

Atrazine Alternatives in No-Till Corn.

00-2A-W160

OBJECTIVE: Determine effectiveness of herbicide alternatives to atrazine in no-till corn.

SUMMARY: No corn injury was observed for any herbicide treatment in this study. Atrazine applied early preplant controlled all winter annual weeds except wild garlic. No other early preplant treatment controlled winter annual weeds as effectively as atrazine. All treatments except Balance and ZA 1296 early preplant controlled at least 90% of Pennsylvania smartweed. Giant foxtail control was unacceptable with all early preplant treatments except treatments that included Basis. All preemergence treatments except Python and ZA 1296 controlled at least 89% of giant foxtail. Only early preplant treatments including atrazine controlled greater than 80% of common waterhemp. However, all preemergence treatments provided acceptable common waterhemp control. There were no significant differences in corn yield among plots that were treated at the preemergence application timing. However, atrazine treatments yielded significantly higher than all other early preplant treatments except those that contained Balance.

HERBICIDES

AATREX 90 WG
 BALANCE 75 WG
 BASIS 75 WG
 DUAL II MAGNUM 7.64 EC
 HORNET 68.5 WG
 PYTHON 80 WG
 ROUNDUP ULTRA 3 SL
 WEEDONE 638 2.8 EC
 ZA1296 4 EC

WEEDS

BUTTERCUP, SMALLFLOWER
 CHICKWEED, MOUSEEAR
 FOXTAIL, CAROLINA
 FOXTAIL, GIANT
 GARLIC, WILD
 HENBIT
 RAGWEED, COMMON
 SHEPHERDSPURSE
 SMARTWEED, PENNSYLVANIA
 WATERHEMP, COMMON

CROP

CORN, FIELD

Bryan Young and Brad Johnson

PLANT, SOIL AND GENERAL AGRICULTURE DEPARTMENT

SOUTHERN ILLINOIS UNIVERSITY

Atrazine Alternatives in No-Till Corn.

Project Code: 00-2A-W160 Location: Belleville Research Center

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

Weed Code	Common Name	Scientific Name
1. SETFA	FOXTAIL, GIANT	SETARIA FABERI HERRM.
2. CAPBP	SHEPHERDSPURSE	CAPELLA BURSA-PASTORIS (L.) MEDIK.
3. CERVU	CHICKWEED, MOUSEEAR	CERASTIUM VULGATUM L.
4. RANAB	BUTTERCUP, SMALLFLOWER	RANUNCULUS ABORTIVUS L.
5. AMBEL	RAGWEED, COMMON	AMBROSIA ARTEMISIIFOLIA L.
6. ALLVI	GARLIC, WILD	ALLIUM VINEALE L.
7. ALOCA	FOXTAIL, CAROLINA	ALOPECURUS CAROLINIANUS
8. POLPY	SMARTWEED, PENNSYLVANIA	POLYGONUM PENNSYLVANICUM L.
9. LAMAM	HENBIT	LAMIUM AMPLEXICAULE L.
10. AMATA	WATERHEMP, COMMON	AMARANTHUS RUDIS SAUER

Crop 1:	ZEAMX CORN, FIELD	Variety:	P33G28 LL
Planting Method:	SEEDED	Planting Date:	May-12-00
Rate:	28000 S/A	Depth:	1.5 IN
Row Spacing:	30 IN		

Plot Width, Unit:	10 FT	Plot Length, Unit:	28 FT	Reps:	4
Tillage Type:	NO-TILL	Study Design:	RCB		
Previous Crop, Year:	GLXMA, 1999	Fertilizer applied:	N 150 LB/A,	P ₂ O ₅ 0 LB/A,	K ₂ O 0 LB/A

Soil Name:	WEIR	% OM:	2.3	pH:	6.5	CEC:	10
Texture:	SILT LOAM	P ₁ :	78 LB/A,	K:	402 LB/A		

APPLICATION DESCRIPTION

	A	B
Application Date:	Apr-25-00	May-13-00
Time of Day:	9:00	6:00
Application Method:	SPRAY	SPRAY
Application Timing:	EPP,4	PRE
Applic. Placement:	BROFOL	BROFOL
Air Temp., Unit:	56 F	68 F
% Relative Humidity:	80	80
Wind Velocity, Unit:	3 MPH	0 MPH
Soil Moisture:	MOIST	MOIST

CROP STAGE AT EACH APPLICATION

	A	B
Crop 1 Code, Stage:	NA	ZEAMX PRE
Height, Unit:	NA	NA

WEED STAGE AT EACH APPLICATION

	A	B
Weed 1 Code:	SETFA	SETFA
Stage(leaves):	3-4	3-4
Height(inches):	1-5	1-5
Density:	MEDIUM	MEDIUM
Weed 2 Code:	CAPBP	CAPBP
Stage(leaves):	7-10	7-10
Height(inches):	6-24	6-24
Density:	HIGH	HIGH
Weed 3 Code:	CERVU	CERVU
Stage(leaves):	7-10	7-10
Height(inches):	4-6	4-6
Density:	HIGH	HIGH
Weed 4 Code:	RANAB	RANAB
Stage(leaves):	7-10	7-10
Height(inches):	4-6	4-6
Density:	MEDIUM	MEDIUM
Weed 5 Code:	AMBEL	AMBEL
Stage(leaves):	3-4	5-6
Height(inches):	1-5	4-8
Density:	LOW	HIGH
Weed 6 Code:	ALLVI	ALLVI
Stage(leaves):	3-4	3-4
Height(inches):	6-24	6-24
Density:	MEDIUM	MEDIUM

