

Influence of Winter Annual Weeds on Common Waterhemp Emergence.

Project Code: 05-11B 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:** 12-05-05

Objective:

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

Weed Code	Common Name	Scientific Name
1.	HORPU barley, little	Hordeum pusillum Nutt.
2.	STEME chickweed, common	Stellaria media (L.) Vill.
3.	LAMAM henbit	Lamium amplexicaule L.
4.	RANAB buttercup, smallflower	Ranunculus abortivus L.
5.	SENGL groundsel, cressleaf	Senecio glabellus Poir.
6.	TAROF dandelion	Taraxacum officinale Weber in Wiggers
7.	AMBTR ragweed, giant	Ambrosia trifida L.
8.	AMATA waterhemp, common	Amaranthus rudis Sauer
9.	AMBEL ragweed, common	Ambrosia artemisiifolia L.
10.	SETFA foxtail, giant	Setaria faberi Herrm.
11.	IPOSS morningglory, species	Ipomoea sp.
12.	ABUTH velvetleaf	Abutilon theophrasti Medicus
13.	CYPES nutsedge, yellow	Cyperus esculentus L.
14.	XANST cocklebur, common	Xanthium strumarium L.

Crop 1: GLXMA soybean **Variety:** Asgrow 4403 RR
Planting Method: Seeded **Planting Date:** 5-24-05
Rate: 75 lb/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, 2004

Field Prep./Maintenance: N 0 LB/A, P205 50 LB/A, K20 100 LB/A

Soil Name: Ebbert **% OM:** 2.3 **pH:** 6.1 **CEC:** 12
Texture: Silt loam **Fert. Level:** P1: 87 LB/A, K: 446 LB/A

APPLICATION DESCRIPTION

	A	B
Application Date:	11-15-04	04-01-05
Time of Day:	11:00	9:00
Application Method:	Spray	Spray
Application Timing:	NOV15	APRIL1
Applic. Placement:	BROFOL	BROFOL
Air Temp., Unit:	60 F	54 F
% Relative Humidity:	50	58
Wind Velocity, Unit:	0 MPH	5 MPH
Soil Moisture:	ABONOR	NORMAL

CROP STAGE AT EACH APPLICATION

	A		B	
Crop 1 Code, Stage:	GLXMA	NA	GLXMA	NA
Height, Unit:	NA	NA	NA	NA

WEED STAGE AT EACH APPLICATION

	A		B	
Weed 1 Code:	HORPU		HORPU	
Stage (leaves):	5-6		10+	
Height (inches):	1-2		4-6	
Density:	Low		Low	
Weed 2 Code:	STEME		STEME	
Stage (leaves):	5-6		10+	
Height (inches):	0-1		1-2	
Density:	Low		Low	
Weed 3 Code:	LAMAM		LAMAM	
Stage (leaves):	5-6		10+	
Height (inches):	0-1		3-4	
Density:	Low		Low	
Weed 4 Code:	RANAB		RANAB	
Stage (leaves):	10+		10+	
Height (inches):	1-2		2-4	
Density:	High		Low	
Weed 5 Code:	SENGL		SENGL	
Stage (leaves):	10+		10+	
Height (inches):	1-3		4-6	
Density:	Medium		Medium	
Weed 6 Code:	TAROF		TAROF	
Stage (leaves):	10+		10+	
Height (inches):	1-3		2-3	
Density:	Low		Low	

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Weed 7 Code: AMBTR
Stage (leaves) : 2-3
Height (inches) : 1-2
Density: Low

APPLICATION EQUIPMENT

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

NOTES:

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										HORPU	HORPU	STEME	STEME	LAMAM	LAMAM	RANAB	RANAB
										GLXMA	Control	Control	Control	Control	Control	Control	Control
										Yield	Percent	Percent	Percent	Percent	Percent	Percent	Percent
										bu/A	14 DAT	28 DAT	14 DAT	28 DAT	14 DAT	28 DAT	14 DAT
										10-07-05	14 DAT	28 DAT	14 DAT	28 DAT	14 DAT	28 DAT	14 DAT
Trt	Treatment	Form	Form	Rate	Prod	Prod	Grow	Appl									
No.	Name	Conc	Type	Unit	Rate	Unit	Stg	Code									
1	NONTREATED								61	0	0	0	0	0	0	0	0
2	Fall and Spring Control								62	99	99	80	98	80	98	80	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								63	99	99	80	98	80	98	80	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								62	100	100	100	100	100	100	100	100
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)									3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Replicate F									1.883	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Replicate Prob(F)									0.1572	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
Treatment F									0.407	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Treatment Prob(F)									0.7500	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	

