

Control of Buckhorn Plantain in Irrigated Pasture 2011 IPM/SA Grant Program

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Materials and Methods

The site was chosen in Wasatch County, it was heavily infested with buckhorn plantain. Site was approximately 12 acres and was divided into eighteen sections measuring 50' X 475'. Site was an irrigated pasture comprised of perennial grasses. Site had not been fertilized



Plantain plot, approximately 12 acres, Heber City, Utah

An experiment was established on April 19, 2011 to evaluate chemical control of Buckhorn Plantain with chlorsulfuron, metsulfuron, triclopyr, 2,4-D, and 2,4-D amine, all have plantain on their labels. The experiment was designed as randomized complete block with individual plots measuring 50 by 475 feet and treatments were replicated three times. Herbicides were applied on May 4, 2011 when plantain was in the early rosette stage. All treatments were applied using a trailer mounted boomless sprayer pulled by an ATV at 3 mph. The sprayer used boomless nozzles and was calibrated to deliver 11 gallon per acre, the spray width was approximately 25 feet.



Counting the plants in a 1/4 meter circle on June 10.

Plants were counted on June 10, July 12, and August 9 of 2011. Counting was accommodated by using a 1/4 meter circle, randomly thrown 10 times in each section on each date. Plant health was assessed in each individual section as a percentage of visual injury and a percentage of visual reduction in each stand on each date.

Pasture was irrigated with gravity flow wheel line, approximately every ten days. No amendments were made to soil. Pasture was grazed by one to six horses during the trial period. The objective of the trial was to find the least cost product that provided the most control of plantain.



Section 301, Metsulfuron treatment.

Herbicides used in trial were triclopyr in the form of Garlon 3A applied at 2 pints per acre with a surfactant. Chlorsulfuron in the form of Telar XP applied at 1/2 ounce per acre with a surfactant. Metsulfuron in the form of Escort applied at 1/2 ounce per acre with a surfactant. 2,4-D in the form of Weedmaster applied at 4 pints per acre. 2,4-D Amine in the form of Weedar 64 applied at 4 pints per acre.

Abstract

Buckhorn plantain (*Plantago lanceolata*) is a weed with increasing significance in Wasatch County. Other names for buckhorn plantain are narrow-leaf plantain, ribwort plantain, English plantain, and ribgrass. Plantain is a problem because it uses up soil nutrients, water, light and crowds out desirable plant species. Experiments were conducted during spring 2011 on a 12 acre site in Wasatch County, heavily infested with buckhorn plantain, to compare the effectiveness of five herbicides (chlorsulfuron, metsulfuron, triclopyr, 2,4-D, and 2,4-D amine) listed on their label to control plantain. The site was divided into eighteen equal sections (50 feet wide by 425 feet deep, and each herbicide applied to 3 randomly assigned sections. The three remaining sections received no herbicide treatment and served as the comparison for determining the percent reduction in the incidence of plantain achieved by the herbicides. Application of the pesticides decreased the incidence of plantain by 52%, 0%, 68%, 63% and 64%, respectively. Incidence was measured by random sample of tossing quarter square meter, ten times in each section, replicated at one month intervals three times. Plans for the coming year are to duplicate the trial using the two most effective herbicides from 2011 and adding three additional herbicides.

Introduction

Buckhorn plantain (*Plantago lanceolata*) is a weed with increasing significance in Wasatch County. It is invading alfalfa fields and pastures in the Wallsburg and Heber valleys. Other names for buckhorn plantain are narrow-leaf plantain, ribwort plantain, English plantain, and ribgrass. Plantain is a problem because it reduces the health of the plants that remain by crowding out desirable plant species and using up soil nutrients, water, and light. Buckhorn plantain grows in both wet and dry periods, but tends to dominate pastures in very dry situations



Plantain in field on July 12 in an untreated plot.

