Evaluating pre-plant in combination with post-emergence herbicides for the control of Italian ryegrass in spring wheat

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A field study was conducted on the WSU Cook Agronomy Farm near Pullman, WA to evaluate Italian ryegrass control with pre-plant in combination with post-emergence herbicides in spring wheat. Pre-plant herbicides included Zidua and Anthem Flex each of which contain pyroxasulfone (Group 15), and post-emergence products Axial XL (pinoxaden) (Group 1), and Everest 2.0 (flucarbazone) or GoldSky (florasulam + pyroxsulam) (Group 2).

The soil at the site is a Naff silt loam with 3.75% organic matter and a pH of 5.0. On April 21st, pre-plant herbicides were applied with a CO_2 backpack sprayer set to deliver 10 gpa at 40 psi and 2 mph. On April 22nd, spring wheat was planted into heavy winter wheat stubble using a Horsch air drill with 12-inch row spacing. On May 19th, post-emergence herbicide applications were made to wheat that was in the 2-tiller stage and was 6 to 8 inches tall. The air temperature was 67°F, relative humidity was 41% and the wind was out of the west at 1 mph. Italian ryegrass was primarily in the 3-leaf stage and 2 to 4 inches in height. The Italian ryegrass population was high at 76 plants per quarter meter squared. Plots were harvested on August 18th using a Kincaid 8XP plot combine.

The majority of the rain that was received fell between May 12th and June 2nd in the amount of 2.47 inches. In general, the summer was very hot and dry. This trial was located in a sub-irrigated portion of the field, which helped with Italian ryegrass germination and supplying additional moisture for grain fill. In general, pre-plant applications of Anthem® Flex provided the majority of the control of Italian ryegrass. The addition of post-emergence herbicides Axial® XL, Everest® 2.0, Audit® 1:1 or GoldSky® to Anthem Flex, increased Italian ryegrass control, but only slightly and was not significantly different than Anthem Flex applied alone. Pre-plant applications of Zidua® did not perform as well as Anthem Flex, however, the Zidua rates used in this study provided less pyroxasulfone than was provided by the Anthem Flex rate. Post-emergence applications of Everest 2.0 + Audit 1:1, Axial XL or GoldSky did not provide acceptable control of Italian ryegrass. Thus, the results of this trial demonstrated a pre-plant application of Anthem Flex (3.0 fl oz/A) provided good control of Italian ryegrass. There were no significant differences among treatments in relation to test weight and yield (data not shown). The average test weight and yield were 60 lb/bu and 58 bu/a, respectively.

	Rate	Application	Application	Italian Ryegrass control (0 to 100)	
Treatment	fl oz/A	Date	Description	6/4	6/29
Nontreated Check				--	--
Anthem Flex	3	4/21	Pre-plant	71 ab[1]	61 ab
Zidua	1.25 oz	4/21	Pre-plant	57 bc	37 b-d
Anthem Flex	3	4/21	Pre-plant	79 a	61 ab
Everest 2.0	1	5/19	3 leaf IR[2]		
Audit 1:1	0.4 oz	5/19	3 leaf IR		
NIS	0.25% v/v	5/19	3 leaf IR		
AMS	1.0 lb	5/19	3 leaf IR		
Zidua	1.0 oz	4/21	Pre-plant	71 ab	56 a-c
Everest 2.0	1	5/19	3 leaf IR		
Audit 1:1	0.4 oz	5/19	3 leaf IR		
NIS	0.25% v/v	5/19	3 leaf IR		
AMS	1.0 lb	5/19	3 leaf IR		
Anthem Flex	3	4/21	Pre-plant	81 a	66 ab
Axial XL	16.4	5/19	3 leaf IR		
Anthem Flex	3	4/21	Pre-plant	82 a	75 a
GoldSky	16	5/19	3 leaf IR		
NIS	0.25% v/v	5/19	3 leaf IR		
AMS	1.0 lb	5/19	3 leaf IR		
Everest 2.0	1	5/19	3 leaf IR	49 c	44 a-d
Audit 1:1	0.4 oz	5/19	3 leaf IR		
NIS	0.25% v/v	5/19	3 leaf IR		
AMS	1.0 lb	5/19	3 leaf IR		
Axial XL	16.4	5/19	3 leaf IR	17 d	10 d
GoldSky	16	5/19	3 leaf IR	25 d	22 cd
NIS	0.25% v/v	5/19	3 leaf IR		
AMS	1.0 lb	5/19	3 leaf IR		

[1] 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.

[2] IR = Italian ryegrass.