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This publication includes lecture notes of papers presented at the 2003 New Jersey Turfgrass Expo. Publication of these lectures provides a readily available 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.

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

PREVENTIVE CONTROL OF BROWN PATCH IN COLONIAL BENTGRASS WITH CHEMICAL FUNGICIDES AND BIORATIONAL PRODUCTS

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Chemical fungicides and biorational products were evaluated in 2003 for their ability to control brown patch at the Rutgers Turf Research Farm in North Brunswick, NJ on colonial bentgrass (*Agrostis tenuis* SR7100) maintained under golf course greens conditions. Turf was established in 2000 on a Norton loam with a pH of 6.5. Mowing was performed three times per week at a height of 0.188 inches with clippings collected. The site was irrigated as needed to prevent drought stress, and localized dry spots were controlled with Primer wetting agent (4.0 fl oz/1000 ft²) on 20 May, and 12 and 30 June (2 oz/1000 ft²).

The site was aerated on 26 September with 0.625-inch hollow tines on 4-inch centers and was topdressed with a sand root zone mix. Fertilizer was applied as 18-4-10 (0.54 lb nitrogen (N)/1000 ft²) on 9 May, 16-4-8 (0.5 lb N/1000 ft²) on 11 June, and 16-4-8 (0.55 lb N/1000 ft²) on 7 October. Bensumec 4LF (2 gal/acre) was applied for pre-emergence weed control on 7 May. Insect pests were controlled with Turcam 7G (1.0 oz/1000 ft²) on 6 June and 28 July and Merit 75WSP (0.145 oz/1000 ft²) plus Primer (2 fl oz/1000 ft²) on 15 July. Daconil Ultrex (3.2 oz/1000 ft²) was applied to the entire study on 27 May and 5 June to control dollar spot prior to initiation of the study. Plots were 3 x 9 ft and were arranged in a randomized complete block with four replications.

Fungicides were applied in water equivalents to 1.9 gal per 1000 ft² with a CO₂ powered sprayer at 30 psi using TeeJet 8003VS flat fan nozzles. Treatments were initiated on 11 June when environmental conditions were conducive to brown patch development. Fungicides were reapplied at the appropriate intervals as indicated in the table. Turf was visually evaluated for percent turf area infested with brown patch (caused by *Rhizoctonia solani*) on 5, 10, 18 and 28

July, 6, 12, and 22 August. In addition, dollar spot was evaluated on 25 June and 21 August, phytotoxicity on 3 July, and turf quality on 9 September. Data were subject to analysis of variance and means were separated using the Waller-Duncan *k*-ratio *t*-test (*k* = 100) following arcsine transformation.

Brown patch infection was first observed on 1 July. Disease pressure increased rapidly over the next four weeks and was uniformly distributed throughout the study by 5 July (Table 1). Most fungicide entries provided good to excellent disease control (less than 10% turf area infected by *R. solani*), except for Propiconazole PRO 1.3MC (trt 5), Banner Maxx 1.3MC (trt 6), Chipco 26GT 2SC (trt 9), TADS 15557 3SC (trts 10-11), Iprodione PRO 2SE (trt 13), Chipco Signature 80WG (trt 16), Cleary 3336 4F (trt 20), Topsin-M 70W (trt 21), TD2193-07 4.5F (trt 22), Eagle 20EW (trt 24), CPR 4-0-1 + Nutri True Foliar N/P/Si (trt 39), Biophos 43L (trt 42), Compost Tea 0.01-0.18-0.027 (trts 45-46), Medallion 50W (trt 48), and Fore Rainshield 80W (trt 49). The most effective treatments included Insignia 20WG (trt 3), Insignia 20WG alternated with Iprodione PRO 2SE (trt 4), Lynx 45WG and Lynx 45WG + Chipco Signature 80WG (trts 18 and 19, respectively), Heritage 50WG (trt 23), formulations of Eagle (trts 25-28), V-10114 50WDG (trts 30-31), V-10114 1.67SC (trt 32), V-10116 1.67SC (trts 35, 37), and ProStar 70W (trt 44) which provided complete or near complete control (0 to 1% disease) of brown patch throughout the study.

