IOWA STATE UNIVERSITY
Department of Agronomy

Weed Science Program
2022 Weed Control Results

Welcome to the 2022 Weed Control Results for the Iowa State University Weed Science Program. Included in the report are data from the individual studies and supplemental information including site characteristics and environmental conditions. We hope you find the report format and contents convenient and useful.

Sections of the 2022 report are listed in the **bookmarks** pane. Click on a bookmark to view the link contents. Click on individual studies within a directory that is in the bookmark pane to go directly to a study.

To search for weed species, products, etc. in the 2022 report, use <control> "f" to expose the "Find" search box on the toolbar.

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Caveat

The information in this report is not to be used for publication without the express consent of the Weed Science Program Project Leader. Information contained within does not constitute a recommendation or endorsement of product use. Recommendations for weed control in field crops are available from Iowa State University Extension, Iowa State University, Ames, Iowa.

Acknowledgements

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- Adjuvants Unlimited
- AgraSyst
- AMVAC Chemical Corporation
- BASF Corporation
- Bayer CropScience
- Belchim Crop Protection USA
- CHS Agronomy
- Committee for Agricultural Development
- Corteva Agriscience
- Farmers' Business Network
- FMC Corporation
- Helm Agro US, Inc.
- Iowa Soybean Association
- Iowa State University Crop Performance Testing
- Iowa State University Extension
- Iowa State University Research Farms
- Kalo
- Nufarm Americas, Inc.
- Summit Agro USA, LLC
- Syngenta Crop Protection, Inc.
- United Soybean Board
- UPL NA Inc.
- Valent USA Corporation

Printing Instructions

Printing page(s) associated with the Bookmarks within the **2022 Weed Control Results** document can be accomplished by:

- opening the bookmark pane on the left
- using the directory bookmarks and clicking the desired study to print within the selected directory
- clicking on the printer icon from the toolbar
- select “Custom” from the drop down menu for “Pages”
- enter the range of page numbers to print
- click on “Print”

Abbreviations

Results contained in the ISU Weed Control Results report are generated mostly by Agriculture Research Manager (ARM) software which uses various abbreviations for treatment, application timing, crop, weed, and observation information.

Treatment and application information

Abbreviation	Description
% v/v	Percent volume of product per volume mix basis
% w/v	Percent weight of product per volume mix basis
EPOST	Early postemergence timing
EPP	Early preplant timing
FL OZ/A	Fluid ounces product per acre
LB AE/A	Pounds acid equivalent per acre
LB AI/A	Pounds active ingredient per acre
LB/100 GAL	Pounds dry product per 100 gallons mix
LB/A	Pounds product per acre
LPOST	Late postemergence timing
MPOST	Mid-postemergence timing
OZ AI/A	Ounces active ingredient per acre
OZ WT/A	Ounces dry product per acre
OZ/A	Ounces product per acre
POST	Postemergence timing
PRE	Preemergence timing
PREPLA	Preplant
PT/A	Pints material per acre
QT/A	Quarts material per acre
SPOST	Sequential postemergence timing

Crop and weed species information

Bayer Code	Common name	Genus species
ABUTH	Velvetleaf	*Abutilon theophrasti*
AMATA	Common/tall waterhemp	*Amaranthus tuberculatus, A. rudis* or *A. tamariscinus*
AMBEL	Common ragweed	*Ambrosia artemisiifolia*
CAPBP	Shepherd's purse	*Capsella bursa-pastoris*
CHEAL	Common lambsquarters	*Chenopodium album*
ERBVI	Woolly cupgrass	*Eriochloa villosa*
ERICA	Canada horseweed	*Conyza Canadensis*
GLXMA	Soybean	*Glycine max*
IPOHE	Ivyleaf morningglory	*Ipomoea hederacea*

Abbreviations (continued)

Crop and weed species information

Bayer Code	Common name	Genus species
POLPY	Pennsylvania smartweed	*Persicaria Pensylvanica*
SETFA	Giant foxtail	*Setaria faberi*
SETVI	Green foxtail	*Setaria viridis*
SOLPT	Eastern black nightshade	*Solanum ptychanthum*
TAROF	Common dandelion	*Taraxacum officinale*
XANSS	Common cocklebur	*Xanthium strumarium*
ZEAMD	Corn	*Zea mays indentata*

Observation information

Visual estimates of % crop phytotoxicity and weed control are compared to an untreated control and made on a 0 to 99 rating scale (0 percent = no crop phytotoxicity or weed control; 99 percent = complete crop death or weed control). Corn stand for 30 inch row spacing is measured at 17.5 row feet and is equivalent to 1/1000th acre.

Abbreviation	Description
BRNDN	Burndown
bu/ac	Bushels per acre
CONTRO	Control
COUPLA	Plants counted
DA-A	Days after application timing code A, B, etc.
DA-E	Days after emergence
DAT	Days after treatment
EMERGE	Emergence
PHYCHL	% phytotoxicity – crop injury chlorosis
PHYGEN	% phytotoxicity – general crop injury
PHYLCU	% phytotoxicity – crop injury leaf curl
PHYLDR	% phytotoxicity – crop injury leaf drop
PHYNEC	% phytotoxicity – crop injury necrosis
PHYSTU	% phytotoxicity – crop injury stunting
STAOBJ	Stand counts
VIGOR	Plant vigor
YIELD	Crop yield

Products used in 2022 Research Program

Commercial Name or Experimental Number	Common Name or Experimental Number	Company
	Herbicide	
AAtrex 4L SC	atrazine	Syngenta Crop Protection
Amicide Advance	2,4-D	Nufarm, Inc.
BCP222H		Belchim Crop Protection
Callisto 4 SC	mesotrione	Syngenta Crop Protection
Cobra 2 EC	lactofen	Valent USA Corporation
Credit Xtreme 4.5 SL (lb ae)	glyphosate	Nufarm Inc.
Dual II Magnum 7.64 EC	s-metolachlor	Syngenta Crop Protection
Durango DMA 4 SL (lb ae)	glyphosate	Corteva Agriscience
Engenia 5 L (lb ae)	dicamba	BASF Corporation
Enlist One 3.8 (lb ae)	2,4-D	Corteva Agriscience
EverpreX 7.62 EC	s-metolachlor	Corteva Agriscience
FirstRate 84 WG	clhoransulam-methyl	Corteva Agriscience
Gramoxone 3 SL	paraquat	Syngenta Crop Protection
Helmet 7.8 EC	metolachlor	Helm Agro US, Inc.
Impact 2.8 SC	topramezone	AMVAC Chemical Corp.
Laudis 3.5 SC	tembotrione	Bayer CropScience
Liberty 280 2.34 SL	glufosinate	Bayer CropScience
Mauler 4 SC	metribuzin	Valent USA Corporation
Outlook 6 EC	dimethenamid-P	BASF Corporation
Rancor 4F	metribuzin	Atticus Ag.
Reviton 2.83 SC	tiafenacil	Helm Agro US, Inc.
Roundup PowerMAX 4.5 SL (lb ae)	glyphosate	Bayer CropScience
Roundup PowerMAX 3 4.8 SL (lb ae)	glyphosate	Bayer CropScience
Select Max 0.97 EC	clethodim	Valent USA Corporation
Sharpen 2.85 SC	saflufenacil	BASF Corporation
Shieldex 3.33 SC	tolpyralate	Summit Agro USA
Spartan 4F	sulfentrazone	FMC Corporation
Stinger 3 SL	clopyralid	Corteva Agriscience
Surpass NXT 7 EC	acetochlor	Corteva Agriscience
Tough 5EC	pyridate	Belchim Crop Protection
TriCor 75 DF	metribuzin	UPL NA Inc.
Valor EZ 4 SC	flumioxazin	Valent USA Corporation
Warrant 3 CS	acetochlor	Bayer CropScience
Weedone LV4 EC (3.8 lb ae)	2,4-D ester	Nufarm Inc.
Xtendimax wVGT 2.9 SL (lb ae.) (Xtendimax with Vaporgrip Technology)	dicamba	Bayer CropScience
Zidua SC 4.17	pyroxasulfone	BASF Corporation

Products used in 2022 Research Program (continued)

Commercial Name or Experimental Number	Common Name or Experimental Number	Company
	Herbicide Prepackage Mixture	
Acuron 3.44 ZC	s-metolachlor & atrazine & mesotrione & bicyclopyrone	Syngenta Crop Protection
Acuron GT 4.29 L	s-metolachlor & glyphosate & mesotrione & bicyclopyrone	Syngenta Crop Protection
Anthem Maxx 4.3 SC	pyroxasulfone & fluthiacet-methyl	FMC Corporation
Armezon PRO 5.35 EC	dimethenamid-P & topramezone	BASF Corporation
Authority Edge 4.25 SC	pyroxasulfone & sulfentrazone	FMC Corporation
Authority MTZ DF 45	sulfentrazone & metribuzin	FMC Corporation
Authority Supreme SC 4.16	pyroxasulfone & sulfentrazone	FMC Corporation
BAS 1008AEH		BASF Corporation
Bicep II Magnum 5.5 SC	atrazine & s-metolachlor	Syngenta Crop Protection
Bicep Lite II Magnum 6 SC	atrazine & s-metolachlor	Syngenta Crop Protection
Boundary 6.5 EC	s-metolachlor & metribuzin	Syngenta Crop Protection
Broadaxe XC 7 EC	sulfentrazone & s-metolachlor	Syngenta Crop Protection
Calibra 3.1 ZC	s-metolachlor & mesotrione	Syngenta Crop Protection
Capreno 3.45 SC	tembotrione & thiencarbazone	Bayer CropScience
Corvus 2.63 SC	isoxaflutole & thiencarbazone-methyl	Bayer CropScience
Diflexx DUO	dicamba & tembotrione	Bayer CropScience
Engenia Prime 5.23 SC	dicamba & pyroxasulfone & imazethapyr	BASF Corporation
Enlist DUO	glyphosate & 2,4-D	Corteva Agriscience
Fierce EZ 3 SC	flumioxazin & pyroxasulfone	Valent USA Corporation
Fierce MTZ SC 2.64	flumioxazin & pyroxasulfone & metribuzin	Valent USA Corporation
Halex GT 4.39 CS	s-metolachlor & glyphosate & mesotrione	Syngenta Crop Protection
Harness MAX 3.85 L	acetochlor & mesotrione	Bayer CropScience
Harness Xtra 5.6 L	acetochlor & atrazine	Bayer CropScience
Harness Xtra 6L	acetochlor & atrazine	Bayer CropScience
Helmet Maxx 3.58 L	metolachlor & atrazine & mesotrione	Helm Agro US, Inc.
Hornet WDG 78.5	clopyralid & flumetsulam	Amvac Chemical Corp.
Keystone NXT 5.6 SE	acetochlor & atrazine	Corteva Agriscience
Kyber 2.64 SC	flumioxazin & metribuzin & pyroxasulfone	Corteva Agriscience
Impact Core 7.15 EC	topramezone & acetolchlor	Amvac Chemical Corp.
Lexar EZ 3.7	atrazine & s-metolachlor & mesotrione	Syngenta Crop Protection
Maverick 2 SC	clopyralid & mesotrione & pyroxasulfone	Valent USA Corporation
Panther MTZ 3.67 L	flumioxazin & metribuzin	Nufarm Inc.
Panther Pro 4.2 L	flumioxazin & imazethapyr & metribuzin	Nufarm Inc.
Perpetuo 2.3 SC	flumiclorac & pyroxasulfone	Valent USA Corporation
Prefix 5.29 EC	s-metolachlor & fomesafen	Syngenta Crop Protection
Resicore 3.29 L	acetochlor & mesotrione & clopyralid	Corteva Agriscience
Restraint 480 SL	acetochlor & tolpyralate	Summit Agro USA
Sequence 5.25 EW	glyphosate & s-metolachlor	Syngenta Crop Protection
Sinate 2.57 SL	topramezone & glufosinate	Amvac Chemical Corp.

Products used in 2022 Research Program (continued)

Commercial Name or Experimental Number	Common Name or Experimental Number	Company
	Herbicide Prepackage Mixture	
Sonic 70 DF	sulfentrazone & cloransulam-methyl	Corteva Agriscience
SureStart II 4.25 SE	acetochlor & flumetsulam & clopyralid	Corteva Agriscience
Tavium Plus Vaporgrip Tech 3.39 CS	s-metolachlor & dicamba	Syngenta Crop Protection
Tendovo 4.14 ZC	cloransulam-methyl & metribuzin & s-metoloachlor	Syngenta Crop Protection
Trivolt 3.65 SC	isoxaflutole + thiencarbazone-methyl + flufenacet	Bayer CropScience
Tough R	pyridate + mesotrione	Belchim Crop Protection
Verdict 5.57 EC	saflufenacil & dimethenamid-P	BASF Corporation
Warrant Ultra	acetochlor & fomesafen	Bayer CropScience
Zidua PRO 4 SC	pyroxasulfone & saflufenacil & imazethapyr	BASF Corporation
Zone Defense 77.2 WG	sulfentrazone & flumoixazin	Helm Agro US, Inc.
Zone Elite 7 EC	sulfentrazone & metolachlor	Helm Agro US, Inc.
	Additives, Fertilizers & Classification	
Agri-dex	crop oil concentrate	
AMS (Ammonium sulfate)	sprayable ammonium sulfate	American Plant Food
AMS 2000	drift reduction agent + water conditioner	Winfield United
Amsol	liquid ammonium sulfate	Winfield United
Aegos	buffering agent	BASF Corporation
AgraSyst 90	nonioinic surfactant	AgraSyst,Inc.
AQ 700	water conditioning surfactant	AgraSyst,Inc.
AQ 700-16	water conditioning surfactant	AgraSyst Inc.
Class Act Ridion	water conditioner/non-ionic surfanctant blend	Winfield United
COC (Prime Oil)	oil surfactant	Winfield United
Destiny HC	high surfactant oil concentrate	Winfield United
Full Load	water conditioning surfactant	AgraSyst Inc.
Induce	non-ionic surfactant	Helena AgriEnterprises
Intact	drift reduction agent	Precision Laboratories
MSO (Exuro)	methylated seed oil	Winfield United
NIS (Preference)	non-ionic surfactant/penetrant	Winfield United
N-Pak AMS Liquid	liquid water conditioning agent	Winfield United
Premium MSO	methylated seed oil	Winfield United
Strikelock	deposition aid & surfactant & methylated seed oil	Winfield United
Vaporgrip Xtra Agent	volatility reduction agent	Bayer CropScience
Volt-Edge	volatility reduction agent	Winfield United

Weather Data – Year 2022

Study locations

Agronomy Research Farms, Ames, IA
Northeast Research and Demonstration Farm, Nashua, IA

Some of the precipitation data was collected manually by personnel at Iowa State University Research Farms at Ames and Nashua.

Air and soil temperature data were obtained from the Iowa Environmental Mesonet web site, Iowa State University, Department of Agronomy, Crop, Soil, and Environmental Sciences. URL address:

http://mesonet.agron.iastate.edu/agclimate/hist/daily.php

Air Temperature, 4-inch Soil Temperature and Precipitation, 2022
Iowa State University Research Farms, Ames, IA

Date	April				May				June				July				August			
	temp °F				temp °F				temp °F				temp °F				temp °F			
	air		soil	precip	air		soil	precip	air		soil	precip	air		soil	precip	air		soil	precip
	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches
1	49	21	40	0.00	50	41	47	0.00	74	53	71	0.00	83	65	78	0.00	87	64	83	0.00
2	56	33	40	0.00	46	41	45	0.00	80	49	70	0.00	85	59	79	0.00	94	70	86	0.00
3	46	30	40	0.00	51	41	47	0.00	82	56	73	0.00	86	62	79	0.00	92	66	85	0.00
4	56	33	43	0.00	59	40	50	0.00	77	60	71	0.00	93	71	79	1.20	83	59	83	0.00
5	57	34	42	0.00	59	49	52	0.00	82	56	70	3.40	94	70	81	0.10	89	63	84	0.00
6	45	37	41	0.00	67	48	56	0.00	72	63	68	0.15	77	68	75	0.00	95	70	86	0.00
7	40	31	37	0.00	72	46	59	0.00	79	58	71	0.00	83	68	76	0.00	85	74	84	0.00
8	48	31	38	0.00	61	53	56	0.90	77	61	71	0.00	80	69	76	0.50	77	62	81	0.00
9	57	26	45	0.00	92	59	63	0.00	80	59	73	0.00	84	65	77	0.00	83	58	81	0.00
10	74	38	50	0.00	86	61	68	0.00	77	61	71	0.20	87	67	78	0.00	88	59	83	0.00
11	65	34	51	0.00	90	68	73	0.00	81	62	70	0.30	82	67	77	0.20	86	63	83	0.00
12	77	42	55	0.00	92	68	76	0.00	87	66	75	0.00	83	62	76	0.00	83	66	82	0.00
13	57	30	40	0.50	82	61	73	0.00	96	75	79	0.00	86	62	78	0.00	84	68	82	0.00
14	48	27	39	0.00	88	54	72	0.00	97	68	82	0.00	91	66	81	0.00	76	62	80	0.00
15	47	28	41	0.00	76	55	68	0.00	78	65	75	3.10	90	72	82	0.00	69	58	75	0.30
16	47	25	43	0.00	82	53	69	0.00	88	63	75	0.00	78	69	78	0.00	80	61	74	0.00
17	38	28	36	0.00	71	52	65	0.00	89	66	77	0.00	84	69	80	0.00	83	60	77	0.00
18	44	26	37	0.00	82	54	66	0.90	85	63	77	0.00	89	65	81	0.00	82	60	78	0.00
19	44	23	40	0.00	90	60	70	0.00	91	66	79	0.00	91	67	82	0.00	81	60	75	0.30
20	48	43	43	0.50	73	54	66	0.00	95	71	82	0.00	86	67	81	0.00	74	63	72	0.20
21	66	33	51	0.00	58	44	59	0.00	93	72	84	0.00	87	63	82	0.00	78	61	70	0.00
22	74	51	58	1.70	64	37	59	0.00	88	66	82	0.00	93	66	83	0.00	83	59	72	0.00
23	73	56	56	0.40	65	42	61	0.00	91	65	81	0.00	94	71	85	0.70	82	61	75	0.00
24	55	43	49	0.00	58	48	57	1.00	82	66	77	0.20	82	64	82	0.00	84	63	76	0.00
25	45	31	41	0.00	56	49	54	0.40	86	67	75	0.00	77	61	77	0.00	80	64	77	0.00
26	58	27	49	0.00	55	50	55	0.00	77	55	73	0.00	83	59	80	0.00	81	59	77	0.00
27	64	36	52	0.00	78	46	61	0.00	84	54	73	0.00	84	66	83	0.00	87	67	79	0.00
28	67	41	55	0.00	85	56	66	0.00	86	60	76	0.00	78	61	79	0.30	84	67	76	3.00
29	62	52	54	0.20	85	66	70	0.00	93	65	79	0.00	80	58	78	0.00	82	64	74	0.00
30	67	45	49	0.20	91	63	75	0.00	91	70	79	0.00	84	57	80	0.00	80	58	72	0.00
31					80	61	72	0.20					85	61	81	0.00	77	60	69	0.00

monthly average max & min air temperature, 4-inch soil temperature and total precipitation

April				May				June				July				August			
temp °F			precip	temp °F			precip	temp °F			precip	temp °F			precip	temp °F			precip
max	min	avg	inches	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches
56	34	45	3.50	72	52	62	3.40	84	63	75	7.35	85	65	80	3.00	83	63	78	3.80

Air Temperature, 4-inch Soil Temperature and Precipitation, 2022
Iowa State University Research Farms, Nashua, IA

Date	April				May				June				July				August			
	temp °F			precip	temp °F			precip	temp °F			precip	temp °F			precip	temp °F			precip
	air		soil		air		soil		air		soil		air		soil		air		soil	
	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches
1	47	20	37	0.00	47	42	45	0.00	73	49	66	0.00	81	58	74	0.00	83	60	79	0.00
2	51	31	36	0.00	48	39	46	0.00	81	42	65	0.00	85	54	73	0.00	92	59	81	0.00
3	43	24	37	0.00	53	35	44	0.64	77	49	67	0.00	86	56	74	0.00	92	63	83	0.00
4	48	30	38	0.00	61	32	49	0.00	62	52	63	0.27	89	65	74	0.72	83	56	82	0.00
5	49	31	40	0.00	59	42	49	0.00	73	55	63	0.21	92	68	79	0.79	86	56	82	0.00
6	42	33	37	0.00	67	44	53	0.00	70	59	65	0.57	83	65	77	0.00	92	70	82	2.85
7	41	30	36	0.00	72	40	57	0.00	77	54	66	0.00	83	67	77	0.00	81	70	78	0.00
8	44	29	35	0.00	59	49	53	0.65	75	56	66	0.62	81	66	76	0.28	76	56	76	0.00
9	56	24	39	0.00	89	56	60	0.43	80	52	66	0.00	81	60	76	0.00	82	53	75	0.00
10	68	33	46	0.00	79	58	64	0.00	75	61	66	0.00	84	61	75	0.00	86	53	76	0.00
11	63	34	45	0.00	93	63	69	0.00	75	59	66	0.00	82	62	75	0.00	74	63	74	0.18
12	68	33	51	0.84	94	69	72	0.00	84	63	69	0.10	82	57	73	0.00	73	59	71	0.01
13	56	30	38	0.00	82	56	70	0.00	80	67	69	0.31	82	61	74	0.00	79	62	72	0.00
14	41	25	36	0.00	89	52	68	0.00	96	68	73	0.00	83	60	75	0.00	73	60	71	0.00
15	41	24	35	0.00	76	48	65	0.00	75	60	71	0.33	80	66	76	0.26	73	56	71	0.00
16	42	23	37	0.00	80	48	65	0.00	89	60	70	0.00	78	64	74	0.00	78	56	73	0.00
17	44	18	38	0.00	60	51	61	0.00	84	59	72	0.00	84	63	76	0.00	82	54	74	0.00
18	39	26	36	0.00	78	53	64	0.00	83	58	73	0.00	88	59	78	0.00	83	56	76	0.52
19	45	21	40	0.00	89	56	65	0.25	91	62	75	0.00	89	65	79	0.00	80	60	73	0.69
20	48	41	42	0.28	73	49	62	0.11	95	67	79	0.00	84	65	79	0.00	75	60	71	0.22
21	62	36	47	0.00	60	41	57	0.00	94	69	81	0.00	84	58	80	0.00	78	56	70	0.00
22	58	46	51	0.59	61	40	57	0.00	87	61	79	0.00	89	58	80	0.00	83	54	71	0.00
23	74	56	54	0.00	63	35	58	0.00	91	61	79	0.00	88	67	80	0.00	82	52	72	0.00
24	56	41	45	0.00	66	45	59	0.58	86	65	79	0.00	79	59	80	0.00	83	63	74	0.00
25	41	30	39	0.00	55	47	55	1.25	82	65	75	2.76	79	52	77	0.00	78	59	73	0.00
26	49	25	43	0.00	56	50	56	0.00	73	55	70	0.00	81	57	79	0.00	78	54	72	0.00
27	52	31	45	0.00	77	44	60	0.00	81	51	69	0.00	83	63	82	0.21	84	63	74	0.29
28	50	32	45	1.40	84	53	62	0.00	84	55	71	0.00	75	56	77	0.00	83	67	73	1.77
29	56	44	49	0.00	85	64	66	0.00	89	57	74	0.00	78	52	76	0.00	79	59	72	0.00
30	64	45	49	0.17	91	66	70	0.00	88	69	75	0.00	83	49	77	0.00	76	53	69	0.00
31					80	57	68					0.00	84	57	78	0.17	84	56	70	0.00

monthly average max & min air temperature, 4-inch soil temperature and total precipitation

temp °F			precip	temp °F			precip	temp °F			precip	temp °F			precip	temp °F			precip
max	min	avg	inches	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches	max	min	avg	inches
51	32	42	3.28	72	49	60	3.91	82	59	71	5.17	83	60	77	2.43	81	59	74	6.53

Study Directory

Ames, IA – Corn studies

Minimum-tillage

ACC1	Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
ACC2	Acuron vs. Key Competitors, Ames, IA, 2022.
ACC3	PRE plus POST Herbicide Programs Demonstration for Weed Control in Corn, Ames, IA, 2022.
ACC4	Residual Weed control with Maverick, Acuron, Bicep II Magnum, Resicore & TriVolt SC in Corn, Ames, IA, 2022.
ACC5	Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.
ACC6	POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.
ACC7	Preemergence Trivolt Programs in Corn for Crop Safety and Efficacy, Ames, IA, 2022.
ACC9	Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.
ACC10	Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.

Study Directory

Ames, IA – Soybean studies

Minimum-tillage

ASC1	Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.
ASC2	Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.
ASC3	Evaluation of BCP222H Control of Common Waterhemp in Soybean, Ames, IA, 2022.
ASC4	Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.
ASC5	Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.
ASC6	Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
ASC7	AQ 700 & AQ 700-16 Water Conditioning Surfactants with Liberty for Weed Control, Ames, IA, 2022.
ASC8	Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.
ASC9	Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.
ASC10	Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.
ASC11	Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.
ASC12	Competitive Soybean Systems Comparison, Ames, IA, 2022.
ASL2	Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.
ASB1	Non-Crop Rainfall Activation Study, Ames, IA, 2022.

No-tillage

ASN1	Soybean Rainfall Activation Study in No-Till Soybean, Ames, IA, 2022.
ASN3	Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.
ASN4	Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.
ASN5	Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.
ASN6	2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Study Directory

Nashua, IA – Soybean study

Minimum tillage

NSC1	Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.

Study Directory

McCallsburg, IA – Corn study

Minimum tillage

MCC2	Evaluation of Tough 5EC, Laudis and Atrazine Combinations for Glyphosate and HPPD Resistant Common Waterhemp Control in Corn, McCallsburg, IA, 2022.

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
Trial ID: ACC1 Location: Ames Trial Year: 2022
Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/25/2022
Initiation Date: 5/14/2022
Completion Date: 10/31/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004912 N
Longitude of LL Corner °: -93.671605 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to demonstrate the efficacy of Syngenta residuals and the knockdown/residual control of Acuron GT compared to competitors.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 7/13/2022 **Stage Scale:** VR
Variety: Syngenta NK0886-5122-EZ1
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/14/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 59 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 5/23/2022
Harvest Date: 10/31/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 15.0 **Harvested Length:** 22 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/13/2022
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/13/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/13/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBTR Ambrosia trifida **Entry Date:** 9/13/2022
Common Name: Giant ragweed **Stage Scale:** DESC

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 8 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
Trial ID: ACC1 Location: Ames Trial Year: 2022
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 14 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 20%.

