

Sequential Preemergence/Postemergence Herbicide Systems in Soybean for the Control of Giant Ragweed in Southeastern Minnesota in 2015.

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The objective of this trial was to evaluate preemergence (PRE) followed by postemergence (POST) herbicide systems for control of giant ragweed and other broadleaf weeds in soybean in southeastern, Minnesota. The research site was a Lawler loam series with pH of 6.2, O.M. 2.4% and soil test P and K levels of 36 ppm and 194 ppm, respectively. In the spring the field was disked and field cultivated once prior to planting. The previous crop was corn. The soybean variety was NK Brand S20-T6 and was planted May 20, 2015 at a depth of 1.5 inches in 30 inch rows at a rate of 150,000 seeds per acre. A randomized complete block design was used with four replications. Preemergence (PRE) treatments were applied with a tractor-mounted sprayer delivering 15 gpa at 30 psi using TTI 11002 spray tips. POST applications for systemic herbicides were made using TTI 11002 spray tips and for contact herbicides using TTI J60 spray tips. Evaluations of this plot were taken June 10, June 19, June 26, June 30, July 8, July 15, and September 22. The center two rows of each plot were machine harvested on October 14, 2015. Application dates, environmental conditions, and weed stages can be found in Table 1. Performance ratings for giant ragweed, common lambsquarters, common waterhemp and grass control, and crop response can be found in Tables 2 through 6, respectively. (University of Minnesota Extension Regional Office, Rochester.)

Table 1. Application timing, plant stage, environmental conditions

Date	5/20	6/16	6/25
Treatment	PRE (A)	POST I (B)	POST II (C)
Temperature (F)			
Air	52	72	80
Soil	56.7	72.5	78.3
Relative Humidity (%)	52	56	52
Wind (mph)	W	VARI	NE
Soil Moisture	SL Wet	Normal	Normal
Soybean			
Stage		V2	V4
Height (inch)		6	10
Giant Ragweed			
Weed Density (ft ²)		11	
Height (inch)		3.8	4.2
Common Lambsquarter			
Weed Density (ft ²)		39	
Height (inch)		1.1	2.11
Common Waterhemp			
Weed Density (ft ²)		5	
Height (inch)		1.4	2.9
Grass			
Weed Density (ft ²)		18	
Height (inch)		1.3	2.8
Rainfall after each application (inch)			
Week 1	1.47	0.78	1.63
Week 2	1.09	1.17	0.69
Week 3	1.64	1.15	0.30

Table 2. PRE/POST herbicide systems in soybean for the control of giant ragweed in SE Minnesota, 2015.

Pest Code	Giant Ragweed									YIELD Oct-10-15 Bu/A
	Rating Date	Jun-10	Jun-19	Jun-26	Jun-30	Jul-15	Sep-22			
Trt	Treatment	Rate	Appl	Percent Control (%)						
8	UNTREATED CHECK			0 j	0 i	0 i	0 i	0 f	0 e	4.3 g
PRE / POST I 5-20 / 6-16										
1	SOA 2, 14 / 14, 9			72 gh	94 cd	96 b-e	92 ef	90 e	89 d	38.2 cde
	AUTHORITY ASSIST	9 fl oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
2	SOA 2,14 / 14, 9			80 ef	96 abc	97 a-d	94 de	93 d	93 c	34.6 f
	AUTHORITY ASSIST	12 fl oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
3	SOA 2,14 / 14, 9			86 bcd	95 abc	96 cde	95 cd	94 cd	93 c	38.3 cde
	AUTHORITY FIRST	4 oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
6	SOA 14,15 / 9			75 fg	89 e	96 de	94 de	90 e	90 d	40.2 abc
	VERDICT	5 fl oz/a	A							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
9	SOA 2,14 / 14, 15, 9			84 cde	98 a	98 ab	97 a	97 ab	97 ab	36.3 ef
	LATIR	4.25 oz/a	A							
	WISE	2 pt/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
10	SOA 2,14 / 14, 9			84 cde	97 ab	98 abc	97 ab	98 ab	98 ab	41.5 abc
	LATIR	4.25 oz/a	A							
	RUMBLE	1 pt/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
11	SOA 5,14 / 2,15, 9			82 de	93 d	97 a-d	97 ab	97 ab	97 ab	40.6 abc
	RANSOM	9 oz/a	A							
	PUMMEL	2 pt/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
12	SOA 5,14 / 2, 14, 9			82 de	95 bcd	99 a	97 abc	97 ab	97 ab	40.2 abc
	RANSOM	9 oz/a	A							
	TORMENT	1 pt/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
13	SOA 5,15 / 2,14,9			69 h	93 d	97 a-d	96 abc	97 ab	97 ab	36.5 def
	TAILWIND	2.5 pt/a	A							
	TORMENT	1 pt/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
14	SOA 5, 15 / 14, 9			70 h	97 ab	98 a-d	96 abc	97 ab	97 ab	38.8 b-e
	TAILWIND	2.5 pt/a	A							
	RUMBLE	1 pt/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
15	SOA 5,14 / 2,15, 9			57 i	85 f	96 b-e	95 bcd	96 bc	95 bc	36.6 def
	AUTHORITY MTZ	11 oz/a	A							
	PUMMEL	2 pt/a	B							
	ROUNDUP POWERMAX	32 fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							