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										SENGL	SENGL	TAROF	TAROF	WNTR ANN	
										Control	Control	Control	Control	GLXMA	Control
										Percent	Percent	Percent	Percent	Injury	Percent
										14 DAT	28 DAT	14 DAT	28 DAT	06-07-05	06-07-05
										14 DAT	28 DAT	14 DAT	28 DAT	18 DAP	18 DAP
Trt	Treatment	Form	Form	Rate	Prod	Prod	Grow	Appl							
No.	Name	Conc	Type	Unit	Rate	Unit	Stg	Code							
1	NONTREATED								0	0	0	0	0	0	98
2	Fall and Spring Control								80	98	50	90	0	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								80	98	50	90	0	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								100	100	98	100	0	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)									0.0	0.0	2.5	0.0	0.0	1.0	
Replicate F									0.000	0.000	1.000	0.000	0.000	0.547	
Replicate Prob(F)									1.0000	1.0000	0.4509	1.0000	1.0000	0.7386	
Treatment F									0.000	0.000	2321.000	0.000	0.000	2.652	
Treatment Prob(F)									1.0000	1.0000	0.0001	1.0000	1.0000	0.0865	

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Weed Code		AMBTR		AMBTR		AMBTR		AMATA		AMATA		AMATA		AMBEL		
Crop Code		Control		Control		Control		Control		Control		Control		Control		
Rating Data Type		Percent		Percent		Percent		Percent		Percent		Percent		Percent		
Rating Unit		06-07-05		06-21-05		07-19-05		06-07-05		06-21-05		07-19-05		06-07-05		
Rating Date		18 DAP		32 DAP		60 DAP		18 DAP		32 DAP		60 DAP		18 DAP		
Trt-Eval Interval																
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code							
1	NONTREATED									93	91	94	99	95	95	
2	Fall and Spring Control									92	90	94	99	90	96	
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	69	88	99	95	95	
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	92	93	97	80	96	
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)										5.6	13.4	5.0	0.7	4.1	1.2	0.3
Replicate F										4.844	2.313	3.235	3.000	1.496	1.352	1.000
Replicate Prob(F)										0.0078	0.0955	0.0353	0.0450	0.2495	0.2966	0.4509
Treatment F										9.839	6.384	2.828	12.069	27.116	1.923	1.000
Treatment Prob(F)										0.0008	0.0053	0.0740	0.0003	0.0001	0.1692	0.4199

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Weed Code		SETFA		IPOSS		IPOSS		ABUTH		CYPES		XANST				
Crop Code		Control		Control		Control		Control		Control		Control				
Rating Data Type		Percent		Percent		Percent		Percent		Percent		Percent				
Rating Unit		06-21-05		07-19-05		06-21-05		07-19-05		06-21-05		07-19-05				
Rating Date		32 DAP		60 DAP		32 DAP		60 DAP		32 DAP		60 DAP				
Trt-Eval Interval																
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code							
1	NONTREATED									94	93	92	81	97	91	
2	Fall and Spring Control									93	94	89	80	95	92	
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									94	92	91	81	98	91	
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									93	95	90	82	97	93	
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)										1.6	3.7	2.9	6.9	1.8	5.4	3.8
Replicate F										3.235	2.632	1.561	2.224	3.501	1.683	3.214
Replicate Prob(F)										0.0353	0.0669	0.2307	0.1058	0.0270	0.1992	0.0360
Treatment F										2.157	1.273	1.951	0.223	5.371	0.215	0.172
Treatment Prob(F)										0.1358	0.3195	0.1647	0.8791	0.0103	0.8847	0.9134

