

## Influence of Winter Annual Weeds on Common Waterhemp Emergence.

Project Code: 06-6C Location: Belleville Research Center  
 Investigator: Bryan Young

**Investigator:** Bryan Young, Associate Professor, Southern Illinois University

**City State Zip Country:** Belleville IL 62221 USA  
**Trial Status:** Final **Updated:** 10-31-06

**Objective:**

Determine the influence of winter annual weed management on common waterhemp emergence.

Weed Code	Common Name	Scientific Name
1.	STEME chickweed, common	Stellaria media (L.) Vill.
2.	LAMPU deadnettle, purple	Lamium purpureum L.
3.	LAMAM henbit	Lamium amplexicaule L.
4.	ALLVI garlic, wild	Allium vineale L.
5.	AMBTR ragweed, giant	Ambrosia trifida L.
6.	SETFA foxtail, giant	Setaria faberi Herrm.
7.	XANST cocklebur, common	Xanthium strumarium L.
8.	IPOSS morningglory, species	Ipomoea sp.
9.	ABUTH velvetleaf	Abutilon theophrasti Medicus
10.	AMATA waterhemp, common	Amaranthus rudis Sauer
11.	CHEAL lambsquarters, common	Chenopodium album L.
12.	POLPY smartweed, Pennsylvania	Polygonum pensylvanicum L.
13.	CYPES nutsedge, yellow	Cyperus esculentus L.

**Crop 1:** GLXMA soybean **Variety:** Asgrow 4403 RR  
**Planting Method:** Seeded **Planting Date:** 5-22-06  
**Rate:** 75 S/A **Depth:** 1.0 IN  
**Row Spacing:** 30 IN

**Plot Width, Unit:** 20 FT **Plot Length, Unit:** 30 FT **Reps:** 6  
**Tillage Type:** No-Till **Study Design:** Randomized complete block  
**Previous Crop, Year:** ZEAMX, 2005  
**Field Prep./Maintenance:** N 0 LB/A, P205 0 LB/A, K20 100 LB/A

**Soil Name:** Stoy **% OM:** 1.6 **pH:** 6.1 **CEC:** 8  
**Texture:** Silt loam **Fert. Level:** P1: 82 LB/A, K: 408 LB/A

**APPLICATION DESCRIPTION**

	A	B
<b>Application Date:</b>	11-18-05	4-4-06
<b>Time of Day:</b>	13:30	11:00
<b>Application Method:</b>	Spray	Spray
<b>Application Timing:</b>	NOV15	APRIL1
<b>Applic. Placement:</b>	BROFOL	BROFOL
<b>Air Temp., Unit:</b>	50 F	55 F
<b>% Relative Humidity:</b>	40	42
<b>Wind Velocity, Unit:</b>	7 MPH	3 MPH
<b>Soil Moisture:</b>	ABONOR	ABONOR
<b>% Cloud Cover:</b>	0	0

**CROP STAGE AT EACH APPLICATION**

	A	B
<b>Crop 1 Code, Stage:</b>	GLXMA NA	GLXMA NA
<b>Height, Unit:</b>	NA NA	NA NA

**WEED STAGE AT EACH APPLICATION**

	A	B
<b>Weed 1 Code:</b>	STEME	STEME
<b>Stage (leaves):</b>	8-12	10+
<b>Height (inches):</b>	1-3	2-4
<b>Density:</b>	High	High
<b>Weed 2 Code:</b>	LAMPU	LAMPU
<b>Stage (leaves):</b>	6-10	10+
<b>Height (inches):</b>	1-2	4-6
<b>Density:</b>	Medium	Medium
<b>Weed 3 Code:</b>	LAMAM	LAMAM
<b>Stage (leaves):</b>	4-8	10+
<b>Height (inches):</b>	1-3	4-6
<b>Density:</b>	Low	Low
<b>Weed 4 Code:</b>	ALLVI	ALLVI
<b>Stage (leaves):</b>	3-4	3-4
<b>Height (inches):</b>	3-6	6-8
<b>Density:</b>	Medium	Low
<b>Weed 5 Code:</b>		AMBTR
<b>Stage (leaves):</b>		5-6
<b>Height (inches):</b>		1-2
<b>Density:</b>		Medium

**APPLICATION EQUIPMENT**

	A	B
<b>Appl. Equipment:</b>	CO2 sprayer	CO2 sprayer
<b>Operating Pressure:</b>	40 PSI	40 PSI
<b>Nozzle Type:</b>	Flat fan	Flat fan
<b>Nozzle Size:</b>	8002	8002
<b>Boom Length, Unit:</b>	10 FT	10 FT
<b>Spray Volume, Unit:</b>	20 GPA	20 GPA

NOTES:

12-12-06 (06-6C)

