

CURATIVE CONTROL OF TAKE-ALL PATCH WITH VARIOUS FUNGICIDES

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INTRODUCTION

Take-all patch (*Gaeumannomyces graminis* var. *avenae*) is a common disease of newly established creeping bentgrass (*Agrostis stolonifera*) fairways and putting greens. Disease symptoms generally appear during the late spring or early summer and may persist for several months. As infected bentgrass declines, unaffected weed species often invade dead patches resulting in a reduction in the overall turf quality.

In situations where turfgrass quality deteriorates or golf course playability is negatively impacted, chemical control strategies are often necessary. Although control is most efficacious when fungicides are applied during the spring and the fall when the pathogen is most active, curative control is often necessary when unexpectedly struck with the disease during the summer months. Due to difficulty to find suitable sites for research on this pathogen, chemical control information is limited. The purpose of this study is to identify effective fungicides for the curative control of take-all patch naturally occurring on a creeping bentgrass putting green.

MATERIALS & METHODS

The study is being conducted at the UConn Plant Science Research and Education Facility. The site consists of an 'A-4' creeping bentgrass putting green established in 2006. Following the establishment of the site, a severe outbreak of take-all patch was observed throughout the season in 2007 and again in the spring of 2008. A curative trial was initiated to assess the efficacy of various fungicides on controlling the disease. All treatments, rates and application timings are listed in the treatment table.

The study area consists of a native soil putting green with approximately 1 inch of topdressing applied between 2006 and 2008. The area was maintained as a creeping bentgrass putting green and mowed 5 times per week to height between 0.125 and 0.156 inches. The area received nitrogen applications in the spring and again in early summer with urea and ammonium sulfate, respectively. Plots measure 3 x 6' and are arranged as a randomized complete block design with 3 replications. All treatments were applied with a CO₂ pressurized (40 psi) sprayer equipped with an air-induction flat fan nozzle, and calibrated to deliver 2.0 gal water per 1000 ft². Treatments were applied during the summer of 2008 and will again be applied in the spring of 2009.

RESULTS

Take all patch was considered very severe in this study and treatments were initiated on 1 Jun when symptoms were already present. There were no differences in the percent plot area affected by take-all patch when treatments were initiated and plots had an average of 35% disease (Table 1). Disease symptoms were prominent during the summer months until a period of heavy rains occurred on 23 and 24 Jul. After these rain events, disease symptoms began to naturally subside and no differences were observed among treatments. In early to mid-Aug, disease symptoms once again resurged and differences among treatments were observed on 18 Aug. At this time, plots treated with Headway (2 applications, 3.0 fl oz) had the least amount of take all patch. Of the remaining treatments, only turf treated with Tartan, Heritage and 3336 had reduced the disease when compared to the untreated control plots. Following this rating, disease symptoms subsided in all plots.

DISCUSSION

Data collected from the first year of this multi-year study confirmed that curative control of take-all patch during the summer is difficult. Despite 2 applications, little suppression in percent disease was observed. When symptoms naturally faded following copious precipitation, however, differences in disease resurgence were observed. Plots treated with

thiophanate methyl or Heritage (alone or as a pre-mix with Banner) reduced disease symptoms when compared to the untreated control plots. It should be pointed out that the application of 3336 was made at an 8 fl oz rate, which is above the legal labeled rate for management of take-all. It is unclear if a rate effect would impact the reduction in disease severity observed in this trial.

Although no fungicides will be applied during the fall 2008, treatments will be initiated again in the spring prior to the onset of symptoms. Results from this study and two other studies seeking to identify the influence of application technology (post application irrigation and application volume), will hopefully improve our understanding of managing take-all patch on golf course putting greens.

