

University of Minnesota 2018 Statewide Soybean Weed Management, a Comparison of dicamba and glufosinate systems at Rochester, MN.

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The objective of this trial was to evaluate and compare dicamba and glufosinate herbicide systems for weed control and crop response in soybeans in southeastern Minnesota. The research site was a loamy sand series with pH of 6.5, O.M. 2.1% and soil test P and K levels of 27 ppm and 124 ppm, respectively. The field was fall chisel plowed, spring disked and field cultivated once prior to planting. The previous crop was corn. The soybean varieties, ASGROW 17X8 XTEND (dicamba systems) and STINE 17LH62 (glufosinate systems) were planted on May 27, 2018 at a depth of 1.5 inches in 30-inch rows at a rate of 165,000 seeds per acre. Soybean emergence date was June 2, 2018. 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 40 psi with a ground speed of 4.0 mph using TTI 110015 spray tips for systemic herbicides and Turbo Tee 110015 tips for contact herbicides. Evaluations of the plots were taken June 14, June 22, June 28, July 10 and September 17. The center two rows of each plot were machine harvested on October 17, 2018. Application dates, environmental conditions, and weed stages can be found in Table 1. Performance rating for dicamba soybeans giant ragweed, common lambsquarters, common waterhemp, grass control, and crop injury for each system, can be found in Tables 2 through 6 and for the glufosinate soybeans tables 7-11.

Discussion:

The initial plans for this trial were to use dicamba herbicide in the POST program on treatments 1-13. However, weather conditions prevented these applications from being made by the June 20 cutoff date for dicamba use on soybean in Minnesota. An alternative plan was implemented, using the herbicides FlexstarGT, Avalanche Ultra and Roundup PowerMax. The results are divided into two parts, dicamba tolerant soybean (Tables 2-6) and glufosinate tolerant soybeans (Tables 7-11).

In the dicamba group, twelve PRE/POST and one POST I /POST V systems were evaluated. PRE applications of Engenia PRO at 16 fl oz/a and Boundary at 1.95 pt/a plus XtendiMAX at 44 fl oz/a performed well providing 92% and 98% control of giant ragweed, respectively and 99% control of all other weeds for June 14 rating. This was comparable to other PRE herbicides that provided over 90% control of giant ragweed, Prefix at 32 fl oz/a, Warrant Ultra at 3 pt/a and Authority First at 6.4 oz wt/a. The weakest PRE for giant ragweed control was Authority Supreme at 8 fl oz/a, giving only 34% control on June 14. Giant ragweed, common lambsquarters, common waterhemp, and grass control was excellent for all systems after POST herbicides were applied and remained excellent throughout the season. The split POST program also performed well. The dicamba and dicamba plus glyphosate checks gave only marginal waterhemp control at 60 and 71%, respectively. Crop injury was substantial after the POST IV Avalanche Ultra at 24 fl oz/a applications were made to V3 soybean, reaching 53% for treatments 5 and 8. Crop yield was significantly lower in these treatments at 35.6 and 32.4 bu/a, respectively, compared to the top yielding treatments in this trial at 44.6 bu/a. However, the split POST program with Warrant Ultra plus Roundup PowerMax (POST I, V1 soybean) followed by Avalanche Ultra plus Roundup PowerMax (POST V, V5 soybean) did not impact yield as much, 43 bu/a, even though crop injury was observed after both applications.

In the glufosinate group, eight PRE/POST and two POST I /POST V systems were evaluated. There was a range of giant ragweed control with the PRE herbicides from 92% for the best, Prefix at 32 fl oz/a, to 35% for the poorest control, Authority Supreme at 8 fl oz/a. Common lambsquarters, common waterhemp and grass control was excellent for all systems. Soybean injury after glufosinate applications at POST III, V2 soybean, ranged from 25 to 31%. Soybean response reached 49% following the POST I applications of Warrant Ultra at 3 pt/a plus Liberty at 32 fl oz/a. Crop yield was highest at 50.7 bu/a for the Surveil at 3.5 oz wt/a / Liberty at 32 fl oz/a treatment. Soybean yield was the lowest at 44.1 bu/a for the Prefix at 32 fl oz/a followed by Liberty at 32 fl oz/a. (University of Minnesota Extension Regional Office, Rochester.)

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

Date	5/28	6/12	6/13	6/15	6/23	6/29
Treatment	PRE A	POST I B	POST II C	POST III D	POST IV E	POST V F
Temperature (F)						
Air	74.0	68.0	74.0	79.0	73.0	74.0
Soil	71.8	72.1	76.3	70.9	70.9	73.6
Relative Humidity (%)	68	43	36	69	73	71
Wind (mph)	3	5	9	17	5	18
Soil Moisture	Normal	Normal	Normal	Normal	Normal	Normal
Soybean						
Stage		V1	V1	V2	V3	V5
Height (in)	0.0	4.0	4.6	6.0	9.1	12.5
Giant Ragweed						
Weed Density (ft ²)			2.3	2.3	2.3	2.3
Height (in)		2.8	3.9	3.5	8.1	4.5
Common Lambsquarter						
Weed Density (ft ²)			1.0	1.0	1.0	1.0
Height (in)		1.3	1.3	1.5	3.3	2.5
Common Waterhemp						
Weed Density (ft ²)			14.0	14.0	14.0	14.0
Height (in)		1.4	1.6	1.5	3.5	2.6
Grass						
Weed Density (ft ²)			2.3	2.3	2.3	2.3
Height (in)		2.3	1.4	1.8	3.8	2.8
Rainfall after each application (in)						
Week 1	0.99	1.62	1.87	2.63	2.13	2.47
Week 2	0.93	3.14	2.89	2.23	2.47	1.26
Week 3	1.27	0.96	0.96	2.47	1.26	0.64

Table 2. Giant ragweed control in dicamba tolerant soybean herbicide systems at Rochester, MN in 2018.

