The Ohio State University

Evaluation of ImpactZ and IMPACT programs for performance and corn safety compared to a competitive program in university trials.

Trial ID: 18IMPACT Trial Year: 2018
Protocol ID: 18C04H096 Investigator: Dr. Mark M. Loux
Project ID: IMPACTZ Study Director: RICHARD PORTER

General Trial Information

Study Director: Richard Porter
Investigator: Dr. Mark M. Loux

Discipline: H herbicide
Trial Usage/Type: DEV Development/Registration
Planned Completion Date: Oct-30-2018

Trial Location

City: South Charleston **Country:** USA United States
State/Prov.: Ohio
Postal Code: 45368 **Climate Zone:** USWARM US Warm Continental

Latitude of LL Corner °: 39.85953 N
Longitude of LL Corner °: 83.67606 W
Altitude of LL Corner, Unit: 1086.00 FT

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
Evaluate commercial ImpactZ treatments in 1-pass and sequential programs compared to standards.

Contacts

Study Director: Richard Porter

Investigator: Dr. Mark M. Loux

Crop Description

Crop 1: ZEAMX Zea mays Corn
Variety: A6499STXRIB
Description: AgriGold RR/LL 112

Planting Date: Apr-29-2018
Planting Method: PLANTD planted
Planting Rate, Unit: 32097 S/A
Planting Equipment: FPP finger pickup planter
Depth, Unit: 2 IN
Emergence Date: May-10-2018
Row Spacing, Unit: 30 IN
Soil Temperature, Unit: 58 F
Soil Moisture: SLIWET slightly wet, moist
Seed Bed: CLODDY cloddy

Pest Description

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

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

Pest 3 Type: W **Code:** CHEAL Chenopodium album
Common Name: common lambsquarters

Pest 4 Type: W **Code:** AMARE Amaranthus retroflexus
Common Name: Redroot pigweed

Pest 5 Type: W **Code:** ABUTH Abutilon theophrasti
Common Name: velvetleaf

Pest 6 Type: W **Code:** IPOHE Ipomoea hederacea
Common Name: ivy-leaf morning glory

Pest 7 Type: W **Code:** SIDSP Sida spinosa
Common Name: Prickly sida

Pest 8 Type: W **Code:** ECHCG Echinochloa crus-galli
Common Name: Common barnyard grass

Site and Design

Treated Plot Width: 6.67 FT
Site Type: FIELD field
Treated Plot Length: 30 FT
Experimental Unit: 4 ROW row
Treated Plot Area: 200.1 FT2 **Treatments:** 8
Tillage Type: CONTIL conventional-till
Replications: 3
Study Design: RACOBL Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block

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No. Previous Crop Year
1. Soybean 2017

Field Prep./Maintenance:

Maintain fertility program for optimum corn growth. Target plant population which simulates commercial corn production in the area.

Soil Description

Description Name: G-6
% Sand: 32 **% OM:** 2.2 **Texture:** SICL silty clay loam
% Silt: 53 **pH:** 5.9 **Soil Name:** Kokomo
% Clay: 15 **CEC:** 14.8 **Fert. Level:** G good
Soil Drainage: G good

Application Description

	A	B	C
Application Date:	Apr-30-2018	May-16-2018	May-29-2018
Appl. Start Time:	10:20 AM	11:30 AM	12:15 PM
Appl. Stop Time:	10:40 AM	11:40 AM	12:30 PM
Application Method:	SPRAY	SPRAY	SPRAY
Application Timing:	PREMCR	EAPOWE	MIPOWE
Application Placement:	BROFOL	BROFOL	BROFOL
Applied By:		Dobbels	Ackley,Lamb
Air Temperature, Unit:	60 F	66 F	81 F
% Relative Humidity:	35	77	63
Wind Velocity, Unit:	4 MPH	3 MPH	10 MPH
Wind Direction:	SW	NE	SE
Dew Presence (Y/N):	N no	Y yes	N no
Soil Temperature, Unit:	50 F	66 F	80 F
Soil Moisture:	NORMAL	SLIWET	DRY
% Cloud Cover:	30	100	40
Next Moisture Occurred On:	May-3-2018	May-17-2018	May-31-2018
Time to Next Moisture, Unit:	3 DAY	1 DAY	2 DAY
Moisture 1 Week after Appl.:	0.71 IN	1.41 IN	0.57 IN

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale:	ZEAMX BCOR	ZEAMX BCOR	ZEAMX BCOR
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	00 100	12 100	16 100
Height, Unit:		5 IN	21 IN
Height Minimum, Maximum:		4 5	18 22

