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AMS alternatives with Touchdown Hi-Tech for weed control in RR corn.

Trial ID: 10S-THP-CTC-89 Protocol ID: 10S-THP-CTC-89
 Location: Throckmorton Study Director: White/Marquardt
 Project ID: Investigator: Dr. Bill Johnson
 Sponsor Contact: Winfield Solutions - George Watters

General Trial Information

Study Director: White/Marquardt **Title:** Research Associate
Investigator: Dr. Bill Johnson **Title:** Professor

Discipline: H herbicide
Trial Status: E established
Initiation Date: 4-13-2010

Trial Location

City: Lafayette
State/Prov.: IN
Postal Code: 47909
Country: USA

Objectives:

AMS alternatives with Touchdown Hi-Tech for weed control in RR corn.

Personnel

Study Director: White/Marquardt **Title:** Research Associate

Affiliation: Purdue University
Address: 915 W State Street
Location: West Lafayette, IN, USA
Postal Code: 47907 **E-mail:** mdwhite@purdue.edu
Phone No.: 765-494-0891

Investigator: Dr. Bill Johnson **Title:** Professor

Affiliation: Purdue University
Address: 915 W State Street
Location: West Lafayette, IN, USA
Postal Code: 47907 **E-mail:** wgj@purdue.edu
Phone No.: 765-494-4656 **Mobile No.:** 765-404-9801

Cooperator/Landowner

Cooperator: Throckmorton Purdue Ag Center **Role:** Purdue Ag Center

Organization: Purdue University
Address 1: 8343 US 231 S
Phone No.: 765-538-3422
Fax No.: 765-538-3423

City: Lafayette
State/Prov.: IN
Postal Code: 47909 **E-mail:** jayyoung@purdue.edu
Country: USA United States

Crop Description

Crop 1: ZEAMD Zea mays indentata Dent corn
Variety: Dekalb DKC 61-19 **Description:** RR/VT3
BBCH Scale: BCOR **Planting Date:** 4-15-2010
Rate, Unit: 32000 S/A
Depth, Unit: 1.5 IN
Row Spacing, Unit: 30 IN
Seed Bed: MEDIUM medium **Soil Temperature, Unit:** 60 F
Soil Moisture: DRY dry **Emergence Date:** 4-27-2010

Pest Description

Pest 1 Type: W **Code:** SETFA Setaria faberi
Common Name: Giant foxtail

Pest 2 Type: W **Code:** AMBTR Ambrosia trifida
Common Name: Giant ragweed

Pest 3 Type: W **Code:** ABUTH Abutilon theophrasti
Common Name: Velvetleaf

Pest 4 Type: W **Code:** CHEAL Chenopodium album
Common Name: Common lambsquarters

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Site and Design	
Plot Width, Unit: 10 FT Plot Length, Unit: 30 FT Plot Area, Unit: 300 FT ² Replications: 4	Site Type: FIELD field Experimental Unit: 1 PLOT plot Tillage Type: CONTIL conventional-till Study Design: RACOB� Randomized Complete Block (RCB) Untreated Arrangement: INCLUDED single control randomized in each block

Soil Description
Description Name: TPAC -Field 4A % OM: 3.1 Texture: SIL silt loam pH: 6 Soil Name: Toronto-Millbrook CEC: 11.1

Application Description	
	A
Application Date:	5-18-2010
Time of Day:	8:30-9 AM
Application Method:	SPRAY
Application Timing:	EPOWE
Application Placement:	FOLIAR
Applied By:	AR
Air Temperature, Unit:	62 F
% Relative Humidity:	75
Wind Velocity, Unit:	7 MPH
Wind Direction:	N
Dew Presence (Y/N):	Y yes
Soil Temperature, Unit:	58 F
Soil Moisture:	WET
% Cloud Cover:	10

Crop Stage At Each Application	
	A
Crop 1 Code, BBCH Scale:	ZEAMD BCOR
Stage Scale Used:	BBCH
Stage Majority, Percent:	V3
Stage Maximum, Percent:	V4 80
Height, Unit:	5 IN
Height Minimum, Maximum:	4 6

