

Evaluation of application timings with Zidua® SC for the control of Italian ryegrass in winter wheat

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A field study was conducted at the Cook Agronomy Farm near Pullman, WA to determine the application timing of Zidua SC that would provide optimum control of Italian ryegrass in winter wheat. We evaluated four herbicide application timings in relation to wheat growth stage: preemergence, delayed preemergence, spike leaf emerged and early tillering.



The soil at this site is a Palouse silt loam with 3.7% organic matter and a pH of 5.2. The trial area followed chickpeas. On October 11, 2017, ‘Trooper (blend of Puma, SY107 and Ovation)’ winter wheat was seeded at 120 lb seed per acre at a depth of 2.0 inches with a Horsch direct-seed air drill on a 12-inch row spacing. Preemergence treatments were applied on October 12th under calm conditions with an air temperature of 46°F and relative humidity of 67%. Delayed preemergence treatments were applied on October 16th with an air temperature of 62°F, relative humidity of 33% and wind out of the east at 8 mph. Spike leaf treatments were applied on October 30th with an air temperature of 51°F, relative humidity of 25% and wind out of the east at 5 mph. Early tillering treatments were applied on March 29, 2018 with an air temperature of 44°F, relative humidity of 64% and winds out of the west at 6 mph. All herbicide treatments were applied with a CO₂-powered backpack sprayer set to deliver 10 gpa at 48 psi at 2.3 mph. The plots were harvested on August 2nd using a Kincaid 8XP plot combine.

Precipitation was above average during the fall and winter months, which was favorable for Italian ryegrass germination and growth. The crop was in and out of snow cover from December to March, but overall winter conditions were moderate and most likely minimal winterkill occurred in the Italian ryegrass. The results suggest that the best control of Italian ryegrass is achieved when the maximum annual use rate (4.0 fl oz/A) of Zidua SC is applied, but 2.5 to 3.25 fl oz/A of the seasonal maximum use rate needs to be applied around the time of planting, or shortly thereafter, with the remainder applied from spike leaf emergence to early tillering. Although waiting until early tillering to make the second application was effective in this study, this was not the case in a similar study conducted the previous year. A single application at early tillering, which is typically late winter/early spring in Pullman, is too late for Italian ryegrass control, suggesting that the majority of the plants are emerging in the fall. Zidua SC + PowerFlex® HL (4.0 fl oz + 2.0 oz/A), applied at spike leaf, was the only treatment where the addition of PowerFlex HL showed a slight improvement in Italian ryegrass control over Zidua SC applied alone.

Trt#	Treatment	Rate	Application timing ²	Italian ryegrass control		Yield
				5/11	7/6	
		fl oz/A		-----0-100%-----		bu/A
1	Nontreated Check	--	--	--	--	28 c
2	Zidua SC	3.25	preemergence	74 cd ²	86 a-c	96 a
3	Zidua SC	3.25	delayed preemergence	61 de	75 c	87 a
4	Zidua SC + Sencor [®]	3.25 + 1.45 oz	delayed preemergence	59 e	75 c	78 ab
5	Zidua SC	4.0	spike leaf	76 bc	81 bc	93 a
6	Zidua SC + PowerFlex HL ¹	4.0 + 2.0 oz	spike leaf	84 ab	88 ab	88 a
7	Zidua SC	4.0	early tillering	70 c-e	40 d	62 b
8	Zidua SC + PowerFlex HL ¹	4.0 + 2.0 oz	early tillering	44 f	35 d	61 b
9	Zidua SC	2.5	preemergence	84 ab	91 ab	90 a
9	Zidua SC	1.5	spike leaf			
10	Zidua SC	2.5	preemergence	82 a-c	93 a	91 a
10	Zidua SC + PowerFlex HL ¹	1.5 + 2.0 oz	spike leaf			
11	Zidua SC	2.5	preemergence	88 ab	94 a	87 a
11	Zidua SC	1.5	early tillering			
12	Zidua SC	2.5	preemergence	91 a	91 ab	84 a
12	Zidua SC + PowerFlex HL ¹	1.5 + 2.0 oz	early tillering			

¹ Treatment was tank mixed with 0.5% NIS and 2.0 qts UAN/A

² Dates of application, preemergence (10/12/17), delayed preemergence (10/16/17), spike leaf (10/30/17) and early tillering (3/29/18)

³ 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.