

RyzUp SmartGrass® in Wheat to Stimulate Italian ryegrass Germination

Beaudoin, M.R., Zuger, R.J., & I.C. Burke

Italian ryegrass is a problematic widespread weed in the inland Pacific Northwest high rainfall zones. Italian ryegrass management is increasingly more difficult due to widespread Acetyl CoA Carboxylase (ACCase) and acetolactate synthase (ALS) inhibitor resistance. The objective of this study was to evaluate the use of gibberellic acid (GA₃) (RyzUp Smartgrass) along with preemergence applications of Zidua, Fierce, and Fierce MTZ in a winter wheat system. Gibberellic acid is known to stimulate Italian ryegrass germination in laboratory and greenhouse settings, and could facilitate improved performance of preemergence herbicides. Additionally, the products Fierce and Fierce MTZ, each containing the active ingredient pyroxasulfone also found in Zidua, were evaluated for crop safety and efficacy on Italian ryegrass.

The study was established in a winter wheat plot near Pullman, WA, at the WSU Cook Agronomy Farm. Treatments were applied preemergence (PRE) on October 7, 2019 and postemergence (POST) on May 7, 2020 (Table 1). The study was conducted as a randomized complete block with four replications. Plots were 10' by 30' long. Preemergence treatments were assessed by visual estimation 28 days after treatment for winter wheat injury and Italian ryegrass control. Treatments were assessed for percent control 14, 27, 35, and 50 days after postemergence treatment



(Table 2, only the 50 day after treatment assessment is presented). Italian ryegrass density and biomass was assessed by harvesting two m² quadrants from each plot 69 days after postemergence treatment. 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).

No injury was observed in winter wheat at 28 days after preemergence treatment (data not shown). Italian ryegrass control at 28 days after preemergence treatment were similar among treatments (Table 2). Percent control was less for Axial XL applied postemergence compared to treatments that included preemergence herbicides (Table 3). Italian ryegrass density and biomass were variable and similar among treatments (Table 4), but were numerically highest in the nontreated and Axial XL postemergence treatment.

Gibberellic acid (GA) has short-lived activity in the environment. Application of GA in the fall under cooler temperature conditions just prior to rainfall events may facilitate increased activity (ie, seed germination). This trial was conducted in winter wheat planted with a Horsch drill, a very high disturbance drill. The high level of soil disturbance likely incorporated the Italian ryegrass seed sufficiently to mitigate the GA activity. Future research will focus on applications in no-till environments where the seed bank is stratified at the soil surface.

Both Fierce and Fierce MTZ are effective herbicides for Italian ryegrass control. The use of flumioxazin and metribuzin in addition to the pyroxasulfone facilitates integrated herbicide

management – the use of two or more modes of action active on the same weed species. Additional trials will address use in different tillage and residue systems.

Table 1. Preemergent treatment application details.

Study Application		
Date	October 7, 2019	May 7, 2020
Application volume (GPA)	15	15
Air temperature (°F)	45.7	45.2
Soil temperature (°F)	48.2	48.3
Wind velocity (mph, direction)	7, E	5.2, SE
Next rain occurred on	October 8, 2019	May 12, 2020

Table 3. Percent injury for winter wheat and percent control for Italian ryegrass following preemergence applications of Zidua, RyzUp Smartgrass, Fierce, and Fierce MTZ, near Pullman, WA, 2019.

Treatment	Rate oz/A	Italian Ryegrass Control ¹
		11/4/19 28 DAT ² — % Control —
Zidua	1.50	58 a
Zidua RyzUp	1.50 1.00	80 a
Fierce	3.00	85 a
Fierce MTZ	16.69	66 a
Fierce RyzUp	3.00 1.00	70 a
Fierce MTZ RyzUp	16.69 1.00	88 a

¹ Means followed by the same letter are not statistically different ($\alpha=0.05$).

² DAT = days after treatment.

Table 4. Italian ryegrass control for preemergence applications of Zidua, RyzUp Smartgrass, Fierce, and Fierce MTZ following postemergence applications of Axial XL, near Pullman, WA, 2020.

Treatment	Rate	Timing ¹	Italian ryegrass control ²	
			5/21/2020 14 DAT ³	6/26/2020 50 DAT
	oz/A		————— % —————	
Axial XL	17.1	POST	64 b	62 b
Zidua	1.50	PRE	81 a	90 a
Axial XL	17.1	POST		
Zidua	1.50	PRE	83 a	85 a
RyzUp	1.00	PRE		
Axial XL	17.1	POST	79 a	86 a
Fierce	3.00	PRE		
Axial XL	17.1	POST	80 a	84 a
Fierce MTZ	16.7	PRE		
Axial XL	17.1	POST	86 a	92 a
Fierce	3.00	PRE		
RyzUp	1.00	PRE	75 a	81 a
Axial XL	17.1	POST		

¹ PRE, preemergence; POST, postemergence.

² Means followed by the same letter are not statistically different ($\alpha=0.05$).

³ DAT = days after treatment.

Table 5. Italian ryegrass density and biomass for preemergence applications of Zidua, RyzUp Smartgrass, Fierce, and Fierce MTZ following postemergence applications of Axial XL, 69 days after treatment, for a study near Pullman, WA, 2020.

Treatment	Rate	Timing ¹	Italian Ryegrass	
			Density	Biomass
	oz/A		plants m ⁻²	g m ⁻²
Nontreated	-	-	7 a	25 a
Axial XL	17.1	POST	6 a	14 a
Zidua	1.50	PRE	0 a	0 a
Axial XL	17.1	POST		
Zidua	1.50	PRE		
RyzUp	1.00	PRE	2 a	6 a
Axial XL	17.1	POST		
Fierce	3.00	PRE		
Axial XL	17.1	POST	5 a	10 a
Fierce MTZ	16.7	PRE		
Axial XL	17.1	POST	1 a	8 a
Fierce	3.00	PRE		
RyzUp	1.00	PRE	1 a	3 a
Axial XL	17.1	POST		
Fierce MTZ	16.7	PRE		
RyzUp	1.00	PRE	3 a	19 a
Axial XL	17.1	POST		

¹ PRE, preemergence; POST, postemergence.

² Means followed by the same letter are not statistically different ($\alpha=0.05$).

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.