

# Purdue University

## Soybean Marestail Timing Protocol: Evaluate tank-mix and timing options for improved marestail control with Kixor

Trial ID: 11S-SEP-NTS-03      Protocol ID: 11S-SEP-NTS-03  
 Location: SEPAC      Study Director: Paul Marquardt  
 Project ID: 11S-SEP-NTS-03      Investigator: Dr. Bill Johnson  
 Sponsor Contact: Gery Welker

### 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:** 3-15-2011

### Trial Location

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

### 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:** wji@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  
**BBCH Scale:** BSOY      **Planting Date:** 6-14-2011  
**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:** 78      F  
**Soil Moisture:** MOIST      **Emergence Date:** 6-19-2011  
**Harvest Date:** 10-25-2011      **Harvest Equipment:** Gleaner F3 Combine  
**Harvested Width, Unit:** 10      FT      **Harvested Length, Unit:** 25      FT  
**% Standard Moisture:** 13.0      **Moisture Meter:** Carter 3" blade  
**Weighing Equipment:** Harvestmaster400

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### Pest Description

**Pest 1 Type:** W **Code:** ERICA *Conyza canadensis*  
**Common Name:** Canada horseweed

**Pest 2 Type:** W **Code:** RANAB *Ranunculus abortivus*  
**Common Name:** Smallflower buttercup

**Pest 3 Type:** W **Code:** TAROF *Taraxacum officinale*  
**Common Name:** Common dandelion

**Pest 4 Type:** W **Code:** AMBEL *Ambrosia artemisiifolia*  
**Common Name:** Common ragweed

**Pest 5 Type:** W **Code:** ALLVI *Allium vineale*  
**Common Name:** Wild garlic

**Pest 6 Type:** W **Code:** BROSS *Bromus* sp.  
**Common Name:** Bromegrass

**Pest 7 Type:** W **Code:** VERPG *Veronica peregrina*  
**Common Name:** Purslane speedwell

**Pest 8 Type:** W **Code:** PLARU *Plantago rugelii*  
**Common Name:** Blackseed plantain

**Pest 9 Type:** W **Code:** POAAN *Poa annua*  
**Common Name:** Annual bluegrass

**Pest10 Type:** W **Code:** XANST *Xanthium strumarium*  
**Common Name:** Common cocklebur

**Pest11 Type:** W **Code:** DIGSA *Digitaria sanguinalis*  
**Common Name:** Large crabgrass

**Pest12 Type:** W **Code:** SETFA *Setaria faberi*  
**Common Name:** Giant foxtail

**Pest13 Type:** W **Code:** ECHCG *Echinochloa crus-galli*  
**Common Name:** Common barnyardgrass

**Pest14 Type:** W **Code:** SOLCA *Solanum carolinense*  
**Common Name:** Horsenettle

**Pest15 Type:** W **Code:** IPOSS *Ipomoea* sp.  
**Common Name:** Morning glory

### Site and Design

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

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## Application Description

	A	B	C
<b>Application Date:</b>	5-5-2011	6-14-2011	8-2-2011
<b>Time of Day:</b>	11 AM	2 PM	12 PM
<b>Application Method:</b>	SPRAY	SPRAY	SPRAY
<b>Application Timing:</b>	EARPRE	ATPLAN	POSPOS
<b>Application Placement:</b>	FOLIAR	FOLIAR	FOLIAR
<b>Applied By:</b>	RT	PM	PM
<b>Air Temperature, Unit:</b>	63 F	81 F	92 F
<b>% Relative Humidity:</b>	40	40	60
<b>Wind Velocity, Unit:</b>	5 MPH	3.6 MPH	2 MPH
<b>Wind Direction:</b>	S	SW	NW
<b>Dew Presence (Y/N):</b>	N no	N no	N no
<b>Soil Temperature, Unit:</b>	51 F	78 F	86 F
<b>Soil Moisture:</b>	WET	MOIST	DRY
<b>% Cloud Cover:</b>	5	90	10

## 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
<b>Stage Majority, Percent:</b>		00 100	62 100
<b>Stage Minimum, Percent:</b>			62 100

## Pest Stage At Each Application

	A	B	C
<b>Pest 1 Code, Type, Scale:</b>	ERICA W	ERICA W	ERICA W
<b>Stage Majority, Percent:</b>	11 100	33 100	51 100
<b>Height, Unit:</b>	1 IN	4.5 IN	24 IN
<b>Height Minimum, Maximum:</b>	0 1	3 6	15 30
<b>Density, Unit:</b>	1.5 YD2	13 YD2	15 YD2
<b>Pest 2 Code, Type, Scale:</b>	RANAB W	RANAB W	RANAB W
<b>Stage Majority, Percent:</b>	11 100		
<b>Height, Unit:</b>	2 IN		
<b>Height Minimum, Maximum:</b>	0 4		
<b>Density, Unit:</b>	10 YD2		
<b>Pest 3 Code, Type, Scale:</b>	TAROF W	TAROF W	TAROF W
<b>Stage Majority, Percent:</b>	65 100	65 100	
<b>Height, Unit:</b>	5 IN	6 IN	
<b>Height Minimum, Maximum:</b>	0 10	1 12	
<b>Density, Unit:</b>	2.5 YD2	5.5 YD2	
<b>Pest 4 Code, Type, Scale:</b>	AMBEL W	AMBEL W	AMBEL W
<b>Stage Majority, Percent:</b>	12 100	34 100	51 100

