

Evaluation ANTHEM MAXX plus XtendiMAX for weed control in Dicamba Tolerant Soybean at Rochester, MN in 2018.

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The objective of this trial was to evaluate the performance of Anthem Maxx plus XtendiMAX herbicides for control of giant ragweed, common lambsquarters and common waterhemp in dicamba tolerant soybeans at Rochester, MN in 2018. The research site was a loamy sand with a pH of 6.4, O.M. of 2.2%, and soil test P and K levels of 31 ppm and 123 ppm, respectively. ASGROW AG19X8 XTEND soybean was planted May 24, 2018 at 1.5 inches deep in 30-inch rows at 165,000 seeds per acre. Soybean emergence date was May 29, 2018. A randomized complete block design was used with four replications. Postemergence (POST) treatments were applied with a tractor-mounted sprayer delivering 15 gpa at 40 psi with a ground speed of 4.0 mph using TTI 110015 spray tips. Evaluations were taken on June 27, July 6, 11, 27 and September 24, 2018. The center two rows of each plot were machine harvested on October 22, 2018. Application date, environmental conditions, and weed stages are in Table 1. Performance ratings for control of giant ragweed, common lambsquarters, common waterhemp and grass and crop response are in Tables 2 through 6, respectively. Common waterhemp population at this site is Group-9 and Group-14 susceptible. Giant ragweed is Group-9 susceptible.

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

Date	June 23
Treatment	POST I (B)
Temperature (F)	
Air	76.0
Soil	74.0
Relative Humidity (%)	66
Wind (mph)	3
Soil Moisture	Normal
Soybean	
Stage	V4
Height (inch)	10.5
Giant Ragweed	
Height (inch)	9.5
Common Lambsquarters	
Height (inch)	4.9
Common Waterhemp	
Height (inch)	4.3
Grass species	
Height (inch)	5.4
Rainfall after each application (inch)	
Week 1	2.13
Week 2	2.47
Week 3	1.26

DISCUSSION

Anthem Maxx was granted approval as a tank mix partner with XtendiMax in June of 2018. The late date of approval for this tank mix meant the target weeds in the study would be larger than recommended for these herbicides. However, we initiated the trial knowing this because it allowed us to demonstrate and compare three combinations that included Anthem Maxx for control of key broadleaf weeds farmers are dealing with in many soybean fields, giant ragweed, common lambsquarters and common waterhemp. In addition, weed density across the reps was variable and reps were laid out accordingly. Higher giant ragweed and common waterhemp densities were present in reps 1 and 2 and lighter densities in reps 3 and 4. Significant crop injury was observed soon after application of all treatments, up to 40%, 4 days after application. Table 6.

Herbicide combinations compared were, Anthem Maxx + XtendiMax + Roundup PowerMax, Anthem Maxx + XtendiMax and Anthem Maxx + Roundup PowerMax. Anthem Maxx + XtendiMax + Roundup PowerMax provided the most consistence and complete control of giant ragweed (99%), common lambsquarters (99%), common waterhemp (94%) and grasses (96%). Anthem Maxx + XtendiMax gave excellent control of giant ragweed and common lambsquarters (98% and 99%, respectively). However, it was weak on common waterhemp at 84% and provided no grass control. The Anthem Maxx + Roundup PowerMax struggled with giant ragweed control at 81%. Giant ragweed plants desiccated quickly with the herbicide combination, but some plants recovered at their growing points producing new leaves and growth. We noted two observations. One, giant ragweed plants were larger than recommended for control at an average of 9.5 inches and two, the rapid burning of plant tissue by Anthem Maxx may not have allowed the Roundup PowerMax to translocate through the plant for complete control. However, control of lambsquarters and grass was excellent at 99% and 98%, respectively. Common waterhemp control was acceptable at 91%.

