

Evaluation of S-Metolachlor/Dicamba (Tavium) Premix in Dicamba Tolerant Soybeans at Rochester, MN in 2017.

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The objective of this trial was to evaluate the performance of herbicide programs that included s-metolachlor plus dicamba premix, *Tavium*, in dicamba tolerant soybeans at Rochester, MN. The research site was a loamy sand with a pH of 6.2, O.M. of 2.6%, and soil test P and K levels of 37 ppm and 240 ppm, respectively. Fall fertilizer was broadcast on November 3, 2016 at a rate of 0-46-180-0 lbs/A. ASGROW AG12X6 XTEND soybeans were planted May 12, 2017 at 1.5 inches deep in 30-inch rows at 135,000 seeds per acre. Soybean emergence date was May 25, 2017. A randomized complete block design was used with four replications. Preemergence (PRE) and postemergence (POST) treatments were applied with a tractor-mounted sprayer delivering 15 gpa. Evaluations were taken on June 5, 13, 20, July 3, 11, 19 and Sept 21. The center two rows of each plot were machine harvested on October 18, 2017. Application dates, environmental conditions, and weed stages are in Table 1. Performance ratings for control of common lambsquarters, common waterhemp, velvetleaf 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.

SUMMARY: The programs that included a preemergence herbicide followed by a postemergence application of Tavium plus AG13063, plus either Roundup PowerMax or Flexstar, provided excellent season-long control of common lambsquarters, common waterhemp, velvetleaf and grass species. Control of common lambsquarters waterhemp and grass was slightly lower with total POST programs of Tavium plus Roundup PowerMax. However, the POST program of Tavium plus Roundup PowerMax, which includes s-metolachlor, provided slightly better lambsquarters and waterhemp control and 12% greater grass control, 97% compared to 85%, respectively (9/21 rating). Crop response was observed with all herbicide systems. The greatest occurred when Flexstar was included in the programs, 48-50%, (7/3 rating). Crop response with Tavium ranged from 16-20% (6/20 and 7/3 ratings). *Note: Treatments included in this trial contain unregistered products.* (University of Minnesota Extension Regional Office, Rochester.)

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

Date	May 12	June 15	June 27
Treatment	PRE (A)	POST I (B)	POST II (C)
Temperature (F)			
Air	63.0	84.0	73.0
Soil	60.5	80.8	73.0
Relative Humidity (%)	38	33	43
Wind (mph)	12	14	12
Soil Moisture	Normal	Normal	Normal
Soybean			
Stage		V3	V4
Height (inch)	0.0	6.5	9.3
Common Lambsquarters			
Weed density (ft ²)		26.3	
Height (inch)		2.5	3.5
Common Waterhemp			
Weed density (ft ²)		16.3	
Height (inch)		2.5	4.5
Velvetleaf			
Weed density (ft ²)		1.0	
Height (inch)		2.6	5.1
Grass species			
Weed density (ft ²)		18.8	
Height (inch)		2.3	4.1
Rainfall after each application (inch)			
Week 1	1.98	1.94	1.53
Week 2	1.17	2.18	0.53
Week 3	0.10	0.30	0.0

Table 2. Common lambsquarters control with s-metolachlor + dicamba premix, Tavium, in dicamba tolerant soybean at Rochester, Minnesota in 2017.