Table 2 (continued). PRE/POST herbicide systems in soybean for the control of giant ragweed in SE Minnesota, 2015.

Pest Code				Giant Ragweed						YIELD	
Rating Date				Jun-10	Jun-19	Jun-26	Jun-30	Jul-15	Sep-22	Oct-14-2015	
Trt	Treatment	Rate	Appl	Percent Control (%)						Bu/A	
PRE / POST II 5-20 / 6-25											
4	SOA 2,14 / 14, 9			90	87	83	89	96	97	41.7	ab
	AUTHORITY FIRST	6.4 oz/a	A								
	MARVEL	7.25 fl oz/a	C								
	ROUNDUP POWERMAX32	fl oz/a	C								
	Ammonium Sulfate	3.3 lb/100 gal	C								
5	SOA 2, 14,15 / 9			89	80	72	85	98	98	42.3	a
	OPTILL PRO										
	OPTILL	2 oz/a	A								
	OUTLOOK	10 fl oz/a	A								
	ROUNDUP POWERMAX32	fl oz/a	C								
	Ammonium Sulfate	3.3 lb/100 gal	C								
7	SOA 14,15 / 9			97	96	92	96	99	99	39.7	a-d
	PREFIX	2 pt/a	A								
	ROUNDUP POWERMAX32	fl oz/a	C								
	Ammonium Sulfate	3.3 lb/100 gal	C								
POST I 6-16											
16	SOA 9			0	69	94	91	91	90	41.4	abc
	GLYPHOSATE CHECK										
	ROUNDUP POWERMAX32	fl oz/a	B								
	Ammonium Sulfate	3.3 lb/100 gal	B								
LSD P=.10 for weed ratings, LSD P = .20 for yields				5.2	2.4	2.2	1.9	2.3	2.4	3.4	

Means followed by same letter do not significantly differ

Table 3 (continued). PRE/POST herbicide systems in soybean for the control of common lambsquarters in SE, Minnesota in 2015.

