

Weed control with PRE and POST herbicide systems with Anthem herbicide in Soybean in 2014

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The objective of this trial was to evaluate the performance of Anthem herbicide programs for weed control in soybeans in southeastern Minnesota. The research site was a Lawler loam series with a pH of 6.6, O.M of 2.3%, and soil test P and K levels of 41 ppm and 126 ppm, respectively. The field was chisel plowed in the fall, disked in the spring and field cultivated once prior to planting. The soybean variety Asgrow AG2232, was planted on May 28, 2014, at a depth of 1.5 inches in 30 inch rows at a rate of 149,000 seeds per acre. A randomized complete block design was used with four replications. Preemergence (PRE) and postemergence (POST I) treatments were applied with a tractor-mounted sprayer delivering 15 gpa at 40 psi using TTI 110015 spray tips for PRE treatments. Post II applications were made at 15 gpa, 40 psi, and 5 mph using TTJ 60 11002 nozzles. Evaluations of the plots were taken on June 16, 24, July 1, 9, 14, 21 and October 6, 2014. The center two rows of each plot were machine harvested on October 10, 2014. Application dates, environmental conditions, and weed stages are listed in Table 1. Herbicide performance for giant ragweed, common lambsquarters, common waterhemp and giant foxtail control, plus crop injury ratings are in Tables 2 through 6, respectively. (University of Minnesota Extension Regional Office, Rochester).

Table 1. Application timing, plant stage, environmental conditions.

Date	5/28	6/25	7/3
Treatment	PRE	POST I	POST II
Temperature			
Air	76	68	64
Soil	72.7	68.9	66.7
Relative Humidity (%)	27	81	67
Wind (mph)	15	10	6
Soil Moisture	Normal	Wet	Normal
Soybean			
Stage		V2	V4-V5
Height (inches)		8	10
Giant Ragweed			
Weed density (ft ²)		2.0	
Height (inches)		5	8
Common Lambsquarters			
Weed density (ft ²)		1.0	
Height (inches)		1.25	3.25
Common Waterhemp			
Weed density (ft ²)		2.7	
Height (inches)		2	3.63
Giant foxtail			
Weed density (ft ²)		13.8	
Height (inches)		4	5.75
Rainfall after each application			
Week 1	1.06	1.27	0.51
Week 2	0.04	0.52	0.59
Week 3	4.61	0.59	0.43

Table 2. Evaluation of Anthem herbicide systems for giant ragweed control in soybeans on June 16, 24, July 1, 9, 14, 21 and October 6, and grain yield at 13% moisture at Rochester, MN, in 2014.

Treatment	Rate	Giant Ragweed Control							Yield
		6/16	6/24	7/1	7/9	7/14	7/21	10/6	
	(rate/A)	(% Control)							(bu/A)
Untreated		0	0	0	0	0	0	0	11.1 d
PRE									
Authority First	6.4 oz wt/a	95	93	90	88	91	89	87	39.5 ab
Authority First + Anthem	6.4 oz wt/a + 8 fl oz/a	96	94	93	92	92	90	88	38.7 ab
(Optill PRO) Optill + Outlook	2 oz/a + 10 fl oz/a	98	91	88	84	85	83	82	36.2 bc
Authority Elite + Accolade	1 qt/a + 1.33 oz wt/a	95	88	86	85	85	83	82	33.5 c
PRE / POST I (V2)									
Authority First / Anthem + Roundup PowerMax + N-Pa-K-AMS	6.4 oz wt/a / 8 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	95	94	98	98	99	98	98	41.2 a
POST I (V2)									
Outlook + Roundup PowerMax + N-Pa-K-AMS	12 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	0	0	90	96	97	96	95	41.1 a
Warrant + Roundup PowerMax + N-Pa-K-AMS	1.5 pt/a + 22 fl oz/a + 3.3gal/100 gal	0	0	87	93	96	94	95	36.5 bc
Anthem + FirstRate +Roundup PowerMax + COC + N-Pa-K-AMS	8 fl oz/a +0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	89	98	98	98	99	38.1 ab
POST II(V2)									
Marvel + FirstRate + Roundup PowerMax + COC + N-Pa-K-AMS	6 fl oz/a +0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	0	85	96	96	98	36.7 bc
LSD (P=0.10)		1	2	3	3	4	3	3	4.1 LSD (P=0.20)

Table 3. Evaluation of Anthem herbicide systems for common lambsquarters control in soybeans on June 16, 24, July 1, 9, 14, 21 and October 6, and grain yield at 13% moisture at Rochester, MN, in 2014.