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Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale:	SETFA W	SETFA W	SETFA W
Stage Majority, Percent:		11 100	15 100
Diameter, Unit:		3 IN	
Height, Unit:		2 IN	5 IN
Height Minimum, Maximum:		0.5 4	1 5
Density, Unit:			223 m2
Pest 2 Code, Type, Scale:	AMBTR W	AMBTR W	AMBTR W
Stage Majority, Percent:		12 100	19 100
Diameter, Unit:		2 IN	
Height, Unit:		2 IN	6 IN
Height Minimum, Maximum:		1 2	2 12
Density, Unit:			11 m2
Pest 3 Code, Type, Scale:	CHEAL W	CHEAL W	CHEAL W
Stage Majority, Percent:		12 100	18 100
Diameter, Unit:		1 IN	
Height, Unit:		0.5 IN	4 IN
Height Minimum, Maximum:			1 6
Density, Unit:			89 m2
Pest 4 Code, Type, Scale:	AMARE W	AMARE W	AMARE W
Stage Majority, Percent:		12 100	
Diameter, Unit:		2 IN	
Height, Unit:		0.75 IN	
Height Minimum, Maximum:		0.5 1	
Density, Unit:			4 m2
Pest 5 Code, Type, Scale:	ABUTH W	ABUTH W	ABUTH W
Stage Majority, Percent:		12 100	16 100
Diameter, Unit:		2 IN	
Height, Unit:		1 IN	3 IN
Density, Unit:			4 m2
Pest 6 Code, Type, Scale:	IPOHE W	IPOHE W	IPOHE W
Stage Majority, Percent:		10 100	16 100
Diameter, Unit:		2.5 IN	
Height, Unit:		1.5 IN	4.5 IN
Height Minimum, Maximum:			1 3
Density, Unit:			7 m2
Pest 7 Code, Type, Scale:	SIDSP W	SIDSP W	SIDSP W
Stage Majority, Percent:		11 100	
Diameter, Unit:		1 IN	
Height, Unit:		1 IN	
Pest 8 Code, Type, Scale:	ECHCG W	ECHCG W	ECHCG W
Density, Unit:			19 m2

Application Equipment

	A	B	C
Appl. Equipment:	6 foot TTI	6' AI XR	6 foot AIXR
Equipment Type:	SPRBAC	SPRBAC	SPRBAC
Operation Pressure, Unit:	42 PSI	46 PSI	42 PSI
Nozzle Type:	TTI	AI XR	AIXR
Nozzle Size:	110015	110015	110015
Nozzle Spacing, Unit:	18 IN	18 IN	18 IN
Boom Length, Unit:	6.67 FT	6 FT	6.67 FT
Boom Height, Unit:	20 IN	20 IN	20 IN
Ground Speed, Unit:	3 MPH	3 MPH	3 MPH
Carrier:	WATER	WATER	WATER
Spray Volume, Unit:	15 GPA	15 GPA	15 GPA
Mix Size, Unit:	1 L	2 L	1 L
Propellant:	COMCO2	CO2	COMCO2

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Pest Type			W Weed	W Weed	W Weed	W Weed
Pest Code			SETFA	AMBTR	CHEAL	ABUTH
Pest Scientific Name			Setaria faberi	Ambrosia trifi>	Chenopodium al>	Abutilon theop>
Pest Name			Giant foxtail	Giant ragweed	common lambsqu>	velvetleaf
Crop Code		ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale		BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name		Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name		Corn	Corn	Corn	Corn	Corn
Description		CROP INJURY	WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated		PLANT C	PLANT P	PLANT P	PLANT P	PLANT P
Rating Date		May-30-2018	May-30-2018	May-30-2018	May-30-2018	May-30-2018
Rating Type		PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit		%	%	%	%	%
Sample Size, Unit		2 ROW	2 ROW	2 ROW	2 ROW	2 ROW
Collection Basis, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1	1
SE Group No.		12	13	14	15	16
Days After First/Last Applic.		30 1	30 1	30 1	30 1	30 1
Trt-Eval Interval		1 DA-C	1 DA-C	1 DA-C	1 DA-C	1 DA-C
Plant-Eval Interval		31 DP-1	31 DP-1	31 DP-1	31 DP-1	31 DP-1
Days After Emergence		20 DE-1	20 DE-1	20 DE-1	20 DE-1	20 DE-1
ARM Action Codes			EC	ER3		
Number of Decimals		0	0	0	0	0

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1*	2*	3*	4*	5*
1	Untreated Check				0 -	0	0 b	0 b	0 c
2	Harness Xtra 5.6	2.52	lb ai/a	A	0 -	85 -	20 b	85 a	27 bc
3	Harness Xtra 5.6	2.52	lb ai/a	A	0 -	87 -	15 b	92 a	50 b
	ImpactZ	0.356	lb ai/a	C					
	MSO	1.0	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
4	Harness Xtra 5.6	2.52	lb ai/a	A	0 -	88 -	45 ab	88 a	37 bc
	ImpactZ	0.266	lb ai/a	C					
	Roundup PowerMax	1.13	lb ae/a	C					
	MSO	0.5	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
5	Harness Xtra 5.6	2.52	lb ai/a	A	0 -	93 -	73 a	93 a	67 ab
	ImpactZ	0.266	lb ai/a	C					
	Liberty 280 SL	0.402	lb ai/a	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
6	Harness	1.64	lb ai/a	B	0 -	100 -	93 a	100 a	100 a
	IMPACT	0.0219	lb ai/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
7	Harness	1.64	lb ai/a	B	0 -	100 -	84 a	100 a	100 a
	IMPACT	0.0164	lb ai/a	B					
	Roundup PowerMax	1.13	lb ae/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					

