

CREEPING BENTGRASS (*Agrostis palustris* 'Dominant Plus')

Summer quality; abiotic

Anthracnose; *Colletotrichum cereale*

Dollar spot; *Sclerotinia homoeocarpa*

Algae; Cyanobacteria sp.

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Impact of fungicides on summer quality of a creeping bentgrass putting green in North Carolina, 2007.

Fungicides were applied to evaluate their effect on the summer quality on creeping bentgrass putting greens. This trial was conducted at the Lake Wheeler Turfgrass Field Laboratory in Raleigh, NC on 'Dominant Plus' creeping bentgrass. Mowing was performed four times weekly at heights of 0.140 in. (11 Jan-12 Apr), 0.125 in. (13 Apr-24 May), and 0.180 in. (after 24 May) with clippings collected. The site was irrigated to prevent drought stress. Fertilizer was applied as 46-0-0 on 11 Jan and 12 Feb (0.125 and 0.25 lb N/1000 sq ft, respectively), 10-0-30 on 16 Feb (0.5 lb N/1000 sq ft), 26-0-22 on 15 Mar (0.33 lb N/1000 sq ft), 18-3-16 on 13 Apr (0.75 lb N/1000 sq ft), 18-0-12 on 10 May (0.25 lb N/1000 sq ft), and 18-9-18 on 25 May, and 2 and 30 Jul (0.6, 0.25, and 0.33 lb N/1000 sq ft, respectively). Micronutrients were applied as Brexil Multi (3.0 oz/1000 sq ft) on 12 Feb and HEP 35 (5.0 oz/1000 sq ft) on 10 May. 26GT (3.5 fl oz) was applied on 12 Mar for control of dollar spot. Insect pests were suppressed with Allectus GC (2.9 lb/1000 sq ft) on 29 Jun. Cascade Plus (8.0 fl oz/1000 sq ft) was applied on 20 Mar and 2 May for improved water infiltration. Plots were 3.33 ft x 6 ft and arranged in a randomized complete block with four replications. Fungicides were applied in water equivalent to 2 gal per 1000 sq ft with a CO₂ powered sprayer at 40 psi using a TeeJet 9508E nozzle, unless otherwise noted in the table. All treatments were initiated on 1 Jun. Turfgrass quality was evaluated on 28 Jun, 10 and 26 Jul, and 17 Aug using a 1 to 9 scale (9=best, 5=acceptable) based on color, density, and uniformity. Algae was observed and rated on 8 and 20 Jun. Anthracnose was noted and rated on 19 and 27 Jul, and dollar spot incidence was evaluated on 20 and 27 Jun. Data were subjected to analysis of variance and means separation using the Waller-Duncan k-ratio t test (k=100).

Turfgrass quality declined during the course of the study as a consequence of record high temperatures combined with severe drought conditions. Most treatments significantly improved turf quality compared to the untreated control on all rating dates, with the exception of BASF Program #1, BASF Program #2, and Tartan. Only Signature + Daconil Ultrex, Lynx (both rates), and Syngenta Program #2 (applied with a flat fan nozzle) provided acceptable turfgrass quality throughout the study. Anthracnose was observed and rated on 19 and 27 Jul. On 19 Jul, all treatments except Tartan provided excellent disease control. On 27 Jul, the best control of anthracnose was observed in plots treated with Signature + Daconil Ultrex, Lynx (1.0 fl oz), Syngenta Program #1 (applied with a flat fan or TurfJet nozzle), and Syngenta Program #2 (applied with a flat fan nozzle). Dollar spot incidence was variable in the study, and no significant treatment differences were observed on 20 Jun. On 27 Jun, all treatments provided control of dollar spot except for Signature + Fore. Algae incidence was also variable in the experimental area and no significant differences were observed on 8 Jun. However, Signature + Daconil Ultrex, Signature + Fore, and Syngenta Program #1 (applied with a flat fan nozzle) provided significant algae suppression on 20 Jun.

