Evaluation of the Performance of Pyroxasulfone Herbicide Programs for Weed Control in Field Corn in 2011.

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The objective of this trial was to evaluate the performance of pyroxasulfone + fluthiocet (Anthem) herbicide programs for weed control in field corn in southeastern Minnesota. The research site was a Lawler loam series with a pH of 6.4, O.M. of 2.3%, and soil test P and K levels of 38 ppm and 97 ppm, respectively. Fall fertilizer was broadcast applied on November 11, 2010 at a rate of 6-26-150 (N-P-K). Spring fertilizer was broadcast ahead of planting on April 5, 2011 at a rate of 120-0-0-24 (N-P-K-S). The area was side dressed with an additional 33 lb/A of N on June 13. The field was spring disked and field cultivated once prior to planting. The corn hybrid, Pioneer P9910AM1 (99 day), was planted on May 3, 2011 at a depth of 1.5 inches in 30 inch rows at 32,000 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 May 24, 31, June 8, 15, 24 and August 31. Application dates, environmental conditions, and weed stages are listed below. The center two rows of each plot were machine harvested on October 13, 2011.

SUMMARY

Giant Ragweed: The addition of Aatrex to Anthem improved control from 40 to 50% in both PRE and POST programs, (6/8 rating. Anthem applied PRE gave giant ragweed control similar to Harness. Anthem + atrazine applied PRE provided control of giant ragweed similar to Harness Xtra. The best early season control was achieved with Verdict (90%) or Lumax (92%) applied PRE (6/8 rating). The best giant ragweed control with POST programs was achieved with Anthem + Aatrex + Roundup PowerMax (85%) and Halex GT (81%). Herbicide programs with PRE Anthem or Anthem + Aatrex fb POST Roundup PowerMax provided superior giant ragweed control compared to POST only Anthem + Roundup PowerMax programs and similar control as POST only program Anthem + Aatrex fb Roundup PowerMax.

Common Lambsquarters: For POST programs, the addition of Aatrex to Anthem provided a slight advantage in common lambsquarters control over Anthem alone.

Common Waterhemp: Control was excellent for all programs except Roundup PowerMax alone, over 90% compared to 59%.

Grasses: Control was acceptable for all programs except Roundup PowerMax alone. (University of Minnesota Extension Regional Office, Rochester)

Date	5/4	5/26	6/8
Treatment	PRE	POST I	POST II
Temperature (F)			
Air	55	61	84
Soil	49.6	62.2	86.2
Relative Humidity (%)	34	45	34
Wind (mph)	15	15	16
Soil Moisture	Adequate	Adequate	Dry
Corn			
Stage		2-Collar	4-Collar
Height (inch)		3.3	13.4
Giant Ragweed			
Weed density (ft^2)		5.0	
Height (inch)		1.3	4.1
Common Lambsquarters			
Weed density (ft^2)		6.0	
Height (inch)		0.7	0.9
Common Waterhemp			
Weed density (ft^2)		3.3	
Height (inch)		0.3	1.5
Giant Foxtail			
Weed density (ft^2)		47.5	
Height (inch)		0.7	2.5
Rainfall after each application (inch)			
Week 1	1.07	0.14	2.26
Week 2	0.41	0.48	2.83
Week 3	2.30	1.82	0.19

Table 1. Evaluation of pyroxasulfone herbicide systems for giant ragweed control in field corn on May 24, 31, June 8, 15, 24, and August 31 at Rochester, MN, in 2011.

Treatment	Rate	Giant Ragweed Control						Yield
		5/24	5/31	6/8	6/15	6/24	8/31	
	(rate/A)	(%)						(bu/A)
Untreated Check		0	0	0	0	0	0	27
PRE								
Anthem	10 fl oz/a	28	30	20	10	11	14	43
Anthem + Aatrex	10 fl oz/a + 1.25 qt/a	60	69	68	48	50	46	99
PRE / POST II (2-4 inch weeds)								
Anthem / Roundup PowerMax + AMS	8 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	24	29	20	86	93	89	183
Anthem / Roundup PowerMax + AMS	10 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	29	34	33	88	94	95	163
Anthem + Aatrex / Roundup PowerMax + AMS	8 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	54	59	60	94	92	89	176
Anthem + Aatrex / Roundup PowerMax + AMS	10 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	68	71	76	98	98	93	167
Verdict / Roundup PowerMax + AMS	13 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	78	88	90	99	96	96	169
Harness / Roundup PowerMax + AMS	2 pt/a / 22 fl oz/a + 8.5 lb/ 100 gal	39	39	38	86	97	92	179
Harness Xtra / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	58	79	68	98	97	97	183
Lumax / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	63	83	92	99	97	97	166
POST I (1-3 inch weeds)								
Anthem + Roundup PowerMax + NIS + AMS	7 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	95	87	75	76	73	155
Anthem + Roundup PowerMax + NIS + AMS	9 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	84	81	69	65	64	147
Anthem + Aatrex + Roundup PowerMax + NIS + AMS	7 fl oz/a + 0.875 qt/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	93	91	89	86	85	167
Halex GT + NIS + AMS	3.6 pt/a + 0.25% v/v + 8.5 lb/ 100 gal	0	86	90	80	81	81	181
Roundup PowerMax + AMS	22 fl oz/a + 8.5 lb/ 100 gal	0	74	79	64	60	59	135
	LSD (P=0.10)	**7**	**10**	**11**	**8**	**9**	**10**	**32**

