Preemergence Herbicides for Downy Brome Management

Zuger, R.J., A.L. Hauvermale & I.C. Burke

Downy brome continues to be a problematic and widespread weed in inland PNW wheat-fallow rotations. Acetolactate synthase inhibitor resistance continues to spread, and there are very few herbicide options remaining. Our objective was to identify one or more herbicide treatments with different herbicide modes of action for management of downy brome.

The study was established in a fallow field near Anatone, WA. Treatments were applied preemergence (PRE) on November 10, 2016, detailed in Table 1 and Table 3. Glyphosate (RT3) and ammonium sulfate (AMS Max) was also applied on November 10, 2016 as a burn-down. The study was conducted in a randomized complete block with 4 replications. Plots were 5' by 10' long.

Downy brome (*Bromus tectorum*) control was assessed by visual estimation at 133, 180, 195, 200, and 202 days after treatment (DAT) of application (Table 2). Downy brome biomass was harvested by collecting two $1/10^{th}$ meter quadrants from each plot on June 15, 2017. All data was subjected to an analysis of variance using the statistical package built into the Agricultural Research Manager software system (ARM 8.5.0, Gylling Data Management).

Zidua with Hoelon and Outlook at 133 DAT both provided significant downy brome control compared to the nontreated control with 73% control for both herbicide treatments and 0% control for the nontreated. Downy brome control with Zidua, Zidua with Hoelon, and Hoelon with Outrider at 180 DAT was greater compared to the nontreated control at 93%, 98%, 78% control, respectively (Table 3). Finesse and Prowl H2O did not provide significant downy brome control at 180 DAT. Similar results were observed at 195 DAT and 200 DAT. By May 31, 2017 (202 DAT), the only treatments to still maintain significant downy brome control compared to the nontreated control (0%) were Zidua (80%), Zidua with Outrider (63%), and Zidua with Hoelon (98%). Zidua, Zidua with Outrider, Zidua with Hoelon, and Hoelon with Outrider significantly reduced the amount of downy brome biomass compared to the nontreated control. Downy brome biomass in the nontreated control was 638 lb A^{-1} compared to 139 lb A^{-1} downy brome biomass for Zidua, 242 lb A^{-1} for Zidua with Outrider, 117 lb A^{-1} Zidua with Hoelon, and 385 lb A^{-1} for Hoelon with Outrider.

Table 1. *Treatment application details*

Study Application	
Date	November 10, 2016
Application volume (GPA)	15
Air temperature (˚F)	54
Soil temperature (˚F)	48
Wind velocity (mph, direction)	8, S
Next rain occurred on	November 15, 2016

Table 2. *Blanket application details. Applied on November 10, 2016.*

Treatment	**Rate**	
	Field Rate	**lb ai/A**
Glyphosate (RT3)	32 fl oz/A	1.375
AMS Max	8 lb/100 gal	

Table 3. *Percent downy brome control and downy brome biomass following preemergent applications. Anatone, WA, 2016-2017. DAT = days after treatment. Means followed by the same letter are not statistically significantly different (α=0.05).*

			Downy Brome Control					***Downy Brome Biomass***
Treatment	**Rate**		**3/23/17** ***133 DAT***	**5/9/17** ***180 DAT***	**5/24/17** ***195 DAT***	**5/29/17** ***200 DAT***	**5/31/17** ***202 DAT***	**6/15/17**
		lb ai/A	**%**	**%**	**%**	**%**	**%**	**LB/A**
Nontreated	-	-	0 a	0 a	0 a	0 a	0 a	638 ab
Zidua	1.50 oz/A	0.080	40 ab	93 bc	88 d	86 bc	80 cd	139 de
Zidua Outrider	1.50 oz/A 0.66 oz/A	0.080 0.031	48 ab	73 bc	75 cd	79 bc	63 bcd	242 cde
Zidua Hoelon	1.50 oz/A 2.66 pt/A	0.080 1.000	73 b	98 c	90 d	98 c	98 d	117 e
Hoelon	2.66 pt/A	1.000	48 ab	70 bc	63 bcd	71 bc	40 abc	475 abcd
Hoelon Outrider	2.66 pt/A 0.66 oz/A	1.000 0.031	43 ab	78 bc	75 cd	75 bc	50 abc	385 bcde
Outrider	0.66 oz/A	0.031	53 ab	70 bc	43 bc	48 abc	10 ab	642 ab
Outrider Olympus	0.66 oz/A 0.60 oz/A	0.031 0.026	28 ab	45 b	23 ab	28 ab	25 ab	568 abc
TriCor DF	0.50 lb/A	0.375	9 ab	56 bc	45 bc	60 bc	18 ab	558 abc
Prowl H2O	2.1 pt/A	1.000	25 ab	0 a	38 abc	33 ab	8 a	796 a
Outlook	16 fl oz/A	0.750	73 b	63 bc	50 bcd	61 bc	33 ab	460 abcd
Valor	2 oz/A	0.064	34 ab	43 b	32 abc	53 bc	18 ab	706 ab
Finesse	0.40 oz/A	0.016	28 ab	0 a	25 ab	28 ab	5 a	808 a
		LSD	*40*	*32*	*27*	*35*	*33*	*239*

Thank you to the grower and their family for the use of land.

Disclaimer

Some of the pesticides discussed in this presentation were tested under an experimental use permit granted by WSDA. Application of a pesticide to a crop or site that is not on the label is a violation of pesticide law and may subject the applicator to civil penalties up to $7,500. In addition, such an application may also result in illegal residues that could subject the crop to seizure or embargo action by WSDA and/or the U.S. Food and Drug Administration. It is your responsibility to check the label before using the product to ensure lawful use and obtain all necessary permits in advance.