ $0.3$ $GH$ $XP 10307A + EXP$ $1.5 \text{ fl oz} + 1.5 \text{ fl oz}$ $28 \text{ days}$ $1$ $0$ $0.3$ $GH$ $XP 10064C$ $1 \text{ oz}$ $28 \text{ days}$ $1$ $0$ $0.77$ $F-H$ $XP 10307A$ $2 \text{ oz}$ $28 \text{ days}$ $1$ $1$ $0$ $0.77$ $F-H$ $XP 10307A$ $2 \text{ oz}$ $28 \text{ days}$ $1$ $1$ $0$ $0.77$ $F-H$ $XP 10307A$ $EXO$ $28 \text{ days}$ $1$ $1$ $1$ $0.77$ $F-H$ $XP 10312A$ $1.6 \text{ fl oz}$ $28 \text{ days}$ $1$ $1$ $1.0$ $E-H$ $C16444$ $0.25 \text{ oz}$	Bayleton + Curalan	0.5 oz + 0.5 fl oz	21 days	0	0	0	0	Н
12787       6 fl oz       14 days       0       0       0       0       H         ayleton       2 oz       28 days       0       0       0       0       H         aconil SDG       3.8 oz       14 days       0       1       0       0.3       GH         XP 10307A + EXP       1.5 fl oz + 1.5 fl oz       28 days       1       0       0       0.3       GH         anner       2 fl oz       28 days       1       0       0       0.3       GH         XP 10307A       2 oz       28 days       1       1       0       0.7       F-H         XP 10307A       2 oz       28 days       1       1       0       0.7       F-H         XP 10307A       2 oz       28 days       1       1       0       0.7       F-H         Z164B       1.6 fl oz       2 z       2 days       1       1       1.0       E-H         Z164B       1.6 fl oz       2 z       2 days       1       1       1.0       E-H         Z164B       0.167 oz       2 days       2       1       1       1.0       E-H         Ad04       0.25 oz ai       2 gm ai	Bayleton + Curalan	0.75 oz + 0.75 fl oz	28 days	0	0	0	0	Н
ayleton       2 oz       28 days       0       0       0       0       0       H         aconil SDG       3.8 oz       14 days       0       1       0       0.3       GH         XP 10307A + EXP       1.5 fl oz + 1.5 fl oz       28 days       1       0       0       0.3       GH         XP 10064C       1 oz       28 days       1       1       0       0.7       F-H         XP 10307A       2 oz       28 days       1       1       0       0.7       F-H         XP 10307A + EXP       1 fl oz + 1 fl oz       28 days       1       1       0       0.7       F-H         XP 10307A + EXP       1 fl oz + 1 fl oz       28 days       1       1       0       0.7       F-H         XP 10512A       1.6 fl oz       28 days       1       1       0       0.7       F-H         h.26019 (WDG)       2 oz       28 days       1       1       1       0       E-H         entinel       0.167 oz       28 days       1       1       1       0       E-H         4404       0.25 oz ai       28 days       2       1       1       1.3       E-H         <	D.2787	6 fl oz	14 days	0	0	0	0	н
