MANAGEMENT OF KOCHIA WITH PREEMERGENCE FOLLOWED BY POSTEMERGENCE ETHOFUMESATE IN ROUNDUP READY® SUGARBEET – BARNEY, ND – 2013

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The objective of this study was to determine the effect of Ethofumesate 4SC applied PRE and/or POST in combination and/or in sequence with glyphosate on the control of kochia and on yield and quality of Roundup Ready sugarbeet.

MATERIALS AND METHODS

'BTS 81RR17' sugarbeet was seeded 1.25 inches deep in 22 inch rows at 60,825 seeds per acre on May 9. Sugarbeet was treated with Tachigaren at 45 grams per 100,000 seeds and NipsIT Suite. Counter 20G insecticide at 8.9 pounds product per acre was applied in a 5-inch band and drag chain incorporated at planting. Herbicide treatments were applied May 9 & 24, June 7 & 25, and July 8. All treatments were applied with a bicycle sprayer in 17 gpa spray solution through 8002 XR flat fan nozzles pressurized with CO₂ at 40 psi to the center four rows of six row plots 30 feet in length. Cercospora leaf spot was controlled with Proline at 5.7 fl oz/A, Inspire XT + Topsin at 7 + 10 fl oz/A, and Headline EC at 9 fl oz/A broadcast July 18, August 1, and August 19, respectively. Lorsban Advanced at 1 pt/A was applied July 18 and August 7 to control grasshopper. Sugarbeet was harvested September 17 from the center two rows of each plot and weighed. Twenty to thirty pounds of sugarbeet was collected from each plot and analyzed for quality at American Crystal Sugar Quality Lab, East Grand Forks, MN.

Sugarbeet stand was counted in the center two rows of plots on September 17. Sugarbeet injury was evaluated on June 7. No visible injury was observed in evaluations after June 7. Kochia control was evaluated June 7, July 8, 15, & 23, August 6, and September 4. All evaluations were a visual estimate of percent fresh weight reduction in the four treated rows compared to the adjacent untreated strip. Experimental design was randomized complete block with 4 replications. Data were analyzed with the ANOVA procedure of Agriculture Research Manager, version 8.5.0 software package.

Table 1. Application Information

Application code	A	В	C	D	E
Date	May 9	May 24	June 7	June 25	July 8
Time of Day	1:40 P	8:30 A	1:30 P	1:15 P	12:30 P
Air Temperature (F)	64	52	71	81	87
Relative Humidity (%)	39	51	38	72	49
Wind Velocity (mph)	13	10	8	12	3
Wind Direction	N	SE	SW	SE	SE
Soil Temp. (F at 6")	55	50	70	70	75
Soil Moisture	Good	Good	Good	Wet	Good
Cloud Cover	5	70	75	70	75
Sugarbeet stage (avg)	PRE	cot	2 lf	9 lf	16 lf
Kochia (untreated avg)	-	cot	0.5" tall	13" tall	30 inch

SUMMARY

Three applications of Roundup PowerMax (glyphosate; 4.5 lbae/gal) gave 74% kochia control at the September 4 evaluation. This indicated the presence of glyphosate-resistant kochia at this location. Four applications of PowerMax gave similar kochia control at 75%. The use of Ethofumesate 4 SC (ethofumesate; 4 lbai/gal) preemergence (PRE) at 2, 4, 6, or 7.5 pt/a followed by three applications of PowerMax did not improve kochia control compared to PowerMax alone. Applying Ethofumesate PRE at 6 pt/a or less followed by three applications of PowerMax + Ethofumesate at 1, 1.5, 2, or 3 pt/a did not improve kochia control compared to glyphosate alone. The only treatment that improved kochia control compared to PowerMax alone was four applications of PowerMax+Ethofumesate at 2 pt/a which gave 92% kochia control. Some sugarbeet injury was observed among treatments; however sugarbeet injury was not severe for any treatment.