Table 2. Evaluation of pyroxasulfone herbicide systems for common lambsquarters control in field corn on May 24, 31, June 8, 15, 24, and August 31 at Rochester, MN, in 2011.

Treatment	Rate	Common Lambsquarters Control						Yield
		5/24	5/31	6/8	6/15	6/24	8/31	
	(rate/A)	(%)						(bu/A)
Untreated Check		0	0	0	0	0	0	27
PRE								
Anthem	10 fl oz/a	99	98	98	96	94	93	43
Anthem + Aatrex	10 fl oz/a + 1.25 qt/a	99	99	99	99	99	97	99
PRE / POST II (2-4 inch weeds)								
Anthem / Roundup PowerMax + AMS	8 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	98	96	99	98	93	183
Anthem / Roundup PowerMax + AMS	10 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	97	97	99	99	94	163
Anthem + Aatrex / Roundup PowerMax + AMS	8 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	96	176
Anthem + Aatrex / Roundup PowerMax + AMS	10 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	97	167
Verdict / Roundup PowerMax + AMS	13 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	97	98	99	99	93	169
Harness / Roundup PowerMax + AMS	2 pt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	97	95	99	99	97	179
Harness Xtra / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	97	183
Lumax / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	99	166
POST I (1-3 inch weeds)								
Anthem + Roundup PowerMax + NIS + AMS	7 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	99	98	91	96	91	155
Anthem + Roundup PowerMax + NIS + AMS	9 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	98	98	91	92	92	147
Anthem + Aatrex + Roundup PowerMax + NIS + AMS	7 fl oz/a + 0.875 qt/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	99	99	99	99	99	167
Halex GT + NIS + AMS	3.6 pt/a + 0.25% v/v + 8.5 lb/ 100 gal	0	95	99	99	99	99	181
Roundup PowerMax + AMS	22 fl oz/a + 8.5 lb/ 100 gal	0	98	97	68	76	74	135
	LSD (P=0.10)	**0.3**	**1**	**2**	**5**	**4**	**5**	**32**

Table 3. Evaluation of pyroxasulfone herbicide systems for common waterhemp control in field corn on May 24, 31, June 8, 15, 24, and August 31 at Rochester, MN, in 2011.

Treatment	Rate	Common Waterhemp Control						Yield
		5/24	5/31	6/8	6/15	6/24	8/31	
	(rate/A)	(%)						(bu/A)
Untreated Check		0	0	0	0	0	0	27
PRE								
Anthem	10 fl oz/a	99	99	99	99	99	99	43
Anthem + Aatrex	10 fl oz/a + 1.25 qt/a	99	99	99	99	99	97	99
PRE / POST II (2-4 inch weeds)								
Anthem / Roundup PowerMax + AMS	8 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	99	183
Anthem / Roundup PowerMax + AMS	10 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	99	163
Anthem + Aatrex / Roundup PowerMax + AMS	8 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	98	99	176
Anthem + Aatrex / Roundup PowerMax + AMS	10 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	99	167
Verdict / Roundup PowerMax + AMS	13 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	97	169
Harness / Roundup PowerMax + AMS	2 pt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	98	99	179
Harness Xtra / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	99	183
Lumax / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	99	99	99	99	99	99	166
POST I (1-3 inch weeds)								
Anthem + Roundup PowerMax + NIS + AMS	7 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	99	98	96	98	99	155
Anthem + Roundup PowerMax + NIS + AMS	9 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	99	98	92	95	99	147
Anthem + Aatrex + Roundup PowerMax + NIS + AMS	7 fl oz/a + 0.875 qt/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	99	99	99	98	99	167
Halex GT + NIS + AMS	3.6 pt/a + 0.25% v/v + 8.5 lb/ 100 gal	0	98	99	99	99	99	181
Roundup PowerMax + AMS	22 fl oz/a + 8.5 lb/ 100 gal	0	99	94	74	85	83	135
	LSD (P=0.10)	**0.1**	**1**	**1**	**4**	**3**	**5**	**32**

Table 4. Evaluation of pyroxasulfone herbicide systems for giant foxtail control in field corn on May 24, 31, June 8, 15, 24, and August 31 at Rochester, MN, in 2011.

