

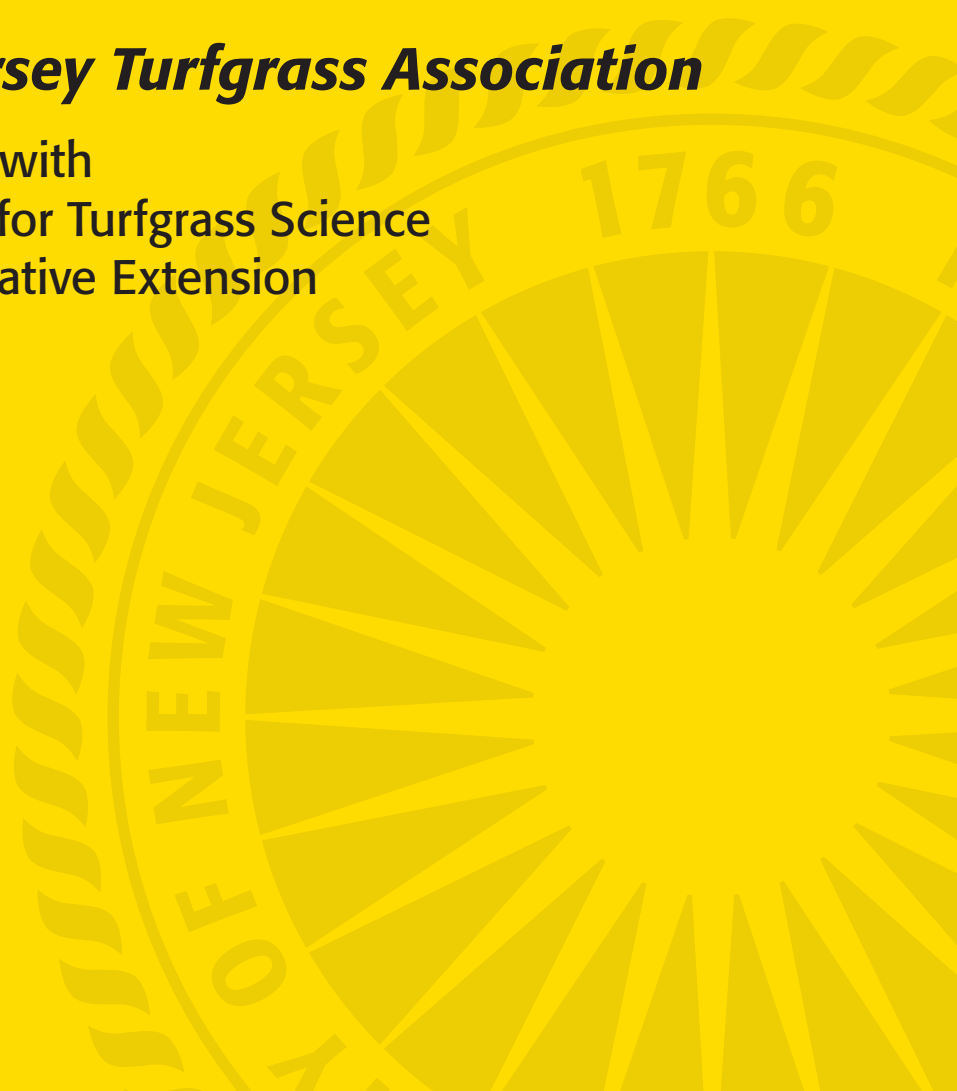
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2008 Turfgrass Proceedings

The New Jersey Turfgrass Association

In Cooperation with
Rutgers Center for Turfgrass Science
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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. Through this forum, these professionals also reach a more general audience, which includes the public.

This publication includes lecture notes of papers presented at the 2008 New Jersey Turfgrass Expo. Publication of these lectures provides a readily avail-

able source of information covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

This proceedings also includes research papers that contain original research findings and reviews of selected subjects in turfgrass science. These papers are presented primarily to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

Special thanks are given to those who have submitted papers for this proceedings, to the New Jersey Turfgrass Association for financial assistance, and to Barbara Fitzgerald, Marlene Karasik, and Ann Diglio for administrative and secretarial support.