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Pest Stage At Each Application	
	A
Pest 1 Code, Type, Scale:	SETFA W
Stage Majority, Percent:	40 100
Height, Unit:	3.5 IN
Height Minimum, Maximum:	1 6
Density, Unit:	35 YD2
Pest 2 Code, Type, Scale:	AMBTR W
Stage Majority, Percent:	40 100
Height, Unit:	4 IN
Height Minimum, Maximum:	1 7
Density, Unit:	5.5 YD2
Pest 3 Code, Type, Scale:	ABUTH W
Stage Majority, Percent:	40 100
Height, Unit:	1.5 IN
Height Minimum, Maximum:	1 2
Density, Unit:	1.5 YD2
Pest 4 Code, Type, Scale:	CHEAL W
Stage Majority, Percent:	40 100
Height, Unit:	1.5 IN
Height Minimum, Maximum:	1 2
Density, Unit:	4 YD2

Application Equipment	
	A
Appl. Equipment:	CO2 BKPK
Equipment Type:	SPRBAC
Operating Pressure, Unit:	17 PSI
Nozzle Type:	FLAT FAN
Nozzle Size:	XR 110 02
Nozzle Spacing, Unit:	15 IN
Nozzles/Row:	6
Boom Length, Unit:	7.5 FT
Boom Height, Unit:	18 IN
Ground Speed, Unit:	3 MPH
Carrier:	MEIGS
Water Hardness (ppm CaCO3):	150
Spray Volume, Unit:	15 gal/ac
Mix Size, Unit:	1.8 liters
Propellant:	C02
Tank Mix (Y/N):	N no

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Trial ID: 10S-THP-CTC-89 Protocol ID: 10S-THP-CTC-89
 Location: Throckmorton Study Director: White/Marquardt
 Project ID: Investigator: Dr. Bill Johnson
 Sponsor Contact: Winfield Solutions - George Watters

Pest Type	W Weed SETFA	W Weed AMBTR	W Weed CHEAL	W Weed AMARE	W Weed ABUTH	W Weed IPOHE				
Pest Code	Setaria faberi	Ambrosia trifida	Chenopodium album	Amaranthus retrofractus	Abutilon theophrasti	Ipomoea hederacea				
Pest Scientific Name	Giant foxtail	Giant ragweed	Common lambsquarters	Redroot pigweed	Velvetleaf	Ivyleaf morning glory				
Pest Name										
Crop Code										
BBCH Scale										
Crop Scientific Name										
Crop Name										
Crop Variety										
Description										
Rating Date	5-26-2010	5-26-2010	5-26-2010	5-26-2010	5-26-2010	5-26-2010	5-26-2010			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	PHYNLS			
Rating Unit	%	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1	1			
Crop Stage Majority										
Pest Stage Majority	1-10"	10-12"	0.5-1"	0.5"	2"	1-2"				
Pest Density, Unit	200 YD2	4 YD2	20 YD2	4 YD2	4 YD2	3 YD2				
Assessed By	MW	MW	MW	MW	MW	MW	MW			
Trt No.	Treatment Name	Rate	Appl	1	2	3	4	5	6	7
		Rate Unit	Code							
1	Untreated Check			0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 a
2	Touchdown Hi-Tech (5 SL)	0.94 lb ae/a	A	93.8 a	78.8 a	89.8 a	99.0 a	99.0 a	72.5 a	0.8 a
3	Touchdown Hi-Tech (5 SL) N-Pak 8-0-0-9	0.94 lb ae/a 2.5 % v/v	A A	90.0 a	90.8 a	79.8 a	94.3 a	99.0 a	66.0 a	1.3 a
4	Touchdown Hi-Tech (5 SL) Alliance	0.94 lb ae/a 1.25 % v/v	A A	94.5 a	85.0 a	84.8 a	99.0 a	98.0 a	60.0 a	0.8 a
5	Touchdown Hi-Tech (5 SL) Class Act NG	0.94 lb ae/a 1.25 % v/v	A A	95.3 a	85.0 a	96.8 a	99.0 a	99.0 a	74.5 a	0.0 a
6	Touchdown Hi-Tech (5 SL) AG 10003	0.94 lb ae/a 1 % v/v	A A	91.8 a	92.3 a	95.5 a	99.0 a	95.5 a	76.0 a	0.8 a
7	Touchdown Hi-Tech (5 SL) AG 10004	0.94 lb ae/a 1 % v/v	A A	90.0 a	83.8 a	94.5 a	96.8 a	99.0 a	77.3 a	0.8 a
8	Touchdown Hi-Tech (5 SL) AG 10009	0.94 lb ae/a 1 % v/v	A A	89.3 a	86.3 a	99.0 a	89.5 a	99.0 a	72.3 a	1.5 a
9	Touchdown Hi-Tech (5 SL) AG 10003	0.94 lb ae/a 0.75 % v/v	A A	92.3 a	87.5 a	98.0 a	91.8 a	99.0 a	77.3 a	0.0 a
10	Touchdown Hi-Tech (5 SL) AG 10004	0.94 lb ae/a 0.75 % v/v	A A	94.3 a	87.3 a	94.5 a	99.0 a	99.0 a	84.3 a	0.0 a
11	Touchdown Hi-Tech (5 SL) AG 10009	0.94 lb ae/a 0.75 % v/v	A A	92.5 a	82.5 a	95.8 a	99.0 a	99.0 a	72.5 a	0.8 a