Pest Code Rating Date				AMBTR (GIANT RAGWEED)					YIELD
				Jun-14-2018	Jun-22-2018	Jun-28-2018	Jul-10-2018	Sep-17-2018	Oct-17-2018
Trt	Treatment	Rate	Appl	PERCENT CONTROL (%)					Bu/A
PRE (5/28/18) / POST IV (6/23/18)									
1	SOA 2,14,9 AUTHORITY FIRST / SONIC FLEXSTAR GT MSO CLASS ACT RIDION	6.4 oz wt/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	92 cd	89 c-f	99 a	99 -	99 -	38.6 cd
2	SOA 2,14,15,9 AUTHORITY FIRST / SONIC EVERPREX ROUNDUP POWERMAX CLASS ACT RIDION	6.4 oz wt/a 16 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	91 cde	88 d-g	98 a	99 -	98 -	40.0 a-d
3	SOA 14,15,9 AUTHORITY SUPREME FLEXSTAR GT MSO CLASS ACT RIDION	8 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	34 g	29 i	98 a	96 -	96 -	41.5 abc
4	SOA 5,14,15,9 FIERCE MTZ FLEXSTAR GT MSO CLASS ACT RIDION	16 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	81 f	74 h	98 a	99 -	98 -	39.2 bcd
5	SOA 14,15,9 PREFIX AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	32 fl oz/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	A E E E E	96 ab	95 abc	99 a	99 -	99 -	35.6 de
6	SOA 14,15,9 PREFIX DUAL MAGNUM ROUNDUP POWERMAX CLASS ACT RIDION	32 fl oz/a 16 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	95 abc	92 bcd	99 a	99 -	99 -	39.0 cd
7	SOA 2,14,9 SURVEIL FLEXSTAR GT MSO CLASS ACT RIDION	3.5 oz wt/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	89 de	85 fg	99 a	99 -	99 -	42.3 abc
8	SOA 14,15,9 WARRANT ULTRA AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	3 pt/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	A E E E E	93 bcd	90 b-e	98 a	98 -	99 -	32.4 ef
9	SOA 2,14,15,9 ZIDUA PRO FLEXSTAR GT MSO CLASS ACT RIDION	4.5 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	89 de	85 efg	99 a	99 -	99 -	42.9 abc
10	SOA 2,14,15,9 ZIDUA PRO OUTLOOK ROUNDUP POWERMAX CLASS ACT RIDION	4.5 fl oz/a 10 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	88 e	85 fg	99 a	98 -	98 -	43.9 a
11	SOA 4,15,14,9 ENGENIA PRO FLEXSTAR GT MSO CLASS ACT RIDION	16 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	92 bcd	83 g	99 a	98 -	99 -	44.6 a
12	SOA 4,5,15,14,9 BOUNDARY XTENDIMAX INTACT CLASS ACT RIDION FLEXSTAR GT MSO CLASS ACT RIDION	1.95 pt/a 44 fl oz/a 0.5 % v/v 1.0 % v/v 3.5 pt/a 1.0 % v/v 1.0 % v/v	A A A A E E E	98 a	95 ab	99 a	99 -	99 -	44.6 a
POST I (6/12/18) / POST V (6/29/18)									
13	SOA 14,15,9 WARRANT ULTRA ROUNDUP POWERMAX AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	3 pt/a 32 fl oz/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	B B F F F F	94 bc	98 a	96 b	99 -	99 -	43.0 abc
POST II (6/13/18)									
14	SOA 4 DICAMBA CHECK	12.8 fl oz/a	C	0 h	99 a	99 a	99 -	98 -	29.1 f
16	SOA 4,9 DICAMBA CHECK GLPHOSATE CHECK INTACT CLASS ACT RIDION	12.8 fl oz/a 32 fl oz/a 0.5 % v/v 1.0 % v/v	C C C C	0 h	99 a	99 a	99 -	98 -	43.8 ab
LSD P=.10				3.9	5.6	1.4	NS	NS	4.7

Table 3. Common Lambsquarters control in dicamba tolerant soybean herbicide systems at Rochester, MN in 2018.

