

Adjuvant Studies, Corn or Soybean

Southern Illinois University

CPDA - Water Conditioning Adjuvants and Surfactant.

Trial ID: 10-21N-E160

Location: Belleville Res. Center

Investigator: Bryan Young, Professor, Southern Illinois University, bgyoung@siu.edu
City State Zip Country: Belleville IL 62221 USA
Trial Status: FINAL **Initiation Date:** 06-11-10

Objectives: Compare the performance of adjuvant water conditioners compared with standard dry AMS for glyphosate efficacy.

Crop 1: GLXMA Soybean **Variety:** AG 4005 **Description:** RR
Planting Method: SEEDED **Planting Date:** 06-11-10
Rate, Unit: 75 LB/A **Depth, Unit:** 1.0 IN
Row Spacing, Unit: 30 IN

Pest 1 Type: W **Code:** GGGAN grasses, annual
Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti Medicus velvetleaf
Pest 3 Type: W **Code:** AMATA Amaranthus rudis Sauer waterhemp, common
Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea (L.) Jacq. morningglory, ivyleaf

Plot Width, Unit: 10 FT **Site Type:** FIELD
Plot Length, Unit: 30 FT **Tillage Type:** REDUCED-TILL
Replications: 3 **Study Design:** Randomized Complete Block

Prior Crops, Year
1. ZEAMD 2009

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

% OM: 2.1 **Texture:** SILT LOAM
pH: 6 **Soil Name:** BETHALTO
CEC: 12 **Fert. Level:** P1: 89 LB/A, K: 400 LB/A

Application Description

Application Date: 07-05-10
Time of Day: 7:30
Application Method: Spray
Application Timing: 6-8"W
Application Placement: BROFOL
Applied By: JRK
Air Temperature, Unit: 76 F
% Relative Humidity: 92
Wind Velocity, Unit: 2 MPH
Wind Direction: S
Dew Presence (Y/N): N
Soil Moisture: NORMAL
% Cloud Cover: 10

Crop stage at application: 07-05-10 V3
Height Min, Max (inch): 5 8

Pest Stage At Each Application

Application Date: 07-15-10
Weed Code: GGGAN
Stage Majority (leaves): 4
Stage Min, Max: 2 6
Height Majority: 6 IN
Height Min, Max: 2 8
Density, Unit: 0.1 FT2
Weed Code: ABUTH
Stage Majority (leaves): 6
Stage Min, Max: 4 8
Height Majority: 7 IN
Height Min, Max: 4 9
Density, Unit: 0.01 FT2
Weed Code: AMATA
Stage Majority (leaves): 10
Stage Min, Max: 4 20
Height Majority: 8 IN
Height Min, Max: 3 10
Density, Unit: 0.01 FT2
Weed Code: IPOHE
Stage Majority (leaves): 7
Stage Min, Max: 3 11
Height Majority: 6 IN
Height Min, Max: 3 7
Density, Unit: 0.1 FT2

Application Equipment

Appl. Equipment: C02 sprayer
Operating Pressure: 40 PSI
Nozzle Type: Flat fan
Nozzle Size: TT 11001
Boom Length, Unit: 6.67 FT
Spray Volume, Unit: 10 GPA