Pest Code				CHEAL						YIELD	
				Common Lambsquarters							
Rating Date				Jun-5-2017	Jun-13-2017	Jun-20-2017	Jul-3-2017	Jul-19-2017	Sep-21-2017	Oct-18-2017	
No.	Name	Rate	Unit Code	Percent Control (%)							
1	UNTREATED CHECK			0.0 c	0.0 d	0.0 f	0.0 d	0.0 d	0.0 d	31.7 c	
PRE (5/27/17) / POST II (6/27/17) (2-4 inch weeds)											
2	SOA 5,15,4,9, BOUNDARY AG13063 TAVIUM ROUNDUP POWERMAX	1.8 1 56.6 28.4	pt/a % v/v fl oz/a fl oz/a	A C C C	99.0 a	97.5 b	95.0 c	97.5 b	98.8 a	98.8 a	49.3 ab
3	SOA 14,15,4,9 BROADAXE AG13063 TAVIUM ROUNDUP POWERMAX	25 1 56.6 28.4	fl oz/a % v/v fl oz/a fl oz/a	A C C C	99.0 a	98.8 a	98.0 ab	98.8 a	99.0 a	99.0 a	49.9 ab
4	SOA 14,15,4,9 PREFIX AG13063 TAVIUM ROUNDUP POWERMAX	32 1 56.6 28.4	fl oz/a % v/v fl oz/a fl oz/a	A C C C	98.7 b	93.4 c	86.1 e	93.7 c	99.1 a	99.1 a	53.1 a
5	SOA 5,15,4,14,9 BOUNDARY AG13063 TAVIUM FLEXSTAR ROUNDUP POWERMAX	1.8 1 56.6 16 28.4	pt/a % v/v fl oz/a fl oz/a fl oz/a	A C C C C	99.0 a	98.3 ab	96.3 bc	98.3 ab	99.0 a	98.8 a	49.4 ab
6	SOA 14,15,4,14,9 BROADAXE AG13063 TAVIUM FLEXSTAR ROUNDUP POWERMAX	25 1 56.6 16 28.4	fl oz/a % v/v fl oz/a fl oz/a fl oz/a	A C C C C	99.0 a	99.0 a	98.5 ab	98.8 a	99.0 a	99.0 a	48.9 ab
7	SOA 2,14,15,4,9 ZIDUA PRO AG13063 XTENDIMAX ROUNDUP POWERMAX	5 1 22 28.4	fl oz/a % v/v fl oz/a fl oz/a	A C C C	99.0 a	99.0 a	99.0 a	99.0 a	99.0 a	99.0 a	46.0 b
10	SOA 2,14,4,9 AUTHORITY FIRST AG13063 XTENDIMAX ROUNDUP POWERMAX	6.4 1 22 28.4	oz wt/a % v/v fl oz/a fl oz/a	A C C C	99.0 a	99.0 a	99.0 a	99.0 a	99.0 a	99.0 a	47.6 ab
POST I (6/15/17) (2-4 inch weeds)											
8	SOA 4,15,9 AG13063 TAVIUM ROUNDUP POWERMAX	1 56.6 28.4	% v/v fl oz/a fl oz/a	B B B	0.0 c	0.0 d	90.0 d	98.5 ab	97.5 b	97.0 b	47.4 ab
9	SOA 4,9 AG13063 XTENDIMAX ROUNDUP POWERMAX	1 22 28.4	% v/v fl oz/a fl oz/a	B B B	0.0 c	0.0 d	90.0 d	98.5 ab	96.3 c	95.8 c	45.8 b
LSD P=.10				0.2	1.2	2.3	1.2	0.5	0.6	6.5	

Table 3. Common waterhemp control with s-metolachlor + dicamba premix, Tavium, in dicamba tolerant soybean at Rochester, Minnesota in 2017.

