

EVALUATION OF PROWL H₂O[®], SANDEA[®], AND TARGA[®] FOR WEED CONTROL IN ALFALFA

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Introduction

The importance of weed control in alfalfa can not be overemphasized, considering the high investment and value associated with the crop. If not controlled in a timely fashion or if allowed to compete with alfalfa, weeds will reduce available moisture, nutrients, sunlight, and negatively impact hay yield and quality. Weeds have also been implicated in causing premature alfalfa stand loss by harboring and increasing disease and insect incidences.

One of the goals of this study was to identify an option for yellow nutsedge control in alfalfa. The specific objective was to evaluate alfalfa injury and weed control from halosulfuron and pendimethalin (Sanda[®] and Prowl[®] H₂O) when applied after the first hay cut to established alfalfa. Sandea is very effective on yellow nutsedge and may provide needed control in fields planted to alfalfa. Another use for Sandea is to provide yellow nutsedge control along field edges in order to minimize sedge expansion into areas surrounding alfalfa plantations. The herbicide also provided excellent control of pigweeds. It is important to recognize that ***Sanda is not registered***, but Prowl H₂O is registered for weed control in established alfalfa.

Materials and Methods

The study was conducted in a field near the Malheur Experiment Station, Ontario, Oregon in 2009. Treatments were arranged in a randomized complete block design with four replications. On May 8, chlorpyrifos (Lorsban[®]-4E) was applied at 0.5 lb ai/acre (16 oz/acre) to control alfalfa weevil. First alfalfa forage cut was on June 2 and immediately placed in the greenhouse to dry before being weighed to determine hay yield. Herbicide treatments were applied on June 27 when alfalfa was about 3 inches tall using a CO₂-pressurized backpack sprayer with a boom equipped with 8002EVS flat fan nozzles. Visual evaluations for alfalfa injury and weed control were done on July 6, July 13, and August 3, 2009 using a 0-100% scale (where 0% = no crop injury and 100% = complete crop damage). The second and third hay harvests were done on July 30 and September 22. The study was furrow irrigated for 24 hours each on April 20, May 28, June 29, July 24, and August 28. Data were subjected to analysis of variance following appropriate procedures and means compared using the least significant difference (LSD) and P = 0.05. Results are presented in Tables 1 and 2.

Results

Visual evaluations on July 6 indicated high alfalfa injury from Sandea treatments (Table 1). Visual injury ranged from 72 to 90 percent and increased with rate. Injury symptoms were characterized by shortening of the internodes and general lack of growth (stunted growth) on sprayed stems. The injury increased with rate increase and was exacerbated by inclusion of a nonionic surfactant (NIS). Alfalfa injury was still very high on July 13, ranging from 68 to 77 percent, again increasing as herbicide rate increased. Visual evaluations on August 3, 2009 indicated alfalfa injury ranging from 5 to 8 percent. The sprayed stems were able to develop new healthy shoots, which helped create a full canopy cover over time. Application of Prowl H₂O and Targa[®] did not injure alfalfa.

Average alfalfa yield for the second cutting was reduced 19 percent by all Sandea treatments compared to Prowl H₂O applied at 4.2 pt/acre and 2.1 pt + Raptor at 4 fl oz/acre (Table 2) reflecting the high injury rate observed earlier. However, there was no difference between treatments for the final alfalfa cutting in September. As a response to reduced growth, most plants initiated new shoots and the canopy was able to close by the time the second cut was done. More tests are needed to determine the timing and fitness of Sandea into established alfalfa fields. Sandea may provide needed yellow nutsedge control along alfalfa field edges to curtail expansion into neighboring fields.

Table 1. Alfalfa injury in response to application of Sandea, Prowl H₂O, and other herbicides after the first cut at the Malheur Experiment Station, Ontario, OR, 2009.