| Treatment, formulation, and rate per 1000 sq ft | Appl. schedule | Turfgrass quality ^z | | | |
|---|------------------|--------------------------------|---------|---------|---------|
| | | 28 Jun | 10 Jul | 26 Jul | 17 Aug |
| Kestrel 1.3ME 1.0 fl oz..... | ACK ^y | 5.0 bc ^x | 5.8 b | 5.0 cd | 4.0 cd |
| LBG-31 L 7.0 fl oz | DEFGHIJ | | | | |
| Signature 80WG 4.0 oz + Daconil Ultrex 82.5WG 3.2 oz..... | ACEGIK | 6.5 ab | 6.3 ab | 5.0 cd | 5.3 abc |
| Signature 80WG 4.0 oz + Fore 80WP 4.0 oz..... | ACEGIK | 5.0 bc | 5.3 bcd | 4.0 de | 3.8 d |
| BASF Program #1 | | 5.8 abc | 5.5 bc | 3.8 de | 2.0 e |
| NCSU-EXP-3 0.8 oz | A | | | | |
| Insignia 20WG 0.5 oz | C | | | | |
| Daconil Ultrex 82.5WG 3.2 oz | E | | | | |
| Insignia 20WG 0.5 oz | G | | | | |
| Iprodione Pro 2SC 2.0 fl oz | I | | | | |
| NCSU-EXP-3 1.1 oz | K | | | | |
| Trinity 1.67SC 0.75 fl oz..... | ACEGIK | 4.8 c | 4.5 cde | 4.0 de | 3.8 d |
| Lynx 2SC 1.0 fl oz..... | ACEGIK | 7.0 a | 6.3 ab | 5.5 bc | 6.0 a |
| Lynx 2SC 2.0 fl oz..... | ACEGIK | 7.0 a | 7.3 a | 5.0 cd | 5.5 ab |
| BASF Program #2 | | 5.5 abc | 4.3 de | 3.8 de | 2.3 e |
| NCSU-EXP-3 0.8 oz | A | | | | |
| Trinity 1.67SC 0.75 fl oz | C | | | | |
| Trinity 1.67SC 0.5 fl oz + Insignia 20WG 0.5 oz | E | | | | |
| Iprodione Pro 2SC 2.0 fl oz | G | | | | |
| NCSU-EXP-3 1.1 oz | I | | | | |
| Trinity 1.67SC 0.75 fl oz | K | | | | |
| Tartan 2.4SC 1.5 fl oz..... | ACEGIK | 5.3 bc | 3.8 e | 2.8 ef | 2.3 e |
| Syngenta Program #1..... | | 5.8 abc | 5.5 bc | 6.5 ab | 4.3 bcd |
| Daconil Weatherstik 6F 3.6 fl oz + Signature 80WG 4.0 oz | A | | | | |
| 26GT 2SC 4.0 fl oz + Insignia 20WG 0.9 oz | C | | | | |
| Headway 1.39ME 1.5 fl oz + Subdue MAXX 2ME 1.0 fl oz | E | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature 80WG 4.0 oz | G | | | | |
| Concert 4.3F 4.33 fl oz + Heritage TL 0.8ME 1.0 fl oz | I | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature 80WG 4.0 oz | K | | | | |
| Syngenta Program #2..... | | 6.5 ab | 5.8 b | 7.0 a | 5.0 a-d |
| Daconil Weatherstik 6F 3.6 fl oz | A | | | | |
| 26GT 2SC 4.0 fl oz + Insignia 20WG 0.9 oz | C | | | | |
| Concert 4.3F 5.28 fl oz + Subdue MAXX 2ME 1.0 fl oz | E | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Medallion 50WP 0.25 oz | G | | | | |
| Headway 1.39ME 1.5 fl oz | I | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature 80WG 4.0 oz | K | | | | |
| Syngenta Program #1 ^w | | 6.0 abc | 5.5 bc | 7.0 a | 4.3 bcd |
| Daconil Weatherstik 6F 3.6 fl oz + Signature 80WG 4.0 oz | A | | | | |
| 26GT 2SC 4.0 fl oz + Insignia 20WG 0.9 oz | C | | | | |
| Headway 1.39ME 1.5 fl oz + Subdue MAXX 2ME 1.0 fl oz | E | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature 80WG 4.0 oz | G | | | | |
| Concert 4.3F 4.33 fl oz + Heritage TL 0.8ME 1.0 fl oz | I | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature 80WG 4.0 oz | K | | | | |
| Syngenta Program #2 ^w | | 6.0 abc | 5.3 bcd | 6.3 abc | 4.3 bcd |
| Daconil Weatherstik 6F 3.6 fl oz | A | | | | |
| 26GT 2SC 4.0 fl oz + Insignia 20WG 0.9 oz | C | | | | |
| Concert 4.3F 5.28 fl oz + Subdue MAXX 2ME 1.0 fl oz | E | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Medallion 50WP 0.25 oz | G | | | | |
| Headway 1.39ME 1.5 fl oz | I | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature 80WG 4.0 oz | K | | | | |
| Untreated Control | | 3.0 d | 2.0 f | 2.0 f | 1.3 e |

