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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

# EFFICACY OF GRANULAR AND SPRAYABLE FORMULATIONS OF FUNGICIDES FOR THE CONTROL OF BROWN PATCH ON TALL FESCUE

**Eric N. Weibel, Pradip R. Majumdar, Paul Goldberg, Katie Green, Paul Lee, Carolyn Zebrowski, John Inguagiato, and Bruce B. Clarke[1]**

Selected fungicides were evaluated in 2003 for their ability to control brown patch (caused by *Rhizoctonia solani*) on tall fescue (*Festuca arundinacea* Matador) at the Plant Science Research and Extension Farm in Adelphia, NJ. The study was established in September 2000 on a Freehold sandy loam with a pH of 6.3. Turf was mowed twice a week at a height of 1.5 inches and clippings were returned. The site was irrigated as needed to prevent drought stress. Plots were 3 x 9 ft and were arranged in a randomized complete block with four replications. Fertilizer was applied as 16-4-8 on 21 May (0.75 lb nitrogen (N)/1000 $ft^2$) and 16 July (0.75 lb N/1000 $ft^2$). Dimension IE (0.73 fl oz/1000 $ft^2$) was applied for pre-emergence weed control on 14 April and 12 August. On 31 October, a tank mix of Weeder (1qt/A) + Banvel (8 oz/A) + Mecomec 4 (16 oz/A) was applied to control broadleaf weeds. The site was inoculated with three isolates of *R. solani* (i.e., COBGBP1, COBGBP2, and Rh76) on 9 July using 2.5 g $m^2$ of oat-infested inoculum from each isolate.

Fungicides were applied in water equivalent to 1.89 gal per 1000 $ft^2$ with a CO2 powered sprayer at 30 psi using TeeJet 8003VS flat fan nozzles. Treatments (trt) were initiated on 6 June and reapplied as indicated in Table 1. The percent turf area infested with *R. solani* was assessed on 2, 10, 18, and 28 July and 7, 13, and 22 August. Turf quality was evaluated on 9 September on a 1 to 9 scale, where 9 = best turf quality. Data were subjected to an analysis of variance and means were separated using Waller-Duncan *k*-ratio *t*-test (*k* = 100) following arcsine transformation.

Brown patch was first observed on 28 June. Disease pressure was moderate (19 to 31% turf area infested) throughout July and August. All of the sprayable fungicide formulations provided excellent disease control except for thiophanate-methyl (i.e., the 1 fl oz rate of Cleary 3336 4F; trt 8). The granular applications of tebuconazole and triadimefon provided good control of brown patch, whereas the granular formulation of thiophanate-methyl (Scotts Lawn Fungicide 2.3G; trts 6-7) generally did not suppress symptoms of this disease to acceptable levels (less than 10% turf area infested). Overall, turf quality was closely associated with the severity of brown patch. No phytotoxicity was observed.

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Table 1. Efficacy of granular and sprayable formulations of fungicides for the control of brown patch in tall fescue, Adelphia, NJ, 2003.