Soil Description
Description Name: 86
% Sand: 47.5 **% OM:** 4.1 **Texture:** SCL sandy clay loam
% Silt: 27.5 **pH:** 7.1 **Soil Name:** CANISTEO
% Clay: 25 **CEC:** 19.7
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN
24.	8/15/2022	0.3	IN
25.	8/19/2022	0.3	IN
26.	8/20/2022	0.2	IN
27.	8/28/2022	3	IN

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
Trial ID: ACC1 Location: Ames Trial Year: 2022
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B
Application Date	5/15/2022	6/17/2022
Appl. Start Time	5:30 PM	12:15 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Appl. Entry Date	7/13/2022	7/13/2022
Air Temperature Start, Stop	77, 77 F	81, 82 F
% Relative Humidity Start, Stop	29, 29	55, 55
Wind Velocity+Dir. Start	12 MPH, W	8 MPH, N
Wind Velocity+Dir. Stop	12 MPH, W	8 MPH, N
Wind Velocity+Dir. Max	14 MPH, W	10 MPH, N
Wet Leaves (Y/N)		N, no
Soil Temperature	59 F	77 F
Soil Moisture	DRY	WET
Soil Surface Condition	MEDIUM	
% Cloud Cover	40	0
Next Moisture Occurred On	5/18/2022	6/24/2022
Time to Next Moisture	3.0 DAY	7.0 DAY

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-8	25
Stage Majority, Percent		V5, -
Stage Minimum, Percent		V5, -
Stage Maximum, Percent		V5, -
Height Average		11 IN
Height Minimum, Maximum		11, 12

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
Trial ID: ACC1 Location: Ames Trial Year: 2022
Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, BBCH	SETFA, W, BBCH
Stage Majority, Percent		5 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		5 IN
Height Minimum, Maximum		4, 6
Density Average		4 FT2
Density Minimum, Maximum		0, 8
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH
Stage Majority, Percent		5 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		4 IN
Height Minimum, Maximum		3, 5
Density Average		1 FT2
Density Minimum, Maximum		0, 3
Pest 3 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		3 IN
Height Minimum, Maximum		2, 4
Density Average		3 FT2
Density Minimum, Maximum		0, 5
Pest 4 Code, Type, Scale	AMBTR, W, BBCH	AMBTR, W, BBCH
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		2 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		4 IN
Height Minimum, Maximum		3, 5
Density Average		5 PLOT
Density Minimum, Maximum		3, 8

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
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Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B
Appl. Equipment	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	110015
Nozzle Type	TT	TT
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19.0 IN
Boom Length	10 FT	10.0 FT
Boom Height	20.0 IN	20.0 IN
Ground Speed	3 MPH	3 MPH
Carrier	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC
Mix Size	2000.0 mL	2000.0 mL
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/13/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

Trial Comments

Herbicide injury to corn by the treatments appeared as plant height reduction.

Weed pressure in the first block was heavier in comparison to the other blocks.

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
Trial ID: ACC1 Location: Ames Trial Year: 2022
Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	AMBTR
	Rating Date							6/17/2022	6/17/2022	6/17/2022	6/17/2022	6/17/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V5	2-5 IN	1-3 IN	1-5 IN	3-7 IN
	Trt-Eval Interval							33 DA-A	33 DA-A	33 DA-A	33 DA-A	33 DA-A
1	Untreated Check							0	0	0	0	0
2	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	0	90	60	87	63
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Halex GT	4.39	CS	3.6	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	0	84	66	91	68
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	0	61	89	91	90
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Calibra	3.1	ZC	1.4	QT/A	PRE	A	0	69	86	93	83
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Harness Xtra	6	SE	1.5	QT/A	PRE	A	0	88	53	96	58
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	SureStart II	4.25	SE	2	PT/A	PRE	A	8	79	84	96	68
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Resicore	3.29	L	1.25	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Verdict	5.57	EC	8	FL OZ/A	PRE	A	0	57	72	75	77
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Armezon PRO	5.35	EC	20	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	LSD P=.05							2.7	15.7	20.3	12.2	15.2
	Standard Deviation							1.8	10.6	13.8	8.3	10.3
	CV							193.22	16.16	21.62	10.54	16.39

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25
Could not calculate LSD (% mean diff) for columns 7,8,9,10,12,13,14,15,16,17,18,19,20,21,22,23 because error mean square = 0.
^Calculated from residual.

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.

Trial ID: ACC1 Location: Ames Trial Year: 2022
Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	AMBTR
	Rating Date							6/28/2022	6/28/2022	6/28/2022	6/28/2022	6/28/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V8	2-5 IN	1-3 IN	1-5 IN	3-7 IN
	Trt-Eval Interval							11 DA-B	11 DA-B	11 DA-B	11 DA-B	11 DA-B
1	Untreated Check							0	0	0	0	0
2	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Halex GT	4.39	CS	3.6	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	1	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Calibra	3.1	ZC	1.4	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Harness Xtra	6	SE	1.5	QT/A	PRE	A	11	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	SureStart II	4.25	SE	2	PT/A	PRE	A	15	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Resicore	3.29	L	1.25	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Verdict	5.57	EC	8	FL OZ/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Armezon PRO	5.35	EC	20	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	LSD P=.05							3.0	.	.	.	.
	Standard Deviation							2.1	0.0	0.0	0.0	0.0
	CV							59.75	0.0	0.0	0.0	0.0

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25
Could not calculate LSD (% mean diff) for columns 7,8,9,10,12,13,14,15,16,17,18,19,20,21,22,23 because error mean square = 0.
^Calculated from residual.

Iowa State University

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Trial ID: ACC1 Location: Ames Trial Year: 2022
Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	AMBTR
	Rating Date							7/2/2022	7/2/2022	7/2/2022	7/2/2022	7/2/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V10				
	Trt-Eval Interval							15 DA-B	15 DA-B	15 DA-B	15 DA-B	15 DA-B
1	Untreated Check							0	0	0	0	0
2	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Halex GT	4.39	CS	3.6	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Calibra	3.1	ZC	1.4	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Harness Xtra	6	SE	1.5	QT/A	PRE	A	1	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	SureStart II	4.25	SE	2	PT/A	PRE	A	9	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Resicore	3.29	L	1.25	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Verdict	5.57	EC	8	FL OZ/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Armezon PRO	5.35	EC	20	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	LSD P=.05							3.6	.	.	.	.
	Standard Deviation							2.4	0.0	0.0	0.0	0.0
	CV							194.94	0.0	0.0	0.0	0.0

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25
Could not calculate LSD (% mean diff) for columns 7,8,9,10,12,13,14,15,16,17,18,19,20,21,22,23 because error mean square = 0.
^Calculated from residual.

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
Trial ID: ACC1 Location: Ames Trial Year: 2022
Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	SETFA 7/15/2022 CONTRO % 28 DA-B	ABUTH 7/15/2022 CONTRO % 28 DA-B	AMATA 7/15/2022 CONTRO % 28 DA-B	AMBTR 7/15/2022 CONTRO % 28 DA-B	SETFA 8/10/2022 CONTRO % 54 DA-B
	Pest Code											
	Rating Date							7/15/2022	7/15/2022	7/15/2022	7/15/2022	8/10/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval							28 DA-B	28 DA-B	28 DA-B	28 DA-B	54 DA-B
								16	17	18	19	20
1	Untreated Check							0	0	0	0	0
2	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Halex GT	4.39	CS	3.6	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Calibra	3.1	ZC	1.4	QT/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Harness Xtra	6	SE	1.5	QT/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	SureStart II	4.25	SE	2	PT/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Resicore	3.29	L	1.25	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Verdict	5.57	EC	8	FL OZ/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Armezon PRO	5.35	EC	20	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	LSD P=.05							.	.	.	.	.
	Standard Deviation							0.0	0.0	0.0	0.0	0.0
	CV							0.0	0.0	0.0	0.0	0.0

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^Calculated from residual.

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.
Trial ID: ACC1 Location: Ames Trial Year: 2022
Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	21	22	23	24	25
	Pest Code							ABUTH	AMATA	AMBTR	ZEAMD	ZEAMD
	Rating Date							8/10/2022	8/10/2022	8/10/2022	8/15/2022	10/31/2022
	Rating Type							CONTRO	CONTRO	CONTRO	STAOBJ	YIELD
	Rating Unit/Min/Max							%	%	%	17.5 FT	bu/ac
	Pest Stage Majority/Min/Max										R5	R6
	Trt-Eval Interval							54 DA-B	54 DA-B	54 DA-B	59 DA-B	136 DA-B
1	Untreated Check							0	0	0	29	141
2	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	99	99	99	29	221
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Halex GT	4.39	CS	3.6	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep Lite II Magnum	6	SC	1.5	QT/A	PRE	A	99	99	99	31	220
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	99	99	99	29	211
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Calibra	3.1	ZC	1.4	QT/A	PRE	A	99	99	99	28	233
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Harness Xtra	6	SE	1.5	QT/A	PRE	A	99	99	99	29	221
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	SureStart II	4.25	SE	2	PT/A	PRE	A	99	99	99	29	213
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Resicore	3.29	L	1.25	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Verdict	5.57	EC	8	FL OZ/A	PRE	A	99	99	99	29	207
	Aatrex 4L	4	F	0.75	QT/A	POST	B					
	Armezon PRO	5.35	EC	20	FL OZ/A	POST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	LSD P=.05							.	.	.	2.7	32.1
	Standard Deviation							0.0	0.0	0.0	1.8	21.7
	CV							0.0	0.0	0.0	6.32	10.45

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^Calculated from residual.

Iowa State University

Acuron GT and other Syngenta and Competitor Herbicides for Burndown and Residual Control in Corn, Ames, IA, 2022.

Trial ID: ACC1 Location: Ames Trial Year: 2022
Protocol ID: H039BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
AMBTR, Ambrosia trifida, Giant ragweed = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
STAOBJ = stand - objective (based on counts)
YIELD = yield
Rating Unit/Min/Max
%, 0, 100 = percent
bu/ac, , = bushels per acre

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/25/2022
Initiation Date: 5/14/2022
Completion Date: 10/31/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004886 N
Longitude of LL Corner °: -93.670995 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to demonstrate the efficacy of Acuron herbicide applied at different timings in different programs compared to competitors.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/13/2022 **Stage Scale:** VR
Variety: Syngenta NK0886-5122-EZ1
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/14/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 59 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 5/23/2022
Harvest Date: 10/31/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 15.0 **Harvested Length:** 22 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/13/2022
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/13/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/13/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBTR Ambrosia trifida **Entry Date:** 9/13/2022
Common Name: Giant ragweed **Stage Scale:** DESC

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 7 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 14 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 20%.

Soil Description
Description Name: 86
% Sand: 47.5 **% OM:** 4.1 **Texture:** SCL sandy clay loam
% Silt: 27.5 **pH:** 7.1 **Soil Name:** CANISTEO
% Clay: 25 **CEC:** 19.7
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN
24.	8/15/2022	0.3	IN
25.	8/19/2022	0.3	IN
26.	8/20/2022	0.2	IN
27.	8/28/2022	3	IN

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B	C
Application Date	5/15/2022	6/4/2022	6/17/2022
Appl. Start Time	5:00 PM	1:15 PM	11:55 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	EPOST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Appl. Entry Date	7/13/2022	7/13/2022	7/13/2022
Air Temperature Start, Stop	77, 77 F	75, 75 F	81, 82 F
% Relative Humidity Start, Stop	29, 29	51, 51	54, 54
Wind Velocity+Dir. Start	12 MPH, W	6 MPH, WSW	6 MPH, N
Wind Velocity+Dir. Stop	12 MPH, W	6 MPH, WSW	7 MPH, N
Wind Velocity+Dir. Max	14 MPH, W	7 MPH, WSW	8 MPH, N
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	59 F	68 F	70 F
Soil Moisture	DRY	DRY	WET
Soil Surface Condition	MEDIUM		
% Cloud Cover	20	100	0
Next Moisture Occurred On	5/18/2022	6/5/2022	6/24/2022
Time to Next Moisture	3.0 DAY	1.0 DAY	7.0 DAY

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR	ZEAMD, BCOR
Stage Majority, Percent		V2, -	V5, -
Stage Minimum, Percent		V2, -	V4, -
Stage Maximum, Percent		V2, -	V6, -
Height Average		5 IN	11 IN
Height Minimum, Maximum		4, 5	10, 12

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent		2 LEAF, -	3 LEAF, -
Stage Minimum, Percent		1 LEAF, -	2 LEAF, -
Stage Maximum, Percent		3 LEAF, -	4 LEAF, -
Height Average		1 IN	4 IN
Height Minimum, Maximum		0.5, 1.5	3, 5
Density Average		10 FT2	1 FT2
Density Minimum, Maximum		5, 15	0, 3
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		1 LEAF, -	3 LEAF, -
Stage Minimum, Percent		COTYLE, -	2 LEAF, -
Stage Maximum, Percent		2 LEAF, -	4 LEAF, -
Height Average		0.5 IN	2 IN
Height Minimum, Maximum		0.25, 1	1, 3
Density Average		3 FT2	3 PLOT
Density Minimum, Maximum		0, 5	0, 5
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		3 LEAF, -	3 LEAF, -
Stage Minimum, Percent		2 LEAF, -	
Stage Maximum, Percent		4 LEAF, -	
Height Average		0.25 IN	1 IN
Height Minimum, Maximum		0.125, 0.5	
Density Average		5 FT2	3 PLOT
Density Minimum, Maximum		0, 10	0, 5
Pest 4 Code, Type, Scale	AMBTR, W, DESC	AMBTR, W, DESC	AMBTR, W, DESC
Stage Majority, Percent		3 LEAF, -	4 LEAF, -
Stage Minimum, Percent		2 LEAF, -	2 LEAF, -
Stage Maximum, Percent		4 LEAF, -	6 LEAF, -
Height Average		1.5 IN	3 IN
Height Minimum, Maximum		1, 2	1, 5
Density Average		5 PLOT	4 PLOT
Density Minimum, Maximum		0, 10	

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B	C
Appl. Equipment	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	110015
Nozzle Type	TT	TT	TT
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	19.0 IN	19.0 IN	19.0 IN
Boom Length	10.0 FT	10.0 FT	10.0 FT
Boom Height	20.0 IN	20.0 IN	20.0 IN
Ground Speed	3 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Mix Size	2000.0 mL	2000.0 mL	2000.0 mL
Propellant	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/13/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

Trial Comments

Herbicide injury on corn appeared as plant height reduction.

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	AMBTR
	Rating Date							6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V5	2-5 IN	1-3 IN	1-3 IN	1-5 IN
	Trt-Eval Interval							11 DA-B	11 DA-B	11 DA-B	11 DA-B	11 DA-B
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	3	QT/A	PRE	A	0	91	98	98	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Acuron	3.44	ZC	3	QT/A	EPOST	B	8	99	99	99	99
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
4	Acuron	3.44	ZC	1.5	QT/A	PRE	A	0	71	98	95	95
	Aatrex 4L	4	F	1	PT/A	PRE	A					
	Acuron	3.44	ZC	1.5	QT/A	POST	C					
	Aatrex 4L	4	F	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
5	Acuron	3.44	ZC	1.5	QT/A	PRE	A	0	83	98	97	97
	Aatrex 4L	4	F	1	PT/A	PRE	A					
	Halex GT	4.39	CS	3.6	PT/A	POST	C					
	Aatrex 4L	4	F	1	PT/A	POST	C					
	NIS		L	0.25	% V/V	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
6	Aatrex 4L	4	F	0.75	QT/A	PRE	A	0	75	94	96	94
	Resicore	3.29	L	1.25	QT/A	PRE	A					
	Aatrex 4L	4	F	0.75	QT/A	POST	C					
	Resicore	3.29	L	1.25	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
7	Aatrex 4L	4	F	0.75	QT/A	PRE	A	0	81	95	99	95
	Harness MAX	3.85	EC	40	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	0.75	QT/A	POST	C					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	LSD P=.05							2.8	11.4	4.4	4.7	5.1
	Standard Deviation							1.9	7.7	3.0	3.1	3.4
	CV							176.38	10.72	3.55	3.77	4.15

Could not calculate LSD (% mean diff) for columns 12,13,14,16,18 because error mean square = 0.
^Calculated from residual.

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	AMBTR
	Rating Date							6/21/2022	6/21/2022	6/21/2022	6/21/2022	6/21/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V6				
	Trt-Eval Interval							17 DA-B	17 DA-B	17 DA-B	17 DA-B	17 DA-B
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	3	QT/A	PRE	A	0	91	98	98	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Acuron	3.44	ZC	3	QT/A	EPOST	B	6	99	99	99	99
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
4	Acuron	3.44	ZC	1.5	QT/A	PRE	A	0	71	98	95	95
	Aatrex 4L	4	F	1	PT/A	PRE	A					
	Acuron	3.44	ZC	1.5	QT/A	POST	C					
	Aatrex 4L	4	F	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
5	Acuron	3.44	ZC	1.5	QT/A	PRE	A	0	83	98	97	97
	Aatrex 4L	4	F	1	PT/A	PRE	A					
	Halex GT	4.39	CS	3.6	PT/A	POST	C					
	Aatrex 4L	4	F	1	PT/A	POST	C					
	NIS		L	0.25	% V/V	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
6	Aatrex 4L	4	F	0.75	QT/A	PRE	A	0	75	94	96	94
	Resicore	3.29	L	1.25	QT/A	PRE	A					
	Aatrex 4L	4	F	0.75	QT/A	POST	C					
	Resicore	3.29	L	1.25	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
7	Aatrex 4L	4	F	0.75	QT/A	PRE	A	0	81	95	99	95
	Harness MAX	3.85	EC	40	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	0.75	QT/A	POST	C					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	LSD P=.05							2.7	11.4	4.4	4.7	5.1
	Standard Deviation							1.8	7.7	3.0	3.1	3.4
	CV							202.65	10.72	3.55	3.77	4.15

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^Calculated from residual.

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							SETFA	ABUTH	AMATA	AMBTR	SETFA
	Rating Date							7/6/2022	7/6/2022	7/6/2022	7/6/2022	8/1/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							10-25 IN				25-60 IN
	Trt-Eval Interval							32 DA-B	32 DA-B	32 DA-B	32 DA-B	58 DA-B
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	3	QT/A	PRE	A	78	99	99	99	78
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Acuron	3.44	ZC	3	QT/A	EPOST	B	99	99	99	99	99
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
4	Acuron	3.44	ZC	1.5	QT/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	1	PT/A	PRE	A					
	Acuron	3.44	ZC	1.5	QT/A	POST	C					
	Aatrex 4L	4	F	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
5	Acuron	3.44	ZC	1.5	QT/A	PRE	A	99	99	99	99	99
	Aatrex 4L	4	F	1	PT/A	PRE	A					
	Halex GT	4.39	CS	3.6	PT/A	POST	C					
	Aatrex 4L	4	F	1	PT/A	POST	C					
	NIS		L	0.25	% V/V	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
6	Aatrex 4L	4	F	0.75	QT/A	PRE	A	99	99	99	99	99
	Resicore	3.29	L	1.25	QT/A	PRE	A					
	Aatrex 4L	4	F	0.75	QT/A	POST	C					
	Resicore	3.29	L	1.25	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
7	Aatrex 4L	4	F	0.75	QT/A	PRE	A	99	99	99	99	99
	Harness MAX	3.85	EC	40	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	0.75	QT/A	POST	C					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	LSD P=.05							4.9	.	.	.	6.7
	Standard Deviation							3.3	0.0	0.0	0.0	4.5
	CV							4.0	0.0	0.0	0.0	5.5

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^Calculated from residual.

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16	17	18	19	20
	Pest Code							ABUTH	AMATA	AMBTR	ZEAMD	ZEAMD
	Rating Date							8/1/2022	8/1/2022	8/1/2022	8/15/2022	10/31/2022
	Rating Type							CONTRO	CONTRO	CONTRO	STAOBJ	YIELD
	Rating Unit/Min/Max							%	%	%	17.5 FT	bu/ac
	Pest Stage Majority/Min/Max								10-40 IN		R5	R6
	Trt-Eval Interval							58 DA-B	58 DA-B	58 DA-B	72 DA-B	149 DA-B
1	Untreated Check							0	0	0	27	154
2	Acuron	3.44	ZC	3	QT/A	PRE	A	99	98	99	29	230
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Acuron	3.44	ZC	3	QT/A	EPOST	B	99	99	99	29	234
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
4	Acuron	3.44	ZC	1.5	QT/A	PRE	A	99	99	99	27	235
	Aatrex 4L	4	F	1	PT/A	PRE	A					
	Acuron	3.44	ZC	1.5	QT/A	POST	C					
	Aatrex 4L	4	F	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
5	Acuron	3.44	ZC	1.5	QT/A	PRE	A	99	99	99	30	234
	Aatrex 4L	4	F	1	PT/A	PRE	A					
	Halex GT	4.39	CS	3.6	PT/A	POST	C					
	Aatrex 4L	4	F	1	PT/A	POST	C					
	NIS		L	0.25	% V/V	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
6	Aatrex 4L	4	F	0.75	QT/A	PRE	A	99	99	99	28	232
	Resicore	3.29	L	1.25	QT/A	PRE	A					
	Aatrex 4L	4	F	0.75	QT/A	POST	C					
	Resicore	3.29	L	1.25	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
7	Aatrex 4L	4	F	0.75	QT/A	PRE	A	99	99	99	29	227
	Harness MAX	3.85	EC	40	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	0.75	QT/A	POST	C					
	Harness MAX	3.85	EC	40	FL OZ/A	POST	C					
	Roundup PowerMAX	4.5	SL	27	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	LSD P=.05							.	1.1	.	2.6	30.5
	Standard Deviation							0.0	0.8	0.0	1.8	20.5
	CV							0.0	0.89	0.0	6.26	9.29

Could not calculate LSD (% mean diff) for columns 12,13,14,16,18 because error mean square = 0.
^Calculated from residual.

Iowa State University

Acuron vs. Key Competitors, Ames, IA, 2022.

Trial ID: ACC2 Location: Ames Trial Year: 2022
Protocol ID: H034BIAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
AMBTR, Ambrosia trifida, Giant ragweed = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
STAOBJ = stand - objective (based on counts)
YIELD = yield
Rating Unit/Min/Max
%, 0, 100 = percent
bu/ac, , = bushels per acre

Iowa State University

PRE plus POST Herbicide Programs Demonstration for Weed Control in Corn, Ames, IA, 2022.
Trial ID: ACC3 Location: Ames Trial Year: 2022
Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/25/2022
Initiation Date: 5/23/2022
Completion Date: 8/4/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.006012 N
Longitude of LL Corner °: -93.672084 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate PRE plus POST herbicide programs for weed control in corn.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 7/14/2022 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/23/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 57 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/1/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/26/2022
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/26/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/26/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 8/26/2022
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 5 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 8/26/2022
Common Name: Ivyleaf morningglory **Stage Scale:** DESC

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 13 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

Iowa State University

PRE plus POST Herbicide Programs Demonstration for Weed Control in Corn, Ames, IA, 2022.
Trial ID: ACC3 Location: Ames Trial Year: 2022
Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included two passes with a field cultivator on May 23 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 71
% Sand: 50 **% OM:** 3.1 **Texture:** SCL sandy clay loam
% Silt: 21 **pH:** 7.1 **Soil Name:** CANISTEO, NICOLLET
% Clay: 29 **CEC:** 14.2 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN
24.	8/15/2022	0.3	IN
25.	8/19/2022	0.3	IN
26.	8/20/2022	0.2	IN
27.	8/28/2022	3	IN

Iowa State University

PRE plus POST Herbicide Programs Demonstration for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC3 Location: Ames Trial Year: 2022
Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B
Application Date	5/24/2022	6/22/2022
Appl. Start Time	2:00 PM	3:00 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Appl. Entry Date	7/14/2022	7/14/2022
Air Temperature Start, Stop	60, - F	87, - F
% Relative Humidity Start, Stop	62, -	35, -
Wind Velocity+Dir. Start	10 MPH, W	8 MPH, NW
Wet Leaves (Y/N)		N, no
Soil Temperature	57 F	78 F
Soil Moisture	SLIWET	DRY
Soil Surface Condition	MEDIUM	
% Cloud Cover	100	0
Next Moisture Occurred On	5/24/2022	6/24/2022
Time to Next Moisture	6.0 HR	2.0 DAY

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-8	21
Stage Majority, Percent		V6, -
Stage Minimum, Percent		V5, -
Stage Maximum, Percent		V6, -
Height Average		12 IN

Iowa State University

PRE plus POST Herbicide Programs Demonstration for Weed Control in Corn, Ames, IA, 2022.
Trial ID: ACC3 Location: Ames Trial Year: 2022
Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, BBCH	SETFA, W, BBCH
Stage Majority, Percent		3 LEAF, -
Stage Minimum, Percent		1 LEAF, -
Stage Maximum, Percent		4 LEAF, -
Height Average		2 IN
Height Minimum, Maximum		1, 3
Density Average		3 FT2
Density Minimum, Maximum		0, 6
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		2 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		1.5 IN
Height Minimum, Maximum		1, 2
Density Average		5 FT2
Density Minimum, Maximum		0, 10
Pest 3 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH
Stage Majority, Percent		8 LEAF, -
Stage Minimum, Percent		4 LEAF, -
Stage Maximum, Percent		11 LEA, -
Height Average		2 IN
Height Minimum, Maximum		1, 3
Density Average		3 FT2
Density Minimum, Maximum		0, 5
Pest 4 Code, Type, Scale	CHEAL, W, BBCH	CHEAL, W, BBCH
Pest 5 Code, Type, Scale	IPOHE, W, BBCH	IPOHE, W, BBCH
Stage Majority, Percent		8 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		12 LEA, -
Height Average		4 IN
Height Minimum, Maximum		1, 6
Density Average		1 FT2
Density Minimum, Maximum		0, 3

Iowa State University

PRE plus POST Herbicide Programs Demonstration for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC3 Location: Ames Trial Year: 2022
Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B
Appl. Equipment	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	110015
Nozzle Type	TTI	TT
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19 IN
Boom Length	10 FT	10 FT
Boom Height	20.0 IN	20.0 IN
Ground Speed	3 MPH	3 MPH
Carrier	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC
Mix Size		1500.0 -
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	5/9/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Missing data was attributed to the effects of heavy June rain that waterlogged plots on the left side of the study. More than seven inches of rain fell from June 5 to June 15.

Corn injury observed on June 30 appeared as plant height reduction.

