

# Purdue University

## Kixor - Influence of glyphosate and additive on spray solution pH and efficacy/Dow - one and two pass systems

Trial ID: 11S-SEP-NTS-10      Protocol ID: 11S-SEP-NTS-10  
 Location: SEPAC      Study Director: Paul Marquardt  
 Project ID: 11S-SEP-NTS-10      Investigator: Dr. Bill Johnson  
 Sponsor Contact: Gery Welker/Jeff Ellis

### General Trial Information

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

**Discipline:** H herbicide  
**Trial Status:** E established  
**Initiation Date:** 4-7-2011

### Trial Location

**City:** Butleville  
**State/Prov.:** IN  
**Postal Code:** 47223  
**Country:** USA

### Objectives:

Gery: Kixor treatments  
 Dow: #40000102

### Personnel

**Study Director:** Paul Marquardt      **Title:** Research Associate  
**Affiliation:** Purdue University  
**Address:** 915 W. State Street  
**Location:** West Lafayette, IN  
**Postal Code:** 47907      **E-mail:** pmarquar@purdue.edu  
**Phone No.:** 765-494-0891      **Mobile No.:** 765-409-6369  
**Investigator:** Dr. Bill Johnson      **Title:** Professor  
**Affiliation:** Purdue University  
**Address:** 915 W. State Street  
**Location:** West Lafayette, IN  
**Postal Code:** 47907      **E-mail:** wgj@purdue.edu  
**Phone No.:** 765-494-4656      **Mobile No.:** 765-404-9801

### Cooperator/Landowner

**Cooperator:** Don Biehle      **Role:** Director  
**Organization:** Southeast Purdue Agricultural Center      **Org. Type:** University  
**Address 1:** 4425 E. CR 350 N  
**City:** Butleville      **Phone No.:** 812-458-6977  
**State/Prov.:** IN      **Fax No.:** 812-458-6979  
**Postal Code:** 47223      **Mobile No.:** 812-592-8426  
**Country:** USA      **E-mail:** biehled@purdue.edu  
 United States

### Crop Description

**Crop 1:** GLXMA Glycine max      Soybean  
**Variety:** AG2931      **Description:** Roundup Ready  
**BBCB Scale:** BSOY      **Planting Date:** 6-3-2011  
**Planting Method:** DIRDRI direct drilled      **Rate, Unit:** 160000 S/A  
**Depth, Unit:** 1 IN  
**Row Spacing, Unit:** 30 IN      **Spacing Within Row, Unit:** 2 IN  
**Seed Bed:** MEDIUM medium      **Soil Temperature, Unit:** 75 F  
**Soil Moisture:** MOIST      **Emergence Date:** 6-8-2011

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### Pest Description

**Pest 1 Type:** W   **Code:** AMBEL   *Ambrosia artemisiifolia*  
**Common Name:** Common ragweed

**Pest 2 Type:** W   **Code:** BROSS   *Bromus* sp.  
**Common Name:** Bromegrass

**Pest 3 Type:** W   **Code:** ERICA   *Conyza canadensis*  
**Common Name:** Canada horseweed

**Pest 4 Type:** W   **Code:** XANST   *Xanthium strumarium*  
**Common Name:** Common cocklebur

**Pest 5 Type:** W   **Code:** GGGAN   Annual grasses  
**Common Name:** Annual grasses

### Site and Design

**Plot Width, Unit:** 10 FT                      **Site Type:** FIELD   field  
**Plot Length, Unit:** 30 FT                    **Experimental Unit:** 1   PLOT plot  
**Plot Area, Unit:** 300 FT<sup>2</sup>                    **Tillage Type:** NOTILL   no-till  
**Replications:** 4                                 **Study Design:** RACOB   Randomized Complete Block (RCB)  
**Untreated Arrangement:** INCLUDED   single control randomized in each block

### Soil Description

**Description Name:** SEPAC-Field U41  
**% OM:** 1.3                      **Texture:** SIL   silt loam  
**pH:** 6.5                          **Soil Name:** Avonburg  
**CEC:** 5.7                         **Fert. Level:** G   good  
**Soil Drainage:** P   poor

### Application Description

	A	B	C
<b>Application Date:</b>	6-3-2011	6-29-2011	8-2-2011
<b>Time of Day:</b>	10 AM	9:30 AM	12 PM
<b>Application Method:</b>	SPRAY	SPRAY	SPRAY
<b>Application Timing:</b>	ATPLAN	POSPOS	LAPOWE
<b>Application Placement:</b>	FOLIAR	FOLIAR	FOLIAR
<b>Applied By:</b>	RT	JR	PM
<b>Air Temperature, Unit:</b>	75 F	73 F	87 F
<b>% Relative Humidity:</b>	62	58	60
<b>Wind Velocity, Unit:</b>	4 MPH	2 MPH	2 MPH
<b>Wind Direction:</b>	SE	SE	NE
<b>Dew Presence (Y/N):</b>	N no	Y yes	N no
<b>Soil Temperature, Unit:</b>	75 F	71 F	86 F
<b>Soil Moisture:</b>	MOIST	WET	DRY
<b>% Cloud Cover:</b>	90	0	20