Pest Code	CHEAL (COMMON LAMBSQUARTERS)					YIELD								
	Rating Date	Jun-14-2018	Jun-22-2018	Jun-28-2018	Jul-10-2018		Sep-17-2018	Oct-17-2018						
Trt Treatment	Rate	Appl	PERCENT CONTROL (%)					BU/A						
PRE (5/28/18) / POST IV (6/23/18)														
1	SOA 2,14,9		99	a	99	a	99	a	99	a	99	a	38.6	cd
	AUTHORITY FIRST / SONIC	6.4 oz wt/a		A										
	FLEXSTAR GT	3.5 pt/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
2	SOA 2,14,15,9		99	a	99	a	99	a	99	a	99	a	40.0	a-d
	AUTHORITY FIRST / SONIC	6.4 oz wt/a		A										
	EVERPREX	16 fl oz/a		E										
	ROUNDUP POWERMAX	32 fl oz/a		E										
	CLASS ACT RIDION	1.0 % v/v		E										
3	SOA 14,15,9		99	a	99	a	99	a	99	a	99	a	41.5	abc
	AUTHORITY SUPREME	8 fl oz/a		A										
	FLEXSTAR GT	3.5 pt/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
4	SOA 5,14,15,9		99	a	99	a	99	a	99	a	99	a	39.2	bcd
	FIERCE MTZ	16 fl oz/a		A										
	FLEXSTAR GT	3.5 pt/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
5	SOA 14,15,9		99	a	99	a	99	a	99	a	99	a	35.6	de
	PREFIX	32 fl oz/a		A										
	AVALANCHE ULTRA	24 fl oz/a		E										
	ROUNDUP POWERMAX	32 fl oz/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
6	SOA 14,15,9		99	a	99	a	99	a	99	a	99	a	39.0	cd
	PREFIX	32 fl oz/a		A										
	DUAL MAGNUM	16 fl oz/a		E										
	ROUNDUP POWERMAX	32 fl oz/a		E										
	CLASS ACT RIDION	1.0 % v/v		E										
7	SOA 2,14,9		99	a	99	a	99	a	99	a	99	a	42.3	abc
	SURVEIL	3.5 oz wt/a		A										
	FLEXSTAR GT	3.5 pt/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
8	SOA 14,15,9		99	a	98	a	99	a	99	a	99	a	32.4	ef
	WARRANT ULTRA	3 pt/a		A										
	AVALANCHE ULTRA	24 fl oz/a		E										
	ROUNDUP POWERMAX	32 fl oz/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
9	SOA 2,14,15,9		99	a	99	a	99	a	99	a	99	a	42.9	abc
	ZIDUA PRO	4.5 fl oz/a		A										
	FLEXSTAR GT	3.5 pt/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
10	SOA 2,14,15,9		99	a	99	a	99	a	99	a	99	a	43.9	a
	ZIDUA PRO	4.5 fl oz/a		A										
	OUTLOOK	10 fl oz/a		E										
	ROUNDUP POWERMAX	32 fl oz/a		E										
	CLASS ACT RIDION	1.0 % v/v		E										
11	SOA 4,15,14,9		99	a	98	a	99	a	99	a	99	a	44.6	a
	ENGENIA PRO	16 fl oz/a		A										
	FLEXSTAR GT	3.5 pt/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
12	SOA 4,5,15,14,9		99	a	99	a	99	a	99	a	99	a	44.6	a
	BOUNDARY	1.95 pt/a		A										
	XTENDIMAX	44 fl oz/a		A										
	INTACT	0.5 % v/v		A										
	CLASS ACT RIDION	1.0 % v/v		A										
	FLEXSTAR GT	3.5 pt/a		E										
	MSO	1.0 % v/v		E										
	CLASS ACT RIDION	1.0 % v/v		E										
POST I (6/12/18) / POST V (6/29/18)														
13	SOA 14,15,9		94	b	97	a	95	b	99	a	99	a	43.0	abc
	WARRANT ULTRA	3 pt/a		B										
	ROUNDUP POWERMAX	32 fl oz/a		B										
	AVALANCHE ULTRA	24 fl oz/a		F										
	ROUNDUP POWERMAX	32 fl oz/a		F										
	MSO	1.0 % v/v		F										
	CLASS ACT RIDION	1.0 % v/v		F										
POST II (6/13/18)														
14	SOA 4		0	c	81	b	87	c	94	b	94	c	29.1	f
	DICAMBA CHECK	12.8 fl oz/a		C										
16	SOA 4,9		0	c	97	a	99	a	98	a	96	b	43.8	ab
	DICAMBA CHECK	12.8 fl oz/a		C										
	GLPHOSATE CHECK	32 fl oz/a		C										
	INTACT	0.5 % v/v		C										
	CLASS ACT RIDION	1.0 % v/v		C										
LSD P=.10			0.8		4.2		2.5		1.8		1.9		4.7	

Table 4. Common waterhemp control in dicamba tolerant soybeans herbicide systems at Rochester, MN in 2018.