acconil SDG       3.8 oz       14 days       0       1       0       0.3       GH         XP 10307A + EXP       1.5 fl oz + 1.5 fl oz       28 days       1       0       0       0.3       GH         anner       2 fl oz       28 days       1       0       0       0.3       GH         XP 10307A       2 oz       28 days       1       1       0       0.7       F-H         XP 10307A       2 oz       28 days       1       1       0       0.7       F-H         XP 10307A       2 oz       28 days       1       1       0       0.7       F-H         XP 10312A       1.6 fl oz       28 days       1       1       0       0.7       F-H         XP 10512A       1.6 fl oz       28 days       1       1       1.0       E-H         cC1 6444       5 oz ai       7 days       f1       f1       f0       0.7       F-H         x404       0.25 oz ai       28 days       1       1       1.0       E-H         cAfd506       Banner       1.75 gm ai + 2 gm ai       28 days       2       1       1       1.3       E-H         GA 173506 + Banner       3.5	Bayleton	2 oz	28 days	0	0	0	0	Н
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Daconil SDG	3.8 oz	14 days	0	1	0	0.3	GH
anner2 fl oz28 days1000.3GHXP 10064C1 oz28 days1100.7F-HXP 10307A2 oz28 days1100.7F-HXP 10307A2 oz28 days1100.7F-HXP 10307A1 fl oz + 1 fl oz28 days1100.7F-HZ164B1.6 fl oz28 days1100.7F-HXP 10512A1.6 fl oz28 days1111.0E-Hc1 64445 oz ai7 daysf1f1f00.7F-Hh26019 (WDG)2 oz28 days1111.0E-Hentinel0.167 oz28 days2111.3E-HA4040.25 oz ai28 days2111.3E-HA173506 + Banner1.75 gm ai + 2 gm ai28 days2111.3E-Hanner + ICIA 55043.5 gm ai + 2 gm ai28 days2111.3E-Hnuner + ICIA 55040.1376 oz ai + 0.1764 oz28 days3111.7D-GND. 375 <sup>B</sup> 4 lbs14 days2222.7B-DGA 1735063.5 gm ai28 days3412.7B-DCI 64441 oz ai7 days5313.0BCND. 374 <sup>B</sup> 4 lbs14 days3 <td>EXP 10307A + EXP )2164B</td> <td>1.5 fl oz + 1.5 fl oz</td> <td>28 days</td> <td>1</td> <td>0</td> <td>0</td> <td>0.3</td> <td>GH</td>	EXP 10307A + EXP )2164B	1.5 fl oz + 1.5 fl oz	28 days	1	0	0	0.3	GH
Line       Line <thline< th="">       Line       Line</thline<>	Banner	2 fl oz	28 days	1	0	0	03	GH
And the second seco	EXP 10064C	1 oz	28 days	1	1	0	0.7	F-H
Important       Iff $oz + 1$ fl $oz$ Iff $oz + 1$ fl $oz + 1$ fl $oz + 1$ Iff $oz + 1$ Iff $oz + 1$ fl $oz + 1$ Iff $oz + 1$ fl $oz + 1$ Iff $oz +$	EXP 10307A	2 oz	28 days	1	1	0	0.7	F-H
2164BXP 10512A1.6 fl oz28 days1100.7F-Hh.26019 (WDG)2 oz2 zz28 days1111.0E-Hentinel0.167 oz28 days1111.0E-H-44040.25 oz ai28 days1111.0E-HxP 10512A0.8 oz28 days2111.3E-Hanner2 gm ai28 days2111.3E-HGA 173506 + Banner1.75 gm ai + 2 gm ai28 days2111.3E-HGA 173506 + Banner1.75 gm ai + 2 gm ai28 days2111.3E-Hanner + ICIA 55040.1376 oz ai + 0.1764 oz28 days2111.3E-HND 375 <sup>k</sup> 4 lbs14 days2312.0C-FA4040.125 oz ai28 days3222.3B-END 374 <sup>g</sup> 4 lbs14 days3232.7B-DGA 1735063.5 gm ai28 days3412.7B-DCI 64441 oz ai7 days5313.0BCND. 378 <sup>g</sup> 4 lbs14 days3232.7B-DCI 64441 oz ai7 days5313.0BCND. 378 <sup>g</sup> 4 lbs14 days333.3BND. 378 <sup>g</sup> <t< td=""><td>EXP 10307A + EXP</td><td>1  fl oz + 1  fl oz</td><td>28 days</td><td>1</td><td>1</td><td>0</td><td>0.7</td><td>F-H</td></t<>	EXP 10307A + EXP	1  fl oz + 1  fl oz	28 days	1	1	0	0.7	F-H
