

MANAGEMENT OF KOCHIA IN ROUNDUP READY® SUGARBEET – BARNEY, ND – 2013

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The objective of this study was to evaluate weed control and sugarbeet injury from preemergence (PRE) and postemergence (POST) herbicide use in 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 3, 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. The 8” band application was made at planting with a planter mounted sprayer calibrated to deliver 12 gpa spray solution at 20 psi through an 8002 E flat fan nozzle. 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 and July 8. Kochia control was evaluated June 7, July 8, and 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	B	C	D	E	F	G
Date	May 9	May 9	May 24	June 3	June 7	June 25	July 8
Time of Day	3:30 P	3:30 P	12:00 P	11:00 A	2:00 P	1:00 P	12:30 P
Air Temperature (F)	64	64	61	64	71	78	87
Relative Humidity (%)	39	39	41	46	38	70	49
Wind Velocity (mph)	13	13	12	7	8	11	3
Wind Direction	N	N	S	E	SW	SE	SE
Soil Temp. (F at 6”)	55	55	54	58	70	70	75
Soil Moisture	Good	Good	Good	Good	Good	Wet	Good
Cloud Cover	5	5	98	95	75	70	75
Sugarbeet stage (avg)	8” Band (IF)	PRE	cot	cot-2 lf	2 lf	9 lf	16 lf
Kochia (untreated avg)	-	-	cot	0.5” tall	0.5” tall	13” tall	30 inch

SUMMARY

Three applications of Roundup PowerMax (glyphosate; 4.5 lbae/gal) gave 69% kochia control at the September 4 evaluation. This level of control indicates the presence of glyphosate-resistant kochia. Six of the 13 treatments tested in this study gave significantly greater kochia control than three applications of PowerMax. PRE Ethofumesate 4SC (ethofumesate; 4 lbai/gal) at 7 pt/a followed by three applications of PowerMax + Betamix (desmedipham+phenmedipham; 0.65+0.65 lbai/gal) + Ethofumesate gave 88% control of kochia. This, however, was similar to the 86% kochia control from the same POST treatment but without PRE Ethofumesate. PRE Ethofumesate at 7 pt/a followed by three applications of PowerMax + Ethofumesate + Betamix at reduced rates + Destiny HC gave 83% control of kochia. Without PRE Ethofumesate, this POST treatment gave only 70% kochia control. This suggests that higher rates of Betamix give greater kochia control than lower rates of Betamix + Destiny HC when tank-mixed with PowerMax and Ethofumesate. No treatment tested in this study gave an acceptable level of kochia control. Sugarbeet injury was greatest on June 7 from PRE Ethofumesate at 7.5 pt/A applied in an 8” band. This application was made while the seed furrow was still open and the herbicide contact with the seed may be partially responsible for this injury. The sugarbeet injury symptomology was a club leaf appearance and slight stunting. No sugarbeet injury was observed at the July 8 evaluation.

Table 2. Management of Kochia in Roundup Ready® Sugarbeet – Barney, ND – 2013 (Carlson)

Trt No	Treatment Name	Rate	Rate Unit	Appl Code	June 7		July 8		Jul 23	Aug 6	Sep 4	September 17				
					sgbt inj	kocz cntl	sgbt inj	kocz cntl	colq cntl	kocz cntl	kocz cntl	kocz cntl	sgbt stand	sgbt yield	sgbt suc	sgbt ext
												-----%-----				
												#/100'	ton/a	%	lb/a	
10	Nortron		7 pt/a	B	3	79	0	80	99	84	86	83	174	37.3	13.9	8794
	Betamix	7.8 / 10.5 / 14.4	fl oz/a	C/E/F												
	Nortron		4 fl oz/a	CEF												
	RU PowerMax	28 / 28 / 22	fl oz/a	C/E/F												
	N Pak AMS		2.5 % v/v	CEF												
	Destiny HC		1.5 pt/a	CEF												
11	Betamix	16.4 / 21.7 / 32.9	fl oz/a	C/E/F	1	15	0	68	98	85	86	86	173	38.7	13.8	9097
	Nortron		4 fl oz/a	CEF												
	RU PowerMax	28 / 28 / 22	fl oz/a	C/E/F												
	N Pak AMS		2.5 % v/v	CEF												
12	Nortron		3.5 pt/a	B	2	64	0	74	98	86	88	87	154	38.4	13.5	8691
	Betamix	16.4 / 21.7 / 32.9	fl oz/a	C/E/F												
	Nortron		4 fl oz/a	CEF												
	RU PowerMax	28 / 28 / 22	fl oz/a	C/E/F												
	N Pak AMS		2.5 % v/v	CEF												
13	Nortron		7 pt/a	B	6	69	0	72	98	86	87	88	148	36.6	14.0	8791
	Betamix	16.4 / 21.7 / 32.9	fl oz/a	C/E/F												
	Nortron		4 fl oz/a	CEF												
	RU PowerMax	28 / 28 / 22	fl oz/a	C/E/F												
	N Pak AMS		2.5 % v/v	CEF												
14	Nortron		7.5 pt/a	A	15	55	0	61	98	74	72	63	166	30.9	13.6	6894
	Betamix	7.8 / 10.5 / 14.4	fl oz/a	C/E/F												
	Nortron		4 fl oz/a	CEF												
	RU PowerMax	28 / 28 / 22	fl oz/a	C/E/F												
	N Pak AMS		2.5 % v/v	CEF												
	Destiny HC		1.5 pt/a	CEF												
		LSD 5%			3.7	20.6	NS	12.1	2.7	9.3	9.8	10.2	33.7	5.8	1.0	1341
		CV %			76	38	0	14	2	9	9	10	16	13	5	13