Dr. Ann Brooks Gould, Editor
Dr. Bruce B. Clarke, Coordinator

PREVENTIVE CONTROL OF GRAY LEAF SPOT WITH FUNGICIDES AND BIORATIONAL PRODUCTS ON PERENNIAL RYEGRASS, 2007

Bruce B. Clarke, Pradip R. Majumdar, Mark Peacos, Andra Pitonak, Lindsay Jepsen, Dennis Fitzgerald, Thomas Flynn, Annmarie Scholz, Tracy J. Lawson, William K. Dickson, and Joseph B. Clark¹

Fungicides were evaluated in 2007 for their ability to control gray leaf spot (caused by *Pyricularia grisea*) at the Rutgers Turf Research Farm in North Brunswick, NJ on perennial ryegrass (*Lolium perenne* cv. Paragon). Turf was established 15 July 2007 with 5.5 lb seed/1000 ft² on a Norton loam with a pH of 6.2. Mowing was performed weekly at a height of 3 inches with clippings returned. The site was irrigated as needed to prevent drought stress and to encourage gray leaf spot.

Fertilizer was applied as 16-4-8 at establishment on 15 July (0.7 lb nitrogen (N)/1000 ft²) and on 25 July (0.6 lb N /1000 ft²). The pre-emergence herbicide Tupersan 4.7G (2.5 lb/1000 ft²) was applied at seeding to suppress weed ingress. Subdue 0.97G (28.8 oz/1000 ft²), Banol 6L (2.5 fl oz/1000 ft²), Chipco Signature 80WG (4.0 oz/1000 ft²), and Alude 44L (5.0 fl oz/1000 ft²) were applied to the entire test area on 15, 20, 27, and 30 July, respectively, to control Pythium blight (caused by *Pythium aphanidermatum*). ProStar 70W (2.8 oz/1000 ft²) was applied on 13 and 27 August to suppress brown patch (caused by *Rhizoctonia solani*). Plots were 3 x 5 ft and were arranged in a randomized complete block with four replications.

Fungicides were applied in water equivalent to 2 gal/1000 ft² with a CO₂ powered sprayer at 30 psi using TeeJet 8003VS flat fan nozzles. Treatments (trt) were initiated on 9 August when environmental conditions were conducive to gray leaf spot development. Fungicides were reapplied as indicated in Table 1A and B. Turf was visually evaluated for percent turf area infested with *P. grisea* on 16, 22, and 29 August, 5, 18, and 27 September, and 4 and 16 October. Turf quality was rated on 29 August using a 1 to 9

scale, where 9 = best turf quality and 5 = acceptable quality. Data were subjected to analysis of variance and means were separated using the Waller-Duncan *k*-ratio *t*-test (*k* = 100).

A natural infestation of gray leaf spot developed on 13 August and became uniformly distributed throughout the study by 16 August. Disease severity increased quickly in the test and peaked on 18 September (85 to 92% turf area infested with *P. grisea* on non-fungicide treated turf). Less than 10% turf area infested per plot represented an acceptable level of disease control. Due to the rapid development and extreme severity of the disease epidemic, only Spectator Ultra 1.3EC + Manicure Ultra 82.5WDG (trt 12), Disarm 480SC + Manicure Ultra 82.5WDG (trt 14), 3336 Plus 19.4F @ 4.0 fl oz (trt 18), Heritage TL 0.8ME + Daconil Ultrex 82.5WDG (trt 33), and RU GLS Program #1 (trt 35) provided adequate control of gray leaf spot throughout the study. Concert 4.3SE (trt 26; a premix of propiconazole and chlorothalonil) also adequately suppressed this disease through 16 October with only two slight reductions in control (> 10% disease) during the study. The high label rates of Heritage TL 0.8ME (trt 10) and Insignia 20WG (trt 15) afforded good protection from gray leaf spot until 5 September when the disease intensified on untreated turf (80 to 89% turf area infested with *P. grisea*).

Turf quality was acceptable (greater or equal to 5.0) for all products evaluated in this study on 6 August, except for Rhapsody AS (trt 9), Trinity 1.67SC (trt 17), LEM17 50WDG (trts 21 to 23), Chipco Signature 80WG (trt 32), and ARY 0473003 G (trts 37, 38) due to poor disease control throughout the study. No phytotoxicity was observed during the treatment period.

