

Comparison of single-pass and two-pass sequential management systems for weed control in field corn at Rochester, MN in 2004. Behnken, Lisa M., Fritz R. Breitenbach, Angela L. White, Kevin R. Griffin. The objective of this trial was to evaluate and compare the performance of single-pass and two-pass sequential management systems for weed control in field corn in southeastern Minnesota. The research site was a Lawler loam series containing 2.4% organic matter with a pH of 6.1 and soil test P and K levels of 59 ppm and 198 ppm, respectively. The previous crop was soybean. The area was fertilized in the spring with 122 lb/A of nitrogen, 23 lb/A phosphorous, 120 lb/A potash, 23 lb/A of sulfur, and 3 T/A of lime. Forty lb/A of additional nitrogen was side-dressed when the corn was at 5 collar on June 15. The field was disked and field cultivated once prior to planting. The corn hybrid, Golden Harvest 7616RR, was planted on May 6, 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 and II) 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 24, June 7, June 14, August 2, and October 21. Application dates, environmental conditions, and crop and weed stages are listed below.

Date	May 6	June 8	June 28
Treatment	PRE	POST I	POST II
Temperature (F)			
Air	62	78	72
Relative humidity (%)	39	71	44
Wind (mph)	15	14	9
Soil moisture	adequate	adequate	adequate
Corn			
Stage	seeded	5 collar	8 collar
height (inches)	0	6	22.0
Giant ragweed			
weed density	--	heavy	heavy
height (inch)	--	4.4	2 Regrowth
Common lambsquarters			
weed density	--	light	light
height (inch)	--	1.3	2 Regrowth
Common waterhemp			
weed density	--	moderate	moderate
height (inch)	--	1.4	2 Regrowth
Giant foxtail			
weed density	--	moderate	moderate
height (inch)	--	1.4	2 Regrowth
Rainfall after application (inch)			
week 1	1.44	5.65	0.16
week 2	1.02	1.92	2.82
week 3	2.91	0.57	0.23

Only two preemergence treatments provided greater than 90% season long giant ragweed control; s-metolachlor & atrazine & mesotrione & benozacor, and s-metolachlor & mesotrione & benozacor, + simazine. All other soil applied treatments provided 71% control, or lower (August 2 rating). Three sequential PRE/POST I treatments provided statistically lower giant ragweed control than the best sequential treatments. They were flufenacet / foramsulfuron + dicamba & diflufenzopyr, acetochlor & atrazine & MON 4660 / glyphosate³, and s-metolachlor & benozacor¹ / glyphosate⁴. Package mixes with atrazine or mesotrione, dimethenamid-P, and flufenacet provided better initial common lambsquarters control than s-metolachlor. The addition of a sequential postemergence treatment resulted in excellent common lambsquarters control for all treatments. All treatments provided excellent early season common waterhemp control, however, control diminished in several treatments by late season. Those treatments were: acetochlor & atrazine & dichlormid + isoxaflutole, dimethenamid-P / dicamba & diflufenzopyr, flufenacet / foramsulfuron + dicamba & diflufenzopyr, acetochlor & atrazine & MON 4660 / glyphosate³, and s-metolachlor & benozacor¹ / glyphosate⁴.

Early season control of giant foxtail was excellent with all treatments, but late season control decreased for several treatments with reduced rates of acetochlor. (University of Minnesota Extension Service, Regional Center, Rochester, MN)

Table. Performance of single-pass and two-pass sequential weed management systems in field corn on May 24, June 14, and August 2 at Rochester, MN in 2004 (Behnken, Breitenbach, White, and Griffin).