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Crop Stage At Each Application			
	A	B	C
<b>Crop 1 Code, BBCH Scale:</b>	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
<b>Stage Scale Used:</b>	BBCH	BBCH	BBCH
<b>Stage Majority, Percent:</b>	00 100	12 100	63 100

Pest Stage At Each Application			
	A	B	C
<b>Pest 1 Code, Type, Scale:</b>	AMBEL W	AMBEL W	AMBEL W
<b>Stage Majority, Percent:</b>	32 100	33 100	33 100
<b>Height, Unit:</b>	3.5 IN	7.5 IN	7.5 IN
<b>Height Minimum, Maximum:</b>	1 6	3 12	3 12
<b>Density, Unit:</b>	16 YD2	7.5 YD2	7.5 YD2
<b>Pest 2 Code, Type, Scale:</b>	BROSS W	BROSS W	BROSS W
<b>Stage Majority, Percent:</b>	67 100		
<b>Height, Unit:</b>	12 IN		
<b>Height Minimum, Maximum:</b>	6 18		
<b>Density, Unit:</b>	125 YD2		
<b>Pest 3 Code, Type, Scale:</b>	ERICA W	ERICA W	ERICA W
<b>Stage Majority, Percent:</b>	30 100	31 100	31 100
<b>Height, Unit:</b>	2.5 IN	3.5 IN	3.5 IN
<b>Height Minimum, Maximum:</b>	1 4	1 6	1 6
<b>Density, Unit:</b>	2 YD2	17.5 YD2	17.5 YD2
<b>Pest 4 Code, Type, Scale:</b>	XANST W	XANST W	XANST W
<b>Stage Majority, Percent:</b>	32 100		
<b>Height, Unit:</b>	2.5 IN		
<b>Height Minimum, Maximum:</b>	1 4		
<b>Density, Unit:</b>	5 YD2		
<b>Pest 5 Code, Type, Scale:</b>	GGGAN W	GGGAN W	GGGAN W
<b>Stage Majority, Percent:</b>		13 100	13 100
<b>Height, Unit:</b>		7.5 IN	7.5 IN
<b>Height Minimum, Maximum:</b>		3 12	3 12
<b>Density, Unit:</b>		35 YD2	35 YD2

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Application Equipment			
	A	B	C
<b>Appl. Equipment:</b>	CO2 Backpack	CO2 Backpack	CO2 Backpack
<b>Equipment Type:</b>	SPRBAC	SPRBAC	SPRBAC
<b>Operation Pressure, Unit:</b>	17 PSI	17 PSI	17 PSI
<b>Nozzle Type:</b>	Flat Fan	Flat Fan	Flat Fan
<b>Nozzle Size:</b>	XR11002	XR11002	XR11002
<b>Nozzle Spacing, Unit:</b>	15 IN	15 IN	15 IN
<b>Nozzles/Row:</b>	6	6	6
<b>Boom Length, Unit:</b>	7.5 FT	7.5 FT	7.5 FT
<b>Boom Height, Unit:</b>	18 IN	18 IN	18 IN
<b>Ground Speed, Unit:</b>	3 MPH	3 MPH	3 MPH
<b>Carrier:</b>	H2O	H2O	H2O
<b>Water Hardness (ppm CaCO3):</b>	150	150	150
<b>Spray Volume, Unit:</b>	15 GAL/AC	15 GAL/AC	15 GAL/AC
<b>Mix Size, Unit:</b>	1.8 Liters	1.8 Liters	1.8 Liters
<b>Propellant:</b>	CO2	CO2	CO2
<b>Tank Mix (Y/N):</b>	N no	N no	N no

Date	By	Notes
6-29-2011	PM	PowerMAX applied @ 22 oz/a over treatments 2-10.

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 Location: SEPAC                  Study Director: Paul Marquardt  
 Project ID: 11S-SEP-NTS-10      Investigator: Dr. Bill Johnson  
 Sponsor Contact: Gery Welker/Jeff Ellis