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	SETFA	AMBTR	CHEAL	AMARE	ABUTH	IPOHE				
Pest Scientific Name	Setaria faberi	Ambrosia trifida	Chenopodium album	Amaranthus retrofractus	Abutilon theophrasti	Ipomoea hederacea				
Pest Name	Giant foxtail	Giant ragweed	Common lambsquarters	Redroot pigweed	Velvetleaf	Lytleaf morningglow				
Crop Code										
BBCH Scale										
Crop Scientific Name										
Crop Name										
Crop Variety										
Description										
Rating Date	5-26-2010	5-26-2010	5-26-2010	5-26-2010	5-26-2010	5-26-2010	5-26-2010			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	PHYNLS			
Rating Unit	%	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1	1			
Crop Stage Majority										
Pest Stage Majority	1-10"	10-12"	0.5-1"	0.5"	2"	1-2"				
Pest Density, Unit	200 YD2	4 YD2	20 YD2	4 YD2	4 YD2	3 YD2				
Assessed By	MW	MW	MW	MW	MW	MW	MW			
Trt No.	Treatment Name	Rate	Appl							
		Rate Unit	Code	1	2	3	4	5	6	7
12	Touchdown Hi-Tech (5 SL) AG 03019	0.94 lb ae/a 0.5 % v/v	A A	91.3 a	81.3 a	96.8 a	99.0 a	95.5 a	69.8 a	1.5 a
LSD (P=.05)		6.48		11.04	13.38	9.59	3.91	29.87	1.98	
Standard Deviation		4.49		7.65	9.27	6.64	2.71	20.69	1.37	
CV		5.3		9.76	10.85	7.48	3.01	30.95	205.6	
Bartlett's X2		8.732		10.026	29.127	3.725	4.126	9.759	1.499	
P(Bartlett's X2)		0.558		0.438	0.001*	0.293	0.127	0.462	0.982	
Replicate F		4.062		2.703	1.841	0.512	2.909	1.388	1.508	
Replicate Prob(F)		0.0146		0.0614	0.1589	0.6769	0.0491	0.2636	0.2306	
Treatment F		141.712		42.599	35.219	71.857	439.955	4.485	0.685	
Treatment Prob(F)		0.0001		0.0001	0.0001	0.0001	0.0001	0.0004	0.7421	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Column 1: Weed or volunteer crop; US; control / burndown or knockdown; percent; 1-10"; per square yard; MW
 Column 2: Weed or volunteer crop; US; control / burndown or knockdown; percent; 10-12"; per square yard; MW
 Column 3: Weed or volunteer crop; US; CONTRO; percent; 0.5-1"; per square yard; MW
 Column 4: Weed or volunteer crop; US; control / burndown or knockdown; percent; 0.5"; per square yard; MW
 Column 5: Weed or volunteer crop; US; control / burndown or knockdown; percent; 2"; per square yard; MW
 Column 6: Weed or volunteer crop; US; control / burndown or knockdown; percent; 1-2"; per square yard; MW
 Column 7: phytotoxicity - necrosis, leaf spot; MW
 Column 8: Weed or volunteer crop; US; control / burndown or knockdown; percent; 16"; per square yard; MW
 Column 9: Weed or volunteer crop; US; control / burndown or knockdown; percent; 17"; per square yard; MW
 Column 10: Weed or volunteer crop; US; control / burndown or knockdown; percent; 14"; per square yard; MW
 Column 11: Weed or volunteer crop; US; control / burndown or knockdown; percent; 12"; per square yard; MW
 Column 12: US; phytotoxicity - general / injury; percent; MW
 Column 13: Weed or volunteer crop; US; control / burndown or knockdown; percent; V7 30"; 26"; per square yard; MW
 Column 14: Weed or volunteer crop; US; control / burndown or knockdown; percent; 32"; per square yard; MW
 Column 15: Weed or volunteer crop; US; control / burndown or knockdown; percent; 20"; per square yard; MW
 Column 16: Weed or volunteer crop; US; control / burndown or knockdown; percent; MW

