



Take-all Patch Management on Golf Course Fairways

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OBJECTIVE

To determine length and degree of efficacy of different fungicides and fungicide combinations in preventing take-all patch caused by the fungus *Gaeumannomyces graminis* var. *graminis*.

MATERIALS AND METHODS

The study was conducted at Royal St. Patrick's Golf Course in Wrightstown, WI on a stand of creeping bentgrass (*Agrostis stolonifera*) maintained at 0.5 inches. The individual plots measured 3 feet by 5 feet and were arranged in a randomized complete block design with four replications. Treatments were applied at a nozzle pressure of 40 p.s.i. using a CO₂ pressurized boom sprayer equipped with two Teejet AI 8004 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 1.5 gallons of water per 1000 ft². The trial was initiated on October 18th, 2017 (Application A) with one more fall application occurring on November 7th, 2017 (B) and two spring applications occurring on May 10th, 2018 (C) and May 30th, 2018 (D). Treatments 16-21 received pre-application irrigation to facilitate the movement of fungicides off of the leaves and down into the rootzone. All products were watered in with approximately 0.1" of water from overhead irrigation within 1 hour of application. Disease severity (percent take-all patch per treatment) and turfgrass quality (1-9, 9 being excellent, 6 acceptable, and 1 bare soil) were visually assessed on 9/14/17, 6/25/18, 7/12/18, and 8/7/18. Turf quality and disease severity were subjected to an analysis of variance and means were separated using Fisher's LSD ($P = 0.05$). Results of the disease severity and turfgrass quality ratings can be found in table 1 and 2, respectively.

RESULTS AND DISCUSSION

Significant pressure was relatively widespread over most of the plot in the fall of 2017 and again on the July 12th rating date. Cooler and wetter conditions in late July allowed most of the take-all damage to heal up prior to the August 7th rating date. Despite the pressure present in July, variability from rep to rep prevented statistical differences from being observed. In general, treatments that contained multiple active ingredients and those that contained applications during both the fall and the spring provided more effective take-all suppression. Phytotoxicity was not observed with any treatment.

Table 1: Mean take-all severity per treatment at fairway height at Royal St. Patrick's Golf Course in Wrightstown, WI during 2017-2018.

Treatment	Rate	Application Code ^a	Take-all Severity ^b			
			Sept 14	Jun 25	Jul 12	Aug 7
1 Nontreated Control			48.8-	1.3-	12.5-	8.8-
2 Kabuto	0.5 fl oz/1000 ft2	ACD	26.3-	0.0-	23.8-	12.5-
3 Kabuto	1.05 fl oz/1000 ft2	ACD	31.3-	2.5-	11.3-	2.5-
4 Kabuto	1.6 fl oz/1000 ft2	AC	31.3-	0.0-	8.8-	0.0-
5 Kabuto	2.0 fl oz/1000 ft2	AC	27.5-	1.3-	7.5-	2.5-
6 Kabuto	3.2 fl oz/1000 ft2	A	18.8-	0.0-	5.0-	0.0-
7 Tekken	3.0 fl oz/1000 ft2	AC	25.0-	1.3-	7.5-	1.3-
8 Tekken	3.0 fl oz/1000 ft2	CD	15.0-	1.3-	13.8-	1.3-
9 Pinpoint	0.31 fl oz/1000 ft2	AB	17.5-	1.3-	18.8-	2.5-
10 Pinpoint	0.31 fl oz/1000 ft2	A	23.8-	1.3-	12.5-	0.0-
Tourney	0.37 fl oz/1000 ft2	C				
11 Pinpoint	0.31 fl oz/1000 ft2	A	13.8-	0.0-	8.8-	0.0-
Tourney	0.37 fl oz/1000 ft2	B				
12 Velist	0.5 fl oz/1000 ft2	ABCD	17.5-	0.0-	6.3-	1.3-
13 Heritage Action	0.4 fl oz/1000 ft2	ABCD	17.5-	0.0-	16.3-	3.8-
14 Velist	0.5 fl oz/1000 ft2	AC	45.0-	3.8-	25.0-	6.3-
15 Heritage Action	0.4 fl oz/1000 ft2	AC	31.3-	0.0-	8.8-	3.8-
16 A19649B	0.157 fl oz/1000 ft2	AC	18.8-	0.0-	10.0-	1.3-
Headway	3.0 fl oz/1000 ft2	AC				
17 Headway	3.0 fl oz/1000 ft2	AC	27.5-	1.3-	6.3-	3.8-
18 A20866A	0.26 fl oz/1000 ft2	AC	11.3-	0.0-	11.3-	1.3-
19 A19649B	0.157 fl oz/1000 ft2	ABCD	26.3-	0.0-	16.3-	1.3-
Headway	3.0 fl oz/1000 ft2	ABCD				
20 Headway	3.0 fl oz/1000 ft2	ABCD	22.5-	0.0-	7.5-	0.0-
21 A20866A	0.26 fl oz/1000 ft2	ABCD	18.8-	2.5-	15.0-	5.0-
LSD P=0.05			23.13	2.97	16.79	7.51