Table 1. Curative control of take-all patch with various fungicides

Treatment and rate per 1000 sq ft	Application ^z timing	Percent take all ^y				
		20 Jun	3 Jul	20 Jul	1 Aug	18 Aug
ProStar 1.5 oz.....	AE	37 a ^x	37 a	25 a	13 a	19 a-e
Tartan 2.0 fl oz.....	AE	31 a	19 a	17 a	4 a	9 def
DPX-LEM 17-50-76 0.5 oz	ACEG	29 a	29 a	18 a	9 a	13 b-f
Headway 3.0 fl oz	AE	35 a	35 a	17 a	8 a	5 f
Heritage 2.0 fl oz	AE	36 a	23 a	16 a	9 a	7 ef
Disarm 0.36 fl oz.....	AE	31 a	25 a	25 a	14 a	17 a-f
Insignia 0.9 oz	AE	35 a	49 a	24 a	13 a	23 a-d
Compass 0.25 oz.....	AE	39 a	32 a	27 a	12 a	24 ab
Banner MAXX 4.0 fl oz	AE	20 a	22 a	18 a	6 a	11 b-f
Bayleton 2.0 fl oz	AE	47 a	46 a	36 a	7 a	10 c-f
Trinity 1.0 fl oz	AE	39 a	39 a	35 a	11 a	16 a-f
Triton 0.30 fl oz.....	AE	36 a	43 a	26 a	17 a	29 a
3336 8.0 fl oz.....	AE	40 a	35 a	13 a	4 a	9 ef
Untreated.....	-	32 a	34 a	23 a	10 a	23 abc

^z Treatments were applied as follows: A = 01 Jun, C = 18 Jun, E = 02 Jul, and G = 15 Jul.

^y Percent of the plot area infested by take all was visually rated on a 0 to 100 percent scale where 0 = no take all or 100 = entire plot covered with take all patch.

^x Means in a column followed by the same letter are not significantly different at P≤0.05 level according to the Fisher's protected least significant difference t-test.

Table 2. Curative control of take-all patch with various fungicides

Treatment and rate per 1000 sq ft	Application ^z timing	Take all severity ^y				
		20 Jun	3 Jul	20 Jul	1 Aug	18 Aug
ProStar 1.5 oz.....	AE	3.0 a ^x	3.7 a	3.0 a	3.7 a	3.7 a
Tartan 2.0 fl oz.....	AE	2.7 a	2.0 a	1.3 a	1.0 a	1.0 a
DPX-LEM 17-50-76 0.5 oz	ACEG	3.0 a	3.0 a	2.7 a	2.3 a	2.3 a
Headway 3.0 fl oz	AE	3.0 a	3.0 a	2.3 a	2.7 a	2.7 a
Heritage 2.0 fl oz	AE	3.3 a	2.3 a	2.0 a	2.3 a	2.3 a
Disarm 0.36 fl oz.....	AE	2.7 a	2.7 a	2.7 a	3.0 a	2.3 a
Insignia 0.9 oz	AE	3.3 a	3.3 a	2.7 a	3.0 a	2.3 a
Compass 0.25 oz.....	AE	3.7 a	3.0 a	2.7 a	3.7 a	3.0 a
Banner MAXX 4.0 fl oz	AE	2.7 a	2.7 a	2.3 a	1.7 a	2.3 a
Bayleton 2.0 fl oz	AE	3.3 a	3.3 a	2.7 a	2.3 a	2.7 a
Trinity 1.0 fl oz	AE	3.0 a	3.7 a	2.7 a	3.0 a	3.7 a
Triton 0.30 oz.....	AE	3.0 a	2.7 a	2.7 a	3.0 a	3.0 a
3336 8.0 fl oz.....	AE	2.7 a	2.7 a	1.7 a	1.0 a	0.7 a
Untreated.....	-	2.7 a	3.0 a	3.0 a	2.3 a	2.3 a

^z Treatments were applied as follows: A = 01 Jun, C = 18 Jun, E = 02 Jul, and G = 15 Jul.

^y Take all severity was rated on a 0 to 5 scale where 0 = no injury visible and 5 = entire plot invested with take all.

^x Means in a column followed by the same letter are not significantly different at P≤0.05 level according to the Fisher's protected least significant difference t-test.