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Excluded replicate 3 in column 3; 2 in 9
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Pest Code					SETFA	AMBTR	CHEAL	ABUTH
Pest Scientific Name					Setaria faberi	Ambrosia trifi>	Chenopodium al>	Abutilon theop>
Pest Name					Giant foxtail	Giant ragweed	common lambsqu>	velvetleaf
Crop Code				ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale				BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name				Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name				Corn	Corn	Corn	Corn	Corn
Description				CROP INJURY	WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated				PLANT C	PLANT P	PLANT P	PLANT P	PLANT P
Rating Date				May-30-2018	May-30-2018	May-30-2018	May-30-2018	May-30-2018
Rating Type				PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit				%	%	%	%	%
Sample Size, Unit				2 ROW	2 ROW	2 ROW	2 ROW	2 ROW
Collection Basis, Unit				1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples				1	1	1	1	1
SE Group No.				12	13	14	15	16
Days After First/Last Applic.				30 1	30 1	30 1	30 1	30 1
Trt-Eval Interval				1 DA-C	1 DA-C	1 DA-C	1 DA-C	1 DA-C
Plant-Eval Interval				31 DP-1	31 DP-1	31 DP-1	31 DP-1	31 DP-1
Days After Emergence				20 DE-1	20 DE-1	20 DE-1	20 DE-1	20 DE-1
ARM Action Codes					EC	ER3		
Number of Decimals				0	0	0	0	0
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1*	2*	3*	4*	5*
8	Halex GT	1.98	lb ai/a	B	0 -	91 -	88 a	99 a	99 a
	Atrazine	0.5	lb ai/a	B					
	NIS	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
LSD P=.05					.	12.1	31.4	13.5	28.5
Standard Deviation					0.0	6.8	12.8	7.7	16.0
CV					0.0	7.32	25.98	9.4	27.36
Levene's F					0.00	0.861		0.76	1.136
Levene's Prob(F)					.	0.548		0.628	0.395
Skewness					.	-0.4088	-0.3119	-2.0792*	-0.2088
Kurtosis					.	-1.6157	-1.5498	3.0374*	-1.4314
Replicate F					0.000	0.663	2.071	0.732	0.215
Replicate Prob(F)					1.0000	0.5347	0.2002	0.4995	0.8095
Treatment F					0.000	2.415	15.006	57.305	16.015
Treatment Prob(F)					1.0000	0.0974	0.0021	0.0001	0.0001

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Pest Code		IPOHE		SETFA	AMBTR	CHEAL
Pest Scientific Name		Ipomoea hedera>		Setaria faberi	Ambrosia trifi>	Chenopodium al>
Pest Name		ivy-leaf morni>		Giant foxtail	Giant ragweed	common lambsqu>
Crop Code		ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale		BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name		Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name		Corn	Corn	Corn	Corn	Corn
Description		WEED CONTROL	CROP INJURY	WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated		PLANT P	PLANT C	PLANT P	PLANT P	PLANT P
Rating Date		May-30-2018	Jun-13-2018	Jun-13-2018	Jun-13-2018	Jun-13-2018
Rating Type		CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO
Rating Unit		%	%	%	%	%
Sample Size, Unit		2 ROW	2 ROW	2 ROW	2 ROW	2 ROW
Collection Basis, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1	1
SE Group No.		17	18	19	20	21
Days After First/Last Applic.		30 1	44 15	44 15	44 15	44 15
Trt-Eval Interval		1 DA-C	15 DA-C	15 DA-C	15 DA-C	15 DA-C
Plant-Eval Interval		31 DP-1	45 DP-1	45 DP-1	45 DP-1	45 DP-1
Days After Emergence		20 DE-1	34 DE-1	34 DE-1	34 DE-1	34 DE-1
ARM Action Codes					ER2	
Number of Decimals		0	0	0	0	0

