Evaluation of Aggressor™ herbicide for the control of cereal rye in the CoAXium™ wheat production system

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The CoAXium™ wheat production system was recently developed by the Colorado Wheat Research Foundation, Inc., Limagrain Cereal Seeds, LLC and Albaugh, LLC. AXigen™ is the non-GMO trait in wheat that confers tolerance to the ACCase inhibitor (Group 1) herbicide Aggressor™ (quizalofop-P-ethyl). The AXigen trait will be made available to both private and public breeders and was one of the reasons we were interested in evaluating the system. Aggressor is labelled to control annual grassy weeds, such as downy brome, jointed goatgrass and feral rye that are problematic in the low to intermediate rainfall zones of eastern WA.

An area on the Cook Agronomy Farm, where previous research trials on feral rye control occurred, was selected for this trial. Since the area was previously in winter wheat, the remaining residue was burnt on September 28, 2017. On October 17th, the trial area was direct-seeded with a John Deere 9400 hoe drill with openers on a 7-inch spacing and a planting depth of 2.0 inches. The area was seeded at the rate of 120 lb/A, 107 lbs CoAxium winter wheat plus 13 lbs cereal rye. The ground was fertilized with 100 lb N per acre from dry urea on March 21, 2018. The soil at this site is a Palouse silt loam with 4.2% organic matter and a pH of 5.0. Early postemergence treatments were applied on April 11th. The applications were made with winds out of the east at 5 mph, air temperature of 56°F and relative humidity of 38%. At the time of application, wheat was at the 2-tiller stage and was 7 inches tall. Cereal rye had one node and was 14 inches tall, which is larger than the 1- to 4-inch height prescribed on the label. Late postemergence treatments were applied on May 4th. The applications were made with winds out of the east at 5 mph, air temperature of 62°F and relative humidity of 51%. At the time of application, wheat had one node and was 14 inches tall. Cereal rye had 3 nodes and was 22 inches tall. Both applications were made with a CO_2-powered backpack sprayer set to deliver 15 gpa at 47 psi at 2.3 mph.

Due to the late establishment of the CoAXium wheat, as well as the prevailing environmental conditions, fall applications of Aggressor did not occur. The Aggressor label only allows applications to be made on 1- to 4-inch tall cereal rye, hence our applications were made outside the label guidelines. Despite the late applications, early spring applications of Aggressor were highly effective for cereal rye control. There were no significant differences among the three rates evaluated, and no differences seen between NIS and MSO. The late spring application was also highly effective. Only Aggressor treatments applied at 8.0 or 10.0 fl oz/A and tank mixed with 1.0% MSO had a few plants that escaped control. There were no significant differences in yield among the Aggressor treatments and the mean was 86 bu/A. The yield in the nontreated check plots was 85 bu/A with 15% foreign material as cereal rye. Aggressor appears to be highly effective for the control of cereal or feral rye in the high rainfall zone. It will be important to

evaluate the CoAXium wheat production system in the intermediate to low rainfall zones to determine its effectiveness under those more stressful environmental conditions.

			Cereal rye control		
Treatment	Rate	Application date	5/23	6/22	Yield
	fl oz/A		----------0 to 100%----------		bu/A
Aggressor + MSO	8.0 + 1.0 % v/v	4/11	100 a[1]	100 a	94 a
Aggressor + MSO	10.0 + 1.0 % v/v	4/11	100 a	100 a	93 a
Aggressor + MSO	12.0 + 1.0 % v/v	4/11	100 a	100 a	84 a
Aggressor + NIS	8.0 + 0.25 % v/v	4/11	99 a	100 a	89 a
Aggressor + NIS	10.0 + 0.25 % v/v	4/11	100 a	100 a	88 a
Aggressor + NIS	12.0 + 0.25 % v/v	4/11	100 a	100 a	94 a
Aggressor + MSO	8.0 + 1.0 % v/v	5/4	88 b	97 c	79 a
Aggressor + NIS	10.0 + 0.25 % v/v	5/4	90 b	100 a	83 a
Aggressor + NIS	12.0 + 0.25 % v/v	5/4	90 b	100 a	76 a
Aggressor + MSO	10.0 + 1.0 % v/v	5/4	85 c	98 b	79 a
Aggressor + MSO + UAN	10.0 + 1.0 % v/v + 3 gal	4/11	100 a	100 a	82 a
Aggressor + NIS + UAN	10.0 + 0.25 % v/v + 3 gal	4/11	100 a	100 a	96 a
Nontreated Check	--	--	--	--	85 a

[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.