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Abstract

All herbicide treatments at the Rocky Ford Research Center (RF) resulted in unacceptable control, as all plots resulted in 100% green bermudagrass cover by August 25, 2014. Any herbicide treatment combination that included glyphosate provided moderate or better control at Stagg Hill Golf Course (SH). Treatments not containing glyphosate showed no control throughout research trial.

Keywords

turfgrass, bermudagrass, bermudagrass control, glyphosate

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Late-Season Bermudagrass Control with Glyphosate, Fluazifop, and Mesotrione Combinations

Jake Reeves, Jared Hoyle, and Cole Thompson

Summary. All herbicide treatments at the Rocky Ford Research Center (RF) resulted in unacceptable control, as all plots resulted in 100% green bermudagrass cover by August 25, 2014. Any herbicide treatment combination that included glyphosate provided moderate or better control at Stagg Hill Golf Course (SH). Treatments not containing glyphosate showed no control throughout research trial.

Rationale. Applying glyphosate multiple times throughout the summer is a standard recommendation for removing bermudagrass. This application regime results in unsightly turfgrass and does not allow for spring renovation, if desired. Fall herbicide applications could possibly allow for bermudagrass control and spring renovation projects without turfgrass injury. Limited information exists on the control of bermudagrass as it transitions into dormancy.

Objectives. Examine efficacy of late-season bermudagrass removal using glyphosate, fluazifop, and mesotrione combinations.

Study Description. Experiments were initiated in 2013 in Manhattan, Kansas, at RF and SH. Research at RF and SH was conducted on hybrid 'Midlawn' bermudagrass [*Cynodon dactylon* L. Pers. × *C. transvaalensis* Burt-Davy] and common bermudagrass (*Cynodon dactylon* L. Pers.), respectively. Turfgrass was maintained at 7.6 cm. All treatments were applied October 9, 2013. Individual treatments are shown in Table 1. Experimental design was a randomized

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complete block with four replications. Herbicides were applied to 1.5 x 1.5 m plots in 374 L/ha water at 275 kPa with a CO₂ pressurized boom sprayer with XR8004VS flat-fan nozzles. Collected data included visual green bermudagrass cover (0 to 100%) and Normalized Difference Vegetation Index (NDVI). Data were collected every 14 days after initiation (DAI) until bermudagrass resulted in 0% green cover (October 31, 2013). Data collection resumed prior to spring greenup in May 2014. Means were separated using Fisher's Protected LSD ($P \leq 0.05$).

Results. A location interaction was observed and prevented pooling data across experimental sites (Figure 1, Table 2). At RF, plots treated with glyphosate resulted in slight delay in greenup. Ultimately, all treated plots reached 100% green bermudagrass cover by August 25, 2014. At SH, treatments that did not contain glyphosate resulted in a slight greenup delay but were completely covered by July 25, 2014. All combinations containing glyphosate at SH resulted in $\leq 28\%$ green bermudagrass cover. Further research will be conducted, examining the difference in varieties and in combination with spring applications before renovation.

Table 1. Treatment regime for late-season bermudagrass control for spring renovation.

Treatment no.	Herbicides	Rate
1	Not treated	
2	Glyphosate	2.35 kg/ha
3	Fluazifop ^a	0.42 kg/ha
4	Mesotrione ^a	0.28 kg/ha
5	Glyphosate + Fluazifop ^a	2.35 kg/ha 0.42 kg/ha
6	Glyphosate + Mesotrione ^a	2.35 kg/ha 0.28 kg/ha
7	Fluazifop + Mesotrione ^a	0.42 kg/ha 0.28 kg/ha
8	Glyphosate + Fluazifop + Mesotrione ^a	2.35 kg/ha 0.42 kg/ha 0.28 kg/ha

^a NIS (75% SAA) added to mix at 0.25% v/v.



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Table 2. Percent green cover of bermudagrass from spring greenup at Rocky Ford Research Center and Stagg Hill Golf Course on May 15, 2014, and July 25, 2014.

Treatment no.	Treatment	May 15, 2014		July 25, 2014	
		Midlawn	Common	Midlawn	Common
1	Not treated	26.3 ^a	72.5 a	100.0 a	100.0 a
2	Glyphosate	0.0 b	1.5 b	92.0 a	27.5 b
3	Fluazifop ^b	16.3 ab	67.5 a	100.0 a	100.0 a
4	Mesotrione ^b	20.0 ab	72.5 a	100.0 a	100.0 a
5	Glyphosate + Fluazifop ^b	0.0 c	0.8 b	92.5 a	27.5 b
6	Glyphosate + Mesotrione ^b	0.0 c	1.5 b	96.3 a	17.8 b
7	Fluazifop + Mesotrione ^b	11.3 bc	70.0 a	100.0 a	100.0 a
8	Glyphosate + Fluazifop + Mesotrione ^b	0.0 c	1.5 b	94.0 a	24.5 b

^a Means in columns for percent cover rating followed by the same letter are not significantly different according to Fisher's LSD at the 0.05 significance level.

^b NIS (75% SAA) added to mix at 0.25% v/v.



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Fig 1. Top: 'Midlawn' bermudagrass plots are almost entirely repaired and covered by July 14, 2014. Bottom: Common bermudagrass plots still show control on the same date.