Pest Code				AMATA Common Waterhemp							YIELD							
Rating Date				Jun-5-2017	Jun-13-2017	Jun-20-2017	Jul-3-2017	Jul-19-2017	Sep-21-2017	2017								
No.	Name	Rate	Unit Code	Percent Control (%)														
1	UNTREATED CHECK			0.0	b	0.0	d	0.0	f	0.0	d	0.0	d	0.0	d	31.7	c	
PRE (5/27/17) / POST II (6/27/17) (2-4 inch weeds)																		
2	SOA 5,15,4,9, BOUNDARY	1.8	pt/a	A	99.0	a	96.5	c	93.0	d	97.5	b	98.8	a	99.0	a	49.3	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
3	SOA 14,15,4,9 BROADAXE	25	fl oz/a	A	99.0	a	98.5	ab	97.3	ab	98.5	a	98.8	a	99.0	a	49.9	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
4	SOA 14,15,4,9 PREFIX	32	fl oz/a	A	99.0	a	98.7	ab	98.6	a	98.9	a	98.9	a	98.9	a	53.1	a
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
5	SOA 5,15,4,14,9 BOUNDARY	1.8	pt/a	A	99.0	a	97.0	c	95.0	cd	98.3	ab	98.8	a	99.0	a	49.4	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	FLEXSTAR	16	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
6	SOA 14,15,4,14,9 BROADAXE	25	fl oz/a	A	99.0	a	98.0	b	96.3	bc	98.5	a	99.0	a	99.0	a	48.9	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	FLEXSTAR	16	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
7	SOA 2,14,15,4,9 ZIDUA PRO	5	fl oz/a	A	99.0	a	98.8	ab	97.8	ab	98.8	a	99.0	a	99.0	a	46.0	b
	AG13063	1	% v/v	C														
	XTENDIMAX	22	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
10	SOA 2,14,4,9 AUTHORITY FIRST	6.4	oz wt/a	A	99.0	a	99.0	a	98.5	a	99.0	a	99.0	a	99.0	a	47.6	ab
	AG13063	1	% v/v	C														
	XTENDIMAX	22	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
POST I (6/15/17) (2-4 inch weeds)																		
8	SOA 4,15,9 AG13063	1	% v/v	B	0.0	b	0.0	d	90.0	e	95.8	c	95.5	b	96.8	b	47.4	ab
	TAVIUM	56.6	fl oz/a	B														
	ROUNDUP POWERMAX	28.4	fl oz/a	B														
9	SOA 4,9 AG13063	1	% v/v	B	0.0	b	0.0	d	90.0	e	96.3	c	93.8	c	93.0	c	45.8	b
	XTENDIMAX	22	fl oz/a	B														
	ROUNDUP POWERMAX	28.4	fl oz/a	B														
LSD P=.10					.	1.0		2.0		0.9		1.4		1.3		6.5		

Table 4. Velvetleaf control with s-metolachlor + dicamba premix, Tavium, in dicamba tolerant soybean at Rochester, Minnesota in 2017.

