

2009 Evaluation of Weed Management Systems in Field Corn

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The objective of this trial was to evaluate the performance of herbicide programs for weed control in field corn in southeastern Minnesota. The research site was a Lawler loam series with a pH of 6.8 and soil test P and K levels of 65 ppm and 184 ppm, respectively. Spring fertilizer was broadcast ahead of planting on April 17, at a rate of 126-35-120-24 (N-P-K-S). The area was side dressed with an additional 30 lb/A of N on June 15. The field was spring disked and field cultivated once prior to planting. The corn hybrid, Pioneer 35F44, was planted on May 8, 2009 at a depth of 1.5 inches in 30 inch rows at 35,000 seeds per acre. A randomized complete block design was used with four replications. Preemergence (PRE) and postemergence (POST) 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 June 1, 9, 18, 26 and July 20, 2009. Application dates, environmental conditions, and weed stages are listed below. The center two rows of each plot were machine harvested on November 13, 2009.

Date	5/11	5/29	6/4	6/18
Treatment	PRE	POST I	POST II	POST III
Temperature (F)				
Air	60	70	67	80
Soil		74.5	70.2	78.6
Relative Humidity (%)	38	34	28	66
Wind (mph)	0	10	6	15
Soil Moisture	Adequate	Adequate	Inadequate	Excessive
Corn				
Stage		V2-V3	V4	V6
Height (inch)		4.0	8.0	17.0
Giant Ragweed				
Weed density (ft ²)		5.4	5.4	5.4
Height (inch)		2.2	5.1	4.1
Common Lambsquarters				
Weed density (ft ²)		2.4	2.4	2.4
Height (inch)		2.1	4.9	1.6
Common Waterhemp				
Weed density (ft ²)		45.9	45.9	45.9
Height (inch)		1.0	1.8	1.8
Grass				
Weed density (ft ²)		1.1	1.1	1.1
Height (inch)		1.9	2.9	2.9
Velvetleaf				
Weed density (ft ²)				
Height (inch)			0	0
Rainfall after each application (inch)				
Week 1	0.61	0.02	1.76	0.21
Week 2	0.19	1.97	1.24	0.17
Week 3	1.76	1.03	0.15	0.90

Table 1. Performance of herbicide systems for giant ragweed control in field corn on June 1, 9, 18, and 26 at Rochester, MN, in 2009

Treatment	Rate (rate/A)	Giant Ragweed Control					Yield (bu/A)
		6/1	6/9	6/18	6/26	7/20	
Untreated Check		0	0	0	0	0	12
Weed Free		100	100	100	100	100	208
PRE/POST I							
Dual II Magnum / Halex GT + NIS + N-Pa-K AMS	1 pt/a / 3.6 pt/a + 0.25% v/v + 3 qt/a	24	92	91	94	89	203
PRE/POST II							
Harness / Laudis + Atrazine + COC + 28%N	1.75 pt/a / 3 oz/a + 16 oz/a + 1% v/v + 1.5 qt/a	26		97	97	97	198
Harness / Laudis + Buctril + COC + 28%N	1.75 pt/a / 3 oz/a + 6 oz/a + 1% v/v + 1.5 qt/a	25		97	98	98	178
Harness / Ignite + N-Pa-K AMS	1.75 pt/a / 22 oz/a + 2 qt/a	26		94	90	86	192
Harness / Capreno + COC + 28%N	1.75 pt/a / 3 oz/a + 1% v/v + 1.5 qt/a	25		79	98	96	190
BreakFree / Rimsulfuron + Mesotrione + Safener + Atrazine + COC + N-Pa-K AMS	1 pt/a / 1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 16 oz/a + 1% v/v + 3 qt/a	19		96	97	95	194
BreakFree / Resolve Q + Roundup Original Max + N-Pa-K AMS	1 pt/a / 1.25 oz/a + 22 oz/a + 3 qt/a	19		96	93	89	197
Harness / Roundup WeatherMax + N-Pa-K AMS	1.25 pt/a / 22 oz/a + 3 qt/a	25		95	90	85	172
Lumax / Touchdown Total + N-Pa-K AMS	3 pt/a / 24 oz/a + 3 qt/a	60		96	95	94	194
Camix / Touchdown Total + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	56		96	96	92	185
SureStart / Durango + N-Pa-K AMS	1.75 pt/a / 24 oz/a + 3 qt/a	70		94	93	89	191
SureStart / Durango + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	81		96	93	90	191
SureStart + Atrazine / Durango + N-Pa-K AMS	1.75 pt/a + 1.5 pt/a / 24 oz/a + 3 qt/a	64		93	93	90	191
Integrity / Roundup Power Max + Status + NIS + N-Pa-K AMS	17 oz/a / 22 oz/a + 2.5 oz/a + 0.25% v/v + 3 qt/a	79		98	97	95	191
Harness / Impact + Atrazine + MSO + 28%N	1.75 pt/a / 0.75 oz/a + 16 oz/a + 1% v/v + 2.5% v/v	25		97	96	92	188
Harness / Impact + Atrazine + Roundup Power Max + N-Pa-K AMS	1.25 pt/a / 0.5 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	19		95	94	93	187
POST I							
Surestart + Durango + N-Pa-K AMS	1.7 pt/a + 24 oz/a + 3 qt/a	0	93	90	88	84	184
Halex GT + Atrazine + NIS + N-Pa-K AMS	3.6 pt/a + 16 oz/a + 0.25% v/v + 3 qt/a	0	94	97	98	97	185
Rimsulfuron + Mesotrione + Safener + Roundup Original Max + N-Pa-K AMS	1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 22 oz/a + 3 qt/a	0	89	89	88	87	187
Steadfast + Safener + Callisto + Atrazine + COC + N-Pa-K AMS	0.75 oz/a + 0.25 oz/a + 2 oz/a + 16 oz/a + 1% v/v + 3 qt/a	0	87	91	93	90	187
Resolve Q + Atrazine + Roundup Original Max + N-Pa-K AMS	1.25 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	0	87	85	79	65	165
POST I/POST III							
Roundup WeatherMax + N-Pa-K AMS / Roundup WeatherMax + N-Pa-K AMS	22 oz/a + 3 qt/a / 22 oz/a + 3 qt/a	0	88	83	97	96	199
LSD (P=0.10)		7	4	3	2	4	28