(continued)

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Project Code: 00-2A-W160 Location: Belleville Research Center

(continued)

Weed 7 Code:	ALOCA	ALOCA
Stage(leaves):	3-4	5-6
Height(inches):	4-6	4-10
Density:	MEDIUM	MEDIUM

Weed 8 Code:	POLPY
Stage(leaves):	5-8
Height(inches):	4-8
Density:	LOW

APPLICATION EQUIPMENT

	A	B
Appl. Equipment:	CO ₂ SPRAY	CO ₂ SPRAY
Operating Pressure:	40 PSI	40 PSI
Nozzle Type:	FLAT FAN	FLAT FAN
Nozzle Size:	8003	8003
Boom Length, Unit:	7.33 FT	7.33 FT
Spray Volume, Unit:	20 GPA	20 GPA

NOTES:

Harvested Oct-09-00, (2) 30 inch rows by 25ft.

TABLE. ATRAZINE ALTERNATIVES IN NO-TILL CORN. PROJECT CODE:00-2A-W160

TREATMENT	FORM.	RATE	UNIT	PROD	RATE	TIME	APPL CODE	YIELD	CONTROL, DAYS AFTER EPP14								ZEAMX INJURY		CONTROL, DAYS AFTER PRE							
									APPL								DA PRE		SETFA		AMBEL		AMATA		POLPY	
									ALOCA	CAPBP	ALLVI	LAMAM	CERVU	RANAB	AMBEL	28	56	28	56	28	56	28	56	28	56	
1 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A		12	0	0	0	0	0	0	0	0	0	50	48	0	0	50	44	62	61	
2 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A		136	95	96	65	99	97	89	99	0	0	78	79	94	91	84	81	99	99	
2 AATREX	90 WG	2.0	LB A/A	2.22	LB/A	EPP14 A																				
2 PRIME OIL COC	100 LIQ	1.0	% V/V	1.0	% V/V	EPP14 A																				
2 28% UAN	100 LIQ	2.5	% V/V	2.5	% V/V	EPP14 A																				
3 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A		114	74	81	56	94	77	65	99	0	0	60	59	76	74	69	69	76	75	
3 BALANCE	75 WG	0.09375	LB A/A	2.0	OZ/A	EPP14 A																				
3 PRIME OIL COC	100 LIQ	1.0	% V/V	1.0	% V/V	EPP14 A																				
3 28% UAN	100 LIQ	2.5	% V/V	2.5	% V/V	EPP14 A																				
4 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A		73	23	56	39	93	74	69	87	0	0	29	31	63	61	70	69	95	96	
4 ZA1296	4 EC	0.18	LB A/A	5.76	OZ/A	EPP14 A																				
4 PRIME OIL COC	100 LIQ	1.0	% V/V	1.0	% V/V	EPP14 A																				
4 28% UAN	100 LIQ	2.5	% V/V	2.5	% V/V	EPP14 A																				
5 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A		65	34	36	41	45	49	48	97	0	0	30	29	61	60	55	56	99	98	
5 PYTHON	80 WG	0.057	LB A/A	1.14	OZ/A	EPP14 A																				
5 PRIME OIL COC	100 LIQ	1.0	% V/V	1.0	% V/V	EPP14 A																				
5 28% UAN	100 LIQ	2.5	% V/V	2.5	% V/V	EPP14 A																				
6 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A		85	13	34	33	38	64	54	98	0	0	39	39	99	95	58	60	99	98	
6 HORNET	68.5 WG	0.2675	LB A/A	6.25	OZ/A	EPP14 A																				
6 PRIME OIL COC	100 LIQ	1.0	% V/V	1.0	% V/V	EPP14 A																				
6 28% UAN	100 LIQ	2.5	% V/V	2.5	% V/V	EPP14 A																				
7 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A		96	96	70	40	65	78	74	80	0	0	84	85	71	74	45	48	99	98	
7 BASIS	75 WG	0.04688	LB A/A	1.0	OZ/A	EPP14 A																				
7 PRIME OIL COC	100 LIQ	1.0	% V/V	1.0	% V/V	EPP14 A																				
7 28% UAN	100 LIQ	2.5	% V/V	2.5	% V/V	EPP14 A																				
8 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	EPP14 A		46	96	69	61	85	90	96	99	0	0	30	29	55	53	48	44	94	94	
8 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	EPP14 A																				
8 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A																				
9 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	EPP14 A		152	96	96	74	99	99	95	99	0	0	84	81	97	97	90	89	99	96	
9 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	EPP14 A																				
9 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A																				
9 AATREX	90 WG	2.0	LB A/A	2.22	LB/A	EPP14 A																				
10 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	EPP14 A		110	98	51	74	95	95	97	99	0	0	71	70	79	79	66	66	89	85	
10 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	EPP14 A																				
10 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A																				
10 BALANCE	75 WG	0.09375	LB A/A	2.0	OZ/A	EPP14 A																				
11 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	EPP14 A		88	98	59	62	91	87	98	98	0	0	68	65	68	65	53	55	86	87	
11 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	EPP14 A																				
11 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A																				
11 ZA1296	4 EC	0.18	LB A/A	5.76	OZ/A	EPP14 A																				
12 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	EPP14 A		104	97	53	64	76	92	98	98	0	0	61	61	79	78	49	49	99	99	
12 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	EPP14 A																				
12 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A																				
12 PYTHON	80 WG	0.057	LB A/A	1.14	OZ/A	EPP14 A																				
13 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	EPP14 A		93	95	60	59	75	89	96	99	0	0	66	69	93	91	48	45	99	98	
13 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	EPP14 A																				
13 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A																				
13 HORNET	68.5 WG	0.2675	LB A/A	6.25	OZ/A	EPP14 A																				