Iowa State University

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Trial ID: ACC3 Location: Ames Trial Year: 2022
Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	CHEAL
	Rating Date							6/22/2022	6/22/2022	6/22/2022	6/22/2022	6/22/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V6	4 IN	1-3 IN	1-3 IN	1-3 IN
	Trt-Eval Interval							29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A
1	Untreated Check							0	0	0	0	0
2	Restraint	6.5	EC	36	FL OZ/A	PRE	A	0	99	75	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	0	99	25	88	99
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	0	93	33	92	99
	Impact	2.8	SC	1	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	MSO		L	0.6	PT/A	POST	B					
	N-Pak AMS Liquid	3.4	L	3	PT/A	POST	B					
5	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	0	99	37	88	99
	Helmet Maxx	2.8	SC	3	QT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
6	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	0	98	13	92	99
	Laudis	3.5	SC	3	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	Resicore	3.29	L	40	FL OZ/A	PRE	A	0	91	85	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Resicore	3.29	L	40	FL OZ/A	PRE	A	0	95	75	97	99
	Resicore	3.29	L	40	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
9	Resicore	3.29	L	2.5	QT/A	PRE	A	0	98	91	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
10	Keystone NXT	5.6	SE	2.3	QT/A	PRE	A	0	97	35	99	99
	Resicore	3.29	L	40	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
11	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	0	88	15	99	99
	Impact Core	7.15	SC	24	FL OZ/A	POST	B					
	Impact	2.8	SC	0.65	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	0.5	% V/V	POST	B					
	AMS		SG	2.5	LB/A	POST	B					

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23
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Iowa State University

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Trial ID: ACC3 Location: Ames Trial Year: 2022
Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	CHEAL
	Rating Date							6/22/2022	6/22/2022	6/22/2022	6/22/2022	6/22/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V6	4 IN	1-3 IN	1-3 IN	1-3 IN
	Trt-Eval Interval							29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A
12	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	0	94	77	99	99
	Hornet WDG	68.5	WG	3.5	OZ WT/A	PRE	A					
	Impact	2.8	SC	1	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	1	% V/V	POST	B					
	AMS		SG	2.5	LB/A	POST	B					
13	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	0	96	47	96	99
	Sinate	2.57	SL	28	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	1	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
	LSD P=.05							.	9.4	16.2	6.9	.
	Standard Deviation							0.0	5.5	9.5	4.0	0.0
	CV							0.0	6.25	20.26	4.57	0.0

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Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							IPOHE	ZEAMD	ZEAMD	SETFA	ABUTH
	Rating Date							6/22/2022	6/30/2022	7/9/2022	7/9/2022	7/9/2022
	Rating Type							CONTRO	PHYGEN	PHYGEN	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-3 IN	V7	V10	4 IN	1-3 IN
	Trt-Eval Interval							29 DA-A	8 DA-B	17 DA-B	17 DA-B	17 DA-B
1	Untreated Check							0	0	0	0	0
2	Restraint	6.5	EC	36	FL OZ/A	PRE	A	35	5	0	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	10	2	0	99	99
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	7	2	0	98	99
	Impact	2.8	SC	1	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	MSO		L	0.6	PT/A	POST	B					
	N-Pak AMS Liquid	3.4	L	3	PT/A	POST	B					
5	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	37	0	0	99	99
	Helmet Maxx	2.8	SC	3	QT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
6	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	10	0	0	99	99
	Laudis	3.5	SC	3	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	Resicore	3.29	L	40	FL OZ/A	PRE	A	45	0	0	98	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Resicore	3.29	L	40	FL OZ/A	PRE	A	20	0	0	99	99
	Resicore	3.29	L	40	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
9	Resicore	3.29	L	2.5	QT/A	PRE	A	53	0	0	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
10	Keystone NXT	5.6	SE	2.3	QT/A	PRE	A	40	3	0	99	99
	Resicore	3.29	L	40	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
11	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	30	5	0	99	99
	Impact Core	7.15	SC	24	FL OZ/A	POST	B					
	Impact	2.8	SC	0.65	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	0.5	% V/V	POST	B					
	AMS		SG	2.5	LB/A	POST	B					

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Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							IPOHE	ZEAMD	ZEAMD	SETFA	ABUTH
	Rating Date							6/22/2022	6/30/2022	7/9/2022	7/9/2022	7/9/2022
	Rating Type							CONTRO	PHYGEN	PHYGEN	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-3 IN	V7	V10	4 IN	1-3 IN
	Trt-Eval Interval							29 DA-A	8 DA-B	17 DA-B	17 DA-B	17 DA-B
12	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	40	10	7	99	99
	Hornet WDG	68.5	WG	3.5	OZ WT/A	PRE	A					
	Impact	2.8	SC	1	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	1	% V/V	POST	B					
	AMS		SG	2.5	LB/A	POST	B					
13	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	30	0	0	99	99
	Sinate	2.57	SL	28	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	1	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
	LSD P=.05							22.9	2.5	1.5	1.7	.
	Standard Deviation							13.3	1.5	0.9	1.0	0.0
	CV							48.44	74.08	166.9	1.07	0.0

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Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMATA	CHEAL	IPOHE	SETFA	ABUTH
	Rating Date							7/9/2022	7/9/2022	7/9/2022	7/20/2022	7/20/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-3 IN	1-3 IN	1-3 IN	4 IN	1-3 IN
	Trt-Eval Interval							17 DA-B	17 DA-B	17 DA-B	28 DA-B	28 DA-B
1	Untreated Check							0	0	0	0	0
2	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	99	95	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	88	99	99
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	93	98	99
	Impact	2.8	SC	1	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	MSO		L	0.6	PT/A	POST	B					
	N-Pak AMS Liquid	3.4	L	3	PT/A	POST	B					
5	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	93	99	99
	Helmet Maxx	2.8	SC	3	QT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
6	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	95	98	99
	Laudis	3.5	SC	3	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	Resicore	3.29	L	40	FL OZ/A	PRE	A	99	99	97	98	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Resicore	3.29	L	40	FL OZ/A	PRE	A	99	99	99	99	99
	Resicore	3.29	L	40	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
9	Resicore	3.29	L	2.5	QT/A	PRE	A	99	99	98	99	98
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
10	Keystone NXT	5.6	SE	2.3	QT/A	PRE	A	99	99	99	99	99
	Resicore	3.29	L	40	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
11	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	90	99	99
	Impact Core	7.15	SC	24	FL OZ/A	POST	B					
	Impact	2.8	SC	0.65	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	0.5	% V/V	POST	B					
	AMS		SG	2.5	LB/A	POST	B					

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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMATA	CHEAL	IPOHE	SETFA	ABUTH
	Rating Date							7/9/2022	7/9/2022	7/9/2022	7/20/2022	7/20/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-3 IN	1-3 IN	1-3 IN	4 IN	1-3 IN
	Trt-Eval Interval							17 DA-B	17 DA-B	17 DA-B	28 DA-B	28 DA-B
12	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	99	98	99
	Hornet WDG	68.5	WG	3.5	OZ WT/A	PRE	A					
	Impact	2.8	SC	1	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	1	% V/V	POST	B					
	AMS		SG	2.5	LB/A	POST	B					
13	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	99	99	99
	Sinate	2.57	SL	28	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	1	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
	LSD P=.05							.	.	5.7	2.4	1.2
	Standard Deviation							0.0	0.0	3.3	1.4	0.7
	CV							0.0	0.0	3.75	1.53	0.79

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16	17	18	19	20
	Pest Code							AMATA	CHEAL	IPOHE	SETFA	ABUTH
	Rating Date							7/20/2022	7/20/2022	7/20/2022	8/4/2022	8/4/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-3 IN	1-3 IN	1-3 IN	3-10 IN	1-3 IN
	Trt-Eval Interval							28 DA-B	28 DA-B	28 DA-B	43 DA-B	43 DA-B
1	Untreated Check							0	0	0	0	0
2	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	99	88	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	83	99	99
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	87	98	99
	Impact	2.8	SC	1	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	MSO		L	0.6	PT/A	POST	B					
	N-Pak AMS Liquid	3.4	L	3	PT/A	POST	B					
5	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	87	99	99
	Helmet Maxx	2.8	SC	3	QT/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
6	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	88	98	99
	Laudis	3.5	SC	3	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
7	Resicore	3.29	L	40	FL OZ/A	PRE	A	99	99	83	98	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Resicore	3.29	L	40	FL OZ/A	PRE	A	99	99	93	99	99
	Resicore	3.29	L	40	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
9	Resicore	3.29	L	2.5	QT/A	PRE	A	99	99	91	99	98
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
10	Keystone NXT	5.6	SE	2.3	QT/A	PRE	A	99	99	85	99	99
	Resicore	3.29	L	40	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
11	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	83	99	99
	Impact Core	7.15	SC	24	FL OZ/A	POST	B					
	Impact	2.8	SC	0.65	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	0.5	% V/V	POST	B					
	AMS		SG	2.5	LB/A	POST	B					

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23
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Iowa State University

PRE plus POST Herbicide Programs Demonstration for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC3 Location: Ames Trial Year: 2022
Protocol ID: DEMO Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16	17	18	19	20
	Pest Code							AMATA	CHEAL	IPOHE	SETFA	ABUTH
	Rating Date							7/20/2022	7/20/2022	7/20/2022	8/4/2022	8/4/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-3 IN	1-3 IN	1-3 IN	3-10 IN	1-3 IN
	Trt-Eval Interval							28 DA-B	28 DA-B	28 DA-B	43 DA-B	43 DA-B
12	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	85	98	99
	Hornet WDG	68.5	WG	3.5	OZ WT/A	PRE	A					
	Impact	2.8	SC	1	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	1	% V/V	POST	B					
	AMS		SG	2.5	LB/A	POST	B					
13	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	85	99	99
	Sinate	2.57	SL	28	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	PT/A	POST	B					
	MSO		L	1	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
	LSD P=.05							.	.	9.2	2.4	1.2
	Standard Deviation							0.0	0.0	5.4	1.4	0.7
	CV							0.0	0.0	6.73	1.53	0.79

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23
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Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMATA 8/4/2022 CONTRO % 1-6 IN 43 DA-B	CHEAL 8/4/2022 CONTRO % 43 DA-B	IPOHE 8/4/2022 CONTRO % 1-20 IN 43 DA-B
	Pest Code							AMATA	CHEAL	IPOHE
	Rating Date							8/4/2022	8/4/2022	8/4/2022
	Rating Type							CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%
	Pest Stage Majority/Min/Max							1-6 IN		1-20 IN
	Trt-Eval Interval							43 DA-B	43 DA-B	43 DA-B
								21	22	23
1	Untreated Check							0	0	0
2	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	99	85
	Aatrex 4L	4	F	1	QT/A	PRE	A			
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B			
	Aatrex 4L	4	F	1	QT/A	POST	B			
	COC		L	1	% V/V	POST	B			
	AMS		SG	8.5	LB/100 GAL	POST	B			
3	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	83
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B			
	Aatrex 4L	4	F	1	QT/A	POST	B			
	COC		L	1	% V/V	POST	B			
	AMS		SG	8.5	LB/100 GAL	POST	B			
4	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	90
	Impact	2.8	SC	1	FL OZ/A	POST	B			
	Aatrex 4L	4	F	1	QT/A	POST	B			
	MSO		L	0.6	PT/A	POST	B			
	N-Pak AMS Liquid	3.4	L	3	PT/A	POST	B			
5	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	88
	Helmet Maxx	2.8	SC	3	QT/A	POST	B			
	NIS		L	0.25	% V/V	POST	B			
6	Bicep II Magnum	5.5	SC	1.67	QT/A	PRE	A	99	99	88
	Laudis	3.5	SC	3	FL OZ/A	POST	B			
	Aatrex 4L	4	F	1	QT/A	POST	B			
	COC		L	1	% V/V	POST	B			
	AMS		SG	8.5	LB/100 GAL	POST	B			
7	Resicore	3.29	L	40	FL OZ/A	PRE	A	99	99	83
	Aatrex 4L	4	F	1	QT/A	PRE	A			
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	B			
	Aatrex 4L	4	F	1	QT/A	POST	B			
	COC		L	1	% V/V	POST	B			
	AMS		SG	8.5	LB/100 GAL	POST	B			
8	Resicore	3.29	L	40	FL OZ/A	PRE	A	99	99	93
	Resicore	3.29	L	40	FL OZ/A	POST	B			
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B			
	COC		L	1	% V/V	POST	B			
	AMS		SG	8.5	LB/100 GAL	POST	B			
9	Resicore	3.29	L	2.5	QT/A	PRE	A	98	99	88
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B			
	AMS		SG	8.5	LB/100 GAL	POST	B			
10	Keystone NXT	5.6	SE	2.3	QT/A	PRE	A	99	99	88
	Resicore	3.29	L	40	FL OZ/A	POST	B			
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B			
	COC		L	1	% V/V	POST	B			
	AMS		SG	8.5	LB/100 GAL	POST	B			
11	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	83
	Impact Core	7.15	SC	24	FL OZ/A	POST	B			
	Impact	2.8	SC	0.65	FL OZ/A	POST	B			
	Aatrex 4L	4	F	1	PT/A	POST	B			
	MSO		L	0.5	% V/V	POST	B			
	AMS		SG	2.5	LB/A	POST	B			

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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMATA 8/4/2022 CONTRO % 1-6 IN 43 DA-B	CHEAL 8/4/2022 CONTRO % 43 DA-B	IPOHE 8/4/2022 CONTRO % 1-20 IN 43 DA-B
	Pest Code							AMATA	CHEAL	IPOHE
	Rating Date							8/4/2022	8/4/2022	8/4/2022
	Rating Type							CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%
	Pest Stage Majority/Min/Max							1-6 IN		1-20 IN
	Trt-Eval Interval							43 DA-B	43 DA-B	43 DA-B
								21	22	23
12	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	88
	Hornet WDG	68.5	WG	3.5	OZ WT/A	PRE	A			
	Impact	2.8	SC	1	FL OZ/A	POST	B			
	Aatrex 4L	4	F	1	PT/A	POST	B			
	MSO		L	1	% V/V	POST	B			
	AMS		SG	2.5	LB/A	POST	B			
13	Harness Xtra 5.6	5.6	L	3.2	PT/A	PRE	A	99	99	85
	Sinate	2.57	SL	28	FL OZ/A	POST	B			
	Aatrex 4L	4	F	1	PT/A	POST	B			
	MSO		L	1	% V/V	POST	B			
	AMS		SG	3	LB/A	POST	B			
	LSD P=.05							1.2	.	8.6
	Standard Deviation							0.7	0.0	5.0
	CV							0.79	0.0	6.24

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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
CHEAL, Chenopodium album, Common lambsquarters = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US

Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown

Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Residual Weed control with Maverick, Acuron, Bicep II Magnum, Resicore & TriVolt SC in Corn, Ames, IA, 2022.

Trial ID: ACC4 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/25/2022
Initiation Date: 5/23/2022
Completion Date: 7/20/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004719 N
Longitude of LL Corner °: -93.672654 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate residual weed control for Maverick and competitive standards.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 10/13/2022 **Stage Scale:** VR
Variety: Syngenta NK0886-5122-EZ1
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/23/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 57 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/1/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 10/13/2022
Common Name: Giant foxtail **Stage Scale:** NOSC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 10/13/2022
Common Name: velvetleaf **Stage Scale:** NOSC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 10/13/2022
Common Name: Common waterhemp **Stage Scale:** NOSC

Pest 4 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 10/13/2022
Common Name: Common lambsquarters **Stage Scale:** NOSC

Pest 5 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 10/13/2022
Common Name: Ivyleaf morningglory **Stage Scale:** NOSC

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 8 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

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Sponsor Contact:

Field Prep./Maintenance:
Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included two passes with a field cultivator on May 23 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 71
% Sand: 50 **% OM:** 3.1 **Texture:** SCL sandy clay loam
% Silt: 21 **pH:** 7.1 **Soil Name:** CANISTEO, NICOLLET
% Clay: 29 **CEC:** 14.2 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Residual Weed control with Maverick, Acuron, Bicep II Magnum, Resicore & TriVolt SC in Corn, Ames, IA, 2022.

Trial ID: ACC4 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B
Application Date	5/24/2022	6/29/2022
Appl. Start Time	10:00 AM	6:00 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Appl. Entry Date	7/14/2022	7/14/2022
Air Temperature Start, Stop	51, 51 F	88, 87 F
% Relative Humidity Start, Stop	84, 84	40, 40
Wind Velocity+Dir. Start	8 MPH, E	12 MPH, S
Wind Velocity+Dir. Stop	8 MPH, E	12 MPH, S
Wet Leaves (Y/N)		N, no
Soil Temperature	57 F	
Soil Moisture	SLIWET	DRY
Soil Surface Condition	MEDIUM	
% Cloud Cover	100	5
Next Moisture Occurred On	5/24/2022	7/4/2022
Time to Next Moisture	1.0 DAY	

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR
Stage Majority, Percent		V7, -
Stage Minimum, Percent		V7, -
Stage Maximum, Percent		V7, -
Height Average		23 IN
Height Minimum, Maximum		20, 25

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, BBCH	SETFA, W, BBCH
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH
Stage Majority, Percent		8 LEAF, -
Stage Minimum, Percent		7 LEAF, -
Stage Maximum, Percent		9 LEAF, -
Height Average		6 IN
Height Minimum, Maximum		2, 10
Density Average		0 FT2
Density Minimum, Maximum		0, 1
Pest 3 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH
Pest 4 Code, Type, Scale	CHEAL, W, BBCH	CHEAL, W, BBCH
Pest 5 Code, Type, Scale	IPOHE, W, BBCH	IPOHE, W, BBCH
Height Average		4 IN
Height Minimum, Maximum		1, 6
Density Average		2 FT2

Iowa State University

Residual Weed control with Maverick, Acuron, Bicep II Magnum, Resicore & TriVolt SC in Corn, Ames, IA, 2022.

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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B
Appl. Equipment	ATV	HAND SPRAYER
Equipment Type	ALTEVE	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	110015
Nozzle Type	TT	TT
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	20 IN	19 IN
Boom Length	10 FT	10 FT
Boom Height	20.0 IN	19.0 IN
Ground Speed	2.7 MPH	3 MPH
Carrier	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/20/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.

Trial Comments

Plots for Treatment 2 did not receive a PRE application and contained larger weeds in heavier densities than the other treatments. Weed densities were 1-5, 0-1 & 1-3 per square ft. for giant foxtail, common waterhemp & ivyleaf morningglory, respectively. Weed sizes for Trt. 2 were 12-20 inches in height.

Ivyleaf morningglory pressure was heavier to the right side of the experiment (higher plot numbers).

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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5	6
	Pest Code							ZEAMD	ZEAMD	SETFA	ABUTH	AMATA	CHEAL
	Rating Date							6/8/2022	6/28/2022	6/28/2022	6/28/2022	6/28/2022	6/28/2022
	Rating Type							PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							V1-V2	V7	0-24 IN	0-24 IN	0-24 IN	0-24 IN
	Trt-Eval Interval							15 DA-A	35 DA-A	35 DA-A	35 DA-A	35 DA-A	35 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B	0	0	0	0	0	0
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
3	Acuron	3.44	ZC	3	QT/A	PRE	A	0	0	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
4	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	0	0	99	70	98	99
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
5	Resicore	3.29	L	88	FL OZ/A	PRE	A	0	0	99	96	99	99
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
6	Maverick	2.04	SC	1	QT/A	PRE	A	0	0	98	99	99	99
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
7	Maverick	2.04	SC	1	QT/A	PRE	A	0	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A						
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
8	TriVolt	3.65	L	21.1	FL OZ/A	PRE	A	0	0	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
	LSD P=.05							.	.	1.4	3.2	1.4	.
	Standard Deviation							0.0	0.0	0.8	1.8	0.8	0.0
	CV							0.0	0.0	1.1	2.62	1.1	0.0

Could not calculate LSD (% mean diff) for columns 1,2,6,8,13,14 because error mean square = 0.
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	7	8	9	10	11	12
	Pest Code							IPOHE	SETFA	ABUTH	AMATA	CHEAL	IPOHE
	Rating Date							6/28/2022	7/6/2022	7/6/2022	7/6/2022	7/6/2022	7/6/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							0-24 IN	0-24 IN	0-24 IN	0-24 IN	0-24 IN	0-24 IN
	Trt-Eval Interval							35 DA-A	43 DA-A	43 DA-A	43 DA-A	43 DA-A	43 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B	0	80		37	83	47
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
3	Acuron	3.44	ZC	3	QT/A	PRE	A	80	99	99	99	99	78
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
4	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	53	99	98	98	99	53
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
5	Resicore	3.29	L	88	FL OZ/A	PRE	A	65	99	99	99	99	68
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
6	Maverick	2.04	SC	1	QT/A	PRE	A	72	99	99	99	99	73
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
7	Maverick	2.04	SC	1	QT/A	PRE	A	93	99	99	99	99	90
	Aatrex 4L	4	F	0.75	QT/A	PRE	A						
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
8	TriVolt	3.65	L	21.1	FL OZ/A	PRE	A	85	99	99	99	99	87
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B						
	Induce		L	0.25	% V/V	POST	B						
	AMS		SG	3	LB/A	POST	B						
	LSD P=.05							12.4	.	1.6	3.7	7.1	14.7
	Standard Deviation							7.1	0.0	0.9	2.1	4.1	8.4
	CV							12.6	0.0	1.03	2.65	4.82	13.49

Could not calculate LSD (% mean diff) for columns 1,2,6,8,13,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Residual Weed control with Maverick, Acuron, Bicep II Magnum, Resicore & TriVolt SC in Corn, Ames, IA, 2022.

Trial ID: ACC4 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	13	14	15	16	17
	Pest Code							SETFA	ABUTH	AMATA	CHEAL	IPOHE
	Rating Date							7/20/2022	7/20/2022	7/20/2022	7/20/2022	7/20/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max									0-30 IN		2-30 IN
	Trt-Eval Interval							57 DA-A	57 DA-A	57 DA-A	57 DA-A	57 DA-A
1	Untreated Check							0	0	0	0	0
2	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B	99		50	98	55
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
3	Acuron	3.44	ZC	3	QT/A	PRE	A	99	99	99	99	60
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	99	99	96	99	60
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Resicore	3.29	L	88	FL OZ/A	PRE	A	99	99	99	99	62
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Maverick	2.04	SC	1	QT/A	PRE	A	99	99	99	99	63
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Maverick	2.04	SC	1	QT/A	PRE	A	99	99	99	99	77
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	TriVolt	3.65	L	21.1	FL OZ/A	PRE	A	99	99	99	99	78
	Roundup PowerMAX 3	4.8	SL	22	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
	LSD P=.05							.	.	6.4	1.4	18.1
	Standard Deviation							0.0	0.0	3.6	0.8	10.3
	CV							0.0	0.0	4.53	0.94	18.15

Could not calculate LSD (% mean diff) for columns 1,2,6,8,13,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Residual Weed control with Maverick, Acuron, Bicep II Magnum, Resicore & TriVolt SC in Corn, Ames, IA, 2022.

Trial ID: ACC4 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
CHEAL, Chenopodium album, Common lambsquarters = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/25/2022
Initiation Date: 5/23/2022
Completion Date: 7/20/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.00355 N
Longitude of LL Corner °: -93.67349 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate standard corn preemergence herbicides for residual weed control.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/26/2022 **Stage Scale:** VR
Variety: Syngenta NK0886-5122-EZ1
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/23/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 50 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/1/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 12/13/2022
Common Name: Giant foxtail

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 12/13/2022
Common Name: velvetleaf

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 12/13/2022
Common Name: Common waterhemp

Pest 4 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 12/13/2022
Common Name: Common lambsquarters

Pest 5 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 12/13/2022
Common Name: Ivyleaf morningglory

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 11 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:

Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included two passes with a field cultivator on May 23 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description

Description Name: 66
% Sand: 24 **% OM:** 6.4 **Texture:** C clay
% Silt: 27 **pH:** 7.8 **Soil Name:** CANISTEO HARPS
% Clay: 49 **CEC:** 39.9 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	5/24/2022
Appl. Start Time	10:15 AM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROSOI
Appl. Entry Date	7/14/2022
Air Temperature Start, Stop	59, 59 F
% Relative Humidity Start, Stop	46, 46
Wind Velocity+Dir. Start	10 MPH, NW
Wind Velocity+Dir. Stop	10 MPH, NW
Soil Temperature	50 F
Soil Moisture	NORMAL
Soil Surface Condition	MEDIUM
% Cloud Cover	100
Next Moisture Occurred On	5/25/2022
Time to Next Moisture	1.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMD, BCOR

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	SETFA, W, -
Pest 2 Code, Type, Scale	ABUTH, W, -
Pest 3 Code, Type, Scale	AMATA, W, -
Pest 4 Code, Type, Scale	CHEAL, W, -
Pest 5 Code, Type, Scale	IPOHE, W, -

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TTI
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Notes

Context	Date	By	Notes
STATUS	4/15/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5	6
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	CHEAL	IPOHE
	Rating Date							6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022	6/14/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							V4	2-3 IN	1 IN	1 IN	1 IN	2 IN
	Trt-Eval Interval							21 DA-A	21 DA-A	21 DA-A	21 DA-A	21 DA-A	21 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Callisto	4	SC	3	FL OZ/A	PRE	A	0	0	17	55	87	25
3	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	0	35	55	58	63	48
4	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A	0	99	70	91	93	33
5	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	8	97	92	99	99	75
	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A						
6	Sharpen	2.85	SC	3	FL OZ/A	PRE	A	6	98	91	99	99	73
	Zidua SC	4.17	SC	3.3	FL OZ/A	PRE	A						
7	Sharpen	2.85	SC	3.8	FL OZ/A	PRE	A	9	98	98	99	99	70
	Zidua SC	4.17	SC	4.1	FL OZ/A	PRE	A						
8	Verdict	5.57	EC	12	FL OZ/A	PRE	A	6	98	92	97	99	58
9	Resicore	3.29	L	40	FL OZ/A	PRE	A	3	98	69	90	94	40
10	Surpass NXT	7	EC	16	FL OZ/A	PRE	A	0	98	68	95	90	48
11	Stinger	3	L	2.54	FL OZ/A	PRE	A	0	0	13	13	13	53
	LSD P=.05							4.6	10.3	21.4	13.5	13.1	16.8
	Standard Deviation							3.2	7.1	14.7	9.3	9.1	11.6
	CV							112.99	10.84	24.46	12.94	11.95	24.55

Missing data estimates are included in columns:Average=3,5,6,9,11,12,14,16,17,19,21,22,24,26,27
^Calculated from residual.

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	7	8	9	10	11	12
	Pest Code							ZEAMD	SETFA	ABUTH	AMATA	CHEAL	IPOHE
	Rating Date							6/28/2022	6/28/2022	6/28/2022	6/28/2022	6/28/2022	6/28/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							V6	10-18 IN	1-8 IN	3-15 IN	4-20 IN	1-18 IN
	Trt-Eval Interval							35 DA-A	35 DA-A	35 DA-A	35 DA-A	35 DA-A	35 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Callisto	4	SC	3	FL OZ/A	PRE	A	0	0	17	55	87	25
3	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	0	15	55	53	63	53
4	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A	0	97	70	91	93	23
5	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	0	94	95	95	99	84
	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A						
6	Sharpen	2.85	SC	3	FL OZ/A	PRE	A	3	98	96	98	99	83
	Zidua SC	4.17	SC	3.3	FL OZ/A	PRE	A						
7	Sharpen	2.85	SC	3.8	FL OZ/A	PRE	A	0	97	99	99	99	86
	Zidua SC	4.17	SC	4.1	FL OZ/A	PRE	A						
8	Verdict	5.57	EC	12	FL OZ/A	PRE	A	1	98	92	75	99	68
9	Resicore	3.29	L	40	FL OZ/A	PRE	A	0	97	65	85	94	33
10	Surpass NXT	7	EC	16	FL OZ/A	PRE	A	0	96	68	90	90	43
11	Stinger	3	L	2.54	FL OZ/A	PRE	A	0	0	8	8	8	50
	LSD P=.05							2.5	5.0	17.0	13.3	9.8	15.6
	Standard Deviation							1.7	3.5	11.8	9.2	6.8	10.7
	CV							500.96	5.5	19.52	13.58	9.01	21.49

Missing data estimates are included in columns:Average=3,5,6,9,11,12,14,16,17,19,21,22,24,26,27
^Calculated from residual.

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	13	14	15	16	17	18
	Pest Code							SETFA	ABUTH	AMATA	CHEAL	IPOHE	SETFA
	Rating Date							7/6/2022	7/6/2022	7/6/2022	7/6/2022	7/6/2022	7/12/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max												15-30 IN
	Trt-Eval Interval							43 DA-A	43 DA-A	43 DA-A	43 DA-A	43 DA-A	49 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Callisto	4	SC	3	FL OZ/A	PRE	A	0	17	50	87	20	0
3	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	10	55	53	63	53	10
4	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A	96	70	91	86	20	96
5	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	91	96	91	97	74	89
	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A						
6	Sharpen	2.85	SC	3	FL OZ/A	PRE	A	98	96	96	99	70	97
	Zidua SC	4.17	SC	3.3	FL OZ/A	PRE	A						
7	Sharpen	2.85	SC	3.8	FL OZ/A	PRE	A	96	99	99	99	76	96
	Zidua SC	4.17	SC	4.1	FL OZ/A	PRE	A						
8	Verdict	5.57	EC	12	FL OZ/A	PRE	A	98	92	68	95	55	98
9	Resicore	3.29	L	40	FL OZ/A	PRE	A	97	65	85	94	25	96
10	Surpass NXT	7	EC	16	FL OZ/A	PRE	A	95	65	89	87	38	95
11	Stinger	3	L	2.54	FL OZ/A	PRE	A	0	8	8	8	45	0
	LSD P=.05							6.2	17.1	12.9	11.2	15.5	7.2
	Standard Deviation							4.3	11.8	9.0	7.7	10.7	5.0
	CV							6.97	19.68	13.52	10.46	24.67	8.16

Missing data estimates are included in columns:Average=3,5,6,9,11,12,14,16,17,19,21,22,24,26,27
^Calculated from residual.