Table 2. Performance of herbicide systems for common lambsquarters control in field corn on June 1, 9, 18, and 26 at Rochester, MN, in 2009

Treatment	Rate (rate/A)	Common Lambsquarters Control					Yield (bu/A)
		6/1	6/9	6/18	6/26	7/20	
Untreated Check		0	0	0	0	0	12
Weed Free		100	100	100	100	100	208
PRE/POST I							
Dual II Magnum / Halex GT + NIS + N-Pa-K AMS	1 pt/a / 3.6 pt/a + 0.25% v/v + 3 qt/a	55	99	99	99	99	203
PRE/POST II							
Harness / Laudis + Atrazine + COC + 28%N	1.75 pt/a / 3 oz/a + 16 oz/a + 1% v/v + 1.5 qt/a	43		99	99	99	198
Harness / Laudis + Buctril + COC + 28%N	1.75 pt/a / 3 oz/a + 6 oz/a + 1% v/v + 1.5 qt/a	44		99	99	99	178
Harness / Ignite + N-Pa-K AMS	1.75 pt/a / 22 oz/a + 2 qt/a	38		94	92	89	192
Harness / Capreno + COC + 28%N	1.75 pt/a / 3 oz/a + 1% v/v + 1.5 qt/a	39		94	98	98	190
BreakFree / Rimsulfuron + Mesotrione + Safener + Atrazine + COC + N-Pa-K AMS	1 pt/a / 1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 16 oz/a + 1% v/v + 3 qt/a	38		99	99	99	194
BreakFree / Resolve Q + Roundup Original Max + N-Pa-K AMS	1 pt/a / 1.25 oz/a + 22 oz/a + 3 qt/a	40		98	99	96	197
Harness / Roundup WeatherMax + N-Pa-K AMS	1.25 pt/a / 22 oz/a + 3 qt/a	38		98	9	97	172
Lumax / Touchdown Total + N-Pa-K AMS	3 pt/a / 24 oz/a + 3 qt/a	93		99	99	99	194
Camix / Touchdown Total + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	91		99	99	99	185
SureStart / Durango + N-Pa-K AMS	1.75 pt/a / 24 oz/a + 3 qt/a	49		99	98	97	191
SureStart / Durango + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	56		98	99	99	191
SureStart + Atrazine / Durango + N-Pa-K AMS	1.75 pt/a + 1.5 pt/a / 24 oz/a + 3 qt/a	91		99	98	99	191
Integrity / Roundup Power Max + Status + NIS + N-Pa-K AMS	17 oz/a / 22 oz/a + 2.5 oz/a + 0.25% v/v + 3 qt/a	95		99	99	94	191
Harness / Impact + Atrazine + MSO + 28%N	1.75 pt/a / 0.75 oz/a + 16 oz/a + 1% v/v + 2.5% v/v	38		99	99	99	188
Harness / Impact + Atrazine + Roundup Power Max + N-Pa-K AMS	1.25 pt/a / 0.5 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	43		98	98	98	187
POST I							
Surestart + Durango + N-Pa-K AMS	1.7 pt/a + 24 oz/a + 3 qt/a	0	99	93	97	92	184
Halex GT + Atrazine + NIS + N-Pa-K AMS	3.6 pt/a + 16 oz/a + 0.25% v/v + 3 qt/a	0	99	99	99	96	185
Rimsulfuron + Mesotrione + Safener + Roundup Original Max + N-Pa-K AMS	1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 22 oz/a + 3 qt/a	0	98	97	99	98	187
Steadfast + Safener + Callisto + Atrazine + COC + N-Pa-K AMS	0.75 oz/a + 0.25 oz/a + 2 oz/a + 16 oz/a + 1% v/v + 3 qt/a	0	99	98	99	98	187
Resolve Q + Atrazine + Roundup Original Max + N-Pa-K AMS	1.25 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	0	99	99	98	98	165
POST I/POST III							
Roundup WeatherMax + N-Pa-K AMS / Roundup WeatherMax + N-Pa-K AMS	22 oz/a + 3 qt/a / 22 oz/a + 3 qt/a	0	94	89	96	97	199
LSD (P=0.10)		6	2	2	2	3	28

