

Glyphosate contamination on non-glyphosate-resistant soybean. Urbana, Illinois, 2005. Maxwell, Douglas J., Dawn E. Nordby, and James L. Moody. The objective of this research was to evaluate glyphosate contamination on non-glyphosate-resistant soybean. The study was established at the Crop Sciences Research and Education Center, Urbana, IL. The soil was a Flanagan silt loam with a pH of 6.4 and 4.8% organic matter. Pioneer 33B15 conventional soybean was planted 1.5 inches deep on May 25 in 30 inch rows. Treatments were arranged in randomized complete blocks with three replications of plots 10 by 30 feet. Herbicides were applied with a CO₂ backpack sprayer delivering 20 gpa and equipped with 80025 air induction nozzles. Pendimethalin at 1.24 lb/A and imazethapyr at 0.063 lb/A were applied preemergence along with hand weeding to maintain weed-free plots. Application information is listed below:

Date	June 21
Application	post
Temperature (F)	
Air	79
Soil	78
Soil Moisture	dry
Wind (mph)	5-W
Sky Cover (%)	0
Precip. after application	
Week 1 (inch)	0.36
Week 2 (inch)	0.08
Relative humidity (%)	50
Soybean	
Leaf no.	3-trif
Height (inch)	8

Treatments containing 0.03 lb acid equivalent (ae)/A or less of glyphosate alone caused in 0-3% visual injury and no significant yield loss. These same treatments with the addition of 0.031 lb/A imazamox increased injury up to 20% by 7 days after treatment (DAT) but did not result in significant yield loss. Similarly, treatments that contained 0.03lb ae/A or less glyphosate plus 0.176 lb/A fomesafen resulted in a peak injury of 23% at 3 and 7 DAT and did not result in significant yield loss. Glyphosate treatments containing 0.03 lb ae/A or less plus 0.031 lb/A imazamox and 0.176 lb/A fomesafen had up to 28 and 27% injury 3 and 7 DAT, respectively, compared to 23 and 18% injury for the imazamox plus fomesafen treatment. None of the herbicide combinations containing 0.03 lb ae/A glyphosate or less resulted in a significant yield loss. Glyphosate treatments containing 0.25, 0.125, and 0.075 lb ae/A had peak injury ratings of 73, 45, and 18% respectively 14 DAT. Glyphosate rates of 0.25 and 0.125 lb ae/A resulted in significant yield losses of 12.6 and 9.0 bushel/A respectively. The 3 high glyphosate rates in combination with imazamox, fomesafen, or both had maximum visual injury of 73-83% 14 DAT. All glyphosate treatments at 0.075 lb ae/A or higher combined with imazamox, fomesafen, or both, resulted in significant yield loss compared with the untreated check, ranging from 4.0 to 19.0 bushel/A. Many treatment combinations that resulted in significant yield loss were slight to moderately stunted and maturity was delayed from 6 to 12 days.

Two newer postemergence corn herbicides were also tested at one-fourth of their typical 1x field use rates to observe visual injury and yield effects. Mesotrione at 0.0235 lb/A with 0.125 lb/A atrazine and topramezone (as Impact) at 0.004 lb/A with 0.125 lb/A atrazine were applied. Both mesotrione and topramezone caused severe injury peaking around 14 DAT with 86 and 96% injury, respectively, and resulted in yield losses of 10.5 and 26.0 bu/A respectively. Plants were stunted and maturity was delayed approximately 14 days. (Dept. of Crop Sciences, University of Illinois, Urbana).

Table. Glyphosate contamination on non-glyphosate-resistant soybean. Urbana, Illinois, 2005. (Maxwell, Nordby, and Moody).