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	19	20	21	22	23	24
	Pest Code							ABUTH	AMATA	CHEAL	IPOHE	SETFA	ABUTH
	Rating Date							7/12/2022	7/12/2022	7/12/2022	7/12/2022	7/20/2022	7/20/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							5-20 IN	9-30 IN	9-30 IN	2-45 IN	15-40 IN	5-20 IN
	Trt-Eval Interval							49 DA-A	49 DA-A	49 DA-A	49 DA-A	57 DA-A	57 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Callisto	4	SC	3	FL OZ/A	PRE	A	17	50	83	20	0	17
3	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	55	50	63	53	10	55
4	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A	70	91	85	13	96	70
5	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	96	89	97	69	89	96
	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A						
6	Sharpen	2.85	SC	3	FL OZ/A	PRE	A	96	96	98	65	97	96
	Zidua SC	4.17	SC	3.3	FL OZ/A	PRE	A						
7	Sharpen	2.85	SC	3.8	FL OZ/A	PRE	A	99	98	99	73	96	99
	Zidua SC	4.17	SC	4.1	FL OZ/A	PRE	A						
8	Verdict	5.57	EC	12	FL OZ/A	PRE	A	92	66	95	55	98	92
9	Resicore	3.29	L	40	FL OZ/A	PRE	A	65	85	94	23	96	65
10	Surpass NXT	7	EC	16	FL OZ/A	PRE	A	65	89	87	30	95	65
11	Stinger	3	L	2.54	FL OZ/A	PRE	A	8	8	8	38	0	8
	LSD P=.05							17.1	13.0	11.4	15.3	7.2	17.1
	Standard Deviation							11.8	9.0	7.9	10.5	5.0	11.8
	CV							19.68	13.73	10.7	26.43	8.16	19.68

Missing data estimates are included in columns:Average=3,5,6,9,11,12,14,16,17,19,21,22,24,26,27
^Calculated from residual.

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMATA 7/20/2022 CONTRO % 9-36 IN 57 DA-A 25	CHEAL 7/20/2022 CONTRO % 9-35 IN 57 DA-A 26	IPOHE 7/20/2022 CONTRO % 2-45 IN 57 DA-A 27
1	Untreated Check							0	0	0
2	Callisto	4	SC	3	FL OZ/A	PRE	A	50	83	20
3	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	50	63	53
4	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A	89	81	13
5	Sharpen	2.85	SC	2.4	FL OZ/A	PRE	A	89	97	66
	Zidua SC	4.17	SC	2.6	FL OZ/A	PRE	A			
6	Sharpen	2.85	SC	3	FL OZ/A	PRE	A	96	98	60
	Zidua SC	4.17	SC	3.3	FL OZ/A	PRE	A			
7	Sharpen	2.85	SC	3.8	FL OZ/A	PRE	A	98	99	65
	Zidua SC	4.17	SC	4.1	FL OZ/A	PRE	A			
8	Verdict	5.57	EC	12	FL OZ/A	PRE	A	63	95	45
9	Resicore	3.29	L	40	FL OZ/A	PRE	A	85	94	20
10	Surpass NXT	7	EC	16	FL OZ/A	PRE	A	88	86	25
11	Stinger	3	L	2.54	FL OZ/A	PRE	A	8	8	35
LSD P=.05								13.5	11.7	17.8
Standard Deviation								9.4	8.1	12.2
CV								14.43	11.06	33.39

Missing data estimates are included in columns:Average=3,5,6,9,11,12,14,16,17,19,21,22,24,26,27
^Calculated from residual.

Iowa State University

Residual Preemergence Corn Herbicide Trial, Ames, IA, 2022.

Trial ID: ACC5 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-C22-A-01. Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
CHEAL, Chenopodium album, Common lambsquarters = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US

Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown

Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.
Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/25/2022
Initiation Date: 5/23/2022
Completion Date: 7/18/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003527 N
Longitude of LL Corner °: -93.673036 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Maverick for use in field corn for PRE and POST weed control when applied postemergence.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 10/14/2022 **Stage Scale:** VR
Variety: Syngenta NK0886-5122-EZ1
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/23/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 57 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/1/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 10/14/2022
Common Name: Giant foxtail

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 10/14/2022
Common Name: velvetleaf

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 10/14/2022
Common Name: Common waterhemp

Pest 4 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 10/14/2022
Common Name: Common lambsquarters

Pest 5 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 10/14/2022
Common Name: Ivyleaf morningglory

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 12 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.

Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included two passes with a field cultivator on May 23 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 66
% Sand: 24 **% OM:** 6.4 **Texture:** C clay
% Silt: 27 **pH:** 7.8 **Soil Name:** CANISTEO HARPS
% Clay: 49 **CEC:** 39.9 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.

Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B	C
Application Date	5/24/2022	6/20/2022	6/22/2022
Appl. Start Time	10:00 AM	2:30 PM	2:30 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	EPOST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Appl. Entry Date	7/14/2022	7/14/2022	7/14/2022
Air Temperature Start, Stop	51, 51 F	93, 93 F	87, 87 F
% Relative Humidity Start, Stop	84, 84	47, 47	35, 35
Wind Velocity+Dir. Start	8 MPH, E	10 MPH, S	8 MPH, NW
Wind Velocity+Dir. Stop	8 MPH, E	10 MPH, S	8 MPH, NW
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	57 F	77 F	76 F
Soil Moisture	SLIWET	DRY	DRY
Soil Surface Condition	MEDIUM		
% Cloud Cover	100	0	0
Next Moisture Occurred On	5/24/2022	6/24/2022	6/24/2022
Time to Next Moisture	1.0 DAY	4.0 DAY	2.0 DAY

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR	ZEAMD, BCOR
Stage Majority, Percent		V4, -	V5, -
Stage Minimum, Percent		V4, -	V5, -
Stage Maximum, Percent		V4, -	V6, -
Height Average		12 IN	13 IN
Height Minimum, Maximum		11, 13	

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.

Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	SETFA, W, -	SETFA, W, -	SETFA, W, -
Pest 2 Code, Type, Scale	ABUTH, W, -	ABUTH, W, -	ABUTH, W, -
Stage Majority, Percent		3 LEAF, -	
Stage Minimum, Percent		2 LEAF, -	
Stage Maximum, Percent		4 LEAF, -	
Height Average		2 IN	
Height Minimum, Maximum		1, 3	
Density Average		2 PLOT	
Density Minimum, Maximum		0, 3	
Pest 3 Code, Type, Scale	AMATA, W, -	AMATA, W, -	AMATA, W, -
Stage Majority, Percent		5 LEAF, -	
Stage Minimum, Percent		2 LEAF, -	
Stage Maximum, Percent		6 LEAF, -	
Height Average		3 IN	
Height Minimum, Maximum		1, 5	
Density Average		5 PLOT	
Density Minimum, Maximum		0, 10	
Pest 4 Code, Type, Scale	CHEAL, W, -	CHEAL, W, -	CHEAL, W, -
Pest 5 Code, Type, Scale	IPOHE, W, -	IPOHE, W, -	IPOHE, W, -
Stage Majority, Percent		NUMERO, -	
Stage Minimum, Percent		NUMERO, -	
Stage Maximum, Percent		NUMERO, -	
Height Average		4 IN	
Height Minimum, Maximum		2, 6	
Density Average		2 FT2	
Density Minimum, Maximum		0, 3	

Application Equipment

	A	B	C
Appl. Equipment	ATV	HAND SPRAYER	HAND SPRAYER
Equipment Type	ALTEVE	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	110015
Nozzle Type	TT	TT	TT
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	20 IN	19 IN	19 IN
Boom Length	10 FT	10 FT	10 FT
Boom Height	20.0 IN	20.0 IN	20.0 IN
Ground Speed	2.7 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.

Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Notes

Context	Date	By	Notes
STATUS	4/22/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

The Herbicide efficacy evaluation on June 25 included residual plus burndown weed control for Trts 2-8 but only residual control for Trts. 9-12. Subsequent evaluations included comprehensive control (burndown and residual); some weeds were emerging since the last postemergence application.

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.

Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5	6
	Pest Code							ZEAMD	ZEAMD	SETFA	ABUTH	AMATA	CHEAL
	Rating Date							6/8/2022	6/25/2022	6/25/2022	6/25/2022	6/25/2022	6/25/2022
	Rating Type							PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							V2	V7	3-6 IN	2-4 IN	3-7 IN	2-5 IN
	Trt-Eval Interval							15 DA-A	32 DA-A	32 DA-A	32 DA-A	32 DA-A	32 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B	0	0	90	77	50	90
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
3	Acuron	3.44	ZC	3	PT/A	EPOST	B	0	0	92	83	82	87
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
4	Halex GT	4.39	CS	2	QT/A	EPOST	B	0	0	90	80	80	77
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
5	Armezon PRO	5.35	EC	24	FL OZ/A	EPOST	B	0	0	92	80	70	87
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
6	Resicore	3.29	L	44	FL OZ/A	EPOST	B	0	0	90	77	57	87
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
7	Maverick	2.04	SC	14	FL OZ/A	EPOST	B	0	0	92	77	63	90
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
8	Maverick	2.04	SC	14	FL OZ/A	EPOST	B	0	0	92	92	78	90
	Aatrex 4L	4	F	0.75	QT/A	EPOST	B						
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
9	Acuron	3.44	ZC	1.5	QT/A	PRE	A	0	0	99	99	99	99
	Acuron	3.44	ZC	1.5	QT/A	POST	C						
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C						
	Induce		L	0.25	% V/V	POST	C						
	AMS		SG	3	LB/A	POST	C						
10	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	0	99	96	99	99
	Maverick	2.04	SC	14	FL OZ/A	POST	C						
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C						
	Induce		L	0.25	% V/V	POST	C						
	AMS		SG	3	LB/A	POST	C						
11	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	0	99	99	99	99
	Aatrex 4L	4	F	0.5	QT/A	PRE	A						
	Maverick	2.04	SC	14	FL OZ/A	POST	C						
	Aatrex 4L	4	F	0.5	QT/A	POST	C						
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C						
	Induce		L	0.25	% V/V	POST	C						
	AMS		SG	3	LB/A	POST	C						
12	Perpetuo	2.3	SC	8	FL OZ/A	PRE	A	0	0	99	99	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A						
	Maverick	2.04	SC	14	FL OZ/A	POST	C						
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C						
	Induce		L	0.25	% V/V	POST	C						
	AMS		SG	3	LB/A	POST	C						
	LSD P=.05							.	.	2.8	6.1	8.8	5.4
	Standard Deviation							0.0	0.0	1.7	3.6	5.2	3.2
	CV							0.0	0.0	1.94	4.48	7.08	3.85

Could not calculate LSD (% mean diff) for columns 1,2,8,11,13,16 because error mean square = 0.
^Calculated from residual.

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.

Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	7	8	9	10	11	12
	Pest Code							IPOHE	SETFA	ABUTH	AMATA	CHEAL	IPOHE
	Rating Date							6/25/2022	7/7/2022	7/7/2022	7/7/2022	7/7/2022	7/7/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							2-8 IN	3-6 IN		6-15 IN		2-8 IN
	Trt-Eval Interval							32 DA-A	44 DA-A	44 DA-A	44 DA-A	44 DA-A	44 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B	50	99	98	53	99	82
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
3	Acuron	3.44	ZC	3	PT/A	EPOST	B	83	99	99	99	99	88
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
4	Halex GT	4.39	CS	2	QT/A	EPOST	B	67	99	99	98	99	93
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
5	Armezon PRO	5.35	EC	24	FL OZ/A	EPOST	B	53	99	99	99	99	75
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
6	Resicore	3.29	L	44	FL OZ/A	EPOST	B	60	99	99	95	99	87
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
7	Maverick	2.04	SC	14	FL OZ/A	EPOST	B	63	99	99	90	99	87
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
8	Maverick	2.04	SC	14	FL OZ/A	EPOST	B	82	99	99	99	99	92
	Aatrex 4L	4	F	0.75	QT/A	EPOST	B						
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B						
	Induce		L	0.25	% V/V	EPOST	B						
	AMS		SG	3	LB/A	EPOST	B						
9	Acuron	3.44	ZC	1.5	QT/A	PRE	A	63	99	99	99	99	87
	Acuron	3.44	ZC	1.5	QT/A	POST	C						
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C						
	Induce		L	0.25	% V/V	POST	C						
	AMS		SG	3	LB/A	POST	C						
10	Maverick	2.04	SC	18	FL OZ/A	PRE	A	50	99	99	99	99	85
	Maverick	2.04	SC	14	FL OZ/A	POST	C						
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C						
	Induce		L	0.25	% V/V	POST	C						
	AMS		SG	3	LB/A	POST	C						
11	Maverick	2.04	SC	18	FL OZ/A	PRE	A	50	99	99	99	99	83
	Aatrex 4L	4	F	0.5	QT/A	PRE	A						
	Maverick	2.04	SC	14	FL OZ/A	POST	C						
	Aatrex 4L	4	F	0.5	QT/A	POST	C						
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C						
	Induce		L	0.25	% V/V	POST	C						
	AMS		SG	3	LB/A	POST	C						
12	Perpetuo	2.3	SC	8	FL OZ/A	PRE	A	50	99	99	99	99	82
	Aatrex 4L	4	F	1	QT/A	PRE	A						
	Maverick	2.04	SC	14	FL OZ/A	POST	C						
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C						
	Induce		L	0.25	% V/V	POST	C						
	AMS		SG	3	LB/A	POST	C						
	LSD P=.05							20.1	.	1.1	7.6	.	14.3
	Standard Deviation							11.9	0.0	0.7	4.5	0.0	8.4
	CV							21.26	0.0	0.74	5.23	0.0	10.79

Could not calculate LSD (% mean diff) for columns 1,2,8,11,13,16 because error mean square = 0.
^Calculated from residual.

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.

Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	13	14	15	16	17
	Pest Code							SETFA	ABUTH	AMATA	CHEAL	IPOHE
	Rating Date							7/18/2022	7/18/2022	7/18/2022	7/18/2022	7/18/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max									6-15 IN		2-20 IN
	Trt-Eval Interval							55 DA-A	55 DA-A	55 DA-A	55 DA-A	55 DA-A
1	Untreated Check							0	0	0	0	0
2	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B	99	98	53	99	78
	Induce		L	0.25	% V/V	EPOST	B					
	AMS		SG	3	LB/A	EPOST	B					
3	Acuron	3.44	ZC	3	PT/A	EPOST	B	99	99	99	99	83
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
	AMS		SG	3	LB/A	EPOST	B					
4	Halex GT	4.39	CS	2	QT/A	EPOST	B	99	99	98	99	90
	Induce		L	0.25	% V/V	EPOST	B					
	AMS		SG	3	LB/A	EPOST	B					
5	Armezon PRO	5.35	EC	24	FL OZ/A	EPOST	B	99	99	99	99	68
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
	AMS		SG	3	LB/A	EPOST	B					
6	Resicore	3.29	L	44	FL OZ/A	EPOST	B	99	99	95	99	83
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
	AMS		SG	3	LB/A	EPOST	B					
7	Maverick	2.04	SC	14	FL OZ/A	EPOST	B	99	99	92	99	85
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
	AMS		SG	3	LB/A	EPOST	B					
8	Maverick	2.04	SC	14	FL OZ/A	EPOST	B	99	99	99	99	88
	Aatrex 4L	4	F	0.75	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
	AMS		SG	3	LB/A	EPOST	B					
9	Acuron	3.44	ZC	1.5	QT/A	PRE	A	99	99	99	99	82
	Acuron	3.44	ZC	1.5	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	AMS		SG	3	LB/A	POST	C					
10	Maverick	2.04	SC	18	FL OZ/A	PRE	A	99	99	99	99	80
	Maverick	2.04	SC	14	FL OZ/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	AMS		SG	3	LB/A	POST	C					
11	Maverick	2.04	SC	18	FL OZ/A	PRE	A	99	99	99	99	75
	Aatrex 4L	4	F	0.5	QT/A	PRE	A					
	Maverick	2.04	SC	14	FL OZ/A	POST	C					
	Aatrex 4L	4	F	0.5	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	AMS		SG	3	LB/A	POST	C					
12	Perpetuo	2.3	SC	8	FL OZ/A	PRE	A	99	99	99	99	78
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Maverick	2.04	SC	14	FL OZ/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	AMS		SG	3	LB/A	POST	C					
	LSD P=.05							.	1.1	6.8	.	16.5
	Standard Deviation							0.0	0.7	4.0	0.0	9.7
	CV							0.0	0.74	4.7	0.0	13.08

Could not calculate LSD (% mean diff) for columns 1,2,8,11,13,16 because error mean square = 0.
^Calculated from residual.

Iowa State University

POST and Sequential Weed Control with Maverick and Standard Herbicides in Corn, Ames, IA, 2022.

Trial ID: ACC6 Location: Ames Trial Year: 2022
Protocol ID: VUSA2022V10494MD68.05 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
CHEAL, Chenopodium album, Common lambsquarters = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Preemergence Trivolt Programs in Corn for Crop Safety and Efficacy, Ames, IA, 2022.
Trial ID: ACC7 Location: Ames Trial Year: 2022
Protocol ID: HP22USAEOA Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/25/2022
Initiation Date: 5/23/2022
Completion Date: 7/18/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003556 N
Longitude of LL Corner °: -93.67241 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate residual weed control and crop safety of Trivolt and other herbicide standards alone and in setup roles for two-pass programs.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 7/14/2022 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/23/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 50 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/1/2022

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/4/2022
Common Name: velvetleaf **Stage Scale:** BBCH

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/4/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Pest 3 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 8/4/2022
Common Name: Common lambsquarters **Stage Scale:** BBCH

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 10 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Preemergence Trivolt Programs in Corn for Crop Safety and Efficacy, Ames, IA, 2022.

Trial ID: ACC7 Location: Ames Trial Year: 2022
Protocol ID: HP22USAEOA Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:

Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included two passes with a field cultivator on May 23 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description

Description Name: 66 - 67
% Sand: 27 **% OM:** 5.8 **Texture:** C clay
% Silt: 30 **pH:** 7.8 **Soil Name:** HARPS
% Clay: 43 **CEC:** 39 **Fert. Level:** E excellent
Soil Drainage: F fair

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Preemergence Trivolt Programs in Corn for Crop Safety and Efficacy, Ames, IA, 2022.

Trial ID: ACC7 Location: Ames Trial Year: 2022
Protocol ID: HP22USAEOA Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B
Application Date	5/24/2022	6/20/2022
Appl. Start Time	12:15 PM	3:00 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Appl. Entry Date	7/14/2022	7/14/2022
Air Temperature Start, Stop	53, 53 F	93, 93 F
% Relative Humidity Start, Stop	40, 40	43, 43
Wind Velocity+Dir. Start	13 MPH, W	10 MPH, S
Wind Velocity+Dir. Stop	13 MPH, W	10 MPH, S
Wet Leaves (Y/N)		N, no
Soil Temperature	50 F	77 F
Soil Moisture	NORMAL	NORMAL
Soil Surface Condition	MEDIUM	
% Cloud Cover	100	0
Next Moisture Occurred On	5/24/2022	6/24/2022
Time to Next Moisture	1.0 DAY	4.0 DAY

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-8	19
Stage Majority, Percent		V4, -
Stage Minimum, Percent		V4, -
Stage Maximum, Percent		V4, -
Height Average		12 IN
Height Minimum, Maximum		11, 13

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH
Pest 2 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH
Pest 3 Code, Type, Scale	CHEAL, W, BBCH	CHEAL, W, BBCH

Iowa State University

Preemergence Trivolt Programs in Corn for Crop Safety and Efficacy, Ames, IA, 2022.

Trial ID: ACC7 Location: Ames Trial Year: 2022
Protocol ID: HP22USAEOA Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B
Appl. Equipment	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	110015
Nozzle Type	TTI	TT
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19 IN
Boom Length	10 FT	10 FT
Boom Height	20.0 IN	20.0 IN
Ground Speed	3 MPH	3 MPH
Carrier	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC
Mix Size	1500.0 mL	1500.0 mL
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Percent ground cover in the untreated controls at several evaluation dates for velvetleaf, common waterhemp & common lambsquarters are listed as follows, respectively:

July 6 Plot 101; 5, 70 & 10
Plot 205; 10, 100 & 5
Plot 310; 5, 100, & 5

July 18 Plot 101; 5, 100 & 15
Plot 205; 10, 100, & 5
Plot 310; 5, 100 & 5

Iowa State University

Preemergence Trivolt Programs in Corn for Crop Safety and Efficacy, Ames, IA, 2022.

Trial ID: ACC7 Location: Ames Trial Year: 2022
Protocol ID: HP22USAEOA Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5	6
	Pest Code							ZEAMD	ZEAMD	ABUTH	AMATA	CHEAL	ZEAMD
	Rating Date							6/8/2022	6/17/2022	6/17/2022	6/17/2022	6/17/2022	7/6/2022
	Rating Type							PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							V2	V4	0.25 IN	0.25 IN	0.25 IN	V9
	Trt-Eval Interval							15 DA-A	24 DA-A	24 DA-A	24 DA-A	24 DA-A	16 DA-B
1	Untreated Check							0	0	0	0	0	0
2	Trivolt	3.65	SC	20	FL OZ/A	PRE	A	0	0	99	99	99	0
	Aatrex 4L	4	F	1	QT/A	PRE	A						
3	Acuron	3.44	ZC	3	QT/A	PRE	A	0	0	98	99	99	0
4	Resicore	3.29	L	3	QT/A	PRE	A	0	0	98	99	99	0
	Aatrex 4L	4	F	1	QT/A	PRE	A						
5	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	0	0	99	98	99	0
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	DiFlexx DUO	2.13	SC	24	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	Class Act Ridion		L	1	% V/V	POST	B						
6	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	0	0	99	96	99	0
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	Laudis	3.5	SC	3	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B						
7	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	0	0	99	99	99	0
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	Capreno	3.45	SC	3	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B						
8	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	0	0	98	98	99	0
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	Capreno	3.45	SC	3	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B						
9	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	0	0	98	99	99	3
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	Harness MAX	3.85	EC	40	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B						
10	Verdict	5.57	EC	10	FL OZ/A	PRE	A	0	0	95	98	99	7
	Aatrex 4L	4	F	1	QT/A	PRE	A						
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	Aatrex 4L	4	F	16	FL OZ/A	POST	B						
	MSO		L	8	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
	LSD P=.05							.	.	3.3	2.6	.	2.2
	Standard Deviation							0.0	0.0	1.9	1.5	0.0	1.3
	CV							0.0	0.0	2.21	1.72	0.0	125.46

Could not calculate LSD (% mean diff) for columns 1,2,5,9,12 because error mean square = 0.
^Calculated from residual.

Iowa State University

Preemergence Trivolt Programs in Corn for Crop Safety and Efficacy, Ames, IA, 2022.

Trial ID: ACC7 Location: Ames Trial Year: 2022
Protocol ID: HP22USAEOA Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	7	8	9	10	11	12
	Pest Code							ABUTH	AMATA	CHEAL	ABUTH	AMATA	CHEAL
	Rating Date							7/6/2022	7/6/2022	7/6/2022	7/18/2022	7/18/2022	7/18/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							0.25 IN	0.25 IN	0.25 IN	3-10 IN	3-10 IN	
	Trt-Eval Interval							16 DA-B	16 DA-B	16 DA-B	28 DA-B	28 DA-B	28 DA-B
1	Untreated Check							0	0	0	0	0	0
2	Trivolt	3.65	SC	20	FL OZ/A	PRE	A	99	98	99	99	98	99
	Aatrex 4L	4	F	1	QT/A	PRE	A						
3	Acuron	3.44	ZC	3	QT/A	PRE	A	99	99	99	99	99	99
4	Resicore	3.29	L	3	QT/A	PRE	A	95	99	99	95	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A						
5	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	99	99	99	99	99	99
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	DiFlexx DUO	2.13	SC	24	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	Class Act Ridion		L	1	% V/V	POST	B						
6	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	99	99	99	99	99	99
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	Laudis	3.5	SC	3	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B						
7	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	99	99	99	99	99	99
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	Capreno	3.45	SC	3	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B						
8	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	99	99	99	99	99	99
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	Capreno	3.45	SC	3	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B						
9	Trivolt	3.65	SC	12	FL OZ/A	PRE	A	99	99	99	99	99	99
	Aatrex 4L	4	F	1	PT/A	PRE	A						
	Harness MAX	3.85	EC	40	FL OZ/A	POST	B						
	Aatrex 4L	4	F	1	PT/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B						
10	Verdict	5.57	EC	10	FL OZ/A	PRE	A	99	99	99	99	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A						
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	B						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B						
	Aatrex 4L	4	F	16	FL OZ/A	POST	B						
	MSO		L	8	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
	LSD P=.05							2.4	1.3	.	2.4	1.3	.
	Standard Deviation							1.4	0.7	0.0	1.4	0.7	0.0
	CV							1.61	0.82	0.0	1.61	0.82	0.0

Could not calculate LSD (% mean diff) for columns 1,2,5,9,12 because error mean square = 0.
^Calculated from residual.

Iowa State University

Preemergence Trivolt Programs in Corn for Crop Safety and Efficacy, Ames, IA, 2022.

Trial ID: ACC7 Location: Ames Trial Year: 2022
Protocol ID: HP22USAEOA Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
CHEAL, Chenopodium album, Common lambsquarters = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.
Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
Trial Status Date: 9/22/2022 **Last Changed By:** Prashant Jha
ARM Trial Created On: 6/11/2022
Initiation Date: 5/23/2022
Completion Date: 8/1/2022 **Protocol Revision Date:** 4/7/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa IA **Region:** MIDWEST
Postal Code: 50014

Latitude of LL Corner °: 42.004437 N
Longitude of LL Corner °: -93.672739 W USAIA 43.501196 - 40.375437
-90.140061 - -96.639485
Time Zone: America/Chicago

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate improved performance of mesotrione with the addition of pyridate.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn **BBCH Scale:** BCOR
Entry Date: 9/22/2022 **Stage Scale:** VR
Variety: Syngenta NK0886-5122-EZ1
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/23/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 50 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/1/2022

Pest Description
Pest 1 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/22/2022
Common Name: Common waterhemp

Pest 2 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/22/2022
Common Name: Common lambsquarters

Pest 3 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/22/2022
Common Name: Ivyleaf morningglory

Site and Design
Treated Plot Width: 6.7 FT **Total Plot Width:** 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Total Plot Length:** 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 5 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:

Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included two passes with a field cultivator on May 23 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description

Description Name: 69
% Sand: 32 **% OM:** 4.7 **Texture:** C clay
% Silt: 25 **pH:** 7.7 **Soil Name:** CANISTEO
% Clay: 43 **CEC:** 35.9 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	6/21/2022
Appl. Start Time	10:50 AM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROFOL
Appl. Entry Date	7/14/2022
Air Temperature Start, Stop	89, 91 F
% Relative Humidity Start, Stop	57, 57
Wind Velocity+Dir. Start	11 MPH, SW
Wind Velocity+Dir. Stop	11 MPH, SW
Wind Velocity+Dir. Max	13 MPH, SW
Wet Leaves (Y/N)	N, no
Soil Temperature	79 F
Soil Moisture	DRY
Soil Surface Condition	MEDIUM
% Cloud Cover	0
Next Moisture Occurred On	6/24/2022
Time to Next Moisture	3.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMD, BCOR
Stage Scale Used	VR
Stage Majority, Percent	V5, -
Stage Minimum, Percent	V5, -
Stage Maximum, Percent	V5, -
Height Average	15 IN
Height Minimum, Maximum	14, 16

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	6 LEAF, -
Stage Minimum, Percent	4 LEAF, -
Stage Maximum, Percent	8 LEAF, -
Height Average	7 IN
Height Minimum, Maximum	3, 10
Density Average	15 FT2
Density Minimum, Maximum	10, 20
Pest 2 Code, Type, Scale	CHEAL, W, DESC
Height Average	9 IN
Height Minimum, Maximum	8, 11
Density Average	8 PLOT
Density Minimum, Maximum	5, 10
Pest 3 Code, Type, Scale	IPOHE, W, DESC
Height Average	7 IN
Height Minimum, Maximum	6, 8
Density Average	1 FT2
Density Minimum, Maximum	1, 2

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TT
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Minimum Mix/Treatment	655 mL
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trial Comments

The original protocol included a PRE application of Dual II Magnum to control grass weeds. However, the PRE applications were dropped to avoid controlling common waterhemp.