^a A=Oct 10th, 2017, B= Nov 7th, 2017, C=May 10th, 2018, D=May 30th, 2018

^b Take-all severity was visually assessed as percent disease. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).

Table 2: Mean turfgrass quality per plot at fairway height at Royal St. Patrick's Golf Course in Wrightstown, WI during 2017-18.

Treatment	Rate	Application Code ^a	Turf Quality ^b				
			Sept 14	Jun 25	Jul 12	Aug 7	
1	Nontreated Control		4.0-	6.8-	5.8-	6.0-	
2	Kabuto	0.5 fl oz/1000 ft2	ACD	5.0-	7.0-	5.5-	6.3-
3	Kabuto	1.05 fl oz/1000 ft2	ACD	4.5-	6.5-	6.0-	5.5-
4	Kabuto	1.6 fl oz/1000 ft2	AC	4.8-	7.0-	6.0-	6.5-
5	Kabuto	2.0 fl oz/1000 ft2	AC	4.8-	6.8-	6.0-	5.3-
6	Kabuto	3.2 fl oz/1000 ft2	A	5.3-	7.0-	6.3-	6.8-
7	Tekken	3.0 fl oz/1000 ft2	AC	5.0-	6.8-	6.0-	6.5-
8	Tekken	3.0 fl oz/1000 ft2	CD	5.3-	6.8-	5.5-	6.5-
9	Pinpoint	0.31 fl oz/1000 ft2	AB	5.0-	6.8-	4.8-	7.0-
10	Pinpoint	0.31 fl oz/1000 ft2	A	5.3-	6.8-	5.8-	6.8-
	Tourney	0.37 fl oz/1000 ft2	C				
11	Pinpoint	0.31 fl oz/1000 ft2	A	5.5-	7.0-	6.3-	6.5-
	Tourney	0.37 fl oz/1000 ft2	B				
12	Velista	0.5 fl oz/1000 ft2	ABCD	5.3-	7.0-	6.0-	6.5-
13	Heritage Action	0.4 fl oz/1000 ft2	ABCD	5.3-	7.0-	5.8-	6.3-
14	Velista	0.5 fl oz/1000 ft2	AC	4.0-	6.3-	4.8-	7.0-
15	Heritage Action	0.4 fl oz/1000 ft2	AC	4.8-	7.0-	6.3-	6.5-
16	A19649B	0.157 fl oz/1000 ft2	AC	5.5-	7.0-	5.8-	6.8-
	Headway	3.0 fl oz/1000 ft2	AC				
17	Headway	3.0 fl oz/1000 ft2	AC	5.3-	6.8-	6.3-	6.8-
18	A20866A	0.26 fl oz/1000 ft2	AC	5.8-	7.0-	5.8-	7.0-
19	A19649B	0.157 fl oz/1000 ft2	ABCD	5.0-	7.0-	5.8-	7.0-
	Headway	3.0 fl oz/1000 ft2	ABCD				
20	Headway	3.0 fl oz/1000 ft2	ABCD	5.0-	7.0-	6.3-	6.3-
21	A20866A	0.26 fl oz/1000 ft2	ABCD	5.5-	6.5-	5.5-	6.5-
LSD P=0.05				1.0	0.59	1.52	1.73

^a A=Oct 10th, 2017, B= Nov 7th, 2017, C=May 10th, 2018, D=May 30th, 2018

^b Turfgrass quality was rated visually on a 1 – 9 scale with 6 being acceptable. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).