Comparison of weed control performance of imazethapyr & glyphosate and glyphosate programs for weed control in soybean at Potsdam, MN in 2003. Behnken, Lisa. M., Fritz R. Breitenbach, Courtney L. Soderholm, and Kristal L. Schaufler. The objective of this trial was to compare the weed control performance of sequential applications of imazethapyr & glyphosate and glyphosate to other glyphosate herbicide combinations in soybean in southeastern Minnesota. The research site was a Port Byron silt loam soil containing 3.2% organic matter with a pH of 6.7 and soil test P and K levels of 66 ppm and 376 ppm, respectively. The previous crop was corn. In the spring, the area was disked once followed by two passes with a field cultivator. The soybean variety, DK 19-51, was planted on June 3, 2003 at a depth of 1.5 inch in 30-inch rows at 160,000 seeds/A. The plot design was a randomized complete block design with four replications. Preemergence (PRE) and postemergence (POST I, POST II, and POST III) treatments were applied with a tractor-mounted sprayer, delivering 20 gpa at 32 psi using TurboTee 11002 nozzles. Evaluations of the plots were taken on July 2, 18 and August 5. Application dates, environmental conditions, crop and weed stages are listed below.

Date	June 3	July 1	July 11	July 16
Treatment	PRE	POST I	POST II	POST III
Temperature (F)				
Air	67	77	70	75
Relative humidity (%)	53	45	74	71
Wind (mph)	10	9	14	11
Soil moisture	inadequate	adequate	adequate	adequate
Soybean				
Stage	seeded	V2	V4	V5
height (inch)	0	5.5	11.5	13
Common lambsquarters				
weed density/ ft^2	42	42	42	42
height (inch)	0	3	7	8
Velvetleaf				
weed density/ ft^2	3	3	3	3
height (inch)	0	4	9	10
Wild proso millet				
weed density/ft^2	10	10	10	10
height (inch)	0	4	9	10
Rainfall after application (inch)				
week 1	2.78	1.98	0.05	0
week 2	0	0.32	0	0.2
week 3	0.45	0	0.25	0.05

The best performance overall were the two pass herbicide programs with only glyphosate applied as a POST III following either a PRE or POST I treatments and glyphosate treatment applied at only POST I, suggesting the importance of early season weed control. Glyphosate applied only at POST I, provided greater common lambsquarters control (July 18 and Aug 5), greater velvetleaf control (July 18) and a higher yield (39 compared to 36 bu/A, respectively) than glyphosate applied at POST II only. This also suggests that early season weed control may be the key to providing the yield advantage. All but one treatment, glyphosate applied only at POST I, provided excellent wild proso millet control by the August 5 rating. All treatments gave excellent velvetleaf control by the August 5 rating. However, the pendimethalin / imazethapyr & glyphosate treatment applied at PRE/POST III gave no early or mid-season control (July 2 and 18 rating) due to the timing of the POST III application of July 16. Flumioxazin at 0.047 lb/A compared to 0.312 lb/A, provided better early season control of common lambsquarters (July 2 rating), velvetleaf (July 2 and 18 rating) and wild proso millet control (July 18 rating). However, yields were similar. Common lambsquarters control was achieved earlier with the POST I treatments (88 to 93%) compared to the POST II treatments (78 to 80%) by the July 18 rating, thus removing weed competition earlier in the season. Early season weed competition appears to be a key factor in soybean yield performance in this trial, with the exception of the POST I / POST III treatment of glyphosate +AMS / imazethapyr & glyphosate + NIS + AMS. (Southeast District, University of Minnesota Extension Service, Rochester).

Table. Performance of one and two pass herbicide systems including glyphosate for weed contol in soybean on July 2, 18, and August 5 at Potsdam, MN in 2003 (Behnken, Breitenbach, Soderholm, and Schaufler).

Treatment	Rate	CHEAL control			ABUTH control			PANMI control			Soybean yield
		7/2	7/18	8/5	7/2	7/18	8/5	7/2	7/18	8/5	
	(lb/A)	(%)			(%)			(%)			(bu/A)
PRE / POST III											
Flumioxazin / glyphosate + AMS	0.0312 + 0.77 + 2	65	66	98	61	56	99	56	50	99	38
Flumioxazin / glyphosate + AMS	0.047 + 0.77 + 2	71	68	99	71	67	98	61	61	99	40
Pendimethalin / imazethapyr & glyphosate + NIS + AMS	1.25 + 0.058 & 0.752 + 0.125% + 2	66	63	99	0	0	98	76	74	98	36
POST I											
Glyphosate + AMS	0.77 + 2	0	93	95	0	99	99	0	94	93	39
POST I / POST III											
Glyphosate + AMS / glyphosate + AMS	0.56 + 2 + 0.77 + 2	0	88	99	0	99	99	0	94	99	41
Imazethapyr & glyphosate + NIS + AMS / glyphosate + AMS	0.058 & 0.752 + 0.125% + 2 + 0.77 + 2	0	90	99	0	99	99	0	96	99	39
Glyphosate + AMS + cloransulam / glyphosate + AMS	0.56 + 2 + 0.0157 / 0.77 + 2	0	90	99	0	99	99	0	96	99	40
Glyphosate + AMS / imazethapyr & glyphosate + NIS + AMS	0.77 + 2 / 0.058 & 0.752 + 0.125% + 2	0	93	99	0	99	99	0	96	99	35
POST II											
Imazethapyr & glyphosate + NIS + AMS	0.058 & 0.752 + 0.125% + 2	0	80	90	0	91	99	0	94	99	35
Glyphosate + AMS + cloransulam	0.77 + 2 + 0.0157	0	79	86	0	94	99	0	94	99	37
Glyphosate + AMS	0.77 + 2	0	79	86	0	92	99	0	94	99	36
POST II / POST III											
Imazethapyr & glyphosate + NIS + AMS / glyphosate + AMS	0.058 & 0.752 + 0.125% + 2 + 0.56 + 2	0	80	97	0	91	99	0	95	99	34
Glyphosate + AMS / glyphosate + AMS	0.77 + 2 + 0.77 + 2	0	75	92	0	92	99	0	95	99	37
Glyphosate + AMS + cloransulam / glyphosate + AMS	0.56 + 2 + 0.0157 + 0.77 + 2	0	78	94	0	93	99	0	95	99	36
Untreated		0	0	0	0	0	0	0	0	0	22
LSD (0.10)		4	5	3	4	3	1	5	3	1	2

AMS = spray grade ammonium sulfate, Helena; NIS = AGRI-DEX nonionic surfactant, Helena.