Pest Code Rating Date				AMATA (COMMON WATERHEMP)					YIELD	
				Jun-14-2018	Jun-22-2018	Jun-28-2018	Jul-10-2018	Sep-17-2018	Oct-17-2018	
Trt	Treatment	Rate	Appl	PERCENT CONTROL (%)					BU/A	
PRE (5/28/18) / POST IV (6/23/18)										
1	SOA 2,14,9 AUTHORITY FIRST / SONIC FLEXSTAR GT MSO CLASS ACT RIDION	6.4 oz wt/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	99 a	38.6 cd
2	SOA 2,14,15,9 AUTHORITY FIRST / SONIC EVERPREX ROUNDUP POWERMAX CLASS ACT RIDION	6.4 oz wt/a 16 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	99 a	98 a	99 a	99 a	99 a	99 a	40.0 a-d
3	SOA 14,15,9 AUTHORITY SUPREME FLEXSTAR GT MSO CLASS ACT RIDION	8 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	99 a	41.5 abc
4	SOA 5,14,15,9 FIERCE MTZ FLEXSTAR GT MSO CLASS ACT RIDION	16 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	99 a	39.2 bcd
5	SOA 14,15,9 PREFIX AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	32 fl oz/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	A E E E E	99 a	99 a	99 a	99 a	99 a	99 a	35.6 de
6	SOA 14,15,9 PREFIX DUAL MAGNUM ROUNDUP POWERMAX CLASS ACT RIDION	32 fl oz/a 16 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	99 a	39.0 cd
7	SOA 2,14,9 SURVEIL FLEXSTAR GT MSO CLASS ACT RIDION	3.5 oz wt/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	99 a	42.3 abc
8	SOA 14,15,9 WARRANT ULTRA AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	3 pt/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	A E E E E	99 a	99 a	99 a	99 a	99 a	99 a	32.4 ef
9	SOA 2,14,15,9 ZIDUA PRO FLEXSTAR GT MSO CLASS ACT RIDION	4.5 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	99 a	42.9 abc
10	SOA 2,14,15,9 ZIDUA PRO OUTLOOK ROUNDUP POWERMAX CLASS ACT RIDION	4.5 fl oz/a 10 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	99 a	43.9 a
11	SOA 4,15,14,9 ENGENIA PRO FLEXSTAR GT MSO CLASS ACT RIDION	16 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	99 a	44.6 a
12	SOA 4,5,15,14,9 BOUNDARY XTENDIMAX INTACT CLASS ACT RIDION FLEXSTAR GT MSO CLASS ACT RIDION	1.95 pt/a 44 fl oz/a 0.5 % v/v 1.0 % v/v 3.5 pt/a 1.0 % v/v 1.0 % v/v	A A A A E E E	99 a	99 a	99 a	99 a	99 a	99 a	44.6 a
POST I (6/12/18) / POST V (6/29/18)										
13	SOA 14,15,9 WARRANT ULTRA ROUNDUP POWERMAX AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	3 pt/a 32 fl oz/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	B B F F F F	94 b	92 b	93 b	99 a	99 a	99 a	43.0 abc
POST III (6/13/18)										
14	SOA 4 DICAMBA CHECK	12.8 fl oz/a	C	0 c	68 d	63 d	65 c	60 c	60 c	29.1 f
16	SOA 4,9 DICAMBA CHECK GLPHOSATE CHECK INTACT CLASS ACT RIDION	12.8 fl oz/a 32 fl oz/a 0.5 % v/v 1.0 % v/v	C C C C	0 c	86 c	90 c	83 b	71 b	71 b	43.8 ab
LSD P=.10				0.8	5.3	2.4	2.9	1.5	1.5	4.68

Table 5. Grass control in dicamba tolerant soybean herbicide systems at Rochester, MN in 2018.

Pest Code Rating Date				GRASS					YIELD	
				Jun-14-2018	Jun-22-2018	Jun-28-2018	Jul-10-2018	Sep-17-2018	Oct-17-2018	
Trt	Treatment	Rate	Appl	PERCENT CONTROL (%)					BU/A	
PRE (5/28/18) / POST IV (6/23/18)										
1	SOA 2,14,9 AUTHORITY FIRST / SONIC FLEXSTAR GT MSO CLASS ACT RIDION	6.4 oz wt/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	98 a	91 d	99 a	99 a	99 b	38.6 cd	
2	SOA 2,14,15,9 AUTHORITY FIRST / SONIC EVERPREX ROUNDUP POWERMAX CLASS ACT RIDION	6.4 oz wt/a 16 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	98 a	90 d	99 a	99 a	99 a	40.0 a-d	
3	SOA 14,15,9 AUTHORITY SUPREME FLEXSTAR GT MSO CLASS ACT RIDION	8 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	41.5 abc	
4	SOA 5,14,15,9 FIERCE MTZ FLEXSTAR GT MSO CLASS ACT RIDION	16 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	98 ab	99 a	99 a	99 a	39.2 bcd	
5	SOA 14,15,9 PREFIX AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	32 fl oz/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	A E E E E	99 a	99 a	99 a	99 a	99 a	35.6 de	
6	SOA 14,15,9 PREFIX DUAL MAGNUM ROUNDUP POWERMAX CLASS ACT RIDION	32 fl oz/a 16 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	39.0 cd	
7	SOA 2,14,9 SURVEIL FLEXSTAR GT MSO CLASS ACT RIDION	3.5 oz wt/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	98 a	95 c	99 a	99 a	99 a	42.3 abc	
8	SOA 14,15,9 WARRANT ULTRA AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	3 pt/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	A E E E E	99 a	99 a	99 a	99 a	99 a	32.4 ef	
9	SOA 2,14,15,9 ZIDUA PRO FLEXSTAR GT MSO CLASS ACT RIDION	4.5 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	42.9 abc	
10	SOA 2,14,15,9 ZIDUA PRO OUTLOOK ROUNDUP POWERMAX CLASS ACT RIDION	4.5 fl oz/a 10 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	99 a	99 a	99 a	99 a	99 a	43.9 a	
11	SOA 4,15,14,9 ENGENIA PRO FLEXSTAR GT MSO CLASS ACT RIDION	16 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	99 a	98 abc	99 a	99 a	99 a	44.6 a	
12	SOA 4,5,15,14,9 BOUNDARY XTENDIMAX INTACT CLASS ACT RIDION FLEXSTAR GT MSO CLASS ACT RIDION	1.95 pt/a 44 fl oz/a 0.5 % v/v 1.0 % v/v 3.5 pt/a 1.0 % v/v 1.0 % v/v	A A A A E E E	99 a	99 a	99 a	99 a	99 a	44.6 a	
POST I (6/12/18) / POST V (6/29/18)										
13	SOA 14,15,9 WARRANT ULTRA ROUNDUP POWERMAX AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	3 pt/a 32 fl oz/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	B B F F F F	94 b	99 a	99 a	99 a	99 a	43.0 abc	
POST II (6/13/18)										
14	SOA 4 DICAMBA CHECK	12.8 fl oz/a	C	0 c	0 e	0 c	0 c	0 d	29.1 f	
16	SOA 4,9 DICAMBA CHECK GLPHOSATE CHECK INTACT CLASS ACT RIDION	12.8 fl oz/a 32 fl oz/a 0.5 % v/v 1.0 % v/v	C C C C	0 c	96 bc	95 b	91 b	90 c	43.8 ab	
LSD P=.10				0.9	2.7	0.6	0.8	0.4	4.7	