^z Turfgrass quality on a 1 to 9 scale, where 9=highest quality, and 5=acceptable.

^y Application schedule indicates application dates of each treatment: A-1 Jun, C-15 Jun, D-22 Jun, E-29 Jun, F-6 Jul, G-13 Jul, H-20 Jul, I-27 Jul, J-3 Aug, K-10 Aug.

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

^w Fungicides applied using a TurfJet TTJ10 nozzle.

| Treatment, formulation, and rate per 1000 sq ft | Appl. schedule | Anthracnose incidence (%) | | Dollar spot inc. (spots/plot) | | Algae incidence (%) | |
|---|------------------|---------------------------|---------|-------------------------------|--------|---------------------|---------|
| | | 19 Jul | 27 Jul | 20 Jun | 27 Jun | 8 Jun | 20 Jun |
| Kestrel 1.3ME 1.0 fl oz..... | ACK ^z | 0.8 bc ^y | 3.8 cd | 6.5 a | 0.0 b | 24.7 a | 11.9 ab |
| LBG-31 L 7.0 fl oz..... | DEFGHIJ | | | | | | |
| Signature 80WG 4.0 oz + Daconil Ultrex 82.5WG 3.2 oz..... | ACEGIK | 0.3 bc | 2.6 d | 3.8 a | 0.3 b | 0.4 a | 0.1 c |
| Signature 80WG 4.0 oz + Fore 80WP 4.0 oz..... | ACEGIK | 0.5 bc | 3.4 cd | 20.5 a | 58.3 a | 6.1 a | 3.9 bc |
| BASF Program #1 | | 2.9 bc | 13.6 bc | 3.8 a | 3.8 b | 19.3 a | 13.1 a |
| NCSU-EXP-3 0.8 oz | A | | | | | | |
| Insignia 20WG 0.5 oz | C | | | | | | |
| Daconil Ultrex 82.5WG 3.2 oz | E | | | | | | |
| Insignia 20WG 0.5 oz | G | | | | | | |
| Iprodione Pro 2SC 2.0 fl oz | I | | | | | | |
| NCSU-EXP-3 1.1 oz | K | | | | | | |
| Trinity 1.67SC 0.75 fl oz..... | ACEGIK | 4.4 bc | 8.0 bcd | 5.3 a | 5.3 b | 14.5 a | 10.1 ab |
| Lynx 2SC 1.0 fl oz..... | ACEGIK | 0.3 bc | 2.3 d | 0.5 a | 0.0 b | 13.8 a | 7.6 abc |
| Lynx 2SC 2.0 fl oz..... | ACEGIK | 0.3 bc | 4.6 cd | 1.0 a | 0.0 b | 17.5 a | 7.5 abc |
| BASF Program #2 | | 2.8 bc | 13.6 bc | 1.8 a | 1.3 b | 17.2 a | 10.6 ab |
| NCSU-EXP-3 0.8 oz | A | | | | | | |
| Trinity 1.67SC 0.75 fl oz | C | | | | | | |
| Trinity 1.67SC 0.5 fl oz + Insignia 20WG 0.5 oz | E | | | | | | |
| Iprodione Pro 2SC 2.0 fl oz | G | | | | | | |
| NCSU-EXP-3 1.1 oz | I | | | | | | |
| Trinity 1.67SC 0.75 fl oz | K | | | | | | |
| Tartan 2.4SC 1.5 fl oz..... | ACEGIK | 5.4 b | 16.3 ab | 1.8 a | 0.0 b | 15.5 a | 8.8 abc |
| Syngenta Program #1..... | | 0.2 bc | 0.3 d | 1.8 a | 0.0 b | 3.9 a | 3.8 bc |