Table 3. Performance of herbicide systems for common waterhemp control in field corn on June 1, 9, 18, and 26 at Rochester, MN, in 2009

Treatment	Rate (rate/A)	Common Waterhemp Control					Yield (bu/A)
		6/1	6/9	6/18	6/26	7/20	
Untreated Check		0	0	0	0	0	12
Weed Free		100	100	100	100	100	208
PRE/POST I							
Dual II Magnum / Halex GT + NIS + N-Pa-K AMS	1 pt/a / 3.6 pt/a + 0.25% v/v + 3 qt/a	95		99	99	98	203
PRE/POST II							
Harness / Laudis + Atrazine + COC + 28%N	1.75 pt/a / 3 oz/a + 16 oz/a + 1% v/v + 1.5 qt/a	97	99	99	99	98	198
Harness / Laudis + Buctril + COC + 28%N	1.75 pt/a / 3 oz/a + 6 oz/a + 1% v/v + 1.5 qt/a	99		99	99	98	178
Harness / Ignite + N-Pa-K AMS	1.75 pt/a / 22 oz/a + 2 qt/a	99		99	99	97	192
Harness / Capreno + COC + 28%N	1.75 pt/a / 3 oz/a + 1% v/v + 1.5 qt/a	99		99	99	97	190
BreakFree / Rimsulfuron + Mesotrione + Safener + Atrazine + COC + N-Pa-K AMS	1 pt/a / 1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 16 oz/a + 1% v/v + 3 qt/a	92		99	99	95	194
BreakFree / Resolve Q + Roundup Original Max + N-Pa-K AMS	1 pt/a / 1.25 oz/a + 22 oz/a + 3 qt/a	92		99	98	92	197
Harness / Roundup WeatherMax + N-Pa-K AMS	1.25 pt/a / 22 oz/a + 3 qt/a	96		99	99	96	172
Lumax / Touchdown Total + N-Pa-K AMS	3 pt/a / 24 oz/a + 3 qt/a	96		99	99	95	194
Camix / Touchdown Total + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	90		99	98	99	185
SureStart / Durango + N-Pa-K AMS	1.75 pt/a / 24 oz/a + 3 qt/a	98		99	95	92	191
SureStart / Durango + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	98		99	98	96	191
SureStart + Atrazine / Durango + N-Pa-K AMS	1.75 pt/a + 1.5 pt/a / 24 oz/a + 3 qt/a	98		99	98	96	191
Integrity / Roundup Power Max + Status + NIS + N-Pa-K AMS	17 oz/a / 22 oz/a + 2.5 oz/a + 0.25% v/v + 3 qt/a	97		99	96	94	191
Harness / Impact + Atrazine + MSO + 28%N	1.75 pt/a / 0.75 oz/a + 16 oz/a + 1% v/v + 2.5% v/v	98		99	99	97	188
Harness / Impact + Atrazine + Roundup Power Max + N-Pa-K AMS	1.25 pt/a / 0.5 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	94		99	97	93	187
POST I							
Surestart + Durango + N-Pa-K AMS	1.7 pt/a + 24 oz/a + 3 qt/a	0	94	87	85	89	184
Halex GT + Atrazine + NIS + N-Pa-K AMS	3.6 pt/a + 16 oz/a + 0.25% v/v + 3 qt/a	0	96	99	98	96	185
Rimsulfuron + Mesotrione + Safener + Roundup Original Max + N-Pa-K AMS	1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 22 oz/a + 3 qt/a	0	97	95	94	90	187
Steadfast + Safener + Callisto + Atrazine + COC + N-Pa-K AMS	0.75 oz/a + 0.25 oz/a + 2 oz/a + 16 oz/a + 1% v/v + 3 qt/a	0	98	98	98	91	187
Resolve Q + Atrazine + Roundup Original Max + N-Pa-K AMS	1.25 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	0	91	80	62	82	165
POST I/POST III							
Roundup WeatherMax + N-Pa-K AMS / Roundup WeatherMax + N-Pa-K AMS	22 oz/a + 3 qt/a / 22 oz/a + 3 qt/a	0	86	69	84	88	199
LSD (P=0.10)		3	2	1	3	4	28