In regards to common waterhemp control, none of the herbicide combinations has residual activity. Control peaked for all combinations on July 11, 18 days after application, but dropped by the final rating on Sept. 24, Table 4, reflecting the extended emergence pattern of waterhemp. In addition, this waterhemp population is Group 9 susceptible. There was no significant difference among the herbicide treatments. (University of Minnesota Extension Regional Office, Rochester.)

Table 2. Giant ragweed control with POST Anthem Maxx + XtendiMax in dicamba tolerant soybean at Rochester, MN in 2018.													
Pest Code				AMBTR GIANT RAGWEED						YIELD			
Rating Date				Jun-27-2018	Jul-6-2018	Jul-11-2018	Jul-27-2018	Sep-24-2018	Oct-22-2018				
Trt	Treatment	Rate	Appl	PERCENT CONTROL (%)									
POST (6/23/18)													
1	ANTHEM MAXX	4.5 fl oz/a	A	91	a	98	a	99	a	99	a	41.2	a
	ROUNDUP	32 fl oz/a	A										
	POWERMAX	22 fl oz/a	A										
	CLASS ACT RIDION	1 % v/v	A										
	INTACT	0.5 % v/v	A										
2	ANTHEM MAXX	4.5 fl oz/a	A	70	c	91	b	98	a	98	a	40.6	a
	XTENDIMAX	22 fl oz/a	A										
	CLASS ACT RIDION	1 % v/v	A										
	INTACT	0.5 % v/v	A										
3	ANTHEM MAXX	4.5 fl oz/a	A	86	b	82	c	81	b	80	b	39.9	a
	ROUNDUP	32 fl oz/a	A										
	POWERMAX	22 fl oz/a	A										
	CLASS ACT RIDION	1 % v/v	A										
	INTACT	0.5 % v/v	A										
4	UNTREATED CHECK			0	d	0	d	0	c	0	c	18.6	b
LSD P=.10				3.0		3.5		4.1		3.7		3.8	
												3.9	

Table 3. Common lambsquarters control with POST Anthem Max + XtendiMax in dicamba tolerant soybean at Rochester, MN in 2018.

Pest Code	CHEAL COMMON LAMBSQUARTERS					YIELD Oct-22-2018	
	Jun-27-2018	Jul-6-2018	Jul-11-2018	Jul-27-2018	Sep-24-2018		
Rating Date							
Trt Treatment	Rate	Appl	PERCENT CONTROL (%)			Bu/A	
POST (6/23/18)							
1 ANTHEM MAXX	4.5 fl oz/a	A	90 a	99 a	99 a	99 a	41.2 a
ROUNDUP	32 fl oz/a	A					
POWERMAX							
XTENDIMAX	22 fl oz/a	A					
CLASS ACT RIDION	1 % v/v	A					
INTACT	0.5 % v/v	A					
2 ANTHEM MAXX	4.5 fl oz/a	A	70 c	98 b	98 a	99 a	40.6 a
XTENDIMAX	22 fl oz/a	A					
CLASS ACT RIDION	1 % v/v	A					
INTACT	0.5 % v/v	A					
3 ANTHEM MAXX	4.5 fl oz/a	A	86 b	99 a	99 a	99 a	39.9 a
ROUNDUP							
POWERMAX	32 fl oz/a	A					
CLASS ACT RIDION	1 % v/v	A					
INTACT	0.5 % v/v	A					
4 UNTREATED CHECK			0 d	0 c	0 b	0 b	18.6 b
LSD P=.10			1.6	1.2	1.0	.	3.9

Table 4. Common waterhemp control with POST Anthem Max + XtendiMax in dicamba tolerant soybean at Rochester, MN in 2018.