| Daconil Weatherstik 6F 3.6 fl oz + Signature WG 4.0 oz | A | | | | | | |
| 26GT 2SC 4.0 fl oz + Insignia 20WG 0.9 oz | C | | | | | | |
| Headway 1.39ME 1.5 oz + Subdue MAXX 2ME 1.0 oz | E | | | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature WG 4.0 oz | G | | | | | | |
| Concert 4.3F 4.33 fl oz + Heritage TL 0.8ME 1.0 fl oz | I | | | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature WG 4.0 oz | K | | | | | | |
| Syngenta Program #2..... | | 0.0 c | 0.3 d | 7.0 a | 0.0 b | 4.3 a | 5.6 abc |
| Daconil Weatherstik 6F 3.6 fl oz | A | | | | | | |
| 26GT 2SC 4.0 fl oz + Insignia 20WG 0.9 oz | C | | | | | | |
| Concert 4.3F 5.28 fl oz + Subdue MAXX 2ME 1.0 fl oz | E | | | | | | |
| Daconil Weatherstik F 3.6 fl oz + Medallion WP 0.25 oz | G | | | | | | |
| Headway 1.39ME 1.5 fl oz | I | | | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature WG 4.0 oz | K | | | | | | |
| Syngenta Program #1 ^x | | 0.7 bc | 1.5 d | 2.8 a | 1.3 b | 7.5 a | 6.3 abc |
| Daconil Weatherstik 6F 3.6 fl oz + Signature WG 4.0 oz | A | | | | | | |
| 26GT 2SC 4.0 fl oz + Insignia 20WG 0.9 oz | C | | | | | | |
| Headway 1.39ME 1.5 oz +Subdue MAXX 2ME 1.0 oz | E | | | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature WG 4.0 oz | G | | | | | | |
| Concert 4.3F 4.33 fl oz + Heritage TL 0.8ME 1.0 fl oz | I | | | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature WG 4.0 oz | K | | | | | | |
| Syngenta Program #2 ^x | | 0.7 bc | 3.8 cd | 2.5 a | 1.0 b | 5.9 a | 5.6 abc |
| Daconil Weatherstik 6F 3.6 fl oz | A | | | | | | |
| 26GT 2SC 4.0 fl oz + Insignia 20WG 0.9 oz | C | | | | | | |
| Concert 4.3F 5.28 fl oz + Subdue MAXX 2ME 1.0 fl oz | E | | | | | | |
| Daconil Weatherstik F 3.6 fl oz + Medallion WP 0.25 oz | G | | | | | | |
| Headway 1.39ME 1.5 fl oz | I | | | | | | |
| Daconil Weatherstik 6F 3.6 fl oz + Signature WG 4.0 oz | K | | | | | | |
| Untreated Control | | 22.7 a | 26.1 a | 21.3 a | 49.0 a | 20.9 a | 13.8 a |

^z Application schedule indicates application dates of each treatment: A-1 Jun, C-15 Jun, D-22 Jun, E-29 Jun, F-6 Jul, G-13 Jul, H-20 Jul, I-27 Jul, J-3 Aug, K-10 Aug.

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

^x Fungicides applied using a TurfJet TTT10 nozzle.