EB2040E

Control of Ventenata with Imazapic

Abstract

In 2007, an herbicidal control study was initiated on rangeland infested with ventenata (*Ventenata dubia* (Leers) Coss & Durieu) near Anatone, Washington. Two rates of imazapic were applied in the early spring and fall of 2007, with the first application demonstrating considerably better control than that of the second.

Introduction

The generic name "ventenata" can be traced to French botanist Pierre Ventenat (1757–1805) (Nature Conservancy 2000). It is also commonly known in North America as wiregrass, hairgrass, North Africa grass, and softbearded oat grass.

Ventenata is an introduced annual grass, native to central and southern Europe, Asia, and Africa (Nature Conservancy 2000). The first recorded sighting of ventenata in North America is dated 1957; more specifically, in Kootenai County, Idaho (Old and Callihan 1987, 130). Since then, confirmed sightings have been made in the states of Washington, Oregon, California, Idaho, Montana, Wyoming, Utah, Wisconsin, New York, and Maine, and the Canadian provinces of New Brunswick, Quebec, Ontario, Alberta, and British Columbia (Map 1).

Ventenata is highly invasive in bluegrass, alfalfa, small grains, pasture, and rangeland (Old and Callihan 1987, 130). Ventenata has shown resistance to the herbicides glyphosate and sethoxydim. Although the impacts of ventenata are still not fully known, the plant is reportedly unpalatable to livestock once panicles appear, ultimately resulting in loss of forage in infested grazing land. In cases of cropland invasions, ventenata has reduced crop yields and interfered with mechanical harvesting equipment (Nature Conservancy 2000). This study was conducted to evaluate the extent of ventenata control possible using the herbicide imazapic.

Map 1. Distribution of ventenata in North America. (Map courtesy of the USDA-NRCS Plants Database.)

Identification

Ventenata is a tufted winter annual grass with fibrous roots. Culms are erect and extend from 6 to 27 inches (Hitchcock et al. 1969, 724). Although the stem appears smooth to the naked eye, magnification reveals tiny hairs. The leaf blades of ventenata are flat but become in-rolled; they are usually smooth on the upper surface, but rough underneath. Membranous ligules are acute, usually lacerate, and 0.04–0.32 inches long (Klinkenberg 2008). The inflorescence is an open, pyramidal panicle, tawny to pale yellow in color, and up to 8 inches long (Hitchcock et al. 1969, 724). The branches of the panicle often spread until they droop (Nature Conservancy 2000). Spikelets are stalked, about 1/2 inch long, located near branch tips, and usually have 3 florets. The lowest floret is sharp-pointed with straight, short (3/16 inch) awns, while the awns of upper florets are longer (3/8–1 inch), twisted, and abruptly bent (Hitchcock et al. 1969, 724).

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Figure 1. Ventenata (top), showing typical bent awns. Downy brome (bottom), showing typical straight awns. (Downy brome photo courtesy of Steve Dewey, Utah State University, Bugwood.org.)

The bent awns of ventenata help to distinguish the plant from downy brome (*Bromus tectorum*), which has straight awns. (See Fig. 1.) Ventenata and downy brome are both annual grasses that grow to similar heights and have open panicles. However, downy brome flowers from May to June, while ventenata flowers from June to August (Nature Conservancy 2000). Although *V. dubia* resembles *B. tectorum,* it is much more likely to be found with Japanese brome (*Bromus japonicus*) (Old 2008).

Site Description

The selected site for the herbicidal control study was a 4,200 ft² native pasture on a plateau (3,560 feet) in Asotin County, Washington, periodically grazed by cattle. The soils consisted of 17 inches of clay or 9 inches of silt loam on top of clay. The site was primarily populated with three grass species: one-spike oatgrass (*Danthonia unispicata*), ventenata, and bulbous bluegrass (*Poa bulbosa*). Ventenata had infested over 90% of the area (Figs. 2–3). Other species at the site were prickly lettuce (*Lactuca serriola*), wild rose (*Rosa* spp.), cinquefoil (*Potentilla gracilis*), horseweed (*Conyza canadensis*), Japanese brome grass (*Bromus japonicus*), and yarrow (*Achillea millefolium*).

Materials and Methods

The 4,200 ft² area, which was measured and staked, was set up as a randomized complete block containing 5 treatments and 4 replications. Each plot (treatment) was 7 feet wide and 30 feet long. The treatments included 2 early spring (April 20, 2007) and 2 fall (September 27, 2007) applications of imazapic at 4 and 8 oz/acre rates, as well as an unsprayed check. Methylated seed oil (MSO) was added to the early spring applications to improve herbicide uptake. A CO_2 knapsack sprayer was used for the herbicide applications. The knapsack sprayer had a 7-foot boom and was calibrated to

Figure 2. Study area—spring/summer ventenata infestation.

Figure 3. Study area—fall ventenata infestation.

Application date	April 20, 2007	September 27, 2007
Time	8:00 am	10:00 am
Timing	Early post	Late post
Air Temp.	44°F	74°F
% RH	78	24
Wind Velocity	1 mph	5 mph
Soil Temp.	3 inches = 37°F	3 inches = 69°F

Table 1. Environmental data for spring and fall imazapic applications.

deliver 20 gallons per acre at 3 miles per hour. Prior to applications, air and soil temperatures were recorded, along with relative humidity and wind speed (Table 1).

Weed control and non-target vegetation (*Rosa* spp.) injury evaluations were collected on May 2 and July 10, 2007. Fall applications of imazapic at the 4 and 8 oz/acre rates were applied on September 27, 2007. Fall applications did not include MSO. Moisture levels were well below normal (2 inches below normal) and precipitation did not occur until November. Fall application weed control data was collected on May 9 and July 21, 2008.

Results and Conclusions

Treated ventenata on the study site became chlorotic 6 days after the spring application of imazapic. The 4 oz/acre rate provided 68% ventenata control, while the 8 oz/acre rate provided 94% control. Imazapic also provided 65 and 95% Japanese brome control at the 4 and 8 oz/acre rates, respectively (Table 2). The oatgrass was not injured at the 4 or 8 oz/acre rate. After ventenata was controlled, cattle heavily grazed the oatgrass left within the treated plots. Spring applied imazapic at 4 oz/acre caused less than 25% injury to the wild rose compared to 55% injury from the 8 oz/acre rate. Injury to non-target vegetation may have been due to the addition of MSO. Nevertheless, all injured non-target plants fully recovered by the end of the growing season.

The fall application of imazapic to ventenata did not perform as well as expected, perhaps due to cattle grazing activity, weather conditions (warm at application, followed by a cold, dry winter), or other factors. Imazapic at the 4 and 8 oz/acre rates provided 62% and 77% ventenata control, respectively (Table 2). Whether the data was atypical will be better understood after data generated from subsequent studies is analyzed.

References

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Treatment	Ventenata (%) 2007	Ventenata (%) 2008	Wild rose injury (%) 2007	Japanese brome (%) 2007
imazapic 4 oz/acre + MSO	68	43	24	65
imazapic 8 oz/acre + MSO	94	46	55	95
imazapic 4 oz/acre	—	62	0	—
imazapic 8 oz/acre	—	77	0	—
untreated	0	0	0	0

Table 2. Ventenata and Japanese brome control from spring and fall herbicide applications.

Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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