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	AMBEL	XANST	IPOSS	GGGAN	ERICA	AMBEL
Pest Scientific Name	Ambrosia artem>	Xanthium strum>	Ipomoea sp.	Annual grasses	Conyza canadens>	Ambrosia artem>
Pest Name	Common ragweed	Common cockleb>	Morning glory	Annual grasses	Canada horsewe>	Common ragweed
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931
Rating Date	6-14-2011	6-14-2011	6-14-2011	6-14-2011	6-14-2011	6-24-2011
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Crop Stage Majority	VC	VC	VC	VC	VC	V2
Pest Stage Majority	1.5-8 IN	2-8 IN	2-4 IN	4 IN	1-3 IN	6 IN
Pest Density, Unit	10 YD2	3 YD2	3 YD2	30 YD2	1 YD2	5 YD2
Assessed By	RH/CB	RH/CB	RH/CB	RH/CB	RH/CB	RT/JR
Days After First/Last Applic.	11 11	11 11	11 11	11 11	11 11	21 21
Trt-Eval Interval	21 DA-A	11 DA-A	11 DA-A	11 DA-A	11 DA-A	11 DA-A
Plant-Eval Interval	11 DP-1	11 DP-1	11 DP-1	11 DP-1	11 DP-1	21 DP-1
Days After Emergence	6 DE-1	6 DE-1	6 DE-1	6 DE-1	6 DE-1	16 DE-
Trt Treatment	Rate	Appl				
No. Name	Rate Unit	Code	1	2	3	4
1 UNTREATED	0.0 b		0.0 c	0.0 c	0.0 b	0.0 c
2 Sharpen	12.5 g ai/ha A		19.5 b	60.0 b	98.0 a	55.0 a
MSO	1 % v/v A					66.3 a
N-Pak AMS	5 % v/v A					12.5 c
3 Sharpen	12.5 g ai/ha A		100.0 a	86.3 a	89.5 a	87.5 a
Roundup PowerMAX	840 g ae/ha A					100.0 a
MSO	1 % v/v A					97.0 a
N-Pak AMS	5 % v/v A					
4 Sharpen	12.5 g ai/ha A		65.5 a	100.0 a	67.5 b	87.5 a
Roundup PowerMAX	840 g ae/ha A					62.5 a
Superb HC	0.5 % v/v A					90.3 a
N-Pak AMS	5 % v/v A					
5 Sharpen	12.5 g ai/ha A		98.8 a	100.0 a	98.3 a	46.8 a
MSO	1 % v/v A					100.0 a
Acidify ing Conditioner	A					96.5 a
6 Sharpen	12.5 g ai/ha A		100.0 a	97.5 a	94.5 a	71.3 a
Roundup PowerMAX	840 g ae/ha A					100.0 a
MSO	1 % v/v A					97.0 a
Acidify ing Conditioner	A					
7 Sharpen	12.5 g ai/ha A		99.3 a	100.0 a	97.0 a	79.5 a
Roundup PowerMAX	840 g ae/ha A					100.0 a
Superb HC	0.5 % v/v A					98.3 a
Acidify ing Conditioner	A					

Means followed by same letter do not significantly differ (P=0.05, Student-New man-Keuls)  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	AMBEL	XANST	IPOSS	GGGAN	ERICA	AMBEL
Pest Scientific Name	Ambrosia artem>	Xanthium strum>	Ipomoea sp.	Annual grasses	Conyza canadens>	Ambrosia artem>
Pest Name	Common ragweed	Common cockleb>	Morning glory	Annual grasses	Canada horsewe>	Common ragweed
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931
Rating Date	6-14-2011	6-14-2011	6-14-2011	6-14-2011	6-14-2011	6-24-2011
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Crop Stage Majority	VC	VC	VC	VC	VC	V2
Pest Stage Majority	1.5-8 IN	2-8 IN	2-4 IN	4 IN	1-3 IN	6 IN
Pest Density, Unit	10 YD2	3 YD2	3 YD2	30 YD2	1 YD2	5 YD2
Assessed By	RH/CB	RH/CB	RH/CB	RH/CB	RH/CB	RT/JR
Days After First/Last Applic.	11 11	11 11	11 11	11 11	11 11	21 21
Trt-Eval Interval	21 DA-A	11 DA-A	11 DA-A	11 DA-A	11 DA-A	11 DA-A
Plant-Eval Interval	11 DP-1	11 DP-1	11 DP-1	11 DP-1	11 DP-1	21 DP-1
Days After Emergence	6 DE-1	6 DE-1	6 DE-1	6 DE-1	6 DE-1	16 DE-

  

Trt	Treatment	Rate	Appl	1		2		3		4		5		6	
No.	Name	Rate	Unit	Code											
8	Sharpen	12.5 g ai/ha	A		100.0 a	96.3 a	100.0 a	57.5 a	100.0 a	99.0 a					
	MSO	1 % v/v	A												
	Basic Conditioner		A												
9	Sharpen	12.5 g ai/ha	A		98.8 a	97.5 a	92.5 a	90.0 a	100.0 a	98.6 a					
	Roundup PowerMAX	840 g ae/ha	A												
	MSO	1 % v/v	A												
	Basic Conditioner		A												
10	Sharpen	12.5 g ai/ha	A		100.0 a	97.5 a	100.0 a	81.3 a	100.0 a	97.0 a					
	Roundup PowerMAX	840 g ae/ha	A												
	Superb HC	0.5 % v/v	A												
	Basic Conditioner		A												
11	Sonic	147 g ai/ha	A		80.0 a	99.5 a	100.0 a	65.0 a	100.0 a	58.8 b					
	Durango DMA	840 g ae/ha	B												
	N-Pak AMS	2.5 % v/v	B												
12	Sonic	220 g ai/ha	A		80.0 a	98.8 a	98.8 a	58.8 a	100.0 a	66.3 b					
	Durango DMA	840 g ae/ha	B												
	N-Pak AMS	2.5 % v/v	B												
13	Durango DMA	840 g ae/ha	B		27.5 b	93.8 a	93.8 a	38.8 ab	72.5 a	0.0 c					
	FirstRate	17.7 g ai/ha	B												
	N-Pak AMS	2.5 % v/v	B												
	Durango DMA	840 g ae/ha	C												
	N-Pak AMS	2.5 % v/v	C												