Ar 10512A       1.6 fi 6z       28 days       1       1       0       0.7       F-H         Cl 6444       5 oz ai       7 days $f_1$ $f_1$ $f_0$ 0.7       F-H         h.26019 (WDG)       2 oz       28 days       1       1       1       0       E-H         entinel       0.167 oz       28 days       1       1       1       1.0       E-H         -4404       0.25 oz ai       28 days       1       1       1       1.0       E-H         xP 10512A       0.8 oz       28 days       2       1       1       1.3       E-H         anner       2 gm ai       28 days       2       1       1       1.3       E-H         GA 173506 + Banner       3.5 gm ai + 2 gm ai       28 days       2       1       1       1.3       E-H         anner + ICIA 5504       0.1376 oz ai + 0.1764 oz       28 days       3       1       1       1.3       E-H         ai       0       2 oz ai       7 days $f^3$ $f^2$ $f^0$ 1.7       D-G         ND 3758       4 lbs       14 days       2       2       2.7       B-D       B-D </td <td>2164B</td> <td>16.0 ar</td> <td>20 4</td> <td></td> <td></td> <td>0</td> <td>0.5</td> <td>E H</td>	2164B	16.0 ar	20 4			0	0.5	E H
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	AP 10512A	1.6 II 0Z	28 days	1	1	0	0.7	F-H
h.26019 (WDG)2 oz28 days1111.0E-Hentinel0.167 oz28 days1111.0E-H-44040.25 oz ai28 days1111.0E-HXP 10512A0.8 oz28 days2111.3E-Hanner2 gm ai28 days2111.3E-HGA 173506 + Banner1.75 gm ai + 2 gm ai28 days2111.3E-HGA 173506 + Banner3.5 gm ai + 2 gm ai28 days2111.3E-Hanner + ICIA 55040.1376 oz ai + 0.1764 oz28 days2111.3E-HaiaiXP 10307A1 fl oz28 days3111.7D-GXP 10307A1 fl oz28 days3222.3B-END. 375 <sup>g</sup> 4 lbs14 days2312.0C-FA0440.125 oz ai28 days3412.7B-DCI 64440.10764 oz ai14 days32313.0BCCI 64441 oz ai7 days5313.0BCND. 376 <sup>g</sup> 4 lbs14 days333.3BND. 373 <sup>g</sup> 4 lbs14 days5323.3BND. 373 <sup>g</sup> 4 lbs14 days5 <td>CI 6444</td> <td>5 oz ai</td> <td>7 days</td> <td><math>f_1</math></td> <td>r1</td> <td>f0</td> <td>0.7</td> <td>F-H</td>	CI 6444	5 oz ai	7 days	$f_1$	r1	f0	0.7	F-H
entinel $0.167 \text{ oz}$ $28 \text{ days}$ $1$ $1$ $1$ $1$ $1.0$ $E-H$ -4404 $0.25 \text{ oz ai}$ $28 \text{ days}$ $1$ $1$ $1$ $1.0$ $E-H$ Aurer $2 \text{ gm ai}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ GA 173506 + Banner $1.75 \text{ gm ai} + 2 \text{ gm ai}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ GA 173506 + Banner $3.5 \text{ gm ai} + 2 \text{ gm ai}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ anner + ICIA 5504 $0.1376 \text{ oz ai} + 0.1764 \text{ oz}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ anner + ICIA 5504 $0.1376 \text{ oz ai} + 0.1764 \text{ oz}$ $28 \text{ days}$ $3$ $1$ $1$ $1.7$ $D-G$ ND $3758$ $4 \text{ lbs}$ $14 \text{ days}$ $2$ $2$ $2.7$ $B-D$ ND $3748$ $4 \text{ lbs}$ $14 \text{ days}$ $4$ $2$ $2$ $2.7$ $B-D$ CI 6444 $0.125 \text{ oz ai}$ $28 \text{ days}$ $3$ $4$ $1$ $2.7$ $B-D$ CI 6444 $0.1764 \text{ oz ai}$ $14 \text{ days}$ $3$ $3$ $3.0$ $BC$ CI 6444 $0.025 \text{ oz ai}$ $14 \text{ days}$ $3$ $2$ $3$ $2$ $3$ $3$ ND $376^8$ $4 \text{ lbs}$ $14 \text{ days}$ $3$ $3$ $3$ $3$ $3$ $3$ ND $373^8$ $4 \text{ lbs}$ $14 \text{ days}$ $5$ $3$ $2$ $3.3$ $B$ anasea Plus $4 \text{ fl oz}$ <	Ch.26019 (WDG)	2 oz	28 days	1	1	1	1.0	E-H
4404 $0.25 \text{ oz ai}$ $28 \text{ days}$ $1$ $1$ $1$ $1.0$ $E-H$ XP 10512A $0.8 \text{ oz}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ anner $2 \text{ gm ai}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ GA 173506 + Banner $1.75 \text{ gm ai} + 2 \text{ gm ai}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ GA 173506 + Banner $3.5 \text{ gm ai} + 2 \text{ gm ai}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ anner + ICIA 5504 $0.1376 \text{ oz ai} + 0.1764 \text{ oz}$ $28 \text{ days}$ $2$ $1$ $1$ $1.3$ $E-H$ $ai$ $coz ai$ $7 \text{ days}$ $e_3$ $e_2$ $e_0$ $1.7$ $D-G$ ND. 37584 lbs14 days $2$ $3$ $1$ $2.0$ $C-F$ $4404$ $0.125 \text{ oz ai}$ $28 \text{ days}$ $3$ $2$ $2$ $2.7$ $B-D$ ND. $374^g$ $4 \text{ lbs}$ $14 \text{ days}$ $4$ $2$ $2$ $2.7$ $B-D$ GA 173506 $3.5 \text{ gm ai}$ $28 \text{ days}$ $3$ $4$ $1$ $2.7$ $B-D$ CI 6444 $1 \text{ oz ai}$ $7 \text{ days}$ $5$ $3$ $1$ $3.0$ $BC$ ND. $376^g$ $4 \text{ lbs}$ $14 \text{ days}$ $3$ $3$ $3.3$ $B$ nareae Plus $4 \text{ fl oz}$ $28 \text{ days}$ $5$ $3$ $2$ $3.3$ $B$ nareae Plus $4 \text{ fl oz}$ $28 \text{ days}$ $5$ $3$ $2$	Sentinel	0.167 oz	28 days	1	1	1	1.0	E-H
XP 10512A anner $0.8 \text{ oz}$ $2 \text{ gm ai}$ $28 \text{ days}$ $28 \text{ days}$ $2 \text{ 1}$ $1 \text{ 1}$ $1 \text{ 1}$ $1.3 \text{ E-H}$ $1.75 \text{ gm ai} + 2 \text{ gm ai}$ $3.5 \text{ gm ai} + 2 \text{ gm ai}$ $28 \text{ days}$ $28 \text{ days}$ $2 \text{ 1}$ $1 \text{ 1}$ $1 \text{ 1}$ $1.3 \text{ E-H}$ $1 \text{ 1}$ GA 173506 + Banner 	-4404	0.25 oz ai	28 days	1	1	1	1.0	E-H
An row20 day2 h111.3E-HGA 173506 + Banner1.75 gm ai + 2 gm ai28 days2111.3E-HGA 173506 + Banner3.5 gm ai + 2 gm ai28 days2111.3E-HGA 173506 + Banner3.5 gm ai + 2 gm ai28 days2111.3E-Hanner + ICIA 55040.1376 oz ai + 0.1764 oz28 days2111.3E-Hai0.1376 oz ai + 0.1764 oz28 days2111.3E-HCI 64442 oz ai7 dayse3e2e01.7D-GND. 375 <sup>g</sup> 4 lbs14 days2312.0C-F44040.125 oz ai28 days3222.3B-END. 374 <sup>g</sup> 4 lbs14 days4222.7B-DGA 1735063.5 gm ai28 days3412.7B-DCI 64441 oz ai7 days5313.0BCCI 64441 oz ai7 days5313.0BCND. 376 <sup>g</sup> 4 lbs14 days333.0BCND. 373 <sup>g</sup> 4 lbs14 days5323.3BND. 373 <sup>g</sup> 4 lbs14 days5323.3BND. 373 <sup>g</sup> 4 lbs14 days5323.3BND. 373 <sup>g</sup> 4 lbs22 <td< td=""><td>TXP 10512A</td><td>0.8 oz</td><td>28 days</td><td>2</td><td>1</td><td>ĩ</td><td>13</td><td>E-H</td></td<>	TXP 10512A	0.8 oz	28 days	2	1	ĩ	13	E-H
