

**Evaluation of fungicides for control of anthracnose of creeping bentgrass, 2007.**

Fungicides were evaluated for control of anthracnose on a putting green established with 'Dominant Plus' creeping bentgrass. This trial was conducted at the Lake Wheeler Turfgrass Field Laboratory in Raleigh, NC. 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/1000 sq ft) was applied on 12 Mar for control of dollar spot. Emerald + ProStar (0.18 oz + 2.2 oz/1000 sq ft) were applied on 22 Jun for control of dollar spot and brown patch. 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 were arranged in a randomized complete block with four replications. Fungicides were applied in water equivalent to 2 gal per 1000 sq ft with a CO<sub>2</sub>-powered sprayer at 40 psi using a TeeJet 9508E nozzle. All treatments were initiated on 10 May, unless otherwise noted in the table. Anthracnose was evaluated on 3, 18, and 31 Jul, and 15 and 29 Aug. Turfgrass quality was evaluated on 1 and 19 Jun and 29 Aug using a 1 to 9 scale (9=best, 5=acceptable) based on color, density, and uniformity. Data were subjected to analysis of variance and means separation using the Waller-Duncan k-ratio t test (k=100).

Temperatures in Raleigh were normal in May, June, and July, but abnormally high in August, with temperatures exceeding 90°F and 100°F on 25 and 6 days, respectively. Over the same period, precipitation was nearly 5 in. below normal, resulting in several 2-3 week periods with no precipitation. Anthracnose was first observed in the experimental area on 4 May, just prior to initiation of the trial. Disease progress was slow throughout May and June, but increased from mid-July through mid-August. Good control of anthracnose was provided by Lynx (1.5 and 2.0 fl oz), Lynx + Signature (2.0 fl oz + 4.0 oz), SARS-346 (0.5 oz), and Signature (4.0 oz) throughout this trial. Banner MAXX, Daconil Ultrex, Alude, and Medallion did not provide significant control of anthracnose in this study, although it should be noted that Medallion was not applied until 6 Jun. Applications of Endorse provided significant suppression of anthracnose only on the 31 Jul rating date. All other treatments provided good suppression of anthracnose on 18 Jul and 31 Jul. On 29 Aug, Lynx + Signature (2.0 fl oz + 4 oz) was the only treatment to provide acceptable turfgrass quality. Phytotoxic effects, in form of dark green- to bronze-colored turf, were first noted on 4 Jun in plots treated with Banner MAXX and worsened during the course of the study.