When the trial was evaluated for dollar spot on 25 June and 21 August (Table 2), Spectro 90WDG (trt 2), Propiconazole PRO 1.3MC (trt 5), Banner Maxx 1.3MC (trt 6), Bayleton 50W (trt 8), Chipco 26GT 2SC (trt 9), TADS 15557 3SC (trts 10-11), Daconil Ultrex 82.5SDG (trts 12, 41), Iprodione PRO 2SE (trt 13),

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Chipco Triton 70WG (trts 14-15), Chipco Signature 80WG + Chipco Triton 70WG (trt 17), Lynx 45 45W (trts 18-19), Cleary 3336 4F (trt 20), Topsin-M 70W (trt 21), TD2193-07 4.5F (trt 22), Eagle 20EW (trts 24-25), Eagle 40W (trts 27-28), V-10114 50WDG (trt 29), V-10114 50WDG (trts 30-31), V-10114 1.67SC (trt 32), V-10116 1.67SC (trts 34-37), Rotational Program 1 (trt 38), and Pana Sea Plus 0-3-2 + Daconil

Ultrex 82.5SDG (trt 40) had significant less disease than did the untreated control (trt 50). In general, turf quality was best for those treatments that provided good to excellent suppression of both brown patch and dollar spot. Slight to moderate foliar necrosis (phytotoxicity) was associated with Chipco 26GT 2SC (trt 9), as well as some of the products containing sterol-inhibiting fungicides (i.e., trts 8, 25-28).

Table 1. Preventive control of brown patch in colonial bentgrass with fungicides and biorational products, North Brunswick, NJ, 2003.

| Treatment and Rate per 1000 sq ft | Spray Interval (days) ^y | Turf Area Infested (%) per Plot ^z | | | | | | |
|--|------------------------------------|--|---------|---------|---------|---------|----------|----------|
| | | 5 July | 10 July | 18 July | 28 July | 6 Aug. | 12 Aug. | 22 Aug. |
| 1. Endorse 2.5W 4.0 oz | 14 | 0.3 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 1.5 ab | 2.3 ab |
| 2. Spectro 90WDG 4.0 oz | 14 | 0.8 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 3.3 ab |
| 3. Insignia 20WG 0.5 oz | 14 | 0.3 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 4. Insignia 20WG 0.5 oz | 14 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 5. / Iprodione PRO 2SE 4.0 fl oz | 14* | 1.0 a | 6.0 e | 13.0 gh | 16.3 cd | 19.5 f | 26.8 f-i | 21.3 d |
| 6. Propiconazole PRO 1.3MC 1.0 fl oz ... | 14 | 1.0 a | 4.5 c-e | 12.0 gh | 21.8 de | 26.0 g | 27.8 g-i | 21.8 d |
| 7. Banner MAXX 1.3MC 1.0 fl oz | 14 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 3.5 ab |
| 8. ProStar 70W 2.2 oz | 14 | 2.0 a | 0.0 a | 1.5 a-c | 0.0 a | 0.0 a | 0.0 a | 4.0 ab |
| 9. Bayleton 50W 1.0 oz | 14 | 2.3 a | 0.3 ab | 0.5 ab | 2.8 ab | 17.5 ef | 22.8 fg | 31.8 e |
| 10. Chipco 26GT 2SC 4.0 fl oz | 14 | 0.0 a | 1.0 a-c | 3.0 a-d | 16.0 c | 23.0 fg | 24.3 f-h | 32.3 e |
| 11. TADS 15557 3SC 2.7 fl oz | 14 | 0.0 a | 1.3 a-c | 0.0 a | 4.0 ab | 10.3 cd | 16.0 de | 21.0 d |
| 12. TADS 15557 3SC 5.4 fl oz | 14 | 0.0 a | 0.3 ab | 0.0 a | 0.0 a | 1.8 ab | 2.5 ab | 1.0 ab |
| 13. Daconil Ultrex 82.5SDG 3.2 oz | 14 | 0.0 a | 2.0 a-d | 5.0 b-f | 17.0 cd | 27.0 gh | 30.0 h-j | 36.5 ef |
| 14. Iprodione PRO 2SE 4.0 fl oz | 14 | 0.5 a | 1.3 a-c | 3.8 a-d | 4.8 ab | 4.0 ab | 9.8 cd | 3.3 ab |
| 15. Chipco Triton 70WG 0.3 oz | 14 | 0.3 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.5 a | 0.0 a |
| 16. Chipco Triton 70WG 0.6 oz | 14 | 7.0 b | 19.8 g | 39.8 i | 53.5 g | 62.5 j | 63.8 m | 33.3 e |
| 17. Chipco Signature 80WG 4.0 oz | 14 | 1.5 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 3.3 ab | 3.0 ab |
| + Chipco Triton 70WG 0.6 oz | 14 | 0.3 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 18. Lynx 45WG 1.2 oz | 14 | 0.3 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 19. Lynx 45WG 1.2 oz | 14 | 0.3 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| + Chipco Signature 80WG 4.0 oz | 14 | 0.3 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 20. Cleary 3336 4F 4.0 fl oz | 14 | 0.0 a | 5.3 de | 9.3 fg | 24.5 e | 40.3 i | 42.5 l | 45.5 gh |
| 21. Topsin-M 70W 2.86 oz | 14 | 0.3 a | 3.8 a-e | 4.3 a-e | 13.5 c | 18.8 f | 27.0 f-i | 38.8 e-g |
| 22. TD2193-07 4.5F 3.6 fl oz | 14 | 0.0 a | 5.3 de | 7.3 d-f | 23.3 e | 32.5 h | 30.8 ij | 50.8 hi |
| 23. Heritage 50WG 0.2 oz | 14 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 24. Eagle 20EW 1.144 fl oz | 14 | 0.8 a | 1.5 a-d | 5.5 c-f | 6.5 e | 12.8 de | 21.0 ef | 17.5 cd |
| 25. Eagle 20EW 2.29 fl oz | 14 | 0.5 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 26. Eagle 20EW 4.58 fl oz | 14 | 0.5 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 27. Eagle 40W 1.2 oz | 14 | 1.0 a | 0.3 ab | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |