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## Purdue University

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	AMBEL	XANST	IPOSS	GGGAN	ERICA	AMBEL
Pest Scientific Name	Ambrosia artem>	Xanthium strum>	Ipomoea sp.	Annual grasses	Conyza canaden>	Ambrosia artem>
Pest Name	Common ragweed	Common cockleb>	Morning glory	Annual grasses	Canada horsewe>	Common ragweed
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931
Rating Date	6-14-2011	6-14-2011	6-14-2011	6-14-2011	6-14-2011	6-24-2011
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Crop Stage Majority	VC	VC	VC	VC	VC	V2
Pest Stage Majority	1.5-8 IN	2-8 IN	2-4 IN	4 IN	1-3 IN	6 IN
Pest Density, Unit	10 YD2	3 YD2	3 YD2	30 YD2	1 YD2	5 YD2
Assessed By	RH/CB	RH/CB	RH/CB	RH/CB	RH/CB	RT/JR
Days After First/Last Applic.	11 11	11 11	11 11	11 11	11 11	21 21
Trt-Eval Interval	21 DA-A	11 DA-A	11 DA-A	11 DA-A	11 DA-A	11 DA-A
Plant-Eval Interval	11 DP-1	11 DP-1	11 DP-1	11 DP-1	11 DP-1	21 DP-1
Days After Emergence	6 DE-1	6 DE-1	6 DE-1	6 DE-1	6 DE-1	16 DE-
Trt Treatment	Rate	Appl				
No. Name	Rate Unit	Code	1	2	3	4
			5	6		
14 UNTREATED	0.0 b	0.0 c	0.0 c	0.0 b	0.0 b	0.0 c
LSD (P=.05)	26.15	19.65	15.13	32.20	22.08	17.29
Standard Deviation	18.30	13.75	10.59	22.53	15.45	12.10
CV	26.43	17.08	13.12	38.53	19.64	18.59
Bartlett's X2	40.747	48.48	34.29	13.315	1.111	55.411
P(Bartlett's X2)	0.001*	0.001*	0.001*	0.273	0.574	0.001*
Replicate F	0.393	1.199	0.484	0.858	2.316	0.537
Replicate Prob(F)	0.7590	0.3230	0.6952	0.4710	0.0907	0.6599
Treatment F	18.814	26.918	44.157	6.801	21.816	49.526
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

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

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	GGGAN	IPOSS	XANST	ERICA	AMBEL	ERICA			
Pest Scientific Name	Annual grasses	Ipomoea sp.	Xanthium strum>	Conyza canadens>	Ambrosia artem>	Conyza canadens>			
Pest Name	Annual grasses	Morning glory	Common cockleb>	Canada horsewee>	Common ragweed	Canada horsewee>			
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max			
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean			
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931			
Rating Date	6-24-2011	6-24-2011	6-24-2011	6-24-2011	7-7-2011	7-7-2011			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1			
Crop Stage Majority	V2	V2	V2	V2	V4/R1	V4/R1			
Pest Stage Majority	4 IN	3 IN	3 IN	3 IN	6 IN	3 IN			
Pest Density, Unit	30 YD2	8 YD2	2 YD2	2 YD2	8 YD2	2 YD2			
Assessed By	RT/JR	RT/JR	RT/JR	RT/JR	JR	JR			
Days After First/Last Applic.	21 21	21 21	21 21	21 21	34 8	34 8			
Trt-Eval Interval	11 DA-A	11 DA-A	11 DA-A	11 DA-A					
Plant-Eval Interval	21 DP-1	21 DP-1	21 DP-1	21 DP-1	34 DP-1	34 DP-1			
Days After Emergence	16 DE-	16 DE-	16 DE-	16 DE-	29 DE-	29 DE-			
Trt No.	Treatment Name	Rate	Appl Code	7	8	9	10	11	12
1	UNTREATED			0.0 d	0.0 f	0.0 b	0.0 d	0.0 c	0.0 b
2	Sharpen MSO N-Pak AMS	12.5 g ai/ha 1 % v/v 5 % v/v	A A A	27.5 cd	45.0 cde	47.5 a	17.5 cd	77.5 a	89.5 a
3	Sharpen Roundup PowerMAX MSO N-Pak AMS	12.5 g ai/ha 840 g ae/ha 1 % v/v 5 % v/v	A A A A	69.1 a	54.6 b-e	44.5 a	78.4 ab	100.0 a	85.0 a
4	Sharpen Roundup PowerMAX Superb HC N-Pak AMS	12.5 g ai/ha 840 g ae/ha 0.5 % v/v 5 % v/v	A A A A	70.0 a	20.0 ef	83.3 a	47.5 bc	97.5 a	56.3 a
5	Sharpen MSO Acidifying Conditioner	12.5 g ai/ha 1 % v/v A	A A A	26.3 cd	77.0 abc	90.0 a	96.8 a	100.0 a	100.0 a
6	Sharpen Roundup PowerMAX MSO Acidifying Conditioner	12.5 g ai/ha 840 g ae/ha 1 % v/v A	A A A A	68.8 a	51.3 b-e	57.5 a	95.0 a	100.0 a	97.0 a
7	Sharpen Roundup PowerMAX Superb HC Acidifying Conditioner	12.5 g ai/ha 840 g ae/ha 0.5 % v/v A	A A A A	62.5 ab	66.3 a-d	78.8 a	95.0 a	97.5 a	100.0 a

