

Comparison of MON76980 (Xtendimax) and Liberty Herbicide Systems for weed control in Soybeans at Rochester, MN in 2017.

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The objective of this trial was to compare MON76980 (Xtendimax) to Liberty herbicide systems for weed control in Xtend and Liberty 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. The field was cultivated prior to planting. Fall fertilizer was broadcast on November 3, 2017 at a rate of 0-46-180-0 lbs/A. The soybean varieties, ASGROW AG21X7 XTEND and STINE 21LH02 LIBERTY were planted May 12, 2017 at 1.5 inches deep in 30-inch rows at 135,000 seeds per acre. Soybeans emerged on 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 at 30 psi with a ground speed of 4.5 mph using TTI 11002 nozzles. Evaluations were taken on June 5, 13, 20 July 11, 17 and October 4. The center two rows of each plot were machine harvested on October 19, 2017. Application dates, environmental conditions, and weed stages are in Table 1. Performance ratings for control of common lambsquarters, common waterhemp, velvetleaf, grass and crop response are in Tables 2 through 5, respectively. Common waterhemp population at this site is Group-9 and Group-14 susceptible.

SUMMARY:

The Xtendimax and Liberty herbicide systems performed very similarly in this trial. Each treatment included preemergence herbicide(s) followed by a postemergence herbicide(s). Control of common lambsquarters, waterhemp and velvetleaf were all over 95% by the October 4 rating. Grass control for the Xtendimax treatment were 7-9% higher than the Liberty herbicide systems, 96-98% compared to 89-93%, respectively, Table 5. The addition of Group 15 herbicide, Warrant, postemergence with the Xtendimax treatment provided a slight increase in common lambsquarters control. The addition of Group 15 herbicide, Zidua, postemergence with Liberty provided a slight increase in waterhemp and grass control. Yields were quite variable due to damage during the growing season caused by deer feeding. (University of Minnesota Extension Regional Office, Rochester.)

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

Date	May 12	June 21
Treatment	PRE	POST I
Temperature (F)		
Air	71.0	66.0
Soil	65.2	64.0
Relative Humidity (%)	32	67
Wind (mph)	5	12
Soil Moisture	Normal	Normal
Soybean		
Stage		V4
Height (inch)	0.0	6.8
Common Lambsquarters		
Weed density (ft ²)		28.9
Height (inch)		3.3
Common Waterhemp		
Weed density (ft ²)		25.3
Height (inch)		3.1
Grass species		
Weed density (ft ²)		12.1
Height (inch)		5.1
Rainfall after each application (inch)		
Week 1	1.98	0.95
Week 2	1.17	1.53
Week 3	0.10	0.53

Table 2. Comparison of common lambsquarter control with Xtendimax and Liberty herbicide systems in Xtend and Liberty soybeans at Rochester, MN in 2017.