(Continued)

Table 1 (continued).

| Treatment and Rate per 1000 sq ft | Spray Interval (days) ^y | Turf Area Infested (%) per Plot ^z | | | | | | |
|---|------------------------------------|--|---------|---------|---------|---------|----------|----------|
| | | 5 July | 10 July | 18 July | 28 July | 6 Aug. | 12 Aug. | 22 Aug. |
| 28. Eagle 40W 2.4 oz | 14 | 0.8 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 29. V-10114 50WDG 0.18 oz | 14 | 0.3 a | 0.5 ab | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 15.8 b-d |
| 30. V-10114 50WDG 0.37 oz | 14 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 31. V-10114 50WDG 0.55 oz | 14 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 32. V-10114 1.67SC 0.88 fl oz | 14 | 0.0 a | 0.3 ab | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 33. V-10116 1.67SC 0.22 fl oz | 14 | 0.5 a | 0.0 a | 1.3 a-c | 5.5 ab | 6.3 bc | 7.5 bc | 9.0 ab |
| 34. V-10116 1.67SC 0.44 fl oz | 14 | 0.3 a | 0.0 a | 2.0 a-c | 0.0 a | 0.5 a | 0.5 a | 1.0 ab |
| 35. V-10116 1.67SC 0.88 fl oz | 14 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 36. V-10116 1.67SC 0.88 fl oz | 21 | 0.8 a | 0.0 a | 1.0 a-c | 1.8 ab | 1.0 ab | 5.8 a-c | 4.3 ab |
| 37. V-10116 1.67SC 1.32 fl oz | 14 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 38. Rotational Program 1 | 14 ^w | 0.3 a | 4.0 b-e | 0.5 ab | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 39. CPR 4-0-1 6.0 fl oz | | | | | | | | |
| + Nutri True Foliar N 19-1-6 3.0 fl oz | | | | | | | | |
| + Nutri True Foliar P 16-12-6 3.0 fl oz | | | | | | | | |
| + Nutri True Foliar Si 3-0-10 3.0 fl oz 14 | | 29.0 e | 52.5 k | 60.5 l | 65.8 h | 64.8 j | 61.8 m | 51.5 hi |
| 40. Pana Sea Plus 0-3-2 3.0 fl oz | | | | | | | | |
| + Daconil Ultrex 82.5SDG 2.4 oz | 14 | 0.8 a | 0.0 a | 0.0 a | 1.3 ab | 3.5 ab | 6.0 a-c | 2.0 ab |
| 41. Daconil Ultrex 82.5SDG 2.4 oz | 14 | 0.0 a | 1.5 a-d | 0.0 a | 0.8 a | 3.0 ab | 7.0 bc | 5.0 ab |
| 42. Biophos 43L 12 fl oz | 14 | 11.8 c | 28.5 h | 46.3 j | 49.3 g | 61.8 j | 34.8 jk | 65.3 j |
| 43. Biophos 43L 12 fl oz | | | | | | | | |
| + ProStar 70W 1.5 oz | 14 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 1.8 ab |
| 44. ProStar 70W 1.5 oz | 14 | 0.5 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a |
| 45. Compost Tea 0.01-0.18-0.027 2.0 gal .. ^v | 7 ^v | 34.3 f | 51.5 jk | 74.0 n | 84.3 i | 79.5 k | 75.5 n | 64.0 j |
| 46. Compost Tea 0.01-0.18-0.027 1.0 gal .. ^v | 7 ^v | 20.8 d | 37.5 i | 55.3 k | 71.0 h | 77.3 k | 76.0 n | 56.3 i |
| 47. Heritage 50WG 0.3 oz | 21 | 0.0 a | 0.0 a | 1.3 a-c | 0.0 a | 0.5 a | 0.0 a | 1.8 ab |
| 48. Medallion 50W 0.33 oz | 14 | 0.0 a | 1.8 a-d | 8.5 e-g | 14.8 c | 27.0 gh | 36.3 j-l | 42.5 fg |
| 49. Fore Rainshield 80W 6.0 oz | 14 | 0.0 a | 11.5 f | 16.0 h | 31.5 f | 44.0 i | 40.0 kl | 31.8 e |
| 50. Untreated Control | --- | 30.5 e | 48.0 j | 65.6 m | 82.0 i | 85.5 l | 80.5 n | 73.5 k |

