

Comparison of glyphosate programs in field corn at Rochester, MN in 2004.

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The objective of this trial was to compare glyphosate programs in field corn in southeastern Minnesota. The research site was a Lawler loam series containing 2.9% organic matter with a pH of 6.0 and soil test P and K levels of 74 ppm and 268 ppm, respectively. The previous crop was soybean. The area was fertilized in the spring with 122 lb/A nitrogen, 23 lb/A phosphorus, 120 lb/A potash, 23 lb/A sulfur and 3 tons/A of lime. The area was topdressed with 40 lb/A of nitrogen on June 15. The field was disked and field cultivated once prior to planting. The corn hybrids, DeKalb DKC 47-10 was planted and used for all treatments except the Lightning treatment where Garst NE-839 IT, was planted. Both hybrids were planted on April 29, 2004 at a depth of 1.5 inches in 30-inch rows at 32,000 seeds/A. A randomized complete block design with four replications was used. 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 Turbo Tee 11002 nozzles. Evaluations of the plots were taken on May 18, June 2, June 7, June 15, and October 20, 2004. Application dates, environmental conditions, and crop and weed stages are listed below.

Date	April 29	June 3	June 8	June 21
Treatment	PRE	POST I	POST II	POST III
Temperature (F)				
air	59	69	79	69
Relative humidity (%)	57	47	68	65
Wind (mph)	8	8	13	7
Soil moisture	adequate	adequate	adequate	adequate
Corn				
stage	seeded	4 collar	5 collar	7 collar
height (inches)	--	7.8	10	21.9
Giant ragweed				
weed density	--	heavy	heavy	heavy
height (inch)	--	5.6	14.4	2 regrowth
Common lambsquarters				
weed density	--	light	light	light
height (inch)	--	4.7	1.7	8 regrowth
Common waterhemp				
weed density	--	moderate	moderate	moderate
height (inch)	--	0.5	1.0	2 regrowth
Giant foxtail				
weed density	--	moderate	moderate	moderate
height (inch)	--	4.6	3.6	3 regrowth
Rainfall after application (inch)				
week 1	0.01	4.27	5.65	0.63
week 2	1.44	3.24	1.92	0.16
week 3	1.02	0.11	0.57	2.82

Outlook applied at 21 oz/A gave some early season control of giant ragweed, 50%, compared to no control when applied at 12 oz/A, (May 18 rating). Glyphosate applied POST I without a tank mix partner (atrazine, Clarity, or Distinct), resulted in significantly lower late season giant ragweed control, (October 20 rating) and resulted in lower grain yields. Sequential glyphosate applications (POST I and POST III) provided superior weed control and grain yield when compared to single pass applications of glyphosate. Reduced PRE applications of Outlook followed by a POST I application of Roundup Original + Distinct resulted in significantly lower giant ragweed control than when applied at POST II, 85 percent compared to 94 percent, respectively. Grain yield, however, was significantly higher for the POST I sequential

application than the POST II sequential application, 226 bushels (POST I) compared to 204 bushels (POST II), suggesting that early weed competition from giant ragweed was a factor.

Common waterhemp control was significantly better when Outlook, was followed by a POST II application of Roundup Original + Distinct compared to the POST I application of the same herbicides, 93% compared to 85%, respectively. Outlook / Distinct + atrazine applied PRE / POST I, Outlook / Roundup Original + Distinct applied PRE / POST II, and Lightning + Marksman applied at POST I provided significantly better common waterhemp control than the single-pass applications at POST I of Roundup WeatherMax, Roundup Original + Clarity, and Roundup Original + Distinct. Giant foxtail control decreased to 66% by the end of the season for Lightning + Marksman treatment compared to all other treatments that maintained control at or above 93%. The sequential application of Roundup WeatherMax applied at POST I and POST III resulted in weed control similar to the Outlook / Roundup Original + Distinct treatment applied at POST II, (University of Minnesota Extension Service, Regional Center, Rochester, MN).

Table. Performance of glyphosate programs for weed control in corn on May 18, June 15, and October 20 at Rochester, MN in 2004 (Behnken, Breitenbach, Schaufler, and Lewis).

Treatment	Rate	Giant ragweed control			Common lambsquarters control			Common waterhemp control			Giant foxtail control			Corn yield (bu/A)
		5/18	6/15	10/20	5/18	6/15	10/20	5/18	6/15	10/20	5/18	6/15	10/20	
	(rate/A)	(%)			(%)			(%)			(%)			
PRE / POST I														
Outlook / Roundup WeatherMax + AMS	12 oz / 22 oz + 3 lbs	0	96	77	94	100	97	100	100	85	98	100	95	202
Outlook / Roundup Original + Distinct + NIS + AMS	12 oz / 24 oz + 3 oz + 0.25% v/v + 3 lbs	0	98	85	96	100	99	100	100	85	97	100	95	226
Outlook / Distinct + atrazine + NIS + AMS	21 oz / 4 oz + 1 pt + 0.25 % v/v + 3 lbs	50	98	96	96	100	99	100	100	91	98	100	94	231
PRE / POST II														
Outlook / Roundup Original + Distinct + NIS + AMS	12 oz / 24 oz + 3 oz + 0.25 % v/v + 3 lbs	0	97	94	97	100	99	100	100	93	97	100	98	204
POST I														
Roundup WeatherMax + AMS	22 oz + 3 lbs	0	96	71	0	99	96	0	96	73	0	99	93	178
Roundup Original + Clarity + NIS + AMS	24 oz + 8 oz + 0.25 % v/v + 3 lbs	0	96	86	0	100	99	0	95	83	0	100	94	208
Roundup Original + Distinct + NIS + AMS	24 oz + 3 oz + 0.25 % v/v + 3 lbs	0	98	88	0	99	99	0	98	80	0	100	94	217
Lightning + Marksman + NIS + AMS	1.28 oz + 2 pts + 0.25 % v/v + 3 lbs	0	97	93	0	100	98	0	97	93	0	84	66	198 ¹
POST I / POST III														
Roundup WeatherMax + AMS / Roundup WeatherMax + AMS	22 oz + 3 lbs / 22 oz + 3 lbs	0	98	91	0	100	99	0	97	89	0	99	99	223
Untreated		0	0	0	0	0	0	0	0	0	0	0	0	2
LSD (0.10)		3	2	5	2	1	3	0	3	7	1	3	5	18

1. Hybrid used for this treatment was Garst NE-839 IT, the hybrid DeKalb DKC 47-10 was used for all other treatments. AMS = spray grade ammonium sulfate, Helena, NIS = AGRI-DEX nonionic surfactant, Helena.