

Zidua for Downy Brome Control in Winter Wheat

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The study objective was to evaluate Zidua (pyroxasulfone) with RyzUp SmartGrass (GA₃) for downy brome (*Bromus tectorum*) control in winter wheat. RyzUp Smartgrass is a plant growth regulator that stimulates seed germination and alleviates seed dormancy in laboratory and greenhouse conditions. The combination of Zidua and RyzUp Smartgrass has potential to reduce downy brome seedbanks in winter wheat production systems.

A study site was established at WSU Wilke Farm near Davenport, WA and downy brome populations were present at the time of study establishment. Preemergence applications of Zidua, Zidua with RyzUp, and Zidua with RyzUp and metribuzin were applied to winter wheat in the fall of 2021 (table 1). Treatments were applied with a CO₂-powered backpack sprayer and a 5-foot boom with four Teejet 11002VS nozzles. The sprayer was calibrated to 15 gallons per acre. This study was conducted in a randomized complete block design with four replications and plots were 10 ft wide by 30 ft long.

Treatments were assessed by visual estimation of winter wheat density at 224 days after treatment with Zidua and downy brome density per m² at 250 and 263 days after treatment with Zidua. All data were subjected to an analysis of variance using Agricultural Research Manager software system (ARM ver. 2022.7, Gylling Data Management).

Table 1. Treatment application details.

Study Application	
Date	9/16/2021
Application volume (GPA)	15
Timing	Preemergence
Crop Stage	-
Air temperature (°F)	51
Wind velocity (mph, direction)	5, NW

Results

There was no difference in winter wheat density between treatments (Table 2) at 224 days after treatment with Zidua as a preemergence herbicide. At 250 days after treatment, downy brome density per m² was reduced in treated plots (1-5 plants/m²) compared to the nontreated plots (15 plants/m²) (Table 2). Although at 263 days after treatment, downy brome density was not statistically different between treatments. Yield was also not statistically different between treatments, though it should be noted that the nontreated is numerically lower than treated plots (Table 2).

Table 2. Percent winter wheat density and downy brome density per m² ratings for the trial at Wilke Farm near Davenport, WA.

Treatment	Rate	Wheat Density (%)	Downy Brome Density (/m ²)	Downy Brome Density (/m ²)*	Yield (lbs/150ft ²)*
		4/28/2022	5/24/2022	6/6/2022	8/17/2022
Nontreated		40 b	15 a	19.5	10.9
Zidua	2 oz wt/A	81 a	3 b	7.9	15.3
Zidua	2 oz wt/A	94 a	5 b	8.5	16.2
RyzUp	.5 oz wt/A				
Zidua	2 oz wt/A	91 a	2.6 b	13.8	16.8
RyzUp	1 oz wt/A				
Zidua	2.9 oz wt/A	81 a	5.6 b	9.5	17.3
Zidua	2.9 oz wt/A	88 a	2.1 b	9.3	14.5
RyzUp	.5 oz wt/A				
Zidua	2.9 oz wt/A	94 a	1 b	4.1	14.4
RyzUp	1 oz wt/A				
Zidua	2 oz wt/A	94 a	1.5 b	11	15.2
Metribuzin	3 oz wt/A				
RyzUp	1 oz wt/A				
Zidua	2.9 oz wt/A	88 a	1.3 b	5.2	15.7
Metribuzin	3 oz wt/A				
RyzUp	1 oz wt/A				

*No difference between treatments.