(Continued)

Table 1 (continued).

| Treatment and Rate per 1000 sq ft | Spray Interval (days) ^y | Turf Area Infested (%) per Plot ^z | | | | | | | | | |
|-----------------------------------|------------------------------------|--|---------|---------|---------|--------|---------|---------|-----|-----|-----|
| | | 5 July | 10 July | 18 July | 28 July | 6 Aug. | 12 Aug. | 22 Aug. | | | |
| | INT ^u | DAT ^t | DAT | DAT | DAT | DAT | DAT | DAT | DAT | DAT | DAT |
| | 7 | 3 | 1 | 2 | 5 | 7 | 6 | 2 | | | |
| | 14 | 10 | 1 | 9 | 5 | 14 | 6 | 2 | | | |
| | 21 | 3 | 8 | 16 | 5 | 14 | 20 | 9 | | | |

^z Values are means of four replications. Means followed by the same letter are not significantly different according to Waller-Duncan k-ratio t-test ($k=100$).

^y Fungicides were applied on 11 June (all treatments except treatments 45, 46), 18 June (7 day treatment), 25 June (7 and 14 day treatments, and treatments 45, 46), 2 July (7 and 21 day treatments), 9 July (7 and 14 day treatments), 16 July (7 day treatment), 23 July (7, 14, and 21 day treatments), 30 July (7 day treatment), 6 August (7 and 14 day treatments), 13 August (7 and 21 day treatments), 20 August (7 and 14 day treatments), 27 August (7 day treatment), 3 September (treatment 38), and 17 September (treatment 38).

^x For treatment 4, Insignia 20WG was applied on 11 June, 9 July, and 6 August; whereas Iprodione PRO 2SE was sprayed on 25 June, 23 July, and 20 August.

^w Rotational Program 1 was applied as follows: Eagle 40W (0.6 oz) + Fore Rainshield 80W (6 oz) on 11 June, Fore Rainshield 80W (6 oz) on 25 June, Eagle 40W (0.6 oz) + ProStar 70W (1.5 oz) on 9 July, Chipco 26GT 2SC (4.0 fl oz) + Fore Rainshield 80W (6.0 oz) on 23 July, Heritage 50WG (0.2 oz) + Curalan 50EG (1.0 oz) on 6 August, Eagle 40W (0.6 oz) + Fore Rainshield 80W (6.0 oz) on 20 August, Fore Rainshield 80W (6.0 oz) + Chipco 26GT 2SC (4.0 fl oz) on 3 September, and Eagle 40W (0.6 oz) on 17 September. All rates were per 1000 sq ft.