Pest Code		Common Lambsquarters									YIELD						
Rating Date		Jun-5-2017	Jun-13-2017	Jun-20-2017	Jul-11-2017	Jul-17-2017	Oct-4-2017			Oct-19-2017							
Trt	Treatment	Rate	Appl	Percent Control (%)							Bu/A						
1	XT UNTREATED CHECK			0.0	b	0.0	c	0.0	c	0.0	c	0.0	c	0.0	d	19.5	b
5	LL UNTREATED CHECK			0.0	b	0.0	c	0.0	c	0.0	c	0.0	c	0.0	d	13.4	b
PRE (5/12/17) / POST I (6/21/17)																	
2	SOA 14,9,4			98.8	a	95.0	b	92.8	b	98.5	ab	98.8	a	97.5	bc	30.9	a
	ROWEL	2 oz wt/a	A														
	ROUNDUP POWERMAX	32 fl oz/a	B														
	MON76980	22 fl oz/a	B														
3	SOA 14, 4, 9			98.8	a	95.0	b	93.8	b	98.8	a	98.5	ab	97.0	c	31.6	a
	ROWEL	2 oz wt/a	A														
	MON76980	22 fl oz/a	A														
	ROUNDUP POWERMAX	32 fl oz/a	B														
	MON76980	22 fl oz/a	B														
4	SOA 14, 4, 9, 15			99.0	a	94.3	b	91.8	b	98.8	a	99.0	a	98.3	ab	33.6	a
	ROWEL	2 oz wt/a	A														
	MON76980	22 fl oz/a	A														
	ROUNDUP POWERMAX	32 fl oz/a	B														
	MON76980	22 fl oz/a	B														
	WARRANT	48 fl oz/a	B														
6	SOA 14, 10			99.0	a	93.3	b	93.0	b	98.0	b	98.0	b	97.8	bc	34.3	a
	VALOR SX	2 oz wt/a	A														
	LIBERTY 280	29 fl oz/a	B														
	AMS	8.5 lb/100 gal	B														
7	SOA 2,14,10			99.0	a	99.0	a	99.0	a	99.0	a	99.0	a	99.0	a	37.9	a
	AUTHORITY FIRST	6.4 oz wt/a	A														
	LIBERTY 280	29 fl oz/a	B														
	AMS	8.5 lb/100 gal	B														
8	SOA 2,14,10,15			99.0	a	99.0	a	99.0	a	99.0	a	99.0	a	98.8	a	34.1	a
	AUTHORITY FIRST	6.4 oz wt/a	A														
	LIBERTY 280	29 fl oz/a	B														
	ZIDUA	2 oz wt/a	B														
	AMS	8.5 lb/100 gal	B														
LSD P=.10				0.3		1.9		2.4		0.7		0.7		1.0		8.7	

Table 3. Comparison of waterhemp control with Xtendimax and Liberty systems in Xtend and Liberty soybeans at Rochester, MN in 2017.

Pest Code Rating Date			AMATA						YIELD	
			Jun-5-2017	Jun-13-2017	Jun-20-2017	Jul-11-2017	Jul-17-2017	Oct 4-2017	Oct-19-2017	
Trt	Treatment	Rate Appl	Percent Control (%)						Bu/A	
1	XT UNTREATED CHECK		0.0 b	0.0 c	0.0 d	0.0 c	0.0 c	0.0 d	19.5 b	
5	LL UNTREATED CHECK		0.0 b	0.0 c	0.0 d	0.0 c	0.0 c	0.0 d	13.4 b	
PRE (5/12/17) / POST I (6/21/17)										
2	SOA 14,9,4		98.8 a	95.0 b	93.5 c	98.8 a	98.5 a	97.0 abc	30.9 a	
	ROWEL	2 oz wt/a A								
	ROUNDUP	32 fl oz/a B								
	POWERMAX	22 fl oz/a B								
	MON76980									
3	SOA 14, 4, 9		99.0 a	96.8 ab	96.0 b	98.8 a	98.5 a	96.8 abc	31.6 a	
	ROWEL	2 oz wt/a A								
	MON76980	22 fl oz/a A								
	ROUNDUP	32 fl oz/a B								
	POWERMAX	22 fl oz/a B								
	MON76980									
4	SOA 14, 4, 9, 15		99.0 a	95.3 b	94.5 bc	98.8 a	98.5 a	98.3 ab	33.6 a	
	ROWEL	2 oz wt/a A								
	MON76980	22 fl oz/a A								
	ROUNDUP	32 fl oz/a B								
	POWERMAX	22 fl oz/a B								
	MON76980	22 fl oz/a B								
	WARRANT	48 fl oz/a B								
6	SOA 14, 10		98.8 a	94.5 b	93.8 c	96.5 b	96.5 b	95.3 c	34.3 a	
	VALOR SX	2 oz wt/a A								
	LIBERTY 280	29 fl oz/a B								
	AMS	8.5 lb/100 gal B								
7	SOA 2,14,10		99.0 a	98.8 a	98.8 a	98.5 a	97.3 b	96.5 bc	37.9 a	
	AUTHORITY FIRST	6.4 oz wt/a A								
	LIBERTY 280	29 fl oz/a B								
	AMS	8.5 lb/100 gal B								
8	SOA 2,14,10,15		99.0 a	98.8 a	98.8 a	99.0 a	99.0 a	99.0 a	34.1 a	
	AUTHORITY FIRST	6.4 oz wt/a A								
	LIBERTY 280	29 fl oz/a B								
	ZIDUA	2 oz wt/a B								
	AMS	8.5 lb/100 gal B								
LSD P=.10			0.3	2.3	2.0	0.9	0.9	2.3	8.7	

Table 4. Comparison of velvetleaf control with Xtendimax and Liberty herbicide systems in Xtend and Liberty soybeans at Rochester, MN in 2017.