Treatment	Rate	Giant Foxtail Control						Yield
		5/24	5/31	6/8	6/15	6/24	8/31	
	(rate/A)	(%)						(bu/A)
Untreated Check		0	0	0	0	0	0	27
PRE								
Anthem	10 fl oz/a	96	97	96	92	81	84	43
Anthem + Aatrex	10 fl oz/a + 1.25 qt/a	96	97	93	93	88	89	99
PRE / POST II (2-4 inch weeds)								
Anthem / Roundup PowerMax + AMS	8 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	95	98	92	99	97	97	183
Anthem / Roundup PowerMax + AMS	10 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	96	97	95	99	97	98	163
Anthem + Aatrex / Roundup PowerMax + AMS	8 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	96	97	96	98	98	97	176
Anthem + Aatrex / Roundup PowerMax + AMS	10 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	97	98	96	99	98	98	167
Verdict / Roundup PowerMax + AMS	13 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	96	98	91	96	96	91	169
Harness / Roundup PowerMax + AMS	2 pt/a / 22 fl oz/a + 8.5 lb/ 100 gal	97	98	99	99	96	90	179
Harness Xtra / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	98	99	97	96	96	94	183
Lumax / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	96	97	89	98	97	96	166
POST I (1-3 inch weeds)								
Anthem + Roundup PowerMax + NIS + AMS	7 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	96	85	77	78	78	155
Anthem + Roundup PowerMax + NIS + AMS	9 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	96	82	80	82	82	147
Anthem + Aatrex + Roundup PowerMax + NIS + AMS	7 fl oz/a + 0.875 qt/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	0	88	86	79	83	79	167
Halex GT + NIS + AMS	3.6 pt/a + 0.25% v/v + 8.5 lb/ 100 gal	0	85	92	86	86	83	181
Roundup PowerMax + AMS	22 fl oz/a + 8.5 lb/ 100 gal	0	90	75	66	60	60	135
	LSD (P=0.10)	**1**	**5**	**5**	**6**	**4**	**6**	**32**

Table 5. Crop response to pyroxasulfone herbicide systems in field corn on May 31, June 8 and 15, at Rochester, MN, in 2011.

Treatment	Rate	Crop Injury			Yield
		5/31	6/8	6/15	
	(rate/A)		(%)		(bu/A)
Untreated Check		0	0	0	27
PRE					
Anthem	10 fl oz/a	0	0	0	43
Anthem + Aatrex	10 fl oz/a + 1.25 qt/a	0	0	0	99
PRE / POST II (2-4 inch weeds)					
Anthem / Roundup PowerMax + AMS	8 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	0	0	0	183
Anthem / Roundup PowerMax + AMS	10 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	0	0	0	163
Anthem + Aatrex / Roundup PowerMax + AMS	8 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	0	0	0	176
Anthem + Aatrex / Roundup PowerMax + AMS	10 fl oz/a + 1 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	0	0	0	167
Verdict / Roundup PowerMax + AMS	13 fl oz/a / 22 fl oz/a + 8.5 lb/ 100 gal	0	0	0	169
Harness / Roundup PowerMax + AMS	2 pt/a / 22 fl oz/a + 8.5 lb/ 100 gal	0	0	0	179
Harness Xtra / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	0	0	0	183
Lumax / Roundup PowerMax + AMS	2 qt/a / 22 fl oz/a + 8.5 lb/ 100 gal	0	1	0	166
POST I (1-3 inch weeds)					
Anthem + Roundup PowerMax + NIS + AMS	7 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	30	11	5	155
Anthem + Roundup PowerMax + NIS + AMS	9 fl oz/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	31	13	5	147
Anthem + Aatrex + Roundup PowerMax + NIS + AMS	7 fl oz/a + 0.875 qt/a + 22 fl oz/a + 0.25% v/v + 8.5 lb/ 100 gal	31	10	5	167
Halex GT + NIS + AMS	3.6 pt/a + 0.25% v/v + 8.5 lb/ 100 gal	0	0	0	181
Roundup PowerMax + AMS	22 fl oz/a + 8.5 lb/ 100 gal	0	0	0	135
	LSD (P=0.10)	**2**	**1**	**1**	**32**