

# Downy Brome control with Fierce® and RyzUp SmartGrass® in Winter Wheat

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The study objective was to evaluate Fierce (pyroxasulfone with flumioxazin) and Fierce MTZ (Pyroxasulfone, flumioxazin, and metribuzin) in systems with Powerflex HL (pyroxsulam) and RyzUp Smartgrass (GA<sub>3</sub>) for downy brome control in winter wheat. RyzUp Smartgrass (GA<sub>3</sub>) is a plant growth regulator that stimulates seed germination and alleviates seed dormancy in laboratory and greenhouse conditions. The combination of Fierce and RyzUp Smartgrass has potential to reduce downy brome seedbanks in winter wheat cropping systems.

The study site was at the WSU Wilke Farm near Davenport, WA. Downy brome populations were present at the time of study establishment. Preemergence applications of Roundup Powermax, Zidua, Fierce, Fierce MTZ, and RyzUp Smartgrass were applied to winter wheat in the fall of 2019 (Table 1). Postemergence treatment of Powerflex HL was applied in the early spring of 2020, detailed in Table 2. Treatments were applied with a CO<sub>2</sub> powered backpack sprayer and a 5-foot boom with 4 Teejet 11002VS nozzles. The sprayer was calibrated to 15 gallons per acre (GPA). This study was conducted in a randomized complete block design with 4 replications. Plots were 10 ft by 30 ft long.

Preemergence treatments were assessed by visual estimation 21, 189, and 217 days after treatment for winter wheat injury, percent control, and plant densities per m<sup>2</sup>. Downy brome control was assessed 25 days after postemergence treatment with Powerflex. Density of downy brome was assessed, and biomass was harvested by collecting two m<sup>2</sup> quadrants 39 days after postemergence treatment from each plot. All data was subjected to an analysis of variance using the statistical package included in Agricultural Research Manager software system (ARM 8.5.0, Gylling Data Management).

At 21 days after preemergence treatment chlorosis and curling had occurred on winter wheat. Treatments that included Fierce MTZ at 15.37 oz/A caused injury, and when RyzUp at 1.0 oz/A applied in mixture with Fierce MTZ injury was greater than other treatments (Table 3). Assessment of downy brome control 189 and 217 days after preemergence treatment were similar (Table 3). Downy brome densities at 217 days after preemergence treatment were also similar among treatments, but were very variable, and herbicide treatments resulted in numerically lower densities (Table 3).

At 25 days after postemergence treatment percent control of downy brome was similar across treatments (Table 4). Downy brome densities at 39 days after postemergence treatment were



Figure 1. Nontreated plot 12 days after



Figure 2. Treated plot 12 days after postemergence application of Powerflex HL.

similar across treatments (Table 4), but densities were numerically lower in treatments that included a preemergence herbicide system. A similar trend was observed with downy brome biomass harvested 39 days after postemergence treatment (Table 4).

Fierce MTZ caused injury, but that injury as not apparent after the winter. Downy brome density and biomass was variable, but always numerically lower where preemergence Fierce, Fierce MTZ, or Zidua was applied. Fierce and Fierce MTZ appear to be effective preemergence treatments for downy brome control in winter wheat.

**Table 1. Preemergent treatment application details**

<b>Study Application</b>	
Date	September 12, 2019
Application volume (GPA)	15
Air temperature (°F)	60
Soil temperature (°F)	55.2
Wind velocity (mph, direction)	2, E
Next rain occurred on	September 19, 2019
Accumulative Moisture for September 10 – 18 (IN)	0

**Table 2. Postemergent treatment application details**

<b>Study Application</b>	
Date	April 16, 2020
Application volume (GPA)	15
Air temperature (°F)	50
Soil temperature (°F)	42.8
Wind velocity (mph, direction)	5.7, E
Next rain occurred on	April 22, 2020
Accumulative Moisture for April 14 - 22 (IN)	0.14

**Table 3.** Winter wheat injury, downy brome percent control, and downy brome density (plants/m<sup>2</sup>) in response to preemergence applications of Roundup Powermax, Zidua, Fierce, Fierce MTZ, and RyzUp Smartgrass. Davenport, WA, 2019/2020. DAT = days after treatment. Means followed by the same letter are not statistically different ( $\alpha=0.05$ ).

Preemergence							
Treatment	Rate		Winter Wheat Injury	Downy Brome Control	Downy Brome Control	Downy Brome Control	Downy Brome Density
	oz/A	Type	10/3/2019 21 DAT	10/3/2019 21 DAT	3/19/2020 189 DAT	4/16/2020 217 DAT	4/16/2020 217 DAT
			%	%	%	%	# m <sup>2</sup>
Nontreated	-	-	0 b	0 a	0 b	94 a	18 a
Roundup Powermax	30.74	PRE	0 b	28 a	53 a	93 a	25 a
Zidua	1.50	PRE					
Roundup Powermax	30.74	PRE	1 b	30 a	63 a	96 a	15 a
Fierce	3.00	PRE					
Roundup Powermax	30.74	PRE	1 b	53 a	50 a	98 a	13 a
Fierce MTZ	15.37	PRE					
Roundup Powermax	30.74	PRE	15 b	40 a	50 a	94 a	23 a
Fierce	3.00	PRE					
RyzUp	1.00	PRE	3 b	31 a	68 a	95 a	20 a
Roundup Powermax	30.74	PRE					
Fierce MTZ	15.37	PRE					
RyzUp	1.00	PRE	25 a	63 a	88 a	99 a	13 a
Roundup Powermax	30.74	PRE					

**Table 4.** Percent control, densities of plants per m<sup>2</sup>, and biomass in grams per m<sup>2</sup> following postemergence applications of Powerflex HL. Davenport, WA, 2020. DAT = days after treatment. Means followed by the same letter are not statistically different ( $\alpha=0.05$ ).

		Postemergence			
Treatment	Rate		Downy Brome Control	Downy Brome Density	Downy Brome Biomass
			5/11/2020 25 DAT	5/25/2020 39 DAT	5/25/2020 39 DAT
	oz/A	Type	%	# m <sup>2</sup>	G m <sup>2</sup>
Nontreated	-	-	56 b	365 a	258 a
Roundup Powermax Powerflex HL	30.74 2.00	PRE POST	72 a	288 a	246 a
Zidua	1.50	PRE			
Roundup Powermax Powerflex HL	30.74 2.00	PRE POST	88 a	85 a	91 a
Fierce	3.00	PRE			
Roundup Powermax Powerflex HL	30.74 2.00	PRE POST	86 a	83 a	38 a
Fierce MTZ	15.37	PRE			
Roundup Powermax Powerflex HL	30.74 2.00	PRE POST	82 a	108 a	106 a
Fierce	3.00	PRE			
RyzUp	1.00	PRE			
Roundup Powermax Powerflex HL	30.74 2.00	PRE POST	83 a	128 a	74 a
Fierce MTZ	15.37	PRE			
RyzUp	1.00	PRE			
Roundup Powermax Powerflex HL	30.74 2.00	PRE POST	84 a	118 a	33 a

## 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.