^v The Compost Tea was applied to turf at full strength (treatment 45) or on a 1:1 (v/v) basis with water (treatment 46).

^u Spray interval in days.

^t Days after treatment (DAT) for each spray interval.

Table 2. Turf quality, phytotoxicity, and incidence of dollar spot in a turf trial designed to control brown patch with fungicides and biorational products, North Brunswick, NJ, 2003.

| Treatment and Rate per 1000 sq ft | Spray Interval (days) ^w | Turf Quality ^v 9 Sept. | Dollar Spot (Number of Infection Centers per Plot ^z) | | Phyto-toxicity ^x 3 July |
|--|------------------------------------|--------------------------------------|---|---------|---------------------------------------|
| | | | 25 June | 21 Aug. | |
| 1. Endorse 2.5W 4.0 oz | 14 | 4.0 b-e | 23.0 e-g | 99.3 g | 1.0 a |
| 2. Spectro 90WDG 4.0 oz | 14 | 5.8 i-l | 1.3 ab | 0.8 a | 1.0 a |
| 3. Insignia 20WG 0.5 oz | 14 | 6.8 mn | 6.8 a-d | 3.5 a | 1.0 a |
| 4. Insignia 20WG 0.5 oz | 14 | | | | |
| / Iprodione PRO 2SE 4.0 fl oz | 14 ^y | 6.3 k-n | 8.3 a-e | 1.0 a | 1.0 a |
| 5. Propiconazole PRO 1.3MC 1.0 fl oz | 14 | 5.8 i-l | 0.3 ab | 0.5 a | 1.0 a |
| 6. Banner MAXX 1.3MC 1.0 fl oz | 14 | 5.8 i-l | 2.5 ab | 1.5 a | 1.0 a |
| 7. ProStar 70W 2.2 oz | 14 | 4.8 e-h | 19.5 c-g | 80.8 f | 1.0 a |
| 8. Bayleton 50W 1.0 oz | 14 | 5.8 i-l | 3.5 a-c | 3.0 a | 2.5 d |
| 9. Chipco 26GT 2SC 4.0 fl oz | 14 | 4.3 c-f | 1.3 ab | 0.3 a | 2.0 c |
| 10. TADS 15557 3SC 2.7 fl oz | 14 | 4.5 d-g | 0.3 ab | 1.8 a | 1.3 ab |
| 11. TADS 15557 3SC 5.4 fl oz | 14 | 5.0 f-i | 0.0 a | 1.0 a | 1.5 ab |
| 12. Daconil Ultrex 82.5SDG 3.2 oz | 14 | 6.5 l-n | 2.3 ab | 0.5 a | 1.0 a |
| 13. Iprodione PRO 2SE 4.0 fl oz | 14 | 4.5 d-g | 0.3 ab | 1.5 a | 1.0 a |
| 14. Chipco Triton 70WG 0.3 oz | 14 | 6.0 j-m | 2.8 ab | 0.5 a | 1.0 a |
| 15. Chipco Triton 70WG 0.6 oz | 14 | 6.0 j-m | 1.8 ab | 0.8 a | 1.5 ab |
| 16. Chipco Signature 80WG 4.0 oz | 14 | 3.5 a-c | 6.3 a-d | 42.3 cd | 1.0 a |
| 17. Chipco Signature 80WG 4.0 oz | | | | | |
| + Chipco Triton 70WG 0.6 oz | 14 | 6.3 k-n | 1.3 ab | 1.0 a | 1.5 ab |
| 18. Lynx 45WG 1.2 oz | 14 | 6.0 j-m | 0.8 ab | 0.3 a | 1.0 a |
| 19. Lynx 45WG 1.2 oz | | | | | |
| + Chipco Signature 80WG 4.0 oz | 14 | 7.0 n | 1.5 ab | 0.0 a | 1.0 a |
| 20. Cleary 3336 4F 4.0 fl oz | 14 | 4.5 d-g | 1.8 ab | 6.3 ab | 1.0 a |
| 21. Topsin-M 70W 2.86 oz | 14 | 4.0 b-e | 1.0 ab | 10.3 ab | 1.0 a |
| 22. TD2193-07 4.5F 3.6 fl oz | 14 | 4.5 d-g | 0.5 ab | 3.3 a | 1.0 a |
| 23. Heritage 50WG 0.2 oz | 14 | 4.8 e-h | 8.8 a-e | 43.3 d | 1.0 a |
| 24. Eagle 20EW 1.144 fl oz | 14 | 5.5 h-k | 3.8 a-c | 1.0 a | 1.5 ab |
| 25. Eagle 20EW 2.29 fl oz | 14 | 6.5 l-n | 3.5 a-c | 2.0 a | 2.5 d |
| 26. Eagle 20EW 4.58 fl oz | 14 | 5.3 g-j | 11.5 a-f | 2.8 a | 3.5 e |
| 27. Eagle 40W 1.2 oz | 14 | 6.5 l-n | 1.5 ab | 0.5 a | 2.0 c |
| 28. Eagle 40W 2.4 oz | 14 | 6.3 k-n | 1.0 ab | 0.0 a | 3.3 e |
| 29. V-10114 50WDG 0.18 oz | 14 | 7.0 n | 3.5 a-c | 1.3 a | 1.0 a |
| 30. V-10114 50WDG 0.37 oz | 14 | 7.0 n | 1.5 ab | 0.8 a | 1.0 a |
| 31. V-10114 50WDG 0.55 oz | 14 | 7.0 n | 1.5 ab | 0.3 a | 1.0 a |
| 32. V-10114 1.67SC 0.88 fl oz | 14 | 6.5 l-n | 1.0 ab | 0.5 a | 1.0 a |
| 33. V-10116 1.67SC 0.22 fl oz | 14 | 5.5 h-k | 8.8 a-e | 1.0 a | 1.0 a |
| 34. V-10116 1.67SC 0.44 fl oz | 14 | 6.3 k-n | 1.3 ab | 0.8 a | 1.0 a |
| 35. V-10116 1.67SC 0.88 fl oz | 14 | 6.8 mn | 1.3 ab | 0.0 a | 1.0 a |
| 36. V-10116 1.67SC 0.88 fl oz | 21 | 6.3 k-n | 2.0 ab | 1.0 a | 1.0 a |
| 37. V-10116 1.67SC 1.32 fl oz | 14 | 6.5 l-n | 0.8 ab | 0.5 a | 1.0 a |
| 38. Rotational Program 1 | 14 ^u | 6.8 mn | 4.8 a-c | 0.0 a | 1.0 a |