Treatment	Appl Rate (lb/A)	Time	Glxma	Glxma	Glxma	Glxma	Glxma	Glxma	Glxma	Glxma	Glxma	Yield
			6-24	6-28	7-5	7-12	7-19	7-26	8-2	8-9	8-23	10-13
Bu/A			-----% inj-----									
Glyphosate ¹ +N-Pak AMS ²	0.25+0.83%	post	43	67	73	67	67	58	50	42	23	43.1
Glyphosate+N-Pak AMS	0.125+0.42%	post	25	40	45	35	33	23	20	8	4	46.7
Glyphosate+N-Pak AMS	0.075+0.25%	post	7	18	18	12	12	7	5	1	0	54.8
Glyphosate+N-Pak AMS	0.03+0.10%	post	0	3	2	1	2	0	0	0	0	55.6
Glyphosate+N-Pak AMS	0.015+0.05%	post	0	0	0	0	0	0	0	0	0	57.6
Glyphosate+N-Pak AMS	0.0075+0.025%	post	0	0	0	0	0	0	0	0	0	56.5
Glyphosate+N-Pak AMS	0.25+0.83%	post	47	68	79	73	65	53	52	45	25	39.9
+imazamox+MSO ³ +28%N	0.031+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.125+0.42%	post	32	45	53	40	32	23	16	10	6	50.2
+imazamox+MSO+28%N	0.031+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.075+0.25%	post	23	38	42	33	23	17	13	9	2	51.0
+imazamox+MSO+28%N	0.031+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.03+0.10%	post	13	20	18	8	5	1	1	0	0	55.3
+imazamox+MSO+28%N	0.031+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.015+0.05%	post	8	17	12	4	3	1	1	0	0	55.6
+imazamox+MSO+28%N	0.031+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.0075+0.025%	post	8	13	8	3	1	0	0	0	0	53.7
+imazamox+MSO+28%N	0.031+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.25+0.83%	post	55	72	83	83	81	68	60	53	37	36.7
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.125+0.42%	post	37	52	60	57	62	47	40	27	21	43.7
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.075+0.25%	post	33	43	52	32	25	14	13	10	5	48.8
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.03+0.10%	post	23	23	17	7	4	2	1	1	0	53.4
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.015+0.05%	post	18	12	5	1	1	0	0	0	0	56.6
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.0075+0.025%	post	22	15	5	1	1	0	0	0	0	56.4
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.25+0.83%	post	55	63	73	67	57	48	43	32	21	43.2
+imazamox	0.031											
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.125+0.42%	post	48	53	62	52	45	35	33	21	18	45.5
+imazamox	0.031											
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.075+0.25%	post	38	32	30	18	13	8	7	3	2	51.7
+imazamox	0.031											
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.03+0.10%	post	28	27	20	13	7	5	4	2	0	54.7
+imazamox	0.031											
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.015+0.05%	post	20	22	15	7	4	4	1	0	0	55.1
+imazamox	0.031											
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Glyphosate+N-Pak AMS	0.0075+0.025%	post	25	17	8	4	2	1	0	0	0	58.6
+imazamox	0.031											
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Imazamox	0.031	post	23	18	12	2	0	0	0	0	0	58.0
+fomesafen+MSO+28%N	0.176+1.0%+2.5%											
Mesotrione+atrazine	0.0235+0.125	post	65	86	84	75	65	50	45	35	20	45.2
+Herbimax ⁴ +28%N	1.0%+2.5%											
Topramezone ⁵ +atrazine	0.004+0.125	post	65	84	96	95	90	83	75	70	57	29.7
+MSO+28%N	1.0%+2.5%											
Weed Free	-	-	0	0	0	0	0	0	0	0	0	55.7
LSD (0.05)			7	7	7	5	6	5	5	5	3	4

¹ Weathermax; ² N-Pak AMS is an ammonium sulfate solution from Agrilience LLC; ³ MSO is a methylated seed oil and surfactant blend from Loveland Products, Inc; ⁴ Herbimax is an oil, emulsifier, and surfactant blend from Loveland Products, Inc; ⁵ Impact from AMVAC.