

Evaluation of Difficult to Control Broadleaf Weeds with an HPPD Herbicide Based Program in Soybean in SE Minnesota in 2015.

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The objective of this trial was to evaluate HPPD tolerant soybean weed control systems and crop response in southeastern Minnesota. The research site was a Lawler loam series with pH of 5.6, O.M. 2.1% and soil test P and K levels of 32 ppm and 309 ppm, respectively. In the spring the field was disked and field cultivated once prior to planting. The previous crop was soybeans. The soybean variety was unknown and was planted May 20, 2015 at a depth of 1.5 inches in 30 inch rows at a rate of 135,000 seeds per acre. A randomized complete block design was used with three replications. Preemergence (PRE) treatments were applied with a tractor mounted sprayer delivering 15 gpa at 40 psi using TTI 110015 spray tips. Postemergence (Post I) treatments were applied with a tractor mounted sprayer delivering 15 gpa at 40 psi using TTJ60 11002 spray tips. Evaluations of the plots were taken on June 3, June 10, June 23, July 1, and July 8. Application dates, environmental conditions, and weed stages can be found in Table 1. Performance ratings for giant ragweed control, common lambsquarters control, common waterhemp control, and crop injury response can be found in Tables 2 through 5, respectively. Grass control was excellent in all plots (99 percent control). Crop was destroyed on July 8 to comply with protocol requirements. (University of Minnesota Extension Regional Office, Rochester.)

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

Date	5/20	6/10
Treatment	PRE	POST I
Temperature (F)		
Air	50	77
Soil	50.9	78.6
Relative Humidity (%)	54	48
Wind (mph)		
Soil Moisture	SLIWet	Normal
Soybean		
Stage		V1
Height (inch)		3.5
Giant Ragweed		
Weed Density (ft ²)		13
Height (inch)		2.5
Common Lambsquarter		
Weed Density (ft ²)		32
Height (inch)		0.25
Common Waterhemp		
Weed Density (ft ²)		28
Height (inch)		0.75
Grass		
Weed Density (ft ²)		1
Height (inch)		1
Rainfall after each application (inch)		
Week 1	1.47	1.46
Week 2	1.09	0.78
Week 3	1.64	1.63

Table 2. Giant ragweed control with HPPD herbicide systems in HPPD tolerant soybeans at Rochester, MN in 2015.

Pest Name	Rating Date	Giant ragweed											
		6/3/2015		6/10/2015		6/23/2015		7/1/2015		7/8/2015			
Trt	Treatment	Rate	Appl	Percent Control (%)									
1	UNTREATED CHECK			0	e	0	e	0	d	0	d	0	d
<i>PREEMERGENCE APPLIED 05/20/2015</i>													
2	SOA 27,15,14 / 1			98	a	98	a	98	a	98	a	97	a
	CALLISTO	5fl oz/a	A										
	DUAL MAGNUM	26.7fl oz/a	A										
	FLEXSTAR	17fl oz/a	A										
3	SOA 27,15, 5 / 14,1			90	a	97	a	98	ab	97	ab	97	ab
	CALLISTO	5fl oz/a	A										
	DUAL MAGNUM	26.7fl oz/a	A										
	TRICOR	5.33oz/a	A										
<i>PREEMERGENCE (A) APPLIED 05/20/2015 / POST I (B) APPLIED 06/10/2015</i>													
4	SOA 5,15 / 14,1			35	d	38	d	98	a	98	a	97	ab
	BOUNDARY	24fl oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
5	SOA 14,15 / 14, 1			58	c	37	d	97	ab	97	ab	96	ab
	BROADAXE	25fl oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
6	SOA 2,14 / 14, 1			80	b	85	b	97	b	95	b	95	ab
	AUTHORITY FIRST	5oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
7	SOA 14,15 / 14, 1			77	b	71	c	91	c	86	c	86	c
	VERDICT	5fl oz/a	A										
	COBRA	10fl oz/a	B										
	SELECT MAX	15fl oz/a	B										
	COC	1.5pt/a	B										
	AMS	17lb/100 gal	B										
<i>POST I (B) APPLIED 06/10/2015</i>													
8	SOA 14, 1			0	e	0	e	97	b	97	ab	94	b
	POST ONLY CHECK												
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
LSD P=.10				8		8		2		3		3	

Means followed by same letter or symbol do not significantly differ (P=.10, LSD)

Table 3. Common lambsquarters control with HPPD herbicide systems in HPPD tolerant soybeans at Rochester, MN in 2015.

Pest Name	Common lambsquarters												
	Rating Date		6/3/2015		6/10/2015		6/23/2015		7/1/2015		7/8/2015		
Trt	Treatment	Rate	Appl	Percent control (%)									
1	UNTREATED CHECK			0	b	0	c	0	c	0	d	0	c
<i>PREEMERGENCE APPLIED 05/20/2015</i>													
2	SOA 27,15,14 / 1			99	a	99	a	99	a	99	a	99	a
	CALLISTO	5fl oz/a	A										
	DUAL MAGNUM	26.7fl oz/a	A										
	FLEXSTAR	17fl oz/a	A										
3	SOA 27,15, 5 / 14,1			99	a	99	a	99	a	99	a	99	a
	CALLISTO	5fl oz/a	A										
	DUAL MAGNUM	26.7fl oz/a	A										
	TRICOR	5.33oz/a	A										
<i>PREEMERGENCE (A) APPLIED 05/20/2015 / POST I (B) APPLIED 06/10/2015</i>													
4	SOA 5,15 / 14,1			99	a	99	a	99	a	99	a	99	a
	BOUNDARY	24fl oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
5	SOA 14,15 / 14, 1			99	a	99	a	99	a	99	a	99	a
	BROADAXE	25fl oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
6	SOA 2,14 / 14, 1			99	a	99	a	99	a	99	a	99	a
	AUTHORITY FIRST	5oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
7	SOA 14,15 / 14, 1			99	a	97	b	96	a	90	b	88	b
	VERDICT	5fl oz/a	A										
	COBRA	10fl oz/a	B										
	SELECT MAX	15fl oz/a	B										
	COC	1.5pt/a	B										
	AMS	17lb/100 gal	B										
<i>POST I (B) APPLIED 06/10/2015</i>													
8	SOA 14, 1			0	b	0	c	76	b	79	c	88	b
	POST ONLY CHECK												
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
LSD P=.10						1		3		2		3	