Treatment	Rate	Common Lambsquarters Control							Yield
		6/16	6/24	7/1	7/9	7/14	7/21	10/6	
	(rate/A)	(% Control)							(bu/A)
Untreated		0	0	0	0	0	0	0	11.1 d
PRE									
Authority First	6.4 oz wt/a	99	99	99	99	99	99	99	39.5 ab
Authority First + Anthem	6.4 oz wt/a + 8 fl oz/a	99	99	99	99	99	99	99	38.7 ab
(Optill PRO) Optill + Outlook	2 oz/a + 10 fl oz/a	99	97	98	99	99	99	99	36.2 bc
Authority Elite + Accolade	1 qt/a + 1.33 oz wt/a	99	99	99	99	99	99	99	33.5 c
PRE / POST I (V2)									
Authority First / Anthem + Roundup PowerMax + N-Pa-K-AMS	6.4 oz wt/a / 8 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	99	99	99	99	99	99	99	41.2 a
POST I (V2)									
Outlook + Roundup PowerMax + N-Pa-K-AMS	12 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	0	0	99	99	99	97	96	41.1 a
Warrant + Roundup PowerMax + N-Pa-K-AMS	1.5 pt/a + 22 fl oz/a + 3.3gal/100 gal	0	0	97	93	94	92	90	36.5 bc
Anthem + FirstRate +Roundup PowerMax + COC + N-Pa-K-AMS	8 fl oz/a +0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	99	99	99	97	97	38.1 ab
POST II(V2)									
Marvel + FirstRate + Roundup PowerMax + COC + N-Pa-K-AMS	6 fl oz/a +0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	0	98	99	97	95	36.7 bc
LSD (P=0.10)		0	0.2	0.7	2	2.5	2.6	3	4.1 LSD (P=0.20)

Table 4. Evaluation of Anthem herbicide systems for common waterhemp control in soybeans on June 16, 24, July 1, 9, 14, 21 and October 6, and grain yield at 13% moisture at Rochester, MN, in 2014.

Treatment	Rate	Common Waterhemp Control							Yield
		6/16	6/24	7/1	7/9	7/14	7/21	10/6	
	(rate/A)	(% Control)							(bu/A)
Untreated		0	0	0	0	0	0	0	11.1 d
PRE									
Authority First	6.4 oz wt/a	99	99	99	99	99	99	99	39.5 ab
Authority First + Anthem	6.4 oz wt/a + 8 fl oz/a	99	99	99	99	99	99	99	38.7 ab
(Optill PRO) Optill + Outlook	2 oz/a + 10 fl oz/a	99	97	98	92	90	87	86	36.2 bc
Authority Elite + Accolade	1 qt/a + 1.33 oz wt/a	99	99	99	99	98	99	99	33.5 c
PRE / POST I (V2)									
Authority First / Anthem + Roundup PowerMax + N-Pa-K-AMS	6.4 oz wt/a / 8 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	99	99	99	99	99	99	99	41.2 a
POST I (V2)									
Outlook + Roundup PowerMax + N-Pa-K-AMS	12 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	0	0	99	98	99	98	96	41.1 a
Warrant + Roundup PowerMax + N-Pa-K-AMS	1.5 pt/a + 22 fl oz/a + 3.3gal/100 gal	0	0	99	94	98	97	96	36.5 bc
Anthem + FirstRate + Roundup PowerMax + COC + N-Pa-K-AMS	8 fl oz/a + 0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	99	99	99	97	97	38.1 ab
POST II(V2)									
Marvel + FirstRate + Roundup PowerMax + COC + N-Pa-K-AMS	6 fl oz/a + 0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	0	95	99	98	95	36.7 bc
LSD (P=0.10)		0	0.2	0.6	2.9	2.7	2.4	3	4.1 LSD (P=0.20)

Table 5. Evaluation of Anthem herbicide systems for grass control in soybeans on June 16, 24, July 1, 9, 14, 21 and October 6, and grain yield at 13% moisture at Rochester, MN, in 2014.

