Post Emergence Control of Broadleaf Weeds and Phytotoxicity Evaluations

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Introduction

Broadleaf weed control and phytotoxicity evaluations were conducted on a stand of mature 'SR-4200' perennial ryegrass (*Lolium perenne* L.) at the Valentine Turfgrass Research Center, Penn State University, University Park, Pa. The objectives of the study were to determine the efficacy of selected broadleaf weed herbicides for the control of dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*), and buckhorn plantain (*Plantago lanceolata*) in perennial ryegrass and the phytotoxicity of these compounds on perennial ryegrass.

Methods and Materials

All plots were rated for the percent dandelion, white clover, and buckhorn plantain prior to the application of any treatment on a plot by plot basis. The test plots were 21 ft^2 and had approximately 80 percent broadleaf weed cover.

The study was a randomized complete block design with three replications. All of the treatments were applied on May 22, 2006 using a three foot CO_2 powered boom sprayer calibrated to deliver 40 gpa using one, flat fan, 11004E nozzle at 40 psi.

The test site was mowed at one and one half inches weekly with a rotary mower with clippings returned to the site. The test site was irrigated to prevent moisture stress.

Results and Discussion

Turfgrass phytotoxicity was rated three times during the study (Table 1). No turfgrass phytotoxicity was found during the study.

The percent control of dandelion, white clover and buckhorn plantain was rated seven times during the study (Table 2). The percent control was somewhat variable during the rating period. On the final rating date, August 15, 2006, all treated turfgrass had a significant reduction in all the weed populations when compared to non treated turfgrass. There was a trend, of all treated turfgrass, that revealed a slight decrease in the control of dandelion by the final rating date. Only turfgrass treated with EH 1382 fell below the 70 percent control level of dandelion while all other treated turfgrass had at least 70 percent control or greater. During the evaluation period the non treated turfgrass broadleaf weed population remained constant.

To better determine the control of these broadleaf weed populations over time, in the late spring/early summer of 2007 further evaluations will be conducted and reported. It should be stated that a single application of broadleaf weed herbicides to a high population of weeds such as this test site have produced very good results to date. With this type of weed population one would expect that a second application of materials would be necessary to completely eradicate the weeds.

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Table 1. Evaluations of turfgrass phytotoxicity in 2006 where 0 = worst, 7 = acceptable and 10 = no phytotoxicity.

Treatment	Form	Rate	(----------Phytotoxicity---------)		
		PT/A	5/31	6/7	6/14
EH 1381	L	4	10.0	10.0	10.0
EH 1406	L	4	10.0	10.0	10.0
CHECK			10.0	10.0	10.0
EH 1403	L	4	10.0	10.0	10.0
EH 1411	L	4	10.0	10.0	10.0
EH 1382	L	5	10.0	10.0	10.0

Table 2. Percent control of the dandelion, white clover, and buckhorn plantain populations following applications of selected herbicides.

Treatment	Form	Rate	(----------May 31, 2006 [1] -------)			(----------June 7, 2005 ----------)		
		PT/A	Dand	Clover	Plant	Dand	Clover	Plant
EH 1381	L	4	76.7a	85.0a	66.7a	96.7a	96.1a	96.7a
EH 1406	L	4	53.9ab	79.2a	46.9a	82.8a	95.0a	87.2a
CHECK			16.7b	0.0b	0.0a	0.0b	0.0b	0.0b
EH 1403	L	4	81.6a	91.6a	80.4a	92.7a	98.7a	90.8a
EH 1411	L	4	91.7a	88.9a	80.4a	100.0a	100.0a	100.0a
EH 1382	L	5	90.0a	80.8a	63.3a	83.3a	91.7a	90.0a

1- Means followed by same letter do not significantly differ (P=0.05, Duncan's New MRT)

Table 2 (continued). Percent control of the dandelion, white clover, and buckhorn plantain populations following applications of selected herbicides.

Treatment	Form	Rate	(----------June 14, 2006 [1]-------)			(----------June 20, 2005 ----------)		
		PT/A	Dand	Clover	Plant	Dand	Clover	Plant
EH 1381	L	4	96.7a	97.2b	100.0b	100.0a	100.0a	100.0a
EH 1406	L	4	100.0a	99.2ab	100.0a	97.2a	100.0a	98.5a
CHECK			0.0b	0.0c	0.0e	0.0c	0.0c	0.0b
EH 1403	L	4	95.0a	99.9a	100.0d	75.6b	97.5b	100.0a
EH 1411	L	4	100.0a	100.0a	100.0c	100.0a	100.0a	100.0a
EH 1382	L	5	93.3a	100.0a	100.0b	96.7a	100.0a	93.3a

1- Means followed by same letter do not significantly differ (P=0.05, Duncan's New MRT)

Table 2 (continued). Percent control of the dandelion, white clover, and buckhorn plantain populations following applications of selected herbicides.

Treatment	Form	Rate	(----------June 30, 2006 [1]-------)			(----------July 18, 2005 ----------)		
		PT/A	Dand	Clover	Plant	Dand	Clover	Plant
EH 1381	L	4	93.3a	97.2a	100.0a	90.0a	100.0a	100.0a
EH 1406	L	4	92.8a	97.5a	87.2a	89.4a	98.3a	100.0a
CHECK			0.0b	0.0b	0.0b	0.0b	0.0b	0.0b
EH 1403	L	4	94.7a	96.9a	92.4a	74.4a	97.2a	100.0a
EH 1411	L	4	95.0a	100.0a	100.0a	95.0a	98.9a	100.0a
EH 1382	L	5	76.7a	98.3a	93.3a	76.7a	100.0a	100.0a

1- Means followed by same letter do not significantly differ (P=0.05, Duncan's New MRT)

Table 2 (continued). Percent control of the dandelion, white clover, and buckhorn plantain populations following applications of selected herbicides.

Treatment	Form	Rate	(----------August 15, 2006 [1] -------)		
		PT/A	Dand	Clover	Plant
EH 1381	L	4	93.3a	98.9a	100.0a
EH 1406	L	4	70.6a	95.0a	100.0a
CHECK			0.0c	0.0b	0.0b
EH 1403	L	4	71.6a	99.3a	98.2a
EH 1411	L	4	91.7a	98.9a	98.2a
EH 1382	L	5	33.3b	89.2a	93.3a

1- Means followed by same letter do not significantly differ (P=0.05, Duncan's New MRT)