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	GGGAN	IPOSS	XANST	ERICA	AMBEL	ERICA
Pest Scientific Name	Annual grasses	Ipomoea sp.	Xanthium strum>	Conyza canaden>	Ambrosia artem>	Conyza canaden>
Pest Name	Annual grasses	Morning glory	Common cockleb>	Canada horsewe>	Common ragweed	Canada horsewe>
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931
Rating Date	6-24-2011	6-24-2011	6-24-2011	6-24-2011	7-7-2011	7-7-2011
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Crop Stage Majority	V2	V2	V2	V2	V4/R1	V4/R1
Pest Stage Majority	4 IN	3 IN	3 IN	3 IN	6 IN	3 IN
Pest Density, Unit	30 YD2	8 YD2	2 YD2	2 YD2	8 YD2	2 YD2
Assessed By	RT/JR	RT/JR	RT/JR	RT/JR	JR	JR
Days After First/Last Applic.	21 21	21 21	21 21	21 21	34 8	34 8
Trt-Eval Interval	11 DA-A	11 DA-A	11 DA-A	11 DA-A		
Plant-Eval Interval	21 DP-1	21 DP-1	21 DP-1	21 DP-1	34 DP-1	34 DP-1
Days After Emergence	16 DE-	16 DE-	16 DE-	16 DE-	29 DE-	29 DE-

  

Trt No.	Treatment Name	Rate	Unit	Appl Code	7	8	9	10	11	12
8	Sharpen	12.5 g ai/ha	A		31.3 c	81.3 abc	77.5 a	100.0 a	100.0 a	100.0 a
	MSO	1 % v/v	A							
	Basic Conditioner		A							
9	Sharpen	12.5 g ai/ha	A		62.4 ab	36.3 def	59.6 a	100.0 a	100.0 a	100.0 a
	Roundup PowerMAX	840 g ae/ha	A							
	MSO	1 % v/v	A							
	Basic Conditioner		A							
10	Sharpen	12.5 g ai/ha	A		61.3 ab	90.0 ab	64.3 a	98.8 a	100.0 a	100.0 a
	Roundup PowerMAX	840 g ae/ha	A							
	Superb HC	0.5 % v/v	A							
	Basic Conditioner		A							
11	Sonic	147 g ai/ha	A		38.8 bc	97.0 a	90.0 a	80.0 ab	98.8 a	80.0 a
	Durango DMA	840 g ae/ha	B							
	N-Pak AMS	2.5 % v/v	B							
12	Sonic	220 g ai/ha	A		25.0 cd	97.0 a	87.5 a	82.5 ab	92.5 a	95.0 a
	Durango DMA	840 g ae/ha	B							
	N-Pak AMS	2.5 % v/v	B							
13	Durango DMA	840 g ae/ha	B		0.0 d	0.0 f	0.0 b	0.0 d	60.0 b	60.0 a
	FirstRate	17.7 g ai/ha	B							
	N-Pak AMS	2.5 % v/v	B							
	Durango DMA	840 g ae/ha	C							
	N-Pak AMS	2.5 % v/v	C							

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

## Purdue University

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed		
Pest Code	GGGAN	IPOSS	XANST	ERICA	AMBEL	ERICA		
Pest Scientific Name	Annual grasses	Ipomoea sp.	Xanthium strum>	Conyza canaden>	Ambrosia artem>	Conyza canaden>		
Pest Name	Annual grasses	Morning glory	Common cockleb>	Canada horsewe>	Common ragweed	Canada horsewe>		
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA		
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY		
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max		
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean		
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931		
Rating Date	6-24-2011	6-24-2011	6-24-2011	6-24-2011	7-7-2011	7-7-2011		
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO		
Rating Unit	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1		
Crop Stage Majority	V2	V2	V2	V2	V4/R1	V4/R1		
Pest Stage Majority	4 IN	3 IN	3 IN	3 IN	6 IN	3 IN		
Pest Density, Unit	30 YD2	8 YD2	2 YD2	2 YD2	8 YD2	2 YD2		
Assessed By	RT/JR	RT/JR	RT/JR	RT/JR	JR	JR		
Days After First/Last Applic.	21 21	21 21	21 21	21 21	34 8	34 8		
Trt-Eval Interval	11 DA-A	11 DA-A	11 DA-A	11 DA-A				
Plant-Eval Interval	21 DP-1	21 DP-1	21 DP-1	21 DP-1	34 DP-1	34 DP-1		
Days After Emergence	16 DE-	16 DE-	16 DE-	16 DE-	29 DE-	29 DE-		
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	7	8	9	10	11	12
14 UNTREATED	0.0 d	0.0 f	0.0 b	0.0 d	0.0 c	0.0 b		
LSD (P=.05)	19.86	26.60	30.86	30.13	16.62	30.91		
Standard Deviation	13.90	18.62	21.59	21.08	11.63	21.63		
CV	35.85	36.42	38.74	33.11	14.49	28.49		
Bartlett's X2	9.08	18.559	11.862	28.315	29.949	17.638		
P(Bartlett's X2)	0.524	0.046*	0.294	0.001*	0.001*	0.007*		
Replicate F	5.631	1.213	2.717	0.360	0.822	1.101		
Replicate Prob(F)	0.0028	0.3184	0.0585	0.7823	0.4898	0.3603		
Treatment F	15.071	14.743	9.715	15.453	38.060	10.629		
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		