Treatment	Rate	AMBTR control			CHEAL control			AMATA control		SETFA control			Corn yield (bu/A)
		5/24	6/14	8/2	5/24	6/14	8/2	6/14	8/2	5/24	6/14	8/2	
	(lb/A)	5/24 6/14 8/2 (%)			5/24 6/14 8/2 (%)			6/14 8/2 (%)		5/24 6/14 8/2 (%)			
Preemergence													
S-metolachlor & atrazine & mesotrione&benoxacor	1.675&0.627 & 0.167	93	99	98	99	99	99	99	97	99	99	97	149
Acetochlor&atrazine& dichlormid	1.999&0.751	88	65	60	99	99	99	99	92	99	99	98	32
Acetochlor & atrazine & dichlormid + flumetsulam & clopyralid	1.999&0.751 + 0.035&0.093	90	91	70	99	99	99	99	94	99	99	96	123
Acetochlor & atrazine & dichlormid + isoxaflutole	0.996&0.374 + 0.07	91	97	71	99	99	99	99	86	99	99	76	122
S-metolachlor & mesotrione & benoxacor + simazine	1.67&0.165 + 1.0	92	99	91	99	99	99	99	93	99	99	98	144
PRE / POST I													
S-metolachlor & benoxacor ¹ / mesotrione + atrazine + COC + 28% UAN	1.27 / 0.094 + 0.5 + 1% + 2.5%	0	75	96	76	99	99	99	95	99	99	96	148
Dimethenamid-P / dicamba & diflufenzopyr + NIS + 28% UAN	0.7 / 0.125& 0.05 + 0.25% + 2.5%	38	79	94	94	99	99	99	81	99	99	94	147
Acetochlor & atrazine & dichlormid / flumetsulam & clopyralid + NIS + 28% UAN	1.999&0.751 / 0.035&0.093 + 0.25% + 2.5%	89	93	95	99	99	98	99	92	99	99	86	170
S-metolachlor & benoxacor ² / nicosulfuron & rimsulfuron + mesotrione + atrazine + COC + 28% UAN	0.63 / 0.0233&0.0117 + 0.094 + 0.5 + 1% + 2.5%	0	74	98	71	99	99	99	96	97	99	96	150
Flufenacet / foramsulfuron + dicamba & diflufenzopyr + MSO + 28% UAN	0.47 / 0.0328 + 0.0625&0.025 + 1% + 2.5%	0	76	86	93	99	98	99	82	99	99	92	155
Acetochlor & atrazine & MON 4660 / glyphosate ³ + AMS	0.771&0.609 / 0.77 + 3.0	75	97	90	99	99	94	99	75	99	99	81	143
S-metolachlor & benoxacor ¹ / glyphosate ⁴ + AMS	0.955 / 0.78 + 3.0	0	89	88	70	99	92	99	82	99	99	95	156
S-metolachlor & benoxacor ¹ / primisulfuron & dicamba + atrazine + COC + 28% UAN	1.27 / 0.0198 & 0.0962 + 0.5 + 1% + 2.5%	0	70	98	71	99	99	99	94	99	99	95	156
S-metolachlor & benoxacor ¹ / primisulfuron & dicamba + nicosulfuron + atrazine + COC + 28% UAN	1.27 / 0.0198&0.0962 + 0.0155 + 0.5 + 1% + 2.5%	0	70	98	73	99	99	99	93	98	99	95	151
POST I / POST II													
Glyphosate ³ + AMS / glyphosate ³ + AMS	0.77 + 3 / 0.56 + 3.0	0	88	100	0	99	100	99	99	0	99	99	141
Untreated Check		0	0	0	0	0	0	0	0	0	0	0	3
LSD (0.05)		6	5	6	6	0	3	0	5	1	0	5	27

S-metolachlor&benoxacor¹ = Dual II Magnum, S-metolachlor&benoxacor² = Cinch, Glyphosate³ = Roundup WeatherMax, Glyphosate⁴ = Touchdown Total, COC = crop oil concentrate; 28 % UAN = an aqueous solution of urea and ammonium nitrate, Helena; NIS = AGRI-DEX nonionic surfactant; Helena; MSO = methylated sunflower oil; Loveland; and AMS = spray grade ammonium sulfate, Helena.