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	6*	7*	8*	9*	10*
1	Untreated Check				0 c	0 -	0 c	0 c	0 c
2	Harness Xtra 5.6	2.52	lb ai/a	A	10 bc	0 -	85 b	35 b	73 b
3	Harness Xtra 5.6	2.52	lb ai/a	A	43 abc	0 -	95 a	84 a	100 a
	ImpactZ	0.356	lb ai/a	C					
	MSO	1.0	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
4	Harness Xtra 5.6	2.52	lb ai/a	A	27 abc	0 -	95 a	85 a	100 a
	ImpactZ	0.266	lb ai/a	C					
	Roundup PowerMax	1.13	lb ae/a	C					
	MSO	0.5	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
5	Harness Xtra 5.6	2.52	lb ai/a	A	47 abc	0 -	97 a	92 a	100 a
	ImpactZ	0.266	lb ai/a	C					
	Liberty 280 SL	0.402	lb ai/a	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
6	Harness	1.64	lb ai/a	B	77 ab	0 -	95 a	82 a	95 a
	IMPACT	0.0219	lb ai/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
7	Harness	1.64	lb ai/a	B	77 ab	0 -	93 a	79 a	100 a
	IMPACT	0.0164	lb ai/a	B					
	Roundup PowerMax	1.13	lb ae/a	B					
	Atrazine	0.5	lb ai/a	B					
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Pest Code				IPOHE		SETFA	AMBTR	CHEAL	
Pest Scientific Name				Ipomoea hedera>		Setaria faberi	Ambrosia trifi>	Chenopodium al>	
Pest Name				ivy-leaf morni>		Giant foxtail	Giant ragweed	common lambsqu>	
Crop Code				ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	
BBCH Scale				BCOR	BCOR	BCOR	BCOR	BCOR	
Crop Scientific Name				Zea mays	Zea mays	Zea mays	Zea mays	Zea mays	
Crop Name				Corn	Corn	Corn	Corn	Corn	
Description				WEED CONTROL	CROP INJURY	WEED CONTROL	WEED CONTROL	WEED CONTROL	
Part Rated				PLANT P	PLANT C	PLANT P	PLANT P	PLANT P	
Rating Date				May-30-2018	Jun-13-2018	Jun-13-2018	Jun-13-2018	Jun-13-2018	
Rating Type				CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO	
Rating Unit				%	%	%	%	%	
Sample Size, Unit				2 ROW	2 ROW	2 ROW	2 ROW	2 ROW	
Collection Basis, Unit				1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Number of Subsamples				1	1	1	1	1	
SE Group No.				17	18	19	20	21	
Days After First/Last Applic.				30 1	44 15	44 15	44 15	44 15	
Trt-Eval Interval				1 DA-C	15 DA-C	15 DA-C	15 DA-C	15 DA-C	
Plant-Eval Interval				31 DP-1	45 DP-1	45 DP-1	45 DP-1	45 DP-1	
Days After Emergence				20 DE-1	34 DE-1	34 DE-1	34 DE-1	34 DE-1	
ARM Action Codes							ER2		
Number of Decimals				0	0	0	0	0	
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	6*	7*	8*	9*	10*
8	Halex GT	1.98	lb ai/a	B	81 a	0 -	92 a	78 a	99 a
	Atrazine	0.5	lb ai/a	B					
	NIS	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
LSD P=.05					42.2	.	5.8	12.2	9.6
Standard Deviation					23.9	0.0	3.3	5.2	5.5
CV					54.45	0.0	4.02	7.76	6.59
Levene's F					1.011	0.00	0.808		0.798
Levene's Prob(F)					0.462	.	0.594		0.601
Skewness					-0.1315	.	-2.2613*	-1.4806*	-2.0225*
Kurtosis					-1.6801	.	3.5759*	0.9007	2.7282*
Replicate F					1.880	0.000	2.302	0.037	0.485
Replicate Prob(F)					0.1918	1.0000	0.1393	0.8521	0.6263
Treatment F					4.988	0.000	308.164	76.683	121.781
Treatment Prob(F)					0.0062	1.0000	0.0001	0.0001	0.0001

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Pest Scientific Name		Abutilon theop>	Ipomoea hedera>	Setaria faberi	Ambrosia trifi>	Chenopodium al>
Pest Name		velvetleaf	ivy-leaf morni>	Giant foxtail	Giant ragweed	common lambsqu>
Crop Code		ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale		BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name		Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name		Corn	Corn	Corn	Corn	Corn
Description		WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated		PLANT P	PLANT P	PLANT P	PLANT P	PLANT P
Rating Date		Jun-13-2018	Jun-13-2018	Jun-26-2018	Jun-26-2018	Jun-26-2018
Rating Type		CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit		%	%	%	%	%
Sample Size, Unit		2 ROW	2 ROW	2 ROW	2 ROW	2 ROW
Collection Basis, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1	1
SE Group No.		22	23	24	25	26
Days After First/Last Applic.		44 15	44 15	57 28	57 28	57 28
Trt-Eval Interval		15 DA-C	15 DA-C	28 DA-C	28 DA-C	28 DA-C
Plant-Eval Interval		45 DP-1	45 DP-1	58 DP-1	58 DP-1	58 DP-1
Days After Emergence		34 DE-1	34 DE-1	47 DE-1	47 DE-1	47 DE-1
ARM Action Codes		ET5			EC	AA
Number of Decimals		0	0	0	0	0

