

Evaluation of spring fungicide applications for preventative control of fairy ring, 2006.

Early spring application of fungicides and fungicide-surfactant tank mixtures were evaluated for control of fairy ring. This trial was conducted at the Lake Wheeler Turfgrass Field Laboratory in Raleigh, NC on 'Penncross' creeping bentgrass maintained under putting green conditions. Mowing was performed five times weekly at a height of 0.160 in. (until 29 Jun) and 0.175 (after 29 Jun). Clippings were collected and the site was irrigated to prevent drought stress. Fertilizer was applied as 19-5-19 on 1 Mar (0.5 lb N/1000 sq ft), 18-3-16 on 20 Mar (0.5 lb N/1000 sq ft), 18-3-6 on 6 Apr (0.24 lb N/1000 sq ft), 20-20-20 on 2 May (0.43 lb N/1000 sq ft), and 25-6-12 on 16 Jun (1.0 lb N/1000 sq ft). Micro-nutrients were applied as Brexil Multi on 14 Feb, 27 Mar, 24 May (3.0 oz/1000 sq ft); and HEP 35 (4.0 oz/1000 sq ft) on 6 Apr and 29 Jun. Insect pests were suppressed with Allectus G (2.9 lb/1000 sq ft) and Scimitar (8.0 fl oz/A) on 1 May and 11 Jul respectively. Emerald 70WG (0.13 oz/1000 sq ft), 3336 4F (3.0 fl oz/1000 sq ft), and 26GT 2SC (3.5 fl oz/1000 sq ft) were applied on 11 Apr, 2 May, and 10 May respectively for control of dollar spot. Plots were 5 ft x 8 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 CO₂ powered sprayer at 40 psi using TeeJet 8004 nozzles. All treatments were immediately watered-in with 0.25" of irrigation applied by hand with a hose and shower nozzle. All treatments were initiated on 22 Mar and were reapplied at the appropriate intervals as indicated in the table. The severity of fairy ring symptoms was assessed on 22 Jun, and 11 and 17 Jul using a 1 to 9 scale (9=most severe, 5=acceptable). Mushroom incidence was evaluated on 26 Jun by counting the number of mushrooms in each plot. Turfgrass quality was evaluated on 5 and 19 May, and 22 Jun, using a 1 to 9 scale (9=best, 5=acceptable) based on color, density, and uniformity. Phytotoxicity was observed and evaluated on 21 Apr. Data were subjected to analysis of variance and means separation by Waller-Duncan k-ratio t test (k=100).

Fairy ring symptoms were first observed in the experimental area in late June, appearing as Type II symptoms (green rings) at this time. No significant differences were detected on 22 Jun, though all treatments provided a numerical reduction in fairy ring severity. As heat stress accumulated in early to mid July, a mixture of Type I and Type II symptoms became evident in the plots, where green rings were surrounded by a zone of necrotic turf. Applications of Bayleton, Lynx, Bayleton + ProStar, Bayleton + Revolution, Insignia + Revolution, and Heritage TL + Revolution provided excellent control of fairy ring on 11 Jul and 17 Jul. On both dates, Heritage TL provided better control when applied at 1 fl oz every 14 days as compared to 2 fl oz every 28 days. The combination of Lynx + Revolution was not significantly different from the untreated control, whereas Lynx alone did provide significant control on 17 Jul. A similar trend was observed with Bayleton + Revolution compared to Bayleton alone, but these differences were not statistically significant. Abundant basidiocarp formation was observed in the plot area on 26 Jun following 7 consecutive days of measurable precipitation. Plots treated with Revolution alone were consistently infested with a larger number of basidiocarps compared to all other treatments.

Phytotoxicity, evident as purpling and necrosis of leaf tips, was observed in the experimental area on 21 Apr, following reapplication of 21-day interval treatments on 12 Apr. Some foliar injury was also observed in untreated plots, likely due to freezing temperatures that occurred over-night on 10 Apr. However, applications of Bayleton 48%SC (2 fl oz) or Bayleton 48%SC + Revolution (2 + 6 fl oz) caused additional injury beyond what was observed in untreated plots. On 5 May, Bayleton 48%SC (2 fl oz) still had a negative impact on turfgrass quality, while the Bayleton + Revolution treatment had completely healed. No significant differences in turfgrass quality were detected on 19 May or 22 Jun.

Early spring fungicide applications were found to be highly effective for fairy ring control in this trial. Tank-mixtures with the soil surfactant Revolution improved the level of control provided by Insignia, but no benefit was observed with Bayleton, Lynx, or ProStar. In fact, Revolution significantly reduced the efficacy of Lynx on one date, and a similar trend was observed with Bayleton. The 2 fl oz rate of Bayleton caused some short-term injury to creeping bentgrass, but the 1 fl oz rate of Bayleton and both rates of Lynx did not have this side-effect and provided excellent fairy ring control. Applications of Heritage TL at low rates and short intervals provided superior control compared to high rates and long intervals.

