



# Buckhorn Plantain Control in Irrigated Pastures

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Buckhorn plantain (*Plantago lanceolata*) is a weed with increasing significance in Utah and the Great Basin. Other names for buckhorn plantain are narrow leaf-plantain, ribwort plantain, ribgrass, and English plantain. Buckhorn plantain is an annual, biennial, or perennial broadleaf plant. It inhabits agricultural land and other disturbed sites (Ag & Natural Resources U. of Cal). 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 (Wall, Whitesides 2008). Buckhorn plantain grows in both wet and dry periods, but tends to dominate pastures in very dry situations. Recent drought conditions have caused this weed to increase in significance.



Photo 1. Mature Buckhorn Plantain plant.



Photo 2. Mature Buckhorn Plantain seed head.

## Plant Description

Buckhorn plantain is a low growing, rosette-forming perennial. Distinctive characteristics

include long, narrow leaves that have prominent parallel veins and inconspicuous flowers in dense clusters located at the end of erect, leafless

flowering stems. Surrounding each flower cluster is what appears to be a ring or halo consisting of pollen-bearing anthers protruding from the centers of the flowers. The species reproduces by seeds.

**Root system** - Roots are mainly fibrous but a short taproot may also form.

**Seedlings & Shoots** - First two leaves to emerge (cotyledons) are grass-like, smooth, narrow, and have a depression on the upper surface. The two leaves that follow have hairy edges. Subsequent leaves are sparsely hairy. All leaves are basal forming a rosette.

**Stems** - The erect flowering stems (scapes) are less than 12 inches tall, leafless, unbranched, and terminate in a cluster of small, inconspicuous flowers. Several stems may emerge from a single root system.

**Leaves** - Mature leaves are thin, pale green, lance-shaped, 2 to 10 inches long, and less than 1 inch wide. Leaves have three to five prominent veins running parallel to the leaf edge. Leaves gradually narrow at the base into a short leaf stalk (petiole). The leaf edge may be smooth or slightly toothed.

**Flowers** - Flowers are comprised of inconspicuous, papery, brownish or yellow petals and are borne in short, dense, oval clusters located at the end of an upright flowering stem. The long, pollen-bearing flower structures (stamens) that protrude from the center of each flower form a ring or halo around the cluster.

**Fruits & Seeds** - Fruit is an elongated, brown, two-seeded capsule that opens by splitting across the middle. Seeds are 1/16 to 1/8 inch long, brown, shiny, and boat-shaped with a scar in the center of the concave side (Ohio Perennial and Biennial Weed Guide).

## **Management**

It has been observed that primary tillage implements, like the moldboard plow, are effective in controlling buckhorn plantain. Heavy disking will also aid in the control. Secondary tillage, including the spike-tooth harrow or "s"-tine harrows like the triple-K, are not effective in controlling buckhorn plantain. This is because of its dense crown and root which is too strong to be pulled out

of the ground by secondary tillage methods. (Sulser, Whitesides, 2008)

## **Observations**

Together we have evaluated tillage as a management technique for buckhorn plantain. Our observations have shown us that established buckhorn plantain can be successfully controlled by a fairly significant tillage such as plowing (moldboard) or a heavy disking (offset tandem disk making two passes in the field). Plants that were not completely cut (top was not separated from the root) grew back after tillage in the field. We have observed a field that was taken out of perennial crop (alfalfa or pasture) and planted to an annual crop (triticale) in an effort to control the buckhorn plantain through regular annual tillage as the seedbed was prepared. We believe that the majority of the buckhorn plantain plants that were established in the alfalfa/pasture were killed by the disking operation. However, the seed reservoir in the soil was so significant that the following year there was a dense stand of new buckhorn that established. The farmer has not been able to go back into perennial pasture yet and he has been working on this for 3 years. He simply plants triticale each year and makes hay out of the crop with an expectation that the buckhorn problem will be reduced over time. So far this does not look very promising.

In another location, on a different farm, we established a series of plots to test a variety of herbicides combined with some fertilizer treatments and grazing (horses). This location is perennial grass pasture that has been in production for many years and had a very dense stand of buckhorn plantain. We first tested standard pasture herbicides that contained active ingredients that were not on the restricted use category list. We combined this with an "over-the-top" fertilizer application to see if we could get the grass to respond quickly after herbicide treatment and thus compete well with the buckhorn plantain.

## **Test Plot Results**

We were disappointed in the control we received from most of the products tested. Usually our best control was in the neighborhood of 50-85% control from application of triclopyr, chlorsulfuron, metsulfuron, 2,4-D Banvel, or 2,4-D Amine. In all



Photo 3. Spring 2015, treated plot with picloram in the fall of 2014, notice lack of plantain in plot with plantain growing all around.

cases we saw some good control about 2 months after treatment, but the control started to decline after that and the buckhorn started to reestablish or regrow in the test plots. We did not see any advantage to the fertilizer treatments in these studies. We had assumed that more available nitrogen would enhance grass growth but that was not evident.

In fall 2014, we established some research plots where we included two products that contain the active ingredient “picloram.” We used picloram and picloram plus 2,4-D, along with chlorsulfuron and metsulfuron. All of the products we have tested are registered for use on pasture/grazing land, picloram is a Restricted Use Herbicide. When we evaluated our test plots in 2015 we found that any treatment that contained picloram provided 87-100% control 8 months after application. Grass content of these plots increased 75%. Our 2014 treatments went on in early spring (May) or late fall (late October 2014). Late fall treatments showed the best results with all products used.

<b>2011 Treatments</b>	<b>%Control</b>
Triclopyr	55
Chlorsulfuron	23
Metsulfuron	71
2,4-D	58
2,4-D, Amine	70
<b>Applied Early Spring (May 2011)</b>	
<b>Counted 30, 60, 90, (Days After Treatment)</b>	

<b>2012 Treatments</b>	<b>%Control</b>
Chlorsulfuron	5
Metsulfuron	69
Dicamba	0
2,4-D, Amine	27
Chlorsulfuron/ 2,4-D, A	34
Metsulfuron/ 2,4-D, A	71
Chlorsulfuron/Dicamba	0
Metsulfuron/Dicamba	55
<b>Applied Late Spring (June 2012)</b>	
<b>Counted 30, 60, 90, (Days After Treatment)</b>	

<b>2014 Spring Treatments</b>	<b>%Control</b>
Aminopyralid+Metsulfuron	63
Picloram+2,4-D	94
Triclopyr+Clopyralid	44
2,4-D, + Dicamba	4
Picloram	49
<b>Applied Late Spring (June 2014)</b>	
<b>Counted 3, 12, 16, months after treatment</b>	

<b>2014 Fall Treatments</b>	<b>%Control</b>
Aminopyralid+Metsulfuron	86
Picloram+2,4-D	100
Triclopyr+Clopyralid	61
2,4-D, + Dicamba	44
Picloram	100
<b>Applied Late Fall (October 2014)</b>	
<b>Counted 6, 12 months after treatment</b>	

### Summary

Recommendations for control include plowing, heavy disking in two directions for conventional methods. To control plantain in established pastures, herbicides containing the restricted use chemical of picloram applied at 2 pints per acre hold the most promise.

### References

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