Bluegrass Tolerance to Mesotrione Applied in the Spring

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Abstract

Four studies were conducted in commercial fields of Kentucky and rough bluegrass grown for seed to evaluate the tolerance of bluegrasses to mesotrione applied at late vegetative and early reproductive growth stages. Both Kentucky bluegrass varieties were very tolerant to mesotrione at the rates and timings evaluated. Rough bluegrass was less tolerant than Kentucky, but early timings on rough bluegrass were safe.

Introduction

Butler et al. (2005) reported that fall applications of mesotrione (Callisto®, Syngenta) were effective for controlling creeping bentgrass (*Agrostis stolonifera*). Butler et al. (2005) also indicated that fall applications of mesotrione did not injure Kentucky bluegrass (*Poa pratensis*) and did not control rough bluegrass (*P. trivialis*). Turf researchers at Iowa State University have reported that neither fall nor spring applications of mesotrione injured Kentucky bluegrass turf (Jones and Christians 2006). This information is useful for developing management practices for volunteer Roundup Ready® (Monsanto) creeping bentgrass in subsequent grass seed crops. Even though rough bluegrass is a problematic weed in Kentucky bluegrass seed fields, it is also grown as a seed crop in central Oregon. Therefore, developing practices for controlling volunteer creeping bentgrass in rough and Kentucky bluegrass fields could be useful.

Materials and Methods

Four studies were conducted in commercial fields of Kentucky and rough bluegrass grown for seed. These studies evaluated the tolerance of Kentucky and rough bluegrasses to mesotrione applied at late vegetative and early reproductive growth stages. 'Shamrock' and 'Merit' Kentucky bluegrass and 'Saber III' and 'Dark Horse' rough bluegrass varieties were tested. 'Dark Horse' rough bluegrass was not harvested for seed yield.

Plots were 10-ft by 25-ft with four replications arranged as randomized complete blocks. Treatments were applied with a CO_2 backpack sprayer delivering 20 gal/acre operating at 20 psi and 3 mph. Application dates and bluegrass growth stages are listed in footnotes in Tables 1 and 2.

Results and Discussion

Both Kentucky bluegrass varieties were very tolerant to mesotrione at the rates and timings evaluated. 'Shamrock' Kentucky bluegrass had some injury from the late application timing (May 29) and was not as tolerant as 'Merit' (Table 1). 'Merit' Kentucky bluegrass had no injury and no treatment resulted in differences in seed yield. Rough bluegrass was less tolerant to mesotrione than Kentucky bluegrass (Table 2).

Rough bluegrass seed yields were reduced by a single late application and any of the sequential treatments that included a late application.

The sequential treatments tested in these studies are based on use patterns for turf management. It is unlikely that control of volunteer creeping bentgrass in bluegrass seed production fields will require the high frequency of applications shown here. Unfortunately, there was no creeping bentgrass present in these studies. Research in progress for 2007 will determine the efficacy of spring-applied mesotrione on creeping bentgrass.

Table 1. Kentucky bluegrass injury and seed yield following mesotrione applications near Madras, Oregon, in 2006.

Mesotrione rate[†]	Application code	Kentucky bluegrass injury, June 22		Kentucky bluegrass clean seed yield[‡]			
		'Shamrock'	'Merit'	'Shamrock'		'Merit'	
lb a.i./acre		---- % visual ----		-------- lb/acre --------			
Check	--	0	0	1,899	ab	1,275	a
0.25	A[§]	1	0	2,082	a	1,117	a
0.25	B[¶]	1	0	1,872	ab	1,187	a
0.25	C[#]	8	0	1,574	ab	1,106	a
0.25	A+B	0	0	1,808	ab	1,284	a
0.25	B+C	10	0	1,788	ab	1,246	a
0.25	A+C	8	0	1,577	ab	1,282	a
0.25	A+B+C	15	0	1,562	ab	941	a
0.5	A	0	0	1,888	ab	1,328	a
0.5	B	0	0	1,847	ab	1,056	a
0.5	C	18	0	1,704	ab	929	a
0.5	A+B	3	0	1,972	ab	1,177	a
0.5	B+C	16	0	1,538	ab	1,158	a
0.5	A+C	15	0	1,641	ab	1,147	a
0.5	A+B+C	18	0	1,363	b	1,234	a
LSD (0.05)		--	--	349		337	

† All treatments applied with crop oil concentrate at 1.0 percent v/v.
‡Means followed by the same letter do not significantly differ.
§'A' applied on April 24, 2006; Kentucky bluegrass was fully tillered.
¶ 'B' applied on May 11, 2006; Kentucky bluegrass was in the boot stage.
# 'C' applied on May 29, 2006; Kentucky bluegrass was pollinating.

Table 2. Rough bluegrass injury and seed yield following mesotrione applications near Madras, Oregon in 2006.

Mesotrione rate[†]	Application code	Rough bluegrass injury, June 22		Rough bluegrass clean seed yield[‡]	
		'Saber III'	'Dark Horse'	'Saber III'	
lb a.i./acre		------- % visual -------		lb/acre	
Check	--	0	0	969	ab
0.25	A[§]	0	0	962	ab
0.25	B[¶]	0	0	930	ab
0.25	C[#]	10	9	658	bc
0.25	A+B	0	0	1056	a
0.25	B+C	15	23	432	cd
0.25	A+C	10	11	713	bc
0.25	A+B+C	18	28	433	cd
0.5	A	0	0	1045	a
0.5	B	0	10	743	b
0.5	C	20	18	363	d
0.5	A+B	0	11	715	bc
0.5	B+C	30	40	165	de
0.5	A+C	15	15	278	de
0.5	A+B+C	30	40	85	e
LSD (0.05)		--	--	208	

† All treatments applied with crop oil concentrate at 1.0 % v/v.
‡ Means followed by the same letter do not significantly differ.
§ 'A' applied on April 24, 2006; rough bluegrass was fully tillered.
¶ 'B' applied on May 12, 2006; rough bluegrass was in the boot stage.
# 'C' applied on May 29, 2006; rough bluegrass was pollinating.

References

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