

MANAGEMENT OF WATERHEMP IN ROUNDUP READY® SUGARBEET - HERMAN, MN - 2013

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The objective of this study was to evaluate sugarbeet injury weed control from preemergence (PRE) and postemergence (POST) herbicide use in Roundup Ready sugarbeet.

MATERIALS AND METHODS

Urea fertilizer was applied at 143 lbs/A and incorporated with a Kongskilde 's-tine' field cultivator equipped with rolling baskets on May 10, 2013. 'Crystal 875RR' sugarbeet was seeded 1.25 inches deep in 22 inch rows at 60,825 seeds per acre on May 13. Sugarbeet was treated with Tachigaren and Poncho Beta at 45 grams and 5.07 fl oz of product, respectively, per 100,000 seeds. Counter 15G insecticide at 6 pounds product per acre was applied in a 5-inch band and drag chain incorporated at planting. Herbicide treatments were applied May 13, June 6, 14, and 27, July 10 and 22. 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 at 9 fl oz/A broadcast July 18, August 1 and 19, respectively. Sugarbeet was harvested September 18 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 injury was evaluated on June 27. Waterhemp control was evaluated on June 27, July 23, August 6, and September 5. 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 13	May 13	June 6	June 14	June 27	July 10	July 22
Time of Day	4:00 P	5:45 P	10:00 A	11:00A	12:45 P	11:35 A	10:15 A
Air Temperature (F)	86	91	58	73	81	73	74
Relative Humidity (%)	29	25	58	42	45	48	63
Wind Velocity (mph)	8	10	6	11	10	4	8
Wind Direction	WSW	WSW	N	SE	NW	NW	NNW
Soil Temp. (F at 6")	57	57	55	66	76	72	75
Soil Moisture	Fair	Fair	Good	Good	Good	Good	Good
Cloud Cover	50	50	100	100	5	5	30
Sugarbeet stage (avg)	8" Band (IF)	PRE	cot-2 lf	2-5 lf	12 lf	16 lf	canopy
Waterhemp (untreated avg)	-	-	cot-1 lf	cot-3 lf	5-6 lf/ 10"	22" tall	36" tall

SUMMARY

Three applications of Roundup PowerMax (glyphosate; 4.5 lbae/gal) gave 74% waterhemp control at the September 5 evaluation. This level of control indicates the presence of glyphosate-resistant waterhemp. Three applications of PowerMax that began when waterhemp were cotyledon to one leaf gave 74% waterhemp control which was greater than 68% waterhemp control from three applications of PowerMax that began when waterhemp were five to six leaf. Larger waterhemp were more difficult to control with glyphosate than smaller waterhemp. PowerMax at 28 fl oz followed by (fb) a micro-rate application of Betamix (desmedipham+phenmedipham; 0.65+0.65 lbai/gal) + Ethofumesate 4SC (ethofumesate; 4 lbai/gal) + UpBeet (triflurosulfuron; 50%) + Stinger (clopyralid; 3 lbae/gal) + MSO (methylated seed oil) fb PowerMax at 28 fl oz fb Powermax at 22 fl oz gave 83% waterhemp control at the end of the growing season. This was not an adequate level of control. Three applications of Betamix + Ethofumesate + PowerMax gave 91% to 94% waterhemp control depending on Betamix rates applied. Broadcast applications of PRE Ethofumesate at either 3.5 pt/a or 7 pt/a gave 100% waterhemp control regardless of the POST herbicide system used. Excellent Ethofumesate activation was achieved from timely and adequate rainfall. Sugarbeet injury was observed June 27 from treatments where Betamix and Ethofumesate were applied POST, but this early season injury did not affect sugarbeet stand, nor did it appear to influence sugarbeet yield or quality.

Table 2. Management of Waterhemp in Sugarbeet – Herman, MN – 2013 (Carlson).

Trt Treatment No Name	Rate	Rate Unit	Appl Code	June 27		July 23		Aug 6	Sept 5	September 18			
				sgbt inj	wahc cntl	wahc cntl	wahc cntl	wahc cntl	sgbt stand	sgbt yld	sgbt sucr	sgbt ext sucr	
				-----%-----					#/100'	ton/a	%	lb/a	
12 Ethofumesate		3.5 pt/a	B	3	99	100	100	100	217	27.0	16.9	8523	
Betamix	16.4 / 21.7 / 32.9 fl oz/a		C/E/F										
Ethofumesate		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 Ethofumesate		7 pt/a	B	5	100	100	100	100	212	27.6	16.9	8716	
Betamix	16.4 / 21.7 / 32.9 fl oz/a		C/E/F										
RU PowerMax	28 / 28 / 22 fl oz/a		C/E/F										
Ethofumesate		4 fl oz/a	CEF										
N Pak AMS		2.5 % v/v	CEF										
14 Ethofumesate		7.5 pt/a	A	6	82	100	99	97	211	28.6	17.0	9041	
Betamix	7.8 / 10.5 / 14.4 fl oz/a		C/E/F										
Ethofumesate		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%				2.6	5.5	3.5	3.8	3.8	NS	3.6	NS	1165	
CV %				67	5	3	3	3	10	10	14	10	