Southern Illinois University

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Weed Code	Crop Code	Rating Data Type	Rating Unit	Rating Date	Trt-Eval Interval	GLXMA Moisture Percent 10-20-06	GLXMA Yield bu/A 10-20-06	STEME Control Percent 14 DAT	STEME Control Percent 28 DAT	STEME Control Percent 134 DA-A 4-1-06	LAMPU Control Percent 14 DAT	LAMPU Control Percent 28 DAT	LAMPU Control Percent 134 DA-A
1	NONTREATED					17.3	46	0	0	0	0	0	0
2	Fall and Spring Control					17.2	49	0	0	100	0	0	100
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A				
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A				
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B				
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B				
3	Fall Control					17.4	43	0	0	100	0	0	100
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A				
3	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A				
4	Spring Control					17.0	45	100	100	0	80	100	0
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B				
4	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B				
LSD (P=.05)						0.31	5.6	0.0	0.0	0.0	0.0	0.0	0.0
Replicate F						10.264	1.110	0.000	0.000	0.000	0.000	0.000	0.000
Replicate Prob(F)						0.0003	0.3987	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Treatment F						1.876	1.689	0.000	0.000	0.000	0.000	0.000	0.000
Treatment Prob(F)						0.1801	0.2150	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

12-12-06 (06-6C)

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1	NONTREATED					0	0	0	0	0	0
2	Fall and Spring Control					0	0	100	0	0	100
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A		
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A		
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B		
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B		
3	Fall Control					0	0	100	0	0	100
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A		
3	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A		
4	Spring Control					100	100	0	90	90	0
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B		
4	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B		
LSD (P=.05)						0.0	0.0	0.0	0.0	0.0	0.0
Replicate F						0.000	0.000	0.000	0.000	0.000	0.000
Replicate Prob(F)						1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Treatment F						0.000	0.000	0.000	0.000	0.000	0.000
Treatment Prob(F)						1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

12-12-06 (06-6C)

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Weed Code	Crop Code	Rating Data Type	Rating Unit	Rating Date	Trt-Eval Interval	AMATA	AMATA	AMATA	AMBTR	AMBTR	AMBTR	
						Control Percent	Control Percent	Control Percent	Control Percent	Control Percent	Control Percent	
						6-8-06	6-22-06	7-20-06	6-8-06	6-22-06	7-20-06	
						15 DABL1	14 DABL2	28 DABL3	15 DABL1	14 DABL2	28 DABL3	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code			
1	NONTREATED									98	99	98
2	Fall and Spring Control									96	99	98
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A			
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A			
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B			
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B			
3	Fall Control									99	99	98
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A			
3	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A			
4	Spring Control									94	99	98
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B			
4	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B			
LSD (P=.05)						4.8	0.0	0.0	9.7	3.1	2.8	
Replicate F						0.906	0.000	0.000	4.315	5.119	1.509	
Replicate Prob(F)						0.5029	1.0000	1.0000	0.0124	0.0062	0.2453	
Treatment F						1.707	0.000	0.000	67.845	50.324	8.863	
Treatment Prob(F)						0.2083	1.0000	1.0000	0.0001	0.0001	0.0013	

12-12-06 (06-6C)

Southern Illinois University

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Weed Code	Crop Code	Rating Data Type	Rating Unit	Rating Date	Trt-Eval Interval	SETFA	SETFA	SETFA	XANST	XANST	XANST	
						Control Percent	Control Percent	Control Percent	Control Percent	Control Percent	Control Percent	
						6-8-06	6-22-06	7-20-06	6-8-06	6-22-06	7-20-06	
						15 DABL1	14 DABL2	28 DABL3	15 DABL1	14 DABL2	28 DABL3	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code			
1	NONTREATED									62	99	99
2	Fall and Spring Control									82	99	98
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A			
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A			
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B			
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B			
3	Fall Control									85	99	98
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A			
3	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A			
4	Spring Control									69	99	98
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B			
4	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B			
LSD (P=.05)						5.8	0.0	0.0	15.5	2.0	0.5	
Replicate F						1.914	0.000	0.000	0.494	1.518	1.000	
Replicate Prob(F)						0.1515	1.0000	1.0000	0.7761	0.2428	0.4509	
Treatment F						32.429	0.000	0.000	3.079	1.194	1.000	
Treatment Prob(F)						0.0001	1.0000	1.0000	0.0596	0.3455	0.4199	

12-12-06 (06-6C)

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Weed Code						IPOSS	IPOSS	IPOSS	ABUTH	ABUTH	ABUTH				
Crop Code						Control	Control	Control	Control	Control	Control				
Rating Data Type						Percent	Percent	Percent	Percent	Percent	Percent				
Rating Unit						6-8-06	6-22-06	7-20-06	6-8-06	6-22-06	7-20-06				
Rating Date															
Trt-Eval Interval						15 DABL1	14 DABL2	28 DABL3	15 DABL1	14 DABL2	28 DABL3				
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code						
1	NONTREATED									87	95	96	96	99	99
2	Fall and Spring Control									75	96	97	86	99	99
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A						
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A						
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B						
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B						
3	Fall Control									81	95	94	95	99	99
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A						
3	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A						
4	Spring Control									80	96	97	93	99	99
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B						
4	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B						
LSD (P=.05)						10.0	2.2	2.3	6.4	0.0	0.0				
Replicate F						1.136	1.442	3.054	0.717	0.000	0.000				
Replicate Prob(F)						0.3841	0.2661	0.0425	0.6208	1.0000	1.0000				
Treatment F						2.094	0.462	2.605	4.659	0.000	0.000				
Treatment Prob(F)						0.1439	0.7132	0.0902	0.0171	1.0000	1.0000				