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Weed Code	AMBTR	AMBTR	AMBTR	AMBTR	AMBTR	AMBTR	AMBTR	AMBTR
Crop Code	Plants	Plants	Plants	Plants	Plants	Plants	Plants	Dry Wt.
Rating Data Type	1.0m2	1.0m2	1.0m2	1.0m2	1.0m2	1.0m2	1.0m2	g/1.0m2
Rating Unit	03-31-05	04-07-05	04-14-05	04-21-05	04-28-05	05-05-05	05-16-05	05-16-05
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									2.2	6.0	4.0	6.0	6.2	6.2	13.8	3.76
2	Fall and Spring Control									2.8	7.7	3.3	2.8	3.0	3.7	4.7	7.81
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									8.5	19.7	16.5	14.8	17.3	18.2	16.0	35.92
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									2.2	0.0	1.2	3.8	4.2	5.5	6.0	3.96
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)										5.43	12.62	10.34	9.85	11.06	12.19	12.33	16.364
Replicate F										2.269	1.833	1.019	2.115	1.945	1.894	1.221	1.891
Replicate Prob(F)										0.1005	0.1668	0.4408	0.1199	0.1461	0.1551	0.3469	0.1557
Treatment F										2.901	3.873	4.090	2.797	3.209	2.673	1.893	8.134
Treatment Prob(F)										0.0694	0.0311	0.0262	0.0761	0.0534	0.0849	0.1742	0.0019

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Weed Code	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA
Crop Code	Plants	Plants	Plants	Plants	Plants	Plants	Plants	Dry Wt.
Rating Data Type	1.0m2	1.0m2	1.0m2	1.0m2	1.0m2	1.0m2	1.0m2	g/1.0m2
Rating Unit	03-31-05	04-07-05	04-14-05	04-21-05	04-28-05	05-05-05	05-16-05	05-16-05
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									0.0	0.0	0.0	12.0	4.2	10.0	19.7	0.12
2	Fall and Spring Control									0.0	0.0	0.0	20.0	7.8	28.7	112.2	1.55
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	0.0	0.0	5.5	2.7	5.7	24.3	0.49
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									0.0	0.0	0.0	0.0	8.5	8.8	31.0	0.41
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)										0.00	0.00	0.00	19.47	16.32	20.46	83.13	1.463
Replicate F										0.000	0.000	0.000	1.537	0.952	3.450	1.145	0.729
Replicate Prob(F)										1.0000	1.0000	1.0000	0.2374	0.4770	0.0284	0.3801	0.6128
Treatment F										0.000	0.000	0.000	1.778	0.272	2.352	2.525	1.664
Treatment Prob(F)										1.0000	1.0000	1.0000	0.1945	0.8447	0.1133	0.0969	0.2173

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		Bare						
		Bare	Bare	Bare	Bare	Bare	Bare	
		Ground	Ground	Ground	Ground	Ground	Ground	
		Percent	Percent	Percent	Percent	Percent	Percent	
		03-31-05	04-07-05	04-14-05	04-21-05	05-05-05	05-16-05	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Prod Rate	Prod Unit	Grow Stg	Appl Code
1	NONTREATED							
2	Fall and Spring Control							
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							
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							
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)								
Replicate F								
Replicate Prob(F)								
Treatment F								
Treatment Prob(F)								

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		WNTR ANN						
		GroundCv	GroundCv	GroundCv	GroundCv	GroundCv	GroundCv	
		Percent	Percent	Percent	Percent	Percent	Percent	
		03-31-05	04-07-05	04-14-05	04-21-05	05-05-05	05-16-05	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Prod Rate	Prod Unit	Grow Stg	Appl Code
1	NONTREATED							
2	Fall and Spring Control							
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							
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							
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)								
Replicate F								
Replicate Prob(F)								
Treatment F								
Treatment Prob(F)								

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Weed Code WNTN ANN
 Crop Code
 Rating Data Type Dry Wt.
 Rating Unit g/1.0m²
 Rating Date 05-16-05
 Trt-Eval Interval

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code	
1	NONTREATED									112.20
2	Fall and Spring Control									5.28
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									20.52
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									1.33
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)									6.251
	Replicate F									1.126
	Replicate Prob(F)									0.3885
	Treatment F									634.336
	Treatment Prob(F)									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).
 Roundup WeatherMax 1.5 lbae/A applied to all plots on 5-20-05.
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 FALL or SPRING application. DAP = Days after planting. WNTN ANN = Winter annual weeds.
 GroundCv = Ground cover. Dry Wt = Oven dry weight. 1.0m² = 1.0 square meter. g/1.0m² = grams per 1.0 meter square.
 Rating dates:
 14 days after FALL and SPRING applications were on 11-29-05 and 4-15-05, respectively.
 28 days after FALL and SPRING applications were on 12-13-05 and 4-29-05, respectively.
 Ratings at 18, 32, and 60 DAP were also 14, 28, and 56 days after burndown application.
8. Treatment 2 rated following SPRING application with 100% control of all weeds on 4-15-05 and 4-29-05.
9. Harvested 10-7-05, 10 ft by 27 ft.