Pest Code	ABUTH					YIELD			
	Velvetleaf								
Rating Date	Jun-13-2017	Jun-20-2017	Jul-3-2017	Jul-19-2017	Sep-21-2017				
No. Name	Rate	Unit	Code	Percent Control (%)					
1 UNTREATED CHECK				0.0 e	0.0 f	0.0 f	0.0 d	0.0 c	31.7 c
PRE (5/27/17) / POST II (6/27/17) (2-4 inch weeds)									
2 SOA 5,15,4,9, BOUNDARY	1.8	pt/a	A	93.5 c	92.3 cd	96.5 d	97.3 b	98.0 b	49.3 ab
AG13063	1	% v/v	C						
TAVIUM	56.6	fl oz/a	C						
ROUNDUP POWERMAX	28.4	fl oz/a	C						
3 SOA 14,15,4,9 BROADAXE	25	fl oz/a	A	96.0 b	94.5 bc	96.8 cd	98.0 ab	99.0 a	49.9 ab
AG13063	1	% v/v	C						
TAVIUM	56.6	fl oz/a	C						
ROUNDUP POWERMAX	28.4	fl oz/a	C						
4 SOA 14,15,4,9 PREFIX	32	fl oz/a	A	89.5 d	86.8 e	93.4 e	95.1 c	97.4 b	53.1 a
AG13063	1	% v/v	C						
TAVIUM	56.6	fl oz/a	C						
ROUNDUP POWERMAX	28.4	fl oz/a	C						
5 SOA 5,15,4,14,9 BOUNDARY	1.8	pt/a	A	97.3 ab	98.0 a	98.5 ab	98.5 a	99.0 a	49.4 ab
AG13063	1	% v/v	C						
TAVIUM	56.6	fl oz/a	C						
FLEXSTAR	16	fl oz/a	C						
ROUNDUP POWERMAX	28.4	fl oz/a	C						
6 SOA 14,15,4,14,9 BROADAXE	25	fl oz/a	A	97.8 ab	96.8 ab	98.0 abc	98.3 ab	98.8 a	48.9 ab
AG13063	1	% v/v	C						
TAVIUM	56.6	fl oz/a	C						
FLEXSTAR	16	fl oz/a	C						
ROUNDUP POWERMAX	28.4	fl oz/a	C						
7 SOA 2,14,15,4,9 ZIDUA PRO	5	fl oz/a	A	98.8 a	98.8 a	99.0 a	99.0 a	99.0 a	46.0 b
AG13063	1	% v/v	C						
XTENDIMAX	22	fl oz/a	C						
ROUNDUP POWERMAX	28.4	fl oz/a	C						
10 SOA 2,14,4,9 AUTHORITY FIRST	6.4	oz wt/a	A	99.0 a	98.0 a	98.8 a	98.8 a	99.0 a	47.6 ab
AG13063	1	% v/v	C						
XTENDIMAX	22	fl oz/a	C						
ROUNDUP POWERMAX	28.4	fl oz/a	C						
POST I (6/15/17) (2-4 inch weeds)									
8 SOA 4,15,9 AG13063	1	% v/v	B	0.0 e	90.0 d	97.3 bcd	98.8 a	99.0 a	47.4 ab
TAVIUM	56.6	fl oz/a	B						
ROUNDUP POWERMAX	28.4	fl oz/a	B						
9 SOA 4,9 AG13063	1	% v/v	B	0.0 e	90.0 d	98.3 ab	98.8 a	99.0 a	45.8 b
XTENDIMAX	22	fl oz/a	B						
ROUNDUP POWERMAX	28.4	fl oz/a	B						
LSD P=.10				1.9	3.2	1.5	1.2	0.7	6.5

Table 5. Grass control with s-metolachlor + dicamba premix, Tavium, in dicamba tolerant soybean at Rochester, Minnesota in 2017.

Pest Code	GRASS Species											YIELD 2017						
	Rating Date		Jun-5-2017	Jun-13-2017	Jun-20-2017	Jul-3-2017	Jul-19-2017	Sep-21-2017	Percent Control (%)									
No.	Name	Rate	Unit	Code														
1	UNTREATED CHECK				0.0	c	0.0	c	0.0	c	0.0	d	0.0	e	0.0	e	31.7	c
PRE (5/27/17) / POST II (6/27/17) (2-4 inch weeds)																		
2	SOA 5,15,4,9, BOUNDARY	1.8	pt/a	A	99.0	a	99.0	a	97.8	a	99.0	a	99.0	a	98.5	ab	49.3	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
3	SOA 14,15,4,9 BROADAXE	25	fl oz/a	A	99.0	a	98.8	a	97.5	a	99.0	a	98.8	ab	98.8	a	49.9	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
4	SOA 14,15,4,9 PREFIX	32	fl oz/a	A	99.0	a	98.5	a	97.9	a	99.0	a	99.1	a	98.9	a	53.1	a
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
5	SOA 5,15,4,14,9 BOUNDARY	1.8	pt/a	A	99.0	a	98.3	a	98.3	a	99.0	a	98.5	ab	98.5	ab	49.4	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	FLEXSTAR	16	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
6	SOA 14,15,4,14,9 BROADAXE	25	fl oz/a	A	99.0	a	98.8	a	97.3	a	99.0	a	98.5	ab	98.3	ab	48.9	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	FLEXSTAR	16	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
7	SOA 2,14,15,4,9 ZIDUA PRO	5	fl oz/a	A	99.0	a	98.0	a	96.5	a	98.5	a	97.8	abc	97.8	ab	46.0	b
	AG13063	1	% v/v	C														
	XTENDIMAX	22	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
10	SOA 2,14,4,9 AUTHORITY FIRST	6.4	oz wt/a	A	97.8	b	92.0	b	90.3	b	97.0	b	96.3	c	95.8	c	47.6	ab
	AG13063	1	% v/v	C														
	XTENDIMAX	22	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
POST I (6/15/17) (2-4 inch weeds)																		
8	SOA 4,15,9 AG13063	1	% v/v	B	0.0	c	0.0	c	90.0	b	98.8	a	96.8	bc	96.8	bc	47.4	ab
	TAVIUM	56.6	fl oz/a	B														
	ROUNDUP POWERMAX	28.4	fl oz/a	B														
9	SOA 4,9 AG13063	1	% v/v	B	0.0	c	0.0	c	90.0	b	95.8	c	85.3	d	84.8	d	45.8	b
	XTENDIMAX	22	fl oz/a	B														
	ROUNDUP POWERMAX	28.4	fl oz/a	B														
LSD P=.10					0.4		1.6		2.0		0.7		2.2		1.8		6.5	