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Pest Type	W Weed SETFA	W Weed AMBTR	W Weed CHEAL	W Weed AMARE		W Weed SETFA	W Weed AMBTR		
Pest Code	Setaria faberi	Ambrosia trifi>	Chenopodium al>	Amaranthus ret>		Setaria faberi	Ambrosia trifi>		
Pest Scientific Name	Giant foxtail	Giant ragweed	Common lambsqu>	Redroot pigweed		Giant foxtail	Giant ragweed		
Pest Name					ZEAMX BCOR				
Crop Code					Zea mays				
BBCH Scale					Corn				
Crop Scientific Name									
Crop Name									
Crop Variety									
Description									
Rating Date	6-4-2010	6-4-2010	6-4-2010	6-4-2010	6-4-2010	6-9-2010	6-9-2010		
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO		
Rating Unit	%	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1	1		
Crop Stage Majority						V7 30"			
Pest Stage Majority	16"	17"	14"	12"		26"	32"		
Pest Density, Unit	300 YD2	7 YD2	3 YD2	6 YD2		250 YD2	5 YD2		
Assessed By	MW	MW	MW	MW	MW	MW	MW		
Trt Treatment	Rate	Appl							
No. Name	Rate Unit	Code	8	9	10	11	12	13	14
1 Untreated Check			0.0 b	0.0 b	0.0 b	0.0 b	0.0 a	0.0 b	0.0 b
2 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A		87.5 a	82.3 a	80.0 a	80.0 a	0.0 a	83.8 a	81.3 a
3 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A N-Pak 8-0-0-9 2.5 % v/v A		83.8 a	87.3 a	79.8 a	76.3 a	0.0 a	77.5 a	84.8 a
4 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A Alliance 1.25 % v/v A		80.0 a	82.3 a	78.8 a	75.0 a	0.0 a	78.8 a	77.5 a
5 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A Class Act NG 1.25 % v/v A		87.5 a	82.5 a	90.8 a	77.5 a	0.0 a	86.3 a	83.5 a
6 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10003 1 % v/v A		91.3 a	84.8 a	92.0 a	78.8 a	0.0 a	86.3 a	84.8 a
7 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10004 1 % v/v A		85.0 a	78.8 a	89.8 a	76.3 a	0.0 a	85.0 a	88.5 a
8 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10009 1 % v/v A		86.3 a	83.8 a	89.8 a	73.8 a	0.0 a	83.8 a	81.0 a
9 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10003 0.75 % v/v A		85.0 a	78.8 a	83.8 a	77.5 a	0.0 a	77.5 a	83.5 a
10 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10004 0.75 % v/v A		86.3 a	86.0 a	87.3 a	81.3 a	0.0 a	85.0 a	81.3 a
11 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10009 0.75 % v/v A		81.3 a	78.8 a	82.3 a	75.0 a	0.0 a	78.8 a	78.8 a