12-12-06 (06-6C)

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Weed Code						WINANN	AMBTR	AMATA	AMBEL	CHEAL	ABUTH	POLPY								
Crop Code						ODW	ODW	ODW	ODW	ODW	ODW	ODW								
Rating Data Type						g/0.25m2	g/0.25m2	g/0.25m2	g/0.25m2	g/0.25m2	g/0.25m2	g/0.25m2								
Rating Unit						5-5-06	5-5-06	5-5-06	5-5-06	5-5-06	5-5-06	5-5-06								
Rating Date																				
Trt-Eval Interval																				
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code											
1	NONTREATED												23.82	0.79	0.00	0.02	0.18	0.00	0.00	
2	Fall and Spring Control												0.00	0.38	0.09	0.06	0.15	0.01	0.00	
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A											
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A											
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B											
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B											
3	Fall Control												11.16	8.33	0.02	0.24	3.98	0.02	0.00	
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A											
3	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A											
4	Spring Control												0.03	0.26	0.02	0.03	0.07	0.02	0.00	
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B											
4	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B											
LSD (P=.05)						6.414	2.968	0.050	0.141	2.366	0.043	0.000								
Replicate F						1.428	1.228	1.028	1.660	0.992	0.545	0.000								
Replicate Prob(F)						0.2706	0.3443	0.4365	0.2049	0.4549	0.7396	1.0000								
Treatment F						28.380	15.960	5.591	4.791	6.016	0.318	0.000								
Treatment Prob(F)						0.0001	0.0001	0.0089	0.0155	0.0067	0.8124	1.0000								

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Weed Code	XANST	CYPES	IPOSS	SUANGR
Crop Code				
Rating Data Type	ODW	ODW	ODW	ODW
Rating Unit	g/0.25m2	g/0.25m2	g/0.25m2	g/0.25m2
Rating Date	5-5-06	5-5-06	5-5-06	5-5-06
Trt-Eval Interval				

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code	XANST	CYPES	IPOSS	SUANGR
1	NONTREATED									0.04	0.00	0.09	0.63
2	Fall and Spring Control									0.04	0.08	0.06	8.00
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A				
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A				
2	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B				
2	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B				
3	Fall Control									0.00	0.04	0.16	2.30
3	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	NOV15	A				
3	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	NOV15	A				
4	Spring Control									0.04	0.03	0.12	4.30
4	ROUNDUP W-MAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	APRIL1	B				
4	AMS	100	DRY	2.0	% w/w	17	lb/100 gal	APRIL1	B				
	LSD (P=.05)									0.065	0.091	0.128	2.524
	Replicate F									1.013	0.960	2.576	0.575
	Replicate Prob(F)									0.4441	0.4726	0.0712	0.7184
	Treatment F									0.973	1.325	0.902	14.359
	Treatment Prob(F)									0.4313	0.3034	0.4631	0.0001

Trial Comments

1. Protocol: USDA - IPM.
2. Ratings: Starting February 1;  
 Air and soil temperature using dataloggers,  
 Weekly - weed species diversity and density from 4 fixed subplots, along a diagonal, within each plot. Use 0.25 or 0.5 m2 quadrants.  
 Every 2 weeks - gravimetric soil moisture content, vegetative cover estimates.
3. Keep all weeds until planting, then determine label recommended rate of Roundup WeatherMax (per treatment) and apply at planting, then after planting whenever weeds are 4-8 inches (per treatment).
4. Harvest weeds and biomass by species at planting in each fixed subplot.
5. Evaluate weed control by species at 14 and 28 DAT. Rate all plots for weed control at 0, 28 and 56 DAP. Make any crop injury notes if observed.
6. Harvest for grain yield.
7. DAT = Days after NOV15 or APRIL1 application.  
 Ratings at 14 days after the NOV15 and APRIL1 applications were on 12-2-05 and 4-18-06, respectively.  
 Ratings at 28 days after the NOV15 and APRIL1 applications were on 12-16-05 and 5-2-06, respectively.  
 DA-A = Days after NOV15 application. 134 DA-A was also 3 days before the APRIL1 application.  
 DABL1, DABL2, and DABL3 = Days after blanket applications 1, 2, and 3, respectively.  
 Blanket applications were Roundup WeatherMax at 44 fl oz/A + AMS at 2.0%, applied to all plots.  
 ODW = Oven dry weight. WINANN = Winter annual weeds. SUANGR = Summer annual grassy weeds.  
 g/0.25m2 = Grams per 0.25 square meter.
8. Harvested 10-20-06, (4) 30 inch rows by 27 ft.