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Impact Tank-Mixes for Glyphosate-Resistant Species

Trial ID: 12S-SEP-NTC-21 Protocol ID: 12S-SEP-NTC-21
Location: SEPAC Study Director: Paul Marquardt
Project ID: 12C04H087 Investigator: Dr. Bill Johnson
Sponsor Contact: Richard Porter

General Trial Information

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

Discipline: H herbicide
Trial Status: E established
Initiation Date: 4-2-2012

Trial Location

City: Butlerville
State/Prov.: Indiana
Postal Code: 47223
Country: USA

Personnel

Study Director: Paul Marquardt **Title:** Research Associate
Affiliation: Purdue University
Address: 915 W. State Street, Lilly Hall
Location: West Lafayette, IN
Postal Code: 47907 **E-mail:** pmarquar@purdue.edu
Phone No.: 765-494-0891 **Mobile No.:** 765-409-6369

Investigator: Bill Johnson **Title:** Professor
Affiliation: Purdue University
Address: 915 W. State Street, Lilly Hall
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:** Superintendent
Organization: Southeast-Purdue Agricultural Center
Address 1: 4425 E CR 350 N
Phone No.: 812-458-6977
City: Butlerville **Fax No.:** 812-458-6979
State/Prov: IN **Mobile No.:** 812-592-8426
Postal Code: 47223 **E-mail:** biehled@purdue.edu
Country: USA United States

Crop Description

Crop 1: ZEAMX Zea mays Corn
Variety: 33W84 **Description:** Roundup Ready/Liberty Link
BBCH Scale: BCOR **Planting Date:** 5-3-2012
Planting Method: DIRDRI direct drilled **Rate, Unit:** 32000 S/A
Depth, Unit: 2 IN
Row Spacing, Unit: 30 IN **Spacing Within Row, Unit:** 6 IN
Seed Bed: MEDIUM medium **Soil Temperature, Unit:** 60 F
Soil Moisture: DRY dry **Emergence Date:** 5-8-2012
Harvest Date: 10-1-2012 **Harvest Equipment:** John Deere 3300
Harvested Width, Unit: 5 FT **Harvested Length, Unit:** 25 FT
% Standard Moisture: 15.5
Weighing Equipment: Harvestmaster

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Pest Description

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

Pest 2 Type: W **Code:** BROTE Bromus tectorum
Common Name: Downy brome

Pest 3 Type: W **Code:** XANST Xanthium strumarium
Common Name: Heart-leaf cocklebur

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

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

Site and Design

Plot Width, Unit: 10 FT
Plot Length, Unit: 30 FT
Plot Area, Unit: 300 FT2
Replications: 4
Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: NOTILL no-till
Study Design: RACOBL Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block

Soil Description

Description Name: SEPAC- U41
% Sand: 20
% Silt: 65
% Clay: 15
% OM: 1.3
pH: 6.5
CEC: 5.7
Texture: SIL silt loam
Soil Name: Avonburg
Soil Drainage: P poor

Application Description

	A
Application Date:	5-31-2012
Time of Day:	11 AM
Application Method:	SPRAY
Application Timing:	POSPOS
Application Placement:	FOLIAR
Applied By:	JR
Air Temperature, Unit:	75 F
% Relative Humidity:	51
Wind Velocity, Unit:	3 MPH
Wind Direction:	S
Dew Presence (Y/N):	Y yes
Soil Moisture:	DRY
% Cloud Cover:	30

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	ZEAMX BCOR
Stage Scale Used:	BBCH
Stage Majority, Percent:	14 100

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Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	ERICA W
Stage Majority, Percent:	30 100
Height, Unit:	6 IN
Height Minimum, Maximum:	2 10
Density, Unit:	5 M2
Pest 2 Code, Type, Scale:	BROTE W
Stage Majority, Percent:	79 100
Height, Unit:	18 IN
Height Minimum, Maximum:	12 24
Density, Unit:	50 M2
Pest 3 Code, Type, Scale:	XANST W
Stage Majority, Percent:	14 100
Height, Unit:	4 IN
Height Minimum, Maximum:	2 6
Density, Unit:	2.5 M2
Pest 4 Code, Type, Scale:	AMBEL W
Stage Majority, Percent:	14 100
Height, Unit:	4 IN
Height Minimum, Maximum:	2 6
Density, Unit:	2.5 M2
Pest 5 Code, Type, Scale:	GGGAN W
Stage Majority, Percent:	12 100
Height, Unit:	6 IN
Height Minimum, Maximum:	4 8
Density, Unit:	25 M2

