HUSKIE™ HERBICIDE PERFORMANCE RELATIVE TO COMMERCIAL STANDARD HERBICIDES IN WINTER WHEAT

Joel Felix and Joey Ishida
Malheur Experiment Station
Oregon State University
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Introduction

Effective weed control in small grain production is important in order to minimize competition and maximize yield. Importantly, weed control helps to keep weed seed production in check for future crops. Pyrasulfotole is a new herbicide marketed by Bayer CropScience under the trade name Huskie™ to control broadleaf weeds in wheat, barley, oats, rye, and triticale. Availability and use of different herbicide chemistries is recommended since repeated use of similar herbicide modes of action over multiple years may result in selecting weeds that are resistant to a certain herbicide. Also, use of multiple herbicide families helps to prevent weed population shifts toward weed species that are more difficult or costly to control. To facilitate proper herbicide rotation, growers are advised to pay close attention to the site of action for the product being used. The objective of this study was to evaluate crop tolerance and broadleaf weed control attributes of a new herbicide, pyrasulfotole (Huskie), under local conditions.

Materials and Methods

A field study was established at the Malheur Experiment Station, Ontario, Oregon, in a well drained furrow-irrigated field that was planted to soybeans in the previous year. The predominant soil was an Owyhee silt loam with 0.71 percent organic matter, a pH of 7.6, and a cation exchange capacity of 11 meq/100 g of soil. The study area was plowed and disked on October 27, 2007 to create a seedbed suitable for winter wheat production. The soil was fertilized with a blend to supply 50 and 100 lb/acre of nitrogen (N) and phosphorus (P), respectively. Wheat variety 'Stephens' was drilled on 30-inch beds at the rate of 100 lb/acre on October 29, 2007. On April 29, 2008 another 50 and 100 lb/acre of N and P, respectively, were broadcast on the study area. The study was furrow irrigated 5 times (24 hours each) between April and July 2008. The study was a randomized complete block design with 4 replications and each plot measured 10 ft wide by 30 ft long. All herbicide treatments were applied on April 26, 2008 using a CO_2-pressurized backpack sprayer fitted with a boom equipped with six Teejet 8002EVS nozzles calibrated to deliver 20 gal/acre at 40 psi and 3 mph. Plants were visually evaluated for crop injury and weed control using 0-100 percent (where 0 = no crop injury or no weed control and 100 = complete crop kill or complete weed control) at 7, 16, 34, and 88 days after herbicide application. Wheat was harvested at maturity on July 31, 2008 and the yield adjusted to 12 percent moisture content. The data were subjected to analysis of variance and means compared using LSD at $P = 0.05$.

Results and Discussion

There was no apparent injury observed on winter wheat plants for any of the Huskie treatments evaluated. There was a transient injury on plants treated with Axial® XL 16.4 fl oz/acre plus Bronate® Advanced™ at 1.2 pt/acre (Tables 1 and 2). The injury may have been a result of tank-mixing these products since wheat plants treated with Bronate Advanced alone were free of injury symptoms. The short-lived injury on plants treated with Axial XL plus Bronate Advanced did not reduce wheat yield (Table 4). Importantly, this combination treatment provided the best (99 percent) wild oat control. Evaluations at 7 days after treatment (DAT) indicated control for kochia, common lambsquarters, shepherd's purse, flixweed, blue mustard, and prostrate knotweed ranged from 44 to 91 percent (Table 1) across treatments. At 16 DAT, weed control was 73 percent or greater for all treatments (Table 2). Weed control ranged from 90 to 99 percent at 34 DAT (Table 3). Huskie provided similar weed control as standard herbicides already being used on winter wheat. At 88 DAT, kochia control was 95 percent or greater (Table 4). Control for common lambsquarters was equally high, ranging from 96 to 99 percent, with Huskie treatments providing the greatest control. Control for wild oat ranged from 20 to 99 percent across treatments, with a combination of Axial XL at 16.4 fl oz/acre plus Bronate Advanced at 1.2 pt/acre providing the best control. Huskie herbicide provided the best late-season control for common lambsquarters, a weed that is always a problem at wheat harvest for most growers. Wheat yield ranged from 128 to 144 bu/acre across treatments. The untreated control had the lowest yield while Huskie at 13 oz/acre provided the highest yield (Table 4). Huskie provided excellent weed control and will be an added tool for growers to control weeds in winter wheat.

Table 1. Wheat injury and weed control ratings 7 days after Huskie™ herbicide application at the Malheur Experiment Station, Oregon State University, Ontario, OR, 2008.

Treatment	Rate	Application timing	Wheat injury	Weed control					
				Kochia	C. lambs-quarters[a]	Shepherd's purse	Flix weed	Blue mustard	P. Knot-weed[a]
			%	%					
Untreated control		--	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Huskie + R-11 (NIS)[b] + Bronc (AMS)[b]	13.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	65.0	62.5	76.3	60.0	70.0	66.3
Huskie + R-11 (NIS) + Bronc (AMS)	15.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	72.5	43.8	82.5	78.8	57.5	43.8
Starane Ultra	0.4 pt/a	Spring	0.0	78.8	62.5	76.3	66.3	75.0	50.0
Starane NXT	14.0 oz/a	Spring	0.0	56.3	46.3	67.5	47.5	43.8	50.0
Bronate Advanced	19.2 oz/a	Spring	0.0	58.8	68.8	78.8	71.8	72.5	55.0
Huskie + Stratego + R-11 (NIS) + Bronc (AMS)	15.0 oz/a 5.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	61.3	42.5	65.0	51.3	66.3	71.3
Axial XL + Bronate Advanced	16.4 oz/a 1.2 pt/a	Spring	53.8	86.3	80.0	91.3	88.8	86.3	71.3
LSD ($P = 0.05$)			6.5	15.7	20.5	11.4	9.3	10.6	20.9

[a]Common lambsquarters, prostrate knotweed.
[b]NIS = non-ionic surfactant, AMS = ammonium sulfate.

