

Strategy for Restoring Central Oregon Rangeland from Medusahead to a Sustainable Bunchgrass Environment, 2007-2008

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Abstract

Annual grassy weeds medusahead (*Taeniatherum caput-medusae*) and cheatgrass (*Bromus tectorum*) are capable of crowding out bunchgrasses, leaving rangelands with little feed for cattle and more prone to devastating fires and soil erosion. Two sets of plots were established at two locations, one where bunchgrasses remained despite significant populations of medusahead and a second where few bunchgrasses were present. Herbicide treatments only were applied to the first, with herbicide applications followed by planting of six bunchgrass species to the second. Herbicide only applications controlled medusahead, and without this competition bunchgrass size increased. Inadequate moisture following two late herbicide applications and planting resulted in poor performance of these products and plant establishment at the second set of plots.

Introduction

Medusahead (*Taeniatherum caput-medusae*) is a Category B noxious weed on the Jefferson County Weed Control List for containment. It is predominant on millions of acres of semi-arid rangeland in the Pacific Northwest. It is extremely competitive and crowds out all other vegetation on infested rangeland, including such undesirable species as cheatgrass or downy brome (*Bromus tectorum*). Medusahead and cheatgrass often out-compete bunch grasses that stabilize the soil and provide feed for cattle and other herbivores. Medusahead and cheatgrass dramatically increase the fuel load, creating hotter, more destructive range and forest fires. They also allow soil structure to deteriorate, setting the stage for increased soil erosion.

Rangeland restoration research in the Great Basin indicates that it is extremely difficult to go directly from medusahead and cheatgrass domination to establishment of native species. However, species like crested wheatgrass (*Agropyron cristatum*) are able to get established and create a bunchgrass system where native grass can be successfully reintroduced over time.

Plots were established at two locations on the Big Cove Ranch near South Junction north of Madras, Oregon. Each location included two sites, one where bunchgrasses were still present despite high populations of medusahead, and a second nearby location where few to no bunchgrasses remained due to domination by medusahead. Herbicide application only where adequate bunchgrasses remained is thought to increase vigor and give bunchgrass the competitive edge. Herbicide applications followed by planting of six bunchgrasses where there were minimal bunchgrasses will provide an opportunity to evaluate methodology to reestablish a bunchgrass environment.

Methods and Materials

During the fall of 2007 small plots were established at two locations where bunchgrasses remained. The herbicides Plateau[®] (imazapic), Journey[®] (imazaic + glyphosate), Matrix[®] (rimsulfuron), and Landmark[®] (sulfometuron + chlorsulfuron) were applied to 10-ft by 25-ft plots replicated four times. Plateau and Journey were applied October 13 and Matrix and Landmark were applied November 21, 2007. Application equipment was a CO₂-pressurized hand-held boom sprayer outfitted with TeeJet 8002 nozzles on a 9-ft boom operated at 40 psi and applying 20 gal water /acre.

The four herbicides were also applied where minimal bunchgrasses remained in single large plots 40 ft by 480 ft or 20 ft by 180 ft, depending on location. Applications were made using a 4-wheeler outfitted with a single Floodjet nozzle with an application width of 20 ft. Plateau and Journey were applied October 12 and Matrix and Landmark were applied December 28, 2007.

Perpendicular to the large herbicide plots, six species of bunchgrasses were planted on December 12 in 10-ft or 20-ft-wide plots replicated 3 or 4 times, depending on location. Seeding rate was 15 lb/acre using a 10-ft-wide Truax Rough Rider Rangeland drill planting 10 rows on 12-inch centers. Bunchgrasses included crested wheatgrass, intermediate wheatgrass (*Agropyron intermedium*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg's bluegrass (*Poa sandbergii*), Sherman big bluegrass (*Poa secunda*), and smooth brome (*Bromus inermis*).

Germination of bunchgrasses was informally evaluated in April and June. Plots were evaluated for herbicide efficacy on September 19, 2008. Plant height of established crested wheatgrass and intermediate wheatgrass at the meadow location was evaluated on September 30, 2008.

Results and Discussion

All four herbicides applied to control medusahead and give the competitive edge to established intermediate wheatgrass or crested wheatgrass provided 100 percent control at the meadow location (Table 1). At the bench location, Plateau and Journey provided 100 percent control, while Matrix provided 98 percent and Landmark 68 percent control.

The large strip plots treated with Plateau and Journey resulted in 100 percent control at both locations (Table 2). The Matrix and Journey applications provided inadequate control at both locations. These two treatments were not applied until December 28. Inadequate moisture until April is thought to be the cause of their poor performance. The same herbicides applied on November 21 to the small plots performed at or nearer expectation. The lighter soil at the bench location combined with lack of precipitation negatively affected both the large and small plot performance compared to the heavier soil at the meadow location.

Both intermediate wheatgrass in the small plots and the crested wheat in the large plots at the meadow location had significantly increased growth following herbicide applications compared to the untreated plot. The best growth followed application of Journey, followed by Plateau, then Matrix and Landmark.

Establishment of the six bunchgrasses was inadequate at both locations due to lack of moisture. Germination was poor by mid-May; rain in late May and early June resulted in additional but inadequate germination. The best performers under these conditions were crested wheatgrass, followed by intermediate wheatgrass and bluebunch wheatgrass.

Table 1. Herbicide applications to small plots for control of medusahead on the Cove Ranch north of Madras, Oregon, 2007-2008.

Treatments ¹	Product /acre	Meadow location		Bench location
		Medusahead control (%)	Interm.wheatgrass height (inch)	Medusahead control (%)
Plateau	6 oz	100	19.6	100
Journey	1 pt	100	20.2	100
Matrix ²	4 oz	100	17.4	98
Landmark ²	0.75 oz	100	18.7	68
Untreated	-----	0		0

¹Plateau = imazapic 2 lb ae/gal, Journey = imazapic 0.75 lb ae/gal + glyphosate 1.5 lb ae/gal, Matrix = rimsulfuron 25 percent, Landmark = sulfometuron 50 percent + chlorsulfuron 25 percent.

²Treatment included a silicon surfactant at 0.25 percent v/v.

Table 2. Herbicide applications to large plots for control of medusahead on the Cove Ranch north of Madras, Oregon 2007-2008.

Treatments ¹	Product /acre	Meadow location		Bench location
		Medusahead control (%)	Crested wheatgrass height (inch)	Medusahead control (%)
Plateau	6 oz	100	15.7	100
Journey	1 pt	100	17.6	100
Matrix ²	4 oz	70	15.6	40
Landmark ²	0.75 oz	20	14.2	0
Untreated	-----	0	12.6	0

¹Plateau = imazapic 2 lb ae/gal, Journey = imazapic 0.75 lb ae/gal + glyphosate 1.5 lb ae/gal, Matrix = rimsulfuron 25 percent, Landmark = sulfometuron 50 percent + chlorsulfuron 25 percent.

²Treatment included a silicon surfactant at 0.25 percent v/v.