Treatments ^a	Rate	Alfalfa injury ^b		
		7/6/2009	7/13/2009	8/3/2009
		% injury		
Untreated		0.0 d	0.0 c	0.0 d
Prowl H ₂ O	2.1 pt/a	0.0 d	0.0 c	0.0 d
Prowl H ₂ O	4.2 pt/a	0.0 d	0.0 c	0.0 d
Prowl H ₂ O	2.1 pt/a	3.3 d	0.0 c	0.0 d
Raptor	4.0 fl oz/a			
MSO	1.6 pt/a			
UAN	4 pt/a			
Prowl H ₂ O	2.1 pt/a	3.3 d	0.0 c	0.0 d
Roundup PowerMax	22 fl oz/a			
NIS	0.4 pt/a			
AMS	2.5 % V/V			
Sandea	0.67 oz/a	71.7 c	68.3 b	5.0 bc
Sandea	0.67 oz/a	83.3 b	77.0 a	6.7 ab
NIS	0.4 pt/a			
Sandea	1.0 oz/a	71.7 c	71.7 ab	3.3 c
Sandea	1.0 oz/a	90.0 a	76.7 a	8.3 a
NIS	0.4 pt/a			
Targa	5 fl oz/a	0.0 d	0.0 c	0.0 d
COC	25.6 fl oz/a			
Targa	7 fl oz/a	0.0 d	0.0 c	0.0 d
COC	25.6 fl oz/a			
Select	6 fl oz/a	0.0 d	0.0 c	0.0 d
COC	25.6 fl oz/a			

^aProwl H₂O = pendimethalin; Raptor = imazamox; Sandea = halosulfuron; Targa = quizalofop-p-ethyl; Select = clethodim; MSO = methylated seed oil; UAN = urea ammonium nitrate; NIS = non-ionic surfactant; AMS = ammonium sulfate; COC = crop oil concentrate.

^bMeans within a column followed by the same letter do not significantly differ (P = 0.05, LSD).

Table 2. Alfalfa hay yield in response to application of Sandea, Prowl H₂O, and other herbicides after the first cut at the Malheur Experiment Station, Ontario, OR, 2009.

Treatments ^a	Rate	Alfalfa yield ^b		Weed wt	Alfalfa yield	
		6/2/2009	7/30/2009	2 nd cut weed	9/22/2009	Total yield
		1st cut hay	2nd cut hay	t/acre	3rd cut hay	
Untreated		2.7 abc	2.1 de	0.17 a	2.0 a	6.8 cde
Prowl H ₂ O	2.1 pt/a	2.4 c	2.7 cd	0.00 e	2.5 a	7.6 bc
Prowl H ₂ O	4.2 pt/a	2.7 abc	3.0 abc	0.00 de	2.2 a	7.9 ab
Prowl H ₂ O Raptor MSO UAN	2.1 pt/a 4.0 fl oz/a 1.6 pt/a 4 pt/a	2.6 abc	3.0 abc	0.00 e	2.5 a	8.1 ab
Prowl H ₂ O Roundup PowerMax NIS AMS	2.1 pt/a 22 fl oz/a 0.4 pt/a 2.5 % V/V	2.5 bc	2.7 bc	0.00 e	2.3 a	7.5 bc
Sandea	0.67 oz/a	2.8 ab	1.6 f	0.06 b	2.2 a	6.6 de
Sandea NIS	0.67 oz/a 0.4 pt/a	2.8 abc	2.0 ef	0.06 b	2.3 a	7.0 cde
Sandea	1.0 oz/a	2.9 a	2.0 ef	0.03 c	2.1 a	6.9 cde
Sandea NIS	1.0 oz/a 0.4 pt/a	2.8 abc	1.7 ef	0.03 cd	2.0 a	6.4 e
Targa COC	5 fl oz/a 25.6 fl oz/a	2.7 abc	3.3 ab	0.02 cde	2.2 a	8.2 ab
Targa COC	7 fl oz/a 25.6 fl oz/a	2.5 bc	2.8 bc	0.01 cde	2.0 a	7.4 bcd
Select COC	6 fl oz/a 25.6 fl oz/a	2.7 abc	3.4 a	0.02 cde	2.3 a	8.4 a

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