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2006 Evaluation of Genica SG 100 and LC 200 for a Reduced Fungicide Management Program

Objective

The objective of this study was to evaluate the effect of the liquid and dry Genica products on golf turf fairway performance under reduced fungicide programs.

Methodology

The experimental design was split plot with three replications. The main treatments included eight granular (Genica SG 100) rate/interval combinations and six liquid (Genica LC 200) rate/interval combinations. Standard fungicide was the secondary treatment as Chlorothalonil (Daconil Weatherstick) at full preventative rate (3 oz.), 1/2 rate (1.5 oz.), 1/4 rate (0.75 oz.), and a control with no fungicide at 14-day intervals. (See Figure 1)

Initial application of standard fungicide treatments was made on June 29. Initial application of Genica products was made July 3. The experiment continued for 12 weeks.

Treatments were applied to experimental plots (4' x 3') established at the Cornell University Turfgrass Research Center in Ithaca, NY on a mixed stand of creeping bentgrass (*Agrostis palustris* "Putter") and annual bluegrass soil-based fairway turf (pH = 6.5). The plots were mowed three times per week at 0.5 inches.

Genica liquid and standard fertilizer applications were made with a handheld CO₂ sprayer at 40 psi (276 kPa) fitted with TeeJet XR8015 nozzles calibrated to deliver 2 gallons (7.6 liters) of water per 1,000 fe (92.9 m²). Genica dry applications were made by hand.

Average daily temperatures for July, August and September ranged from a high of 75.9° F (24.4° C) and a low of 56.4° F (13.6° C). Precipitation during this period was approximately 3.6 inches above normal.

The data collected in Figure 2 reflects disease levels – the higher the value the more severe the disease. Data analysis was conducted using linear mixed models with compound symmetric covariance structure to assess overall treatment effects when repeated measurements were made on the same experimental unit over time. Treatment differences at individual measurement events were evaluated using analysis of variance and least squares means. The MIXED procedure in SAS/STAT software version 9.1 (SAS, Cary, NC) was used to perform the analyses.

Disease Incidence

The 2006 growing season presented very high disease pressure due to high temperature, high humidity, high evening temperatures and excessive rainfall. Individually any of these factors would be conducive to epidemics. Collectively they are devastating.

Data in Figure 2 were collected during three serious disease epidemics that resulted from natural infection. The primary disease on each date is indicated and records severity on a scale of 1 to 5. After the data was collected, the entire plot areas were treated with additional amounts of Daconil to avoid plot loss. The only exception was the August 9 anthracnose outbreak where we followed up with tank mix combination of Daconil, Banner Maxx, and Heritage. This provided sufficient control and protected the plots until the final dollar spot outbreak in September.

In general, the liquid treatments (LC 200) provided better disease suppression than the granular formulation (SG 100). In evaluating the significant interactive effect of the Genica and fungicide treatments, it is interesting to look first at treatments 43-56 where no fungicide was applied. First, the SG 100 provided significant suppression at the 50 pound rate applied at 28-day intervals and the 25-pound rate at 14-day intervals. An interesting correlation was observed for the LC 200 without fungicide where the 30-ounce rate at 28 day intervals provided good suppression as did the 15-ounce rate at 14 day intervals.

A consistent response among these four treatments was observed throughout the study period suggesting that there is a significant rate response. Interestingly, over-application of the Genica products actually diminishes its effectiveness but without any evidence of phytotoxicity.

An oversight was made in this study by not including the fungicide without a Genica liquid and dry treatment. Therefore the contribution of the fungicide at each rate cannot be assessed independently. This would be an important aspect of any follow up study.

This study confirms previous observations from 2005 but in much stronger terms due to the high disease pressure of 2006 and the increased focus of this study on disease observations. The Genica products seemed to offer significant disease suppression that could translate into a 75 to 50 percent reduction in fungicide use.

Figure 1. Treatment application regimes.

#	Product	Rate/1000	Interval
1	Genica SG 100	100 lbs	28d
2	Genica SG 100	75 lbs	28d
3	Genica SG 100	50 lbs	28d
4	Genica SG 100	25 lbs	28d
5	Genica SG 100	10 lbs	28d
6	Genica SG 100	50 lbs	14d
7	Genica SG 100	25 lbs	14d
8	Genica SG 100	10 lbs	14d
9	Genica LC 200	60 oz	28d
10	Genica LC 200	30 oz	28d
11	Genica LC 200	15 oz	28d
12	Genica LC 200	60 oz	14d
13	Genica LC 200	30 oz	14d
14	Genica LC 200	15 oz	14d
Chlorothalonil			
1.0 x	Daconil WStk	3.0 oz.	14d
0.5 x	Daconil WStk	1.5 oz.	14d
0.25 x	Daconil WStk	0.75 oz.	14d

Figure 2. Interactive effect of Genica products and chlorothalonil on turfgrass disease incidence.

