

Glyphosate and ALS resistant giant ragweed control in Soybeans at Rochester, MN 2013

Behnken, Lisa M., Fritz R. Breitenbach, Ryan P. Miller, Kyle Borst and Brianne Baker

The objective of this trial was to evaluate the performance of herbicide systems for herbicide resistant giant ragweed control in soybeans in southeastern Minnesota. The research site was a Port Byron silt loam soil with a pH of 7.2, O.M. of 3.0%, and soil test P and K levels of 9 ppm and 85 ppm, respectively. Fall fertilizer was applied at the rate of 21-100-180-24 lbs. of actual N-P-K-S. The field was fall chisel plowed, and disked and field cultivated twice prior to planting in the spring. The soybean variety DuPont Pioneer P91Y90 was used for the glyphosate based treatments, and Stine 17LD02 was used for the LibertyLink based treatment. Both soybean brands were planted on June 13, 2013 at a depth of 1.5 inches in 30 inch rows at a rate of 165,500 seeds per acre. 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 32 psi using TeeJet 11002 air induction flat spray tips for PRE treatments, and Turbo TeeJet 11002 wide angle flat spray tip nozzles for POST applications. Evaluations of the plot were taken on June 28, and July 1, 8, 15, and 24, and August 15. The center two rows of selected plots were machine harvested on October 25, 2013. Application dates, environmental conditions, and weed stages are listed in Table 1. Herbicide performance for giant ragweed and plant injury ratings are found in Tables 2 through 3 respectively. (University of Minnesota Extension Regional Office, Rochester)

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

Date	6/13	6/28	7/1	7/12	7/15
Treatment	PRE	POST I	POST II	POST III	POST IV
Temperature (F)					
Air	77	73	75	79	79
Soil	67.6	76.1	70.3		72.5
Relative Humidity (%)	44	59	46	52	62
Wind (mph)	13	24	8	18	7
Soil Moisture	Adequate	Adequate	Adequate	Adequate	Adequate
Soybean					
Stage		V2-V3	V3	V4-V5	R1
Height (inch)		4.0	4.5	7.0	
Giant Ragweed					
Weed density (ft ²)		2.0			
Height (inch)			4.6	12.0	
Rainfall after each application (inch)					
Week 1	0.21	0.44	0.3	1.07	0.75
Week 2	5.25	0.35	0.89	0.66	0.47
Week 3	0.44	1.07	0.75	0.06	0.0

Table 2. Performance of herbicide systems for giant ragweed control in soybeans on June 28, July 1, 8, 15, and 24, and August 15 and grain yield at 13% at Rochester, MN in 2013.

Treatment	Rate (rate/A)	Giant Ragweed Control (% Control)						Yield (bu/A)
		6/28	7/1	7/8	7/15	7/24	8/15	
Untreated		0	0	0	0	0	0	
PRE / POST III (4" Weeds)								
Verdict / Flexstar GT + 28% UAN + MSO	5 oz/a / 3.5 pt/A + 2.5% v/v + 1% v/v	40	33	84	85	87	91	33.7
Sonic / Flexstar GT + 28% UAN + MSO	6.4 oz/a / 3.5 pt/A + 2.5% v/v + 1% v/v	43	36	76	81	84	91	32.4
Verdict / Cobra + 28% UAN + COC	5 oz/a / 12.5 fl oz/a + 2.5% v/v + 0.5% v/v	40	38	88	94	97	97	29.7
Prefix / Cobra + 28% UAN + COC	2 pt/a / 12/5 fl oz/a + 2.5% v/v + 0.5% v/v	51	39	74	86	90	92	33.9
Authority Elite / Flexstar + Butyrac 200 + 28% UAN + MSO	2 qt/a / 1 pt/a + 1 fl oz/a + 2.5% v/v + 1% v/v	0	0	92	94	93	96	30.8
Authority Elite / Flexstar + Basagran + 28% UAN + MSO	2 qt/a / 1 pt/a + 1 pt/a + 2.5% v/v + 1% v/v	0	0	88	87	94	95	32.6
POST I (1-2" Weeds)								
Roundup PowerMax + N-Pak-AMS	22 fl oz/a + 3 qt/a	0	69	11	20	24	23	
Roundup PowerMax + N-Pak-AMS	44 fl oz/a + 3 qt/a	0	71	15	29	28	25	
Flexstar GT + 28% UAN + MSO	3.5 pt/a + 2.5% v/v + 1% v/v	0	98	79	85	91	94	33.3
POST II (4" Weeds)								
Roundup PowerMax + N-Pak-AMS	22 fl oz/a + 3 qt/a	0	0	18	19	21	18	
Roundup PowerMax + N-Pak-AMS	44 fl oz/a + 3 qt/a	0	0	20	36	25	31	
POST I (1-2" weeds) / POST II (14 days after POST I)								
Roundup PowerMax + N-Pak-AMS	22 fl oz/a + 3 qt/a	0	69	30	43	35	35	
/ Roundup PowerMax + N-Pak-AMS	/ 44 fl oz/a + 3 qt/a							
Roundup PowerMax + N-Pak-AMS	44 fl oz/a + 3 qt/a	0	71	25	34	33	28	23.8
/ Roundup PowerMax + N-Pak-AMS	/ 22 fl oz/a + 3 qt/a							
POST III (6" Weeds)								
Roundup PowerMax + N-Pak-AMS	64 fl oz/a + 3 qt/a	0	0	0	43	29	28	
POST I (1-2" Weeds) / POST IV (14 days after POST I)								
Flexstar GT + 28% UAN + MSO	3.5 pt/a + 2.5% v/v + 1% v/v	0	98	79	86	99	99	33.5
/ Cobra + 285 UAN + COC	/ 12 fl oz + 4% v/v + 0.5% v/v							
Liberty 280 + N-Pak-AMS / Liberty 280 + N-Pak-AMS	28 fl oz/a + 3 qt/a / 28fl oz/a + 3qt/a	0	78	73	60	82	93	
LSD (P=0.10)		7.1	4.7	9.4	9.6	6.3	4.7	4.4