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	11*	12*	13*	14*	15*
1	Untreated Check				0 c	0 d	0 c	0	0 c
2	Harness Xtra 5.6	2.52	lb ai/a	A	37 b	37 c	82 b	57 c	60 b
3	Harness Xtra 5.6	2.52	lb ai/a	A	101 a	80 ab	98 a	89 a	100 a
	ImpactZ	0.356	lb ai/a	C					
	MSO	1.0	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
4	Harness Xtra 5.6	2.52	lb ai/a	A	100 a	90 ab	100 a	81 ab	100 a
	ImpactZ	0.266	lb ai/a	C					
	Roundup PowerMax	1.13	lb ae/a	C					
	MSO	0.5	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
5	Harness Xtra 5.6	2.52	lb ai/a	A	100	95 a	100 a	95 a	100 a
	ImpactZ	0.266	lb ai/a	C					
	Liberty 280 SL	0.402	lb ai/a	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
6	Harness	1.64	lb ai/a	B	93 a	65 abc	100 a	87 ab	100 a
	IMPACT	0.0219	lb ai/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
7	Harness	1.64	lb ai/a	B	93 a	57 bc	99 a	71 b	100 a
	IMPACT	0.0164	lb ai/a	B					
	Roundup PowerMax	1.13	lb ae/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Due to missing data, the effective replicates used for mean comparisons are: col. 2,4,6-8,10,12-16,18-22,24=2.8; 3=1.8; 5,17,23=2.7; 11=2.6
* Adjusted means
Excluded replicate 3 in column 3; 2 in 9
Could not calculate LSD (% mean diff) for columns 1,7,16,22,25 because error mean square = 0.

The Ohio State University

Evaluation of ImpactZ and IMPACT programs for performance and corn safety compared to a competitive program in university trials.

Trial ID: 18IMPACT Trial Year: 2018
Protocol ID: 18C04H096 Investigator: Dr. Mark M. Loux
Project ID: IMPACTZ Study Director: RICHARD PORTER

Pest Type			W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code			ABUTH	IPOHE	SETFA	AMBTR	CHEAL
Pest Scientific Name			Abutilon theop>	Ipomoea hedera>	Setaria faberi	Ambrosia trifi>	Chenopodium al>
Pest Name			velvetleaf	ivy-leaf morni>	Giant foxtail	Giant ragweed	common lambsqu>
Crop Code			ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale			BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name			Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name			Corn	Corn	Corn	Corn	Corn
Description			WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated			PLANT P	PLANT P	PLANT P	PLANT P	PLANT P
Rating Date			Jun-13-2018	Jun-13-2018	Jun-26-2018	Jun-26-2018	Jun-26-2018
Rating Type			CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit			%	%	%	%	%
Sample Size, Unit			2 ROW	2 ROW	2 ROW	2 ROW	2 ROW
Collection Basis, Unit			1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples			1	1	1	1	1
SE Group No.			22	23	24	25	26
Days After First/Last Applic.			44 15	44 15	57 28	57 28	57 28
Trt-Eval Interval			15 DA-C	15 DA-C	28 DA-C	28 DA-C	28 DA-C
Plant-Eval Interval			45 DP-1	45 DP-1	58 DP-1	58 DP-1	58 DP-1
Days After Emergence			34 DE-1	34 DE-1	47 DE-1	47 DE-1	47 DE-1
ARM Action Codes			ET5			EC	AA
Number of Decimals			0	0	0	0	0

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	11*	12*	13*	14*	15*
8	Halex GT	1.98	lb ai/a	B	100 a	78 ab	97 a	81 ab	99 a
	Atrazine	0.5	lb ai/a	B					
	NIS	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
LSD P=.05					14.0	23.7	3.0	11.1	0.8 - 8.6
Standard Deviation					7.7	13.4	1.7	6.2	2.9t
CV					10.64	21.6	2.05	7.73	4.04t
Levene's F					0.561	1.502	1.343	0.248	4.194
Levene's Prob(F)					0.753	0.24	0.298	0.952	0.009*
Skewness					-1.0317	-0.8217	-2.2074*	-0.8899	-1.7054*
Kurtosis					-0.6141	-0.5474	3.4*	1.6709	1.6007
Replicate F					0.099	0.937	0.016	8.193	0.981
Replicate Prob(F)					0.9066	0.4167	0.9841	0.0066	0.4009
Treatment F					77.947	16.477	1206.590	12.830	364.665
Treatment Prob(F)					0.0001	0.0001	0.0001	0.0002	0.0001

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Due to missing data, the effective replicates used for mean comparisons are: col. 2,4,6-8,10,12-16,18-22,24=2.8; 3=1.8; 5,17,23=2.7; 11=2.6
* Adjusted means
Excluded replicate 3 in column 3; 2 in 9
Could not calculate LSD (% mean diff) for columns 1,7,16,22,25 because error mean square = 0.

The Ohio State University

Evaluation of ImpactZ and IMPACT programs for performance and corn safety compared to a competitive program in university trials.