Left and 	Banner	2 em ai	28 days	2	1	î	13	E-H
Or 173506 + Banner GA 173506 + Banner anner + ICIA 55041.13 gm ai 2.5 gm ai + 2 gm ai ai28 days 2.1211.3E-H 2.6CI 6444 ai2 oz ai ai7 days ai $^{\circ}3$ 2.8 days $^{\circ}2$ 2.1 $^{\circ}0$ 1.31.7D-G D-GCI 6444 XP 10307A ND. 375g -44042 oz ai 4 lbs7 days 1.4 bs $^{\circ}3$ 2.8 days $^{\circ}2$ 2.1 $^{\circ}0$ 1.7D-G D-GND. 375g -44044 lbs14 days 1.25 oz ai2.8 days 2.8 days3.11.1.7D-G 2.0CF -44040.125 oz ai 0.125 oz ai2.8 days 2.8 days3.22.2.7B-DGA 173506 CI A 55043.5 gm ai 0.1764 oz ai2.8 days 1.4 days3.23.2.7B-DGA 173506 CI 6444 ND. 376g ontrol3.5 gm ai 4.1bs2.8 days 1.4 days3.23.2.7B-DGA 173506 CI 6444 ND. 376g3.5 gm ai 4.1bs2.8 days 4.1days3.33.0BCND. 373g anasea Plus A fl oz anasea Plus A fl oz A fl o	GA 173506 + Banner	1.75  gm ai + 2  gm ai	28 days	2	1	1	1.5	E-H
Ort resolve bundleSis gin at $2$ gin at $3$ gin $2$ gin at $2$	GA 173506 + Banner	35  gm ai + 2  gm ai	28 days	2	1	i	1.3	E-H
CI 64442 oz ai7 days $e_3$ $e_2$ $e_0$ 1.7D-GXP 10307A1 fl oz28 days3111.7D-GND. 375g4 lbs14 days2312.0C-F $e4404$ 0.125 oz ai28 days3222.3B-END. 374g4 lbs14 days4222.7B-DGA 1735063.5 gm ai28 days3412.7B-DCI 64441 oz ai7 days5313.0BCND. 376g4 lbs14 days333.0BControl4333.3BND. 373g4 lbs14 days5323.3BND. 373g4 lbs14 days5323.3BAnasea Plus4 fl oz28 days52 <td>Banner + ICIA 5504</td> <td>0.1376 oz ai + 0.1764 oz ai</td> <td>28 days</td> <td>2</td> <td>1</td> <td>ì</td> <td>1.3</td> <td>E-H</td>	Banner + ICIA 5504	0.1376 oz ai + 0.1764 oz ai	28 days	2	1	ì	1.3	E-H
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ND. $375^g$ 4 lbs14 days2312.0C-F $4404$ $0.125$ oz ai $28$ days $3$ $2$ $2$ $2.3$ $B-E$ ND. $374^g$ $4$ lbs $14$ days $4$ $2$ $2$ $2.7$ $B-D$ GA 173506 $3.5$ gm ai $28$ days $3$ $4$ $1$ $2.7$ $B-D$ CIA 5504 $0.1764$ oz ai $14$ days $3$ $2$ $3$ $2.7$ $B-D$ CI 6444 $1$ oz ai $7$ days $5$ $3$ $1$ $3.0$ $BC$ ND. $376^g$ $4$ lbs $14$ days $3$ $3$ $3.0$ $BC$ ontrol $$ $$ $4$ $3$ $3$ $3.3$ $B$ ND. $373^g$ $4$ lbs $14$ days $5$ $3$ $2$ $3.3$ $B$ anasea Plus + Trypt. $4$ fl oz $28$ days $5$ $3$ $2$ $3.3$ $B$ CI 6444 $0.5$ oz ai $7$ days $6$ $2$ $3$ $3.7$ $AB$ L DS (Strain #16) $3$ lbs $28$ days $5$ $2$ $4$ $3.7$ $AB$	EXP 10307A	1 fl oz	28 days	3	1	1	1.7	D-G
-4404 $0.125$ oz ai $28$ days $3$ $2$ $2$ $2.3$ $B-E$ ND. $374^g$ $4$ lbs $14$ days $4$ $2$ $2$ $2.7$ $B-D$ GA 173506 $3.5$ gm ai $28$ days $3$ $4$ $1$ $2.7$ $B-D$ CIA 5504 $0.1764$ oz ai $14$ days $3$ $2$ $3$ $2.7$ $B-D$ CI 6444 $1$ oz ai $7$ days $5$ $3$ $1$ $3.0$ $BC$ ND. $376^g$ $4$ lbs $14$ days $3$ $3$ $3$ $3.0$ $BC$ ontrol $$ $$ $4$ $3$ $3$ $3.3$ $B$ ND. $373^g$ $4$ lbs $14$ days $5$ $3$ $2$ $3.3$ $B$ anasea Plus + Trypt. $4$ fl oz $28$ days $5$ $3$ $2$ $3.3$ $B$ anasea Plus $4$ fl oz $28$ days $4$ $3$ $3$ $3.3$ $B$ CI 6444 $0.5$ oz ai $7$ days $6$ $2$ $3$ $3.7$ $AB$ J. DS (Strain #16) $3$ lbs $28$ days $5$ $2$ $4$ $3.7$ $AB$	ND. 375 <sup>g</sup>	4 lbs	14 days	2	3	1	2.0	C-F