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

# Purdue University

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	IPOSS	GGGAN	XANST	AMBEL	ERICA	IPOSS	GGGAN
Pest Scientific Name	Ipomoea sp.	Annual grasses	Xanthium strum>	Ambrosia artem>	Conyza canadens>	Ipomoea sp.	Annual grasses
Pest Name	Morning glory	Annual grasses	Common cockleb>	Common ragweed	Canada horsewe>	Morning glory	Annual grasses
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931
Rating Date	7-7-2011	7-7-2011	7-7-2011	7-14-2011	7-14-2011	7-14-2011	7-14-2011
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1	1
Crop Stage Majority	V4/R1	V4/R1	V4/R1	R1-R2	R1-R2	R1-R2	R1-R2
Pest Stage Majority	4 IN	8 IN	4 IN	6-18 IN	1-10 IN	12 IN	18 IN
Pest Density, Unit	4 YD2	35 YD2	3 YD2	5 YD2	1.5 YD2	25 YD2	5 YD2
Assessed By	JR	JR	JR	PM	PM	PM	PM
Days After First/Last Applic.	34 8	34 8	34 8	41 15	41 15	41 15	41 15
Trt-Eval Interval							
Plant-Eval Interval	34 DP-1	34 DP-1	34 DP-1	41 DP-1	41 DP-1	41 DP-1	41 DP-1
Days After Emergence	29 DE-	29 DE-	29 DE-	36 DE-	36 DE-	36 DE-	36 DE-

  

Trt No.	Treatment Name	Rate	Appl Unit	Code	13	14	15	16	17	18	19
1	UNTREATED				0.0 b	0.0 c	0.0 b	0.0 c	0.0 c	0.0 b	0.0 b
2	Sharpen	12.5 g ai/ha	A		82.5 a	91.0 a	92.5 a				
	MSO	1 % v/v	A								
	N-Pak AMS	5 % v/v	A								
3	Sharpen	12.5 g ai/ha	A		91.3 a	96.8 a	92.0 a				
	Roundup PowerMAX	840 g ae/ha	A								
	MSO	1 % v/v	A								
	N-Pak AMS	5 % v/v	A								
4	Sharpen	12.5 g ai/ha	A		63.8 a	99.5 a	95.8 a				
	Roundup PowerMAX	840 g ae/ha	A								
	Superb HC	0.5 % v/v	A								
	N-Pak AMS	5 % v/v	A								
5	Sharpen	12.5 g ai/ha	A		94.5 a	92.5 a	100.0 a				
	MSO	1 % v/v	A								
	Acidifying Conditioner		A								
6	Sharpen	12.5 g ai/ha	A		66.3 a	97.8 a	93.3 a				
	Roundup PowerMAX	840 g ae/ha	A								
	MSO	1 % v/v	A								
	Acidifying Conditioner		A								
7	Sharpen	12.5 g ai/ha	A		77.5 a	98.3 a	97.5 a				
	Roundup PowerMAX	840 g ae/ha	A								
	Superb HC	0.5 % v/v	A								
	Acidifying Conditioner		A								

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

# Purdue University

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed		
Pest Code	IPOSS	GGGAN	XANST	AMBEL	ERICA	IPOSS	GGGAN		
Pest Scientific Name	Ipomoea sp.	Annual grasses	Xanthium strum>	Ambrosia artem>	Conyza canadens>	Ipomoea sp.	Annual grasses		
Pest Name	Morning glory	Annual grasses	Common cockleb>	Common ragweed	Canada horsewe>	Morning glory	Annual grasses		
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA		
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY		
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max		
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean		
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931		
Rating Date	7-7-2011	7-7-2011	7-7-2011	7-14-2011	7-14-2011	7-14-2011	7-14-2011		
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO		
Rating Unit	%	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1	1		
Crop Stage Majority	V4/R1	V4/R1	V4/R1	R1-R2	R1-R2	R1-R2	R1-R2		
Pest Stage Majority	4 IN	8 IN	4 IN	6-18 IN	1-10 IN	12 IN	18 IN		
Pest Density, Unit	4 YD2	35 YD2	3 YD2	5 YD2	1.5 YD2	25 YD2	5 YD2		
Assessed By	JR	JR	JR	PM	PM	PM	PM		
Days After First/Last Applic.	34 8	34 8	34 8	41 15	41 15	41 15	41 15		
Trt-Eval Interval									
Plant-Eval Interval	34 DP-1	34 DP-1	34 DP-1	41 DP-1	41 DP-1	41 DP-1	41 DP-1		
Days After Emergence	29 DE-	29 DE-	29 DE-	36 DE-	36 DE-	36 DE-	36 DE-		
Trt Treatment	Rate	Appl							
No. Name	Rate Unit	Code	13	14	15	16	17	18	19
8 Sharpen	12.5 g ai/ha	A	97.5 a	96.8 a	95.0 a				
MSO	1 % v/v	A							
Basic Conditioner		A							
9 Sharpen	12.5 g ai/ha	A	72.5 a	97.5 a	93.8 a				
Roundup PowerMAX	840 g ae/ha	A							
MSO	1 % v/v	A							
Basic Conditioner		A							
10 Sharpen	12.5 g ai/ha	A	91.3 a	96.3 a	80.8 a				
Roundup PowerMAX	840 g ae/ha	A							
Superb HC	0.5 % v/v	A							
Basic Conditioner		A							
11 Sonic	147 g ai/ha	A	95.0 a	91.8 a	97.0 a	96.3 a	100.0 a	95.0 a	94.5 a
Durango DMA	840 g ae/ha	B							
N-Pak AMS	2.5 % v/v	B							
12 Sonic	220 g ai/ha	A	97.5 a	92.5 a	92.5 a	92.0 a	99.5 a	92.0 a	96.3 a
Durango DMA	840 g ae/ha	B							
N-Pak AMS	2.5 % v/v	B							
13 Durango DMA	840 g ae/ha	B	86.3 a	81.8 b	84.3 a	77.5 b	96.5 b	83.3 a	90.0 a
FirstRate	17.7 g ai/ha	B							
N-Pak AMS	2.5 % v/v	B							
Durango DMA	840 g ae/ha	C							
N-Pak AMS	2.5 % v/v	C							