Table 6. Crop response to herbicide programs applied in dicamba tolerant soybeans at Rochester, MN in 2018.

Pest Code				SOYBEAN RESPONSE								YIELD	
Rating Date				Jun-14-2018		Jun-22-2018		Jun-28-2018		Jul-10-2018		Oct-17-2018	
Trt	Treatment	Rate	Appl	PERCENT INJURY (%)								BU/A	
PRE (5/28/18) / POST IV (6/23/18)													
1	SOA 2,14,9 AUTHORITY FIRST / SONIC FLEXSTAR GT MSO CLASS ACT RIDION	6.4 oz wt/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	0	b	0	c	33	b	0	c	38.6	cd
2	SOA 2,14,15,9 AUTHORITY FIRST / SONIC EVERPREX ROUNDUP POWERMAX CLASS ACT RIDION	6.4 oz wt/a 16 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	0	b	0	c	19	c	0	c	40.0	a-d
3	SOA 14,15, 9 AUTHORITY SUPREME FLEXSTAR GT MSO CLASS ACT RIDION	8 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	0	b	0	c	33	b	0	c	41.5	abc
4	SOA 5,14,15,9 FIERCE MTZ FLEXSTAR GT MSO CLASS ACT RIDION	16 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	0	b	0	c	34	b	0	c	39.2	bcd
5	SOA 14,15,9 PREFIX AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	32 fl oz/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	A E E E E	0	b	0	c	53	a	24	a	35.6	de
6	SOA 14,15,9 PREFIX DUAL MAGNUM ROUNDUP POWERMAX CLASS ACT RIDION	32 fl oz/a 16 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	0	b	0	c	20	c	0	c	39.0	cd
7	SOA 2,14,9 SURVEIL FLEXSTAR GT MSO CLASS ACT RIDION	3.5 oz wt/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	0	b	0	c	34	b	0	c	42.3	abc
8	SOA 14,15,9 WARRANT ULTRA AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	3 pt/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	A E E E E	0	b	0	c	53	a	23	ab	32.4	ef
9	SOA 2,14,15,9 ZIDUA PRO FLEXSTAR GT MSO CLASS ACT RIDION	4.5 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	0	b	0	c	33	b	0	c	42.9	abc
10	SOA 2,14,15,9 ZIDUA PRO OUTLOOK ROUNDUP POWERMAX CLASS ACT RIDION	4.5 fl oz/a 10 fl oz/a 32 fl oz/a 1.0 % v/v	A E E E	0	b	0	c	15	d	0	c	43.9	a
11	SOA 4,15,14,9 ENGENIA PRO FLEXSTAR GT MSO CLASS ACT RIDION	16 fl oz/a 3.5 pt/a 1.0 % v/v 1.0 % v/v	A E E E	0	b	0	c	33	b	0	c	44.6	a
12	SOA 4, 5,15,14, 9 BOUNDARY XTENDIMAX INTACT CLASS ACT RIDION FLEXSTAR GT MSO CLASS ACT RIDION	1.95 pt/a 44 fl oz/a 0.5 % v/v 1.0 % v/v 3.5 pt/a 1.0 % v/v 1.0 % v/v	A A A A E E E	0	b	0	c	34	b	0	c	44.6	a
POST I (6/12/18) / POST V (6/29/18)													
13	SOA 14,15,9 WARRANT ULTRA ROUNDUP POWERMAX AVALANCHE ULTRA ROUNDUP POWERMAX MSO CLASS ACT RIDION	3 pt/a 32 fl oz/a 24 fl oz/a 32 fl oz/a 1.0 % v/v 1.0 % v/v	B B F F F F	36	a	41	a	14	d	21	b	43.0	abc
POST II (6/13/18)													
14	SOA 4 DICAMBA CHECK	12.8 fl oz/a	C	0	b	0	c	0	e	0	c	29.1	f
16	SOA 4,9 DICAMBA CHECK GLPHOSATE CHECK INTACT CLASS ACT RIDION	12.8 fl oz/a 32 fl oz/a 0.5 % v/v 1.0 % v/v	C C C C	0	b	14	b	0	e	0	c	43.8	ab
LSD P=.10				0.8	2.4	2.7	1.4	4.7					

Table 7. Giant ragweed control with herbicide systems in glufosinate tolerant soybean at Rochester, MN in 2018.