¹Extension Specialist in Turfgrass Pathology, Senior Laboratory Technician, Senior Greenhouse and Field Technician, Research Assistant, Research Assistant, Research Assistant, Research Assistant, Research Assistant, Principal Laboratory Technician, Turfgrass Research Farm Supervisor, and Principal Laboratory Technician, respectively, New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey, New Brunswick, NJ 08901-8520.

Table 1A. Preventive control of gray leaf spot with fungicides and biorational products on perennial ryegrass: Rutgers University, 2007.

Treatment	Rate per 1000 sq ft)	Spray Interval (days) ²	Turf Area Infested (%) per Plot ¹				
			16 Aug.	22 Aug.	29 Aug.	5 Sept.	18 Sept.
1 Disarm 480SC.....	0.18 fl oz	14	5.0 ac	6.3 gi	7.8 hj	27.5 eh	41.3 hi
2 Disarm 480SC.....	0.36 fl oz	28	3.8 ac	3.0 hi	6.0 ij	40.0 de	56.3 gf
3 ARY 0534002 SC.....	0.30 fl oz	14	5.5 ac	12.5 di	11.3 hj	8.8 hk	20.0 mn
4 ARY 0534002 SC.....	0.60 fl oz	28	2.5 ac	8.8 fi	8.5 hj	26.3 ei	65.0 df
5 ARY 0534003 SC.....	3.5 fl oz	14	5.0 ac	12.5 di	15.5 gi	17.5 fk	22.5 ln
6 ARY 0534001 SC.....	0.35 fl oz	14	1.8 ac	15.0 ch	18.5 gh	26.3 ei	33.8 il
7 Tourney 50WDG	0.37 oz	14	5.0 ac	21.3 ae	10.8 hj	32.5 dg	42.5 hi
8 Tourney 50WDG	0.44 oz	14	3.0 ac	7.5 gi	7.5 hj	23.8 ej	35.0 hk
9 Rhapsody AS	5.0 fl oz	14	8.0 ab	31.3 a	66.8 ab	61.3 bc	82.5 ab
10 Heritage TL 0.8ME	2.0 fl oz	14	0.5 bc	3.0 hi	3.5 ij	8.8 hk	23.8 ln
11 Rhapsody AS	5.0 fl oz						
+ Heritage TL 0.8ME.....	1.0 fl oz	14	2.5 ac	11.3 ei	15.5 gi	27.5 eh	58.8 ef
12 Spectator Ultra 1.3EC	2.0 fl oz						
+ Manicure Ultra 82.5WDG.....	5.0 oz	14	0.5 bc	3.0 hi	8.3 hj	5.0 jk	3.8 q
13 Disarm 480SC.....	0.18 fl oz						
+ Spectator Ultra 1.3EC	1.0 fl oz	14	0.5 bc	4.8 hi	4.0 ij	28.8 dh	12.5 nq
14 Disarm 480SC.....	0.18 fl oz						
+ Manicure Ultra 82.5WDG.....	3.25 oz	14	1.3 ac	1.3 i	5.3 ij	2.5 k	5.0 pq
15 Insignia 20WG	0.9 oz	28	1.5 ac	0.5 i	0.8 j	3.8 jk	28.8 jm
16 Insignia 20WG	0.5 oz						
+ Trinity 1.67SC	1.0 fl oz	28	0.0 c	4.3 hi	1.3 j	21.3 ek	46.3 gh
17 Trinity 1.67SC	1.0 fl oz	28	6.3 ac	27.5 ab	59.0 bc	82.5 a	76.3 bd
18 3336 Plus 19.4F.....	4.0 fl oz	14	2.5 ac	4.8 hi	2.5 j	6.3 ik	5.3 oq
19 3336 Plus 19.4F.....	8.0 fl oz	21	2.5 ac	3.8 hi	1.0 j	21.3 ek	21.3 mn
20 CL EXP9 WG	1.2 oz	21	0.5 bc	3.0 hi	5.3 ij	23.8 ej	23.8 kn
21 LEM17 50WDG.....	0.2 oz	14	3.8 ac	21.3 ae	58.5 bc	72.5 ab	70.0 ce
22 LEM17 50WDG.....	0.3 oz	14	3.5 ac	26.3 ac	64.8 ab	81.3 a	83.8 ab
23 LEM17 50WDG.....	0.4 oz	14	4.3 ac	25.0 ac	48.5 cd	85.0 a	87.5 ab
24 Heritage TL 0.8ME	1.0 fl oz	14	1.3 ac	1.8 i	0.5 j	8.8 hk	23.8 kn
25 Instrata 3.6SE	4.0 fl oz	14	2.5 ac	5.0 hi	7.8 hj	10.0 hk	17.5 mo