Means followed by same letter do not significantly differ (P=0.05, Student-Newman-Keuls)  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Purdue University

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed		
Pest Code	IPOSS	GGGAN	XANST	AMBEL	ERICA	IPOSS	GGGAN		
Pest Scientific Name	Ipomoea sp.	Annual grasses	Xanthium strum>	Ambrosia artem>	Conyza canadens>	Ipomoea sp.	Annual grasses		
Pest Name	Morning glory	Annual grasses	Common cockleb>	Common ragweed	Canada horsewe>	Morning glory	Annual grasses		
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA		
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY		
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max		
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean		
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931		
Rating Date	7-7-2011	7-7-2011	7-7-2011	7-14-2011	7-14-2011	7-14-2011	7-14-2011		
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO		
Rating Unit	%	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1	1		
Crop Stage Majority	V4/R1	V4/R1	V4/R1	R1-R2	R1-R2	R1-R2	R1-R2		
Pest Stage Majority	4 IN	8 IN	4 IN	6-18 IN	1-10 IN	12 IN	18 IN		
Pest Density, Unit	4 YD2	35 YD2	3 YD2	5 YD2	1.5 YD2	25 YD2	5 YD2		
Assessed By	JR	JR	JR	PM	PM	PM	PM		
Days After First/Last Applic.	34 8	34 8	34 8	41 15	41 15	41 15	41 15		
Trt-Eval Interval									
Plant-Eval Interval	34 DP-1	34 DP-1	34 DP-1	41 DP-1	41 DP-1	41 DP-1	41 DP-1		
Days After Emergence	29 DE-	29 DE-	29 DE-	36 DE-	36 DE-	36 DE-	36 DE-		
Trt Treatment	Rate	Appl							
No. Name	Rate Unit	Code	13	14	15	16	17	18	19
14 UNTREATED	0.0 b	0.0 c	0.0 b	0.0 c	0.0 c	0.0 b	0.0 b		
LSD (P=.05)	21.74	5.40	15.97	13.74	1.85	10.68	5.71		
Standard Deviation	15.21	3.78	11.17	8.92	1.19	6.93	3.71		
CV	20.97	4.67	14.04	16.78	2.01	12.82	6.6		
Bartlett's X2	33.05	17.356	26.084	1.73	2.568	0.376	1.821		
P(Bartlett's X2)	0.001*	0.098	0.004*	0.421	0.109	0.54	0.402		
Replicate F	0.903	1.377	0.636	1.833	1.006	0.198	1.722		
Replicate Prob(F)	0.4484	0.2642	0.5961	0.1949	0.4265	0.8956	0.2155		
Treatment F	18.463	334.840	37.234	120.826	8255.860	204.357	766.762		
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		

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

# Purdue University

Pest Type	W Weed		
Pest Code	XANST		
Pest Scientific Name	Xanthium strum>		
Pest Name	Common cockleb>		
Crop Code	GLXMA		
BBCH Scale	BSOY		
Crop Scientific Name	Glycine max		
Crop Name	Soybean		
Crop Variety	AG2931		
Rating Date	7-14-2011		
Rating Type	CONTRO		
Rating Unit	%		
Number of Subsamples	1		
Crop Stage Majority	R1-R2		
Pest Stage Majority	8 IN		
Pest Density, Unit	3 YD2		
Assessed By	PM		
Days After First/Last Applic.	41 15		
Trt-Eval Interval			
Plant-Eval Interval	41 DP-1		
Days After Emergence	36 DE-		
Trt No.	Treatment Name	Rate	Appl Code
		Rate Unit	
			20
1	UNTREATED		0.0 b
2	Sharpen	12.5 g ai/ha	A
	MSO	1 % v/v	A
	N-Pak AMS	5 % v/v	A
3	Sharpen	12.5 g ai/ha	A
	Roundup PowerMAX	840 g ae/ha	A
	MSO	1 % v/v	A
	N-Pak AMS	5 % v/v	A
4	Sharpen	12.5 g ai/ha	A
	Roundup PowerMAX	840 g ae/ha	A
	Superb HC	0.5 % v/v	A
	N-Pak AMS	5 % v/v	A
5	Sharpen	12.5 g ai/ha	A
	MSO	1 % v/v	A
	Acidifying Conditioner		A
6	Sharpen	12.5 g ai/ha	A
	Roundup PowerMAX	840 g ae/ha	A
	MSO	1 % v/v	A
	Acidifying Conditioner		A
7	Sharpen	12.5 g ai/ha	A
	Roundup PowerMAX	840 g ae/ha	A
	Superb HC	0.5 % v/v	A
	Acidifying Conditioner		A