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Pest Code	Crop Code	Rating Date	Rating Data Type	Rating Unit	Rating Timing	Trt-Eval Interval							GLXMA 07-19-10 Injury Percent	GLXMA 08-02-10 Injury Percent	GGGAN 07-19-10 Control Percent	GGGAN 08-02-10 Control Percent	ABUTH 07-19-10 Control Percent	ABUTH 08-02-10 Control Percent
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	
1	DEIONIZED WATER									0 a	0 a	93 ab	90 ab	67 bc	65 a-d			
1	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
1	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
2	HARD WATER (1000 PPM)									0 a	0 a	90 ab	88 ab	58 de	58 c-f			
2	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
2	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
3	DEIONIZED WATER									0 a	0 a	90 ab	84 b	73 ab	72 ab			
3	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
3	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
3	AMS	100 SG		1 % w/w	8.5 lb/100 gal			6-8"W	A									
4	HARD WATER (1000 PPM)									0 a	0 a	95 a	95 a	76 a	73 a			
4	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
4	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
4	AMS	100 SG		1 % w/w	8.5 lb/100 gal			6-8"W	A									
5	HARD WATER (1000 PPM)									0 a	0 a	93 ab	92 ab	53 ef	52 efg			
5	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
5	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
5	REQUEST	100 SL		0.5 % v/v	0.5 % v/v			6-8"W	A									
6	HARD WATER (1000 PPM)									0 a	0 a	94 a	93 a	58 de	55 d-g			
6	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
6	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
6	HEL-FIRE	100 SL		0.5 % v/v	0.5 % v/v			6-8"W	A									
7	HARD WATER (1000 PPM)									0 a	0 a	88 b	88 ab	48 fg	47 fg			
7	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
7	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
7	N-TENSE	100 SL		0.5 % v/v	0.5 % v/v			6-8"W	A									
8	HARD WATER (1000 PPM)									0 a	0 a	95 a	93 ab	69 abc	68 abc			
8	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
8	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
8	ARRAY	100 SG		1.08 % w/w	9 lb/100 gal			6-8"W	A									
9	HARD WATER (1000 PPM)									0 a	0 a	89 ab	87 ab	45 g	45 g			
9	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
9	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
9	BRONC MAX	100 SL		0.5 % v/v	0.5 % v/v			6-8"W	A									
10	HARD WATER (1000 PPM)									0 a	0 a	95 a	93 a	57 de	53 d-g			
10	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
10	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
10	CHOICE WEATHER MASTER	100 SL		0.5 % v/v	0.5 % v/v			6-8"W	A									
11	HARD WATER (1000 PPM)									0 a	0 a	95 a	93 ab	66 bc	63 a-e			
11	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
11	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
11	CLASS ACT NG	100 SL		2.5 % v/v	2.5 % v/v			6-8"W	A									
12	HARD WATER (1000 PPM)									0 a	0 a	95 a	94 a	65 cd	61 b-e			
12	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
12	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
12	BRONC PLUS DRY EDT	100 SG		1.2 % w/w	10 lb/100 gal			6-8"W	A									
13	HARD WATER (1000 PPM)									0 a	0 a	90 ab	88 ab	55 ef	52 efg			
13	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
13	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
13	FLAME	100 SL		0.5 % v/v	0.5 % v/v			6-8"W	A									
14	HARD WATER (1000 PPM)									0 a	0 a	93 ab	92 ab	55 ef	53 efg			
14	TOUCHDOWN HI-TECH	5 SL		0.28 lb ae/a	7.2 fl oz/a			6-8"W	A									
14	MON 0818	100 SL		0.25 % v/v	0.25 % v/v			6-8"W	A									
14	CAYUSE PLUS	100 SL		0.5 % v/v	0.5 % v/v			6-8"W	A									
15	NONTREATED									0 a	0 a	0 c	0 c	0 h	0 h			
LSD (P=.05)										0.0	0.0	6.2	9.1	8.2	12.1			

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Pest Code										GGGAN	GGGAN	ABUTH	ABUTH
Crop Code										GLXMA	GLXMA		
Rating Date										07-19-10	08-02-10	07-19-10	08-02-10
Rating Data Type										Injury	Injury	Control	Control
Rating Unit										Percent	Percent	Percent	Percent
Rating Timing													
Trt-Eval Interval										14 DA-A	28 DA-A	14 DA-A	28 DA-A
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code				
Replicate F										0.000	0.000	2.847	0.553
Replicate Prob(F)										1.0000	1.0000	0.0749	0.5816
Treatment F										0.000	0.000	125.477	56.238
Treatment Prob(F)										1.0000	1.0000	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

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Trial ID: 10-21N-E160

Location: Belleville Res. Center

Pest Code	AMATA	AMATA	IPOHE	IPOHE
Crop Code				
Rating Date	07-19-10	08-02-10	07-19-10	08-02-10
Rating Data Type	Control	Control	Control	Control
Rating Unit	Percent	Percent	Percent	Percent
Rating Timing				
Trt-Eval Interval	14 DA-A	28 DA-A	14 DA-A	28 DA-A

