

Evaluation of the impact of BMP rates of atrazine tank mixed with several broadleaf herbicides in field corn at Rochester, MN, in 2007.

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The objective of this trial was to evaluate the impact of BMP rates of atrazine tank mixed with several broadleaf herbicides in field corn in southeastern Minnesota. The research site was a Lawler loam series with a pH of 7.0 and soil test P and K levels of 16 ppm and 160 ppm, respectively. Spring fertilizer was broadcast ahead of planting on April 13, at a rate of 99-23-60-24 (N-P-K-S). The area was side dressed with an additional 30 lb/A of N on June 7. The field was spring disked twice and field cultivated once prior to planting. The corn hybrid, Pioneer 38H65, was planted on April 27, 2007, at a depth of 1.5 inches in 30 inch rows at 32,000 seeds per acre. A randomized complete block design was used with four replications. Preemergence (PRE) and postemergence (POST) treatments were applied with a tractor-mounted sprayer delivering 20 gpa at 32 psi using Turbo Tee 11002 nozzles. Evaluations of the plots were taken on May 30, June 4, June 11, June 28, and August 10. Application dates, environmental conditions, and weed stages are listed below. The center two rows of each plot were machine harvested on September 26, 2007.

Date	April 27	May 23
Treatment	PRE	POST
Temperature (F)		
Air	71	70
soil	62.1	69.4
Relative Humidity (%)	34	70
Wind (mph)	10	23
Soil moisture	adequate	excessive
Corn		
stage	--	3 collar
height (inch)	--	4.0
Giant Ragweed		
weed density (ft ²)	--	24.9
height (inch)	--	1.6
Common Lambsquarters		
weed density (ft ²)	--	4
height (inch)	--	1.1
Common Waterhemp		
weed density (ft ²)	--	3.5
height (inch)	--	1.1
Giant Foxtail		
weed density (ft ²)	--	1.5
height (inch)	--	1.3
Velvetleaf		
weed density (ft ²)	--	1.5
height (inch)	--	2.0
Rainfall after each application (inch)		
week 1	0.52	2.04
week 2	0.52	1.28
week 3	0.34	0.38

CONCLUSIONS

Soil applied atrazine (Bicep Lite II Mag) applied at recommended BMP rates for SE Minnesota resulted in no improvement of broadleaf weed control when compared to the no atrazine check (Dual II Mag). Postemergence programs that included atrazine at 0.5 lb/A, which is lower than the recommended BMP rate of 0.8 lb/A for SE Minnesota, provided significantly higher weed control and grain yield at Rochester.

The addition of 0.5 lb of atrazine to Callisto, Hornet, and Clarity herbicides resulted in higher giant ragweed control when compared to Callisto, Hornet, and Clarity alone. The 0.5 lb rate of atrazine tank mixed with Hornet, and Clarity herbicides also resulted in significantly better common lambsquarters and common waterhemp control when compared to Hornet and Clarity by themselves.

Grain yield was also statistically higher in the Callisto + atrazine and Hornet + atrazine tank mixes when compared to Callisto and Hornet by themselves. Combined grain yields for the post emergent atrazine tank mixes increased grain yield by an average of 30.3 bushels per acre when compared to the same post emergence treatments by themselves.

Table 1. Performance of herbicide systems for giant ragweed control in field corn on May 30, June 4, June 11, June 28, and August 10 at Rochester, MN, in 2007.

Treatment	Rate	Giant Ragweed Control					Yield
		5/30	6/4	6/11	6/28	8/10	
	(rate/A)	%					(bu/A)
PRE							
Dual II Mag	1 pt	0	0	0	0	0	5
Bicep Lite II Mag	2.3 pt	0	0	0	0	0	4
PRE / POST I							
Dual II Mag / Callisto + COC + 28% UAN	1 pt / 3 fl oz + 1% v/v + 2.5% v/v	73	88	82	87	84	124
Dual II Mag / Callisto + Aatrex + COC + 28% UAN	1 pt / 3 fl oz + 16 fl oz + 1% v/v + 2.5% v/v	95	96	94	96	95	159
Dual II Mag / Hornet + COC + 28% UAN	1 pt / 3 oz + 1% v/v + 2.5% v/v	76	78	73	89	81	109
Dual II Mag / Hornet + Aatrex + COC + 28% UAN	1 pt / 3 oz + 16 fl oz + 1% v/v + 2.5% v/v	92	93	90	92	93	142
Dual II Mag / Clarity + 28% UAN	1 pt / 1 pt + 2.5% v/v	76	85	79	77	74	97
Dual II Mag / Clarity + Aatrex + 28% UAN	1 pt / 1 pt + 16 fl oz + 2.5% v/v	93	94	88	90	86	120
LSD (P=0.10)		4	3	3	3	3	25

Table 2. Performance of herbicide systems for common lambsquarters control in field corn on May 30, June 4, June 11, June 28, and August 10 at Rochester, MN, in 2007.