Means followed by same letter do not significantly differ (P=0.05, Student-Newman-Keuls)  
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

# Purdue University

Pest Type	W Weed		
Pest Code	XANST		
Pest Scientific Name	Xanthium strum>		
Pest Name	Common cockleb>		
Crop Code	GLXMA		
BBCH Scale	BSOY		
Crop Scientific Name	Glycine max		
Crop Name	Soybean		
Crop Variety	AG2931		
Rating Date	7-14-2011		
Rating Type	CONTRO		
Rating Unit	%		
Number of Subsamples	1		
Crop Stage Majority	R1-R2		
Pest Stage Majority	8 IN		
Pest Density, Unit	3 YD2		
Assessed By	PM		
Days After First/Last Applic.	41 15		
Trt-Eval Interval			
Plant-Eval Interval	41 DP-1		
Days After Emergence	36 DE-		
Trt No.	Treatment Name	Rate	Appl Code
		Rate Unit	
			20
8	Sharpen	12.5 g ai/ha	A
	MSO	1 % v/v	A
	Basic Conditioner		A
9	Sharpen	12.5 g ai/ha	A
	Roundup PowerMAX	840 g ae/ha	A
	MSO	1 % v/v	A
	Basic Conditioner		A
10	Sharpen	12.5 g ai/ha	A
	Roundup PowerMAX	840 g ae/ha	A
	Superb HC	0.5 % v/v	A
	Basic Conditioner		A
11	Sonic	147 g ai/ha	A
	Durango DMA	840 g ae/ha	B
	N-Pak AMS	2.5 % v/v	B
12	Sonic	220 g ai/ha	A
	Durango DMA	840 g ae/ha	B
	N-Pak AMS	2.5 % v/v	B
13	Durango DMA	840 g ae/ha	B
	FirstRate	17.7 g ai/ha	B
	N-Pak AMS	2.5 % v/v	B
	Durango DMA	840 g ae/ha	C
	N-Pak AMS	2.5 % v/v	C

Means followed by same letter do not significantly differ (P=0.05, Student-Newman-Keuls)  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Purdue University

Pest Type	W Weed
Pest Code	XANST
Pest Scientific Name	Xanthium strum>
Pest Name	Common cockleb>
Crop Code	GLXMA
BBCH Scale	BSOY
Crop Scientific Name	Glycine max
Crop Name	Soybean
Crop Variety	AG2931
Rating Date	7-14-2011
Rating Type	CONTRO
Rating Unit	%
Number of Subsamples	1
Crop Stage Majority	R1-R2
Pest Stage Majority	8 IN
Pest Density, Unit	3 YD2
Assessed By	PM
Days After First/Last Applic.	41 15
Trt-Eval Interval	
Plant-Eval Interval	41 DP-1
Days After Emergence	36 DE-
Trt Treatment	Rate Appl
No. Name	Rate Unit Code
14 UNTREATED	20
	0.0 b
LSD (P=.05)	7.71
Standard Deviation	5.01
CV	9.05
Bartlett's X2	4.523
P(Bartlett's X2)	0.104
Replicate F	1.035
Replicate Prob(F)	0.4121
Treatment F	407.726
Treatment Prob(F)	0.0001

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



## Purdue University

### Kixor - Influence of glyphosate and additive on spray solution pH and efficacy/Dow - one and two pass systems

Trial ID: 11S-SEP-NTS-10      Protocol ID: 11S-SEP-NTS-10  
 Location: SEPAC              Study Director: Paul Marquardt  
 Project ID: 11S-SEP-NTS-10      Investigator: Dr. Bill Johnson  
    Sponsor Contact: Gery Welker/Jeff Ellis

#### Pest Type

W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop

#### Pest Code

AMBEL, Ambrosia artemisiifolia, = US

XANST, Xanthium strumarium, = US

IPOSS, Ipomoea sp., = US

GGGAN, Annual grasses, = US

ERICA, Conyza canadensis, = US

#### Crop Code

GLXMA, BSOY, Glycine max., = US

#### Rating Type

CONTRO = control / burndown or knockdown

#### Rating Unit

% = percent

YD2 = per square yard

#### Plant-Eval Interval

11 DP-1 = 1 GLXMA 6-3-2011

21 DP-1 = 1 GLXMA 6-3-2011

34 DP-1 = 1 GLXMA 6-3-2011

41 DP-1 = 1 GLXMA 6-3-2011