| Treatment, formulation, and rate per 1000 sq ft                           | Appl. interval  | Anthracnose incidence (%) |          |          |          |        |
|---------------------------------------------------------------------------|-----------------|---------------------------|----------|----------|----------|--------|
|                                                                           |                 | 3 Jul                     | 18 Jul   | 31 Jul   | 15 Aug   | 29 Aug |
| Lynx 2SC 1.5 fl oz.....                                                   | 14 <sup>z</sup> | 5.6 de <sup>y</sup>       | 2.3 fg   | 1.3 cd   | 5.7 cd   | 7.5 a  |
| Lynx 2SC 2.0 fl oz.....                                                   | 14              | 5.6 de                    | 2.3 fg   | 0.2 d    | 3.5 d    | 1.8 a  |
| Lynx 2SC 2.0 fl oz + Signature 80WG 4.0 oz.....                           | 14              | 4.4 e                     | 11.9 b-g | 3.3 bcd  | 3.8 d    | 1.3 a  |
| Lynx 2SC 1.5 fl oz + Signature 80WG 4.0 oz.....                           | 14              | 8.8 cde                   | 4.8 efg  | 3.6 bcd  | 8.0 bcd  | 7.8 a  |
| <i>Alt</i> Signature 80WG 4.0 oz + Dac. Ultrex 82.5WG 3.2 oz <sup>x</sup> | 14              |                           |          |          |          |        |
| Banner MAXX 1.3ME 1.0 fl oz.....                                          | 14              | 23.8 a                    | 19.5 ab  | 12.3 ab  | 20.3 abc | 6.8 a  |
| SARS-346 40WP 0.5 oz <sup>w</sup> .....                                   | 14              | 10.0 cde                  | 1.5 g    | 1.2 cd   | 6.4 cd   | 7.8 a  |
| SARS-346 40WP 0.75 oz <sup>v</sup> .....                                  | 21              | 13.8 bcd                  | 6.5 d-g  | 5.4 bcd  | 11.8 a-d | 13.5 a |
| SARS-346 40WP 0.4 oz + 3336 50WP 1.44 oz <sup>w</sup> .....               | 14              | 15.6 abc                  | 9.0 b-g  | 7.4 bcd  | 12.4 a-d | 9.8 a  |
| SARS-346 40WP 0.6 oz + 3336 50WP 2.16 oz <sup>v</sup> .....               | 21              | 13.8 bcd                  | 4.9 efg  | 5.9 bcd  | 7.4 bcd  | 7.8 a  |
| 3336 Plus F 6.0 fl oz.....                                                | 14              | 10.0 cde                  | 12.8 b-f | 9.2 bcd  | 13.4 a-d | 10.8 a |
| 3336 Plus F 6.0 fl oz + CX-08-B 50WP 4.0 oz <sup>u</sup> .....            | 14              | 10.0 cde                  | 4.9 efg  | 3.0 bcd  | 7.9 bcd  | 5.0 a  |
| 3336 Plus F 6.0 fl oz + CX-08-B 50WP 2.0 oz <sup>u</sup> .....            | 14              | 6.9 cde                   | 4.3 efg  | 0.4 d    | 7.4 bcd  | 6.5 a  |
| CLEXP-18 WG 5.75 oz.....                                                  | 14              | 13.8 bcd                  | 5.6 efg  | 11.0 abc | 18.1 a-d | 9.5 a  |
| CX-08-B 50WP 4.0 oz <sup>u</sup> .....                                    | 14              | 12.5 b-e                  | 5.2 efg  | 4.8 bcd  | 9.3 bcd  | 5.5 a  |
| CX-08-B 50WP 2.0 oz <sup>u</sup> .....                                    | 14              | 11.9 b-e                  | 5.6 efg  | 2.8 bcd  | 8.9 bcd  | 9.8 a  |
| CLEXP-9 WG 1.2 oz.....                                                    | 14              | 10.0 cde                  | 9.5 b-g  | 7.4 bcd  | 12.6 a-d | 2.8 a  |
| Spectro 90WG 5.75 oz.....                                                 | 14              | 10.6 cde                  | 6.1 d-g  | 7.0 bcd  | 13.4 a-d | 4.3 a  |
| Daconil Ultrex 82.5WG 3.2 oz.....                                         | 14              | 8.1 cde                   | 13.6 a-e | 10.3 a-d | 12.3 a-d | 5.8 a  |
| Signature 80WG 4.0 oz + Daconil Ultrex 82.5WG 3.2 oz.....                 | 14              | 12.5 b-e                  | 7.4 c-g  | 11.3 abc | 8.7 bcd  | 9.0 a  |
| Signature 80WG 4.0 oz.....                                                | 14              | 7.5 cde                   | 4.9 efg  | 4.9 bcd  | 4.4 d    | 2.5 a  |
| Alude L 5.5 fl oz.....                                                    | 14              | 20.0 ab                   | 15.2 a-e | 12.1 ab  | 20.6 abc | 16.0 a |
| Endorse 2.5WP 4.0 oz.....                                                 | 14              | 11.9 b-e                  | 17.2 a-d | 8.7 bcd  | 12.1 a-d | 10.5 a |
| Medallion 50WP 0.5 oz <sup>v</sup> .....                                  | 14              | 13.1 b-e                  | 18.3 abc | 12.6 ab  | 24.7 a   | 12.8 a |
| Untreated Control.....                                                    |                 | 13.1 b-e                  | 24.2 a   | 19.8 a   | 22.1 ab  | 17.5 a |

<sup>z</sup> Fungicides were applied 10 May (14-day treatments), 23 May (14-day treatments), 30 May (21-day treatments), 6 Jun (14-day treatments), 21 Jun (all treatments), 3 Jul (14-day treatments), 11 Jul (21-day treatments), 18 Jul (14-day treatments), 2 Aug (all treatments), 15 Aug (14-day treatments).

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

<sup>x</sup> Tank mixtures were alternated on a 14-day interval: Lynx + Signature applied 10 May, 6 Jun, 3 Jul, and 2 Aug; Signature + Daconil Ultrex applied 23 May, 21 Jun, 18 Jul, and 15 Aug.

<sup>w</sup> Treatment initiated 23 May.

<sup>v</sup> Treatment initiated 6 Jun.