Trial ID: 18IMPACT Trial Year: 2018
Protocol ID: 18C04H096 Investigator: Dr. Mark M. Loux
Project ID: IMPACTZ Study Director: RICHARD PORTER

Pest Type		W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code		AMARE	ABUTH	IPOHE	SETFA	AMBTR
Pest Scientific Name		Amaranthus ret>	Abutilon theop>	Ipomoea hedera>	Setaria faberi	Ambrosia trifi>
Pest Name		Redroot pigweed	velvetleaf	ivy-leaf morni>	Giant foxtail	Giant ragweed
Crop Code		ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale		BCOR	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name		Zea mays	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name		Corn	Corn	Corn	Corn	Corn
Description		WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated		PLANT P	PLANT P	PLANT P	PLANT P	PLANT P
Rating Date		Jun-26-2018	Jun-26-2018	Jun-26-2018	Jul-18-2018	Jul-18-2018
Rating Type		CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit		%	%	%	%	%
Sample Size, Unit		2 ROW	2 ROW	2 ROW	2 ROW	2 ROW
Collection Basis, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1	1
SE Group No.		27	28	29	30	31
Days After First/Last Applic.		57 28	57 28	57 28	79 50	79 50
Trt-Eval Interval		28 DA-C	28 DA-C	28 DA-C	50 DA-C	50 DA-C
Plant-Eval Interval		58 DP-1	58 DP-1	58 DP-1	80 DP-1	80 DP-1
Days After Emergence		47 DE-1	47 DE-1	47 DE-1	69 DE-1	69 DE-1
ARM Action Codes				AA		
Number of Decimals		0	0	0	0	0

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	16*	17*	18*	19*	20*
1	Untreated Check				0 -	0 c	0 d	0 c	0 d
2	Harness Xtra 5.6	2.52	lb ai/a	A	100 -	40 b	33 c	95 b	67 c
3	Harness Xtra 5.6	2.52	lb ai/a	A	100 -	100 a	78 ab	98 a	88 ab
	ImpactZ	0.356	lb ai/a	C					
	MSO	1.0	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
4	Harness Xtra 5.6	2.52	lb ai/a	A	100 -	100 a	83 ab	100 a	89 ab
	ImpactZ	0.266	lb ai/a	C					
	Roundup PowerMax	1.13	lb ae/a	C					
	MSO	0.5	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
5	Harness Xtra 5.6	2.52	lb ai/a	A	100 -	100 a	92 a	100 a	97 a
	ImpactZ	0.266	lb ai/a	C					
	Liberty 280 SL	0.402	lb ai/a	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
6	Harness	1.64	lb ai/a	B	100 -	100 a	57 bc	100 a	87 ab
	IMPACT	0.0219	lb ai/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
7	Harness	1.64	lb ai/a	B	100 -	100 a	66 abc	100 a	80 b
	IMPACT	0.0164	lb ai/a	B					
	Roundup PowerMax	1.13	lb ae/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Due to missing data, the effective replicates used for mean comparisons are: col. 2,4,6-8,10,12-16,18-22,24=2.8; 3=1.8; 5,17,23=2.7; 11=2.6
* Adjusted means
Excluded replicate 3 in column 3; 2 in 9
Could not calculate LSD (% mean diff) for columns 1,7,16,22,25 because error mean square = 0.

The Ohio State University

Evaluation of ImpactZ and IMPACT programs for performance and corn safety compared to a competitive program in university trials.

Trial ID: 18IMPACT Trial Year: 2018
Protocol ID: 18C04H096 Investigator: Dr. Mark M. Loux
Project ID: IMPACTZ Study Director: RICHARD PORTER

Pest Type				W Weed		W Weed		W Weed	W Weed	W Weed
Pest Code				AMARE		ABUTH		IPOHE	SETFA	AMBTR
Pest Scientific Name				Amaranthus ret>		Abutilon theop>		Ipomoea hedera>	Setaria faberi	Ambrosia trifi>
Pest Name				Redroot pigweed		velvetleaf		ivy-leaf morni>	Giant foxtail	Giant ragweed
Crop Code				ZEAMX		ZEAMX		ZEAMX	ZEAMX	ZEAMX
BBCH Scale				BCOR		BCOR		BCOR	BCOR	BCOR
Crop Scientific Name				Zea mays		Zea mays		Zea mays	Zea mays	Zea mays
Crop Name				Corn		Corn		Corn	Corn	Corn
Description				WEED CONTROL		WEED CONTROL		WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated				PLANT P		PLANT P		PLANT P	PLANT P	PLANT P
Rating Date				Jun-26-2018		Jun-26-2018		Jun-26-2018	Jul-18-2018	Jul-18-2018
Rating Type				CONTRO		CONTRO		CONTRO	CONTRO	CONTRO
Rating Unit				%		%		%	%	%
Sample Size, Unit				2 ROW		2 ROW		2 ROW	2 ROW	2 ROW
Collection Basis, Unit				1 PLOT		1 PLOT		1 PLOT	1 PLOT	1 PLOT
Number of Subsamples				1		1		1	1	1
SE Group No.				27		28		29	30	31
Days After First/Last Applic.				57 28		57 28		57 28	79 50	79 50
Trt-Eval Interval				28 DA-C		28 DA-C		28 DA-C	50 DA-C	50 DA-C
Plant-Eval Interval				58 DP-1		58 DP-1		58 DP-1	80 DP-1	80 DP-1
Days After Emergence				47 DE-1		47 DE-1		47 DE-1	69 DE-1	69 DE-1
ARM Action Codes								AA		
Number of Decimals				0		0		0	0	0
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	16*	17*	18*	19*	20*	
8	Halex GT	1.98	lb ai/a	B	100 -	100 a	45 bc	100 a	83 ab	
	Atrazine	0.5	lb ai/a	B						
	NIS	0.25	% v/v	B						
	N-Pak AMS Liquid	2.5	% v/v	B						
LSD P=.05					.	0.4	20.1 - 26.8	1.9	9.9	
Standard Deviation					0.0	0.2	8.8t	1.1	5.6	
CV					0.0	0.28	18.3t	1.23	7.62	
Levene's F					0.00	0.864	0.966	0.932	0.626	
Levene's Prob(F)					.	0.557	0.489	0.511	0.727	
Skewness					-2.3509*	-1.3694*	-0.8731	-2.3363*	-1.8907*	
Kurtosis					3.8552*	0.2316	0.3704	3.8127*	2.4266*	
Replicate F					0.000	0.923	1.982	0.967	4.891	
Replicate Prob(F)					1.0000	0.4238	0.1772	0.4061	0.0261	
Treatment F					0.000	89853.411	20.196	3280.789	92.351	
Treatment Prob(F)					1.0000	0.0001	0.0001	0.0001	0.0001	