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Height, Unit:	1.5 IN	6 IN	30 IN
Height Minimum, Maximum:	0 3	2 10	20 40
Density, Unit:	10 YD2	13 YD2	5 YD2
Pest 5 Code, Type, Scale:	ALLVI W	ALLVI W	ALLVI W
Stage Majority, Percent:	40 100		
Height, Unit:	12 IN		
Height Minimum, Maximum:	6 18		
Density, Unit:	55 YD2		
Pest 6 Code, Type, Scale:	BROSS W	BROSS W	BROSS W
Stage Majority, Percent:	13 100	65 100	
Height, Unit:	2.5 IN	15 IN	
Height Minimum, Maximum:	1 5	12 18	
Density, Unit:	50 YD2	55 YD2	
Pest 7 Code, Type, Scale:	VERPG W	VERPG W	VERPG W
Stage Majority, Percent:	32 100		
Height, Unit:	2 IN		
Height Minimum, Maximum:	1 3		
Density, Unit:	10 YD2		
Pest 8 Code, Type, Scale:	PLARU W	PLARU W	PLARU W
Stage Majority, Percent:	30 100		
Height, Unit:	1.5 IN		
Height Minimum, Maximum:	0 3		
Density, Unit:	5 YD2		
Pest 9 Code, Type, Scale:	POAAN W	POAAN W	POAAN W
Stage Majority, Percent:	65 100		
Height, Unit:	3.5 IN		
Height Minimum, Maximum:	3 4		
Density, Unit:	10 YD2		
Pest10 Code, Type, Scale:	XANST W	XANST W	XANST W
Stage Majority, Percent:		33 100	36 100
Height, Unit:		3.5 IN	18 IN
Height Minimum, Maximum:		1 6	10 24
Density, Unit:		7.5 YD2	12 YD2
Pest11 Code, Type, Scale:	DIGSA W	DIGSA W	DIGSA W
Stage Majority, Percent:		11 100	
Height, Unit:		1.5 IN	
Height Minimum, Maximum:		1 2	
Density, Unit:		50 YD2	
Pest12 Code, Type, Scale:	SETFA W	SETFA W	SETFA W
Stage Majority, Percent:		13 100	
Height, Unit:		5 IN	
Height Minimum, Maximum:		1 10	
Density, Unit:		25 YD2	

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<b>Pest13 Code, Type, Scale:</b>	ECHCG W	ECHCG W	ECHCG W
<b>Stage Majority, Percent:</b>		13 100	
<b>Height, Unit:</b>		5 IN	
<b>Height Minimum, Maximum:</b>		1 10	
<b>Density, Unit:</b>		25 YD2	
<b>Pest14 Code, Type, Scale:</b>	SOLCA W	SOLCA W	SOLCA W
<b>Stage Majority, Percent:</b>		33 100	
<b>Height, Unit:</b>		3 IN	
<b>Height Minimum, Maximum:</b>		2 6	
<b>Density, Unit:</b>		2 YD2	
<b>Pest15 Code, Type, Scale:</b>	IPOSS W	IPOSS W	IPOSS W

### 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>	8	8	8
<b>Boom Length, Unit:</b>	10 FT	10 FT	10 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

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## Soybean Marestalk Timing Protocol: Evaluate tank-mix and timing options for improved marestalk control with Kixor

Trial ID: 11S-SEP-NTS-03      Protocol ID: 11S-SEP-NTS-03  
 Location: SEPAC                      Study Director: Paul Marquardt  
 Project ID: 11S-SEP-NTS-03      Investigator: Dr. Bill Johnson  
 Sponsor Contact: Gery Welker

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	ERICA	AMBEL	BROSE	ERICA	AMBEL	XANST
Pest Scientific Name	Conyza canadensis	Ambrosia artemisiifolia	Bromus setiflorus	Conyza canadensis	Ambrosia artemisiifolia	Xanthium strumarium
Pest Name	Canada horseweed	Common ragweed	Cheat	Canada horseweed	Common ragweed	Common cocklebur
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	5-20-2011	5-20-2011	5-20-2011	6-24-2011	6-24-2011	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
Pest Stage Majority	0-2"	1-3"	6-8"	1-8 IN	1-12 IN	1-8 IN
Pest Density, Unit	3 YD2	13.5YD2	50 YD2	5 YD2	13 YD2	27.5YD2
Assessed By	PM	PM	PM	PM	PM	PM
Days After First/Last Applic.	15 15	15 15	15 15	50 10	50 10	50 10
Plant-Eval Interval	-25 DP-1	-25 DP-1	-25 DP-1	10 DP-1	10 DP-1	10 DP-1
Days After Emergence	-30 DE	-30 DE	-30 DE	5 DE-1	5 DE-1	5 DE-1
ARM Action Codes						
Number of Decimals						
Trt No.	1	2	3	4	5	6
Treatment Name	1 UNTREATED					
Rate	0.0 b	0.0 b	0.0 c	0.0 b	0.000 c	0.0 d
Rate Unit						
Appl Code						
2 Roundup Original	100.0 a	100.0 a	97.0 b	81.5 a	87.500 a	5.0 d
2,4-D Ester						
NIS						
N-Pak AMS						
Roundup Original						
NIS						
N-Pak AMS						
3 Sharpen	100.0 a	100.0 a	99.5 a	99.5 a	37.745 b	15.0 d
Roundup Original						
MISO						
N-Pak AMS						
Roundup Original						
NIS						
N-Pak AMS						
4 Sharpen	100.0 a	100.0 a	100.0 a	99.5 a	98.250 a	43.8 c
Roundup Original						
MISO						
N-Pak AMS						
Roundup Original						
NIS						
N-Pak AMS						

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.