Treatment	Rate	Grass Control							Yield
		6/16	6/24	7/1	7/9	7/14	7/21	10/6	
	(rate/A)	(% Control)							(bu/A)
Untreated		0	0	0	0	0	0	0	11.1 d
PRE									
Authority First	6.4 oz wt/a	94	92	91	88	88	87	85	39.5 ab
Authority First + Anthem	6.4 oz wt/a + 8 fl oz/a	99	97	97	98	98	98	97	38.7 ab
(Optill PRO) Optill + Outlook	2 oz/a + 10 fl oz/a	99	95	92	88	90	90	88	36.2 bc
Authority Elite + Accolade	1 qt/a + 1.33 oz wt/a	99	99	99	98	98	98	98	33.5 c
PRE / POST I (V2)									
Authority First / Anthem + Roundup PowerMax + N-Pa-K-AMS	6.4 oz wt/a / 8 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	96	93	99	99	99	99	99	41.2 a
POST I (V2)									
Outlook + Roundup PowerMax + N-Pa-K-AMS	12 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	0	0	94	99	99	99	98	41.1 a
Warrant + Roundup PowerMax + N-Pa-K-AMS	1.5 pt/a + 22 fl oz/a + 3.3gal/100 gal	0	0	90	95	96	95	94	36.5 bc
Anthem + FirstRate +Roundup PowerMax + COC + N-Pa-K-AMS	8 fl oz/a +0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	95	99	99	98	98	38.1 ab
POST II(V2)									
Marvel + FirstRate + Roundup PowerMax + COC + N-Pa-K-AMS	6 fl oz/a +0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	0	93	98	97	97	36.7 bc
LSD (P=0.10)		1.6	2.6	2.9	3.7	4.5	4.5	4	4.1 LSD(P=0.2)

Table 6. Crop response to Anthem herbicide systems on June 16, 24, July 1, 9, 14, and 21, and grain yield at 13% moisture at Rochester, MN, in 2014.

Treatment	Rate (rate/A)	Injury						Yield (bu/A)
		6/16	6/24	7/1	7/9	7/14	7/21	
Untreated		0	0	0	0	0	0	11.1 d
PRE								
Authority First	6.4 oz wt/a	0	0	0	0	0	0	39.5 ab
Authority First + Anthem	6.4 oz wt/a + 8 fl oz/a	0	0	0	0	0	0	38.7 ab
(Optill PRO) Optill + Outlook	2 oz/a + 10 fl oz/a	0	0	0	0	0	0	36.2 bc
Authority Elite + Accolade	1 qt/a + 1.33 oz wt/a	0	0	0	0	0	0	33.5 c
PRE / POST I (V2)								
Authority First / Anthem + Roundup PowerMax + N-Pa-K-AMS	6.4 oz wt/a / 8 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	0	0	54	29	14	0	41.2 a
POST I (V2)								
Outlook + Roundup PowerMax + N-Pa-K-AMS	12 fl oz/a + 22 fl oz/a + 3.3gal/100 gal	0	0	20	11	3	0	41.1 a
Warrant + Roundup PowerMax + N-Pa-K-AMS	1.5 pt/a + 22 fl oz/a + 3.3gal/100 gal	0	0	0	0	0	0	36.5 bc
Anthem + FirstRate +Roundup PowerMax + COC + N-Pa-K-AMS	8 fl oz/a +0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	65	28	13	0	38.1 ab
POST II(V2)								
Marvel + FirstRate + Roundup PowerMax + COC + N-Pa-K-AMS	6 fl oz/a +0.3 oz wt/a + 22 fl oz/a + 1% v/v + 3.3gal/100 gal	0	0	0	66	31	23	36.7 bc
LSD (P=0.10)		0	0	1.8	3.5	2.0	1.1	4.1 LSD (P=0.20)