Pest Code	AMATA COMMON WATERHEMP					YIELD Oct-22-2018	
	Jun-27-2018	Jul-6-2018	Jul-11-2018	Jul-27-2018	Sep-24-2018		
Rating Date							
Trt Treatment	Rate	Appl	PERCENT CONTROL (%)			Bu/A	
POST (6/23/18)							
1 ANTHEM MAXX	4.5 fl oz/a	A	90 a	94 a	97 a	96 a	41.2 a
ROUNDUP	32 fl oz/a	A					
POWERMAX							
XTENDIMAX	22 fl oz/a	A					
CLASS ACT RIDION	1 % v/v	A					
INTACT	0.5 % v/v	A					
2 ANTHEM MAXX	4.5 fl oz/a	A	70 c	87 b	90 b	90 b	40.6 a
XTENDIMAX	22 fl oz/a	A					
CLASS ACT RIDION	1 % v/v	A					
INTACT	0.5 % v/v	A					
3 ANTHEM MAXX	4.5 fl oz/a	A	85 b	92 ab	93 ab	93 ab	39.9 a
ROUNDUP							
POWERMAX	32 fl oz/a	A					
CLASS ACT RIDION	1 % v/v	A					
INTACT	0.5 % v/v	A					
4 UNTREATED CHECK			0 d	0 c	0 c	0 c	18.6 b
LSD P=.10			.	6.8	5.6	5.6	7.8

Table 5. Grass control with POST Anthem Max + XtendiMax in dicamba tolerant soybean at Rochester, MN in 2018.

Pest Code Rating Date				GRASS					YIELD						
				Jun-27-2018	Jul-6-2018	Jul-11-2018	Jul-27-2018	Sep-24-2018	Oct-22-2018						
Trt	Treatment	Rate	Appl	PERCENT CONTROL (%)					BU/A						
POST (6/23/18)															
1	ANTHEM MAXX	4.5 fl oz/a	A	92	a	98	b	98	b	97	a	96	a	41.2	a
	ROUNDUP	32 fl oz/a	A												
	POWERMAX														
	XTENDIMAX	22 fl oz/a	A												
	CLASS ACT RIDION	1 % v/v	A												
	INTACT	0.5 % v/v	A												
2	ANTHEM MAXX	4.5 fl oz/a	A	0	b	0	c	0	c	0	b	0	b	40.6	a
	XTENDIMAX	22 fl oz/a	A												
	CLASS ACT RIDION	1 % v/v	A												
	INTACT	0.5 % v/v	A												
3	ANTHEM MAXX	4.5 fl oz/a	A	92	a	99	a	99	a	98	a	98	a	39.9	a
	ROUNDUP														
	POWERMAX	32 fl oz/a	A												
	CLASS ACT RIDION	1 % v/v	A												
	INTACT	0.5 % v/v	A												
4	UNTREATED CHECK			0	b	0	c	0	c	0	b	0	b	18.6	b
LSD P=.10				1.9		0.7		1.1		1.9		2.7		3.9	

Table 6. Soybean response to Anthem Max + XtendiMax in dicamba tolerant soybean at Rochester, MN in 2018.

Rating Date				SOYBEAN RESPONSE			YIELD				
				Jun-27-2018	Jul-6-2018	Jul-11-2018	Oct-22-2018				
Trt	Treatment	Rate	Appl	PERCENT INJURY (%)			BU/A				
POST (6/23/18)											
1	ANTHEM MAXX	4.5 fl oz/a	A	40	a	21	a	0	-	41.2	a
	ROUNDUP POWERMAX	32 fl oz/a	A								
	XTENDIMAX	22 fl oz/a	A								
	CLASS ACT RIDION	1 % v/v	A								
	INTACT	0.5 % v/v	A								
2	ANTHEM MAXX	4.5 fl oz/a	A	31	b	11	b	0	-	40.6	a
	XTENDIMAX	22 fl oz/a	A								
	CLASS ACT RIDION	1 % v/v	A								
	INTACT	0.5 % v/v	A								
3	ANTHEM MAXX	4.5 fl oz/a	A	39	a	21	a	0	-	39.9	a
	ROUNDUP POWERMAX	32 fl oz/a	A								
	CLASS ACT RIDION	1 % v/v	A								
	INTACT	0.5 % v/v	A								
4	UNTREATED CHECK			0	c	0	c	0	-	18.6	b
LSD P=.10				2.6		1.0		.		3.9	