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed		
Pest Code	ERICA	AMBEL	BROSE	ERICA	AMBEL	XANST		
Pest Scientific Name	Conyza canadens>	Ambrosia artem>	Bromus secalin>	Conyza canadens>	Ambrosia artem>	Xanthium strum>		
Pest Name	Canada horsewee>	Common ragwee>	Cheat	Canada horsewee>	Common ragweed	Common cockleb>		
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	5-20-2011	5-20-2011	5-20-2011	6-24-2011	6-24-2011	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		
Pest Stage Majority	0-2"	1-3"	6-8"	1-8 IN	1-12 IN	1-8 IN		
Pest Density, Unit	3 YD2	13.5YD2	50 YD2	5 YD2	13 YD2	27.5YD2		
Assessed By	PM	PM	PM	PM	PM	PM		
Days After First/Last Applic.	15 15	15 15	15 15	50 10	50 10	50 10		
Plant-Eval Interval	-25 DP-1	-25 DP-1	-25 DP-1	10 DP-1	10 DP-1	10 DP-1		
Days After Emergence	-30 DE	-30 DE	-30 DE	5 DE-1	5 DE-1	5 DE-1		
ARM Action Codes								
Number of Decimals								
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	1	2	3	4	5	6
5 Verdict	244 g ai/ha	A	100.0 a	100.0 a	100.0 a	99.5 a	98.750 a	37.5 c
Roundup Original	840 g ae/ha	A						
MSO	1.0 % v/v	A						
N-Pak AMS	5 % v/v	A						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
6 Sharpen	25 g ai/ha	A	100.0 a	100.0 a	100.0 a	100.0 a	100.000 a	32.5 c
2,4-D Ester	560 g ai/ha	A						
Roundup Original	840 g ae/ha	A						
MSO	1.0 % v/v	A						
N-Pak AMS	5 % v/v	A						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
7 Valor XLT	85 g ai/ha	A	100.0 a	100.0 a	100.0 a	99.5 a	99.500 a	66.3 b
2,4-D Ester	560 g ai/ha	A						
Roundup Original	840 g ae/ha	A						
MSO	1.0 % v/v	A						
N-Pak AMS	5 % v/v	A						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
8 Sharpen	25 g ai/ha	B	0.0 b	0.0 b	0.0 c	100.0 a	100.000 a	98.8 a
Roundup Original	840 g ae/ha	B						
MSO	1.0 % v/v	B						
N-Pak AMS	5 % v/v	B						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	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.

