

INVASIVE WEED CONTROL WITH PLATEAU® AND OASIS®

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Introduction

Invasive species continue to spread across rangeland. Once established, invasive species often have a competitive advantage over native plants. Invasive grass species like downy brome and medusahead rye quickly use the available moisture in the spring, set seed, and senesce by early to mid-summer. Once the moisture is depleted and the plants have matured and dried, they become a serious fire hazard. Areas infested with either downy brome or medusahead burn on a regular basis. Native species not adapted to frequent burning are further eliminated, resulting in monocultures of the invading species.

Other invasive species like hoary cress (whitetop) are able to compete with native vegetation because of extensive root systems that can use water from deep in the soil profile. Hoary cress generally establishes at disturbed sites and is then able to spread by its root system. Because it is perennial and its root system contains nutrient reserves, it can be very difficult to control.

A new herbicide, imazapic, has shown promise for control of noxious weeds in rangeland. Imazapic is the active ingredient in Plateau and is combined in a premix with 2,4-D ester in Oasis. Imazapic has been shown to be fairly selective to seeded desirable grass species. The ability to control invasive species without injury to newly seeded grasses would be a great tool for reclaiming badly infested sites. Imazapic needs to be tested under local conditions to determine its effectiveness in controlling invasive species common to the Treasure Valley.

Methods

Trials were established at Alkali Springs north of Vale, Oregon to evaluate Plateau and Oasis for control of downy brome and medusahead rye. A trial was established just north of Ontario, Oregon to evaluate Plateau and Oasis for hoary cress control. At each location, herbicide treatments were applied with a CO₂-pressurized backpack sprayer calibrated to deliver 20 gal/acre at 30 psi. Plots were 10 ft wide and 30 ft long. Treatments were replicated three times in randomized complete block designs.

Medusahead Rye Control with Spring or Fall Applied Plateau and Oasis

Plateau and Oasis were evaluated for medusahead rye control when applied in the spring or in the fall. Medusahead rye was the predominant species in these trials with a small amount of downy brome throughout the studies. The treatments included Plateau at 8 oz product/acre and Oasis at a range from 4 to 12 oz product/acre. These treatments were compared to Accord or Rodeo applied at 24 oz product/acre. Plateau and Oasis treatments also included methylated seed oil (MSO) at 1.0 qt/acre. Spring treatments were applied May 5, 2000 to medusahead that averaged 6 inches tall and downy brome that averaged 9 inches tall. Fall treatments were applied on November 11, 2000, to 2-inch-tall medusahead and 2-inch-tall downy brome.

Downy Brome Control with Fall-applied Plateau and Oasis

In this trial, downy brome was the predominant species with very little medusahead present. The

objectives of the trial were to evaluate Plateau and Oasis for downy brome control as well as for safety to desirable species seeded at the time of treatment. Desirable species were planted with a 5-ft range drill just prior to herbicide application. Three different grass species and a grass and broadleaf mixture were seeded perpendicular to the herbicide plots and randomized to produce a split-plot design. The species planted included 'Hycrest' crested wheatgrass, 'Secar' Snake River wheatgrass, 'Goldar' bluebunch wheatgrass, and a mixture of grasses and western yarrow. One pass within each replication was left unseeded. The herbicide treatments included Plateau at 8 oz product/acre and Oasis at 4-12 oz product/acre. Plateau and Oasis treatments included MSO at 1.0 qt/acre. These treatments were compared to Escort at 1.0 oz product/acre applied with a non-ionic surfactant (NIS) at 0.25 percent v/v. Planting and herbicide application were completed on November 11, 2000. At the time of treatment, downy brome was approximately 2 inches tall.

Hoary Cress (Whitetop) Control with Plateau and Oasis

Plateau and Oasis were each applied at 4, 8, or 12 oz product/acre with MSO at 1.0 qt/acre. Treatments were compared to Escort at 1.0 oz/acre applied with NIS at 0.25 percent v/v. Escort is considered very effective for hoary cress control. Treatments were applied on May 12, 2000. At the time of application the hoary cress averaged 19 inches tall and was in the late bud to early flower growth stage. Hoary cress control was evaluated in the spring and summer of 2001 and the spring of 2002.

Results and Discussion

Medusahead Rye Control with Spring or Fall-applied Plateau and Oasis

On June 15, medusahead control with spring herbicide applications was similar between Accord, Plateau, and for Oasis at 8.0 oz /acre or above (Table 1). Downy brome control was greater with Accord than with Plateau or Oasis. Evaluations in March showed that Accord did not provide residual control of medusahead. Medusahaead control was similar for Plateau and Oasis at a rate of 8.0 oz/acre or above. In May, because of dry conditions, very little medusahead was growing in any of the Plateau or Oasis plots. In plots where the medusahead growth was suppressed by Accord the previous spring, downy brome was able to become the predominant species.

When treatments were applied in the fall, medusahead control was similar for all Plateau and Oasis treatments (Table 2). Rodeo plus NIS provided less control of both medusahead and downy brome compared to all other herbicide treatments. On May 25, the untreated plot had almost no downy brome growing in it because the medusahead had used the available water.