(CONTINUED)

TABLE. ATRAZINE ALTERNATIVES IN NO-TILL CORN. PROJECT CODE:00-2A-W160 (CONTINUED)

TREATMENT	FORM.	RATE	UNIT	PROD	RATE	APPL TIME	APPL CODE	YIELD	CONTROL, DAYS AFTER EPP14								ZEAMX INJURY		CONTROL, DAYS AFTER PRE							
									ALOCA	CAPBP	ALLVI	LAMAM	CERVU	RANAB	AMBEL	28	56	28	56	28	56	28	56	28	56	
									%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
14 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	EPP14 A		94	97	69	64	89	94	97	99	0	0	92	91	91	90	40	41	99	99	
14 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	EPP14 A																				
14 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A																				
14 BASIS	75 WG	0.04688	LB A/A	1.0	OZ/A	EPP14 A																				
15 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	PRE B		154								0	0	86	85	83	76	89	90	84	82	
15 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	PRE B																				
15 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	PRE B																				
16 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	PRE B		177								0	0	98	97	99	99	99	99	99	99	
16 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	PRE B																				
16 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	PRE B																				
16 AATREX	90 WG	2.0	LB A/A	2.22	LB/A	PRE B																				
17 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	PRE B		170								0	0	94	93	98	97	98	97	99	99	
17 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	PRE B																				
17 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	PRE B																				
17 BALANCE	75 WG	0.09375	LB A/A	2.0	OZ/A	PRE B																				
18 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	PRE B		155								0	0	78	75	97	96	99	98	99	98	
18 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	PRE B																				
18 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	PRE B																				
18 ZA1296	4 EC	0.18	LB A/A	5.76	OZ/A	PRE B																				
19 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	PRE B		164								0	0	86	84	96	93	96	95	99	99	
19 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	PRE B																				
19 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	PRE B																				
19 PYTHON	80 WG	0.057	LB A/A	1.14	OZ/A	PRE B																				
20 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	PRE B		168								0	0	93	93	99	98	96	93	99	98	
20 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	PRE B																				
20 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	PRE B																				
20 HORNET	68.5 WG	0.2675	LB A/A	6.25	OZ/A	PRE B																				
21 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	PRE B		155								0	0	91	89	91	88	90	89	98	98	
21 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	PRE B																				
21 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	PRE B																				
21 BASIS	75 WG	0.04688	LB A/A	1.0	OZ/A	PRE B																				
22 NONTREATED								6								0	0	0	0	0	0	0	0	0	0	
23 WEED FREE								127	99	99	99	99	99	99	99	0	0	99	99	99	99	99	99	99	99	
23 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	EPP14 A																				
23 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	EPP14 A																				
23 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	EPP14 A																				
23 HANDWEED																										
24 WEED FREE								175								0	0	99	99	99	99	99	99	99	99	
24 ROUNDUP ULTRA	3 SL	0.375	LB AE/A	1.0	PT/A	PRE B																				
24 WEEDONE 638	2.8 EC	0.5	LB A/A	1.43	PT/A	PRE B																				
24 DUAL II MAGNUM	7.64 EC	1.27	LB A/A	1.33	PT/A	PRE B																				
24 HANDWEED																										
LSD								25	22	33	28	16	25	21	8	0	0	16	16	9	10	16	16	17	16	
P								0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1.0	1.0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	

1. PROTOCOL: SIU AND U OF I.

2. RATING DATES:

14 DAYS AFTER EPP14, 28 DAYS AFTER PRE, AND 56 DAYS AFTER PRE ON MAY-9-00, JUN-10-00, AND JUL-8-00, RESPECTIVELY.