

Effect of glyphosate rate, timing, and micro-nutrient additive on common lambsquarters. Trower, Timothy L. and Chris M. Boerboom. Two glyphosate formulations were evaluated for postemergence common lambsquarters (CHEAL) control in soybeans. Glyphosate, formulated as Roundup WeatherMax, was applied at 0.39 and 0.77 lb ae/A while the GF-1279 formulation was applied at 0.5 and 1.0 lb ae/A. Both formulations were applied alone with ammonium sulfate or tank mixed with a foliar fertilizer, MAX-IN, at 1 qt/A. Glyphosate formulations were applied postemergence to common lambsquarters that ranged from 8 to 15 inches tall in the first application timing to 10 to 20 inches tall in the second application timing. Asgrow AG2106 Roundup Ready soybeans were no-till drilled on May 7 at a depth of 0.75 inches in 7-inch rows and a population of 200,000 seeds per acre. The study was conducted at the University of Wisconsin Arlington Research Station on a Plano silt loam with a pH of 6.0 and 3.2% organic matter. Trial design was a randomized complete block with 10 by 25 foot plots replicated four times. Herbicide applications were made with a CO₂ backpack sprayer calibrated at 20 gpa and equipped with XR8003 nozzles. Application data were as follows:

Date	6/17/04	6/30/04
Treatment	POST	POST
Spray		
gpa	20	20
psi	23	23
mph	3	3
Temperature (F)		
air	77	75
soil	76	70
Soil moisture (surface)	moist	moist
Wind/direction (mph)	3-5, NNW	3-5, S
Relative humidity (%)	64	48
Cloud cover (%)	100	0
Soybean		
leaf no.	V2-3	V4
height (inch)	6	7
Common lambsquarters		
leaf no.		
height (inch)	8-15	10-20

Both application timings were rain-free for 24 hours after application. No crop injury was observed with any treatment at either application timing. All glyphosate treatments in the first application timing provided acceptable common lambsquarters control by 28 days after application. Common lambsquarters control was less at 12 days after application with Roundup WeatherMax at 0.39 lb ae/A tank mixed with Max-In as compared to Roundup WeatherMax applied alone. However, no differences were evident 28 days after application.

Common lambsquarters control differed among herbicide treatments at the second application timing. No differences in common lambsquarters control were noted between glyphosate formulations at either reduced or full rates. Control increased with higher rates of both glyphosate formulations when evaluated 15 days after application. Tank mixing Max-In with Roundup WeatherMax at 0.39 lb ae/A or GF-1279 at 0.5 lb ae/A decreased common lambsquarters control 15 days after application when compared to either formulation applied alone, averaging an 18% decrease in activity for Roundup Weather Max and a 24% decrease in activity for GF-1279. Common lambsquarters control remained less with the Max-In tank mixtures when evaluated 26 days after application, averaging 75% control with both formulations. Common lambsquarters control did not differ between Roundup WeatherMax applied at 0.39 lb ae/A alone or tank mixed with Max-In at 92 days after application. Common lambsquarters control was less at 92 days after application with GF-1279 applied at 0.5 lb ae/A tank mixed with Max-In compared to GF-1279 applied alone.

All herbicide treatments yielded more than the untreated control. Few differences in yields were observed among treatments as yields ranged from a high of 62 bu/a with Roundup WeatherMax at 0.77 lb ae/A plus Max-In to a low of 52 bu/a with GF-1279 applied at 0.5 lb ae/A (Department of Agronomy, University of Wisconsin-Madison).

Table 1. Glyphosate rate, timing, and additive evaluation on common lambsquarters (Trower and Boerboom).

Treatment ^c	Rate	Appl. Timing	CHEAL control ^a				Yield ^b (bu/A)
			June 29 (%)	July 15 (%)	July 26 (%)	Aug 30 (%)	
Untreated	(lb ae/A)		0	0	0	0	44
Glyphosate (WM ^d)	0.39	Post-A	97	100	100	100	61
Glyphosate (WM ^d)	0.77	Post-A	99	100	100	100	58
Glyphosate (WM ^c)+MAX-IN ^e	0.39+1 qt/A	Post-A	89	97	98	100	61
Glyphosate (WM ^c)+MAX-IN ^e	0.77+1 qt/A	Post-A	95	100	100	100	62
Glyphosate (GF-1279)	0.5	Post-A	97	99	99	100	52
Glyphosate (GF-1279)	1	Post-A	99	100	100	100	58
Glyphosate (GF-1279)+MAX-IN ^e	0.5+1 qt/A	Post-A	94	99	99	100	53
Glyphosate (GF-1279)+MAX-IN ^e	1+1 qt/A	Post-A	98	99	100	100	58
Glyphosate (WM ^d)	0.39	Post-B		85	91	99	60
Glyphosate (WM ^d)	0.77	Post-B		98	99	100	61
Glyphosate (WM ^c)+MAX-IN ^d	0.39+1 qt/A	Post-B		70	76	97	58
Glyphosate (WM ^c)+MAX-IN ^d	0.77+1 qt/A	Post-B		92	95	100	59
Glyphosate (GF-1279)	0.5	Post-B		90	95	100	59
Glyphosate (GF-1279)	1	Post-B		96	100	100	53
Glyphosate (GF-1279)+MAX-IN ^e	0.5+1 qt/A	Post-B		68	75	90	54
Glyphosate (GF-1279)+MAX-IN ^e	1+1 qt/A	Post-B		93	97	100	54
LSD (P=0.1)			3	5	5	3	8

^aWeed control is a visual rating of biomass reduction ranging from 0 to 100%, where 100% is complete weed control.

^bYields are expressed as bushels per acre adjusted to 13% moisture.

^cAmmonium sulfate at 2.5 lb/A was added to all treatments.

^dGlyphosate (WM) was Roundup WeatherMax from Monsanto.

^eMAX-IN is a foliar fertilizer from Agrilience LLC with the following analysis: 0.2% boron, 0.3% iron, 3.2% manganese, 0.1% molybdenum and 2.1% zinc.