Downy Brome Control with Fall-applied Plateau and Oasis

Downy brome control on March 29, 2001 was greater than 93 percent for all Plateau or Oasis treatments (Table 3). Escort plus NIS provided little control. By May 24, downy brome control was slightly less with 4.0 oz rates compared with the 8.0 oz rates of both Plateau and Oasis. Because of the extremely dry winter none of the seeded grasses emerged and tolerance of these grasses to the herbicide treatments was not evaluated.

Hoary Cress (Whitetop) Control with Plateau and Oasis

Hoary cress control 1 year after treatment was greater than 89 percent for Escort or Plateau and Oasis each applied at 8 or 12 oz/acre (Table 4). Plateau and Oasis at 4 oz/acre provided less control than the other treatments. Approximately two years after treatment, Oasis and Plateau at 12 oz/acre provided 70 and 74 percent hoary cress control. Applied at the 12 oz/acre rate, both products provided greater control than lower rates and also greater control than Escort.

Table 1. Medusahead and downy brome control with spring herbicide applications, Alkali Springs north of Vale, OR. Malheur Experiment Station, Oregon State University, Ontario, OR, 2001.

Treatment*	Product rate fl oz/acre	Weed control					Downy brome	
		Medusahead					6-15-	5-25-
		6-15-00	7-7-00	11-3-00	3-29-01	5-25-01		
Plateau + MSO	8.0 + 1.0 qt	93	58	96	73	95	80	90
Oasis + MSO	4.0 + 1.0 qt	68	68	85	45	92	73	77
Oasis + MSO	6.0 + 1.0 qt	82	82	90	57	95	83	88
Oasis + MSO	8.0 + 1.0 qt	92	88	97	83	95	82	90
Oasis + MSO	10.0 + 1.0	93	88	97	82	95	83	93
Oasis + MSO	12.0 + 1.0	92	88	95	87	95	75	93
Accord	24.0	98	100	65	27	57	98	0
Untreated		0	0	0	0	0	0	90†
LSD (0.05)		13	30	7	18	5	11	6

*MSO = methylated seed oil.

†Downy brome control attributed to medusahead rye competition.

Table 2. Medusahead and downy brome control with fall herbicide applications, Alkali Springs north of Vale, OR. Malheur Experiment Station, Oregon State University, Ontario, OR, 2001.

Treatment*	Product rate fl oz/acre	Weed control			Downy
		Medusahead			5-25-01
		11-3-00	3-29-01	5-25-01	
Plateau + MSO	8.0 + 1.0 qt	96	73	95	90
Oasis + MSO	4.0 + 1.0 qt	85	45	92	77
Oasis + MSO	6.0 + 1.0 qt	90	57	95	88
Oasis + MSO	8.0 + 1.0 qt	97	83	95	90
Oasis + MSO	10.0 + 1.0 qt	97	82	95	93
Oasis + MSO	12.0 + 1.0 qt	95	87	95	93
Rodeo + NIS	24.0 + 0.25%	65	27	57	0
Untreated		0	0	0	90†
LSD (0.05)		7	18	5	6

*MSO = methylated seed oil; NIS = non-ionic surfactant.

†Downy brome control attributed to medusahead rye competition.

Table 3. Downy brome control with fall herbicide applications, Alkali Springs north of Vale, OR; Malheur Experiment Station, Oregon State University, Ontario, OR, 2001.

Treatment*	Product rate fl oz/acre	Downy brome control	
		March 29, 2001	May 24, 2001
Oasis + MSO	4.0 + 1.0 at	93	95
Oasis + MSO	8.0 + 1.0 at	98	97
Oasis + MSO	12.0 + 1.0 at	98	98
Plateau + MSO	4.0 + 1.0 at	95	93
Plateau + MSO	8.0 + 1.0 at	98	98
Plateau + MSO	12.0 + 1.0 at	98	98
Escort + NIS	1.0 + 0.25% v/v	7	0
Untreated		0	0
LSD (0.05)		8	2

*MSO = methylated seed oil; NIS = non-ionic surfactant.

Table 4. Hoary cress control with fall herbicide applications, Malheur River north of Ontario, OR. Malheur Experiment Station, Oregon State University, Ontario, OR, 2001.

Treatment*	Product rate fl oz/acre	Hoary cress control	
		May 14, 2001	April 24, 2002
Oasis + MSO	4.0 + 1.0 at	61	13
Oasis + MSO	8.0 + 1.0 at	89	37
Oasis + MSO	12.0 + 1.0 at	95	70
Plateau + MSO	4.0 + 1.0 at	55	10
Plateau + MSO	8.0 + 1.0 at	89	48
Plateau + MSO	12.0 + 1.0 at	97	74
Escort + NIS	1.0 + 0.25% v/v	87	33
Untreated		0	0
LSD (0.05)		18	25

*MSO= methylated seed oil; NIS = non-ionic surfactant.