Table 2. Wheat injury and weed control ratings 16 days after treatment with Huskie™ herbicide at the Malheur Experiment Station, Oregon State University, Ontario, OR, 2008.

Treatment	Rate	Application timing	Wheat injury	Weed control					
				Kochia	C. lambs-quarters[a]	Shepherd's purse	Flix weed	Blue mustard	P. Knot-weed[a]
			%	%					
Untreated control		--	0.00	0.0	0.0	0.0	0.0	0.0	0.0
Huskie + NIS[b] + AMS[b]	13.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.00	87.5	88.8	82.5	97.0	83.8	87.5
Huskie + NIS + AMS	15.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.00	90.0	90.0	88.5	99.0	99.0	87.5
Starane Ultra	0.4 pt/a	Spring	0.00	86.3	62.5	76.3	85.0	83.8	77.5
Starane NXT	14.0 oz/a	Spring	0.00	89.8	88.5	67.5	90.0	80.0	88.8
Bronate Advanced	19.2 oz/a	Spring	0.00	86.3	90.0	83.8	91.3	86.3	73.8
Huskie + Stratego + NIS + AMS	15.0 oz/a 5.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.00	93.8	95.0	81.3	93.8	93.8	83.8
Axial XL + Bronate Advanced	16.4 oz/a 1.2 pt/a	Spring	8.13	80.0	80.0	94.8	97.0	83.8	78.8
LSD ($P = 0.05$)			1.25	4.62	5.7	11.1	3.3	7.6	7.6

[a]Common lambsquarters, prostrate knotweed.
[b]NIS = non-ionic surfactant, AMS = ammonium sulfate.

Table 3. Wheat injury and weed control ratings 34 days after treatment with Huskie™ herbicide at the Malheur Experiment Station, Oregon State University, Ontario, OR, 2008.

Treatment	Rate	Application timing	Wheat injury	Weed control					
				Kochia	C. lambs-quarters[a]	Shepherd's purse	Flix weed	Blue mustard	P. Knot-weed[a]
				%					
Untreated control		--	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Huskie + NIS[b] + AMS[b]	13.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	95.0	96.0	97.0	99.0	96.0	93.8
Huskie + NIS + AMS	15.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	97.0	98.0	95.5	98.0	98.0	92.5
Starane Ultra	0.4 pt/a	Spring	0.0	92.5	92.5	91.3	92.5	90.0	95.0
Starane NXT	14.0 oz/a	Spring	0.0	92.3	94.8	83.8	91.3	94.8	92.5
Bronate Advanced	19.2 oz/a	Spring	0.0	94.5	95.8	93.3	98.0	95.8	92.5
Huskie + Stratego + NIS + AMS	15.0 oz/a 5.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	95.8	95.0	89.5	95.8	97.0	92.5
Axial XL + Bronate Advanced	16.4 oz/a 1.2 pt/a	Spring	0.0	93.8	94.8	94.8	97.0	90.0	92.3
LSD ($P = 0.05$)			NS	5.3	4.1	8.8	3.6	5.1	3.6

[a]Common lambsquarters, prostrate knotweed.
[b]NIS = non-ionic surfactant, AMS = ammonium sulfate.

Table 4. Wheat injury and weed control ratings 88 days after Huskie™ herbicide application and grain yield (adjusted to 13.5% moisture and 60 lbs/bu) at the Malheur Experiment Station, Oregon State University, Ontario, OR, 2008.

Treatment	Rate	Application timing	Wheat injury	Weed control			Wheat yield
				Kochia	Common lambsquarters	Wild oats	
			%	%			bu/acre
Untreated control		--	0.0	0.0	0.0	0.0	127.9
Huskie + NIS[a] + AMS[a]	13.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	99.0	99.0	31.3	143.5
Huskie + NIS + AMS	15.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	99.0	99.0	33.8	138.1
Starane Ultra	0.4 pt/a	Spring	0.0	99.0	90.0	18.8	136.6
Starane NXT	14.0 oz/a	Spring	0.0	97.0	96.0	20.0	125.3
Bronate Advanced	19.2 oz/a	Spring	0.0	99.0	99.0	26.3	142.9
Huskie + Stratego + NIS + AMS	15.0 oz/a 5.0 oz/a 0.4 pt/a 0.467 pt/a	Spring	0.0	99.0	99.0	22.5	139.4
Axial XL + Bronate Advanced	16.4 oz/a 1.2 pt/a	Spring	0.0	95.0	96.0	99.0	135.3
LSD ($P = 0.05$)			NS	1.2	1.5	13.8	12.0

[a]NIS = non-ionic surfactant, AMS = ammonium sulfate.