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Due to missing data, the effective replicates used for mean comparisons are: col. 2,4,6-8,10,12-16,18-22,24=2.8; 3=1.8; 5,17,23=2.7; 11=2.6
* Adjusted means
Excluded replicate 3 in column 3; 2 in 9
Could not calculate LSD (% mean diff) for columns 1,7,16,22,25 because error mean square = 0.

The Ohio State University

Evaluation of ImpactZ and IMPACT programs for performance and corn safety compared to a competitive program in university trials.

Trial ID: 18IMPACT Trial Year: 2018
Protocol ID: 18C04H096 Investigator: Dr. Mark M. Loux
Project ID: IMPACTZ Study Director: RICHARD PORTER

Pest Type	W Weed	W Weed	W Weed	W Weed
Pest Code	CHEAL	AMARE	ABUTH	IPOHE
Pest Scientific Name	Chenopodium al>	Amaranthus ret>	Abutilon theop>	Ipomoea hedera>
Pest Name	common lambsqu>	Redroot pigweed	velvetleaf	ivy-leaf morni>
Crop Code	ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale	BCOR	BCOR	BCOR	BCOR
Crop Scientific Name	Zea mays	Zea mays	Zea mays	Zea mays
Crop Name	Corn	Corn	Corn	Corn
Description	WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated	PLANT P	PLANT P	PLANT P	PLANT P
Rating Date	Jul-18-2018	Jul-18-2018	Jul-18-2018	Jul-18-2018
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%
Sample Size, Unit	2 ROW	2 ROW	2 ROW	2 ROW
Collection Basis, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1 1
SE Group No.	32	33	34	35 37
Days After First/Last Applic.	79 50	79 50	79 50	79 50
Trt-Eval Interval	50 DA-C	50 DA-C	50 DA-C	50 DA-C
Plant-Eval Interval	80 DP-1	80 DP-1	80 DP-1	80 DP-1
Days After Emergence	69 DE-1	69 DE-1	69 DE-1	69 DE-1
ARM Action Codes				
Number of Decimals	0	0	0	0

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	21*	22*	23*	24*	25
1	Untreated Check				0 b	0 -	0 c	0 b	
2	Harness Xtra 5.6	2.52	lb ai/a	A	93 a	100 -	60 b	67 a	
3	Harness Xtra 5.6	2.52	lb ai/a	A	100 a	100 -	99 a	97 a	
	ImpactZ	0.356	lb ai/a	C					
	MSO	1.0	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
4	Harness Xtra 5.6	2.52	lb ai/a	A	100 a	100 -	100 a	90 a	
	ImpactZ	0.266	lb ai/a	C					
	Roundup PowerMax	1.13	lb ae/a	C					
	MSO	0.5	% v/v	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
5	Harness Xtra 5.6	2.52	lb ai/a	A	100 a	100 -	100 a	95 a	
	ImpactZ	0.266	lb ai/a	C					
	Liberty 280 SL	0.402	lb ai/a	C					
	N-Pak AMS Liquid	2.5	% v/v	C					
6	Harness	1.64	lb ai/a	B	100 a	100 -	100 a	93 a	
	IMPACT	0.0219	lb ai/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
7	Harness	1.64	lb ai/a	B	100 a	100 -	100 a	92 a	
	IMPACT	0.0164	lb ai/a	B					
	Roundup PowerMax	1.13	lb ae/a	B					
	Atrazine	0.5	lb ai/a	B					
	MSO	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					

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Due to missing data, the effective replicates used for mean comparisons are: col. 2,4,6-8,10,12-16,18-22,24=2.8; 3=1.8; 5,17,23=2.7; 11=2.6
* Adjusted means
Excluded replicate 3 in column 3; 2 in 9
Could not calculate LSD (% mean diff) for columns 1,7,16,22,25 because error mean square = 0.