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed		
Pest Code	ERICA	AMBEL	BROSE	ERICA	AMBEL	XANST		
Pest Scientific Name	Conyza canadens>	Ambrosia artem>	Bromus secalin>	Conyza canadens>	Ambrosia artem>	Xanthium strum>		
Pest Name	Canada horsewe>	Common ragwee>	Cheat	Canada horsewe>	Common ragweed	Common cockleb>		
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	5-20-2011	5-20-2011	5-20-2011	6-24-2011	6-24-2011	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		
Pest Stage Majority	0-2"	1-3"	6-8"	1-8 IN	1-12 IN	1-8 IN		
Pest Density, Unit	3 YD2	13.5YD2	50 YD2	5 YD2	13 YD2	27.5YD2		
Assessed By	PM	PM	PM	PM	PM	PM		
Days After First/Last Applic.	15 15	15 15	15 15	50 10	50 10	50 10		
Plant-Eval Interval	-25 DP-1	-25 DP-1	-25 DP-1	10 DP-1	10 DP-1	10 DP-1		
Days After Emergence	-30 DE	-30 DE	-30 DE	5 DE-1	5 DE-1	5 DE-1		
ARM Action Codes								
Number of Decimals								
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	1	2	3	4	5	6
9 Sharpen	37.5 g ai/ha	B	0.0 b	0.0 b	0.0 c	100.0 a	100.000 a	100.0 a
Roundup Original	840 g ae/ha	B						
MISO	1.0 % v/v	B						
N-Pak AMS	5 % v/v	B						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
10 Verdict	244 g ai/ha	B	0.0 b	0.0 b	0.0 c	100.0 a	100.000 a	100.0 a
Roundup Original	840 g ae/ha	B						
MISO	1.0 % v/v	B						
N-Pak AMS	5 % v/v	B						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
11 Authority First	147 g ai/ha	B	0.0 b	0.0 b	0.0 c	99.5 a	97.000 a	98.8 a
Roundup Original	840 g ae/ha	B						
MISO	1.0 % v/v	B						
N-Pak AMS	5 % v/v	B						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
12 UNTREATED			0.0 b	0.0 b	0.0 c	0.0 b	0.000 c	0.0 d
LSD (P=.05)	0.00	0.00	1.08	14.36	21.8121	16.87		
Standard Deviation	0.00	0.00	0.75	9.94	15.1062	11.68		
CV	0.0	0.0	1.51	12.19	19.73	23.46		
Bartlett's X2	0.0	0.0	2.112	70.131	50.092	20.971		
P(Bartlett's X2)	.	.	0.146	0.001*	0.001*	0.004*		
Replicate F	0.000	0.000	1.430	0.983	1.757	2.011		
Replicate Prob(F)	1.0000	1.0000	0.2515	0.4125	0.1745	0.1315		
Treatment F	0.000	0.000	19151.504	59.859	27.813	50.025		
Treatment Prob(F)	1.0000	1.0000	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		ERICA	AMBEL	GGGAN	XANST			
Pest Scientific Name	Annual grasses		Conyza canadensis	Ambrosia artemisiifolia	Annual grasses	Xanthium strumarium			
Pest Name	Annual grasses		Canada horseweed	Common ragweed	Annual grasses	Common cocklebur			
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	6-24-2011	6-29-2011	6-29-2011	6-29-2011	6-29-2011	6-29-2011	8-2-2011		
Rating Type	CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN		
Rating Unit	%	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1	1		
Crop Stage Majority	VC	V1	V1	V1	V1	V1	R2		
Pest Stage Majority	1-10 IN		3 IN	12 IN	6 IN	6 IN			
Pest Density, Unit	80 YD2		15 YD2	5 YD2	50 YD2	12 YD2			
Assessed By	PM	JR	JR	JR	JR	JR	PM		
Days After First/Last Applic.	50 10	55 15	55 15	55 15	55 15	55 15	89 49		
Plant-Eval Interval	10 DP-1	15 DP-1	15 DP-1	15 DP-1	15 DP-1	15 DP-1	49 DP-1		
Days After Emergence	5 DE-1	10 DE-	10 DE-	10 DE-	10 DE-	10 DE-	44 DE-		
ARM Action Codes									
Number of Decimals									
Trt Treatment	Rate	Appl							
No. Name	Rate Unit	Code	7	8	9	10	11	12	13
1 UNTREATED			0.0 d	0.0 a	0.0 b	0.0 b	0.0 c	0.0 d	0.0 a
2 Roundup Original	840 g ae/ha	A	25.0 c	0.5 a	78.8 a	72.5 a	20.0 c	7.5 d	0.5 a
2,4-D Ester	560 g ai/ha	A							
NIS	0.25 % v/v	A							
N-Pak AMS	5 % v/v	A							
Roundup Original	840 g ae/ha	C							
NIS	0.25 % v/v	C							
N-Pak AMS	5 % v/v	C							
3 Sharpen	25 g ai/ha	A	25.0 c	0.0 a	100.0 a	57.5 a	21.3 c	26.3 cd	0.0 a
Roundup Original	840 g ae/ha	A							
MSO	1.0 % v/v	A							
N-Pak AMS	5 % v/v	A							
Roundup Original	840 g ae/ha	C							
NIS	0.25 % v/v	C							
N-Pak AMS	5 % v/v	C							
4 Sharpen	37.5 g ai/ha	A	10.0 cd	0.0 a	100.0 a	77.5 a	22.5 c	35.0 bc	0.0 a
Roundup Original	840 g ae/ha	A							
MSO	1.0 % v/v	A							
N-Pak AMS	5 % v/v	A							
Roundup Original	840 g ae/ha	C							
NIS	0.25 % v/v	C							
N-Pak AMS	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				
Pest Code	GGGAN		ERICA	AMBEL	GGGAN	XANST				
Pest Scientific Name	Annual grasses		Conyza canadensis	Ambrosia artem	Annual grasses	Xanthium strum				
Pest Name	Annual grasses		Canada horsewee	Common ragweed	Annual grasses	Common cockleb				
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	6-24-2011	6-29-2011	6-29-2011	6-29-2011	6-29-2011	6-29-2011	8-2-2011			
Rating Type	CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN			
Rating Unit	%	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1	1			
Crop Stage Majority	VC	V1	V1	V1	V1	V1	R2			
Pest Stage Majority	1-10 IN		3 IN	12 IN	6 IN	6 IN				
Pest Density, Unit	80 YD2		15 YD2	5 YD2	50 YD2	12 YD2				
Assessed By	PM	JR	JR	JR	JR	JR	PM			
Days After First/Last Applic.	50 10	55 15	55 15	55 15	55 15	55 15	89 49			
Plant-Eval Interval	10 DP-1	15 DP-1	15 DP-1	15 DP-1	15 DP-1	15 DP-1	49 DP-1			
Days After Emergence	5 DE-1	10 DE-	10 DE-	10 DE-	10 DE-	10 DE-	44 DE-			
ARM Action Codes										
Number of Decimals										
Trt No.	Treatment Name	Rate	Appl Unit	7	8	9	10	11	12	13
5	Verdict	244 g ai/ha	A	18.8 cd	0.3 a	100.0 a	100.0 a	20.0 c	25.0 cd	0.3 a
	Roundup Original	840 g ae/ha	A							
	MSO	1.0 % v/v	A							
	N-Pak AMS	5 % v/v	A							
	Roundup Original	840 g ae/ha	C							
	NIS	0.25 % v/v	C							
	N-Pak AMS	5 % v/v	C							
6	Sharpen	25 g ai/ha	A	30.0 c	0.0 a	100.0 a	95.5 a	10.0 c	20.0 cd	0.0 a
	2,4-D Ester	560 g ai/ha	A							
	Roundup Original	840 g ae/ha	A							
	MSO	1.0 % v/v	A							
	N-Pak AMS	5 % v/v	A							
	Roundup Original	840 g ae/ha	C							
	NIS	0.25 % v/v	C							
	N-Pak AMS	5 % v/v	C							
7	Valor XLT	85 g ai/ha	A	67.5 b	0.5 a	75.0 a	100.0 a	58.8 b	52.5 b	0.5 a
	2,4-D Ester	560 g ai/ha	A							
	Roundup Original	840 g ae/ha	A							
	MSO	1.0 % v/v	A							
	N-Pak AMS	5 % v/v	A							
	Roundup Original	840 g ae/ha	C							
	NIS	0.25 % v/v	C							
	N-Pak AMS	5 % v/v	C							
8	Sharpen	25 g ai/ha	B	95.3 a	0.0 a	100.0 a	100.0 a	94.0 a	92.0 a	0.0 a
	Roundup Original	840 g ae/ha	B							
	MSO	1.0 % v/v	B							
	N-Pak AMS	5 % v/v	B							
	Roundup Original	840 g ae/ha	C							
	NIS	0.25 % v/v	C							
	N-Pak AMS	5 % v/v	C							