Treatment, formulation, and rate per 1000 sq ft	Application code	Fairy ring severity ^z			Mushroom incidence ^y
		22 Jun	11 Jul	17 Jul	26 Jun
Bayleton 4SC 1 fl oz.....	AC ^x	0.3 a ^w	0.8 e	1.3 bcd	0.0 b
Bayleton 4SC 2 fl oz.....	AD	0.5 a	1.0 e	0.0 d	0.0 b
Lynx 2SC 1 fl oz.....	AC	0.0 a	0.8 e	0.8 cd	0.0 b
Lynx 2SC 2 fl oz.....	AD	0.3 a	0.5 e	0.0 d	0.5 b
ProStar 70WP 2.2 oz.....	AD	2.5 a	5.3 ab	3.5 a-d	3.0 b
Bayleton 4SC 1 fl oz + ProStar 70WP 2.2 oz.....	AD	0.5 a	1.8 cde	0.8 cd	0.0 b
Bayleton 4SC 2 fl oz + Revolution L 6 fl oz.....	AD	1.0 a	0.0 e	0.8 cd	0.0 b
Lynx 2SC 2 fl oz + Revolution L 6 fl oz.....	AD	0.8 a	1.8 cde	2.5 a-d	0.0 b
ProStar 70WP 2.2 oz + Revolution L 6 fl oz.....	AD	0.5 a	5.0 abc	4.5 ab	3.0 b
Insignia 20WG 0.9 oz.....	AE	3.0 a	2.5 b-e	2.3 a-d	0.0 b
Insignia 20WG 0.9 oz + Revolution L 6 fl oz.....	AE	0.5 a	2.5 b-e	1.8 bcd	0.0 b
Heritage TL 0.8ME 1 fl oz	ACEG	0.3 a	1.3 de	0.3 d	0.3 b
+ Revolution L 6 fl oz.....	AE				
Heritage TL 0.8ME 2 fl oz + Revolution L 6 fl oz.....	AE	1.3 a	4.8 abc	4.3 abc	1.3 b
Revolution L 6 fl oz.....	AE	1.3 a	4.5 a-d	2.3 a-d	15.3 a
Untreated Control.....		4.0 a	7.8 a	5.5 a	3.3 b

^zFairy ring severity on a 1-9 scale, where 9=most severe and 5=acceptable.

^yMushroom incidence evaluated by counting the number of mushrooms in each plot.

^xApplication code indicates the application dates of each treatment: A-22 Mar, C-5 Apr, D-12 Apr, E-19 Apr, and G-3 May.

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

Treatment, formulation, and rate per 1000 sq ft	Application code	Turfgrass quality ^z			Phytotoxicity ^y
		5 May	19 May	22 Jun	21 Apr
Bayleton 4SC 1 fl oz.....	AC ^x	5.0 bc ^w	6.8 a	6.3 a	4.0 abc
Bayleton 4SC 2 fl oz.....	AD	3.8 c	5.3 a	6.5 a	5.8 a
Lynx 2SC 1 fl oz.....	AC	7.3 ab	7.3 a	6.5 a	1.0 d
Lynx 2SC 2 fl oz.....	AD	6.8 ab	8.3 a	7.5 a	1.3 cd
ProStar 70WP 2.2 oz.....	AD	7.3 ab	6.3 a	6.3 a	1.0 d
Bayleton 4SC 1 fl oz + ProStar 70WP 2.2 oz.....	AD	6.3 ab	6.8 a	7.0 a	1.5 cd
Bayleton 4SC 2 fl oz + Revolution L 6 fl oz.....	AD	6.8 ab	7.3 a	7.0 a	5.5 ab
Lynx 2SC 2 fl oz + Revolution L 6 fl oz.....	AD	7.8 a	8.0 a	7.5 a	1.0 d
ProStar 70WP 2.2 oz + Revolution L 6 fl oz.....	AD	7.8 a	7.3 a	7.0 a	1.0 d
Insignia 20WG 0.9 oz.....	AE	5.5 abc	6.5 a	7.3 a	1.5 cd
Insignia 20WG 0.9 oz + Revolution L 6 fl oz.....	AE	7.8 a	6.5 a	7.0 a	2.8 bcd
Heritage TL 0.8ME 1 fl oz	ACEG	7.0 ab	7.0 a	7.3 a	2.3 cd
+ Revolution L 6 fl oz.....	AE				
Heritage TL 0.8ME 2 fl oz + Revolution L 6 fl oz.....	AE	7.8 a	7.8 a	7.0 a	2.5 cd
Revolution L 6 fl oz.....	AE	6.8 ab	7.3 a	6.0 a	2.0 cd
Untreated Control.....		5.5 abc	6.0 a	5.3 a	2.3 cd

^zTurfgrass quality on a 1-9 scale, where 9=highest quality, and 5=acceptable.

^yPhytotoxicity on a 0-9 scale, where 0=no phytotoxicity, and 9=entire plot severely injured or killed.

^xApplication code indicates the application dates of each treatment: A-22 Mar, C-5 Apr, D-12 Apr, E-19 Apr, and G-3 May.

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