

Balance Pro, Atrazine, Autumn Super, Corvus, Sencor, Authority, and Banvel for Preemergence Kochia Control in Fallow

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Summary

A study was initiated near Garden City, KS, in 2016 comparing kochia control of several herbicide treatments and their time of application in fallow. Spring applications of five tank mixes containing the active ingredient isoxaflutole provided greater than 92% control of kochia. Fall applications of similar tank mixes provided from 78 to 84% control. Tank mixes of atrazine and dicamba applied in the spring provided only 89% control.

Introduction

It has become common for growers to apply Banvel (dicamba) for effective preemergence control of kochia in early spring. Due to time constraints, growers often would like to apply these treatments in the fall or early winter. Although dicamba resistance in kochia is very rare, it has been reported. Balance Pro (isoxaflutole), atrazine, Autumn Super (iodosulfuron + thien carbazon), Corvus (isoxaflutole + thien carbazon), Sencor (metribuzin) and Authority (sulfentrazone) have all been shown to have activity for kochia control. Therefore, it was the objective of this study to explore tank mix combinations and timing of these compounds with and without dicamba for kochia 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 fall and spring preemergence herbicides in fallow. Fall applications were applied December 3, 2015, and spring treatments were applied March 3, 2016. All herbicides were applied using a tractor-mounted, CO₂-pressurized plot sprayer, delivering 20 gallons per acre (GPA) at 30 psi and 4.1 mph. Soil was a Ulysses silt loam with 1.4% organic matter, pH of 8.0, and a cation exchange capacity of 18.4. Plots were 10- by 35-feet. The experimental design was a randomized complete block and treatments were replicated four times. Visual kochia control was determined on April 6, May 26, and July 28, 2016, which was 5, 12, and 21 weeks after spring applications (WAST), respectively.

Results and Discussion

A spring application of tank mixes containing the active ingredients isoxaflutole, atrazine, or dicamba provided greater than 92% control of kochia at 12 WAST. Fall

applications of similar tank mixes provided 78 to 84% control. Previous work has also shown a reduced control with winter application (Proc. North Central Weed Sci. Soc. 70:49-50). However, these studies did not show as severe a penalty for fall application due to different patterns of fall and winter precipitation. Tank mixes of atrazine and dicamba provided only 89% control. By 21 WAST, no treatment provided more than 65% kochia control.

Dicamba rates used in this study are only 75% of the most effective rate often used in fallow. This was done to maximize expression of the other tank mix partners evaluated. Further, this trial was conducted in an area with exceptional naturally occurring kochia seed load. In fields with modest infestations of kochia or if the rate of dicamba is increased to 16 oz, most of these tank mixes should provide good control. With the increasing threat of dicamba resistance, it should always be applied with a tank mix partner of a different mode of action. Clearly several of these products should enhance control over dicamba alone and help delay the onset of dicamba-resistant kochia.

Table 1. Fallow kochia control with Balance Pro, Atrazine, Autumn Super, Corvus, and Banvel

Herbicide ^a	Rate oz/a	Timing	Kochia		
			5 WAST ^b	12 WAST	21 WAST
			----- % control -----		
Balance Pro	2	Fall	100	84	40
Atrazine	32	Fall			
Balance Pro	2	Fall	100	86	43
Atrazine	32	Fall			
Corvus	0.5	Fall			
Corvus	4	Fall	100	86	38
Atrazine	32	Fall			
Authority MTZ	12	Fall	99	78	30
Atrazine	32	Fall	100	80	35
Atrazine	32	Fall	100	87	43
Balance Pro	2	Spring			
Sencor	8	Spring			
MSO	1%	Spring			
Atrazine	32	Fall	99	89	38
Corvus	3.5	Spring			
Sencor	8	Spring			
MSO	1%	Spring			
Balance Pro	2	Spring	100	90	50
Atrazine	32	Spring			
MSO	1%	Spring			

continued

Table 1. Fallow kochia control with Balance Pro, Atrazine, Autumn Super, Corvus, and Banvel

Herbicide ^a	Rate	Timing	Kochia		
			5 WAST ^b	12 WAST	21 WAST
			----- % control -----		
Balance Pro	2	Spring	99	93	48
Atrazine	32	Spring			
Banvel	12	Spring			
MSO	1%	Spring			
Balance Pro	2	Spring	100	93	50
Atrazine	32	Spring			
Autumn Super	0.5	Spring			
MSO	1%	Spring			
Balance Pro	2	Spring	99	95	65
Atrazine	32	Spring			
Autumn Super	0.5	Spring			
Banvel	12	Spring			
MSO	1%	Spring			
Corvus	3.5	Spring	99	95	53
Atrazine	32	Spring			
MSO	1%	Spring			
Corvus	4	Spring	100	97	63
Atrazine	32	Spring			
Banvel	12	Spring			
MSO	1%	Spring			
Atrazine	32	Spring	99	89	50
Banvel	12	Spring			
MSO	1%	Spring			
Authority MTZ	10	Spring	99	89	25
Untreated	---	---	0	0	0
Least significant difference (0.05)			2	4	13

^a MSO is methylated seed oil.^b WAST is weeks after spring application.



Figure 1. Untreated control.



Figure 2. Spring-applied Balance Pro 2.0 oz + Atrazine 32 oz + Autumn Super 0.5 oz + Banvel 12 oz + methylated seed oil 1% 105 days after spring application.



Figure 3. Spring-applied Corvus 3.5 oz + Atrazine 32 oz + methylated seed oil 1% 105 days after spring application.



Figure 4. Spring-applied Corvus 4.0 oz + Atrazine 32 oz + Banvel 12 oz + methylated seed oil 1% 105 days after spring application.



Figure 5. Spring-applied Atrazine 32 oz + Banvel 12 oz + methylated seed oil 1% 105 days after spring application.