Table 6. Crop response to s-metolachlor + dicamba premix, Tavium, in dicamba tolerant soybean at Rochester, Minnesota in 2017.

Pest Code	Crop Response										Yield							
	Rating Date	Jun-5-2017		Jun-13-2017		Jun-20-2017		Jul-3-2017		Jul-11-2017		Oct-18-2017						
No. Name	Rate	Unit	Code	Percent Injury (%)										Bu/A				
1	UNTREATED CHECK			0.0		0.0		0.0	c	0.0		0.0		0.0		31.7	c	
PRE (5/27/17) / POST II (6/27/17) (2-4 inch weeds)																		
2	SOA 5,15,4,9, BOUNDARY			1.8	pt/a	A	0.0	-	0.0	-	0.0	c	17.5	b	0.0	b	49.3	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
3	SOA 14,15,4,9 BROADAXE			25	fl oz/a	A	2.5	-	0.0	-	0.0	c	16.3	bc	0.0	b	49.9	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
4	SOA 14,15,4,9 PREFIX			32	fl oz/a	A	0.0	-	0.0	-	0.0	c	16.9	bc	0.0	b	53.1	a
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
5	SOA 5,15,4,14,9 BOUNDARY			1.8	pt/a	A	0.0	-	0.0	-	0.0	c	47.5	a	12.5	a	49.4	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	FLEXSTAR	16	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
6	SOA 14,15,4,14,9 BROADAXE			25	fl oz/a	A	1.3	-	0.0	-	0.0	c	50.0	a	13.8	a	48.9	ab
	AG13063	1	% v/v	C														
	TAVIUM	56.6	fl oz/a	C														
	FLEXSTAR	16	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
7	SOA 2,14,15,4,9 ZIDUA PRO			5	fl oz/a	A	0.0	-	0.0	-	0.0	c	11.3	de	0.0	b	46.0	b
	AG13063	1	% v/v	C														
	XTENDIMAX	22	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
10	SOA 2,14,4,9 AUTHORITY FIRST			6.4	oz wt/a	A	0.0	-	0.0	-	0.0	c	10.0	e	0.0	b	47.6	ab
	AG13063	1	% v/v	C														
	XTENDIMAX	22	fl oz/a	C														
	ROUNDUP POWERMAX	28.4	fl oz/a	C														
POST I (6/15/17) (2-4 inch weeds)																		
8	SOA 4,15,9 AG13063			1	% v/v	B	0.0	-	0.0	-	20.0	a	13.8	cd	0.0	b	47.4	ab-
	TAVIUM	56.6	fl oz/a	B														
	ROUNDUP POWERMAX	28.4	fl oz/a	B														
9	SOA 4,9 AG13063			1	% v/v	B	0.0	-	0.0	-	8.8	b	6.3	f	0.0	b	45.8	b
	XTENDIMAX	22	fl oz/a	B														
	ROUNDUP POWERMAX	28.4	fl oz/a	B														
LSD P=.10							2.2		1.0		3.6		1.5		6.5			