The common waterhemp populations in the trial contained significant glyphosate resistance (up to 50 percent).

Weed control ratings through July 8 characterized only burndown. Subsequent ratings included residual control of weeds that emerged after the POST application.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	1	2	3	4	5
	Pest Code						ZEAMD	AMATA	CHEAL	IPOHE	ZEAMD
	Rating Date						6/29/2022	6/29/2022	6/29/2022	6/29/2022	7/8/2022
	Rating Type						PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max						%	%	%	%	%
	Pest Stage Majority/Min/Max						V7	3-7 IN	3-7 IN	3-7 IN	V10
	Trt-Eval Interval						8 DA-A	8 DA-A	8 DA-A	8 DA-A	17 DA-A
1	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	0	67	93	60	0
	N-Pak AMS Liquid		L	2.5	% V/V	POST					
2	Callisto	4	SC	3	FL OZ/A	POST	0	88	95	72	0
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid		L	2.5	% V/V	POST					
3	Tough	5	EC	8	FL OZ/A	POST	0	98	98	92	0
	Callisto	4	SC	3	FL OZ/A	POST					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid		L	2.5	% V/V	POST					
4	Tough R	5	EC	16	FL OZ/A	POST	0	95	99	90	0
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid		L	2.5	% V/V	POST					
5	Tough R	5	EC	16	FL OZ/A	POST	0	98	95	92	0
	Aatrex 4L	4	F	16	FL OZ/A	POST					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid		L	2.5	% V/V	POST					
	LSD P=.05						.	21.5	5.4	21.3	.
	Standard Deviation						0.0	11.4	2.8	11.3	0.0
	CV						0.0	12.83	2.96	13.94	0.0

Could not calculate LSD (% mean diff) for columns 1,5,10,13 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	6	7	8	9	10	11
	Pest Code						AMATA	CHEAL	IPOHE	AMATA	CHEAL	IPOHE
	Rating Date						7/8/2022	7/8/2022	7/8/2022	7/18/2022	7/18/2022	7/18/2022
	Rating Type						CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max						%	%	%	%	%	%
	Pest Stage Majority/Min/Max						3-20 IN	3-7 IN	3-7 IN	3-20 IN	3-7 IN	3-20 IN
	Trt-Eval Interval						17 DA-A	17 DA-A	17 DA-A	27 DA-A	27 DA-A	27 DA-A
1	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	67	99	70	70	99	60
	N-Pak AMS Liquid		L	2.5	% V/V	POST						
2	Callisto	4	SC	3	FL OZ/A	POST	93	99	77	93	99	62
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid		L	2.5	% V/V	POST						
3	Tough	5	EC	8	FL OZ/A	POST	99	99	96	99	99	73
	Callisto	4	SC	3	FL OZ/A	POST						
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid		L	2.5	% V/V	POST						
4	Tough R	5	EC	16	FL OZ/A	POST	99	98	93	99	99	78
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid		L	2.5	% V/V	POST						
5	Tough R	5	EC	16	FL OZ/A	POST	99	99	98	99	99	73
	Aatrex 4L	4	F	16	FL OZ/A	POST						
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid		L	2.5	% V/V	POST						
	LSD P=.05						22.5	1.9	13.0	24.8	.	16.5
	Standard Deviation						12.0	1.0	6.9	13.2	0.0	8.8
	CV						13.12	1.05	7.97	14.33	0.0	12.63

Could not calculate LSD (% mean diff) for columns 1,5,10,13 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	12	13	14
	Pest Code						AMATA	CHEAL	IPOHE
	Rating Date						8/1/2022	8/1/2022	8/1/2022
	Rating Type						CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max						%	%	%
	Pest Stage Majority/Min/Max						3-35 IN		3-30 IN
	Trt-Eval Interval						41 DA-A	41 DA-A	41 DA-A
1	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	70	99	55
	N-Pak AMS Liquid		L	2.5	% V/V	POST			
2	Callisto	4	SC	3	FL OZ/A	POST	93	99	57
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid		L	2.5	% V/V	POST			
3	Tough	5	EC	8	FL OZ/A	POST	99	99	67
	Callisto	4	SC	3	FL OZ/A	POST			
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid		L	2.5	% V/V	POST			
4	Tough R	5	EC	16	FL OZ/A	POST	99	99	73
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid		L	2.5	% V/V	POST			
5	Tough R	5	EC	16	FL OZ/A	POST	99	99	70
	Aatrex 4L	4	F	16	FL OZ/A	POST			
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid		L	2.5	% V/V	POST			
	LSD P=.05						24.8	.	17.9
	Standard Deviation						13.2	0.0	9.5
	CV						14.33	0.0	14.81

Could not calculate LSD (% mean diff) for columns 1,5,10,13 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for Weed Control in Corn, Ames, IA, 2022.

Trial ID: ACC9 Location: Ames Trial Year: 2022
Protocol ID: 22-114 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
CHEAL, Chenopodium album, Common lambsquarters = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.
Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/11/2022
Initiation Date: 5/23/2022
Completion Date: 8/1/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004518 N
Longitude of LL Corner °: -93.672242 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to determine optimum HPPD herbicide use rates when tank-mixed with Tough 5 EC.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/22/2022 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/23/2022 **Planting Rate:** 30800 S/A
Depth: 2 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 50 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/1/2022

Pest Description
Pest 1 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/22/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 2 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/22/2022
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 3 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/22/2022
Common Name: Ivyleaf morningglory **Stage Scale:** DESC

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 11 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.

Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2021. 150 lbs of actual N was applied as 32% UAN in the spring, 2022. Soil testing indicated soil fertility to be at least optimum for all nutrients. Tillage included two passes with a field cultivator on May 23 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 69
% Sand: 32 **% OM:** 4.7 **Texture:** C clay
% Silt: 25 **pH:** 7.7 **Soil Name:** CANISTEO
% Clay: 43 **CEC:** 35.9 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.

Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	6/21/2022
Appl. Start Time	11:10 AM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROFOL
Appl. Entry Date	7/14/2022
Air Temperature Start, Stop	89, 91 F
% Relative Humidity Start, Stop	57, 57
Wind Velocity+Dir. Start	11 MPH, SW
Wind Velocity+Dir. Stop	11 MPH, SW
Wind Velocity+Dir. Max	13 MPH, SW
Wet Leaves (Y/N)	N, no
Soil Temperature	79 F
Soil Moisture	DRY
Soil Surface Condition	MEDIUM
% Cloud Cover	0
Next Moisture Occurred On	6/24/2022
Time to Next Moisture	3.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMD, BCOR
Stage Majority, Percent	V5, -
Stage Minimum, Percent	V5, -
Stage Maximum, Percent	V5, -
Height Average	15 IN
Height Minimum, Maximum	14, 16

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.
Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	10 LEA, -
Stage Minimum, Percent	8 LEAF, -
Stage Maximum, Percent	12 LEA, -
Height Average	5 IN
Height Minimum, Maximum	4, 6
Density Average	12 FT2
Density Minimum, Maximum	5, 20
Pest 2 Code, Type, Scale	CHEAL, W, DESC
Pest 3 Code, Type, Scale	IPOHE, W, DESC
Stage Majority, Percent	NUMERO, -
Stage Minimum, Percent	NUMERO, -
Stage Maximum, Percent	NUMERO, -
Height Average	8 IN
Height Minimum, Maximum	7, 10
Density Average	1 FT2
Density Minimum, Maximum	1, 2

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TT
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.

Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trial Comments

The original protocol included a PRE application of Dual II Magnum to control grass weeds. However, the PRE applications were dropped to avoid controlling common waterhemp.

The common waterhemp populations in the trial contained significant glyphosate resistance (up to 50 percent).

Weed control ratings through July 8 characterized only burndown. Subsequent ratings included residual control of weeds that emerged after the POST application.

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.
Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	1	2	3	4	5
	Pest Code						ZEAMD	AMATA	CHEAL	IPOHE	ZEAMD
	Rating Date						6/29/2022	6/29/2022	6/29/2022	6/29/2022	7/8/2022
	Rating Type						PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max						%	%	%	%	%
	Pest Stage Majority/Min/Max						V7	3-7 IN	3-7 IN	3-7 IN	V10
	Trt-Eval Interval						8 DA-A	8 DA-A	8 DA-A	8 DA-A	17 DA-A
1	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	0	77	98	70	0
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
2	Callisto	4	SC	2.25	FL OZ/A	POST	0	87	96	70	0
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
3	Tough R	5	EC	12	FL OZ/A	POST	0	95	99	70	0
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
4	Callisto	4	SC	3	FL OZ/A	POST	0	95	98	60	0
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
5	Tough 5EC	5	EC	8	FL OZ/A	POST	0	96	99	90	0
	Callisto	4	SC	3	FL OZ/A	POST					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
6	Tough R	5	EC	16	FL OZ/A	POST	0	95	98	83	0
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
7	Tough R	5	EC	16	FL OZ/A	POST	0	99	99	90	0
	Aatrex 4L	4	F	1	PT/A	POST					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
8	Tough 5EC	5	EC	6	FL OZ/A	POST	0	99	99	75	0
	Laudis	3.5	SC	3	FL OZ/A	POST					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
9	Tough R	5	EC	8	FL OZ/A	POST	0	97	97	85	0
	Laudis	3.5	SC	3	FL OZ/A	POST					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
10	Impact	2.8	SC	1	FL OZ/A	POST	0	85	95	50	0
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
11	Tough 5EC	5	EC	8	FL OZ/A	POST	0	98	99	82	0
	Impact	2.8	SC	1	FL OZ/A	POST					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST					
	LSD P=.05						.	10.9	3.6	12.8	.
	Standard Deviation						0.0	6.3	2.1	7.3	0.0
	CV						0.0	6.82	2.16	9.74	0.0

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14
Could not calculate LSD (% mean diff) for columns 1,5,7 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.
Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	6	7	8	9	10	11
	Pest Code						AMATA	CHEAL	IPOHE	AMATA	CHEAL	IPOHE
	Rating Date						7/8/2022	7/8/2022	7/8/2022	7/18/2022	7/18/2022	7/18/2022
	Rating Type						CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max						%	%	%	%	%	%
	Pest Stage Majority/Min/Max						3-20 IN	3-7 IN	3-7 IN	3-20 IN	3-7 IN	3-7 IN
	Trt-Eval Interval						17 DA-A	17 DA-A	17 DA-A	27 DA-A	27 DA-A	27 DA-A
1	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	78	99	88	78	99	60
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
2	Callisto	4	SC	2.25	FL OZ/A	POST	92	99	83	91	99	70
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
3	Tough R	5	EC	12	FL OZ/A	POST	99	99	85	99	99	62
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
4	Callisto	4	SC	3	FL OZ/A	POST	95	99	80	93	99	75
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
5	Tough 5EC	5	EC	8	FL OZ/A	POST	98	99	96	98	99	86
	Callisto	4	SC	3	FL OZ/A	POST						
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
6	Tough R	5	EC	16	FL OZ/A	POST	98	99	90	96	98	68
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
7	Tough R	5	EC	16	FL OZ/A	POST	99	99	99	99	99	77
	Aatrex 4L	4	F	1	PT/A	POST						
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
8	Tough 5EC	5	EC	6	FL OZ/A	POST	99	99	83	99	99	68
	Laudis	3.5	SC	3	FL OZ/A	POST						
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
9	Tough R	5	EC	8	FL OZ/A	POST	99	99	99	99	99	80
	Laudis	3.5	SC	3	FL OZ/A	POST						
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
10	Impact	2.8	SC	1	FL OZ/A	POST	96	99	77	96	99	67
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
11	Tough 5EC	5	EC	8	FL OZ/A	POST	99	99	95	99	99	78
	Impact	2.8	SC	1	FL OZ/A	POST						
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST						
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST						
	LSD P=.05						14.4	.	11.3	15.1	1.3	24.6
	Standard Deviation						8.4	0.0	6.5	8.8	0.7	14.1
	CV						8.82	0.0	7.32	9.26	0.74	19.61

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14
Could not calculate LSD (% mean diff) for columns 1,5,7 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.
Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	AMATA	CHEAL	IPOHE
Pest Code							AMATA	CHEAL	IPOHE
Rating Date							8/1/2022	8/1/2022	8/1/2022
Rating Type							CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max							%	%	%
Pest Stage Majority/Min/Max							3-30 IN		5-20 IN
Trt-Eval Interval							41 DA-A	41 DA-A	41 DA-A
							12	13	14
1	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	78	99	55
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
2	Callisto	4	SC	2.25	FL OZ/A	POST	91	99	68
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
3	Tough R	5	EC	12	FL OZ/A	POST	99	99	57
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
4	Callisto	4	SC	3	FL OZ/A	POST	93	99	72
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
5	Tough 5EC	5	EC	8	FL OZ/A	POST	98	99	85
	Callisto	4	SC	3	FL OZ/A	POST			
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
6	Tough R	5	EC	16	FL OZ/A	POST	96	98	63
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
7	Tough R	5	EC	16	FL OZ/A	POST	99	99	77
	Aatrex 4L	4	F	1	PT/A	POST			
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
8	Tough 5EC	5	EC	6	FL OZ/A	POST	99	99	63
	Laudis	3.5	SC	3	FL OZ/A	POST			
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
9	Tough R	5	EC	8	FL OZ/A	POST	99	99	80
	Laudis	3.5	SC	3	FL OZ/A	POST			
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
10	Impact	2.8	SC	1	FL OZ/A	POST	96	99	62
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
11	Tough 5EC	5	EC	8	FL OZ/A	POST	99	99	75
	Impact	2.8	SC	1	FL OZ/A	POST			
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST			
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST			
LSD P=.05							15.1	1.3	29.7
Standard Deviation							8.8	0.7	16.9
CV							9.26	0.74	24.71

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14
Could not calculate LSD (% mean diff) for columns 1,5,7 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough and HPPD Rates POST for Optimum Common Waterhemp Control in Corn, Ames, IA, 2022.

Trial ID: ACC10 Location: Ames Trial Year: 2022
Protocol ID: 22-112 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
CHEAL, Chenopodium album, Common lambsquarters = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/1/2022
Completion Date: 11/1/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003406 N
Longitude of LL Corner °: -93.66993 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Authority Edge, Anthem Maxx and other standard preemergence programs for residual weed control in soybean.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/14/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/1/2022 **Planting Rate:** 154000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: ROUGH rough
Soil Temperature: 65 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/7/2022
Harvest Date: 11/1/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 13.0 **Harvested Length:** 22 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/1/2022
Common Name: Giant foxtail

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/1/2022
Common Name: velvetleaf

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/1/2022
Common Name: Common waterhemp

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 11 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 79
% Sand: 42.5 **% OM:** 3.5 **Texture:** L loam
% Silt: 32.5 **pH:** 5.4 **Soil Name:** CLARION
% Clay: 25 **CEC:** 18.3 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/15/2022	0.2	IN
23.	7/24/2022	0.7	IN
24.	7/28/2022	0.3	IN

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B
Application Date	6/2/2022	7/7/2022
Appl. Start Time	2:00 PM	3:00 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Appl. Entry Date	7/14/2022	7/14/2022
Air Temperature Start, Stop	75, - F	80, - F
% Relative Humidity Start, Stop	26, -	81, -
Wind Velocity+Dir. Start	13 MPH, E	4 MPH, ESE
Wet Leaves (Y/N)		N, no
Soil Temperature	- F	
Soil Moisture	DRY	SLIWET
Soil Surface Condition	CLODDY	
% Cloud Cover	10	80
Next Moisture Occurred On	6/5/2022	7/8/2022
Time to Next Moisture	3.0 DAY	1.0 DAY

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-5	30
Stage Majority, Percent		V5, -
Stage Minimum, Percent		V5, -
Stage Maximum, Percent		V5, -
Height Average		10 IN
Height Minimum, Maximum		9, 11

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, BBCH	SETFA, W, BBCH
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		2 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		6 IN
Height Minimum, Maximum		3, 8
Density Average		3 FT2
Density Minimum, Maximum		0, 5
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH
Stage Majority, Percent		6 LEAF, -
Stage Minimum, Percent		4 LEAF, -
Stage Maximum, Percent		8 LEAF, -
Height Average		7 IN
Height Minimum, Maximum		3, 10
Density Average		2 FT2
Density Minimum, Maximum		0, 3
Pest 3 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH
Stage Majority, Percent		NUMERO, -
Stage Minimum, Percent		NUMERO, -
Stage Maximum, Percent		NUMERO, -
Height Average		7 IN
Height Minimum, Maximum		3, 10
Density Average		2 FT2
Density Minimum, Maximum		0, 3

Application Equipment

	A	B
Appl. Equipment	HAND SPRAYER	ATV
Equipment Type	BACMAN	ALTEVE
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	110015
Nozzle Type	TTI	TT
Nozzle TradeName	TeeJet	
Nozzle Tip Size, Color	-, GREEN	
Nozzle Spacing	19 IN	20 IN
Boom Length	10 FT	10 FT
Ground Speed	3 MPH	2.7 MPH
Application Amount	15 GAL/AC	15 GAL/AC

Notes

Context	Date	By	Notes
STATUS	4/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trial Comments

Weed densities and sizes varied greatly at the POST application, depending on the PRE treatment that was applied at planting.

"Phynec" includes leaf crinkling and shortening of the leaf midvein causing heart-shaped leaves to form a "drawstring effect".

Weed counts were taken on June 30 within three random 0.25 square meter quadrants per plot. The three counts were converted to plants per square meter per plot

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	GLXMA	GLXMA	GLXMA	SETFA
	Rating Date							6/28/2022	6/28/2022	6/28/2022	6/28/2022	6/30/2022
	Rating Type							PHYGEN	PHYSTU	PHYNEC	PHYCHL	COUPLA
	Rating Unit/Min/Max							%	%	%	%	m2
	Pest Stage Majority/Min/Max							V3	V3	V3	V3	1-4 IN
	Trt-Eval Interval							26 DA-A	26 DA-A	26 DA-A	26 DA-A	28 DA-A
1	Untreated Check							0	0	0	0	477
2	Boundary	6.5	EC	29	FL OZ/A	PRE	A	2	0	2	0	21
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
3	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	2	0	2	0	22
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Kyber	2.64	SC	16	FL OZ/A	PRE	A	2	0	2	0	11
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	0	0	0	0	18
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Warrant	3	CS	48	FL OZ/A	PRE	A	2	0	2	0	34
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Outlook	6	EC	14	FL OZ/A	PRE	A	3	0	3	0	22
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	Dual II Magnum	7.64	EC	20.8	FL OZ/A	PRE	A	3	0	3	0	10
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
9	Authority Edge	4.25	SC	8	FL OZ/A	PRE	A	0	0	0	0	42
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
10	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	2	0	2	0	57
	TriCor DF	75	DF	5	OZ WT/A	PRE	A					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
11	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	2	0	2	0	64
	Anthem Maxx	4.3	SC	3	FL OZ/A	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
	LSD P=.05							4.3	.	4.3	.	259.9
	Standard Deviation							2.5	0.0	2.5	0.0	152.6
	CV							166.49	0.0	166.49	0.0	215.65

Missing data estimates are included in columns:Average=17
Could not calculate LSD (% mean diff) for columns 2,4 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10	11
	Pest Code							ABUTH	AMATA	SETFA	ABUTH	AMATA	SETFA
	Rating Date							6/30/2022	6/30/2022	6/30/2022	6/30/2022	6/30/2022	7/8/2022
	Rating Type							COUPLA	COUPLA	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							m2	m2	%	%	%	%
	Pest Stage Majority/Min/Max							1-4 IN	1-4 IN	1-4 IN	1-4 IN	1-4 IN	3-8 IN
	Trt-Eval Interval							28 DA-A	28 DA-A	28 DA-A	28 DA-A	28 DA-A	36 DA-A
1	Untreated Check							82	457	0	0	0	0
2	Boundary	6.5	EC	29	FL OZ/A	PRE	A	14	3	95	80	98	91
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
3	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	2	5	99	99	96	95
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
4	Kyber	2.64	SC	16	FL OZ/A	PRE	A	2	3	96	98	99	94
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
5	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	13	4	98	70	99	95
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
6	Warrant	3	CS	48	FL OZ/A	PRE	A	53	23	93	0	83	93
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
7	Outlook	6	EC	14	FL OZ/A	PRE	A	51	34	99	43	60	98
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
8	Dual II Magnum	7.64	EC	20.8	FL OZ/A	PRE	A	43	71	98	0	50	98
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
9	Authority Edge	4.25	SC	8	FL OZ/A	PRE	A	7	4	95	85	99	85
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
10	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	8	6	85	87	98	73
	TriCor DF	75	DF	5	OZ WT/A	PRE	A						
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
11	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	6	1	87	85	95	78
	Anthem Maxx	4.3	SC	3	FL OZ/A	POST	B						
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
	LSD P=.05							26.6	36.9	5.8	11.3	8.6	9.8
	Standard Deviation							15.6	21.6	3.4	6.6	5.0	5.8
	CV							61.25	38.91	3.94	11.25	6.33	7.06

Missing data estimates are included in columns:Average=17
Could not calculate LSD (% mean diff) for columns 2,4 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	12	13	14	15	16	17
	Pest Code							ABUTH	AMATA	SETFA	ABUTH	AMATA	GLXMA
	Rating Date							7/8/2022	7/8/2022	7/27/2022	7/27/2022	7/27/2022	11/1/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	YIELD
	Rating Unit/Min/Max							%	%	%	%	%	bu/ac
	Pest Stage Majority/Min/Max							3-8 IN	3-8 IN	3-8 IN	3-20 IN	3-20 IN	R8
	Trt-Eval Interval							36 DA-A	36 DA-A	55 DA-A	55 DA-A	55 DA-A	152 DA-A
1	Untreated Check							0	0	0	0	0	56
2	Boundary	6.5	EC	29	FL OZ/A	PRE	A	77	87	98	99	99	46
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
3	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	99	91	99	99	99	69
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
4	Kyber	2.64	SC	16	FL OZ/A	PRE	A	98	98	98	99	99	53
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
5	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	70	96	98	98	99	53
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
6	Warrant	3	CS	48	FL OZ/A	PRE	A	0	80	96	93	96	43
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
7	Outlook	6	EC	14	FL OZ/A	PRE	A	40	60	96	95	95	58
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
8	Dual II Magnum	7.64	EC	20.8	FL OZ/A	PRE	A	0	47	98	93	90	65
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
9	Authority Edge	4.25	SC	8	FL OZ/A	PRE	A	82	98	98	98	99	42
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
10	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	83	95	99	99	98	49
	TriCor DF	75	DF	5	OZ WT/A	PRE	A						
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
11	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	85	93	99	99	98	61
	Anthem Maxx	4.3	SC	3	FL OZ/A	POST	B						
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B						
	AMS		SG	3	LB/A	POST	B						
	LSD P=.05							12.3	11.8	2.4	3.3	3.2	26.9
	Standard Deviation							7.2	6.9	1.4	1.9	1.9	15.6
	CV							12.59	9.05	1.59	2.16	2.13	28.76

Missing data estimates are included in columns:Average=17
Could not calculate LSD (% mean diff) for columns 2,4 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2022.

Trial ID: ASC1 Location: Ames Trial Year: 2022
Protocol ID: USA-22-067 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US

Rating Type
PHYGEN = phytotoxicity - general / injury
PHYSTU = phytotoxicity - stunting
PHYNEC = phytotoxicity - necrosis /burn
PHYCHL = phytotoxicity - chlorosis
COUPLA = count - plant / emergence - objective
CONTRO = control / burndown or knockdown
YIELD = yield

Rating Unit/Min/Max
%, 0, 100 = percent
m2, , = square meter
bu/ac, , = bushels per acre

Iowa State University

Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC2 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D38-A-01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/1/2022
Completion Date: 7/15/2023

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003143 N
Longitude of LL Corner °: -93.67033 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare broadleaf weed control in soybean with PRE products, alone, and in combination with Engenia.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/26/2022 **Stage Scale:** VR
Variety: Asgrow AG23XF2
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 6/1/2022 **Planting Rate:** 154000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: ROUGH rough
Soil Temperature: 65 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/7/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/26/2022
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/26/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/26/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 9 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC2 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D38-A-01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 76
% Sand: 40 **% OM:** 3.8 **Texture:** L loam
% Silt: 35 **pH:** 5.5 **Soil Name:** CLARION
% Clay: 25 **CEC:** 18.7 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/15/2022	0.2	IN
23.	7/24/2022	0.7	IN
24.	7/28/2022	0.3	IN

Iowa State University

Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC2 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D38-A-01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	6/2/2022
Appl. Start Time	2:00 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROSOI
Appl. Entry Date	9/26/2022
Air Temperature Start, Stop	75, - F
% Relative Humidity Start, Stop	26, -
Wind Velocity+Dir. Start	13 MPH, E
Wind Velocity+Dir. Stop	13 MPH, E
Soil Temperature	64 F
Soil Moisture	DRY
Soil Surface Condition	MEDIUM
% Cloud Cover	10
Next Moisture Occurred On	6/5/2022
Time to Next Moisture	3.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	-5

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	SETFA, W, DESC
Pest 2 Code, Type, Scale	ABUTH, W, DESC
Pest 3 Code, Type, Scale	AMATA, W, DESC

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TTI
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Iowa State University

Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC2 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D38-A-01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Notes

Context	Date	By	Notes
STATUS	4/15/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

None of the herbicide treatments appeared to cause soybean injury.

Ratings could not be taken earlier than 14 DA-A due to lack of emergence.

Iowa State University

Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC2 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D38-A-01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4
	Pest Code							SETFA	ABUTH	AMATA	SETFA
	Rating Date							6/14/2022	6/14/2022	6/14/2022	6/30/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%
	Pest Stage Majority/Min/Max							0.25 IN	0.5 IN	0.125 IN	1-5 IN
	Trt-Eval Interval							12 DA-A	12 DA-A	12 DA-A	28 DA-A
1	Untreated Check							0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	23	53	57	23
	Aegos	5.8	SL	8	FL OZ/A	PRE	A				
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	87	53	96	80
4	Engenia	5	SL	12.8	FL OZ/A	PRE	A	88	50	99	82
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A				
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	90	88	99	91
6	Engenia	5	SL	12.8	FL OZ/A	PRE	A	93	80	99	93
	Zidua PRO	4	SC	6	FL OZ/A	PRE	A				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A				
7	Tavium Plus VaporGrip Tech	3.39	CS	3.53	PT/A	PRE	A	90	57	77	93
	Volt-Edge		L	20	FL OZ/A	PRE	A				
8	Engenia	5	SL	12.8	FL OZ/A	PRE	A	98	92	99	95
	BroadAxe XC	7	EC	28	FL OZ/A	PRE	A				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A				
9	Engenia Prime	5.23	SC	16	FL OZ/A	PRE	A	87	82	99	96
	LSD P=.05							8.5	17.9	9.7	10.5
	Standard Deviation							4.9	10.3	5.6	6.1
	CV							6.76	16.77	6.97	8.38

^Calculated from residual.