Pest Code			Common Lambsquarters						YIELD							
Rating Date			Jun-10	Jun-19	Jun-26	Jun-30	Jul-15	Sep-22	Oct-14-2015							
Trt	Treatment	Rate	Percent Control (%)						BU/A							
PRE / POST II 5-20 / 6-25																
4	SOA 2,14 / 14, 9		99	a	99	a	99	a	99	a	41.7	ab				
	AUTHORITY FIRST	6.4 oz/a														
	MARVEL	7.25 fl oz/a														
	ROUNDUP POWERMAX32	fl oz/a														
	Ammonium Sulfate	3.3 lb/100 gal														
5	SOA 2, 14,15 / 9		99	a	99	a	99	ab	99	a	98	a	42.3	a		
	OPTILL PRO															
	OPTILL	2 oz/a														
	OUTLOOK	10 fl oz/a														
	ROUNDUP POWERMAX32	fl oz/a														
	Ammonium Sulfate	3.3 lb/100 gal														
7	SOA 14,15 / 9		99	a	99	a	98	b	99	a	98	a	99	a	39.7	a-d
	PREFIX	2 pt/a														
	ROUNDUP POWERMAX32	fl oz/a														
	Ammonium Sulfate	3.3 lb/100 gal														
POST I 6-16																
16	SOA 9		0	b	81	b	90	d	86	c	77	c	77	c	41.4	abc
	GLYPHOSATE CHECK															
	ROUNDUP POWERMAX32	fl oz/a														
	Ammonium Sulfate	3.3 lb/100 gal														
LSD P=.10 for weed ratings, LSD P = .20 for yields					0.8		0.8		1.4		1.9		1.9		3.4	

Means followed by same letter do not significantly differ

Table 4. PRE/POST herbicide systems in soybean for the control of common waterhemp in SE Minnesota in 2015.										
Pest Code				Common Waterhemp						YIELD
Rating Date				Jun-10	Jun-19	Jun-26	Jun-30	Jul-15	Sep-22	Oct-14-2015
Trt	Treatment	Rate	Appl	Percent Control (%)						BU/A
8	UNTREATED CHECK			0 c	0 c	0 d	0 d	0 d	0 d	4.3 g
PRE / POST I 5-22 / 6-16										
1	SOA 2, 14 / 14, 9			99 b	99 a	99 a	99 a	99 a	99 a	38.2 cde
	AUTHORITY ASSIST	9 fl oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
2	SOA 2,14 / 14, 9			99 a	99 a	99 a	99 a	99 a	99 a	34.6 f
	AUTHORITY ASSIST	12 fl oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
3	SOA 2,14 / 14, 9			99 a	99 a	99 a	99 a	98 a	98 a	38.3 cde
	AUTHORITY FIRST	4 oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
6	SOA 14,15 / 9			99 a	99 a	97 b	95 b	91 b	90 b	40.2 abc
	VERDICT	5 fl oz/a	A							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
9	SOA 2,14 / 14, 15, 9			99 a	99 a	99 a	99 a	99 a	99 a	36.3 ef
	LATIR	4.25 oz/a	A							
	WISE	2 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
10	SOA 2,14 / 14, 9			99 a	99 a	99 a	99 a	99 a	99 a	41.5 abc
	LATIR	4.25 oz/a	A							
	RUMBLE	1 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
11	SOA 5,14 / 2,15, 9			99 a	99 a	99 a	99 a	99 a	99 a	40.6 abc
	RANSOM	9 oz/a	A							
	PUMMEL	2 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
12	SOA 5,14 / 2, 14, 9			99 a	99 a	99 a	99 a	99 a	99 a	40.2 abc
	RANSOM	9 oz/a	A							
	TORMENT	1 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
13	SOA 5,15 / 2,14,9			99 a	99 a	99 a	99 a	99 a	99 a	36.5 def
	TAILWIND	2.5 pt/a	A							
	TORMENT	1 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
14	SOA 5, 15 / 14, 9			99 a	99 a	99 a	99 a	99 a	99 a	38.8 b-e
	TAILWIND	2.5 pt/a	A							
	RUMBLE	1 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
15	SOA 5,14 / 2,15, 9			99 a	99 a	99 a	99 a	99 a	99 a	36.6 def
	AUTHORITY MTZ	11 oz/a	A							
	PUMMEL	2 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							

Table 4 (continued). PRE/POST herbicide systems in soybean for the control of common waterhemp in SE Minnesota in 2015.