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 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		
Pest Code	GGGAN		ERICA		AMBEL	GGGAN	XANST		
Pest Scientific Name	Annual grasses		Conyza canadensis		Ambrosia artem	Annual grasses	Xanthium strum		
Pest Name	Annual grasses		Canada horsewee		Common ragweed	Annual grasses	Common cockleb		
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	
Rating Date	6-24-2011	6-29-2011	6-29-2011	6-29-2011	6-29-2011	6-29-2011	6-29-2011	8-2-2011	
Rating Type	CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN	
Rating Unit	%	%	%	%	%	%	%	%	
Number of Subsamples	1	1	1	1	1	1	1	1	
Crop Stage Majority	VC	V1	V1	V1	V1	V1	V1	R2	
Pest Stage Majority	1-10 IN		3 IN		12 IN	6 IN	6 IN		
Pest Density, Unit	80 YD2		15 YD2		5 YD2	50 YD2	12 YD2		
Assessed By	PM	JR	JR	JR	JR	JR	JR	PM	
Days After First/Last Applic.	50 10	55 15	55 15	55 15	55 15	55 15	55 15	89 49	
Plant-Eval Interval	10 DP-1	15 DP-1	15 DP-1	15 DP-1	15 DP-1	15 DP-1	15 DP-1	49 DP-1	
Days After Emergence	5 DE-1	10 DE-	10 DE-	10 DE-	10 DE-	10 DE-	10 DE-	44 DE-	
ARM Action Codes									
Number of Decimals									
Trt Treatment	Rate	Appl							
No. Name	Rate Unit	Code	7	8	9	10	11	12	13
9 Sharpen	37.5 g ai/ha	B	96.0 a	0.0 a	100.0 a	100.0 a	95.8 a	94.5 a	0.0 a
Roundup Original	840 g ae/ha	B							
MSO	1.0 % v/v	B							
N-Pak AMS	5 % v/v	B							
Roundup Original	840 g ae/ha	C							
NIS	0.25 % v/v	C							
N-Pak AMS	5 % v/v	C							
10 Verdict	244 g ai/ha	B	96.0 a	0.3 a	100.0 a	100.0 a	95.3 a	95.0 a	0.3 a
Roundup Original	840 g ae/ha	B							
MSO	1.0 % v/v	B							
N-Pak AMS	5 % v/v	B							
Roundup Original	840 g ae/ha	C							
NIS	0.25 % v/v	C							
N-Pak AMS	5 % v/v	C							
11 Authority First	147 g ai/ha	B	97.3 a	0.0 a	100.0 a	94.0 a	96.5 a	100.0 a	0.0 a
Roundup Original	840 g ae/ha	B							
MSO	1.0 % v/v	B							
N-Pak AMS	5 % v/v	B							
Roundup Original	840 g ae/ha	C							
NIS	0.25 % v/v	C							
N-Pak AMS	5 % v/v	C							
12 UNTREATED			0.0 d	0.0 a	0.0 b	0.0 b	0.0 c	0.0 d	0.0 a
LSD (P=.05)			15.70	0.58	20.89	29.57	17.14	18.03	0.58
Standard Deviation			10.87	0.40	14.46	20.48	11.87	12.49	0.40
CV			23.27	319.09	18.2	27.4	26.68	27.36	319.09
Bartlett's X2			23.135	2.176	0.432	12.929	32.515	13.116	2.176
P(Bartlett's X2)			0.006*	0.537	0.511	0.012*	0.001*	0.108	0.537
Replicate F			0.671	0.524	1.616	1.091	3.508	3.705	0.524
Replicate Prob(F)			0.5761	0.6689	0.2045	0.3667	0.0259	0.0211	0.6689
Treatment F			55.109	1.000	27.848	13.417	46.270	40.033	1.000
Treatment Prob(F)			0.0001	0.4671	0.0001	0.0001	0.0001	0.0001	0.4671