Pest Code				AMBTR (GIANT RAGWEED)					YIELD						
				Jun-14-2018	Jun-22-2018	Jun-28-2018	Jul-10-2018	Sep-17-2018	Oct-17-2018						
Rating Date				PERCENT CONTROL (%)					BU/A						
Trt	Treatment	Rate	Appl												
PRE (5/28/18) / POST III (6/15/18)															
17	SOA 2,14,10			86	de	99	ab	98	ab	98	a	98	ab	46.1	bcd
	AUTHORITY FIRST / SONIC	6.4 oz wt/a	A												
	LIBERTY 280	32 fl oz/a	D												
	N-PAK AMS	2.5 % v/v	D												
18	SOA 14,15,10			35	g	98	ab	98	ab	89	d	88	d	45.9	bcd
	AUTHORITY SUPREME	8 fl oz/a	A												
	LIBERTY 280	32 fl oz/a	D												
	N-PAK AMS	2.5 % v/v	D												
19	SOA 14,15,10			76	f	99	ab	98	ab	96	ab	95	bc	44.9	bcd
	FIERCE	3 oz wt/a	A												
	LIBERTY 280	32 fl oz/a	D												
	N-PAK AMS	2.5 % v/v	D												
20	SOA 5,14,15,10			79	f	99	a	99	a	98	a	98	ab	46.6	bcd
	FIERCE MTZ	16 fl oz/a	A												
	LIBERTY 280	32 fl oz/a	D												
	N-PAK AMS	2.5 % v/v	D												
21	SOA 14,15,10			92	bc	99	a	99	a	99	a	99	a	44.1	d
	PREFIX	32 fl oz/a	A												
	LIBERTY 280	32 fl oz/a	D												
	N-PAK AMS	2.5 % v/v	D												
22	SOA 14,15,10			90	cd	99	a	99	a	99	a	99	a	50.7	a
	SURVEIL	3.5 oz wt/a	A												
	LIBERTY 280	32 fl oz/a	D												
	N-PAK AMS	2.5 % v/v	D												
23	SOA 14,15,10			88	cd	99	ab	99	a	98	a	99	a	47.1	bc
	WARRANT ULTRA	3 pt/a	A												
	LIBERTY 280	32 fl oz/a	D												
	N-PAK AMS	2.5 % v/v	D												
24	SOA 2,14,15, 10			83	e	99	a	98	ab	93	bc	93	c	47.8	ab
	ZIDUA PRO	4.5 fl oz/a	A												
	LIBERTY 280	32 fl oz/a	D												
	N-PAK AMS	2.5 % v/v	D												
POST I (6/12/18) / POST VI (6/29/18)															
26	SOA 14,15,10			98	a	98	b	97	ab	99	a	99	a	45.2	bcd
	WARRANT ULTRA	3 pt/a	B												
	LIBERTY 280	32 fl oz/a	B												
	N-PAK AMS	2.5 % v/v	B												
	LIBERTY 280	32 fl oz/a	F												
	N-PAK AMS	2.5 % v/v	F												
27	SOA 15,10			95	ab	96	c	93	c	99	a	99	a	46.5	bcd
	WARRANT	3 pt/a	B												
	LIBERTY 280	32 fl oz/a	B												
	N-PAK AMS	2.5 % v/v	B												
	LIBERTY 280	32 fl oz/a	F												
	N-PAK AMS	2.5 % v/v	F												
POST III (6/15/18)															
25	SOA 10			0	h	98	ab	96	b	90	cd	88	d	44.4	cd
	GLUFOSINATE CHECK	32 fl oz/a	C												
	N-PAK AMS	2.5 % v/v	C												
LSD P=.10				3.9		1.0		2.1		3.9		3.9		3.0	

Table 8. Common lambsquarters control with herbicide systems for glufosinate tolerant soybean at Rochester, MN in 2018.