The Ohio State University

Evaluation of ImpactZ and IMPACT programs for performance and corn safety compared to a competitive program in university trials.

Trial ID: 18IMPACT Trial Year: 2018
Protocol ID: 18C04H096 Investigator: Dr. Mark M. Loux
Project ID: IMPACTZ Study Director: RICHARD PORTER

Pest Type		W Weed	W Weed	W Weed	W Weed
Pest Code		CHEAL	AMARE	ABUTH	IPOHE
Pest Scientific Name		Chenopodium al>	Amaranthus ret>	Abutilon theop>	Ipomoea hedera>
Pest Name		common lambsqu>	Redroot pigweed	velvetleaf	ivy-leaf morni>
Crop Code		ZEAMX	ZEAMX	ZEAMX	ZEAMX
BBCH Scale		BCOR	BCOR	BCOR	BCOR
Crop Scientific Name		Zea mays	Zea mays	Zea mays	Zea mays
Crop Name		Corn	Corn	Corn	Corn
Description		WEED CONTROL	WEED CONTROL	WEED CONTROL	WEED CONTROL
Part Rated		PLANT P	PLANT P	PLANT P	PLANT P
Rating Date		Jul-18-2018	Jul-18-2018	Jul-18-2018	Jul-18-2018
Rating Type		CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit		%	%	%	%
Sample Size, Unit		2 ROW	2 ROW	2 ROW	2 ROW
Collection Basis, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1 1
SE Group No.		32	33	34	35 37
Days After First/Last Applic.		79 50	79 50	79 50	79 50
Trt-Eval Interval		50 DA-C	50 DA-C	50 DA-C	50 DA-C
Plant-Eval Interval		80 DP-1	80 DP-1	80 DP-1	80 DP-1
Days After Emergence		69 DE-1	69 DE-1	69 DE-1	69 DE-1
ARM Action Codes					
Number of Decimals		0	0	0	0

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	21*	22*	23*	24*	25
8	Halex GT	1.98	lb ai/a	B	100 a	100 -	99 a	80 a	
	Atrazine	0.5	lb ai/a	B					
	NIS	0.25	% v/v	B					
	N-Pak AMS Liquid	2.5	% v/v	B					
LSD P=.05					7.5	.	11.7	22.4	.
Standard Deviation					4.2	0.0	6.6	12.7	.
CV					4.91	0.0	8.14	16.61	.
Levene's F					0.932	0.00	0.864	0.811	.
Levene's Prob(F)					0.511	.	0.557	0.592	.
Skewness					-2.2897*	-2.3509*	-1.7096*	-1.6555*	.
Kurtosis					3.6494*	3.8552*	1.4606	1.6858	.
Replicate F					0.967	0.000	0.923	0.513	
Replicate Prob(F)					0.4061	1.0000	0.4238	0.6104	
Treatment F					205.449	0.000	88.292	19.629	
Treatment Prob(F)					0.0001	1.0000	0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Due to missing data, the effective replicates used for mean comparisons are: col. 2,4,6-8,10,12-16,18-22,24=2.8; 3=1.8; 5,17,23=2.7; 11=2.6
* Adjusted means
Excluded replicate 3 in column 3; 2 in 9
Could not calculate LSD (% mean diff) for columns 1,7,16,22,25 because error mean square = 0.

The Ohio State University

Evaluation of ImpactZ and IMPACT programs for performance and corn safety compared to a competitive program in university trials.

Trial ID: 18IMPACT Trial Year: 2018

Protocol ID: 18C04H096 Investigator: Dr. Mark M. Loux

Project ID: IMPACTZ Study Director: RICHARD PORTER

Pest Type

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

Pest Code

SETFA, Setaria faberi, Giant foxtail = US

AMBTR, Ambrosia trifida, Giant ragweed = US

CHEAL, Chenopodium album, common lambsquarters = US

ABUTH, Abutilon theophrasti, velvetleaf = US

IPOHE, Ipomoea hederacea, ivy-leaf morning glory = US

AMARE, Amaranthus retroflexus, Redroot pigweed = US

Crop Code

ZEAMX, BCOR, Zea mays, Corn = US

Part Rated

PLANT = plant

C = Crop is Part Rated

P = Pest is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

CONTRO = control / burndown or knockdown

Rating Unit

% = percent

ROW = row

PLOT = total plot

Plant-Eval Interval

31 DP-1 = 1 ZEAMX Apr-29-2018

45 DP-1 = 1 ZEAMX Apr-29-2018

58 DP-1 = 1 ZEAMX Apr-29-2018

80 DP-1 = 1 ZEAMX Apr-29-2018

ARM Action Codes

EC = Do not analyze untreated check, while still reporting treatment mean on AOV Means Table

ER3 = Excluded replicate 3

ER2 = Excluded replicate 2

ET5 = Excluded treatment 5

AA = Automatic arcsine square root % transformation