Pest Code	Rating Date	Common Waterhemp								YIELD		
		Jun-10	Jun-19	Jun-26	Jun-30	Jul-15	Sep-22	Oct-14-2015				
Trt	Treatment	Rate	Appl	Percent Control (%)								BU/A
PRE / POST II 5-22 / 6-25												
4	SOA 2,14 / 14, 9			99 a	99 a	99 a	99 a	99 a	99 a	99 a	41.7	ab
	AUTHORITY FIRST	6.4 oz/a	A									
	MARVEL	7.25 fl oz/a	C									
	ROUNDUP POWERMAX32	fl oz/a	C									
	Ammonium Sulfate	3.3 lb/100 gal	C									
5	SOA 2, 14,15 / 9			99 a	99 a	99 a	99 a	97 a	97 a	97 a	42.3	a
	OPTILL PRO											
	OPTILL	2 oz/a	A									
	OUTLOOK	10 fl oz/a	A									
	ROUNDUP POWERMAX32	fl oz/a	C									
	Ammonium Sulfate	3.3 lb/100 gal	C									
7	SOA 14,15 / 9			99 a	99 a	99 a	99 a	99 a	99 a	99 a	39.7	a-d
	PREFIX	2 pt/a	A									
	ROUNDUP POWERMAX32	fl oz/a	C									
	Ammonium Sulfate	3.3 lb/100 gal	C									
POST I 6-16												
16	SOA 9			0 c	90 b	88 c	87 c	77 c	77 c	77 c	41.4	abc
	GLYPHOSATE CHECK											
	ROUNDUP POWERMAX32	fl oz/a	B									
	Ammonium Sulfate	3.3 lb/100 gal	B									
LSD P=.10 for weed ratings, LSD P = .20 for yields				0.2	.	1.1	1.2	3.2	3.1	3.4		

Means followed by same letter do not significantly differ

Table 5 (continued). PRE/POST herbicide systems in soybean for grass control in SE Minnesota in 2015

Pest Code			GRASS						YIELD							
Rating Date			June 10	June 19	June 26	June 30	July 15	Sept 22	Oct-14-2015							
Trt	Treatment	Rate	Percent Control (%)						Bu/A							
PRE / POST II 5-22 / 6-25																
4	SOA 2,14 / 14, 9		99	a	99	a	99	a	99	a	41.7	ab				
	AUTHORITY FIRST	6.4 oz/a														
	MARVEL	7.25 fl oz/a														
	ROUNDUP POWERMAX32	fl oz/a														
	Ammonium Sulfate	3.3 lb/100 gal														
5	SOA 2, 14,15 / 9		99	a	99	a	99	a	98	a	42.3	a				
	OPTILL PRO															
	OPTILL	2 oz/a														
	OUTLOOK	10 fl oz/a														
	ROUNDUP POWERMAX32	fl oz/a														
	Ammonium Sulfate	3.3 lb/100 gal														
7	SOA 14,15 / 9		99	a	99	a	99	a	99	a	39.7	a-d				
	PREFIX	2 pt/a														
	ROUNDUP POWERMAX32	fl oz/a														
	Ammonium Sulfate	3.3 lb/100 gal														
POST I 6-16																
16	SOA 9		0	b	90	b	94	c	89	c	86	c	85	c	41.4	abc
	GLYPHOSATE CHECK															
	ROUNDUP POWERMAX32	fl oz/a														
	Ammonium Sulfate	3.3 lb/100 gal														
LSD P=.10 for weed ratings, LSD P = .20 for yields					0.8	0.8	1.4	1.9	1.9	3.4						

Means followed by same letter do not significantly differ

Table 6. Crop response to PRE/POST herbicide systems in soybean in SE Minnesota in 2015.