Pest Code	CHEAL (COMMON LAMBSQUARTERS)					YIELD									
	Rating	Date	Jun-14-2018	Jun-22-2018	Jun-28-2018		Jul-10-2018	Sep-17-2018	Oct-17-2018						
Trt	Treatment	Rate	Appl	PERCENT CONTROL (%)					BU/A						
PRE (5/28/18) / POST III (6/15/18)															
17	SOA 2,14,10			99	a	99	-	99	a	99	a	99	a	46.1	bcd
	AUTHORITY FIRST / SONIC	6.4	oz wt/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
18	SOA 14,15,10			99	a	99	-	99	a	99	a	99	a	45.9	bcd
	AUTHORITY SUPREME	8	fl oz/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
19	SOA 14,15,10			99	a	99	-	99	a	99	a	99	a	44.9	bcd
	FIERCE	3	oz wt/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
20	SOA 5,14,15,10			99	a	99	-	99	a	99	a	99	a	46.6	bcd
	FIERCE MTZ	16	fl oz/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
21	SOA 14,15,10			99	a	99	-	99	a	99	a	99	a	44.1	d
	PREFIX	32	fl oz/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
22	SOA 14,15,10			99	a	99	-	99	a	99	a	99	a	50.7	a
	SURVEIL	3.5	oz wt/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
23	SOA 14,15,10			99	a	99	-	99	a	99	a	99	a	47.1	bc
	WARRANT ULTRA	3	pt/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
24	SOA 2,14,15, 10			99	a	99	-	99	a	99	a	99	a	47.8	ab
	ZIDUA PRO	4.5	fl oz/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
POST I (6/12/18) / POST V (6/29/18)															
26	SOA 14,15,10			98	b	99	-	99	a	99	a	99	a	45.2	bcd
	WARRANT ULTRA	3	pt/a	B											
	LIBERTY 280	32	fl oz/a	B											
	N-PAK AMS	2.5	% v/v	B											
	LIBERTY 280	32	fl oz/a	F											
	N-PAK AMS	2.5	% v/v	F											
27	SOA 15,10			95	c	99	-	98	b	99	a	99	a	46.5	bcd
	WARRANT	3	pt/a	B											
	LIBERTY 280	32	fl oz/a	B											
	N-PAK AMS	2.5	% v/v	B											
	LIBERTY 280	32	fl oz/a	F											
	N-PAK AMS	2.5	% v/v	F											
POST III (6/15/18)															
25	SOA 10			0	d	99	-	98	b	92	b	93	b	44.4	cd
	GLUFOSINATE CHECK	32	fl oz/a	C											
	N-PAK AMS	2.5	% v/v	C											
LSD P=.10						NS		1.0		1.3		1.8		2.96	

Table 9. Common waterhemp control with herbicide systems for glufosinate tolerant soybean at Rochester, MN in 2018.

Pest Code	AMATA (COMMON WATERHEMP)					YIELD									
	Rating	Date	Jun-14-2018	Jun-22-2018	Jun-28-2018		Jul-10-2018	Sep-17-2018	Oct-17-2018						
Trt	Treatment	Rate	Appl	PERCENT CONTROL (%)					BU/A						
PRE (5/28/18) / POST III (6/15/18)															
17	SOA 2,14,10			99	a	99	a	99	a	99	a	99	a	46.1	bcd
	AUTHORITY FIRST / SONIC	6.4	oz wt/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
18	SOA 14,15,10			99	a	99	a	99	a	99	a	99	a	45.9	bcd
	AUTHORITY SUPREME	8	fl oz/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
19	SOA 14,15,10			99	a	99	a	99	a	99	a	99	a	44.9	bcd
	FIERCE	3	oz wt/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
20	SOA 5,14,15,10			99	a	99	a	99	a	99	a	99	a	46.6	bcd
	FIERCE MTZ	16	fl oz/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
21	SOA 14,15,10			99	a	99	a	99	a	99	a	99	a	44.1	d
	PREFIX	32	fl oz/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
22	SOA 14,15,10			99	a	99	a	99	a	99	a	99	a	50.7	a
	SURVEIL	3.5	oz wt/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
23	SOA 14,15,10			99	a	99	a	99	a	99	a	99	a	47.1	bc
	WARRANT ULTRA	3	pt/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
24	SOA 2,14,15,10			99	a	99	a	99	a	99	a	99	a	47.8	ab
	ZIDUA PRO	4.5	fl oz/a	A											
	LIBERTY 280	32	fl oz/a	D											
	N-PAK AMS	2.5	% v/v	D											
POST I (6/12/18) / POST V (6/29/18)															
26	SOA 14,15,10			98	b	99	a	99	a	99	a	99	a	45.2	bcd
	WARRANT ULTRA	3	pt/a	B											
	LIBERTY 280	32	fl oz/a	B											
	N-PAK AMS	2.5	% v/v	B											
	LIBERTY 280	32	fl oz/a	F											
	N-PAK AMS	2.5	% v/v	F											
27	SOA 15,10			95	c	99	a	99	a	99	a	99	a	46.5	bcd
	WARRANT	3	pt/a	B											
	LIBERTY 280	32	fl oz/a	B											
	N-PAK AMS	2.5	% v/v	B											
	LIBERTY 280	32	fl oz/a	F											
	N-PAK AMS	2.5	% v/v	F											
POST II (6/13/18)															
25	SOA 10			0	d	98	b	98	b	93	b	90	b	44.4	cd
	GLUFOSINATE CHECK	32	fl oz/a	C											
	N-PAK AMS	2.5	% v/v	C											
LSD P=.10						0.3		0.6		1.8		2.8		2.96	

Table 10. Grass control with herbicide systems for glufosinate tolerant soybean at Rochester, MN in 2018.