Table 4. Performance of herbicide systems for grass control in field corn on June 1, 9, 18, and 26 at Rochester, MN, in 2009

Treatment	Rate (rate/A)	Grass					Yield (bu/A)
		6/1	6/9	6/18	6/26	7/20	
Untreated Check		0	0	0	0	0	12
Weed Free		100	100	100	100	100	208
PRE/POST I							
Dual II Magnum / Halex GT + NIS + N-Pa-K AMS	1 pt/a / 3.6 pt/a + 0.25% v/v + 3 qt/a	91	99	99	99	99	203
PRE/POST II							
Harness / Laudis + Atrazine + COC + 28%N	1.75 pt/a / 3 oz/a + 16 oz/a + 1% v/v + 1.5 qt/a	97		99	97	98	198
Harness / Laudis + Buctril + COC + 28%N	1.75 pt/a / 3 oz/a + 6 oz/a + 1% v/v + 1.5 qt/a	96		98	98	93	178
Harness / Ignite + N-Pa-K AMS	1.75 pt/a / 22 oz/a + 2 qt/a	95		99	98	99	192
Harness / Capreno + COC + 28%N	1.75 pt/a / 3 oz/a + 1% v/v + 1.5 qt/a	97		99	98	95	190
BreakFree / Rimsulfuron + Mesotrione + Safener + Atrazine + COC + N-Pa-K AMS	1 pt/a / 1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 16 oz/a + 1% v/v + 3 qt/a	90		97	98	96	194
BreakFree / Resolve Q + Roundup Original Max + N-Pa-K AMS	1 pt/a / 1.25 oz/a + 22 oz/a + 3 qt/a	89		99	99	98	197
Harness / Roundup WeatherMax + N-Pa-K AMS	1.25 pt/a / 22 oz/a + 3 qt/a	91		99	99	99	172
Lumax / Touchdown Total + N-Pa-K AMS	3 pt/a / 24 oz/a + 3 qt/a	91		99	99	99	194
Camix / Touchdown Total + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	89		99	99	98	185
SureStart / Durango + N-Pa-K AMS	1.75 pt/a / 24 oz/a + 3 qt/a	94		99	99	98	191
SureStart / Durango + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	96		99	99	99	191
SureStart + Atrazine / Durango + N-Pa-K AMS	1.75 pt/a + 1.5 pt/a / 24 oz/a + 3 qt/a	96		99	98	98	191
Integrity / Roundup Power Max + Status + NIS + N-Pa-K AMS	17 oz/a / 22 oz/a + 2.5 oz/a + 0.25% v/v + 3 qt/a	88		99	98	98	191
Harness / Impact + Atrazine + MSO + 28%N	1.75 pt/a / 0.75 oz/a + 16 oz/a + 1% v/v + 2.5% v/v	96		99	99	99	188
Harness / Impact + Atrazine + Roundup Power Max + N-Pa-K AMS	1.25 pt/a / 0.5 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	95		99	98	98	187
POST I							
Surestart + Durango + N-Pa-K AMS	1.7 pt/a + 24 oz/a + 3 qt/a	0	93	89	93	87	184
Halex GT + Atrazine + NIS + N-Pa-K AMS	3.6 pt/a + 16 oz/a + 0.25% v/v + 3 qt/a	0	95	96	96	94	185
Rimsulfuron + Mesotrione + Safener + Roundup Original Max + N-Pa-K AMS	1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 22 oz/a + 3 qt/a	0	93	95	94	94	187
Steadfast + Safener + Callisto + Atrazine + COC + N-Pa-K AMS	0.75 oz/a + 0.25 oz/a + 2 oz/a + 16 oz/a + 1% v/v + 3 qt/a	0	89	93	93	88	187
Resolve Q + Atrazine + Roundup Original Max + N-Pa-K AMS	1.25 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	0	92	94	92	92	165
POST I/POST III							
Roundup WeatherMax + N-Pa-K AMS / Roundup WeatherMax + N-Pa-K AMS	22 oz/a + 3 qt/a / 22 oz/a + 3 qt/a	0	91	80	98	98	199
LSD (P=0.10)		7	4	3	2	6	28

Table 5. Performance of herbicide systems for injury in field corn on June 9 and 18 at Rochester, MN, in 2009.