Application Equipment

	A
Appl. Equipment:	CO2 Backpack
Equipment Type:	SPRBAC
Operation Pressure, Unit:	17 PSI
Nozzle Type:	Flat Fan
Nozzle Size:	XR11002
Nozzle Spacing, Unit:	15 IN
Boom Length, Unit:	7.5 FT
Boom Height, Unit:	18 IN
Ground Speed, Unit:	3 MPH
Carrier:	H2O
Water Hardness (ppm CaCO3):	150
Spray Volume, Unit:	15 gal/ac
Mix Size, Unit:	1.8 liters
Propellant:	CO2
Tank Mix (Y/N):	N no

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Location: SEPAC Study Director: Paul Marquardt
Project ID: 12C04H087 Investigator: Dr. Bill Johnson
Sponsor Contact: Richard Porter

Trt No.	Treatment Name	Rate	Unit	Appl Code	1	2	3	4	5	6	7	8
	Pest Type					W Weed		W Weed		W Weed	W Weed	
	Pest Code					ERICA		ERICA		ERICA	ERICA	
	Pest Scientific Name					Conyza canaden>		Conyza canaden>		Conyza canaden>	Conyza canaden>	
	Pest Name					Canada horsewe>		Canada horsewe>		Canada horsewe>	Canada horsewe>	
	Crop Code				ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
	BBCH Scale				BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR
	Crop Scientific Name				Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
	Crop Name				Corn	Corn	Corn	Corn	Corn	Corn	Corn	Corn
	Crop Variety				P33W84	P33W84	P33W84	P33W84	P33W84	P33W84	P33W84	P33W84
	Description				18 IN	18 IN	28 IN	28 IN	28 IN	28 IN	28 IN	
	Part Rated				PLOT C	PLOT P	PLOT C	PLOT P	PLOT C	PLOT P	PLOT P	PLOT P
	Rating Date				6-7-2012	6-7-2012	6-14-2012	6-14-2012	6-29-2012	6-29-2012	7-27-2012	10-1-2012
	Rating Type				PHYGEN	CONTRO	PHYGEN	CONTRO	PHYGEN	CONTRO	CONTRO	MOISTURE
	Rating Unit				%	%	%	%	%	%	%	%
	Number of Subsamples				1	1	1	1	1	1	1	1
	Crop Stage Majority				34	34	36	36	37	37	37	
	Pest Stage Majority					1-8 IN		1-8 IN		1-8 IN	1-24 IN	
	Pest Density, Unit					5 M2		5 M2		5 M2	5 M2	
	Assessed By				PM	PM	PM	PM	PM	PM	PM	PM
	Days After First/Last Applic.				7 7	7 7	14 14	14 14	29 29	29 29	57 57	123 123
	Trt-Eval Interval				7 DA-A	7 DA-A	7 DA-A	7 DA-A	14 DA-A	14 DA-A	29 DA-A	57 DA-A
	Plant-Eval Interval				35 DP-1	35 DP-1	42 DP-1	42 DP-1	57 DP-1	57 DP-1	85 DP-1	151 DP-1
	Days After Emergence				30 DE-1	30 DE-1	37 DE-1	37 DE-1	52 DE-1	52 DE-1	80 DE-1	146 DE-1
	ARM Action Codes											
	Number of Decimals											
1	UNTREATED				0.0 a	0.0 b	0.0 a	0.0 b	0.0 a	0.0 b	0.0 b	0.040 c
2	Impact	18.4	g ai/ha	A	0.0 a	83.8 a	0.0 a	96.8 a	0.0 a	96.8 a	100.0 a	19.545 a
	Atrazine	560	g ai/ha	A								
	MSO	1	% v/v	A								
	UAN 28%	2.5	% v/v	A								
3	Impact	24.6	g ai/ha	A	0.0 a	87.5 a	0.0 a	97.5 a	0.0 a	97.5 a	100.0 a	7.960 b
	Atrazine	560	g ai/ha	A								
	MSO	1	% v/v	A								
	UAN 28%	2.5	% v/v	A								
4	Roundup PowerMAX	870	g ae/ha	A	0.0 a	77.5 a	0.0 a	67.5 a	0.0 a	67.5 a	100.0 a	18.165 a
	N-Pak AMS	3500	g ai/ha	A								
5	Roundup PowerMAX	870	g ae/ha	A	0.0 a	57.5 a	0.0 a	93.8 a	0.0 a	93.8 a	100.0 a	19.758 a
	Impact	18.4	g ai/ha	A								
	Atrazine	560	g ai/ha	A								
	MSO	0.5	% v/v	A								
	N-Pak AMS	3500	g ai/ha	A								
6	Warrant	1260	g ai/ha	A	0.0 a	53.8 a	0.0 a	85.0 a	0.0 a	85.0 a	100.0 a	20.193 a
	Roundup PowerMAX	870	g ae/ha	A								
	Impact	18.4	g ai/ha	A								
	Atrazine	560	g ai/ha	A								
	MSO	0.5	% v/v	A								
	N-Pak AMS	3500	g ai/ha	A								

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.