Table 3. Crop response to herbicide systems used to control herbicide resistant for giant ragweed control in soybeans on June 28, July 1, 15, and 24, and grain yield at 13% at Rochester, MN in 2013.

Treatment	Rate (rate/A)	Crop Response (% Injury)				Yield (bu/A)
		6/28	7/1	7/15	7/24	
Untreated		0	0	0	0	
PRE / POST III (4" Weeds)						
Verdict / Flexstar GT + 28% UAN + MSO	5 oz/a / 3.5 pt/A + 2.5% v/v + 1% v/v	0	0	14	0	33.7
Sonic / Flexstar GT + 28% UAN + MSO	6.4 oz/a / 3.5 pt/A + 2.5% v/v + 1% v/v	0	5	12	0	32.4
Verdict / Cobra + 28% UAN + COC	5 oz/a / 12.5 fl oz/a + 2.5% v/v + 0.5% v/v	0	0	21	0	29.7
Prefix / Cobra + 28% UAN + COC	2 pt/a / 12/5 fl oz/a + 2.5% v/v + 0.5% v/v	0	0	13	0	33.9
Authority Elite / Flexstar + Butyrac 200 + 28% UAN + MSO	2 qt/a / 1 pt/a + 1 fl oz/a + 2.5% v/v + 1% v/v	0	23	24	0	30.8
Authority Elite / Flexstar + Basagran + 28% UAN + MSO	2 qt/a / 1 pt/a + 1 pt/a + 2.5% v/v + 1% v/v	0	25	23	0	32.6
POST I (1-2" Weeds)						
Roundup PowerMax + N-Pak-AMS	22 fl oz/a + 3 qt/a	0	0	0	0	
Roundup PowerMax + N-Pak-AMS	44 fl oz/a + 3 qt/a	0	0	0	0	
Flexstar GT + 28% UAN + MSO	3.5 pt/a + 2.5% v/v + 1% v/v	0	70	8	0	33.3
POST II (4" Weeds)						
Roundup PowerMax + N-Pak-AMS	22 fl oz/a + 3 qt/a	0	0	0	0	
Roundup PowerMax + N-Pak-AMS	44 fl oz/a + 3 qt/a	0	0	0	0	
POST I (1-2" weeds) / POST II (14 days after POST I)						
Roundup PowerMax + N-Pak-AMS / Roundup PowerMax + N-Pak-AMS	22 fl oz/a + 3 qt/a / 44 fl oz/a + 3 qt/a	0	3	0	0	
Roundup PowerMax + N-Pak-AMS / Roundup PowerMax + N-Pak-AMS	44 fl oz/a + 3 qt/a / 22 fl oz/a + 3 qt/a	0	3	0	0	23.8
POST III (6" Weeds)						
Roundup PowerMax + N-Pak-AMS	64 fl oz/a + 3 qt/a	0	0	0	0	
POST I (1-2" Weeds) / POST IV (14 days after POST I)						
Flexstar GT + 28% UAN + MSO / Cobra + 285 UAN + COC	3.5 pt/a + 2.5% v/v + 1% v/v / 12 fl oz + 4% v/v + 0.5% v/v	0	75	8	41	33.5
Liberty 280 + N-Pak-AMS / Liberty 280 + N-Pak-AMS	28 fl oz/a + 3 qt/a / 28fl oz/a + 3qt/a	0	20	0	0	
LSD (P=0.10)		0	5	4	1	4.4