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Pest Type	W Weed	W Weed	W Weed	W Weed		W Weed	W Weed
Pest Code	SETFA	AMBTR	CHEAL	AMARE		SETFA	AMBTR
Pest Scientific Name	Setaria faberi	Ambrosia trifi>	Chenopodium al>	Amaranthus ret>		Setaria faberi	Ambrosia trifi>
Pest Name	Giant foxtail	Giant ragweed	Common lambsqu>	Redroot pigweed		Giant foxtail	Giant ragweed
Crop Code					ZEAMX		
BBCH Scale					BCOR		
Crop Scientific Name					Zea mays		
Crop Name					Corn		
Crop Variety							
Description							
Rating Date	6-4-2010	6-4-2010	6-4-2010	6-4-2010	6-4-2010	6-9-2010	6-9-2010
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1	1
Crop Stage Majority						V7 30"	
Pest Stage Majority	16"	17"	14"	12"		26"	32"
Pest Density, Unit	300 YD2	7 YD2	3 YD2	6 YD2		250 YD2	5 YD2
Assessed By	MW	MW	MW	MW	MW	MW	MW
Trt Treatment	Rate	Appl					
No. Name	Rate Unit	Code	8	9	10	11	12
12 Touchdown Hi-Tech (5 SL) AG 03019	0.94 lb ae/a A 0.5 % v/v A		83.8 a	80.0 a	87.3 a	78.8 a	0.0 a
LSD (P=.05)	6.66	15.90	14.94	8.59	0.00	8.00	13.67
Standard Deviation	4.61	11.01	10.35	5.95	0.00	5.54	9.47
CV	5.9	14.6	13.19	8.39	0.0	7.34	12.61
Bartlett's X2	10.216	2.631	7.166	6.877	0.0	11.932	2.031
P(Bartlett's X2)	0.422	0.989	0.71	0.737	.	0.29	0.996
Replicate F	3.297	2.730	0.616	4.675	0.000	0.815	11.654
Replicate Prob(F)	0.0324	0.0596	0.6096	0.0079	1.0000	0.4949	0.0001
Treatment F	115.451	18.874	23.581	56.839	0.000	74.975	25.456
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	1.0000	0.0001	0.0001

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Pest Type	W Weed	W Weed						
Pest Code	CHEAL	AMARE						
Pest Scientific Name	Chenopodium al>	Amaranthus ret>						
Pest Name	Common lambsqu>	Redroot pigweed						
Crop Code								
BBCH Scale								
Crop Scientific Name								
Crop Name								
Crop Variety								
Description								
Rating Date	6-9-2010	6-9-2010						
Rating Type	CONTRO	CONTRO						
Rating Unit	%	%						
Number of Subsamples	1	1				1		
Crop Stage Majority								
Pest Stage Majority	20"							
Pest Density, Unit	3 YD2							
Assessed By	MW	MW						
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	15	16	17	18	19	20
1 Untreated Check			0.0 b	0.0 b				
2 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A		83.8 a	75.0 a				
3 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A N-Pak 8-0-0-9 2.5 % v/v A		71.3 a	63.8 a				
4 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A Alliance 1.25 % v/v A		86.0 a	71.3 a				
5 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A Class Act NG 1.25 % v/v A		89.5 a	70.0 a				
6 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10003 1 % v/v A		86.3 a	73.8 a				
7 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10004 1 % v/v A		83.8 a	76.3 a				
8 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10009 1 % v/v A		92.3 a	66.3 a				
9 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10003 0.75 % v/v A		82.5 a	70.0 a				
10 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10004 0.75 % v/v A		85.0 a	76.3 a				
11 Touchdown Hi-Tech (5 SL)	0.94 lb ae/a A AG 10009 0.75 % v/v A		85.0 a	65.0 a				

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Pest Type	W Weed	W Weed							
Pest Code	CHEAL	AMARE							
Pest Scientific Name	Chenopodium al>	Amaranthus ret>							
Pest Name	Common lambsqu>	Redroot pigweed							
Crop Code									
BBCH Scale									
Crop Scientific Name									
Crop Name									
Crop Variety									
Description									
Rating Date	6-9-2010	6-9-2010							
Rating Type	CONTRO	CONTRO							
Rating Unit	%	%							
Number of Subsamples	1	1				1			
Crop Stage Majority									
Pest Stage Majority	20"								
Pest Density, Unit	3 YD2								
Assessed By	MW	MW							
Trt No.	Treatment Name	Rate	Appl Code	15	16	17	18	19	20
12	Touchdown Hi-Tech (5 SL) AG 03019	0.94 lb ae/a 0.5 % v/v	A A	87.3 a	77.5 a				
LSD (P=.05)		12.74		14.57					
Standard Deviation		8.83		10.09					
CV		11.36		15.42					
Bartlett's X2		16.563		10.136					
P(Bartlett's X2)		0.085		0.429					
Replicate F		0.831		2.225					
Replicate Prob(F)		0.4866		0.1037					
Treatment F		32.053		17.512					
Treatment Prob(F)		0.0001		0.0001					