Pest Code											Velvetleaf					YIELD	
Rating Date											Jun-13-2017	Jun-20-2017	Jul-11-2017	Jul-17-2017	Oct-4-2017	Oct-19-2017	
Trt	Treatment	Rate	Appl	Percent Control (%)							Bu/A						
1	XT UNTREATED CHECK			0.0	c	0.0	c	0.0	c	0.0	b	0	c	19.5	b		
5	LL UNTREATED CHECK			0.0	c	0.0	c	0.0	c	0.0	b	0	d	13.4	b		
PRE (5/12/17) / POST I (6/21/17)																	
2	SOA 14,9,4			94.3	b	92.3	b	99.0	a	98.5	a	97.8	b	30.9	a		
	ROWEL	2 oz wt/a	A														
	ROUNDUP POWERMAX	32 fl oz/a	B														
	MON76980	22 fl oz/a	B														
3	SOA 14, 4, 9			94.8	b	93.0	b	99.0	a	98.3	a	98.8	a	31.6	a		
	ROWEL	2 oz wt/a	A														
	MON76980	22 fl oz/a	A														
	ROUNDUP POWERMAX	32 fl oz/a	B														
	MON76980	22 fl oz/a	B														
4	SOA 14, 4, 9, 15			93.8	b	92.5	b	99.0	a	98.8	a	98.8	a	33.6	a		
	ROWEL	2 oz wt/a	A														
	MON76980	22 fl oz/a	A														
	ROUNDUP POWERMAX	32 fl oz/a	B														
	MON76980	22 fl oz/a	B														
	WARRANT	48 fl oz/a	B														
6	SOA 14, 10			94.5	b	92.3	b	98.3	b	98.3	a	98.5	a	34.3	a		
	VALOR SX	2 oz wt/a	A														
	LIBERTY 280	29 fl oz/a	B														
	AMS	8.5 lb/100 gal	B														
7	SOA 2,14,10			98.3	a	98.3	a	98.8	a	98.8	a	99.0	a	37.9	a		
	AUTHORITY FIRST	6.4 oz wt/a	A														
	LIBERTY 280	29 fl oz/a	B														
	AMS	8.5 lb/100 gal	B														
8	SOA 2,14,10,15			98.3	a	98.8	a	99.0	a	98.8	a	98.8	a	34.1	a		
	AUTHORITY FIRST	6.4 oz wt/a	A														
	LIBERTY 280	29 fl oz/a	B														
	ZIDUA	2 oz wt/a	B														
	AMS	8.5 lb/100 gal	B														
LSD P=.10				2.7		4.0		0.5		0.7		1.0		8.7			

Table 5. Comparison of grass control with Xtendimax and Liberty herbicide systems in Xtend and Liberty soybeans at Rochester, MN in 2017.