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# Purdue University

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed							
Pest Code	ERICA	AMBEL	GGGAN	XANST	ERICA	AMBEL							
Pest Scientific Name	Conyza canadensis	Ambrosia artemisiifolia	Annual grasses	Xanthium strumarium	Conyza canadensis	Ambrosia artemisiifolia							
Pest Name	Canada horseweed	Common ragweed	Annual grasses	Common cocklebur	Canada horseweed	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	8-2-2011	8-2-2011	8-2-2011	8-2-2011	8-25-2011	8-25-2011							
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO							
Rating Unit	%	%	%	%	%	%							
Number of Subsamples	1	1	1	1	1	1							
Crop Stage Majority	R2	R2	R2	R2	R5	R5							
Pest Stage Majority	24 IN	36 IN	24 IN	36 IN	36 IN	48 IN							
Pest Density, Unit	15 YD2	5 YD2	50 YD2	12 YD2	15 YD2	5 YD2							
Assessed By	PM	PM	PM	PM	PM	PM							
Days After First/Last Applic.	89 49	89 49	89 49	89 49	112 23	112 23							
Plant-Eval Interval	49 DP-1	49 DP-1	49 DP-1	49 DP-1	72 DP-1	72 DP-1							
Days After Emergence	44 DE-	44 DE-	44 DE-	44 DE-	67 DE-	67 DE-							
ARM Action Codes													
Number of Decimals													
Trt Treatment	Rate	Appl											
No. Name	Rate Unit	Code	14	15	16	17	18	19					
1 UNTREATED	0.0 b		0.0 b		0.0 c		0.0 d		0.0 b				
2 Roundup Original	840 g ae/ha A		78.8 a		72.5 a		20.0 c		7.5 d		100.0 a		100.0 a
2,4-D Ester	560 g ai/ha A												
NIS	0.25 % v/v A												
N-Pak AMS	5 % v/v A												
Roundup Original	840 g ae/ha C												
NIS	0.25 % v/v C												
N-Pak AMS	5 % v/v C												
3 Sharpen	25 g ai/ha A		100.0 a		57.5 a		21.3 c		26.3 cd		100.0 a		100.0 a
Roundup Original	840 g ae/ha A												
MSO	1.0 % v/v A												
N-Pak AMS	5 % v/v A												
Roundup Original	840 g ae/ha C												
NIS	0.25 % v/v C												
N-Pak AMS	5 % v/v C												
4 Sharpen	37.5 g ai/ha A		100.0 a		77.5 a		22.5 c		35.0 bc		100.0 a		100.0 a
Roundup Original	840 g ae/ha A												
MSO	1.0 % v/v A												
N-Pak AMS	5 % v/v A												
Roundup Original	840 g ae/ha C												
NIS	0.25 % v/v C												
N-Pak AMS	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		
Pest Code	ERICA	AMBEL	GGGAN	XANST	ERICA	AMBEL		
Pest Scientific Name	Conyza canadens>	Ambrosia artem>	Annual grasses	Xanthium strum>	Conyza canadens>	Ambrosia artem>		
Pest Name	Canada horsewee>	Common ragwee	Annual grasses	Common cockleb>	Canada horsewee>	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	8-2-2011	8-2-2011	8-2-2011	8-2-2011	8-25-2011	8-25-2011		
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO		
Rating Unit	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1		
Crop Stage Majority	R2	R2	R2	R2	R5	R5		
Pest Stage Majority	24 IN	36 IN	24 IN	36 IN	36 IN	48 IN		
Pest Density, Unit	15 YD2	5 YD2	50 YD2	12 YD2	15 YD2	5 YD2		
Assessed By	PM	PM	PM	PM	PM	PM		
Days After First/Last Applic.	89 49	89 49	89 49	89 49	112 23	112 23		
Plant-Eval Interval	49 DP-1	49 DP-1	49 DP-1	49 DP-1	72 DP-1	72 DP-1		
Days After Emergence	44 DE-	44 DE-	44 DE-	44 DE-	67 DE-	67 DE-		
ARM Action Codes								
Number of Decimals								
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	14	15	16	17	18	19
5 Verdict	244 g ai/ha	A	100.0 a	100.0 a	20.0 c	25.0 cd	100.0 a	100.0 a
Roundup Original	840 g ae/ha	A						
MSO	1.0 % v/v	A						
N-Pak AMS	5 % v/v	A						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
6 Sharpen	25 g ai/ha	A	100.0 a	95.5 a	10.0 c	20.0 cd	100.0 a	100.0 a
2,4-D Ester	560 g ai/ha	A						
Roundup Original	840 g ae/ha	A						
MSO	1.0 % v/v	A						
N-Pak AMS	5 % v/v	A						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
7 Valor XLT	85 g ai/ha	A	75.0 a	100.0 a	58.8 b	52.5 b	100.0 a	100.0 a
2,4-D Ester	560 g ai/ha	A						
Roundup Original	840 g ae/ha	A						
MSO	1.0 % v/v	A						
N-Pak AMS	5 % v/v	A						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	5 % v/v	C						
8 Sharpen	25 g ai/ha	B	100.0 a	100.0 a	94.0 a	92.0 a	100.0 a	100.0 a
Roundup Original	840 g ae/ha	B						
MSO	1.0 % v/v	B						
N-Pak AMS	5 % v/v	B						
Roundup Original	840 g ae/ha	C						
NIS	0.25 % v/v	C						
N-Pak AMS	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	ERICA	AMBEL	GGGAN	XANST	ERICA	AMBEL		
Pest Scientific Name	Conyza canadens>	Ambrosia artem>	Annual grasses	Xanthium strum>	Conyza canadens>	Ambrosia artem>		
Pest Name	Canada horsewe>	Common ragweed	Annual grasses	Common cockleb>	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	8-2-2011	8-2-2011	8-2-2011	8-2-2011	8-25-2011	8-25-2011		
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO		
Rating Unit	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1		
Crop Stage Majority	R2	R2	R2	R2	R5	R5		
Pest Stage Majority	24 IN	36 IN	24 IN	36 IN	36 IN	48 IN		
Pest Density, Unit	15 YD2	5 YD2	50 YD2	12 YD2	15 YD2	5 YD2		
Assessed By	PM	PM	PM	PM	PM	PM		
Days After First/Last Applic.	89 49	89 49	89 49	89 49	112 23	112 23		
Plant-Eval Interval	49 DP-1	49 DP-1	49 DP-1	49 DP-1	72 DP-1	72 DP-1		
Days After Emergence	44 DE-	44 DE-	44 DE-	44 DE-	67 DE-	67 DE-		
ARM Action Codes								
Number of Decimals								
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	14	15	16	17	18	19
9 Sharpen	37.5 g ai/ha B		100.0 a	100.0 a	95.8 a	94.5 a	100.0 a	100.0 a
Roundup Original	840 g ae/ha B							
MSO	1.0 % v/v B							
N-Pak AMS	5 % v/v B							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							
10 Verdict	244 g ai/ha B		100.0 a	100.0 a	95.3 a	95.0 a	100.0 a	100.0 a
Roundup Original	840 g ae/ha B							
MSO	1.0 % v/v B							
N-Pak AMS	5 % v/v B							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							
11 Authority First	147 g ai/ha B		100.0 a	94.0 a	96.5 a	100.0 a	100.0 a	100.0 a
Roundup Original	840 g ae/ha B							
MSO	1.0 % v/v B							
N-Pak AMS	5 % v/v B							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							
12 UNTREATED			0.0 b	0.0 b	0.0 c	0.0 d	0.0 b	0.0 b
LSD (P=.05)	20.89	29.57	17.14	18.03	0.00	0.00		
Standard Deviation	14.46	20.48	11.87	12.49	0.00	0.00		
CV	18.2	27.4	26.68	27.36	0.0	0.0		
Bartlett's X2	0.432	12.929	32.515	13.116	0.0	0.0		
P(Bartlett's X2)	0.511	0.012*	0.001*	0.108	.	.		
Replicate F	1.616	1.091	3.508	3.705	0.000	0.000		
Replicate Prob(F)	0.2045	0.3667	0.0259	0.0211	1.0000	1.0000		
Treatment F	27.848	13.417	46.270	40.033	0.000	0.000		
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	1.0000	1.0000		