ND. $374^g$ 4 lbs14 days4222.7B-DGA 173506 $3.5 \text{ gm ai}$ $28 \text{ days}$ $3$ 41 $2.7$ B-DCIA 5504 $0.1764 \text{ oz ai}$ $14 \text{ days}$ $3$ $2$ $3$ $2.7$ B-DCI 64441 oz ai $7 \text{ days}$ $5$ $3$ $1$ $3.0$ BCND. $376^g$ 4 lbs $14 \text{ days}$ $3$ $3$ $3$ $3.0$ BControl $-4$ $3$ $3$ $3.3$ BND. $373^g$ 4 lbs $14 \text{ days}$ $5$ $3$ $2$ $3.3$ Banasea Plus + Trypt.4 fl oz $28 \text{ days}$ $5$ $3$ $2$ $3.3$ Banasea Plus4 fl oz $28 \text{ days}$ $4$ $3$ $3$ $3.3$ BCI 6444 $0.5 \text{ oz ai}$ $7 \text{ days}$ $6$ $2$ $3$ $3.7$ ABJ. DS (Strain #16) $3 \text{ lbs}$ $28 \text{ days}$ $5$ $2$ $4$ $3.7$ AB	-4404	0.125 oz ai	28 days	3	2	2	2.3	B-E
GA 173506 $3.5 \text{ gm ai}$ $28 \text{ days}$ $3$ $4$ $1$ $2.7$ $B-D$ CIA 5504 $0.1764 \text{ oz ai}$ $14 \text{ days}$ $3$ $2$ $3$ $2.7$ $B-D$ CI 6444 $1 \text{ oz ai}$ $7 \text{ days}$ $5$ $3$ $1$ $3.0$ $BC$ ND. 376g $4 \text{ lbs}$ $14 \text{ days}$ $3$ $3$ $3$ $3$ $3.0$ $BC$ ontrol $4$ $3$ $3$ $3.3$ $B$ ND. 373g $4 \text{ lbs}$ $14 \text{ days}$ $5$ $3$ $2$ $3.3$ $B$ anasea Plus + Trypt. $4 \text{ fl oz}$ $28 \text{ days}$ $5$ $3$ $2$ $3.3$ $B$ CI 6444 $0.5 \text{ oz ai}$ $7 \text{ days}$ $6$ $2$ $3$ $3.7$ $AB$ L DS (Strain #16) $3 \text{ lbs}$ $28 \text{ days}$ $5$ $2$ $4$ $3.7$ $AB$	ND. 374 <sup>g</sup>	4 lbs	14 days	4	2	2	2.7	B-D
CIA 5504 $0.1764$ oz ai14 days3232.7B-DCI 64441 oz ai7 days5313.0BCND. 376g4 lbs14 days3333.0BControl4333.3BND. 373g4 lbs14 days5323.3Banasea Plus + Trypt.4 fl oz28 days5323.3Banasea Plus4 fl oz28 days4333.3BCI 64440.5 oz ai7 days6233.7ABAtch X Blank3 lbs28 days5243.7AB	CGA 173506	3.5 gm ai	28 days	3	4	1	2.7	B-D
CI 6444       1 oz ai       7 days       5       3       1       3.0       BC         ND. 376 <sup>g</sup> 4 lbs       14 days       3       3       3       3.0       BC         ontrol         4       3       3       3.0       BC         ND. 373 <sup>g</sup> 4 lbs       14 days       5       3       2       3.3       B         ND. 373 <sup>g</sup> 4 lbs       14 days       5       3       2       3.3       B         ND. 373 <sup>g</sup> 4 lbs       14 days       5       3       2       3.3       B         anasea Plus + Trypt.       4 fl oz       28 days       5       3       2       3.3       B         cI 6444       0.5 oz ai       7 days       6       2       3       3.7       AB         Abtch X Blank       3 lbs       28 days       5       2       4       3.7       AB	CIA 5504	0.1764 oz ai	14 days	3	2	3	2.7	B-D
