

## **Atrazine, Clarity, Verdict, and Armezon Pro Application Timings for Weed Control in Fallow**

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### **Summary**

A study was initiated near Garden City, KS, in 2016, comparing the weed control of several herbicide treatments and their time of application in fallow. A single application of Clarity (dicamba) and atrazine applied on March 3, 2016, did not provide more than 93% control of kochia, Russian thistle, and Palmer amaranth on June 9. All other treatments provided 95% or greater control at the evaluation conducted June 9. Three applications were needed to provide 90% or greater control of all three species through July 6.

### **Introduction**

With the advent of kochia and Palmer amaranth that is resistant to glyphosate, there is an urgent need to explore non-glyphosate options for control of these weeds. Atrazine, Clarity, Verdict (saflufenacil + dimethenamid), and Armezon Pro (topramezone + dimethenamid) have been shown to have activity on both kochia and Palmer amaranth. It is not known what rates and what times of application might provide season-long control of these species. Therefore, it was the objective of this research to explore timings and rates of various combinations of these products for control of kochia and Palmer amaranth.

### **Experimental Procedures**

An experiment was conducted at the Kansas State University Southwest Research-Extension Center near Garden City, KS, to examine the efficacy of single and sequential herbicide treatments in fallow. Application, environmental, and weed information are given in Table 1. All herbicides were applied using a compressed-CO<sub>2</sub> backpack sprayer, delivering 20 GPA at 3.0 mph and 27 psi. Soil was a Ulysses silt loam with 1.4% organic matter, pH of 8.0, and cation exchange capacity of 18.4. Plots were 10- by 35-feet, arranged in a randomized complete block design with four replications. Control of kochia, Palmer amaranth, and Russian thistle were visually determined on June 9 and July 6, 2016, which were 15 and 42 days after the May 25 application, respectively.

### **Results and Discussion**

A single application of Clarity and atrazine applied on March 3, 2016, did not provide more than 93% control of kochia, Russian thistle, and Palmer amaranth on June 9. All

other treatments provided 95% or greater control at the evaluation conducted June 9. Three applications were needed to provide 90% or greater control of all three species through July 6. Previous unpublished work by the BASF Corporation had suggested that Armezon Pro might be an effective tool in the fallow period prior to planting sorghum. However, at the completion of this study, and based on other data, they have concluded that subsequent sorghum injury might be too severe to allow its use in this crop. Consequently, although initial results in this and other studies looked promising, it is unlikely that Armezon Pro will be labeled for this use. However, Armezon Pro has excellent crop safety in corn, and these tank mixes would provide an excellent strategy for dealing with both kochia and Palmer amaranth in that crop.

**Table 1. Application information**

Application date	March 3, 2016	April 22, 2016	May 11, 2016	May 25, 2016
Air temperature (°F)	64	62	50	57
Relative humidity (%)	14	54	64	81
Soil temperature (°F)	47	47	60	64
Wind speed (mph)	5	1	5	5
Wind direction	West-northwest	South	North-northwest	West-northwest
Soil moisture	Dry	Good	Fair	Fair
Kochia				
Height (in.)	0.25	0.25	2	3
Density (plants/m <sup>2</sup> )	100	75	3	1
Palmer amaranth				
Height (in.)	---	---	2	2
Density (plants/m <sup>2</sup> )	0	0	1	1
Russian thistle				
Height (in.)	---	---	---	---
Density (plants/m <sup>2</sup> )	0	0	0	0

**Table 2. Fallow weed control with Clarity, atrazine, Verdict, and Armezon Pro application timings**

Herbicide <sup>a</sup>	Rate	Application date	June 9, 2016			July 6, 2016		
			Kochia	Russian thistle	Palmer amaranth	Kochia	Russian thistle	Palmer amaranth
			----- % control -----					
Clarity	16	March 3	93	88	73	80	88	13
Atrazine	24	March 3						
Glyphosate	22	March 3						
MSO	1%	March 3						
AMS	2%	March 3						
Clarity	16	March 3	99	99	95	99	98	61
Atrazine	24	March 3						
Glyphosate	22	March 3						
MSO	1%	March 3						
AMS	2%	March 3						
Verdict	10	April 21						
Atrazine	16	April 21						
Glyphosate	22	April 21						
MSO	1%	April 21						
AMS	2%	April 21						
Clarity	16	March 3	100	100	100	100	100	90
Atrazine	24	March 3						
Glyphosate	22	March 3						
MSO	1%	March 3						
AMS	2%	March 3						
Verdict	10	April 21						
Atrazine	16	April 21						
Glyphosate	22	April 21						
MSO	1%	April 21						
AMS	2%	April 21						
Armezon Pro	16	May 25						
Atrazine	16	May 25						
Glyphosate	22	May 25						
COC	1%	May 25						
AMS	2%	May 25						
Clarity	16	March 3	100	100	100	98	100	74
Atrazine	24	March 3						
Glyphosate	22	March 3						
MSO	1%	March 3						
AMS	2%	March 3						
Armezon Pro	20	May 12						
Atrazine	16	May 12						
Glyphosate	22	May 12						
COC	1%	May 12						
AMS	2%	May 12						
Untreated	---	---	0	0	0	0	0	0
Least significant difference (0.05)			2	3	4	4	4	20

<sup>a</sup> AMS is ammonium sulfate, COC is crop oil concentrate, and MSO is methylated seed oil.



**Figure 1. Untreated control.**



**Figure 2. Clarity 16 oz + atrazine 24 oz + glyphosate 22 oz applied March 3, 2016; 125 days after treatment.**



**Figure 3. Clarity 16 oz + atrazine 24 oz + glyphosate 22 oz applied March 3 followed by Verdict 10 oz + atrazine 24 oz + glyphosate 22 oz applied April 21 2016; 76 days after the last application.**



**Figure 4. Clarity 16 oz + atrazine 24 oz + glyphosate 22 oz applied March 3 followed by Verdict 10 oz + atrazine 24 oz + glyphosate 22 oz applied April 21 followed by Armezon Pro 16 oz + atrazine 24 oz + glyphosate 22 oz applied May 25, 2016; 42 days after the last application.**



**Figure 5. Clarity 16 oz + atrazine 24 oz + glyphosate 22 oz applied March 3 followed by Armezon Pro 16 oz + atrazine 24 oz + glyphosate 22 oz applied May 12, 2016; 55 days after the last application.**