Means followed by same letter do not significantly differ (P=.05, Student-New man-Keuls)  
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# Purdue University

Pest Type	W Weed	W Weed						
Pest Code	GGGAN	XANST						
Pest Scientific Name	Annual grasses	Xanthium strum>						
Pest Name	Annual grasses	Common cockleb>						
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	8-25-2011	8-25-2011	10-25-2011	10-25-2011	10-25-2011	10-25-2011		
Rating Type	CONTRO	CONTRO	YIELD	MOISTURE	YIELD	YIELD		
Rating Unit	%	%	LB	%	BU	KG		
Number of Subsamples	1	1	1	1	1	1		
Crop Stage Majority	R5	R5						
Pest Stage Majority	24 IN	36 IN						
Pest Density, Unit	50 YD2	12 YD2						
Assessed By	PM	PM	PM	PM	PM	PM		
Days After First/Last Applic.	112 23	112 23	173 84	173 84	173 84	173 84		
Plant-Eval Interval	72 DP-1	72 DP-1	133 DP-1	133 DP-1	133 DP-1	133 DP-1		
Days After Emergence	67 DE-	67 DE-	128 DE	128 DE	128 DE	128 DE		
ARM Action Codes					TY1	TY2		
Number of Decimals					1	1		
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	20	21	22	23	24	25
1 UNTREATED	0.0 b		0.0 b	5.31134420 d	14.7087398 a	15.1 d	1014.7 d	
2 Roundup Original	840 g ae/ha A		100.0 a	6.14406647 d	13.2885622 ab	17.8 d	1196.0 d	
2,4-D Ester	560 g ai/ha A							
NIS	0.25 % v/v A							
N-Pak AMS	5 % v/v A							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							
3 Sharpen	25 g ai/ha A		100.0 a	6.50670689 d	13.6791567 ab	18.8 d	1261.9 d	
Roundup Original	840 g ae/ha A							
MSO	1.0 % v/v A							
N-Pak AMS	5 % v/v A							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							
4 Sharpen	37.5 g ai/ha A		100.0 a	6.70816870 d	13.6588787 ab	19.3 d	1300.2 d	
Roundup Original	840 g ae/ha A							
MSO	1.0 % v/v A							
N-Pak AMS	5 % v/v A							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							

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.