(Continued)

Table 2 (continued).

| Treatment and Rate per 1000 sq ft | Spray Interval (days) ^w | Turf Quality ^y 9 Sept. | Dollar Spot (Number of Infection Centers per Plot ^z) | | Phyto-toxicity ^x 3 July | |
|---|------------------------------------|-----------------------------------|--|----------|------------------------------------|-----|
| | | | 25 June | 21 Aug. | | |
| 39. CPR 4-0-1 6.0 fl oz + Nutri True Foliar N 19-1-6 3.0 fl oz + Nutri True Foliar P 16-12-6 3.0 fl oz + Nutri True Foliar Si 3-0-10 3.0 fl oz | 14 | 3.3 ab | 10.8 a-e | 10.8 ab | 1.0 a | |
| 40. Pana Sea Plus 0-3-2 3.0 fl oz + Daconil Ultrex 82.5SDG 2.4 oz | 14 | 5.3 g-j | 2.3 ab | 3.0 a | 1.0 a | |
| 41. Daconil Ultrex 82.5SDG 2.4 oz | 14 | 5.8 i-l | 2.8 ab | 1.8 a | 1.0 a | |
| 42. Biophos 43L 12 fl oz | 14 | 3.0 a | 16.8 b-g | 74.8 f | 1.0 a | |
| 43. Biophos 43L 12 fl oz + ProStar 70W 1.5 oz | 14 | 3.8 a-d | 5.5 a-d | 109.5 h | 1.0 a | |
| 44. ProStar 70W 1.5 oz | 14 | 4.5 d-g | 28.0 g | 107.0 gh | 1.0 a | |
| 45. Compost Tea 0.01-0.18-0.027 2.0 gal | 7 ⁱ | 3.3 ab | 26.5 fg | 43.3 d | 1.0 a | |
| 46. Compost Tea 0.01-0.18-0.027 1.0 gal | 7 ⁱ | 3.3 ab | 19.3 c-g | 33.0 c | 1.0 a | |
| 47. Heritage 50WG 0.3 oz | 21 | 4.3 c-f | 16.0 a-g | 34.3 cd | 1.0 a | |
| 48. Medallion 50W 0.33 oz | 14 | 3.5 a-c | 5.0 a-c | 14.5 b | 1.0 a | |
| 49. Fore Rainshield 80W 6.0 oz | 14 | 4.8 e-h | 14.3 a-g | 34.3 cd | 1.0 a | |
| 50. Untreated Control | --- | 3.5 a-c | 21.0 d-g | 64.8 e | 1.0 a | |
| | | INT ^s | DAT ^q | DAT | DAT | DAT |
| | | 7 | 13 | 7 | 1 | 1 |
| | | 14 | 20 | 14 | 1 | 8 |
| | | 21 | 27 | 14 | 8 | 1 |

