

Response of Poa annua to Post Emergence Application of Sulfentrazone Herbicide

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Abstract

Poa annua (annual bluegrass) is a major weed problem in winter turfs. It is a cosmopolitan and well adapted weed in most turfgrass settings. Cultural management programs to control or eliminate Poa annua are either limited or unsuccessful. Sulfentrazone herbicide was applied to perennial ryegrass turf (as overseeded bermudagrass) which had high levels of Poa annua infestation (45%-75%) at 0.125, 0.250 and 0.375 lb. AI/A. There was essentially a limited response of Poa annua to Sulfentrazone at these rates when applied on March 7, 1997. EMBARK LITE (Mefluidide) was applied once at 0.125 lb. AI/A and caused some initial discoloration to the turf at 10 DAT. At 25 DAT percent control of Poa annua (seed heads) reached 90% or greater which declined to 58% on April 15 (40 DAT). Turfgrass color was enhanced from the single application of Mefluidide at 25 and 40 DAT on golf course rough turf maintained at a mowing height of 1.50 inches. Sulfentrazone exhibited minimal or no effect on Poa annua when applied as a post emergence treatment.

Introduction

Annual bluegrass (Poa annua) is perhaps the single most troublesome grassy turf weed. As a winter annual, it germinates in early fall, becomes visible in overseeded turf in late December and early January, and then flowers incessantly in March and early April. Pre-emergence control is realistically limited to Rubigan (fenarimol), which is applied to two or three applications before overseeding. Cost limitations usually limit treatment applications to bermudagrass tees and greens.

Due to the cosmopolitan existence of Poa annua and its great persistence, a herbicide for pre-emergence control of this weed which would not interfere with fall overseeding, is extremely desirable for the entire turfgrass industry. Sulfentrazone herbicide was evaluated for post emergence control of Poa annua, maintained under golf course rough conditions when overseeded with perennial ryegrass.

Materials and Methods

A heavily infested site of Poa annua was selected on an irrigated and mowed golf course rough in Green Valley, Arizona. A uniform area was marked for plot treatments. Plot size was 40" X 60". Each plot was sprayed with a twenty inch band (½ of the plot), while the other half served as the control plot. Treatments were applied on March 7 as follows. Sulfentrazone at 0.125, 0.250 and 0.375 lbs. AI/A. Embark Lite (Mefluidide) was also applied at 0.125 lb. AI/A. Treatments were applied with a CO₂ backpack sprayer with an 8004E nozzle at 28 psi, delivery a final solution delivery rate of 56 gpa. Plots were irrigated fourteen hours after the 6:30 am treatment on March 7.

Plots were evaluated for percent injury, turfgrass color, and percent annual bluegrass control on two applicable dates when expression was adequate from March 17 to April 15, 1997. Weed control was expressed as the percent reduction (or suppression) of Poa annua in the treated plot half versus that of the respective control plot.

Results and Discussion

Weed Control

On March 17, Poa annua reduction occurred at low levels for treated plots. Sulfentrazone at the 0.250 and 0.375 lbs. AI/A rates had basically 25% reduction in Poa annua (as seed heads)(Table 1). Mefluidide and Sulfentrazone at 0.125 lb. AI/A rates had 7% or less visible suppression. On April 2, the Mefluidide treated plots showed very good seed head suppression at 91% (Table 1). This treatment did not eliminate the predominate stand of Poa annua, but suppressed seed head emergence and made the Poa annua slightly darker in color. Sulfentrazone treated turfs had 2%-23% suppression, only, with essentially no response at the low rate of 0.125 lb. AI/A (Table 1). By April 15, percent weed control (seed head suppression) decreased to 57% for Mefluidide and to 9%-13% for Sulfentrazone treated turfs, respectively (Table 1). Based on the rates and application timing made here, Sulfentrazone had a low activity effect on Poa annua when applied post emergence. Mefluidide showed very good activity at the 0.125 lb. AI/A rate and based on these observations would require multiple applications anywhere from 4-5 weeks apart to suppress flowering.

Turfgrass Response

Percent plot injury mean scores ranged from 1%-2% on 17 March, for Sulfentrazone treated turfs, to 29% for Mefluidide (Table 2). The injury was essentially in the form of leaf-tip twisting of the annual bluegrass, which predominated the plots in relation to perennial ryegrass.

Turfgrass color scores ranged from 4.0 to 6.5 on April 2, 1997 (Table 2). The enhanced color of Poa annua, followed the initial injury (on March 17 ratings) from Mefluidide. This is often a typical latent response of turfgrasses. By April 15, turfgrass color scores were very low due to extreme flowering of Poa annua, which decreased the color of the "vegetative" portion of the plant itself. Note again, that Poa annua was the predominate species compromising the turf, for weed control purposes.

Conclusions

1. Applied to late winter season flowering Poa annua in overseeded bermudagrass turf, Sulfentrazone herbicide had low-level activity for both vegetative or seed head suppression.
2. The low rate of 0.125 lb. AI/A provided essentially no control/suppression while the 0.250 and 0.375 lbs. AI/A rates yielded 18%-26% control via seed head suppression.
3. This level of control lasted for about 35 days, then declined drastically.
4. Mefluidide applied once at the 0.125 lb. AI/A rate, induced temporary injury to the Poa annua, and then resulted in 91% mean seed head suppression. Repeat applications would needed to be made to promote extended seed head suppression.
5. Sulfentrazone does not appear to reduce/suppress Poa annua as a post emergence herbicide at rates and timings tested here.

Table 1. Percent weed control¹ of annual bluegrass (*Poa annua*) after applications of Sulfentrazone and Mefluidide. University of Arizona, 1997.

TREATMENT	RATE ² LB. AI/A	17 MAR (15DAT)	2 APR (25DAT)	15 APR (40DAT)
Sulfentrazone	0.125	7%	2%	9%
Sulfentrazone	0.250	26%	23%	12%
Sulfentrazone	0.375	25%	18%	13%
Mefluidide	0.125	4%	91%	57%
Test Mean ³		16%	33%	22%
LSD Value ⁴		NA	35%	17%

¹Weed control, expressed as percent reduction versus control plots. Values are the mean of four replications.

²Rates in lbs. active ingredient per acre. Treatments applied March 7, 1997.

³Mean of all treatments per evaluation date.

⁴LSD values = LSD mean separation statistic. Entry means which differ in value greater than the LSD value are significantly different from each other.

Table 2. Mean percent injury¹ and color scores² of overseeded turf with high infestation levels of *Poa annua*, after treatment with Sulfentrazone or Mefluidide herbicides applied post emergence³. University of Arizona, 1997.

TREATMENT	RATE ² LB. AI/A	% INJURY		COLOR	
		17 MAR (10DAT)	2 APR (25DAT)	15 APR (40DAT)	
Sulfentrazone	0.125	2%	4.0	2.8	
Sulfentrazone	0.250	1%	5.0	3.5	
Sulfentrazone	0.375	2%	4.3	2.8	
Mefluidide	0.125	29%	6.5	5.0	
Control	--	0%	4.8	3.5	
Test Mean ⁴		7%	4.9	3.5	
LSD Value ⁵		13%	0.7	0.9	

¹Percent plot injury = (0-100%). Discoloration. Values are the mean of four replications.

²Color = (1-9), 1 = dead, 9 = dark green. Values are the mean of four replications.

³Treatments applied to overseeded turf March 30, 1997. Plots 40%-70% *Poa annua*. 30%-60% rye.

⁴Mean of all treatments per evaluation date.

⁵LSD values = LSD mean separation statistic. Entry means which differ in value greater than the LSD value are significantly different from each other.