Iowa State University

Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC2 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D38-A-01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	5	6	7	8
	Pest Code							ABUTH	AMATA	SETFA	ABUTH
	Rating Date							6/30/2022	6/30/2022	7/15/2022	7/15/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%
	Pest Stage Majority/Min/Max							1-4 IN	1-3 IN	8-24 IN	6-20 IN
	Trt-Eval Interval							28 DA-A	28 DA-A	43 DA-A	43 DA-A
1	Untreated Check							0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	53	57	23	53
	Aegos	5.8	SL	8	FL OZ/A	PRE	A				
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	67	98	67	58
4	Engenia	5	SL	12.8	FL OZ/A	PRE	A	58	98	60	47
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A				
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	96	98	73	95
6	Engenia	5	SL	12.8	FL OZ/A	PRE	A	95	99	78	90
	Zidua PRO	4	SC	6	FL OZ/A	PRE	A				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A				
7	Tavium Plus VaporGrip Tech	3.39	CS	3.53	PT/A	PRE	A	63	70	87	52
	Volt-Edge		L	20	FL OZ/A	PRE	A				
8	Engenia	5	SL	12.8	FL OZ/A	PRE	A	70	92	82	47
	BroadAxe XC	7	EC	28	FL OZ/A	PRE	A				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A				
9	Engenia Prime	5.23	SC	16	FL OZ/A	PRE	A	93	96	85	93
	LSD P=.05							18.6	16.1	12.1	15.0
	Standard Deviation							10.7	9.3	7.0	8.7
	CV							16.22	11.82	11.31	14.64

^Calculated from residual.

Iowa State University

Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC2 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D38-A-01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	9
	Pest Code							AMATA
	Rating Date							7/15/2022
	Rating Type							CONTRO
	Rating Unit/Min/Max							%
	Pest Stage Majority/Min/Max							6-20 IN
	Trt-Eval Interval							43 DA-A
1	Untreated Check							0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	57
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	88
4	Engenia	5	SL	12.8	FL OZ/A	PRE	A	93
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	93
6	Engenia	5	SL	12.8	FL OZ/A	PRE	A	92
	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	
7	Tavium Plus VaporGrip Tech	3.39	CS	3.53	PT/A	PRE	A	47
	Volt-Edge		L	20	FL OZ/A	PRE	A	
8	Engenia	5	SL	12.8	FL OZ/A	PRE	A	80
	BroadAxe XC	7	EC	28	FL OZ/A	PRE	A	
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	
9	Engenia Prime	5.23	SC	16	FL OZ/A	PRE	A	82
	LSD P=.05							15.2
	Standard Deviation							8.8
	CV							12.48

^Calculated from residual.

Iowa State University

Engenia PRE Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC2 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D38-A-01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Evaluation of BCP222H Control of Common Waterhemp in Soybean, Ames, IA, 2022.

Trial ID: ASC3 Location: Ames Trial Year: 2022
Protocol ID: 22-636 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/1/2022
Completion Date: 7/6/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003428 N
Longitude of LL Corner °: -93.670323 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to determine BCP222H efficacy for common waterhemp in soybean.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/27/2022 **Stage Scale:** VR
Variety: Asgrow AG23XF2
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 6/1/2022 **Planting Rate:** 154000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: ROUGH rough
Soil Temperature: 65 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/7/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/27/2022
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/27/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/27/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 10 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Evaluation of BCP222H Control of Common Waterhemp in Soybean, Ames, IA, 2022.

Trial ID: ASC3 Location: Ames Trial Year: 2022
Protocol ID: 22-636 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 78
% Sand: 40 **% OM:** 4.1 **Texture:** CL clay loam
% Silt: 32.5 **pH:** 5.9 **Soil Name:** CLARION
% Clay: 27.5 **CEC:** 19.4 **Fert. Level:** E excellent

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/15/2022	0.2	IN
23.	7/24/2022	0.7	IN
24.	7/28/2022	0.3	IN

Iowa State University

Evaluation of BCP222H Control of Common Waterhemp in Soybean, Ames, IA, 2022.

Trial ID: ASC3 Location: Ames Trial Year: 2022
Protocol ID: 22-636 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	6/3/2022
Appl. Start Time	10:30 AM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROSOI
Appl. Entry Date	7/14/2022
Air Temperature Start, Stop	70, 71 F
% Relative Humidity Start, Stop	31, 31
Wind Velocity+Dir. Start	7 MPH, S
Wind Velocity+Dir. Stop	7 MPH, S
Wind Velocity+Dir. Max	8 MPH, S
Soil Temperature	64 F
Soil Moisture	DRY
Soil Surface Condition	CLODDY
% Cloud Cover	0
Next Moisture Occurred On	6/5/2022
Time to Next Moisture	2.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	SETFA, W, DESC
Pest 2 Code, Type, Scale	ABUTH, W, DESC
Pest 3 Code, Type, Scale	AMATA, W, DESC

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TTI
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Iowa State University

Evaluation of BCP222H Control of Common Waterhemp in Soybean, Ames, IA, 2022.

Trial ID: ASC3 Location: Ames Trial Year: 2022
Protocol ID: 22-636 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/14/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Soybean injury under "PHYSTU" is plant height reduction and leaf crinkling.

Soybean stand counts per meter of row in "Assessment Data" are an average of two rows in each plot.

Iowa State University

Evaluation of BCP222H Control of Common Waterhemp in Soybean, Ames, IA, 2022.

Trial ID: ASC3 Location: Ames Trial Year: 2022
Protocol ID: 22-636 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5	6
	Pest Code							GLXMA	GLXMA	GLXMA	SETFA	ABUTH	AMATA
	Rating Date							6/21/2022	6/21/2022	6/23/2022	6/21/2022	6/21/2022	6/21/2022
	Rating Type							PHYSTU	PHYCHL	STAOBJ	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	m	%	%	%
	Pest Stage Majority/Min/Max							V1	V1	V1	2 IN	0.5 IN	0.125 IN
	Trt-Eval Interval							18 DA-A	18 DA-A	20 DA-A	18 DA-A	18 DA-A	18 DA-A
1	Untreated Check							0	0	25	0	0	0
2	BCP222H	4.17	EC	1.73	PT/A	PRE	A	0	0	25	40	17	57
3	BCP222H	4.17	EC	1.73	PT/A	PRE	A	2	0	26	99	20	96
	Dual II Magnum	7.64	EC	1.5	PT/A	PRE	A						
4	BCP222H	4.17	EC	1.73	PT/A	PRE	A	5	0	27	99	40	98
	Dual II Magnum	7.64	EC	2	PT/A	PRE	A						
5	BCP222H	4.17	EC	2.57	PT/A	PRE	A	2	0	25	60	30	87
6	BCP222H	4.17	EC	2.57	PT/A	PRE	A	2	0	28	99	23	96
	Dual II Magnum	7.64	EC	1.5	PT/A	PRE	A						
7	BCP222H	4.17	EC	2.57	PT/A	PRE	A	3	0	26	99	50	99
	Dual II Magnum	7.64	EC	2	PT/A	PRE	A						
8	Dual II Magnum	7.64	EC	1.5	PT/A	PRE	A	7	0	26	98	33	73
9	Dual II Magnum	7.64	EC	2	PT/A	PRE	A	3	0	25	99	33	93
10	Zidua PRO	4	SC	4.5	FL OZ/A	PRE	A	3	0	28	98	85	99
	LSD P=.05							4.9	.	4.5	11.8	18.1	11.2
	Standard Deviation							2.8	0.0	2.6	6.9	10.6	6.5
	CV							106.43	0.0	10.11	8.73	31.9	8.16

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of BCP222H Control of Common Waterhemp in Soybean, Ames, IA, 2022.

Trial ID: ASC3 Location: Ames Trial Year: 2022
Protocol ID: 22-636 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	7	8	9	10	11	12
	Pest Code							SETFA	ABUTH	AMATA	SETFA	ABUTH	AMATA
	Rating Date							7/6/2022	7/6/2022	7/6/2022	7/16/2022	7/16/2022	7/16/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							4-15 IN	2-12 IN	1-12 IN	10-30 IN	8-30 IN	8-30 IN
	Trt-Eval Interval							33 DA-A	33 DA-A	33 DA-A	43 DA-A	43 DA-A	43 DA-A
1	Untreated Check							0	0	0	0	0	0
2	BCP222H	4.17	EC	1.73	PT/A	PRE	A	37	17	50	37	17	50
3	BCP222H	4.17	EC	1.73	PT/A	PRE	A	93	17	88	83	13	80
	Dual II Magnum	7.64	EC	1.5	PT/A	PRE	A						
4	BCP222H	4.17	EC	1.73	PT/A	PRE	A	98	23	90	95	17	87
	Dual II Magnum	7.64	EC	2	PT/A	PRE	A						
5	BCP222H	4.17	EC	2.57	PT/A	PRE	A	50	23	73	47	20	73
6	BCP222H	4.17	EC	2.57	PT/A	PRE	A	98	17	87	95	13	85
	Dual II Magnum	7.64	EC	1.5	PT/A	PRE	A						
7	BCP222H	4.17	EC	2.57	PT/A	PRE	A	92	37	95	90	20	95
	Dual II Magnum	7.64	EC	2	PT/A	PRE	A						
8	Dual II Magnum	7.64	EC	1.5	PT/A	PRE	A	98	27	55	91	13	50
9	Dual II Magnum	7.64	EC	2	PT/A	PRE	A	98	20	80	93	13	73
10	Zidua PRO	4	SC	4.5	FL OZ/A	PRE	A	85	85	87	73	77	83
	LSD P=.05							12.2	13.2	12.2	12.7	10.3	13.6
	Standard Deviation							7.1	7.7	7.1	7.4	6.0	8.0
	CV							9.5	28.98	10.12	10.5	29.44	11.76

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of BCP222H Control of Common Waterhemp in Soybean, Ames, IA, 2022.

Trial ID: ASC3 Location: Ames Trial Year: 2022
Protocol ID: 22-636 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
PHYSTU = phytotoxicity - stunting
PHYCHL = phytotoxicity - chlorosis
STAOBJ = stand - objective (based on counts)
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent
m, , = meter

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.
Trial ID: ASC4 Location: Ames Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/1/2022
Completion Date: 7/26/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003188 N
Longitude of LL Corner °: -93.670603 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate residual weed control of preemergence residual herbicides with and without Xtendimax Herbicide.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 8/12/2022 **Stage Scale:** VR
Variety: Asgrow AG23XF2
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 6/1/2022 **Planting Rate:** 154000 S/A
Depth: 1.75 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 65 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/7/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/12/2022
Common Name: Giant foxtail **Stage Scale:** BBCH

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/12/2022
Common Name: velvetleaf **Stage Scale:** BBCH

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/12/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 14 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.
Trial ID: ASC4 Location: Ames Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 76
% Sand: 40 **% OM:** 3.8 **Texture:** L loam
% Silt: 35 **pH:** 5.5 **Soil Name:** CLARION
% Clay: 25 **CEC:** 18.7 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/15/2022	0.2	IN
23.	7/24/2022	0.7	IN
24.	7/28/2022	0.3	IN

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.
Trial ID: ASC4 Location: Ames Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	6/3/2022
Appl. Start Time	10:30 AM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROSOI
Appl. Entry Date	8/12/2022
Air Temperature Start, Stop	70, - F
% Relative Humidity Start, Stop	31, -
Wind Velocity+Dir. Start	7 MPH, S
Soil Temperature	64 F
Soil Moisture	DRY
Soil Surface Condition	MEDIUM
% Cloud Cover	0
Next Moisture Occurred On	6/5/2022
Time to Next Moisture	2.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	-4

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	SETFA, W, BBCH
Pest 2 Code, Type, Scale	ABUTH, W, BBCH
Pest 3 Code, Type, Scale	AMATA, W, BBCH

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TTI
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC4 Location: Ames Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.
Trial ID: ASC4 Location: Ames Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	SETFA
	Rating Date							6/28/2022	6/28/2022	6/28/2022	6/28/2022	7/12/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V3	1-3 IN	1-3 IN		9-18 IN
	Trt-Eval Interval							25 DA-A	25 DA-A	25 DA-A	25 DA-A	39 DA-A
1	Untreated Check							0	0	0	0	0
2	Warrant	3	CS	48	FL OZ/A	PRE	A	0	92	73	96	88
	Mauler	4	SC	8	FL OZ/A	PRE	A					
3	Warrant	3	CS	48	FL OZ/A	PRE	A	0	85	43	83	78
4	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	0	82	7	98	80
5	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	0	87	93	96	83
6	Valor EZ	4	SC	2	FL OZ/A	PRE	A	0	53	83	90	47
7	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	0	27	83	93	20
8	Warrant	3	CS	48	FL OZ/A	PRE	A	0	93	77	98	82
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
9	Warrant	3	CS	48	FL OZ/A	PRE	A	0	93	40	88	90
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
10	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	0	88	27	98	80
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
11	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	0	88	88	96	73
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
12	Valor EZ	4	SC	2	FL OZ/A	PRE	A	0	60	77	82	50
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
13	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	0	33	82	90	20
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
14	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	0	0	7	10	0
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	LSD P=.05							.	13.3	16.7	13.8	14.4
	Standard Deviation							0.0	7.9	9.9	8.2	8.6
	CV							0.0	12.57	17.83	10.33	15.17

Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.
^Calculated from residual.

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.
Trial ID: ASC4 Location: Ames Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							ABUTH	AMATA	SETFA	ABUTH	AMATA
	Rating Date							7/12/2022	7/12/2022	7/26/2022	7/26/2022	7/26/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							5-17 IN	5-17 IN			
	Trt-Eval Interval							39 DA-A	39 DA-A	53 DA-A	53 DA-A	53 DA-A
1	Untreated Check							0	0	0	0	0
2	Warrant	3	CS	48	FL OZ/A	PRE	A	67	93	82	67	93
	Mauler	4	SC	8	FL OZ/A	PRE	A					
3	Warrant	3	CS	48	FL OZ/A	PRE	A	30	73	75	23	72
4	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	7	91	73	7	90
5	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	92	91	70	92	88
6	Valor EZ	4	SC	2	FL OZ/A	PRE	A	80	78	40	80	77
7	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	83	88	17	80	85
8	Warrant	3	CS	48	FL OZ/A	PRE	A	62	96	73	58	93
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
9	Warrant	3	CS	48	FL OZ/A	PRE	A	33	82	85	30	78
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
10	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	23	95	77	23	95
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
11	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	85	90	68	82	83
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
12	Valor EZ	4	SC	2	FL OZ/A	PRE	A	70	75	40	67	70
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
13	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	82	90	13	82	87
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
14	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	7	7	0	7	7
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	LSD P=.05							19.0	14.8	15.5	19.8	14.5
	Standard Deviation							11.3	8.8	9.2	11.8	8.7
	CV							21.97	11.76	18.12	23.67	11.91

Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.
^Calculated from residual.

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASC4 Location: Ames Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/2/2022
Completion Date: 11/2/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004108 N
Longitude of LL Corner °: -93.669947 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare Tendovo Herbicide weed control and crop safety to current Syngenta and competitor residual herbicides in conventional tillage soybean systems.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/18/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/2/2022 **Planting Rate:** 154000 S/A
Depth: 1.25 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 62 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/8/2022
Harvest Date: 11/2/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 13.0 **Harvested Length:** 22 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/6/2022
Common Name: Giant foxtail **Stage Scale:** BBCH

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/6/2022
Common Name: velvetleaf **Stage Scale:** BBCH

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/6/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/6/2022
Common Name: Ivyleaf morningglory **Stage Scale:** BBCH

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Site and Design

Treated Plot Width: 10 FT
Treated Plot Length: 25 FT
Treated Plot Area: 250.0 FT2 **Treatments:** 9
Replications: 4
Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: MINTIL minimum-till
Study Design: RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description

Description Name: 85
% Sand: 37.5 **% OM:** 4.7 **Texture:** CL clay loam
% Silt: 32.5 **pH:** 6.5 **Soil Name:** CANISTEO
% Clay: 30 **CEC:** 21.6 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B
Application Date	6/3/2022	7/1/2022
Appl. Start Time	5:30 PM	9:30 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Appl. Entry Date	7/18/2022	7/18/2022
Air Temperature Start, Stop	81, 81 F	75, 76 F
% Relative Humidity Start, Stop	20, 20	50, 50
Wind Velocity+Dir. Start	9 MPH, N	8 MPH, N
Wind Velocity+Dir. Stop	9 MPH, N	8 MPH, N
Wet Leaves (Y/N)		N, no
Soil Temperature	62 F	
Soil Moisture	DRY	DRY
Soil Surface Condition	MEDIUM	
% Cloud Cover	5	95
Next Moisture Occurred On	6/5/2022	7/4/2022
Time to Next Moisture	2.0 DAY	3.0 DAY

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-5	23
Stage Majority, Percent		V4, -
Stage Minimum, Percent		V4, -
Stage Maximum, Percent		V4, -
Height Average		9 IN
Height Minimum, Maximum		8, 10

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, BBCH	SETFA, W, BBCH
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		2 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		4 IN
Height Minimum, Maximum		1, 6
Density Average		2 FT2
Density Minimum, Maximum		0, 3
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		2 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		2 IN
Height Minimum, Maximum		1, 3
Density Average		50 PLOT
Density Minimum, Maximum		0, 100
Pest 3 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH
Stage Majority, Percent		6 LEAF, -
Stage Minimum, Percent		2 LEAF, -
Stage Maximum, Percent		8 LEAF, -
Height Average		3 IN
Height Minimum, Maximum		1, 5
Density Average		25 PLOT
Density Minimum, Maximum		0, 50
Pest 4 Code, Type, Scale	IPOHE, W, BBCH	IPOHE, W, BBCH
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		2 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		3 IN
Height Minimum, Maximum		1, 4
Density Average		0.5 FT2
Density Minimum, Maximum		0, 1

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B
Appl. Equipment	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	110015
Nozzle Type	TTI	TTI
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19 IN
Boom Length	10 FT	10 FT
Boom Height	20.0 IN	20.0 IN
Ground Speed	3 MPH	3 MPH
Carrier	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

The common waterhemp populations in the trial contained significant glyphosate resistance (at least 40 percent).

Soybean injury appeared as leaf crinkling caused by PRE treatments.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Rating Date							6/28/2022	6/28/2022	6/28/2022	6/28/2022	6/28/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V3		1-3 IN	1-3 IN	1-3 IN
	Trt-Eval Interval							25 DA-A	25 DA-A	25 DA-A	25 DA-A	25 DA-A
1	Untreated Check							0	0	0	0	0
2	Tendovo Herbicide	4.14	ZC	1.75	QT/A	PRE	A	3	99	99	99	73
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
3	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PRE	A	6	99	99	99	70
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
4	Boundary	6.5	EC	1.8	PT/A	PRE	A	4	98	95	99	17
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
5	BroadAxe XC	7	EC	25	FL OZ/A	PRE	A	6	98	60	93	70
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
6	Sonic	70	DF	6.45	OZ WT/A	PRE	A	0	73	97	91	99
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
7	Fierce MTZ SC	2.64	SC	1.25	PT/A	PRE	A	6	98	96	99	67
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
8	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	1	99	99	99	82
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
9	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	4	99	92	99	87
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
	LSD P=.05							4.6	2.8	8.4	5.6	19.5
	Standard Deviation							3.1	1.9	5.8	3.9	12.9
	CV							94.37	2.3	7.05	4.47	20.65

Missing data estimates are included in columns:Average=5,10,15
Could not calculate LSD (% mean diff) for columns 7,8,12 because error mean square = 0.
^Calculated from residual.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 7/16/2022 PHYGEN % R1 15 DA-B	SETFA 7/16/2022 CONTRO % 15 DA-B	ABUTH 7/16/2022 CONTRO % 15 DA-B	AMATA 7/16/2022 CONTRO % 15 DA-B	IPOHE 7/16/2022 CONTRO % 15 DA-B
	Pest Code											
	Rating Date							7/16/2022	7/16/2022	7/16/2022	7/16/2022	7/16/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							R1				
	Trt-Eval Interval							15 DA-B	15 DA-B	15 DA-B	15 DA-B	15 DA-B
								6	7	8	9	10
1	Untreated Check							0	0	0	0	0
2	Tendovo Herbicide	4.14	ZC	1.75	QT/A	PRE	A	11	99	99	99	99
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
3	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PRE	A	10	99	99	99	99
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
4	Boundary	6.5	EC	1.8	PT/A	PRE	A	11	99	99	99	98
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
5	BroadAxe XC	7	EC	25	FL OZ/A	PRE	A	10	99	99	98	99
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
6	Sonic	70	DF	6.45	OZ WT/A	PRE	A	10	99	99	98	99
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
7	Fierce MTZ SC	2.64	SC	1.25	PT/A	PRE	A	10	99	99	99	99
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
8	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	10	99	99	99	99
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
9	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	10	99	99	99	99
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
	LSD P=.05							1.8	.	.	1.3	1.2
	Standard Deviation							1.2	0.0	0.0	0.9	0.8
	CV							13.12	0.0	0.0	1.0	0.9

Missing data estimates are included in columns:Average=5,10,15
Could not calculate LSD (% mean diff) for columns 7,8,12 because error mean square = 0.
^Calculated from residual.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 7/28/2022 PHYGEN % R1 27 DA-B	SETFA 7/28/2022 CONTRO % 27 DA-B	ABUTH 7/28/2022 CONTRO % 27 DA-B	AMATA 7/28/2022 CONTRO % 3-15 IN 27 DA-B	IPOHE 7/28/2022 CONTRO % 1-8 IN 27 DA-B
								11	12	13	14	15
1	Untreated Check							0	0	0	0	0
2	Tendovo Herbicide	4.14	ZC	1.75	QT/A	PRE	A	6	99	99	99	93
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
3	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PRE	A	5	99	99	99	90
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
4	Boundary	6.5	EC	1.8	PT/A	PRE	A	6	99	99	98	87
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
5	BroadAxe XC	7	EC	25	FL OZ/A	PRE	A	5	99	98	97	92
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
6	Sonic	70	DF	6.45	OZ WT/A	PRE	A	5	99	99	96	97
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
7	Fierce MTZ SC	2.64	SC	1.25	PT/A	PRE	A	5	99	99	99	95
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
8	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	5	99	99	98	96
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
9	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	5	99	99	99	98
	Class Act Ridion		L	1	% V/V	POST	B					
	Sequence	5.25	EW	3.5	PT/A	POST	B					
	Enlist One	3.8	EC	2	PT/A	POST	B					
LSD P=.05								1.8	.	1.0	2.5	6.4
Standard Deviation								1.2	0.0	0.7	1.7	4.2
CV								25.47	0.0	0.76	1.96	5.08

Missing data estimates are included in columns:Average=5,10,15
Could not calculate LSD (% mean diff) for columns 7,8,12 because error mean square = 0.
^Calculated from residual.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16
	Pest Code							GLXMA
	Rating Date							11/2/2022
	Rating Type							YIELD
	Rating Unit/Min/Max							bu/ac
	Pest Stage Majority/Min/Max							R8
	Trt-Eval Interval							124 DA-B
1	Untreated Check							33
2	Tendovo Herbicide	4.14	ZC	1.75	QT/A	PRE	A	67
	Class Act Ridion		L	1	% V/V	POST	B	
	Sequence	5.25	EW	3.5	PT/A	POST	B	
	Enlist One	3.8	EC	2	PT/A	POST	B	
3	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PRE	A	73
	Class Act Ridion		L	1	% V/V	POST	B	
	Sequence	5.25	EW	3.5	PT/A	POST	B	
	Enlist One	3.8	EC	2	PT/A	POST	B	
4	Boundary	6.5	EC	1.8	PT/A	PRE	A	76
	Class Act Ridion		L	1	% V/V	POST	B	
	Sequence	5.25	EW	3.5	PT/A	POST	B	
	Enlist One	3.8	EC	2	PT/A	POST	B	
5	BroadAxe XC	7	EC	25	FL OZ/A	PRE	A	76
	Class Act Ridion		L	1	% V/V	POST	B	
	Sequence	5.25	EW	3.5	PT/A	POST	B	
	Enlist One	3.8	EC	2	PT/A	POST	B	
6	Sonic	70	DF	6.45	OZ WT/A	PRE	A	74
	Class Act Ridion		L	1	% V/V	POST	B	
	Sequence	5.25	EW	3.5	PT/A	POST	B	
	Enlist One	3.8	EC	2	PT/A	POST	B	
7	Fierce MTZ SC	2.64	SC	1.25	PT/A	PRE	A	72
	Class Act Ridion		L	1	% V/V	POST	B	
	Sequence	5.25	EW	3.5	PT/A	POST	B	
	Enlist One	3.8	EC	2	PT/A	POST	B	
8	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	72
	Class Act Ridion		L	1	% V/V	POST	B	
	Sequence	5.25	EW	3.5	PT/A	POST	B	
	Enlist One	3.8	EC	2	PT/A	POST	B	
9	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	73
	Class Act Ridion		L	1	% V/V	POST	B	
	Sequence	5.25	EW	3.5	PT/A	POST	B	
	Enlist One	3.8	EC	2	PT/A	POST	B	
	LSD P=.05							9.1
	Standard Deviation							6.2
	CV							9.14

Missing data estimates are included in columns:Average=5,10,15
Could not calculate LSD (% mean diff) for columns 7,8,12 because error mean square = 0.
^Calculated from residual.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in Conventional Tillage Soybean, Ames, IA, 2022.

Trial ID: ASC5 Location: Ames Trial Year: 2022
Protocol ID: HSM050C4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US

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

Rating Unit/Min/Max
%, 0, 100 = percent
bu/ac, , = bushels per acre

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/2/2022
Completion Date: 11/2/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004378 N
Longitude of LL Corner °: -93.669962 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to demonstrate the efficacy of Syngenta residuals in the Enlist Cropping System and the cost of late applied Enlist and residual herbicides.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/6/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/2/2022 **Planting Rate:** 154000 S/A
Depth: 1.25 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 62 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/8/2022
Harvest Date: 11/2/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 13.0 **Harvested Length:** 22 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/6/2022
Common Name: Giant foxtail **Stage Scale:** BBCH

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/6/2022
Common Name: velvetleaf **Stage Scale:** BBCH

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/6/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/6/2022
Common Name: Ivyleaf morningglory **Stage Scale:** BBCH

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Site and Design
Treated Plot Width: 10 FT
Treated Plot Length: 25 FT
Treated Plot Area: 250.0 FT2 **Treatments:** 15
Replications: 4
Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: MINTIL minimum-till
Study Design: RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 85
% Sand: 37.5 **% OM:** 4.7 **Texture:** CL clay loam
% Silt: 32.5 **pH:** 6.5 **Soil Name:** CANISTEO
% Clay: 30 **CEC:** 21.6 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.

Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B	C
Application Date	6/3/2022	7/1/2022	7/22/2022
Appl. Start Time	5:30 PM	10:00 AM	10:30 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	POST1	POST2
Application Placement	BROSOI	BROFOL	BROFOL
Appl. Entry Date	7/18/2022	7/18/2022	9/6/2022
Air Temperature Start, Stop	81, 81 F	76, 77 F	81, 82 F
% Relative Humidity Start, Stop	20, 20	56, 56	50, 50
Wind Velocity+Dir. Start	9 MPH, N	8 MPH, N	11 MPH, SSW
Wind Velocity+Dir. Stop	9 MPH, N	8 MPH, N	11 MPH, SSW
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	62 F		
Soil Moisture	DRY	DRY	DRY
Soil Surface Condition	MEDIUM		
% Cloud Cover	5	95	70
Next Moisture Occurred On	6/5/2022	7/4/2022	7/23/2022
Time to Next Moisture	2.0 DAY	3.0 DAY	1.0 DAY

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-5	23	44
Stage Majority, Percent		V3, -	R2, -
Stage Minimum, Percent		V3, -	R2, -
Stage Maximum, Percent		V3, -	R2, -
Height Average		8.5 IN	25 IN
Height Minimum, Maximum		7, 10	23, 26

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	SETFA, W, BBCH	SETFA, W, BBCH	SETFA, W, BBCH
Stage Majority, Percent		3 LEAF, -	5 LEAF, -
Stage Minimum, Percent		2 LEAF, -	3 LEAF, -
Stage Maximum, Percent		5 LEAF, -	7 LEAF, -
Height Average		5 IN	17 IN
Height Minimum, Maximum		1, 8	13, 22
Density Average		12 FT2	5 FT2
Density Minimum, Maximum		5, 20	0, 8
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH	ABUTH, W, BBCH
Stage Majority, Percent		5 LEAF, -	12 LEA, -
Stage Minimum, Percent		2 LEAF, -	8 LEAF, -
Stage Maximum, Percent		8 LEAF, -	20 LEA, -
Height Average		3 IN	18 IN
Height Minimum, Maximum		1, 4	13, 24
Density Average		10 PLOT	2 PLOT
Density Minimum, Maximum		0, 20	0, 3
Pest 3 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH	AMATA, W, BBCH
Stage Majority, Percent		8 LEAF, -	
Stage Minimum, Percent		4 LEAF, -	
Stage Maximum, Percent		10 LEA, -	
Height Average		3 IN	
Height Minimum, Maximum		2, 4	
Density Average		8 PLOT	
Density Minimum, Maximum		5, 10	
Pest 4 Code, Type, Scale	IPOHE, W, BBCH	IPOHE, W, BBCH	IPOHE, W, BBCH
Stage Majority, Percent		6 LEAF, -	11 LEA, -
Stage Minimum, Percent		2 LEAF, -	4 LEAF, -
Stage Maximum, Percent		10 LEA, -	20 LEA, -
Height Average		3 IN	17 IN
Height Minimum, Maximum		1, 6	12, 22
Density Average		1 FT2	6 FT2
Density Minimum, Maximum		0, 2	2, 10

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B	C
Appl. Equipment	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	110015
Nozzle Type	TTI	TTI	TTI
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19 IN	19 IN
Boom Length	10 FT	10 FT	10 FT
Boom Height	20.0 IN	20.0 IN	20.0 IN
Ground Speed	3 MPH	3 MPH	3 MPH
Carrier	WATER		
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2		

Notes

Context	Date	By	Notes
STATUS	4/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Herbicide injury to soybean from the PRE treatments appeared as heart-shaped, puckered soybean leaves. POST2 application treatments caused necrotic speckling on the entire soybean plant canopy.

Residual control of weeds emerged since the POST1 applications was included in the July 28 and August 26 ratings.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Rating Date							7/2/2022	7/2/2022	7/2/2022	7/2/2022	7/2/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V4	2-6 IN	1-5 IN	1-5 IN	2-6 IN
	Trt-Eval Interval							29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A
1	Untreated Check							0	0	0	0	0
2	Boundary	6.5	EC	2	PT/A	PRE	A	1	98	97	99	43
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	1	98	75	91	95
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	1	96	95	99	35
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	3	99	99	98	92
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
6	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	3	99	99	99	89
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS		SG	3	LB/A	POST1	B					
7	Boundary	6.5	EC	1.8	PT/A	PRE	A	4	98	97	99	77
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
8	Sonic	70	DF	6	OZ WT/A	PRE	A	0	48	99	97	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST1	B					
	Warrant	3	CS	1	QT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A	1	95	92	98	0
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	3	96	75	96	93
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
11	Prefix	5.29	EC	2	PT/A	PRE	A	3	91	88	99	40
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Rating Date							7/2/2022	7/2/2022	7/2/2022	7/2/2022	7/2/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V4	2-6 IN	1-5 IN	1-5 IN	2-6 IN
	Trt-Eval Interval							29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	3	97	98	99	84
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
13	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	1	95	96	96	70
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS		SG	3	LB/A	POST2	C					
14	Boundary	6.5	EC	1.8	PT/A	PRE	A	4	98	91	99	80
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
15	Sonic	70	DF	6	OZ WT/A	PRE	A	1	45	99	96	98
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST2	C					
	Warrant	3	CS	1	QT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
	LSD P=.05							3.4	5.5	6.5	4.9	11.6
	Standard Deviation							2.4	3.9	4.6	3.4	8.1
	CV							130.39	4.64	5.26	3.77	12.2

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 7/11/2022 PHYGEN % V6 10 DA-B	SETFA 7/11/2022 CONTRO % 2-15 IN 10 DA-B	ABUTH 7/11/2022 CONTRO % 3-15 IN 10 DA-B	AMATA 7/11/2022 CONTRO % 1-15 IN 10 DA-B	IPOHE 7/11/2022 CONTRO % 3-15 IN 10 DA-B
	Pest Code											
	Rating Date							7/11/2022	7/11/2022	7/11/2022	7/11/2022	7/11/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V6	2-15 IN	3-15 IN	1-15 IN	3-15 IN
	Trt-Eval Interval							10 DA-B	10 DA-B	10 DA-B	10 DA-B	10 DA-B
1	Untreated Check							0	0	0	0	0
2	Boundary	6.5	EC	2	PT/A	PRE	A	13	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	11	99	99	95	97
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	11	99	99	99	99
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	10	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
6	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	8	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS		SG	3	LB/A	POST1	B					
7	Boundary	6.5	EC	1.8	PT/A	PRE	A	11	98	99	99	99
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
8	Sonic	70	DF	6	OZ WT/A	PRE	A	8	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST1	B					
	Warrant	3	CS	1	QT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A	0	94	86	95	0
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	0	93	69	89	90
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
11	Prefix	5.29	EC	2	PT/A	PRE	A	0	92	83	99	40
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Rating Date							7/11/2022	7/11/2022	7/11/2022	7/11/2022	7/11/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V6	2-15 IN	3-15 IN	1-15 IN	3-15 IN
	Trt-Eval Interval							10 DA-B	10 DA-B	10 DA-B	10 DA-B	10 DA-B
								6	7	8	9	10
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	0	97	98	99	75
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
13	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	0	91	95	91	65
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS		SG	3	LB/A	POST2	C					
14	Boundary	6.5	EC	1.8	PT/A	PRE	A	0	97	88	99	78
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
15	Sonic	70	DF	6	OZ WT/A	PRE	A	0	38	98	94	91
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST2	C					
	Warrant	3	CS	1	QT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
	LSD P=.05							2.4	4.5	6.5	7.5	8.1
	Standard Deviation							1.7	3.1	4.5	5.2	5.7
	CV							36.08	3.64	5.19	5.8	7.55

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 7/16/2022 PHYGEN % R1 15 DA-B	SETFA 7/16/2022 CONTRO % 2-24 IN 15 DA-B	ABUTH 7/16/2022 CONTRO % 3-26 IN 15 DA-B	AMATA 7/16/2022 CONTRO % 1-30 IN 15 DA-B	IPOHE 7/16/2022 CONTRO % 1-30 IN 15 DA-B
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Rating Date							7/16/2022	7/16/2022	7/16/2022	7/16/2022	7/16/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							R1	2-24 IN	3-26 IN	1-30 IN	1-30 IN
	Trt-Eval Interval							15 DA-B	15 DA-B	15 DA-B	15 DA-B	15 DA-B
								11	12	13	14	15
1	Untreated Check							0	0	0	0	0
2	Boundary	6.5	EC	2	PT/A	PRE	A	10	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	10	99	99	96	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	11	99	99	99	99
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	10	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
6	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	5	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS		SG	3	LB/A	POST1	B					
7	Boundary	6.5	EC	1.8	PT/A	PRE	A	10	99	99	99	99
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
8	Sonic	70	DF	6	OZ WT/A	PRE	A	6	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST1	B					
	Warrant	3	CS	1	QT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A	0	94	84	93	0
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	0	93	69	88	89
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
11	Prefix	5.29	EC	2	PT/A	PRE	A	0	90	83	99	40
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Rating Date							7/16/2022	7/16/2022	7/16/2022	7/16/2022	7/16/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							R1	2-24 IN	3-26 IN	1-30 IN	1-30 IN
	Trt-Eval Interval							15 DA-B	15 DA-B	15 DA-B	15 DA-B	15 DA-B
								11	12	13	14	15
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	0	95	98	99	69
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
13	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	0	91	95	91	58
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS		SG	3	LB/A	POST2	C					
14	Boundary	6.5	EC	1.8	PT/A	PRE	A	0	95	88	98	76
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
15	Sonic	70	DF	6	OZ WT/A	PRE	A	0	38	98	94	91
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST2	C					
	Warrant	3	CS	1	QT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
	LSD P=.05							1.3	4.3	7.1	7.6	7.1
	Standard Deviation							0.9	3.0	5.0	5.3	5.0
	CV							22.17	3.48	5.7	5.91	6.66

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 7/28/2022 PHYGEN % R2 27 DA-B	SETFA 7/28/2022 CONTRO % 8-30 IN 27 DA-B	ABUTH 7/28/2022 CONTRO % 5-30 IN 27 DA-B	AMATA 7/28/2022 CONTRO % 5-35 IN 27 DA-B	IPOHE 7/28/2022 CONTRO % 1-30 IN 27 DA-B
	Pest Code											
	Rating Date							7/28/2022	7/28/2022	7/28/2022	7/28/2022	7/28/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							R2	8-30 IN	5-30 IN	5-35 IN	1-30 IN
	Trt-Eval Interval							27 DA-B	27 DA-B	27 DA-B	27 DA-B	27 DA-B
								16	17	18	19	20
1	Untreated Check							0	0	0	0	0
2	Boundary	6.5	EC	2	PT/A	PRE	A	4	99	99	99	93
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	5	99	99	97	98
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	4	99	98	99	95
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	5	99	99	99	98
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
6	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	1	99	99	99	90
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS		SG	3	LB/A	POST1	B					
7	Boundary	6.5	EC	1.8	PT/A	PRE	A	4	99	99	99	98
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
8	Sonic	70	DF	6	OZ WT/A	PRE	A	3	99	99	99	97
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST1	B					
	Warrant	3	CS	1	QT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A	13	94	90	95	83
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	10	93	85	89	94
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
11	Prefix	5.29	EC	2	PT/A	PRE	A	10	91	89	99	85
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	IPOHE
	Rating Date							7/28/2022	7/28/2022	7/28/2022	7/28/2022	7/28/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							R2	8-30 IN	5-30 IN	5-35 IN	1-30 IN
	Trt-Eval Interval							27 DA-B	27 DA-B	27 DA-B	27 DA-B	27 DA-B
								16	17	18	19	20
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	10	95	98	99	91
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
13	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	9	91	96	95	93
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS		SG	3	LB/A	POST2	C					
14	Boundary	6.5	EC	1.8	PT/A	PRE	A	10	95	90	98	91
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
15	Sonic	70	DF	6	OZ WT/A	PRE	A	1	84	98	95	94
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST2	C					
	Warrant	3	CS	1	QT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
	LSD P=.05							2.7	3.7	2.7	5.4	4.7
	Standard Deviation							1.9	2.6	1.9	3.8	3.3
	CV							32.84	2.95	2.14	4.2	3.81

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	SETFA 8/26/2022 CONTRO % 8-30 IN 56 DA-B	ABUTH 8/26/2022 CONTRO % 5-30 IN 56 DA-B	AMATA 8/26/2022 CONTRO % 5-35 IN 56 DA-B	IPOHE 8/26/2022 CONTRO % 1-30 IN 56 DA-B	GLXMA 11/1/2022 YIELD bu/ac R8 123 DA-B
	Pest Code											
	Rating Date							8/26/2022	8/26/2022	8/26/2022	8/26/2022	11/1/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	YIELD
	Rating Unit/Min/Max							%	%	%	%	bu/ac
	Pest Stage Majority/Min/Max							8-30 IN	5-30 IN	5-35 IN	1-30 IN	R8
	Trt-Eval Interval							56 DA-B	56 DA-B	56 DA-B	56 DA-B	123 DA-B
								21	22	23	24	25
1	Untreated Check							0	0	0	0	47
2	Boundary	6.5	EC	2	PT/A	PRE	A	99	99	99	95	77
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	99	99	97	98	76
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	99	98	99	95	72
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	99	99	97	73
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
6	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	99	99	90	64
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS		SG	3	LB/A	POST1	B					
7	Boundary	6.5	EC	1.8	PT/A	PRE	A	99	99	99	96	57
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Sequence	5.25	EW	3	PT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
8	Sonic	70	DF	6	OZ WT/A	PRE	A	99	98	99	97	68
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST1	B					
	Warrant	3	CS	1	QT/A	POST1	B					
	AMS		SG	17	LB/100 GAL	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A	98	97	98	92	71
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	99	98	94	98	63
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
11	Prefix	5.29	EC	2	PT/A	PRE	A	97	99	99	98	74
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.
Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	21	22	23	24	25
	Pest Code							SETFA	ABUTH	AMATA	IPOHE	GLXMA
	Rating Date							8/26/2022	8/26/2022	8/26/2022	8/26/2022	11/1/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	YIELD
	Rating Unit/Min/Max							%	%	%	%	bu/ac
	Pest Stage Majority/Min/Max							8-30 IN	5-30 IN	5-35 IN	1-30 IN	R8
	Trt-Eval Interval							56 DA-B	56 DA-B	56 DA-B	56 DA-B	123 DA-B
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	99	99	97	70
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
13	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	97	99	99	95	72
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS		SG	3	LB/A	POST2	C					
14	Boundary	6.5	EC	1.8	PT/A	PRE	A	99	99	99	95	76
	BroadAxe XC	7	EC	24	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Sequence	5.25	EW	3	PT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
15	Sonic	70	DF	6	OZ WT/A	PRE	A	99	99	94	97	65
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST2	C					
	Warrant	3	CS	1	QT/A	POST2	C					
	AMS		SG	17	LB/100 GAL	POST2	C					
	LSD P=.05							1.4	1.5	3.1	4.2	17.8
	Standard Deviation							1.0	1.1	2.2	2.9	12.5
	CV							1.05	1.15	2.35	3.24	18.31

Missing data estimates are included in columns:Average=5,10,15,20,24,25
^Calculated from residual.

Iowa State University

Comparisons of Syngenta Residual Herbicides for Weed Control in the Enlist Soybean System, Ames, IA, 2022.

Trial ID: ASC6 Location: Ames Trial Year: 2022
Protocol ID: H077SMAD-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US

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

Rating Unit/Min/Max
%, 0, 100 = percent
bu/ac, , = bushels per acre

Iowa State University

AQ 700 & AQ 700-16 Water Conditioning Surfactants with Liberty for Weed Control, Ames, IA, 2022.
Trial ID: ASC7 Location: Ames Trial Year: 2022
Protocol ID: AgraSyst AQ-700 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 7/5/2022
Initiation Date: 6/1/2022
Completion Date: 8/3/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003849 N
Longitude of LL Corner °: -93.670301 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate AQ 700 & AQ 700-16 water conditioning surfactants with Liberty for weed control.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/30/2022 **Stage Scale:** VR
Variety: Asgrow AG23XF2
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 6/1/2022 **Planting Rate:** 154000 S/A
Depth: 1.75 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 65 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/7/2022

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/30/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/30/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 6 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Iowa State University

AQ 700 & AQ 700-16 Water Conditioning Surfactants with Liberty for Weed Control, Ames, IA, 2022.
Trial ID: ASC7 Location: Ames Trial Year: 2022
Protocol ID: AgraSyst AQ-700 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Soil Description
Description Name: 81
% Sand: 47.5 **% OM:** 3.7 **Texture:** SCL sandy clay loam
% Silt: 27.5 **pH:** 5.7 **Soil Name:** CANISTEO, CLARION
% Clay: 25 **CEC:** 18 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/15/2022	0.2	IN
23.	7/24/2022	0.7	IN
24.	7/28/2022	0.3	IN

Iowa State University

AQ 700 & AQ 700-16 Water Conditioning Surfactants with Liberty for Weed Control, Ames, IA, 2022.

Trial ID: ASC7 Location: Ames Trial Year: 2022
Protocol ID: AgraSyst AQ-700 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	7/5/2022
Appl. Start Time	1:15 PM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROFOL
Appl. Entry Date	7/18/2022
Air Temperature Start, Stop	94, 94 F
% Relative Humidity Start, Stop	56, 56
Wind Velocity+Dir. Start	5 MPH, SW
Wind Velocity+Dir. Stop	5 MPH, SW
Wet Leaves (Y/N)	N, no
Soil Moisture	WET
% Cloud Cover	50
Next Moisture Occurred On	7/8/2022
Time to Next Moisture	3.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Stage Majority, Percent	V5, -
Stage Minimum, Percent	V4, -
Stage Maximum, Percent	V5, -
Height Average	11 IN
Height Minimum, Maximum	10, 12

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	ABUTH, W, DESC
Stage Majority, Percent	6 LEAF, -
Stage Minimum, Percent	4 LEAF, -
Stage Maximum, Percent	7 LEAF, -
Height Average	8 IN
Height Minimum, Maximum	4, 11
Density Average	7 FT2
Density Minimum, Maximum	3, 10
Pest 2 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	NUMERO, -
Height Average	8 IN
Height Minimum, Maximum	5, 10
Density Average	20 FT2
Density Minimum, Maximum	10, 30

Iowa State University

AQ 700 & AQ 700-16 Water Conditioning Surfactants with Liberty for Weed Control, Ames, IA, 2022.

Trial ID: ASC7 Location: Ames Trial Year: 2022
Protocol ID: AgraSyst AQ-700 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TT
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	19 IN
Boom Length	10 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/15/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Iowa State University

AQ 700 & AQ 700-16 Water Conditioning Surfactants with Liberty for Weed Control, Ames, IA, 2022.

Trial ID: ASC7 Location: Ames Trial Year: 2022
Protocol ID: AgraSyst AQ-700 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5	6
	Pest Code							ABUTH	AMATA	ABUTH	AMATA	ABUTH	AMATA
	Rating Date							7/14/2022	7/14/2022	7/19/2022	7/19/2022	7/26/2022	7/26/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							15 IN	15 IN		15 IN		10-24 IN
	Trt-Eval Interval							9 DA-A	9 DA-A	14 DA-A	14 DA-A	21 DA-A	21 DA-A
1	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	95	72	99	62	99	45
	AMS		SG	3	LB/A	POST	A						
	Preference		L	0.25	% V/V	POST	A						
2	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	95	72	99	62	99	45
	AMS		SG	3	LB/A	POST	A						
	AgraSyst 90		L	0.25	% V/V	POST	A						
3	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	95	78	99	68	99	43
	AMS		SG	1.5	LB/A	POST	A						
	AQ 700		L	0.25	% V/V	POST	A						
4	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	95	70	98	60	98	42
	AMS		SG	1.5	LB/A	POST	A						
	AQ 700-16		L	0.25	% V/V	POST	A						
5	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	96	73	99	65	99	45
	AMS		SG	1.5	LB/A	POST	A						
	Full Load		L	0.25	% V/V	POST	A						
6	Untreated Check							0	0	0	0	0	0
	LSD P=.05							1.7	4.4	1.7	4.0	1.7	9.7
	Standard Deviation							0.9	2.4	0.9	2.2	0.9	5.3
	CV							1.19	3.97	1.15	4.12	1.15	14.52

^Calculated from residual.

Iowa State University

AQ 700 & AQ 700-16 Water Conditioning Surfactants with Liberty for Weed Control, Ames, IA, 2022.

Trial ID: ASC7 Location: Ames Trial Year: 2022
Protocol ID: AgraSyst AQ-700 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	7	8
	Pest Code							ABUTH	AMATA
	Rating Date							8/3/2022	8/3/2022
	Rating Type							CONTRO	CONTRO
	Rating Unit/Min/Max							%	%
	Pest Stage Majority/Min/Max								10-24 IN
	Trt-Eval Interval							29 DA-A	29 DA-A
1	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	99	37
	AMS		SG	3	LB/A	POST	A		
	Preference		L	0.25	% V/V	POST	A		
2	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	99	33
	AMS		SG	3	LB/A	POST	A		
	AgraSyst 90		L	0.25	% V/V	POST	A		
3	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	99	35
	AMS		SG	1.5	LB/A	POST	A		
	AQ 700		L	0.25	% V/V	POST	A		
4	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	98	35
	AMS		SG	1.5	LB/A	POST	A		
	AQ 700-16		L	0.25	% V/V	POST	A		
5	Liberty 280 SL	2.34	SL	25	FL OZ/A	POST	A	99	33
	AMS		SG	1.5	LB/A	POST	A		
	Full Load		L	0.25	% V/V	POST	A		
6	Untreated Check							0	0
	LSD P=.05							1.7	8.1
	Standard Deviation							0.9	4.4
	CV							1.15	15.37

^Calculated from residual.

Iowa State University

AQ 700 & AQ 700-16 Water Conditioning Surfactants with Liberty for Weed Control, Ames, IA, 2022.

Trial ID: ASC7 Location: Ames Trial Year: 2022
Protocol ID: AgraSyst AQ-700 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.
Trial ID: ASC8 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D41-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/2/2022
Completion Date: 9/6/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.00451 N
Longitude of LL Corner °: -93.670325 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to differentiate the Liberty 3 MOA product vs. common tank Mixes for residual control of broadleaf weeds.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/23/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/2/2022 **Planting Rate:** 154000 S/A
Depth: 1.25 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 62 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/8/2022

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/23/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/23/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 9 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Iowa State University

Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.
Trial ID: ASC8 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D41-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Soil Description
Description Name: 84
% Sand: 50 **% OM:** 2.7 **Texture:** SCL sandy clay loam
% Silt: 27.5 **pH:** 6.5 **Soil Name:** CANISTEO, CLARION
% Clay: 22.5 **CEC:** 16.2 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.
Trial ID: ASC8 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D41-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B
Application Date	6/3/2022	7/11/2022
Appl. Start Time	7:00 PM	5:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Appl. Entry Date	7/18/2022	7/18/2022
Air Temperature Start, Stop	79, 77 F	82, 82 F
% Relative Humidity Start, Stop	23, 23	52, 52
Wind Velocity+Dir. Start	4 MPH, NNE	9 MPH, NW
Wind Velocity+Dir. Stop	4 MPH, NNE	9 MPH, NW
Wet Leaves (Y/N)		N, no
Soil Temperature	81 F	77 F
Soil Moisture	NORMAL	DRY
Soil Surface Condition	MEDIUM	
% Cloud Cover	40	5
Next Moisture Occurred On	6/5/2022	7/23/2022
Time to Next Moisture	2.0 DAY	12.0 DAY

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Stage Majority, Percent		V6, -
Stage Minimum, Percent		V6, -
Stage Maximum, Percent		V6, -
Height Average		16 IN
Height Minimum, Maximum		15, 17

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		8 LEAF, -
Stage Minimum, Percent		6 LEAF, -
Stage Maximum, Percent		10 LEA, -
Height Average		12 IN
Height Minimum, Maximum		8, 18
Density Average		1 FT2
Density Minimum, Maximum		0, 2
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		NUMERO, -
Stage Minimum, Percent		NUMERO, -
Stage Maximum, Percent		NUMERO, -
Height Average		12 IN
Height Minimum, Maximum		8, 18
Density Average		5 FT2
Density Minimum, Maximum		3, 7

Iowa State University

Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.
Trial ID: ASC8 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D41-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B
Appl. Equipment	ATV	HAND SPRAYER
Equipment Type	ALTEVE	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	11002
Nozzle Type	TTI	AIXR & TT
Nozzle TradeName		TeeJet
Nozzle Tip Size, Color		-, YELLOW
Nozzle Spacing	20 IN	20 IN
Boom Length	10 FT	6.7 FT
Boom Height		20.0 IN
Ground Speed	2.8 MPH	3 MPH
Carrier		WATER
Application Amount	15 GAL/AC	20 GAL/AC
Propellant		COMCO2

Notes

Context	Date	By	Notes
STATUS	4/15/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Soybean injury from the herbicide treatments appeared as partially chlorotic leaves lower in the canopy with red leaf veins.

Iowa State University

Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.

Trial ID: ASC8 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D41-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	ABUTH	AMATA	GLXMA	ABUTH
	Rating Date							7/18/2022	7/18/2022	7/18/2022	7/26/2022	7/26/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							R2			R2	12-18 IN
	Trt-Eval Interval							7 DA-B	7 DA-B	7 DA-B	15 DA-B	15 DA-B
1	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	0	0	0	0
2	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	95	93	0	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
3	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	95	95	0	99
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
4	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	95	93	0	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
5	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	95	93	0	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
6	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	95	95	0	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
7	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	87	73	0	99
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Agri-dex			1	% V/V	POST	B					
	AIXR Nozzle					POST	B					
8	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	95	93	10	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Anthem Maxx	4.3	SC	2.5	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
9	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	95	95	0	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	AIXR Nozzle					POST	B					
	LSD P=.05							.	1.7	3.6	.	.
	Standard Deviation							0.0	1.0	2.1	0.0	0.0
	CV							0.0	1.15	2.58	0.0	0.0

Could not calculate LSD (% mean diff) for columns 1,4,5,8 because error mean square = 0.
^Calculated from residual.

Iowa State University

Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.

Trial ID: ASC8 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D41-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
Pest Code								AMATA	GLXMA	ABUTH	AMATA	ABUTH
Rating Date								7/26/2022	8/2/2022	8/2/2022	8/2/2022	8/8/2022
Rating Type								CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								12-18 IN	R2	12-18 IN	12-18 IN	3-10 IN
Trt-Eval Interval								15 DA-B	22 DA-B	22 DA-B	22 DA-B	28 DA-B
1	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	0	0	0	0
2	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	88	0	99	77	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
3	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	90	0	99	82	99
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
4	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	83	0	99	77	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
5	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	87	0	99	77	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
6	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	92	0	99	87	98
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
7	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	78	0	99	78	99
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Agri-dex			1	% V/V	POST	B					
	AIXR Nozzle					POST	B					
8	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	83	8	99	75	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Anthem Maxx	4.3	SC	2.5	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
9	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	95	0	99	95	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	AIXR Nozzle					POST	B					
LSD P=.05								6.5	1.7	.	12.0	1.3
Standard Deviation								3.8	1.0	0.0	6.9	0.8
CV								4.85	103.92	0.0	9.66	0.88

Could not calculate LSD (% mean diff) for columns 1,4,5,8 because error mean square = 0.
^Calculated from residual.

Iowa State University

Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.

Trial ID: ASC8 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D41-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMATA	ABUTH	AMATA	ABUTH	AMATA
	Rating Date							8/8/2022	8/26/2022	8/26/2022	9/6/2022	9/6/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							12-25 IN	3-10 IN	12-25 IN	3-10 IN	12-30 IN
	Trt-Eval Interval							28 DA-B	46 DA-B	46 DA-B	57 DA-B	57 DA-B
1	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	0	0	0	0	0
2	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	70	99	70	99	70
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
3	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	75	99	73	99	72
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
4	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	67	98	65	98	62
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
5	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	67	98	65	98	63
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
6	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	80	95	75	95	75
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
7	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	83	99	83	99	83
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Agri-dex			1	% V/V	POST	B					
	AIXR Nozzle					POST	B					
8	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	67	99	62	99	63
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Anthem Maxx	4.3	SC	2.5	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
9	Dual II Magnum	7.64	EC	0.75	PT/A	PRE	A	93	99	95	99	95
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	16	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	AIXR Nozzle					POST	B					
	LSD P=.05							13.4	3.2	12.0	3.2	12.5
	Standard Deviation							7.7	1.8	6.9	1.8	7.2
	CV							11.58	2.09	10.61	2.09	11.12

Could not calculate LSD (% mean diff) for columns 1,4,5,8 because error mean square = 0.
^Calculated from residual.