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Table 1A (continued).

Treatment	Rate per 1000 sq ft)	Spray Interval (days) ²	Turf Area Infested (%) per Plot ¹				
			16 Aug.	22 Aug.	29 Aug.	5 Sept.	18 Sept.
26 Concert 4.3SE.....	5.4 fl oz	14	0.0 c	2.5 hi	6.0 ij	5.0 jk	16.3 np
27 Spectator Ultra 1.3EC	1.0 fl oz	14	1.0 ac	8.8 fi	19.0 gh	37.5 df	40.0 hj
28 Spectator Ultra 1.3EC	2.0 fl oz	14	1.0 ac	17.5 bg	26.5 fg	38.8 de	38.8 hj
29 Daconil Ultrex 82.5WDG.....	3.2 oz	14	2.5 ac	3.5 hi	33.5 ef	77.5 ab	40.0 hj
30 Chipco 26GT 2SC.....	4.0 fl oz	14	0.5 bc	11.8 di	39.5 de	47.5 cd	56.3 gf
31 ProStar 70W	2.2 oz	14	7.5 ac	21.3 ae	50.8 cd	76.3 ab	61.3 ef
32 Chipco Signature 80WG	4.0 oz	14	5.0 ac	23.8 ad	47.5 cd	75.0 ab	82.5 ab
33 Heritage TL 0.8ME	1.0 fl oz	14	1.3 ac	0.5 i	2.0 j	1.3 k	1.3 q
+ Daconil Ultrex 82.5WDG.....	3.2 oz						
34 Heritage TL 0.8ME	1.5 fl oz	21	2.5 ac	6.3 gi	5.3 ij	23.8 ej	46.3 gh
35 RU GLS Program #1.....	—	VAR ³	0.5 bc	1.5 i	2.0 j	6.3 ik	2.5 q
36 Heritage TL 0.8ME	2.0 fl oz	28	1.8 ac	2.5 hi	0.0 j	16.3 gk	38.8 hj
37 ARY 0473003 G.....	2.3 lb	14 ⁴	5.0 ac	20.0 af	58.3 bc	80.0 ab	80.0 bc
38 ARY 0473004 G.....	3.4 lb	14 ⁴	7.5 ac	30.0 a	72.0 a	88.8 a	81.3 ac
39 Untreated Check.....	—	—	8.8 a	28.8 ab	68.5 ab	88.8 a	92.5 a
40 Untreated Check.....	—	—	6.3 ac	30.0 a	74.3 a	80.0 ab	85.0 ab
		INT ⁵	DAT ⁶	DAT	DAT	DAT	DAT
		14	7	13	6	3	12
		21	7	13	20	6	19
		28	7	13	20	27	12

¹ Values are means of four replicates. Means followed by the same letter are not significantly different according to Waller-Duncan *k*-ratio *t*-test (*k*=100). Infection naturally occurred on 13 August 2007.

² Fungicides were applied on 9 August (all treatments, except treatments 37 and 38), 15 August (treatments 37 and 38 initiated), 23 August (14-day treatment), 30 August (21-day treatment), 6 September (14- and 28-day treatments), 20 September (14- and 21-day treatments), 4 October (14- and 28-day treatments), 11 October (21-day treatment), and 18 October (14-day treatment).

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Table 1A (continued).