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Pest Type		W Weed		W Weed		W Weed	W Weed	
Pest Code		ERICA		ERICA		ERICA	ERICA	
Pest Scientific Name		Conyza canaden>		Conyza canaden>		Conyza canaden>	Conyza canaden>	
Pest Name		Canada horsewe>		Canada horsewe>		Canada horsewe>	Canada horsewe>	
Crop Code	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn	Corn	Corn	Corn	Corn	Corn
Crop Variety	P33W84	P33W84	P33W84	P33W84	P33W84	P33W84	P33W84	P33W84
Description	18 IN	18 IN	28 IN	28 IN	28 IN	28 IN	28 IN	
Part Rated	PLOT C	PLOT P	PLOT C	PLOT P	PLOT C	PLOT P	PLOT P	PLOT P
Rating Date	6-7-2012	6-7-2012	6-14-2012	6-14-2012	6-29-2012	6-29-2012	7-27-2012	10-1-2012
Rating Type	PHYGEN	CONTRO	PHYGEN	CONTRO	PHYGEN	CONTRO	CONTRO	MOISTURE
Rating Unit	%	%	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1	1	1
Crop Stage Majority	34	34	36	36	37	37	37	
Pest Stage Majority		1-8 IN		1-8 IN		1-8 IN	1-24 IN	
Pest Density, Unit		5 M2		5 M2		5 M2	5 M2	
Assessed By	PM	PM	PM	PM	PM	PM	PM	PM
Days After First/Last Applic.	7 7	7 7	14 14	14 14	29 29	29 29	57 57	123 123
Trt-Eval Interval	7 DA-A	7 DA-A	7 DA-A	7 DA-A	14 DA-A	14 DA-A	29 DA-A	57 DA-A
Plant-Eval Interval	35 DP-1	35 DP-1	42 DP-1	42 DP-1	57 DP-1	57 DP-1	85 DP-1	151 DP-1
Days After Emergence	30 DE-1	30 DE-1	37 DE-1	37 DE-1	52 DE-1	52 DE-1	80 DE-1	146 DE-1
ARM Action Codes								
Number of Decimals								
Trt Treatment Rate Appl No. Name Rate Unit Code	1	2	3	4	5	6	7	8
7 UNTREATED	0.0 a	0.0 b	0.0 a	0.0 b	0.0 a	0.0 b	0.0 b	0.010 c
LSD (P=.05)	0.00	42.46	0.00	24.36	0.00	24.36	0.00	6.1988
Standard Deviation	0.00	28.58	0.00	16.40	0.00	16.40	0.00	4.1725
CV	0.0	55.58	0.0	26.06	0.0	26.06	0.0	34.09
Bartlett's X2	0.0	2.422	0.0	18.656	0.0	18.656	0.0	69.609
P(Bartlett's X2)	.	0.659	.	0.001*	.	0.001*	.	0.001*
Replicate F	0.000	1.411	0.000	0.404	0.000	0.404	0.000	0.371
Replicate Prob(F)	1.0000	0.2722	1.0000	0.7516	1.0000	0.7516	1.0000	0.7746
Treatment F	0.000	6.820	0.000	29.054	0.000	29.054	0.000	20.102
Treatment Prob(F)	1.0000	0.0007	1.0000	0.0001	1.0000	0.0001	1.0000	0.0001