^z Dollar spot rated as infection centers per plot. Values are means of four replications. Means followed by the same letter are not significantly different according to Waller-Duncan *k*-ratio *t*-test ($k = 100$).

^y Turf Quality on a 1 to 9 scale, where 9 = best turf quality. Values above 6.0 represent acceptable turf quality.

^x Phytotoxicity on a 1 to 5 scale, where 1 = no toxicity, 2 = necrosis, 3 = moderate necrosis, 4 = severe necrosis, and 5 = most of the leaf tissue in the plot is dead. Foliar necrosis was observed for treatment 24 (1.2 on 18 June and 1.2 on 3 July), treatment 25 (1.2 on 18 June, 2.0 on 27 June, and 2.0 on 3 July), treatment 26 (1.8 on 18 June, 3.0 on 27 June, 2.8 on 3 July, 2.3 on 11 July, 2.0 on 17 July, 2.0 on 24 July, 2.0 on 4 August, 1.5 on 7 August, and 1.5 on 21 August), treatment 27 (1.3 on 27 June, 2.3 on 3 July, 1.8 on 11 July, and 2.0 on 17 July), and treatment 28 (1.8 on 18 June, 2.0 on 27 June, 3.0 on 3 July, 1.8 on 11 July, 1.3 on 17 July, 1.2 on 24 July, 1.8 on 4 August, and 1.3 on 7 August).

^w Fungicides were applied on 11 June (all treatments except treatments 45, 46), 18 June (7 day treatment), 25 June (7 and 14 day treatments, and treatments 45, 46), 2 July (7 and 21 day treatments), 9 July (7 and 14 day treatments), 16 July (7 day treatment), 23 July (7, 14, and 21 day treatments), 30 July (7 day treatment), 6 August (7 and 14 day treatments), 13 August (7 and 21 day treatments), 20 August (7 and 14 day treatments), 27 August (7 day treatment), 3 September (treatment 38), and 17 September (treatment 38).

(Continued)

Table 2 (continued).

^v For treatment 4, Insignia 20WG was applied on 11 June, 9 July, and 6 August; whereas Iprodione PRO 2SE was sprayed on 25 June, 23 July, and 20 August.

^u Rotational Program 1 was applied as follows: Eagle 40W (0.6 oz) + Fore Rainshield 80W (6 oz) on 11 June, Fore Rainshield 80W (6 oz) on 25 June, Eagle 40W (0.6 oz) + ProStar 70W (1.5 oz) on 9 July, Chipco 26GT 2SC (4.0 fl oz) + Fore Rainshield 80W (6.0 oz) on 23 July, Heritage 50WG (0.2 oz) + Curalan 50EG (1.0 oz) on 6 August, Eagle 40W (0.6 oz) + Fore Rainshield 80W (6.0 oz) on 20 August, Fore Rainshield 80W (6.0 oz) + Chipco 26GT 2SC (4.0 fl oz) on 3 September, and Eagle 40W (0.6 oz) on 17 September. All rates were per 1000 sq ft.

^t The Compost Tea was applied to turf at full strength (treatment 45) or on a 1:1 (v/v) basis with water (Treatment 46).

^s Spray interval in days.

^q Days after treatment (DAT) for each spray interval.