Utah IPM/SA Mini-Grant Final Report for 2012

Title: Control of Buckhorn Plantain in Pastures, Forages, and Waste Areas in Wasatch County

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Total Grant Award: $1813

Location: Heber City, Wasatch County, Utah

Objectives:

1. Determine which herbicide will control buckhorn plantain in pasture and forage lands which will be the least cost for producers.
2. Establish a weed control demonstration site for landowners, producers, and the public to view the results.
3. Education and public awareness of best herbicide to control buckhorn plantain.
4. Provide the public, landowners, and producers with a fact sheet and powerpoint on the results of the project.

Summary:
A field trial was conducted in 2012 to evaluate chemical control of Buckhorn Plantain with chlorsulfuron, metsulfuron, dimethylamine salt of dicamba, and 2,4-D amine. The experiment was designed as randomized complete block with individual plots measuring 10 by 30 feet and treatments were replicated four times. Herbicides were applied when plantain was in the early rosette stage. All treatments were applied using CO2 backpack sprayer calibrated for each herbicide at recommended levels. The objective of the trial was to determine which herbicide would be most productive and least cost for local producers.

Results:

Treatment	35 DAT	59 DAT	92 DAT
	Plants per square foot (P ft2)	Plants per square foot (P ft2)	Plants per square foot (P ft2)
1.Control	27.7 a	50.5 a	37.8 a
2. Chlorsulfuron	25.6 ab	43.6 a	41.0 ab

3. Metsulfuron	15.0 b	7.5 c	14.0 d
4.dimethylamine salt of dicamba	41.2 a	47.4 a	44.6 ab
5.2, 4-D, Amine	23.5 ab	30.4 b	30.4 bcd
6.Chlorsulfuron/ 2,4-D, Amine	21.8 ab	28 b	26.5 bcd
7. Metsulfuron/ 2,4-D Amine	9.4 b	7.9 c	16.2 d
8.Chlorsulfuron/ dimethylamine salt of dicamba	42.5 a	52.7 a	55.0 a
9.Metsulfuron/ dimethylamine salt of dicamba	22.7 ab	9.0 c	20.3 cd

Table 1. DAT= Days after Treatment

Table 1 indicates number of plants per square foot 35, 59, and 92 days after treatment. The letter following the number explains significant difference. In column 1 all letters are "a or ab" indicating no significant difference at this time. In column 2 and 3 the b's, c's, and d's indicate significant difference at the 68 and 99 days after treatment.

Table 2 indicates the percent of visual health in the plantain stand. The first measurement has significant difference as well as the 68 and 99 days after treatment.

Treatment	35 DAT	59 DAT	92 DAT
	% Healthy Plants in Stand	% Healthy Plants in Stand	% Healthy Plants in Stand
1.Control	10 a	10 a	10 a
2. Chlorsulfuron	8.16 ab	8.58 a	8.58 a
3. Metsulfuron	3.16 c	4.25 bc	4.25 c
4.dimethylamine salt of dicamba	9.16 a	9.33 a	8.75 ab
5.2, 4-D, Amine	6.83 b	7.74 a	6.5 bc
6.Chlorsulfuron/ 2,4-D, Amine	6.91 b	8.58 a	6.58 bc
7. Metsulfuron/ 2,4-D Amine	3.42 c	3.16 c	4.16 c
8.Chlorsulfuron/ dimethylamine salt of dicamba	7.25 ab	8.83 a	8.83 ab
9.Metsulfuron/ dimethylamine salt of dicamba	3.25 c	5.16 b	5.33 c

Table 2. Percent healthy plants in the Buckhorn Plantain stand.

Table 3 indicates the application rates and the total cost per acre for treating buckhorn plantain infested pastures. 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 pasture grass especially at the 36 DAT stage. Metsulfuron was the least cost at $5.29 per acre, followed by metsulfuron and dimethylamine salt of dicamba combination at $9.00 per acre. Results were analyzed using Student-Newman-Keuls, P=.05.

Treatment	Application Rates	Cost/Acre	Surfactant	Total/Acre
Chlorsufuron	1 ounce/ acre	$16.48	$0.13	$16.61
Metsulfuron	1 ounce/ acre	$5.16	$0.13	$5.29
dimethylamine salt of dicamba	1 quart/acre	$14.84	$0.13	$14.97
2, 4-D, Amine	4 pints/acre	$12.28	$0.13	$12.41
Chlorsulfuron/ 2,4-D, Amine	1 ounce/acre/ 4 pints/ acre	$28.76	$0.13	$28.89
Metsulfuron/ 2,4-D Amine	1 ounce/acre/ 4 pints/ acre	$17.44	$0.13	$17.57
Chlorsulfuron/ dimethylamine salt of dicamba	1 ounce/acre/ 8 ounces/acre	$18.02	$0.13	$18.15
Metsulfuron/ dimethylamine salt of dicamba	1 ounce/acre/ 8 ounces/acre	$8.87	$0.13	$9.00

Table 3. Application rates and cost per acre.

Problems:

There were no major problems in the 2012 year.

Evaluation and Impact:

A. The project was evaluated on which chemicals delivered at the least cost. This could possibly affect hundreds of acres in Wasatch County especially on small farms and ranches of five to twenty acres. The total impact cannot be measured until the conclusion of the 2012 study to see if we can control plantain on a higher level with less cost.

B. Knowledge and Skills: Results for NACAA meeting in South Carolina.

Improved Awareness of Topic:	14 yes	0 no
Provided new knowledge:	14 yes	0 no
Provided new skills:	11 yes	3 no
Modified opinions/attitudes:	12 yes	2 no
People estimated to share with in next 12 months: 135		
I will use in an education program:	9 yes	2 no
Use as a resource:	11 yes	0 no
Use as professional development:	5 yes	4 no
Use as council for producers	11 yes	0 no

C. We could become the Buckhorn Plantain professionals as very little research or knowledge is available. Most do not even know what plantain is or how to treat it. Most being the crop specialists in Utah and southern Idaho, other agents, and professional people that I made contact with.

Educational Outreach:

A. Poster was developed and shared at Wasatch Conservation District, Wasatch Weed Management Cooperative, and at Annual Conference. It will be hung in the court house after annual conference. Fact sheet has been updated and submitted to fast tract at USU. Power point will be presented at Annual Conference and at other meetings where invited to present. Calls to the Wasatch County office and the County Weed manager have been answered with data produced.

B. Presented results at Extension Annual Conference, Logan 2012.

C. Presented results at NACAA AM&PIC, South Carolina, 2012.

D. Presented results at Summer Ag Agents Meeting, Brigham City 2012.

E. Presented results at NACAA Western Region AM&PIC, Twin Falls, 2012.

F. Applied to present at Galaxy IV Conference in 2013.