<sup>u</sup> CX-08-B was applied as a 25WP formulation through 6 Jun, and as a 50WP formulation thereafter. The rate of ai was consistent throughout the study.

| Treatment, formulation, and rate per 1000 sq ft                              | Appl. interval  | Turfgrass quality    |         |         |
|------------------------------------------------------------------------------|-----------------|----------------------|---------|---------|
|                                                                              |                 | 1 Jun                | 19 Jun  | 29 Aug  |
| Lynx 2SC 1.5 fl oz.....                                                      | 14 <sup>z</sup> | 7.0 abc <sup>y</sup> | 6.5 a   | 3.3 b-g |
| Lynx 2SC 2.0 fl oz.....                                                      | 14              | 6.5 a-e              | 6.0 abc | 4.5 b   |
| Lynx 2SC 2.0 fl oz + Signature 80WG 4.0 oz.....                              | 14              | 7.0 abc              | 5.5 abc | 6.3 a   |
| Lynx 2SC 1.5 fl oz + Signature 80WG 4.0 oz.....                              | 14              | 7.5 a                | 6.3 ab  | 3.8 b-e |
| <i>Alt</i> Signature 80WG 4.0 oz + Daconil Ultrex 82.5WG 3.2 oz <sup>x</sup> | 14              |                      |         |         |
| Banner MAXX 1.3ME 1.0 fl oz.....                                             | 14              | 4.3 g                | 3.5 d   | 2.8 d-g |
| SARS-346 40WP 0.5 oz <sup>w</sup> .....                                      | 14              | 5.8 a-g              | 5.5 abc | 3.0 c-g |
| SARS-346 40WP 0.75 oz <sup>y</sup> .....                                     | 21              | 5.0 d-g              | 5.3 a-d | 3.0 c-g |
| SARS-346 40WP 0.4 oz + 3336 50WP 1.44 oz <sup>w</sup> .....                  | 14              | 5.3 c-g              | 4.8 a-d | 2.8 d-g |
| SARS-346 40WP 0.6 oz + 3336 50WP 2.16 oz <sup>y</sup> .....                  | 21              | 5.0 d-g              | 5.0 a-d | 3.0 c-g |
| 3336 Plus F 6.0 fl oz.....                                                   | 14              | 5.8 a-g              | 4.5 bcd | 2.8 d-g |
| 3336 Plus F 6.0 fl oz + CX-08-B 50WP 4.0 oz <sup>u</sup> .....               | 14              | 5.8 a-g              | 5.3 a-d | 4.0 bcd |
| 3336 Plus F 6.0 fl oz + CX-08-B 50WP 2.0 oz <sup>u</sup> .....               | 14              | 5.3 c-g              | 5.5 abc | 4.3 bc  |
| CLEXP-18 WG 5.75 oz.....                                                     | 14              | 6.3 a-f              | 5.8 abc | 4.0 bcd |
| CX-08-B 50WP 4.0 oz <sup>u</sup> .....                                       | 14              | 6.8 a-d              | 6.3 ab  | 3.3 b-g |
| CX-08-B 50WP 2.0 oz <sup>u</sup> .....                                       | 14              | 5.3 c-g              | 5.3 a-d | 3.5 b-f |
| CLEXP-9 WG 1.2 oz.....                                                       | 14              | 4.5 fg               | 4.3 cd  | 3.3 b-g |
| Spectro 90WG 5.75 oz.....                                                    | 14              | 6.0 a-g              | 5.8 abc | 3.5 b-f |
| Daconil Ultrex 82.5WG 3.2 oz.....                                            | 14              | 4.8 efg              | 5.0 a-d | 2.5 efg |
| Signature 80WG 4.0 oz + Daconil Ultrex 82.5WG 3.2 oz.....                    | 14              | 7.3 ab               | 6.3 ab  | 3.3 b-g |
| Signature 80WG 4.0 oz.....                                                   | 14              | 6.3 a-f              | 5.0 a-d | 3.3 b-g |
| Alude L 5.5 fl oz.....                                                       | 14              | 5.8 a-g              | 5.3 a-d | 2.0 g   |
| Endorse 2.5WP 4.0 oz.....                                                    | 14              | 5.0 d-g              | 5.3 a-d | 2.8 d-g |
| Medallion 50WP 0.5 oz <sup>y</sup> .....                                     | 14              | 5.5 b-g              | 4.5 bcd | 2.0 g   |
| Untreated Control.....                                                       |                 | 5.3 c-g              | 4.8 a-d | 2.3 fg  |

<sup>z</sup> Fungicides were applied 10 May (14-day treatments), 23 May (14-day treatments), 30 May (21-day treatments), 6 Jun (14-day treatments), 21 Jun (all treatments), 3 Jul (14-day treatments), 11 Jul (21-day treatments), 18 Jul (14-day treatments), 2 Aug (all treatments), 15 Aug (14-day treatments).

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

<sup>x</sup> Tank mixtures were alternated on a 14-day interval: Lynx + Signature applied 10 May, 6 Jun, 3 Jul, and 2 Aug; Signature + Daconil Ultrex applied 23 May, 21 Jun, 18 Jul, and 15 Aug.

<sup>w</sup> Treatment initiated 23 May.

<sup>v</sup> Treatment initiated 30 May.

<sup>u</sup> CX-08-B was applied as a 25WP formulation through 6 Jun, and as a 50WP formulation thereafter. The rate of ai was consistent throughout the study.