Pest Code	GRASS					YIELD									
	Rating	Date	Jun-14-2018	Jun-22-2018	Jun-28-2018		Jul-10-2018	Sep-17-2018	Oct-17-2018						
Trt	Treatment	Rate	Appl	PERCENT CONTROL (%)					BU/A						
PRE (5/28/18) / POST III (6/15/18)															
17	SOA 2,14,10			99	a	99	a	99	a	99	-	46.1	bcd		
	AUTHORITY FIRST / SONIC	6.4	oz wt/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
18	SOA 14,15,10			99	a	99	a	99	a	99	-	45.9	bcd		
	AUTHORITY SUPREME	8	fl oz/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
19	SOA 14,15,10			99	a	99	a	99	a	99	-	44.9	bcd		
	FIERCE	3	oz wt/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
20	SOA 5,14,15,10			99	a	99	a	99	a	99	-	46.6	bcd		
	FIERCE MTZ	16	fl oz/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
21	SOA 14,15,10			99	a	99	a	99	a	99	-	44.1	d		
	PREFIX	32	fl oz/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
22	SOA 14,15,10			97	b	99	a	99	a	99	-	50.7	a		
	SURVEIL	3.5	oz wt/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
23	SOA 14,15,10			99	a	99	a	99	a	99	-	47.1	bc		
	WARRANT ULTRA	3	pt/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
24	SOA 2,14,15,10			99	a	99	a	99	a	99	-	47.8	ab		
	ZIDUA PRO	4.5	fl oz/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
POST I (6/12/18) / POST V (6/29/18)															
26	SOA 14,15,10			98	a	99	a	99	a	99	-	45.2	bcd		
	WARRANT ULTRA	3	pt/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
27	SOA 15,10			95	c	99	a	99	a	99	-	46.5	bcd		
	WARRANT	3	pt/a												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
	LIBERTY 280	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
POST II (6/13/18)															
25	SOA 10			0	d	99	b	98	b	95	b	99	-	44.4	cd
	GLUFOSINATE CHECK	32	fl oz/a												
	N-PAK AMS	2.5	% v/v												
LSD P=.10				1.2	0.2	0.5	1.4	NS	2.96						

Table 11. Crop response to herbicide systems applied in glufosinate tolerant soybean at Rochester, MN in 2018.

Pest Code	SOYBEAN RESPONSE				YIELD								
	Rating	Date	Jun-14-2018	Jun-22-2018		Jun-28-2018	Jul-10-2018	Oct-17-2018					
Trt	Treatment	Rate	Appl	PERCENT INJURY (%)				BU/A					
PRE (5/28/18) / POST III (6/15/18)													
17	SOA 2,14,10			0	c	25	e	0	c	0	b	46.1	bcd
	AUTHORITY FIRST / SONIC	6.4	oz wt/a		A								
	LIBERTY 280	32	fl oz/a		D								
	N-PAK AMS	2.5	% v/v		D								
18	SOA 14,15,10			0	c	25	e	0	c	0	b	45.9	bcd
	AUTHORITY SUPREME	8	fl oz/a		A								
	LIBERTY 280	32	fl oz/a		D								
	N-PAK AMS	2.5	% v/v		D								
19	SOA 14,15,10			0	c	28	de	0	c	0	b	44.9	bcd
	FIERCE	3	oz wt/a		A								
	LIBERTY 280	32	fl oz/a		D								
	N-PAK AMS	2.5	% v/v		D								
20	SOA 5,14,15,10			0	c	31	bc	0	c	0	b	46.6	bcd
	FIERCE MTZ	16	fl oz/a		A								
	LIBERTY 280	32	fl oz/a		D								
	N-PAK AMS	2.5	% v/v		D								
21	SOA 14,15,10			0	c	29	cd	0	c	0	b	44.1	d
	PREFIX	32	fl oz/a		A								
	LIBERTY 280	32	fl oz/a		D								
	N-PAK AMS	2.5	% v/v		D								
22	SOA 14,15,10			0	c	31	bc	0	c	0	b	50.7	a
	SURVEIL	3.5	oz wt/a		A								
	LIBERTY 280	32	fl oz/a		D								
	N-PAK AMS	2.5	% v/v		D								
23	SOA 14,15,10			0	c	29	cd	0	c	0	b	47.1	bc
	WARRANT ULTRA	3	pt/a		A								
	LIBERTY 280	32	fl oz/a		D								
	N-PAK AMS	2.5	% v/v		D								
24	SOA 2,14,15,10			0	c	26	de	0	c	0	b	47.8	ab
	ZIDUA PRO	4.5	fl oz/a		A								
	LIBERTY 280	32	fl oz/a		D								
	N-PAK AMS	2.5	% v/v		D								
POST I (6/12/18) / POST V (6/29/18)													
26	SOA 14,15,10			41	a	49	a	15	a	1	b	45.2	bcd
	WARRANT ULTRA	3	pt/a		B								
	LIBERTY 280	32	fl oz/a		B								
	N-PAK AMS	2.5	% v/v		B								
	LIBERTY 280	32	fl oz/a		F								
	N-PAK AMS	2.5	% v/v		F								
27	SOA 15,10			31	b	34	b	4	b	4	a	46.5	bcd
	WARRANT	3	pt/a		B								
	LIBERTY 280	32	fl oz/a		B								
	N-PAK AMS	2.5	% v/v		B								
	LIBERTY 280	32	fl oz/a		F								
	N-PAK AMS	2.5	% v/v		F								
POST II (6/13/18)													
25	SOA 10			0	c	26	de	0	c	0	b	44.4	cd
	GLUFOSINATE CHECK	32	fl oz/a		C								
	N-PAK AMS	2.5	% v/v		C								
LSD P=.10				1.2		3.4		0.9		1.9		2.96	