## Purdue University

Pest Type	W Weed	W Weed							
Pest Code	GGGAN	XANST							
Pest Scientific Name	Annual grasses	Xanthium strum>							
Pest Name	Annual grasses	Common cockleb>							
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	8-25-2011	8-25-2011	10-25-2011	10-25-2011	10-25-2011	10-25-2011			
Rating Type	CONTRO	CONTRO	YIELD	MOISTURE	YIELD	YIELD			
Rating Unit	%	%	LB	%	BU	KG			
Number of Subsamples	1	1	1	1	1	1			
Crop Stage Majority	R5	R5							
Pest Stage Majority	24 IN	36 IN							
Pest Density, Unit	50 YD2	12 YD2							
Assessed By	PM	PM	PM	PM	PM	PM			
Days After First/Last Applic.	112 23	112 23	173 84	173 84	173 84	173 84			
Plant-Eval Interval	72 DP-1	72 DP-1	133 DP-1	133 DP-1	133 DP-1	133 DP-1			
Days After Emergence	67 DE-	67 DE-	128 DE	128 DE	128 DE	128 DE			
ARM Action Codes					TY1	TY2			
Number of Decimals					1	1			
Trt	Treatment	Rate	Appl						
No.	Name	Rate Unit	Code	20	21	22	23	24	25
5	Verdict	244 g ai/ha	A	100.0 a	100.0 a	7.55432204 cd	13.2135214 ab	21.9 cd	1471.3 cd
	Roundup Original	840 g ae/ha	A						
	MSO	1.0 % v/v	A						
	N-Pak AMS	5 % v/v	A						
	Roundup Original	840 g ae/ha	C						
	NIS	0.25 % v/v	C						
	N-Pak AMS	5 % v/v	C						
6	Sharpen	25 g ai/ha	A	100.0 a	100.0 a	8.17215048 bcd	13.7869229 ab	23.5 bcd	1580.9 bcd
	2,4-D Ester	560 g ai/ha	A						
	Roundup Original	840 g ae/ha	A						
	MSO	1.0 % v/v	A						
	N-Pak AMS	5 % v/v	A						
	Roundup Original	840 g ae/ha	C						
	NIS	0.25 % v/v	C						
	N-Pak AMS	5 % v/v	C						
7	Valor XLT	85 g ai/ha	A	100.0 a	100.0 a	9.42123317 abc	13.3358425 ab	27.2 abc	1832.0 abc
	2,4-D Ester	560 g ai/ha	A						
	Roundup Original	840 g ae/ha	A						
	MSO	1.0 % v/v	A						
	N-Pak AMS	5 % v/v	A						
	Roundup Original	840 g ae/ha	C						
	NIS	0.25 % v/v	C						
	N-Pak AMS	5 % v/v	C						
8	Sharpen	25 g ai/ha	B	100.0 a	100.0 a	11.48960228 a	13.2265276 ab	33.3 a	2237.7 a
	Roundup Original	840 g ae/ha	B						
	MSO	1.0 % v/v	B						
	N-Pak AMS	5 % v/v	B						
	Roundup Original	840 g ae/ha	C						
	NIS	0.25 % v/v	C						
	N-Pak AMS	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						
Pest Code	GGGAN	XANST						
Pest Scientific Name	Annual grasses	Xanthium strum>						
Pest Name	Annual grasses	Common cockleb>						
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	8-25-2011	8-25-2011	10-25-2011	10-25-2011	10-25-2011	10-25-2011		
Rating Type	CONTRO	CONTRO	YIELD	MOISTURE	YIELD	YIELD		
Rating Unit	%	%	LB	%	BU	KG		
Number of Subsamples	1	1	1	1	1	1		
Crop Stage Majority	R5	R5						
Pest Stage Majority	24 IN	36 IN						
Pest Density, Unit	50 YD2	12 YD2						
Assessed By	PM	PM	PM	PM	PM	PM		
Days After First/Last Applic.	112 23	112 23	173 84	173 84	173 84	173 84		
Plant-Eval Interval	72 DP-1	72 DP-1	133 DP-1	133 DP-1	133 DP-1	133 DP-1		
Days After Emergence	67 DE-	67 DE-	128 DE	128 DE	128 DE	128 DE		
ARM Action Codes					TY1	TY2		
Number of Decimals					1	1		
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	20	21	22	23	24	25
9 Sharpen	37.5 g ai/ha B		100.0 a	100.0 a	10.15993792 abc	13.0730852 ab	29.5 abc	1982.2 abc
Roundup Original	840 g ae/ha B							
MSO	1.0 % v/v B							
N-Pak AMS	5 % v/v B							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							
10 Verdict	244 g ai/ha B		100.0 a	100.0 a	11.36872405 a	11.5393984 b	33.6 a	2259.9 a
Roundup Original	840 g ae/ha B							
MSO	1.0 % v/v B							
N-Pak AMS	5 % v/v B							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							
11 Authority First	147 g ai/ha B		100.0 a	100.0 a	10.53600607 ab	12.5470317 ab	30.8 ab	2069.8 ab
Roundup Original	840 g ae/ha B							
MSO	1.0 % v/v B							
N-Pak AMS	5 % v/v B							
Roundup Original	840 g ae/ha C							
NIS	0.25 % v/v C							
N-Pak AMS	5 % v/v C							
12 UNTREATED			0.0 b	0.0 b	5.67398509 d	13.8387255 ab	16.4 d	1099.9 d
LSD (P=.05)	0.00	0.00			1.994561872	1.39695646	5.89	396.11
Standard Deviation	0.00	0.00			1.381359715	0.96748028	4.08	274.33
CV	0.0	0.0			16.74	7.26	17.05	17.05
Bartlett's X2	0.0	0.0			7.35	38.721	7.232	7.232
P(Bartlett's X2)	.	.			0.77	0.001*	0.78	0.78
Replicate F	0.000	0.000			1.622	1.408	1.377	1.377
Replicate Prob(F)	1.0000	1.0000			0.2029	0.2580	0.2668	0.2669
Treatment F	0.000	0.000			10.687	2.529	10.818	10.818
Treatment Prob(F)	1.0000	1.0000			0.0001	0.0194	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

### Soybean Marestalk Timing Protocol: Evaluate tank-mix and timing options for improved marestalk control with Kixor

Trial ID: 11S-SEP-NTS-03      Protocol ID: 11S-SEP-NTS-03  
 Location: SEPAC              Study Director: Paul Marquardt  
 Project ID: 11S-SEP-NTS-03      Investigator: Dr. Bill Johnson  
    Sponsor Contact: Gery Welker

#### Pest Type

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

#### Pest Code

ERICA, Conyza canadensis, = US  
 AMBEL, Ambrosia artemisiifolia, = US  
 BROSE, Bromus secalinus, = US  
 XANST, Xanthium strumarium, = US  
 GGGAN, Annual grasses, = US

#### Crop Code

GLXMA, BSOY, Glycine max., = US

#### Rating Type

CONTRO = control / burndown or knockdown  
 PHYGEN = phytotoxicity - general / injury  
 YIELD = yield

#### Rating Unit

% = percent  
 LB = pound  
 BU = bushel  
 KG = kilogram

YD2 = per square yard

#### Plant-Eval Interval

-25 DP-1 = 1 GLXMA 6-14-2011  
 10 DP-1 = 1 GLXMA 6-14-2011  
 15 DP-1 = 1 GLXMA 6-14-2011  
 49 DP-1 = 1 GLXMA 6-14-2011  
 72 DP-1 = 1 GLXMA 6-14-2011  
 133 DP-1 = 1 GLXMA 6-14-2011

#### ARM Action Codes

$TY1 = 2.904 * [22] * (100 - [23]) / 87$   
 $TY2 = 195.2984 * [22] * (100 - [23]) / 87$