 $Table\ 2.\ Management\ of\ Kochia\ with\ Preemergence\ Followed\ by\ Postemergence\ Ethofumesate\ in\ Roundup\ Ready \&\ Sugarbeet-Barney,\ ND-2013\ (Carlson)$

Barney, ND – 2013 (Carlson)		Jui	ne 7	Jul	y 8	Jul 15	Jul 23	Aug 6	Sept 4		Septen	ıber 17	
Trt Treatment	Rate Appl	sgbt	kocz	kocz	colq	kocz	kocz	kocz	kocz	sgbt	sgbt	sgbt	sgbt
No Name	Rate Unit Code	inj	cntl	cntl	cntl	cntl	cntl	cnlt	cnlt	stand	yield	sucr	ext suc
1 11 4 101 1						, 0				#/100'	ton/a	%	lb/a
1 Untreated Check 2 RU PowerMax	32 / 24 / 22 fl oz/a B/C/D	0	21	60	100	0 79	0 74	75	0 74	8 177	0.0 36.2	0.0	9159
N Pak AMS	2.5 % v/v BCD	U	21	00	100	19	/4	13	74	1//	30.2	14.5	9139
NIS NIS	0.25 % v/v BCD												
3 RU PowerMax	32 / 24 / 22 fl oz/a B/C/D	0	18	49	100	58	66	74	75	185	33.9	14.5	8564
RU PowerMax	22 fl oz/a E	Ü	10	.,	100	50	00	, .	,,,	105	33.7	11.0	0501
N Pak AMS	2.5 % v/v BCDE												
NIS	0.25 % v/v BCDE												
4 RU PowerMax	32 / 24 / 22 fl oz/a B/C/D	3	37	52	100	76	76	71	65	179	31.8	13.9	7518
Ethofumesate 4SC	1												
N Pak AMS	2.5 % v/v BCD												
Destiny HC	1.5 pt/a BCD												
5 RU PowerMax	32 / 24 / 22 fl oz/a B/C/D	4	66	67	100	84	91	92	92	175	34.5	14.3	8476
RU PowerMax	22 fl oz/a E												
Ethofumesate 4SC	1												
N Pak AMS	2.5 % v/v BCDE 1.5 pt/a BCDE												
Destiny HC 6 Ethofumesate 4SC		1	30	60	99	74	73	69	60	163	30.1	13.4	6795
RU PowerMax	2 pt/a A 32 / 24 / 22 fl oz/a B/C/D	1	30	60	99	/4	13	09	60	103	30.1	13.4	0/93
N Pak AMS	2.5 % v/v BCD												
NIS	0.25 % v/v BCD												
7 Ethofumesate 4SC		5	55	57	99	71	72	73	69	158	32.3	14.0	7824
RU PowerMax	32 / 24 / 22 fl oz/a B/C/D	5	55	57		, 1	, _	, 3	0)	150	32.3	1 1.0	7021
N Pak AMS	2.5 % v/v BCD												
NIS	0.25 % v/v BCD												
8 Ethofumesate 4SC		3	46	73	99	87	84	82	83	156	36.2	13.9	8652
RU PowerMax	32 / 24 / 22 fl oz/a B/C/D												
N Pak AMS	2.5 % v/v BCD												
NIS	0.25 % v/v BCD												
9 Ethofumesate 4SC	7.5 pt/a A	5	65	67	100	84	78	78	77	166	36.1	14.1	8680
RU PowerMax	32 / 24 / 22 fl oz/a B/C/D												
N Pak AMS	2.5 % v/v BCD												
NIS	0.25 % v/v BCD												
10 Ethofumesate 4SC	1	3	60	60	100	69	71	70	72	174	33.3	14.3	8148
RU PowerMax	32 / 24 / 22 fl oz/a B/C/D												
Ethofumesate 4SC	1												
Destiny HC	1.5 pt/a BCD												
N Pak AMS	2.5 % v/v BCD		70		100	7.0	7.4	7.4	7.0	100	24.0	147	0.661
11 Ethofumesate 4SC	*	2	72	66	100	73	74	74	76	182	34.0	14.7	8661
RU PowerMax Ethofumesate 4SC	32 / 24 / 22 fl oz/a B/C/D												
Destiny HC	2 pt/a BCD 1.5 pt/a BCD												
N Pak AMS	2.5 % v/v BCD												
12 Ethofumesate 4SC		8	69	66	100	79	77	72	75	159	34.1	14.7	8675
RU PowerMax	32 / 24 / 22 fl oz/a B/C/D	O	0)	00	100	17	, ,	, 2	73	137	54.1	14.7	0075
Ethofumesate 4SC													
Destiny HC	1.5 pt/a BC												
N Pak AMS	2.5 % v/v BCD												
13 Ethofumesate 4SC	2 pt/a A	3	63	49	100	63	71	71	71	179	32.0	13.9	7451
RU PowerMax	32 / 24 / 22 fl oz/a B/C/D												
RU PowerMax	22 fl oz/a E												
Ethofumesate 4SC	1 pt/a BCDE												
Destiny HC	1.5 pt/a BCDE												
N Pak AMS	2.5 % v/v BCDE												
14 Ethofumesate 4SC	•	6	56	64	100	70	74	71	71	164	31.4	14.3	7706
RU PowerMax	32 / 24 / 22 fl oz/a B/C/D												
Ethofumesate 4SC	*												
Destiny HC	1.5 pt/a BCD												
N Pak AMS	2.5 % v/v BCD												