| | Treatment and Rate per 1000 sq ft | Spray Interval (days)[x] | Turf Area Infested (%) per Plot[z] 2 July | 10 July | 18 July | 28 July | 7 Aug. | 13 Aug. | 22 Aug. | Turf Quality[y] 9 Sept. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Tebuconazole Attapulgite 1G 24 oz | 14[w] | 0.8 ab | 4.0 cd | 10.5 fg | 10.8 g-i | 1.8 ab | 10.8 fg | 7.8 fg | 4.3 ab |
| 2. | Tebuconazole Attapulgite 1G 48 oz | 14[w] | 0.8 ab | 3.8 b-d | 7.8 d-f | 5.5 d-f | 0.0 a | 3.5 a-d | 3.0 a-f | 5.8 c-g |
| 3. | Tebuconazole Biodac LD 1G 24 oz | 14[w] | 2.0 a-c | 3.3 a-d | 5.3 b-d | 3.8 a-e | 9.3 d-f | 8.8 e-g | 8.5 g | 4.3 ab |
| 4. | Tebuconazole Biodac LD 1G 48 oz | 14[w] | 0.5 a | 2.5 a-d | 4.5 b-d | 6.8 ef | 6.8 b-e | 7.0 c-f | 6.0 b-g | 5.0 b-d |
| 5. | Triadimefon Attapulgite 1G 48 oz | 14[w] | 1.8 a-c | 4.3 d | 12.0 fg | 7.5 e-g | 0.0 a | 2.3 a-c | 0.0 a | 7.0 h |
| 6. | Scotts Lawn Fungicide 2.3G 22 oz | 14[w] | 3.5 c | 8.0 e | 17.8 h | 14.3 i | 25.0 g | 18.8 h | 13.8 h | 3.8 a |
| 7. | Scotts Lawn Fungicide 2.3G 43 oz | 14[w] | 3.0 bc | 4.8 de | 12.8 g | 12.3 hi | 11.3 ef | 11.3 fg | 10.5 gh | 5.0 b-d |
| 8. | Cleary 3336 4F 1 fl oz | 14 | 2.3 a-c | 0.0 a | 9.8 e-g | 8.5 f-h | 13.8 f | 13.3 g | 11.0 gh | 5.5 c-f |
| 9. | Cleary 3336 4F 2 fl oz | 14 | 1.0 ab | 0.0 a | 2.0 a-c | 1.8 a-d | 5.0 a-e | 8.3 d-f | 7.5 e-g | 5.3 b-e |
| 10. | Lynx 45W 0.533 oz | 14 | 0.5 a | 0.0 a | 0.0 a | 0.0 a | 0.5 ab | 1.8 ab | 2.3 a-e | 6.5 f-h |
| 11. | Lynx 45W 1.067 oz | 14 | 0.5 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 7.0 h |
| 12. | Bayleton 50DF 0.96 oz | 14 | 1.0 ab | 0.0 a | 0.0 a | 1.3 a-c | 8.8 c-f | 1.0 ab | 3.0 a-f | 6.3 e-h |
| 13. | Spectracide Immunox 1.55SC 14 fl oz | 14 | 1.5 a-c | 0.5 ab | 4.8 b-d | 4.0 b-e | 6.3 a-e | 5.3 b-e | 6.5 c-g | 5.5 c-f |
| 14. | Eagle 40W 0.565 oz | 14 | 0.5 a | 0.8 a-c | 5.5 c-e | 2.5 a-d | 2.5 a-c | 4.3 a-e | 6.8 d-g | 5.8 c-g |
| 15. | Trifloxystrobin 0.3125EW 16 fl oz | 14 | 1.3 a-c | 0.0 a | 4.5 b-d | 5.0 c-f | 0.5 ab | 0.5 ab | 2.0 a-d | 5.8 c-g |
| 16. | Compass 50WG 0.11 oz | 14 | 2.0 a-c | 0.0 a | 3.3 a-c | 2.0 a-d | 0.5 ab | 1.3 ab | 2.3 a-e | 6.0 d-h |
| 17. | Tebuconazole 2.9SE 8 fl oz | 14 | 1.3 a-c | 0.0 a | 0.0 a | 0.0 a | 3.0 a-d | 0.0 a | 1.0 a-c | 6.3 e-h |
| 18. | ProStar 70W 2.2 oz | 14 | 3.0 bc | 0.0 a | 0.0 a | 0.0 a | 2.5 a-c | 0.0 a | 1.0 a-c | 5.8 c-g |
| 19. | ProStar 70W 3.0 oz | 14[v] | 0.8 ab | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.8 ab | 5.8 c-g |
| 20. | Chipco Triton 1.67SC 1.2 fl oz | 14 | 0.0 a | 0.0 a | 1.0 ab | 2.8 a-d | 1.3 ab | 2.5 a-c | 3.0 a-f | 6.0 d-h |
| 21. | Heritage 50WG 0.2 oz | 14 | 0.3 a | 0.0 a | 1.0 ab | 0.0 a | 1.3 ab | 0.0 a | 0.0 a | 6.0 d-h |
| 22. | Heritage 50WG 0.3 oz | 28 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 1.0 ab | 0.0 a | 0.0 a | 5.8 c-g |
| 23. | Insignia 20WG 0.5 oz | 14 | 0.8 ab | 2.0 a-d | 0.0 a | 1.0 ab | 2.5 a-c | 0.5 ab | 1.0 a-c | 6.8 gh |
| 24. | Insignia 20WG 0.9 oz | 28 | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.0 a | 0.5 ab | 6.0 d-h |
| 25. | Untreated Control | | 23.3 d | 15.8 f | 30.5 i | 25.8 j | 27.5 g | 23.8 i | 18.8 i | 4.8 a-c |
| | | INT[u] | DAT[t] | DAT | DAT | DAT | DAT | DAT | DAT | DAT |
| | | 14 | 12 | 7 | 14 | 10 | 6 | 12 | 7 | 25 |
| | | 28 | 26 | 7 | 14 | 24 | 6 | 12 | 21 | 39 |

(Continued)

Table 1 (continued).

[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] Turf quality on a 1 to 9 scale, where 9=best turf quality. Values above 6 represent acceptable turf quality.
[x] Fungicides were applied on 6 June (all treatments, except treatment 19), 20 June (14 day treatment), 3 July (14 and 28 day treatments), 18 July (14 day treatment), 1 August (14 and 28 day treatments), and 15 August (14 day treatment).
[w] Granular treatments 1-7 were applied with a shaker bottle and were immediately irrigated into the thatch with 2 gal water per 3 x 9 ft plot.
[v] Treatment 19 was applied on a curative basis starting 3 July and was reapplied every 14 days thereafter.
[u] Spray interval in days.
[t] Days after treatment (DAT) for each spray interval.