

Timing glyphosate applications for 'Roundup Ready' soybeans at Waseca, MN in 1997.

Hoverstad, Thomas R. The objective of this trial was to evaluate glyphosate application timing and how it affects weed control and seed yields in soybeans. The research site was a Webster clay loam soil containing 6.5% organic matter with a pH of 7.0 and soil test P and K levels of 14 and 196 ppm, respectively. The previous crop was corn that had been fall moldboard plowed. The entire area was field cultivated once prior to any herbicide application. Following preplant incorporated treatments the entire area was field cultivated twice to a depth of 3 to 4 inches to incorporate herbicides and prepare a seedbed. Asgrow 'AG 1901' Roundup Ready soybean seed was planted on May 21, 1997 in 30-inch rows. All treatments up to 50 DAP were applied with a tractor mounted sprayer delivering 20 gpa at 40 psi using 8002 flat-fan nozzle tips. The retreatment following the 40 and 50 DAP treatments were applied with a hand sprayer directed between the soybean rows. Application dates, environmental conditions, crop and weed stages are listed below.

Date	May 19	June 12	June 20	June 30	July 10
Treatment	PPI	20 DAP	30 DAP	40 DAP	50 DAP
air temp °F	58	87	86	84	81
soil temp (4-inch)	59	76	73	74	69
Relative humidity (%)	26	22	40	50	50
Wind	NW 11	NE 2	W 6	W 2	S 10
Soil moisture	moist	dry	dry	wet	moist
Soybeans					
stage	--	V1	V2	V4	R1
height	--	3-4	5	11	16
Giant foxtail					
leaf no.	--	2-3	3-4	5	6
height	--	1-2	4	8-10	16-18
Common cocklebur					
leaf no.	--	2	2-4	5	9
height	--	1-2	2-3	8	16
Common ragweed					
leaf no.	--	2-4	4-6	8	16
height	--	1-2	3-4	8	16-18
Common lambsquarters					
leaf no.	--	2-4	4-6	10	14
height	--	1-2	2-3	8	12-14
Velvetleaf					
leaf no.	--	2-4	4	6	10
height	--	1-2	3	8	16
Redroot pigweed					
leaf no.	--	2-4	4-6	10	14
height	--	1-2	4	8	16
Rainfall after application (inch)					
week 1	1.69	0.24	1.58	0.24	3.53
week 2	0.64	1.60	1.20	3.22	1.60
week 3	0.19	1.06	0.61	1.64	1.50

Applying glyphosate at 20 or 30 days after planting (DAP) without a sequential application resulted in reduced control of giant foxtail, common cocklebur, common lambsquarters and redroot pigweed compared to those treatments with sequential glyphosate applications. This was largely the result of weeds germinating after the glyphosate application and did not cause yield reductions. Applying glyphosate at 50 DAP without sequential treatments resulted in poorer control of velvetleaf. Delaying the glyphosate application to 50 DAP resulted in 3 to 5 bu/A yield reductions compared to applications at 40 DAP or earlier.

Table. Timing glyphosate applications for 'Roundup Ready' soybeans at Waseca, MN in 1997 (Hoverstad).

Treatment <sup>a</sup>	Rate	Timing	Gift	Cocb	Corw	Colq	Vele	Rrpw	Yield <sup>b</sup>
<u>Postemergence</u>	(lb/A or pt/A)			(% control	9-30-97)				(bu/A)
Glyphosate	0.75	20 DAP	86	91	96	87	99	90	49.4
Glyphosate	0.75	30 DAP	86	91	99	92	95	74	50.5
Glyphosate	0.75	40 DAP	99	99	99	99	99	99	50.4
Glyphosate	0.75	50 DAP	99	99	92	99	88	97	45.5
<u>Postemergence/Postemergence</u>									
Glyphosate/glyphosate	0.75 /0.75	20/40 DAP	99	99	99	99	99	99	49.0
Glyphosate/glyphosate	0.75 /0.75	30/50 DAP	99	99	99	99	99	99	48.3
Glyphosate/glyphosate	0.75 /0.75	40/70 DAP	99	99	99	99	99	99	50.5
Glyphosate/glyphosate	0.75 /0.75	50/70 DAP	99	99	99	99	93	99	47.0
<u>Preplant Incorporated/Postemergence</u>									
Trifluralin/ Imazethapyr+MSO+28%N	0.75/ 0.063+(1.5+2)	PPI/ 30 DAP	99	99	86	99	99	99	48.0
Trifluralin/ glyphosate	0.75/ 0.75	PPI/ 30 DAP	96	97	99	95	98	99	50.5
<u>Check Plots</u>									
Weedy Check	-		0	0	0	0	0	0	11.2
Hand-weeded	-		100	100	100	100	100	100	46.9
	LSD (0.10)		3	5	3	3	4	12	4.1

<sup>a</sup> glyphosate = Roundup Ultra; trifluralin = Treflan 4 MTF; imazethapyr = Pursuit 70DF; MSO = Sun-It II; 28%N = an aqueous solution of urea and ammonium nitrate.

<sup>b</sup> yield adjusted to 13% moisture.