³ Variable application schedule, where treatment 35 (Rutgers GLS Program #1) received Insignia 20WG (0.9 oz) on 9 August, 3336 Plus 19.4F (4.0 fl oz) on 23 August, Disarm 480SC (0.18 fl oz) + Daconil Ultrex 82.5WDG (2.5 oz) on 6 September, 3336 Plus 19.4F (3.0 fl oz) + Daconil Ultrex 82.5WDG (2.5 oz) on 20 September, and Banner MAXX 1.3ME (2.0 fl oz) on 4 October.

⁴ Treatments 37 and 38 were irrigated immediately after application with 0.5 gal water per plot.

⁵ Spray intervals in days.

⁶ Days after treatment (DAT) for each spray interval.

Table 1B. Preventive control of gray leaf spot with fungicides and biorational products on perennial ryegrass: Rutgers University, 2007.

Treatment	Rate per 1000 sq ft)	Spray Interval (days) ³	Turf Area Infested (%) per Plot ¹			Turf Quality ² 29 Aug.
			27 Sept.	4 Oct.	16 Oct.	
1 Disarm 480SC.....	0.18 fl oz	14	33.8 ij	26.3 jm	10.0 cg	7.3 be
2 Disarm 480SC.....	0.36 fl oz	28	46.3 fh	40.0 gi	11.3 cf	7.5 ad
3 ARY 0534002 SC.....	0.30 fl oz	14	12.5 ot	16.3 mp	2.5 hj	7.0 ce
4 ARY 0534002 SC.....	0.60 fl oz	28	53.8 dg	42.5 ei	10.0 cg	7.0 ce
5 ARY 0534003 SC.....	3.5 fl oz	14	16.3 mr	13.8 nq	1.3 ij	7.0 ce
6 ARY 0534001 SC.....	0.35 fl oz	14	25.0 jn	16.3 mp	1.3 ij	7.5 ad
7 Tourney 50WDG	0.37 oz	14	20.0 lq	22.5 lo	2.5 hj	6.0 eg
8 Tourney 50WDG	0.44 oz	14	15.0 ns	11.3 ot	0.5 j	6.8 df
9 Rhapsody AS	5.0 fl oz	14	66.3 ac	56.3 ad	12.5 ce	4.0 ij
10 Heritage TL 0.8ME	2.0 fl oz	14	25.0 jn	35.0 hk	11.3 cf	8.0 ad
11 Rhapsody AS	5.0 fl oz					
+ Heritage TL 0.8ME.....	1.0 fl oz	14	42.5 gi	41.3 fi	7.5 di	6.8 df
12 Spectator Ultra 1.3EC	2.0 fl oz					
+ Manicure Ultra 82.5WDG.....	5.0 oz	14	7.5 ru	10.0 pt	3.8 gj	7.3 be
13 Disarm 480SC.....	0.18 fl oz					
+ Spectator Ultra 1.3EC	1.0 fl oz	14	8.8 qu	16.3 mp	10.0 cg	7.8 ad
14 Disarm 480SC.....	0.18 fl oz					
+ Manicure Ultra 82.5WDG.....	3.25 oz	14	1.3 tu	2.5 rt	1.3 ij	8.0 ad
15 Insignia 20WG	0.9 oz	28	31.3 il	31.3 il	11.3 cf	9.0 a
16 Insignia 20WG	0.5 oz					
+ Trinity 1.67SC	1.0 fl oz	28	23.8 jo	25.0 kn	5.0 fj	8.5 ac
17 Trinity 1.67SC	1.0 fl oz	28	58.8 be	58.8 ac	11.3 cf	4.0 ij
18 3336 Plus 19.4F.....	4.0 fl oz	14	3.8 su	3.8 qt	1.3 ij	7.8 ad
19 3336 Plus 19.4F.....	8.0 fl oz	21	13.8 ns	11.3 ot	10.0 cg	8.3 ad
20 CL EXP9 WG	1.2 oz	21	10.0 pu	6.3 pt	2.5 hj	7.8 ad
21 LEM17 50WDG.....	0.2 oz	14	60.0 be	52.5 bf	13.8 bd	4.5 hj
22 LEM17 50WDG.....	0.3 oz	14	63.8 ad	50.0 cg	11.3 cf	3.5 j
23 LEM17 50WDG.....	0.4 oz	14	70.0 ab	46.3 dh	10.0 cg	3.5 j
24 Heritage TL 0.8ME	1.0 fl oz	14	20.0 lq	31.3 il	7.5 di	8.8 ab
25 Instrata 3.6SE	4.0 fl oz	14	21.3 kp	15.0 mq	5.0 fj	6.8 df

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(Continued)

Table 1B. Preventive control of gray leaf spot with fungicides and biorational products on perennial ryegrass: Rutgers University, 2007.