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code				
1	DEIONIZED WATER									70 abc	68 a-d	67 a	67 a
1	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
1	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
2	HARD WATER (1000 PPM)									58 fg	58 fg	57 d	57 e
2	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
2	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
3	DEIONIZED WATER									74 ab	72 ab	63 abc	61 b-e
3	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
3	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
3	AMS	100	SG	1	% w/w	8.5	lb/100 gal	6-8"W	A				
4	HARD WATER (1000 PPM)									75 a	73 a	63 abc	63 abc
4	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
4	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
4	AMS	100	SG	1	% w/w	8.5	lb/100 gal	6-8"W	A				
5	HARD WATER (1000 PPM)									63 def	63 c-f	60 cd	58 de
5	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
5	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
5	REQUEST	100	SL	0.5	% v/v	0.5	% v/v	6-8"W	A				
6	HARD WATER (1000 PPM)									65 cde	62 def	65 ab	65 ab
6	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
6	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
6	HEL-FIRE	100	SL	0.5	% v/v	0.5	% v/v	6-8"W	A				
7	HARD WATER (1000 PPM)									60 ef	58 efg	62 bc	60 cde
7	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
7	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
7	N-TENSE	100	SL	0.5	% v/v	0.5	% v/v	6-8"W	A				
8	HARD WATER (1000 PPM)									73 ab	67 a-d	62 bc	62 bcd
8	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
8	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
8	ARRAY	100	SG	1.08	% w/w	9	lb/100 gal	6-8"W	A				
9	HARD WATER (1000 PPM)									53 g	53 g	52 e	52 f
9	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
9	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
9	BRONC MAX	100	SL	0.5	% v/v	0.5	% v/v	6-8"W	A				
10	HARD WATER (1000 PPM)									70 abc	66 bcd	63 abc	62 bcd
10	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
10	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
10	CHOICE WEATHER MASTER	100	SL	0.5	% v/v	0.5	% v/v	6-8"W	A				
11	HARD WATER (1000 PPM)									71 abc	69 abc	63 abc	63 abc
11	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
11	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
11	CLASS ACT NG	100	SL	2.5	% v/v	2.5	% v/v	6-8"W	A				
12	HARD WATER (1000 PPM)									68 bcd	65 b-e	64 abc	64 abc
12	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
12	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
12	BRONC PLUS DRY EDT	100	SG	1.2	% w/w	10	lb/100 gal	6-8"W	A				
13	HARD WATER (1000 PPM)									68 bcd	68 a-d	62 bc	62 bcd
13	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
13	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
13	FLAME	100	SL	0.5	% v/v	0.5	% v/v	6-8"W	A				
14	HARD WATER (1000 PPM)									68 bcd	63 c-f	64 abc	63 a-d
14	TOUCHDOWN HI-TECH	5	SL	0.28	lb ae/a	7.2	fl oz/a	6-8"W	A				
14	MON 0818	100	SL	0.25	% v/v	0.25	% v/v	6-8"W	A				
14	CAYUSE PLUS	100	SL	0.5	% v/v	0.5	% v/v	6-8"W	A				
15	NONTREATED									0 h	0 h	0 f	0 g
LSD (P=.05)										6.3	7.0	4.5	4.5

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Location: Belleville Res. Center

Pest Code	AMATA	AMATA	IPOHE	IPOHE
Crop Code				
Rating Date	07-19-10	08-02-10	07-19-10	08-02-10
Rating Data Type	Control	Control	Control	Control
Rating Unit	Percent	Percent	Percent	Percent
Rating Timing				
Trt-Eval Interval	14 DA-A	28 DA-A	14 DA-A	28 DA-A

Trt	Treatment	Form	Form	Rate	Other	Other	Growth	Appl
No.	Name	Conc	Type	Rate	Rate	Rate	Stage	Code

Replicate F	1.596	3.184	0.915	0.691
Replicate Prob(F)	0.2205	0.0568	0.4120	0.5093
Treatment F	70.831	53.013	110.030	110.454
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

Trial Comments

1. Protocol: CPDA-1.
2. Ratings: WC at 14 and 28 DAT.
3. Target ABUTH and any other weed species.
4. HARD WATER (1000 PPM) = Ca + Mg hard water.
HARD WATER MIXING INSTRUCTIONS:
To make 3 gallons of 1000 ppm Ca + Mg hard water use the formula:
13.45 g of CaCl₂·2H₂O (Calcium Chloride Dihydrate)
4.62 g of MgCl₂·6H₂O (Magnesium Chloride Hexahydrate)
3 gallons distilled water
Be sure to use the dihydrate form of the calcium chloride and the hexahydrate form of the magnesium chloride.
Be sure to stir in the salts to insure that the solutions are all homogeneous before use.
5. Spraying instructions, must use TT11001 tips and 40 PSI.
6. GGGAN = Annual grasses including 80% SETFA (giant foxtail) and 20% PANDI (fall panicum).
7. Not harvested.