

Herbicide timings for the control of Italian ryegrass in winter wheat

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A study was conducted to determine the optimal timing(s) for the use of group 15 herbicides including Zidua[®] SC (pyroxosulfone) and Axiom[®] DF [flufenacet plus metribuzin (group 5)]. Sencor[®] 75DF (metribuzin) was also evaluated at the wheat spike leaf and early tillering timing as a supplement to Zidua SC and Axiom DF. We evaluated three herbicide timings: (1) post-plant preemergence, (2) wheat spike leaf emergence and (3) early wheat tillering, which is typically late winter/early spring in Pullman.



The soil at this site is a Naff silt loam with 3.6% organic matter and a pH of 5.0. On October 1, 2019, the field was sprayed with RT 3[®] (glyphosate) + Aim[®] (carfentrazone) + Conform DP + Downrigger[™] (32 + 1.0 + 3.0 + 6.9 fl oz/A) to burndown the field in preparation for planting. The trial area followed spring canola. On October 2nd, ‘Norwest Tandem’ winter wheat was planted with a Horsch direct-seed air drill with row openers on a 12-inch spacing. Post-plant preemergence treatments were applied on October 4th with a CO₂-powered backpack sprayer set to deliver 10 gpa at 52 psi at 2.3 mph. The applications were made under moderate, 8 mph winds out of the southwest with an air temperature of 50°F and relative humidity of 56%. Wheat spike leaf emergence treatments were applied on October 24th. The applications were made under moderate, 6 mph winds out of the east with an air temperature of 54°F and relative humidity of 44%. The early tillering treatments were applied on February 27, 2020. The applications were made under calm conditions with an air temperature of 54°F and relative humidity of 40%. The majority of the wheat was four-leaf with the fifth emerging, thus in the early stages of tillering. On June 23rd, the trial area was sprayed with Priaxor[®] + Tilt[®] + NIS (6.0 + 4.0 fl oz/A + 0.125% v/v) to control stripe rust. The trial area was harvested with a Kincaid 8XP plot combine on August 26th.

Precipitation was extremely variable throughout the growing season, with much below average precipitation in some months and above average precipitation in other months. Temperatures did not fluctuate as much and in general they were below average in the spring and summer months. Italian ryegrass counts were taken on October 24, 2019 and February 27, 2020 in the nontreated check plots and they were 1 and 1.5 plants per square foot, respectively. The winter wheat and the Italian ryegrass finally started to grow after 2.21 inches of rain fell from May 17th to the 21st. Despite the low levels of Italian ryegrass at the herbicide application timings, by the time July came around there was a moderately heavy population throughout the trial area. None of the treatments evaluated in this trial caused any crop injury. All treatments containing Zidua SC provided \geq 83% control of Italian ryegrass except Zidua SC (3.25 fl oz/A) at the post-plant preemergence timing, which provided only 69% control (Table). Treatments that contained Axiom DF provided anywhere from 54 to 59% control of Italian ryegrass, which is not commercially acceptable. Sencor 75DF, either added to Zidua SC or Axiom DF at the wheat spike leaf or early tillering application timings, did not improve control compared to Zidua SC or Axiom DF applied alone. Unlike previous studies, where early application of Zidua provided the

best control of Italian rygrass, we were unable to determine an optimum application timing for Zidua SC or Axiom DF in this study. That was likely due to the late emergence of much of the Italian ryegrass in this study. The average yield and test weight among all treatments, including the nontreated check, was 125 bu/A and 59.2 lb/bu. Yield and test weight data were not presented since there were no significant differences among treatments.

			7/22
			Italian
		Application	ryegrass
Treatment	Rate	date ¹	control
	fl oz/A		%
Nontreated check	--	--	--
Zidua [®] SC	4.0	10/4/19	84 ab ²
Zidua SC	3.25	10/4/19	69 a-d
Zidua SC	3.25	10/4/19	89 a
Zidua SC	0.75	10/24/19	
Zidua SC	3.25	10/4/19	83 a-c
Zidua SC	0.75	10/24/19	
Sencor [®] 75DF	3.0 oz	10/24/19	
Zidua SC	3.25	10/4/19	83 a-c
Zidua SC	0.75	2/27/20	
Zidua SC	3.25	10/4/19	84 ab
Zidua SC	0.75	2/27/20	
Sencor 75DF	3.0 oz	2/27/20	
Axiom [®] DF	10.0 oz	10/4/19	56 d
Axiom DF	8.0 oz	10/4/19	59 b-d
Axiom DF	8.0 oz	10/4/19	58 cd
Sencor 75DF	3.0 oz	10/24/19	
Axiom DF	8.0 oz	10/4/19	54 d
Sencor 75DF	3.0 oz	2/27/20	

¹ (10/4/2019) post plant preemergence; (10/24/2019) wheat spike leaf emergence; (2/27/2020) early wheat tillering

² Means, based on four replicates, within a column, followed by the same letter are not significantly different at P = 0.05 as determined by Fisher's protected LSD test, which means that we are not confident that the difference is the result of treatment rather than experimental error or random variation associated with the experiment.