ND. 376 <sup>g</sup> 4 lbs       14 days       3       3       3       3.0       BC         ontrol         4       3       3       3.3       B         ND. 373 <sup>g</sup> 4 lbs       14 days       5       3       2       3.3       B         ND. 373 <sup>g</sup> 4 lbs       14 days       5       3       2       3.3       B         anasea Plus + Trypt.       4 fl oz       28 days       5       3       2       3.3       B         anasea Plus       4 fl oz       28 days       4       3       3       3.3       B         CI 6444       0.5 oz ai       7 days       6       2       3       3.7       AB         Atch X Blank       3 lbs       28 days       5       2       4       3.7       AB	FCI 6444	1 oz ai	7 days	5	3	1	3.0	BC
ontrol         4       3       3       3.3       B         ND. 373 <sup>g</sup> 4 lbs       14 days       5       3       2       3.3       B         anasea Plus + Trypt.       4 fl oz       28 days       5       3       2       3.3       B         anasea Plus       4 fl oz       28 days       4       3       3       3.3       B         cl 6444       0.5 oz ai       7 days       6       2       3       3.7       AB         hatch X Blank       3 lbs       28 days       5       2       4       3.7       AB	ND. 376 <sup>g</sup>	4 lbs	14 days	3	3	3	3.0	BC
ND. 373 <sup>g</sup> 4 lbs       14 days       5       3       2       3.3       B         anasea Plus + Trypt.       4 fl oz       28 days       5       3       2       3.3       B         anasea Plus       4 fl oz       28 days       4       3       3       3.3       B         cl 6444       0.5 oz ai       7 days       6       2       3       3.7       AB         hatch X Blank       3 lbs       28 days       5       2       4       3.7       AB	Control			4	3	3	3.3	В
anasea Plus + Trypt.       4 fl oz       28 days       5       3       2       3.3       B         anasea Plus       4 fl oz       28 days       4       3       3       3.3       B         CI 6444       0.5 oz ai       7 days       6       2       3       3.7       AB         hatch X Blank       3 lbs       28 days       5       2       4       3.7       AB	ND. 373 <sup>g</sup>	4 lbs	14 days	5	3	2	3.3	в
anasea Plus       4 fl oz       28 days       4       3       3       3.3       B         CI 6444       0.5 oz ai       7 days       6       2       3       3.7       AB         hatch X Blank       3 lbs       28 days       5       2       4       3.7       AB         J. DS (Strain #16)       3 lbs       28 days       5       2       4       3.7       AB	Panasea Plus + Trypt.	4 fl oz	28 days	5	3	2	3.3	в
CI 6444       0.5 oz ai       7 days       6       2       3       3.7       AB         hatch X Blank       3 lbs       28 days       5       2       4       3.7       AB         J. DS (Strain #16)       3 lbs       28 days       5       2       4       3.7       AB	'anasea Plus	4 fl oz	28 days	4	3	3	3.3	в
hatch X Blank       3 lbs       28 days       5       2       4       3.7       AB         .I. DS (Strain #16)       3 lbs       28 days       5       2       4       3.7       AB	CI 6444	0.5 oz ai	7 days	6	2	3	3.7	AB
I. DS (Strain #16) 3 lbs 28 days 5 2 4 3.7 AB	hatch X Blank	3 lbs	28 days	5	2	4	3.7	AB
	I. DS (Strain #16)	3 lbs	28 days	5	2	4	3.7	AB

