

GIANT RAGWEED CONTROL IN ROUNDUP READY® SUGARBEET, SOUTHWEST OF HUTCHINSON, MINNESOTA SITE #1 - 2010.

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Introduction

Glyphosate-resistant giant ragweed continues to increase in the Southern Minnesota Beet Sugar Cooperative. Control of giant ragweed in sugarbeet needs to be investigated to determine the proper rate, timing, and number of applications of Stinger.

Materials and Methods

'Betaseed 95RR03' sugarbeet was seeded April 23, 2010 in 22 inch rows in a grower's field having glyphosate-resistant giant ragweed SW of Hutchinson, MN. Sugarbeet seed was treated with Tachigaren at 45 grams dry product per 100,000 seeds. Herbicide treatment information is provided in the table below. All treatments were applied in 17 gpa water at 40 psi through XR8002 nozzles with a bicycle sprayer to the center four rows of six row plots 40 feet in length. Glyphosate and/or clopyralid were applied according to the treatments in the data table below. Ammonium sulfate as AmStik from West Central was included in all treatments at 2.5 qt/A. Giant ragweed was evaluated 21 days after each application with the most pertinent data presented. Visual evaluations are an estimate of percent control in the treated plot area compared to the adjacent untreated strips and based upon a scale of 0 (no control) to 100% (complete control). Sugarbeet was harvested September 8 from one of the two center rows of each plot. Experiment designed as a randomized complete block having four replications.

Table1. Application information.

Application Code	1	2	3	4	5	6	7	8	9
Date of Application	May 18	June 9	June 29	May 27	June 24	July 8	June 2	June 24	July 13
Time of Day	1:30 pm	2:00 pm	1:00 pm	4:30 pm	3:30 pm	12:30 pm	2:30 pm	3:30 pm	11:00 am
Air Temperature (°F)	77	67	70	83	81	80	67	81	75
Relative Humidity (%)	20	70	45	19	58	50	56	58	78
Soil Temp. (°F at 6")	64	57	70	67	69	66	56	69	66
Wind Velocity (mph)	6	10	3	5	3	4	4	3	4
Cloud Cover (%)	15	70	5	0	25	100	30	25	100
Sugarbeet (stage – range)	Cot.-2lf	V6-V13	V10-V24	V2-V5.5	V6-V17	V10-V24	V2-V10	V6-V17	V11-V26.5
Giant Ragweed (stage/height - range)	Cot.-2.5N/ 0.125- 1.75"	-	-	Cot.-5N/ 0.5-9"	-	-	Cot.-6N/ 0.5-17.5"	-	-
Giant Ragweed (avg. density)	23/ft ²	-	-	22/ft ²	-	-	23/ft ²	-	-

Summary

Sugarbeet injury increased with increasing rates of Stinger applied once or multiple times, although plants resumed normal growth over time with little injury observed at the last evaluation (data not shown). Glyphosate applied once and multiple times inadequately controlled giant ragweed, although multiple glyphosate applications controlled more giant ragweed and increased sugarbeet yield compared to a single application. Glyphosate controlled more giant ragweed 1" in height compared to larger giant ragweed at 21 days after the initial application. The inadequate control with glyphosate is a result of the presence of a glyphosate-resistant biotype in the population.

Stinger controlled more giant ragweed and increased sugarbeet yield as rates of a single application increased. Stinger more effectively controlled smaller giant ragweed plants compared to larger plants at 21 days after the initial application. Stinger controlled more giant ragweed and improved sugarbeet yield when applied multiple times compared to a single application. Giant ragweed control was maximized within each timing when Stinger was applied at 0.94 followed by 0.188 lb ae/A.

Season-long giant ragweed competition caused 84% reduction of sugarbeet root yield compared to removing giant ragweed at 1" in height. Root yield improved when weeds were removed at 1" compared to 3 or 6". Stinger (0.047 lb/A) plus glyphosate (0.75 lb ae/A) applied to giant ragweed 1" in height and followed by the same treatment 21 days later maximized sugarbeet root yield, indicating Stinger should be applied initially to giant ragweed 1" in height and at the lowest effective rate to minimize competition and sugarbeet injury.

