

# Post Emergence Control of Broadleaf Weeds and Phytotoxicity Evaluations

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## Introduction

Broadleaf weed control and turfgrass 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 by recording the population of dandelion, white clover, and buckhorn plantain species prior to the application of any treatment, on a plot by plot basis. The rating was conducted by way of visual interpretation. This was repeated following the application of materials and a percent control of the population was produced. The test plots were 18 ft<sup>2</sup> and had approximately 75 percent broadleaf weed cover.

The study was a randomized complete block design with three replications. Applications were applied to wet foliage on June 8, 2012 (BLEAF) using a three foot CO<sub>2</sub> powered boom sprayer (Figure 1) calibrated to deliver 40 gpa using one, flat fan, TP9504EVS nozzle at 40 psi .

The test site (Figure 2) was mowed at three 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 twice during the study (Table 1). No phytotoxicity was observed during the study.

The control of dandelion, white clover, and buckhorn plantain was rated four times during the study (Table 2). Broadleaf weed control was variable until the final rating date. On the final rating date, July 18, 2012, all treated turfgrass significantly reduce the dandelion, white clover and buckhorn plantain populations when compared to non treated turfgrass. The range of the dandelion population control was from about 94% to 100%. Similarly, excellent control of white clover (all treated controlled to 100%) was observed. Finally, the reduction of the buckhorn plantain population ranged from about 99 to 100%.

It is obvious that these materials are controlling these weed populations near the 100% level with only one application and without any phytotoxicity to the perennial ryegrass.

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**Table 1.** Evaluations of turfgrass phytotoxicity in 2012 where 0 = dead turf, 7 = acceptable, and 10 = no phytotoxicity.

Treatment	Form	Rate pt/A	Timing	(--Turf Phytotoxicity--)	
				6/11	6/14
QUALI PRO 17202	3.843L	2.5	BLEAF	10.0	10.0
QUALI PRO 17203	4.162L	2.5	BLEAF	10.0	10.0
QUALI PRO 2-D	3L	1	BLEAF	10.0	10.0
CHECK				10.0	10.0
QUALI PRO 2-D	3L	2	BLEAF	10.0	10.0
QUALI PRO 3-D	3.3L	3	BLEAF	10.0	10.0
QUALI PRO 3-D	3.3L	4	BLEAF	10.0	10.0
TRIPLET SF	3.23SL	4	BLEAF	10.0	10.0
MILLENIUM	3.55SL	2.5	BLEAF	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 pt/A	Timing	(------June 14, 2012 <sup>1</sup> -----)			(------June 22, 2012 <sup>1</sup> -----)		
				Dand	Clover	Plant	Dand	Clover	Plant
QUALI PRO 17202	3.843L	2.5	BLEAF	0.0a	0.0a	0.0a	61.9b	100.0a	86.1ab
QUALI PRO 17203	4.162L	2.5	BLEAF	0.0a	0.0a	0.0a	64.6ab	100.0a	94.4a
QUALI PRO 2-D	3L	1	BLEAF	0.0a	0.0a	0.0a	73.8ab	100.0a	80.0b
CHECK				0.0a	0.0a	0.0a	0.0c	0.0b	0.0c
QUALI PRO 2-D	3L	2	BLEAF	0.0a	0.0a	0.0a	66.0ab	100.0a	93.3a
QUALI PRO 3-D	3.3L	3	BLEAF	0.0a	0.0a	0.0a	66.0ab	100.0a	94.4a
QUALI PRO 3-D	3.3L	4	BLEAF	0.0a	0.0a	0.0a	76.7a	100.0a	86.7ab
TRIPLET SF	3.23SL	4	BLEAF	0.0a	0.0a	0.0a	69.0ab	100.0a	90.0a
MILLENIUM	3.55SL	2.5	BLEAF	0.0a	0.0a	0.0a	61.3b	100.0a	90.0a

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

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

Treatment	Form	Rate pt/A	Timing	(------July 4, 2012 <sup>1</sup> -----)			(------July 18, 2012 <sup>1</sup> -----)		
				Dand	Clover	Plant	Dand	Clover	Plant
QUALI PRO 17202	3.843L	2.5	BLEAF	97.1ab	100.0a	100.0a	97.1ab	100.0a	100.0a
QUALI PRO 17203	4.162L	2.5	BLEAF	93.9b	100.0a	100.0a	93.9b	100.0a	100.0a
QUALI PRO 2-D	3L	1	BLEAF	96.8ab	100.0a	98.7a	96.8ab	100.0a	98.7a
CHECK				0.0c	0.0b	0.0b	0.0c	0.0b	0.0b
QUALI PRO 2-D	3L	2	BLEAF	97.9ab	100.0a	100.0a	97.9ab	100.0a	100.0a
QUALI PRO 3-D	3.3L	3	BLEAF	97.7ab	100.0a	100.0a	97.7ab	100.0a	100.0a
QUALI PRO 3-D	3.3L	4	BLEAF	100.0a	100.0a	100.0a	100.0a	100.0a	100.0a
TRIPLET SF	3.23SL	4	BLEAF	96.8ab	100.0a	100.0a	96.8ab	100.0a	100.0a
MILLENIUM	3.55SL	2.5	BLEAF	98.9a	100.0a	100.0a	98.9a	100.0a	100.0a

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



*Figure 1: CO<sub>2</sub> powered boom sprayer used for applying liquid materials.*



*Figure 2: Representative overview of broadleaf trial at the conclusion. Photo taken 8/15/12.*