Pest Code				INJURY						YIELD
Rating Date				June 10	June 19	June 26	June 30	July 8	July 15	
Trt	Treatment	Rate	Appl	Percent Injury (%)						BU/A
8	UNTREATED CHECK			0 d	0 f	0 g	0 h	0 e	0	4.3 g
PRE/ POST I 5-22/6-16										
1	SOA 2, 14 / 14, 9			0 d	59 bc	44 d	4 fg	0 e	0	38.2 cde
	AUTHORITY ASSIST	9 fl oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
2	SOA 2,14 / 14, 9			0 d	63 ab	48 d	5 fg	0 e	0	34.6 f
	AUTHORITY ASSIST	12 fl oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
3	SOA 2,14 / 14, 9			0 d	58 bc	43 d	3 g	0 e	0	38.3 cde
	AUTHORITY FIRST	4 oz/a	A							
	MARVEL	7.25 fl oz/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
6	SOA 14,15 / 9			0 d	9 d	0 g	0 h	0 e	0	40.2 abc
	VERDICT	5 fl oz/a	A							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
9	SOA 2,14 / 14, 15, 9			12 c	67 a	63 a	15 b	10 b	0	36.3 ef
	LATIR	4.25 oz/a	A							
	WISE	2 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
10	SOA 2,14 / 14, 9			14 b	66 a	59 b	10 cd	6 c	0	41.5 abc
	LATIR	4.25 oz/a	A							
	RUMBLE	1 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
11	SOA 5,14 / 2,15, 9			16 a	58 c	34 e	5 fg	0 e	0	40.6 abc
	RANSOM	9 oz/a	A							
	PUMMEL	2 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
12	SOA 5,14 / 2, 14, 9			15 ab	63 ab	53 c	5 fg	0 e	0	40.2 abc
	RANSOM	9 oz/a	A							
	TORMENT	1 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
13	SOA 5,15 / 2,14,9			0 d	60 bc	54 c	6 ef	4 d	0	36.5 def
	TAILWIND	2.5 pt/a	A							
	TORMENT	1 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
14	SOA 5, 15 / 14, 9			0 d	65 a	60 ab	13 bc	5 cd	0	38.8 b-e
	TAILWIND	2.5 pt/a	A							
	RUMBLE	1 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
15	SOA 5,14 / 2,15, 9			0 d	56 c	33 e	9 de	0 e	0	36.6 def
	AUTHORITY MTZ	11 oz/a	A							
	PUMMEL	2 pt/a	B							
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							

Table 6 (continued). Crop response to PRE/POST herbicide systems in soybean in SE Minnesota in 2015.

Pest Code				INJURY						YIELD
Rating Date				June 10	June 19	June 26	June 30	July 8	July 15	
Trt	Treatment	Rate	Appl	Percent Injury (%)						BU/A
PRE / POST II 5-22 / 6-25										
4	SOA 2,14 / 14, 9			0 d	0 f	28 f	35 a	24 a	0	41.7 ab
	AUTHORITY FIRST	6.4 oz/a	A							
	MARVEL	7.25 fl oz/a	C							
	ROUNDUP POWERMAX32	fl oz/a	C							
	Ammonium Sulfate	3.3 lb/100 gal	C							
5	SOA 2, 14,15 / 9			0 d	3 ef	0 g	0 h	0 e	0	42.3 a
	OPTILL PRO									
	OPTILL	2 oz/a	A							
	OUTLOOK	10 fl oz/a	A							
	ROUNDUP POWERMAX32	fl oz/a	C							
	Ammonium Sulfate	3.3 lb/100 gal	C							
7	SOA 14,15 / 9			0 d	6 de	0 g	0 h	0 e	0	39.7 a-d
	PREFIX	2 pt/a	A							
	ROUNDUP POWERMAX32	fl oz/a	C							
	Ammonium Sulfate	3.3 lb/100 gal	C							
POST I 6-16										
16	SOA 9			0 d	5 de	0 g	0 h	0 e	0	41.4 abc
	GLYPHOSATE CHECK									
	ROUNDUP POWERMAX32	fl oz/a	B							
	Ammonium Sulfate	3.3 lb/100 gal	B							
LSD P=.10 for weed ratings, LSD P = .20 for yields				1.4	4.5	4.5	2.6	1.9	.	3.4

Means followed by same letter do not significantly differ