Table 4. Common waterhemp control with HPPD herbicide systems in HPPD tolerant soybeans at Rochester, MN in 2015.

Pest Name	Common waterhemp												
	Rating Date		6/3/2015		6/10/2015		6/23/2015		7/1/2015		7/8/2015		
Trt	Treatment	Rate	Appl	Percent Control (%)									
1	UNTREATED CHECK			0	b	0	b	0	c	0	c	0	c
<i>PREEMERGENCE APPLIED 05/20/2015</i>													
2	SOA 27,15,14 / 1			99	a	99	a	99	a	99	a	99	a
	CALLISTO	5fl oz/a	A										
	DUAL MAGNUM	26.7fl oz/a	A										
	FLEXSTAR	17fl oz/a	A										
3	SOA 27,15, 5 / 14,1			99	a	99	a	99	a	99	a	99	a
	CALLISTO	5fl oz/a	A										
	DUAL MAGNUM	26.7fl oz/a	A										
	TRICOR	5.33oz/a	A										
<i>PREEMERGENCE (A) APPLIED 05/20/2015 /POST I (B) APPLIED 06/10/2015</i>													
4	SOA 5,15 / 14,1			99	a	99	a	99	a	99	a	99	a
	BOUNDARY	24fl oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
5	SOA 14,15 / 14, 1			99	a	99	a	99	a	99	a	99	a
	BROADAXE	25fl oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
6	SOA 2,14 / 14, 1			99	a	99	a	99	a	99	a	99	a
	AUTHORITY FIRST	5oz/a	A										
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
7	SOA 14,15 / 14, 1			99	a	99	a	98	a	96	ab	96	b
	VERDICT	5fl oz/a	A										
	COBRA	10fl oz/a	B										
	SELECT MAX	15fl oz/a	B										
	COC	1.5pt/a	B										
	AMS	17lb/100 gal	B										
<i>POST I (B) APPLIED 06/10/2015</i>													
8	SOA 14, 1			0	b	0	b	92	b	92	b	97	b
	POST ONLY CHECK												
	FLEXSTAR	17fl oz/a	B										
	FUSION	12fl oz/a	B										
	MSO	1% v/v	B										
LSD P=.10								1		4		1	

Table 5. Crop response to HPPD herbicide systems at Rochester, MN in 2015.

Pest Name Rating Date			Crop Response				
			6/3/2015	6/10/2015	6/23/2015	7/1/2015	7/8/2015
Trt	Treatment	Rate Appl	Percent crop response (%)				
1	UNTREATED CHECK		0 a	0 c	0 c	0 b	0 b
<i>PREEMERGENCE APPLIED 05/20/2015</i>							
2	SOA 27,15,14 / 1		0 a	13 b	0 c	0 b	0 b
	CALLISTO	5fl oz/a A					
	DUAL MAGNUM	26.7fl oz/a A					
	FLEXSTAR	17fl oz/a A					
3	SOA 27,15, 5 / 14,1		0 a	20 a	0 c	0 b	0 b
	CALLISTO	5fl oz/a A					
	DUAL MAGNUM	26.7fl oz/a A					
	TRICOR	5.33oz/a A					
<i>PREEMERGENCE (A) APPLIED 05/20/2015 / POST I (B) APPLIED 06/10/2015</i>							
4	SOA 5,15 / 14,1		0 a	0 c	30 b	0 b	0 b
	BOUNDARY	24fl oz/a A					
	FLEXSTAR	17fl oz/a B					
	FUSION	12fl oz/a B					
	MSO	1% v/v B					
5	SOA 14,15 / 14, 1		0 a	0 c	30 b	0 b	0 b
	BROADAXE	25fl oz/a A					
	FLEXSTAR	17fl oz/a B					
	FUSION	12fl oz/a B					
	MSO	1% v/v B					
6	SOA 2,14 / 14, 1		0 a	0 c	30 b	0 b	0 b
	AUTHORITY FIRST	5oz/a A					
	FLEXSTAR	17fl oz/a B					
	FUSION	12fl oz/a B					
	MSO	1% v/v B					
7	SOA 14,15 / 14, 1		0 a	0 c	40 a	10 a	10 a
	VERDICT	5fl oz/a A					
	COBRA	10fl oz/a B					
	SELECT MAX	15fl oz/a B					
	COC	1.5pt/a B					
	AMS	17lb/100 gal B					
<i>POST I (B) APPLIED 06/10/2015</i>							
8	SOA 14, 1		0 a	0 c	30 b	0 b	0 b
	POST ONLY CHECK						
	FLEXSTAR	17fl oz/a B					
	FUSION	12fl oz/a B					
	MSO	1% v/v B					