Table 2. Giant ragweed control in Roundup Ready® sugarbeet, SW Hutchinson, MN Site #1 (Fisher, Luecke and Stachler).

Treatment*	Rate (lb ae/A)	Timing	21 DAT	21 DAT	Harvest	
			1,4,7	3,6,9	Root Yield Ton/A	Extr Sucr lb/A
				Girw cntrl %		
Untreated	-	-	0	0	3.9	555
Weed Free Check-1"	-	-	100	100	24.0	2253
Glyt-PM + AMS	0.75	1	53	6	1.0	803
Clpy + Glyt-PM + AMS	0.047 + 0.75	1	70	16	4.2	1896
Clpy + Glyt-PM + AMS	0.094 + 0.75	1	77	48	8.3	1031
Clpy + Glyt-PM + AMS	0.188 + 0.75	1	92	63	18.5	1637
Clpy + Glyt-PM + AMS	0.047 + 0.75	1,2	70	93	25.5	2383
Clpy + Glyt-PM + AMS	0.094 + 0.75	1,2	76	95	21.1	2301
Clpy + Glyt-PM + AMS	0.094 + 0.75	1				
Clpy + Glyt-PM + AMS	0.188 + 0.75	2	78	100	21.5	2330
Clpy + Glyt-PM + AMS	0.047 + 0.75	1,2				
Clpy + Glyt-PM + AMS	0.094 + 0.75	3	66	96	22.5	2053
Clpy + Glyt-PM + AMS	0.094 + 0.75	1,2,3	77	99	22.3	2237
Weed-Free Check-3"	-	-	100	100	17.9	2041
Glyt-PM + AMS	0.75	4	46	21	1.3	1099
Clpy + Glyt-PM + AMS	0.047 + 0.75	4	65	39	9.1	1210
Clpy + Glyt-PM + AMS	0.094 + 0.75	4	71	63	11.0	1406
Clpy + Glyt-PM + AMS	0.188 + 0.75	4	84	88	19.1	1929
Clpy + Glyt-PM + AMS	0.047 + 0.75	4,5	65	82	17.4	1653
Clpy + Glyt-PM + AMS	0.094 + 0.75	4,5	80	96	21.7	2223
Clpy + Glyt-PM + AMS	0.094 + 0.75	4				
Clpy + Glyt-PM + AMS	0.188 + 0.75	5	75	100	16.6	1645
Clpy + Glyt-PM + AMS	0.047 + 0.75	4,5				
Clpy + Glyt-PM + AMS	0.094 + 0.75	6	68	89	22.3	2107
Clpy + Glyt-PM + AMS	0.094 + 0.75	4,5,6	76	97	20.1	2059
Glyt-PM + AMS	0.75	4,5	50	39	8.6	1599
Glyt-PM + AMS	0.75	4,5,6	50	59	11.0	1288
Weed-Free Check-6"	-	-	100	100	18.8	1874
Glyt-PM + AMS	0.75	7	34	15	1.4	1830
Clpy + Glyt-PM + AMS	0.047 + 0.75	7	58	38	4.9	1790
Clpy + Glyt-PM + AMS	0.094 + 0.75	7	64	48	5.8	1641
Clpy + Glyt-PM + AMS	0.188 + 0.75	7	75	81	15.4	1876
Clpy + Glyt-PM + AMS	0.047 + 0.75	7,8	60	81	15.2	1679
Clpy + Glyt-PM + AMS	0.094 + 0.75	7,8	69	96	17.6	1622
Clpy + Glyt-PM + AMS	0.094 + 0.75	7				
Clpy + Glyt-PM + AMS	0.188 + 0.75	8	67	97	16.1	1551
Clpy + Glyt-PM + AMS	0.047 + 0.75	7,8				
Clpy + Glyt-PM + AMS	0.094 + 0.75	9	56	88	16.5	1548
Clpy + Glyt-PM + AMS	0.094 + 0.75	7,8,9	65	95	19.6	1970
LSD (0.05)			6.2	4.6	5.7	1019

*Glyt-PM = Roundup PowerMAX from Monsanto; Clpy = Stinger from Dow AgroSciences; AMS = Amstik from West Central at 2.5 qt/A.