Buckhorn plantain is a cool season perennial, which means it grows best in the spring or fall and its rootstock survives the winter. It reproduces by seeds and roots (taproot). The root systems are fairly weak. It forms a rosette with dark-green, narrow, lance-like leaves with sharp tips and prominent veins. Leaves are between 3 and 12 inches long and 3/4 to 1 1/2 inches wide with 3 to 5 veins. It has flower stalks from 12 to 18 inches tall. Flowers are tightly clustered at the ends of long stems. The inflorescences, or flower clusters, resemble a large caliber bullet. Flowers occur from May to October. The base and crown are covered with tan, woolly hairs. Its boat-like seeds are black and shiny and about 1/16 inches long. Buckhorn plantain is well adapted to irrigated areas where frequent mowing or grazing is practiced. This includes lawns, pastures, and alfalfa fields. Buckhorn plantain will tolerate drought when it is well established.

Results

Based on the numbers during the study, Metsulfuron, 2,4-D, and 2,4-D Amine showed significant differences at the 68 and 99 DAT (Days After Treatment) in all three categories; plants per square foot, percentage visual reduction in stand, and percentage visual injury. It should be noted that metsulfuron and chlorsulfuron showed some damage to the grass, especially at the 36 DAT stage. Estimates were 50% grass reduction for metsulfuron and 30% grass reduction for chlorsulfuron. Metsulfuron was the least cost at \$2.63 per acre, followed by the 2,4-D, Amine and 2,4-D which were both \$12.00 per acre. Results were analyzed using Student-Newman-Keuls, P=.05.



Field view of treatments, control on right.

Conclusions

The conclusions of this study indicated that the herbicides metsulfuron, 2,4-D, and 2,4-D amine had significant differences at the 68 and 99 day after treatment counts, % visual reduction, and % stand reduction. They each showed significant differences. They were also the least cost applications for this trial. Further study should include using the herbicides from this trial and adding some combinations of herbicides from this trial for added benefits. It is also recommended to reduce the size of the treatment sites.

Treatment	36 DAT	68 DAT	99 DAT
	Plants per square foot		
1-Control	12.1 a	34.5 a	24.0 a
2-Triclopyr	8.4 a	11.7 bc	11.6 ab
3-Chlorsulfuron	8.2 a	21.3 b	25.0 a
4-Metsulfuron	12.3 a	3.3 c	5.2 b
5-2,4-D	15.6 a	7.8 c	6.6 b
6-2,4-D, Amine	10.23 a	4.6 c	6.3 b

Treatment	36 DAT	68 DAT	99 DAT
	% Visual Reduction In Stand		
1-Control	0-a	0-a	0-a
2-Triclopyr	58 b	57 c	53 b
3-Chlorsulfuron	62 b	27 b	23 ab
4-Metsulfuron	63 b	73 c	57 b
5-2,4-D	66 b	77 c	63 b
6-2,4-D, Amine	66 b	67 c	63 b

Treatment	36 DAT	68 DAT	99 DAT
	Plant Health---% Visual Injury		
1-Control	0-a	0-a	0-a
2-Triclopyr	58 b	43 b	15 ab
3-Chlorsulfuron	62 b	35 b	11 ab
4-Metsulfuron	63 b	85 c	25 bc
5-2,4-D	66 b	78 c	38 c
6-2,4-D, Amine	66 b	78 c	34 c

Treatment	Rate of Application	Cost/Acre	Surfactant	Total/Acre
Triclopyr	2pts/ac .25% v/v	\$18.00	\$1.25	\$19.25
Chlorsulfuron	0.5 oz/ac .25%v/v	\$10.62	\$0.13	\$10.75
Metsulfuron	0.5 oz/ac .25%v/v	\$2.50	\$0.13	\$2.63
2,4-D	4 pts/ac	\$12.00	n/a	\$12.00
2,4-D, Amine	4 pts/ac	\$12.00	n/a	\$12.00



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