 $Table\ 2.\ Management\ of\ Kochia\ with\ Preemergence\ Followed\ by\ Postemergence\ Ethofumesate\ in\ Roundup\ Ready \&\ Sugarbeet-Barney,\ ND-2013\ (Carlson)$

. ,			June 7 July 8		Jul 15	15 Jul 23 Aug 6 Se			4 September 17					
Trt Treatment	Rate	Appl	sgbt	kocz	kocz	colq	kocz	kocz	kocz	kocz	sgbt	sgbt	sgbt	sgbt
No Name		Code	inj	cntl	cntl	cntl	cntl	cntl	cnlt	cnlt	stand	yield	sucr	ext suc
							%				#/100'	ton/a	%	lb/a
15 Ethofumesate 4SC	4 pt/a	A	3	68	72	100	84	80	81	81	169	36.9	13.5	8347
RU PowerMax	32 / 24 / 22 fl oz/a	B/C/D												
Ethofumesate 4SC	1 pt/a	BD												
Ethofumesate 4SC	2 pt/a	C												
Destiny HC	1.5 pt/a	BCD												
N Pak AMS	2.5 % v/v	BCD												
16 Ethofumesate 4SC	4 pt/a	A	8	73	61	100	71	73	72	73	165	32.2	14.5	8052
RU PowerMax	32 / 24 / 22 fl oz/a	B/C/D												
Ethofumesate 4SC	2 pt/a	BC												
Destiny HC	1.5 pt/a	BC												
N Pak AMS	2.5 % v/v	BCD												
17 Ethofumesate 4SC	6 pt/a	A	6	74	58	100	74	69	70	67	172	31.7	13.8	7442
RU PowerMax	32 / 24 / 22 fl oz/a	B/C/D												
Ethofumesate 4SC	1 pt/a	BC												
Destiny HC	1.5 pt/a	BC												
N Pak AMS	2.5 % v/v	BCD												
18 Ethofumesate 4SC	6 pt/a	A	3	45	71	99	80	80	77	77	177	34.4	15.4	9021
RU PowerMax	32 / 24 / 22 fl oz/a	B/C/D												
Ethofumesate 4SC	2 pt/a	C												
Destiny HC	1.5 pt/a	C												
N Pak AMS	2.5 % v/v	BCD												
	LSD 5%		4.8	17.0	16.2	1.2	18.8	16.8	12.8	16.5	35.2	6.03	1.65	1612
·	CV %		100	23	19	1	19	17	13	17	15	13	9	15