Treatment	Rate	Common Lambsquarters Control					Yield
		5/30	6/4	6/11	6/28	8/10	
	(rate/A)	%					(bu/A)
PRE							
Dual II Mag	1 pt	30	40	0	0	0	5
Bicep Lite II Mag	2.3 pt	36	40	0	0	0	4
PRE / POST I							
Dual II Mag / Callisto + COC + 28% UAN	1 pt / 3 fl oz + 1% v/v + 2.5% v/v	85	93	99	99	99	124
Dual II Mag / Callisto + Aatrex + COC + 28% UAN	1 pt / 3 fl oz + 16 fl oz + 1% v/v + 2.5% v/v	99	99	99	99	99	159
Dual II Mag / Hornet + COC + 28% UAN	1 pt / 3 oz + 1% v/v + 2.5% v/v	70	78	70	71	68	109
Dual II Mag / Hornet + Aatrex + COC + 28% UAN	1 pt / 3 oz + 16 fl oz + 1% v/v + 2.5% v/v	98	99	99	99	99	142
Dual II Mag / Clarity + 28% UAN	1 pt / 1 pt + 2.5% v/v	75	73	77	81	74	97
Dual II Mag / Clarity + Aatrex + 28% UAN	1 pt / 1 pt + 16 fl oz + 2.5% v/v	97	98	99	99	99	120
LSD (P=0.10)		4	6	4	4	3	25

Table 3 Performance of herbicide systems for common waterhemp control in field corn on May 30, June 4, June 11, June 28, and August 10 at Rochester, MN, in 2007.

Treatment	Rate	Common Waterhemp Control					Yield
		5/30	6/4	6/11	6/28	8/10	
	(rate/A)	(%)					(bu/A)
PRE							
Dual II Mag	1 pt	40	70	0	0	0	5
Bicep Lite II Mag	2.3 pt	40	73	0	0	0	4
PRE / POST I							
Dual II Mag / Callisto + COC + 28% UAN	1 pt / 3 fl oz + 1% v/v + 2.5% v/v	96	92	97	90	94	124
Dual II Mag / Callisto + Aatrex + COC + 28% UAN	1 pt / 3 fl oz + 16 fl oz + 1% v/v + 2.5% v/v	99	99	99	98	98	159
Dual II Mag / Hornet + COC + 28% UAN	1 pt / 3 oz + 1% v/v + 2.5% v/v	81	91	78	82	70	109
Dual II Mag / Hornet + Aatrex + COC + 28% UAN	1 pt / 3 oz + 16 fl oz + 1% v/v + 2.5% v/v	87	95	86	83	86	142
Dual II Mag / Clarity + 28% UAN	1 pt / 1 pt + 2.5% v/v	83	92	84	87	73	97
Dual II Mag / Clarity + Aatrex + 28% UAN	1 pt / 1 pt + 16 fl oz + 2.5% v/v	96	94	87	88	88	120
		LSD (P=0.10)					25

Table 4. Performance of herbicide systems for giant foxtail control in field corn on May 30, June 4, June 11, June 28, and August 10 at Rochester, MN, in 2007.

Treatment	Rate	Giant Foxtail Control					Yield
		5/30	6/4	6/11	6/28	8/10	
	(rate/A)	(%)					(bu/A)
PRE							
Dual II Mag	1 pt	80	78	0	0	0	5
Bicep Lite II Mag	2.3 pt	80	80	0	0	0	4
PRE / POST I							
Dual II Mag / Callisto + COC + 28% UAN	1 pt / 3 fl oz + 1% v/v + 2.5% v/v	81	81	83	75	85	124
Dual II Mag / Callisto + Aatrex + COC + 28% UAN	1 pt / 3 fl oz + 16 fl oz + 1% v/v + 2.5% v/v	93	85	86	75	89	159
Dual II Mag / Hornet + COC + 28% UAN	1 pt / 3 oz + 1% v/v + 2.5% v/v	81	80	80	75	85	109
Dual II Mag / Hornet + Aatrex + COC + 28% UAN	1 pt / 3 oz + 16 fl oz + 1% v/v + 2.5% v/v	83	81	83	75	85	142
Dual II Mag / Clarity + 28% UAN	1 pt / 1 pt + 2.5% v/v	83	81	84	75	85	97
Dual II Mag / Clarity + Aatrex + 28% UAN	1 pt / 1 pt + 16 fl oz + 2.5% v/v	86	80	84	75	85	120
		LSD (P=0.10)					25