

Preemergence and Post-Harvest Kochia Control in Wheat

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Summary

A study was initiated near Garden City, KS, in 2016, comparing the weed control of several herbicide treatments applied preemergence and post-harvest for kochia control in wheat. Clarity (dicamba) with any premix partner applied preemergence provided less than 30% kochia control at evaluations conducted on July 25 and August 12, 2016. The addition of glyphosate plus Distinct (dicamba + diflufenzopyr) postemergence increased control 45 to 66% compared to preemergence treatments alone on July 25 and August 12. However, all treatments receiving a postemergence application controlled kochia similarly on August 12.

Introduction

A scheduled approach of herbicides before and after wheat harvest is needed for effective season-long weed control. Clarity, Distinct, Prowl H₂O (pendimethalin), Rave (dicamba + triasulfuron), and Zidua (pyroxasulfone) have all shown activity on the normal weed spectrum seen in this region. The various combinations and timings of application to achieve effective weed control with these herbicides are not known. Therefore, it was the objective of this study to explore various combinations and timings of these compounds for season-long weed control.

Experimental Procedures

An experiment was conducted at the Kansas State University Southwest Research-Extension Center near Garden City, KS, to examine the efficacy of preemergence and/or post-harvest dicamba tank mixtures in winter wheat. Herbicides were applied March 3, 2016 (preemergence to kochia), and July 11, 2016 (postemergence following wheat harvest). Treatments were applied using a CO₂-compressed, tractor-mounted or backpack sprayer, delivering 20 GPA at 3.0 mph and 27 or 30 psi. Soil was a Ulysses silt loam with 1.4% organic matter, pH of 8.0, and cation exchange capacity of 18.4. Plot size was 10- by 40-feet and arranged in a split-plot design replicated four times, with preemergence herbicide as the main plot and post-harvest herbicides as the subplots. Wheat was removed from the experiment June 20, 2016, but no yield data were collected. Kochia control was evaluated visually on March 4, July 11, July 25, and August 12, 2016. These dates were 29 and 130 days after the preemergence treatments and 14 and 32 days after the post-harvest treatments, respectively.

Results and Discussion

Clarity with any premix partner applied preemergence provided less than 30% kochia control at the evaluations conducted on July 25 and August 12, 2016. The addition of glyphosate plus Distinct postemergence increased control 45 to 66% compared to preemergence treatments alone on July 25 and August 12. However, all treatments receiving a postemergence application controlled kochia similarly on August 12. No set of treatments provided season-long control of kochia. The study area was allowed to naturally reseed for two years prior to conducting this trial. Therefore, weed pressure was far more than what might be normally found in a producer's field. Although 85% control is not acceptable, it is often enough to thin the weeds, allowing a postemergence application of paraquat with atrazine or metribuzin to be successful, which would otherwise have been ineffective due to poor spray coverage.

Table 1. Preemergence and post-harvest kochia control in wheat

Herbicide ^a	Rate oz/a	Timing	Kochia			
			March 4	July 11	July 25	August 12
			----- % control -----			
Glyphosate	32	POST-Harvest	---	---	60	85
Distinct	6	POST-Harvest				
COC	1%	POST-Harvest				
AMS	2%	POST-Harvest				
Clarity	4	Preemergence	80	25	25	20
MCPA ester	8	Preemergence				
Zidua	2	Preemergence				
NIS	0.125%	Preemergence				
Clarity	4	Preemergence	80	25	70	86
MCPA ester	8	Preemergence				
Zidua	2	Preemergence				
NIS	0.125%	Preemergence				
Glyphosate	32	POST-Harvest				
Distinct	6	POST-Harvest				
COC	1%	POST-Harvest				
AMS	2%	POST-Harvest				
Clarity	4	Preemergence	83	33	20	20
MCPA ester	8	Preemergence				
Prowl H ₂ O	32	Preemergence				
NIS	0.125%	Preemergence				

continued

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Herbicide ^a	Rate	Timing	Kochia			
			March 4	July 11	July 25	August 12
			----- % control -----			
Clarity	4	Preemergence	83	33	70	85
MCPA ester	8	Preemergence				
Prowl H ₂ O	32	Preemergence				
NIS	0.125%	Preemergence				
Glyphosate	32	POST-Harvest				
Distinct	6	POST-Harvest				
COC	1%	POST-Harvest				
AMS	2%	POST-Harvest				
Clarity	4	Preemergence	84	30	28	28
MCPA ester	8	Preemergence				
Prowl H ₂ O	32	Preemergence				
Zidua	2	Preemergence				
NIS	0.125%	Preemergence				
Clarity	4	Preemergence	84	30	73	85
MCPA ester	8	Preemergence				
Prowl H ₂ O	32	Preemergence				
Zidua	2	Preemergence				
NIS	0.125%	Preemergence				
Glyphosate +	32	POST-Harvest				
Distinct	6	POST-Harvest				
COC	1%	POST-Harvest				
AMS	2%	POST-Harvest				
Rave	4	Preemergence	73	28	23	23
NIS	0.125%	Preemergence				
Rave	4	Preemergence	73	28	68	84
NIS	0.125%	Preemergence				
Glyphosate	32	POST-Harvest				
Distinct	6	POST-Harvest				
COC	1%	POST-Harvest				
AMS	2%	POST-Harvest				
Untreated	---	---	0	0	0	0
Least significant difference (0.05)			4	8	4	4

^a AMS is ammonium sulfate, COC is crop oil concentrate, and NIS is nonionic surfactant.



Figure 1. Clarity 4 oz +MCPA 8 oz + Zidua 2 oz preemergence to kochia 154 days after application.



Figure 2. Clarity 4 oz +MCPA 8 oz + Zidua 2 oz preemergence to kochia followed by glyphosate 32 oz + Distinct 6 oz POST-harvest 24 days after POST-harvest application.



Figure 3. Clarity 4 oz + MCPA 8 oz + Prowl H₂O 32 oz preemergence to kochia followed by glyphosate 32 oz + Distinct 6 oz POST-harvest 24 days after POST-harvest application.



Figure 4. Clarity 4 oz + MCPA 8 oz + Zidua 2 oz + Prowl H₂O 32 oz preemergence to kochia followed by glyphosate 32 oz + Distinct 6 oz POST-harvest 24 days after POST-harvest application.



Figure 5. Rave 4 oz preemergence to kochia followed by glyphosate 32 oz + Distinct 6 oz POST-harvest 24 days after POST-harvest application.