# 46 GENERAL SESSION - HIGHLIGHTS AND UPDATES

Treatment <sup>c</sup>	Rate/1000 ft <sup>2b</sup>	I II Interval			ш	Avg	DMR (.05) <sup>a</sup>	
Thatch X + Trypt.	3 lbs	28 days	5	3	3	3.7	AB	
Thatch X	3 lbs	28 days	5	6	3	4.7	А	

<sup>a</sup>Treatments followed by the same letter are not significantly different from each other at the 5% level. <sup>b</sup>Rates listed are formulation unless listed as active ingredient (ai).

<sup>c</sup>Deleted treatments are proprietary.

<sup>e</sup>Moderately severe phytotoxicity observed.

fSevere phytotoxicity observed.

Rating Scale:

Rating Date:

<sup>g</sup>Treatments initiated curatively on 9/3.

## **NECROTIC RING SPOT FUNGICIDE STUDIES - 1993**

Two necrotic ring spot (*Leptosphaeria korrae*) studies were conducted this year; one on a commercial lawn site in Grand Rapids, and another on a similar site in Lansing. Both sites consisted of diseased Kentucky bluegrass turf which was automatically irrigated and was fertilized at ½ lb N./1000 ft<sup>2</sup>/mo., except as noted on the data tables.

Initial applications were made on symptomatic turf with necrotic ring spot patches from previous disease activity on 5/28/93 (fertilizers and natural products) and 8/28/93 (fungicides) at the Lansing site and on 6/19/93 and 7/24/93, respectively, on the Grand Rapids site. Fertilizer and natural product applications were made on monthly schedules through October on both sites. The fungicides were reapplied approximately a month after the initial applications. Liquid applications were made as foliar sprays as previously described in this report while granular products were preweighed and hand applied to the 6' x 9' plots.

As Table 6 indicate, disease severity is inversely correlated to fertility level. At somewhat elevated nitrogen levels of 1 lb/1000 ft<sup>2</sup>/mo., Turf Restore and IBDU fertilizers provided virtually total control of patch symptoms. Statistically similar levels of disease control were achieved with lower levels of fertility ( $\frac{1}{2}$  lb nitrogen/1000 ft<sup>2</sup>/mo.) combined with experimental fungicides such as ASC 67103, EXP 10307A, EXP 02164B, ASC 67098-X, Eagle, etc.

No phytotoxicity or significant turf greening was observed at any time in either of these studies, however, overall turf quality and density was best in the Turf Restore and IBDU plots.

Treatment	Rate/1000 ft <sup>2</sup>	I	11	III	IV	Avg	DMR $(.1)^{a}$
IBDU Fertilizer	1 lb N (nitrogen)/mo	100	100	100	100	100.0	A
Turf Restore	1 lb N/mo	100	96.0	100	94.0	97.5	AB
ASC 67098-X	6 oz	85	100	100	100	96.3	ABC
							A-D
D.2787 + ASC 67103	6 fl oz + 16 ml	80	90	100	100	92.5	A-E
EXP 10307A + EXP 02164B	3 fl oz + 2.4 fl oz	100	66.7	100	100	91.7	A-E
Eagle	0.6 oz	100	100	53.3	100	88.3	A-E
Thatch X Blank	3 lbs/mo	75	85.7	82.5	90	83.3	A-F
Thatch X	3 lbs/mo	71.4	66.7	90	88	79.0	A-G
D.2787 + ASC 67135	4 fl oz + 2 oz	100	40	88	76	76.0	A-G

### Table 6. Necrotic Ring Spot Study (Lansing Site) - 1993

9/10/93

percent recovery/plot from pretreatment disease levels