

Evaluation of No-Till Spring Wheat Response to Preemergence, Delayed Preemergence, and Early Postemergence Applications of Pyroxasulfone

Caleb Dalley, Daniel Guimaraes Abe, Hettinger Research Extension Center

A trial was conducted to evaluate the response of spring wheat to pyroxasulfone applied at different timings after planting. The hard red spring wheat ‘Shelly’ was planted into safflower stubble on May 1, 2020 using a no-till drill at a depth of 2.5 inches. The herbicide Zidua SC (pyroxasulfone) was applied at 1.75, 2.5, 3.25, and 4 oz/A at three timings. Treatments were applied preemergence (PRE) on May 2; delayed preemergence (DPRE) on May 11, and early postemergence to 1-leaf wheat on May 22. Treatments were applied using a tractor-mounted research sprayer at a spray volume of 10 gallons per acre using XP8002 flat fan nozzles. The herbicide glyphosate was applied to the entire field site to control weeds that had emerged prior to planting. Between planting and wheat emergence on May 14, rainfall of 0.39 inches occurred with 0.11 inches on May 5, 0.23 inches on May 7, 0.03 inches on May 9, and 0.02 inches on May 12. Wheat was evaluated for injury on May 22 and on June 1 (8 and 18 days after crop emergence). Wheat was harvested and yield measured on August 31 using a small plot combine with a 5-foot header (Kincaid 8 XP).

There was no visual injury to wheat from any of the herbicide treatments regardless of treatment rate or timing at either evaluation dates. The label for Zidua SC described increased risks for applying Zidua as a preplant or preemergence application and recommends a delayed preemergence timing to reduce risk for injury. A delayed preemergence application is defined as an application following wheat planting when 80% of germinated wheat seeds have a shoot at least one-half inch long and prior to wheat spiking. The risk for injury is greater when higher rainfall occurs in-between planting and wheat emergence or when seed furrow remains open after planting that allows herbicide to directly contact seed. In this trial, there was only 0.39 inches of rainfall and a maximum daily rainfall of 0.23 inches. Perhaps under a higher rainfall environment, injury to wheat would have occurred, but this was not observed in this trial. Pyroxasulfone is not highly mobile in the soil and generally needs an inch of rainfall for adequate incorporation into the soil as a herbicide for weed control. Wheat yields were similar between all treatments regardless of rate of pyroxasulfone applied or the timing of application.

While there was no injury to wheat in this trial and no reduction in wheat yield due to herbicide treatment, caution should be taken when using this herbicide prior to the delayed preemergence wheat stage as described earlier. When using under no-till conditions, ensure seed drill is set up properly to fully close seed furrow during planting. Also realize that seed drills that leave a deep seed furrow during planting increase the risk of crop injury. Also check weather for predicted rainfall as higher rainfall increases risk of crop injury although this rainfall will also increase weed control with this herbicide.

Table 1. Spring wheat response to the herbicide pyroxasulfone (Zidua) at four rates and three application timings.

Treatment Product name	Rate (oz/A)	Timing	Wheat Injury		Yield	Test wt
			8 DAE	18 DAE		
1 Zidua SC	1.75	PRE	0 -	0 -	40.1 -	59.00 -
2 Zidua SC	2.5	PRE	0 -	0 -	42.0 -	59.18 -
3 Zidua SC	3.25	PRE	0 -	0 -	42.7 -	59.08 -
4 Zidua SC	4.0	PRE	0 -	0 -	37.7 -	59.08 -
5 Zidua SC	1.75	DPRE	0 -	0 -	36.1 -	58.90 -
6 Zidua SC	2.5	DPRE	0 -	0 -	40.8 -	59.08 -
7 Zidua SC	3.25	DPRE	0 -	0 -	39.5 -	59.15 -
8 Zidua SC	4.0	DPRE	0 -	0 -	43.0 -	59.35 -
9 Zidua SC	1.75	EPOST	0 -	0 -	39.0 -	58.98 -
10 Zidua SC	2.5	EPOST	0 -	0 -	44.2 -	59.25 -
11 Zidua SC	3.25	EPOST	0 -	0 -	40.2 -	58.90 -
12 Zidua SC	4.0	EPOST	0 -	0 -	45.3 -	59.38 -
13 Weed Free			0 -	0 -	39.5 -	59.36 -
LSD P=.10			.	.	5.86	0.382
CV			0.0	0.0	12.05	0.54
Treatment F			0.000	0.000	1.111	0.920
Treatment Prob(F)			1.0000	1.0000	0.3813	0.5376

-Spring wheat 'Shelly' was planted on May 1, 2020 and emerged on May 14.

-Treatment timings were: preemergence (PRE), applied on May 2, 2020; delayed preemergence (DPRE), applied on May 11; early postemergence (EPOST) applied to 1-leaf wheat on May 21.

-Wheat was evaluated for injury on May 22 and June 1 (8 and 18 days after wheat emergence).

-Wheat was harvested on August 31 using a small plot combine (Kincaid 8XP).