Pest Code	GRASS								YIELD								
	Rating Date		Jun-5-2017	Jun-13-2017	Jun-20-2017	Jul-11-2017	Jul-17-2017	Oct 4-2017	Oct-19-2017								
Trt	Treatment	Rate	Appl	Percent Control (%)								Bu/A					
1	XT UNTREATED CHECK			0.0	b	0.0	b	0.0	b	0.0	e	0.0	e	0.0	d	19.5	b
5	LL UNTREATED CHECK			0.0	b	0.0	b	0.0	b	0.0	e	0.0	e	0.0	d	13.4	b
PRE (5/12/17) / POST I (6/21/17)																	
2	SOA 14,9,4			97.8	a	91.8	a	89.8	a	97.5	abc	96.8	ab	96.0	a	30.9	a
	ROWEL	2	oz wt/a	A													
	ROUNDUP POWERMAX	32	fl oz/a	B													
	MON76980	22	fl oz/a	B													
3	SOA 14, 4, 9			98.0	a	93.3	a	92.3	a	97.8	ab	97.8	a	96.8	a	31.6	a
	ROWEL	2	oz wt/a	A													
	MON76980	22	fl oz/a	A													
	ROUNDUP POWERMAX	32	fl oz/a	B													
	MON76980	22	fl oz/a	B													
4	SOA 14, 4, 9, 15			97.8	a	93.3	a	90.5	a	98.5	a	98.0	a	98.0	a	33.6	a
	ROWEL	2	oz wt/a	A													
	MON76980	22	fl oz/a	A													
	ROUNDUP POWERMAX	32	fl oz/a	B													
	MON76980	22	fl oz/a	B													
	WARRANT	48	fl oz/a	B													
6	SOA 14, 10			97.3	a	91.0	a	92.0	a	92.8	d	90.0	cd	89.0	c	34.3	a
	VALOR SX	2	oz wt/a	A													
	LIBERTY 280	29	fl oz/a	B													
	AMS	8.5	lb/100 gal	B													
7	SOA 2,14,10			97.8	a	89.8	a	90.3	a	94.3	bcd	89.0	d	89.3	c	37.9	a
	AUTHORITY FIRST	6.4	oz wt/a	A													
	LIBERTY 280	29	fl oz/a	B													
	AMS	8.5	lb/100 gal	B													
8	SOA 2,14,10,15			97.8	a	93.0	a	92.3	a	94.0	cd	93.0	bc	92.8	b	34.1	a
	AUTHORITY FIRST	6.4	oz wt/a	A													
	LIBERTY 280	29	fl oz/a	B													
	ZIDUA	2	oz wt/a	B													
	AMS	8.5	lb/100 gal	B													
LSD P=.10				0.9		3.9		4.6		3.5		3.8		2.9		8.7	

Table 6. Soybean injury caused by Xtendimax and Liberty herbicide systems in Xtend and Liberty soybeans at Rochester, MN in 2017.

Pest Code Rating Date				INJURY					YIELD		
				Jun-5-2017	Jun-13-2017	Jun-20-2017	Jul-11-2017	Jul-17-2017	Oct-19-2017		
Trt	Treatment	Rate	Appl	Percent Injury (%)					Bu/A		
1	XT UNTREATED CHECK			0	0	0	0.0	c	0	19.5	b
5	LL UNTREATED CHECK			0	0	0	0.0	c	0	13.4	b
PRE (5/12/17) / POST I (6/21/17)											
2	SOA 14,9,4			0	0	0	0.0	c	0	30.9	a
	ROWEL	2	oz wt/a	A							
	ROUNDUP POWERMAX	32	fl oz/a	B							
	MON76980	22	fl oz/a	B							
3	SOA 14, 4, 9			0	0	0	0.0	c	0	31.6	a
	ROWEL	2	oz wt/a	A							
	MON76980	22	fl oz/a	A							
	ROUNDUP POWERMAX	32	fl oz/a	B							
	MON76980	22	fl oz/a	B							
4	SOA 14, 4, 9, 15			0	0	0	0.0	c	0	33.6	a
	ROWEL	2	oz wt/a	A							
	MON76980	22	fl oz/a	A							
	ROUNDUP POWERMAX	32	fl oz/a	B							
	MON76980	22	fl oz/a	B							
	WARRANT	48	fl oz/a	B							
6	SOA 14, 10			0	0	0	2.5	bc	0	34.3	a
	VALOR SX	2	oz wt/a	A							
	LIBERTY 280	29	fl oz/a	B							
	AMS	8.5	lb/100 gal	B							
7	SOA 2,14,10			0	0	0	3.8	b	0	37.9	a
	AUTHORITY FIRST	6.4	oz wt/a	A							
	LIBERTY 280	29	fl oz/a	B							
	AMS	8.5	lb/100 gal	B							
8	SOA 2,14,10,15			0	0	0	12.5	a	0	34.1	a
	AUTHORITY FIRST	6.4	oz wt/a	A							
	LIBERTY 280	29	fl oz/a	B							
	ZIDUA	2	oz wt/a	B							
	AMS	8.5	lb/100 gal	B							
LSD P=.10				.	.	.	2.9	.	.	8.7	