Trtmnt	Product	Application		Dac Rate (oz/1000)	Brwn Patch Anthracnose Dollar Spot		
		Rate	Interval		22-Jul	9-Aug	6-Sep
1	Genica SG	100 lb	28 d	3.0	35	40	30
2	Genica SG	75 lb	28 d	3.0	30	35	26
3	Genica SG	50 lb	28 d	3.0	15	17	13
4	Genica SG	25 lb	28 d	3.0	20	23	17
5	Genica SG	10 lb	28 d	3.0	25	29	21
6	Genica SG	50 lb	14 d	3.0	10	12	9
7	Genica SG	25 lb	14 d	3.0	20	23	17
8	Genica SG	10 lb	14 d	3.0	20	23	17
9	Genica LC	60 oz	28 d	3.0	12	14	10
10	Genica LC	30 oz	28 d	3.0	8	9	7
11	Genica LC	15 oz	28 d	3.0	10	12	9
12	Genica LC	60 oz	14 d	3.0	22	25	19
13	Genica LC	30 oz	14 d	3.0	10	12	9
14	Genica LC	15 oz	14 d	3.0	5	6	4
15	Genica SG	100 lb	28 d	1.5	45	52	38
16	Genica SG	75 lb	28 d	1.5	40	46	34
17	Genica SG	50 lb	28 d	1.5	20	23	17
18	Genica SG	25 lb	28 d	1.5	27	31	23
19	Genica SG	10 lb	28 d	1.5	25	29	21
20	Genica SG	50 lb	14 d	1.5	20	23	17
21	Genica SG	25 lb	14 d	1.5	30	35	26
22	Genica SG	10 lb	14 d	1.5	35	40	30
23	Genica LC	60 oz	28 d	1.5	18	21	15
24	Genica LC	30 oz	28 d	1.5	10	12	9
25	Genica LC	15 oz	28 d	1.5	15	17	13
26	Genica LC	60 oz	14 d	1.5	25	29	21
27	Genica LC	30 oz	14 d	1.5	12	14	10
28	Genica LC	15 oz	14 d	1.5	15	17	13
29	Genica SG	100 lb	28 d	0.75	60	69	51
30	Genica SG	75 lb	28 d	0.75	55	63	47
31	Genica SG	50 lb	28 d	0.75	20	23	17
32	Genica SG	25 lb	28 d	0.75	60	69	51
33	Genica SG	10 lb	28 d	0.75	55	63	47
34	Genica SG	50 lb	14 d	0.75	50	58	43
35	Genica SG	25 lb	14 d	0.75	20	23	17
36	Genica SG	10 lb	14 d	0.75	30	35	26
37	Genica LC	60 oz	28 d	0.75	45	52	38
38	Genica LC	30 oz	28 d	0.75	15	17	13
39	Genica LC	15 oz	28 d	0.75	35	40	30
40	Genica LC	60 oz	14 d	0.75	45	52	38
41	Genica LC	30 oz	14 d	0.75	40	46	34
42	Genica LC	15 oz	14 d	0.75	10	12	9
43	Genica SG	100 lb	28 d	0.0	75	86	64
44	Genica SG	75 lb	28 d	0.0	70	81	60
45	Genica SG	50 lb	28 d	0.0	30	35	26

46	Genica SG	25 lb	28 d	0.0	60	69	51
47	Genica SG	10 lb	28 d	0.0	65	75	55
48	Genica SG	50 lb	14 d	0.0	60	69	51
49	Genica SG	25 lb	14 d	0.0	30	35	26
50	Genica SG	10 lb	14 d	0.0	40	46	34
51	Genica LC	60 oz	28 d	0.0	45	52	38
52	Genica LC	30 oz	28 d	0.0	20	23	17
53	Genica LC	15 oz	28 d	0.0	45	52	38
54	Genica LC	60 oz	14 d	0.0	40	46	34
55	Genica LC	30 oz	14 d	0.0	35	40	30
56	Genica LC	15 oz	14 d	0.0	15	17	13
LSD (0.05)					17	22	11