Treatment	Rate (rate/A)	Injury		Yield (bu/A)
		6/9	6/18	
		Injury (%)		
Untreated Check		5	0	12
Weed Free		10	25	208
PRE/POST I				
Dual II Magnum / Halex GT + NIS + N-Pa-K AMS	1 pt/a / 3.6 pt/a + 0.25% v/v + 3 qt/a	12	0	203
PRE/POST II				
Harness / Laudis + Atrazine + COC + 28%N	1.75 pt/a / 3 oz/a + 16 oz/a + 1% v/v + 1.5 qt/a	8	0	198
Harness / Laudis + Buctril + COC + 28%N	1.75 pt/a / 3 oz/a + 6 oz/a + 1% v/v + 1.5 qt/a	18	0	178
Harness / Ignite + N-Pa-K AMS	1.75 pt/a / 22 oz/a + 2 qt/a	13	0	192
Harness / Capreno + COC + 28%N	1.75 pt/a / 3 oz/a + 1% v/v + 1.5 qt/a	19	0	190
BreakFree / Rimsulfuron + Mesotrione + Safener + Atrazine + COC + N-Pa-K AMS	1 pt/a / 1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 16 oz/a + 1% v/v + 3 qt/a	16	0	194
BreakFree / Resolve Q + Roundup Original Max + N-Pa-K AMS	1 pt/a / 1.25 oz/a + 22 oz/a + 3 qt/a	18	0	197
Harness / Roundup WeatherMax + N-Pa-K AMS	1.25 pt/a / 22 oz/a + 3 qt/a	10	0	172
Lumax / Touchdown Total + N-Pa-K AMS	3 pt/a / 24 oz/a + 3 qt/a	15	0	194
Camix / Touchdown Total + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	15	0	185
SureStart / Durango + N-Pa-K AMS	1.75 pt/a / 24 oz/a + 3 qt/a	17	0	191
SureStart / Durango + N-Pa-K AMS	2.5 pt/a / 24 oz/a + 3 qt/a	14	0	191
SureStart + Atrazine / Durango + N-Pa-K AMS	1.75 pt/a + 1.5 pt/a / 24 oz/a + 3 qt/a	12	0	191
Integrity / Roundup Power Max + Status + NIS + N-Pa-K AMS	17 oz/a / 22 oz/a + 2.5 oz/a + 0.25% v/v + 3 qt/a	10	0	191
Harness / Impact + Atrazine + MSO + 28%N	1.75 pt/a / 0.75 oz/a + 16 oz/a + 1% v/v + 2.5% v/v	14	0	188
Harness / Impact + Atrazine + Roundup Power Max + N-Pa-K AMS	1.25 pt/a / 0.5 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	13	0	187
POST I				
Surestart + Durango + N-Pa-K AMS	1.7 pt/a + 24 oz/a + 3 qt/a	12	0	184
Halex GT + Atrazine + NIS + N-Pa-K AMS	3.6 pt/a + 16 oz/a + 0.25% v/v + 3 qt/a	16	0	185
Rimsulfuron + Mesotrione + Safener + Roundup Original Max + N-Pa-K AMS	1.2 oz/a + 2.5 oz/a + 0.3 oz/a + 22 oz/a + 3 qt/a	14	0	187
Steadfast + Safener + Callisto + Atrazine + COC + N-Pa-K AMS	0.75 oz/a + 0.25 oz/a + 2 oz/a + 16 oz/a + 1% v/v + 3 qt/a	10	0	187
Resolve Q + Atrazine + Roundup Original Max + N-Pa-K AMS	1.25 oz/a + 16 oz/a + 22 oz/a + 3 qt/a	10	0	165
POST I/POST III				
Roundup WeatherMax + N-Pa-K AMS / Roundup WeatherMax + N-Pa-K AMS	22 oz/a + 3 qt/a / 22 oz/a + 3 qt/a	11	0	199
LSD (P=0.10)		5	12	28