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Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	9	10	11
	Pest Type						
	Pest Code						
	Pest Scientific Name						
	Pest Name						
	Crop Code				ZEAMX	ZEAMX	ZEAMX
	BBCH Scale				BCOR	BCOR	BCOR
	Crop Scientific Name				Zea mays	Zea mays	Zea mays
	Crop Name				Corn	Corn	Corn
	Crop Variety				P33W84	P33W84	P33W84
	Description						
	Part Rated				PLOT P	PLOT P	PLOT P
	Rating Date				10-1-2012	10-1-2012	10-1-2012
	Rating Type				YIELD	YIELD	YIELD
	Rating Unit				LB	BU	KG
	Number of Subsamples				1	1	1
	Crop Stage Majority						
	Pest Stage Majority						
	Pest Density, Unit						
	Assessed By				PM	PM	PM
	Days After First/Last Applic.				123 123	123 123	123 123
	Trt-Eval Interval				123 DA-A	123 DA-A	123 DA-A
	Plant-Eval Interval				151 DP-1	151 DP-1	151 DP-1
	Days After Emergence				146 DE-1	146 DE-1	146 DE-1
	ARM Action Codes					TY3	TY4
	Number of Decimals					1	1
1	UNTREATED				4.295 b	31.6 b	1984.7 b
2	Impact	18.4	g ai/ha	A	8.013 ab	47.6 ab	2988.8 ab
	Atrazine	560	g ai/ha	A			
	MSO	1	% v/v	A			
	UAN 28%	2.5	% v/v	A			
3	Impact	24.6	g ai/ha	A	10.033 ab	70.0 ab	4395.1 ab
	Atrazine	560	g ai/ha	A			
	MSO	1	% v/v	A			
	UAN 28%	2.5	% v/v	A			
4	Roundup PowerMAX	870	g ae/ha	A	14.860 a	88.9 a	5583.0 a
	N-Pak AMS	3500	g ai/ha	A			
5	Roundup PowerMAX	870	g ae/ha	A	14.830 a	87.7 a	5504.0 a
	Impact	18.4	g ai/ha	A			
	Atrazine	560	g ai/ha	A			
	MSO	0.5	% v/v	A			
	N-Pak AMS	3500	g ai/ha	A			
6	Warrant	1260	g ai/ha	A	14.055 a	82.6 a	5186.2 a
	Roundup PowerMAX	870	g ae/ha	A			
	Impact	18.4	g ai/ha	A			
	Atrazine	560	g ai/ha	A			
	MSO	0.5	% v/v	A			
	N-Pak AMS	3500	g ai/ha	A			

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Pest Type			
Pest Code			
Pest Scientific Name			
Pest Name			
Crop Code	ZEAMX	ZEAMX	ZEAMX
BBCH Scale	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn
Crop Variety	P33W84	P33W84	P33W84
Description			
Part Rated	PLOT P	PLOT P	PLOT P
Rating Date	10-1-2012	10-1-2012	10-1-2012
Rating Type	YIELD	YIELD	YIELD
Rating Unit	LB	BU	KG
Number of Subsamples	1	1	1
Crop Stage Majority			
Pest Stage Majority			
Pest Density, Unit			
Assessed By	PM	PM	PM
Days After First/Last Applic.	123 123	123 123	123 123
Trt-Eval Interval	123 DA-A	123 DA-A	123 DA-A
Plant-Eval Interval	151 DP-1	151 DP-1	151 DP-1
Days After Emergence	146 DE-1	146 DE-1	146 DE-1
ARM Action Codes		TY3	TY4
Number of Decimals		1	1
Trt Treatment Name / No.	Rate Rate Unit / Appl Code			
	9	10	11
7 UNTREATED		3.953 b	29.1 b	1826.7 b
LSD (P=.05)		5.5176	37.15	2331.99
Standard Deviation		3.7140	25.01	1569.70
CV		37.12	40.0	40.0
Bartlett's X2		5.746	6.621	6.621
P(Bartlett's X2)		0.452	0.357	0.357
Replicate F		1.781	1.818	1.818
Replicate Prob(F)		0.1868	0.1800	0.1800
Treatment F		6.595	4.356	4.356
Treatment Prob(F)		0.0008	0.0069	0.0069

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Location: SEPAC Study Director: Paul Marquardt
Project ID: 12C04H087 Investigator: Dr. Bill Johnson
Sponsor Contact: Richard Porter

Pest Type
W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop
Pest Code
ERICA, Conyza canadensis, = US
Crop Code
ZEAMX, BCOR, Zea mays, = US
Part Rated
PLOT = plot
C = Crop is Part Rated
P = Pest is Part Rated
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
YIELD = yield
Rating Unit
% = percent
LB = pound
BU = bushel
KG = kilogram
Crop Stage Majority
34 = 4 nodes detectable
36 = 6 nodes detectable
37 = 7 nodes detectable

M2 = per square meter
Plant-Eval Interval
35 DP-1 = 1 ZEAMX 5-3-2012
42 DP-1 = 1 ZEAMX 5-3-2012
57 DP-1 = 1 ZEAMX 5-3-2012
85 DP-1 = 1 ZEAMX 5-3-2012
151 DP-1 = 1 ZEAMX 5-3-2012
ARM Action Codes
TY3 = 6.222857*[9]*(100-[8])/84.5
TY4 = 390.5967*[9]*(100-[8])/84.5