Treatment	Rate per 1000 sq ft)	Spray Interval (days) ³	Turf Area Infested (%) per Plot ¹			Turf Quality ² 29 Aug.
			27 Sept.	4 Oct.	16 Oct.	
26 Concert 4.3SE.....	5.4 fl oz	14	8.8 qu	12.5 os	1.3 ij	8.0 ad
27 Spectator Ultra 1.3EC	1.0 fl oz	14	35.0 hj	40.0 gi	6.3 ej	7.0 ce
28 Spectator Ultra 1.3EC	2.0 fl oz	14	32.5 ik	41.3 fi	8.8 dh	5.0 gi
29 Daconil Ultrex 82.5WDG.....	3.2 oz	14	28.8 jl	17.5 mp	2.5 hj	6.0 eg
30 Chipco 26GT 2SC.....	4.0 fl oz	14	50.0 eg	51.3 cg	8.8 dh	5.5 fh
31 ProStar 70W	2.2 oz	14	55.0 cf	43.8 eh	12.5 ce	5.0 gi
32 Chipco Signature 80WG	4.0 oz	14	57.5 cf	50.0 cg	16.3 bc	4.5 hj
33 Heritage TL 0.8ME	1.0 fl oz	14	3.8 su	1.3 st	0.0 j	8.8 ab
+ Daconil Ultrex 82.5WDG.....	3.2 oz					
34 Heritage TL 0.8ME	1.5 fl oz	21	27.5 jm	36.3 hk	10.5 cg	8.0 ad
35 RU GLS Program #1.....	—	VAR ⁴	0.0 u	0.0 t	0.0 j	8.8 ab
36 Heritage TL 0.8ME	2.0 fl oz	28	30.0 jl	35.0 hk	7.5 di	8.8 ab
37 ARY 0473003 G.....	2.3 lb	14 ⁵	63.8 ad	53.8 be	10.0 cg	4.3 hj
38 ARY 0473004 G.....	3.4 lb	14 ⁵	62.5 bd	37.5 hj	10.0 cg	3.3 j
39 Untreated Check.....	—	—	75.0 a	66.3 a	20.0 b	3.5 j
40 Untreated Check.....	—	—	65.0 ad	63.8 ab	27.5 a	3.3 j
		INT ⁶	DAT ⁷	DAT	DAT	DAT
		14	7	14	12	6
		21	7	14	5	20
		28	21	28	12	20

¹ Values are means of four replicates. Means followed by the same letter are not significantly different according to Waller-Duncan *k*-ratio *t*-test (*k*=100). Infection naturally occurred on 13 August 2007.

² Turf quality on a 1 to 9 scale of where 9 = best turf quality and 5 = commercially acceptable quality.

³ Fungicides were applied on 9 August (all treatments, except treatments 37 and 38), 15 August (treatments 37 and 38 initiated), 23 August (14-day treatment), 30 August (21-day treatment), 6 September (14- and 28-day treatments), 20 September (14- and 21-day treatments), 4 October (14- and 28-day treatments), 11 October (21-day treatment), and 18 October (14-day treatment).

(Continued)

Table 1B (continued).

⁴ Variable application schedule, where treatment 35 (Rutgers GLS Program #1) received Insignia 20WG (0.9 oz) on 9 August, 3336 Plus 19.4F (4.0 fl oz) on 23 August, Disarm 480SC (0.18 fl oz) + Daconil Ultrex 82.5WDG (2.5 oz) on 6 September, 3336 Plus 19.4F (3.0 fl oz) + Daconil Ultrex 82.5WDG (2.5 oz) on 20 September, and Banner MAXX 1.3ME (2.0 fl oz) on 4 October.

⁵ Treatments 37 and 38 were irrigated immediately after application with 0.5 gal water per plot.

⁶ Spray intervals in days.

⁷ Days after treatment (DAT) for each spray interval.



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