Iowa State University

Liberty in Three Modes of Action Programs for Residual Broadleaf Weed Control, Ames, IA, 2022.

Trial ID: ASC8 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D41-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.
Trial ID: ASC9 Location: Ames Trial Year: 2022
Protocol ID: NA22K1A005H Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/2/2022
Completion Date: 8/1/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004566 N
Longitude of LL Corner °: -93.670347 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate PRE plus POST programs for weed control in Enlist Soybean Systems.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/29/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/2/2022 **Planting Rate:** 154000 S/A
Depth: 1.25 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 62 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/8/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/29/2022
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/29/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/29/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/29/2022
Common Name: Ivyleaf morningglory **Stage Scale:** DESC

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 7 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.
Trial ID: ASC9 Location: Ames Trial Year: 2022
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 84
% Sand: 50 **% OM:** 2.7 **Texture:** SCL sandy clay loam
% Silt: 27.5 **pH:** 6.5 **Soil Name:** CANISTEO, CLARION
% Clay: 22.5 **CEC:** 16.2 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.
Trial ID: ASC9 Location: Ames Trial Year: 2022
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B	C
Application Date	6/3/2022	7/1/2022	7/16/2022
Appl. Start Time	7:00 PM	10:30 AM	1:00 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	POST	SPOST
Application Placement	BROSOI	BROFOL	BROFOL
Appl. Entry Date	7/18/2022	7/18/2022	7/18/2022
Air Temperature Start, Stop	79, 78 F	76, 77 F	78, 79 F
% Relative Humidity Start, Stop	23, 23	50, 50	73, 73
Wind Velocity+Dir. Start	4 MPH, NNE	8 MPH, N	7 MPH, ESE
Wind Velocity+Dir. Stop	4 MPH, NNE	8 MPH, N	7 MPH, ESE
Wind Velocity+Dir. Max	5 MPH, NNE		8 MPH, ESE
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	81 F		73 F
Soil Moisture	NORMAL	DRY	DRY
Soil Surface Condition	MEDIUM		
% Cloud Cover	40	95	100
Next Moisture Occurred On	6/5/2022	7/4/2022	7/23/2022
Time to Next Moisture	2.0 DAY	3.0 DAY	7.0 DAY

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Stage Majority, Percent		V3, -	R1, -
Stage Minimum, Percent		V3, -	R1, -
Stage Maximum, Percent		V3, -	R1, -
Height Average			21 IN
Height Minimum, Maximum			20, 22

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Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.
Trial ID: ASC9 Location: Ames Trial Year: 2022
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent		3 LEAF, -	
Height Average		6 IN	
Height Minimum, Maximum		4, 8	
Density Average		10 FT2	
Density Minimum, Maximum		5, 15	
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		7 LEAF, -	
Stage Minimum, Percent		3 LEAF, -	
Stage Maximum, Percent		11 LEA, -	
Height Average		4 IN	
Height Minimum, Maximum		1, 6	
Density Average		3 PLOT	
Density Minimum, Maximum		0, 5	
Pest 4 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC	IPOHE, W, DESC

Application Equipment

	A	B	C
Appl. Equipment	ATV	HAND SPRAYER	HAND SPRAYER
Equipment Type	ALTEVE	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	110015
Nozzle Type	TTI	AIXR	AIXR
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	20 IN	19 IN	19.0 IN
Boom Length	10 FT	10 FT	10.0 FT
Boom Height	20.0 IN	20.0 IN	20.0 IN
Ground Speed	2.8 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Soybean injury from the treatments that was observed on July 11 and July 16 appeared as necrotic speckling on the lower canopy leaves.

Iowa State University

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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5	6
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	IPOHE	GLXMA
	Rating Date							7/2/2022	7/2/2022	7/2/2022	7/2/2022	7/2/2022	7/11/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							V4					V6
	Trt-Eval Interval							29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A	10 DA-B
1	Sonic	70	DF	8	OZ WT/A	PRE	A	0	50	99	98	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B						
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B						
	EverpreX	7.62	EC	1	PT/A	POST	B						
	AMS	3.4	L	2.5	% V/V	POST	B						
2	Sonic	70	DF	8	OZ WT/A	PRE	A	0	50	99	99	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B						
	Durango DMA	4	SL	32	FL OZ/A	POST	B						
	EverpreX	7.62	EC	1	PT/A	POST	B						
	AMS	3.4	L	2.5	% V/V	POST	B						
3	Sonic	70	DF	8	OZ WT/A	PRE	A	0	50	99	99	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B						
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B						
	EverpreX	7.62	EC	1	PT/A	POST	B						
	AMS	3.4	L	2.5	% V/V	POST	B						
	Enlist One	3.8	EC	2	PT/A	SPOST	C						
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C						
	AMS	3.4	L	2.5	% V/V	SPOST	C						
4	Sonic	70	DF	8	OZ WT/A	PRE	A	0	50	99	98	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B						
	Durango DMA	4	SL	32	FL OZ/A	POST	B						
	EverpreX	7.62	EC	1	PT/A	POST	B						
	AMS	3.4	L	2.5	% V/V	POST	B						
	Enlist One	3.8	EC	2	PT/A	SPOST	C						
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C						
	AMS	3.4	L	2.5	% V/V	SPOST	C						
5	Sonic	70	DF	8	OZ WT/A	PRE	A	0	50	99	98	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B						
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B						
	EverpreX	7.62	EC	1	PT/A	POST	B						
	AMS	3.4	L	2.5	% V/V	POST	B						
	Enlist One	3.8	EC	2	PT/A	SPOST	C						
	Durango DMA	4	SL	32	FL OZ/A	SPOST	C						
	AMS	3.4	L	2.5	% V/V	SPOST	C						
6	Sonic	70	DF	8	OZ WT/A	PRE	A	0	50	99	96	99	0
	Durango DMA	4	SL	32	FL OZ/A	POST	B						
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B						
	EverpreX	7.62	EC	1	PT/A	POST	B						
	AMS	3.4	L	2.5	% V/V	POST	B						
7	Untreated Check							0	0	0	0	0	0
	LSD P=.05							.	.	.	2.9	.	.
	Standard Deviation							0.0	0.0	0.0	1.6	0.0	0.0
	CV							0.0	0.0	0.0	1.95	0.0	0.0

Could not calculate LSD (% mean diff) for columns 1,2,3,5,6,8,9,10,13,15,16,18,20,21,23 because error mean square = 0.
^Calculated from residual.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.
Trial ID: ASC9 Location: Ames Trial Year: 2022
Protocol ID: NA22K1A005H Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	7	8	9	10	11
	Pest Code							SETFA	ABUTH	AMATA	IPOHE	GLXMA
	Rating Date							7/11/2022	7/11/2022	7/11/2022	7/11/2022	7/16/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max											R1
	Trt-Eval Interval							10 DA-B	10 DA-B	10 DA-B	10 DA-B	15 DA-B
1	Sonic	70	DF	8	OZ WT/A	PRE	A	98	99	99	99	8
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
2	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
3	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	8
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
4	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
5	Sonic	70	DF	8	OZ WT/A	PRE	A	98	99	99	99	7
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Durango DMA	4	SL	32	FL OZ/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
6	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	0
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
7	Untreated Check							0	0	0	0	0
	LSD P=.05							2.3	.	.	.	3.0
	Standard Deviation							1.3	0.0	0.0	0.0	1.7
	CV							1.52	0.0	0.0	0.0	35.0

Could not calculate LSD (% mean diff) for columns 1,2,3,5,6,8,9,10,13,15,16,18,20,21,23 because error mean square = 0.
^Calculated from residual.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.

Trial ID: ASC9 Location: Ames Trial Year: 2022
Protocol ID: NA22K1A005H Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	12	13	14	15	16
	Pest Code							SETFA	ABUTH	AMATA	IPOHE	GLXMA
	Rating Date							7/16/2022	7/16/2022	7/16/2022	7/16/2022	7/22/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max											R2
	Trt-Eval Interval							15 DA-B	15 DA-B	15 DA-B	15 DA-B	21 DA-B
1	Sonic	70	DF	8	OZ WT/A	PRE	A	98	99	99	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
2	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	98	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
3	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
4	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
5	Sonic	70	DF	8	OZ WT/A	PRE	A	98	99	99	99	5
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Durango DMA	4	SL	32	FL OZ/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
6	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	0
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
7	Untreated Check							0	0	0	0	0
	LSD P=.05							2.3	.	1.6	.	.
	Standard Deviation							1.3	0.0	0.9	0.0	0.0
	CV							1.52	0.0	1.03	0.0	0.0

Could not calculate LSD (% mean diff) for columns 1,2,3,5,6,8,9,10,13,15,16,18,20,21,23 because error mean square = 0.
^Calculated from residual.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.
Trial ID: ASC9 Location: Ames Trial Year: 2022
Protocol ID: NA22K1A005H Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	17	18	19	20	21
	Pest Code							SETFA	ABUTH	AMATA	IPOHE	GLXMA
	Rating Date							7/22/2022	7/22/2022	7/22/2022	7/22/2022	8/1/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max											R3
	Trt-Eval Interval							21 DA-B	21 DA-B	21 DA-B	21 DA-B	31 DA-B
1	Sonic	70	DF	8	OZ WT/A	PRE	A	98	99	99	99	0
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
2	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	98	99	0
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
3	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	0
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
4	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	0
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
5	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	0
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
	Enlist One	3.8	EC	2	PT/A	SPOST	C					
	Durango DMA	4	SL	32	FL OZ/A	SPOST	C					
	AMS	3.4	L	2.5	% V/V	SPOST	C					
6	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99	0
	Durango DMA	4	SL	32	FL OZ/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1	PT/A	POST	B					
	AMS	3.4	L	2.5	% V/V	POST	B					
7	Untreated Check							0	0	0	0	0
	LSD P=.05							1.6	.	1.6	.	.
	Standard Deviation							0.9	0.0	0.9	0.0	0.0
	CV							1.03	0.0	1.03	0.0	0.0

Could not calculate LSD (% mean diff) for columns 1,2,3,5,6,8,9,10,13,15,16,18,20,21,23 because error mean square = 0.
^Calculated from residual.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.
Trial ID: ASC9 Location: Ames Trial Year: 2022
Protocol ID: NA22K1A005H Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	22	23	24	25
	Pest Code							SETFA	ABUTH	AMATA	IPOHE
	Rating Date							8/1/2022	8/1/2022	8/1/2022	8/1/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%
	Pest Stage Majority/Min/Max							3-12 IN		3-20 IN	1-5 IN
	Trt-Eval Interval							31 DA-B	31 DA-B	31 DA-B	31 DA-B
1	Sonic	70	DF	8	OZ WT/A	PRE	A	98	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST	B				
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B				
	EverpreX	7.62	EC	1	PT/A	POST	B				
	AMS	3.4	L	2.5	% V/V	POST	B				
2	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	98	98
	Enlist One	3.8	EC	2	PT/A	POST	B				
	Durango DMA	4	SL	32	FL OZ/A	POST	B				
	EverpreX	7.62	EC	1	PT/A	POST	B				
	AMS	3.4	L	2.5	% V/V	POST	B				
3	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST	B				
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B				
	EverpreX	7.62	EC	1	PT/A	POST	B				
	AMS	3.4	L	2.5	% V/V	POST	B				
	Enlist One	3.8	EC	2	PT/A	SPOST	C				
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C				
	AMS	3.4	L	2.5	% V/V	SPOST	C				
4	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST	B				
	Durango DMA	4	SL	32	FL OZ/A	POST	B				
	EverpreX	7.62	EC	1	PT/A	POST	B				
	AMS	3.4	L	2.5	% V/V	POST	B				
	Enlist One	3.8	EC	2	PT/A	SPOST	C				
	Liberty 280 SL	2.34	SL	2	PT/A	SPOST	C				
	AMS	3.4	L	2.5	% V/V	SPOST	C				
5	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST	B				
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B				
	EverpreX	7.62	EC	1	PT/A	POST	B				
	AMS	3.4	L	2.5	% V/V	POST	B				
	Enlist One	3.8	EC	2	PT/A	SPOST	C				
	Durango DMA	4	SL	32	FL OZ/A	SPOST	C				
	AMS	3.4	L	2.5	% V/V	SPOST	C				
6	Sonic	70	DF	8	OZ WT/A	PRE	A	99	99	99	98
	Durango DMA	4	SL	32	FL OZ/A	POST	B				
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B				
	EverpreX	7.62	EC	1	PT/A	POST	B				
	AMS	3.4	L	2.5	% V/V	POST	B				
7	Untreated Check							0	0	0	0
	LSD P=.05							1.6	.	1.6	2.3
	Standard Deviation							0.9	0.0	0.9	1.3
	CV							1.03	0.0	1.03	1.52

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^Calculated from residual.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2022.

Trial ID: ASC9 Location: Ames Trial Year: 2022
Protocol ID: NA22K1A005H Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US

Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown

Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 6/2/2022
Completion Date: 8/18/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004503 N
Longitude of LL Corner °: -93.670801 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to differentiate the Liberty 3 MOA product vs. common tank mixes for residual control of grasses.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/23/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/2/2022 **Planting Rate:** 154000 S/A
Depth: 1.25 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 62 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/8/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/23/2022
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/23/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/23/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 8 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 83
% Sand: 40 **% OM:** 4 **Texture:** CL clay loam
% Silt: 32.5 **pH:** 5.4 **Soil Name:** CLARION
% Clay: 27.5 **CEC:** 20.1 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B	C
Application Date	6/3/2022	6/27/2022	6/27/2022
Appl. Start Time	7:00 PM	5:00 PM	5:00 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	POST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Appl. Entry Date	7/18/2022	7/18/2022	7/18/2022
Air Temperature Start, Stop	79, 77 F	81, 81 F	81, 81 F
% Relative Humidity Start, Stop	23, 23	32, 32	32, 32
Wind Velocity+Dir. Start	4 MPH, NNE	5 MPH, NW	5 MPH, NW
Wind Velocity+Dir. Stop	4 MPH, NNE	5 MPH, NW	5 MPH, NW
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	81 F	77 F	77 F
Soil Moisture	NORMAL	DRY	DRY
Soil Surface Condition	MEDIUM		
% Cloud Cover	40	10	10
Next Moisture Occurred On	6/5/2022	7/4/2022	7/4/2022
Time to Next Moisture	2.0 DAY	7.0 DAY	7.0 DAY

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Stage Majority, Percent		V2, -	V2, -
Stage Minimum, Percent		V2, -	V2, -
Stage Maximum, Percent		V2, -	V2, -
Height Average		6 IN	6 IN
Height Minimum, Maximum		5, 7	5, 7

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent		4 LEAF, -	4 LEAF, -
Stage Minimum, Percent		3 LEAF, -	3 LEAF, -
Stage Maximum, Percent		6 LEAF, -	6 LEAF, -
Height Average		5 IN	5 IN
Height Minimum, Maximum		3, 7	3, 7
Density Average		30 FT2	30 FT2
Density Minimum, Maximum		20, 40	20, 40
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		4 LEAF, -	4 LEAF, -
Stage Minimum, Percent		3 LEAF, -	3 LEAF, -
Stage Maximum, Percent		5 LEAF, -	5 LEAF, -
Height Average		4 IN	4 IN
Height Minimum, Maximum		3, 5	3, 5
Density Average		30 PLOT	30 PLOT
Density Minimum, Maximum		25, 35	25, 35
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC

Application Equipment

	A	B	C
Appl. Equipment	ATV	HAND SPRAYER	HAND SPRAYER
Equipment Type	ALTEVE	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	11002	110015
Nozzle Type	TTI	TT	AIXR
Nozzle TradeName		TeeJet	TeeJet
Nozzle Tip Size, Color		-, YELLOW	-, GREEN
Nozzle Spacing	20 IN	20 IN	20 IN
Boom Length	10 FT	6.7 FT	6.7 FT
Boom Height	20.0 IN	20.0 IN	20.0 IN
Ground Speed	2.8 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER
Application Amount	15 GAL/AC	20 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/2/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Treatments 2-6 were applied with 20 GPA volume and TT tips, and Treatments 7 & 8 utilized 15 GPA and AIXR tips (Application Codes B & C). See "Application Equipment" for details.

Yellow foxtail was mixed in with giant foxtail in some areas of the study, and it was not possible to collect accurate giant foxtail control data for several of those plots in August.

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	GLXMA
	Rating Date							7/6/2022	7/6/2022	7/6/2022	7/6/2022	7/13/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V5	5-8 IN	5-8 IN	5-7 IN	V5
	Trt-Eval Interval							9 DA-B	9 DA-B	9 DA-B	9 DA-B	16 DA-B
1	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	0	0	0	0	0
	Treated Check											
2	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	3	99	99	99	0
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
3	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	2	99	99	99	0
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
4	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	5	99	99	99	0
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
5	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	5	99	99	99	0
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Agri-dex			1	% V/V	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
6	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	5	99	99	99	0
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
7	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	10	99	99	99	3
	Enlist Duo	3.3	SL	76	FL OZ/A	POST	C					
	AMS 2000		SG	3	LB/A	POST	C					
	AIXR Nozzle					POST	C					
8	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	10	72	85	70	3
	Enlist One	3.8	EC	32	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	Agri-dex			1	% V/V	POST	C					
	AMS 2000		SG	3	LB/A	POST	C					
	AIXR Nozzle					POST	C					
	LSD P=.05							3.6	1.8	.	.	2.6
	Standard Deviation							2.0	1.0	0.0	0.0	1.5
	CV							40.82	1.23	0.0	0.0	179.28

Missing data estimates are included in columns:Average=3,4,7,8,11,12,14,15,16,17,18,19,20,21
Could not calculate LSD (% mean diff) for columns 3,4,7,8,9,11,12,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							SETFA	ABUTH	AMATA	GLXMA	SETFA
	Rating Date							7/13/2022	7/13/2022	7/13/2022	7/18/2022	7/18/2022
	Rating Type							CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							5-8 IN	5-8 IN	5-7 IN	R2	5-8 IN
	Trt-Eval Interval							16 DA-B	16 DA-B	16 DA-B	21 DA-B	21 DA-B
1	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	0	0	0	0	0
	Treated Check											
2	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	99	0	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
3	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	99	0	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
4	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	99	0	99
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
5	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	99	0	99
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Agri-dex			1	% V/V	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
6	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	99	0	99
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
7	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	99	0	99
	Enlist Duo	3.3	SL	76	FL OZ/A	POST	C					
	AMS 2000		SG	3	LB/A	POST	C					
	AIXR Nozzle					POST	C					
8	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	78	99	75	0	92
	Enlist One	3.8	EC	32	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	Agri-dex			1	% V/V	POST	C					
	AMS 2000		SG	3	LB/A	POST	C					
	AIXR Nozzle					POST	C					
	LSD P=.05							4.7	.	.	.	3.6
	Standard Deviation							2.7	0.0	0.0	0.0	2.0
	CV							3.21	0.0	0.0	0.0	2.38

Missing data estimates are included in columns:Average=3,4,7,8,11,12,14,15,16,17,18,19,20,21
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Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							ABUTH	AMATA	SETFA	ABUTH	AMATA
	Rating Date							7/18/2022	7/18/2022	7/26/2022	7/26/2022	7/26/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							5-8 IN	5-7 IN	5-18 IN		5-18 IN
	Trt-Eval Interval							21 DA-B	21 DA-B	29 DA-B	29 DA-B	29 DA-B
1	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	0	0	0	0	0
	Treated Check											
2	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	77	99	73
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
3	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	82	99	63
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
4	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	96	99	82
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
5	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	98	99	72
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Agri-dex			1	% V/V	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
6	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	99	99	73
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
7	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	95	99	75
	Enlist Duo	3.3	SL	76	FL OZ/A	POST	C					
	AMS 2000		SG	3	LB/A	POST	C					
	AIXR Nozzle					POST	C					
8	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	95	90	99	70
	Enlist One	3.8	EC	32	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	Agri-dex			1	% V/V	POST	C					
	AMS 2000		SG	3	LB/A	POST	C					
	AIXR Nozzle					POST	C					
	LSD P=.05							.	.	7.1	.	14.5
	Standard Deviation							0.0	0.0	4.1	0.0	8.1
	CV							0.0	0.0	5.1	0.0	12.8

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^Calculated from residual.

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16	17	18	19	20
	Pest Code							SETFA	ABUTH	AMATA	SETFA	ABUTH
	Rating Date							8/8/2022	8/8/2022	8/8/2022	8/18/2022	8/18/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							10-30 IN		10-30 IN	10-35 IN	10-20 IN
	Trt-Eval Interval							42 DA-B	42 DA-B	42 DA-B	52 DA-B	52 DA-B
1	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	0	0	0	0	0
	Treated Check											
2	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	70	98	65	70	98
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
3	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	78	99	55	78	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
4	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	95	99	63	95	99
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
5	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	96	99	60	96	99
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Agri-dex			1	% V/V	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
6	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	99	99	60	99	99
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	B					
	AMS 2000		SG	3	LB/A	POST	B					
	Turbo TeeJet Nozzle					POST	B					
7	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	88	99	65	88	98
	Enlist Duo	3.3	SL	76	FL OZ/A	POST	C					
	AMS 2000		SG	3	LB/A	POST	C					
	AIXR Nozzle					POST	C					
8	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	80	99	55	80	99
	Enlist One	3.8	EC	32	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	Agri-dex			1	% V/V	POST	C					
	AMS 2000		SG	3	LB/A	POST	C					
	AIXR Nozzle					POST	C					
	LSD P=.05							11.2	1.6	11.6	11.2	2.3
	Standard Deviation							6.2	0.9	6.5	6.2	1.3
	CV							8.17	1.02	12.3	8.17	1.5

Missing data estimates are included in columns:Average=3,4,7,8,11,12,14,15,16,17,18,19,20,21
Could not calculate LSD (% mean diff) for columns 3,4,7,8,9,11,12,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	21
	Pest Code							AMATA
	Rating Date							8/18/2022
	Rating Type							CONTRO
	Rating Unit/Min/Max							%
	Pest Stage Majority/Min/Max							10-40 IN
	Trt-Eval Interval							52 DA-B
1	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	0
	Treated Check							
2	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	63
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B	
	AMS 2000		SG	3	LB/A	POST	B	
	Turbo TeeJet Nozzle					POST	B	
3	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	52
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	
	AMS 2000		SG	3	LB/A	POST	B	
	Turbo TeeJet Nozzle					POST	B	
4	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	63
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B	
	AMS 2000		SG	3	LB/A	POST	B	
	Turbo TeeJet Nozzle					POST	B	
5	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	57
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B	
	Select Max	0.97	EC	12	FL OZ/A	POST	B	
	Agri-dex			1	% V/V	POST	B	
	AMS 2000		SG	3	LB/A	POST	B	
	Turbo TeeJet Nozzle					POST	B	
6	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	55
	BAS 1008AEH	2.42	SC	36	FL OZ/A	POST	B	
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	B	
	AMS 2000		SG	3	LB/A	POST	B	
	Turbo TeeJet Nozzle					POST	B	
7	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	65
	Enlist Duo	3.3	SL	76	FL OZ/A	POST	C	
	AMS 2000		SG	3	LB/A	POST	C	
	AIXR Nozzle					POST	C	
8	Sharpen	2.85	SC	1	FL OZ/A	PRE	A	50
	Enlist One	3.8	EC	32	FL OZ/A	POST	C	
	Select Max	0.97	EC	12	FL OZ/A	POST	C	
	Agri-dex			1	% V/V	POST	C	
	AMS 2000		SG	3	LB/A	POST	C	
	AIXR Nozzle					POST	C	
	LSD P=.05							11.9
	Standard Deviation							6.7
	CV							13.19

Missing data estimates are included in columns:Average=3,4,7,8,11,12,14,15,16,17,18,19,20,21
Could not calculate LSD (% mean diff) for columns 3,4,7,8,9,11,12,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Liberty in Three Modes of Action for Residual Grassy Weed Control, Ames, IA, 2022.

Trial ID: ASC10 Location: Ames Trial Year: 2022
Protocol ID: MKD-H-2022-US-D42-A-01.0 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.
Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 9/30/2022
Initiation Date: 6/2/2022
Completion Date: 8/10/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004295 N
Longitude of LL Corner °: -93.671656 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare weed control for various application volumes and spray tip selection for Liberty and Enlist One.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/30/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/2/2022 **Planting Rate:** 154000 S/A
Depth: 1.25 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 62 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/8/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/30/2022
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/30/2022
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/30/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 10 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.

Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description

Description Name: 82
% Sand: 40 **% OM:** 4.3 **Texture:** CL clay loam
% Silt: 30 **pH:** 7 **Soil Name:** CANISTEO
% Clay: 30 **CEC:** 22.3 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.
Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B	C	D	E	F
Application Date	7/12/2022	7/12/2022	7/12/2022	7/12/2022	7/12/2022	7/12/2022
Appl. Start Time	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	POST	POST	POST	POST	POST	POST
Application Placement	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL
Appl. Entry Date	7/18/2022	7/18/2022	7/18/2022	7/18/2022	7/18/2022	7/18/2022
Air Temperature Start, Stop	80, 81 F	80, 81 F	80, 81 F	80, 81 F	80, 81 F	80, 81 F
% Relative Humidity Start, Stop	52, 52	52, 52	52, 52	52, 52	52, 52	52, 52
Wind Velocity+Dir. Start	8 MPH, NW	8 MPH, NW	8 MPH, NW	8 MPH, NW	8 MPH, NW	8 MPH, NW
Wind Velocity+Dir. Stop	9 MPH, NW	9 MPH, NW	9 MPH, NW	9 MPH, NW	9 MPH, NW	9 MPH, NW
Wind Velocity+Dir. Max	10 MPH, NW	10 MPH, NW	10 MPH, NW	10 MPH, NW	10 MPH, NW	10 MPH, NW
Wet Leaves (Y/N)	N, no	N, no	N, no	N, no	N, no	N, no
Soil Temperature	76 F	76 F	76 F	76 F	76 F	76 F
Soil Moisture	DRY	DRY	DRY	DRY	DRY	DRY
Soil Surface Condition	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
% Cloud Cover	20	20	20	20	20	20
Next Moisture Occurred On	7/23/2022	7/23/2022	7/23/2022	7/23/2022	7/23/2022	7/23/2022
Time to Next Moisture	11.0 DAY	11.0 DAY	11.0 DAY	11.0 DAY	11.0 DAY	11.0 DAY

	G	H	I
Application Date	7/12/2022	7/12/2022	7/12/2022
Appl. Start Time	12:00 PM	12:00 PM	12:00 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	POST	POST	POST
Application Placement	BROFOL	BROFOL	BROFOL
Appl. Entry Date	7/18/2022	7/18/2022	7/18/2022
Air Temperature Start, Stop	80, 81 F	80, 81 F	80, 81 F
% Relative Humidity Start, Stop	52, 52	52, 52	52, 52
Wind Velocity+Dir. Start	8 MPH, NW	8 MPH, NW	8 MPH, NW
Wind Velocity+Dir. Stop	9 MPH, NW	9 MPH, NW	9 MPH, NW
Wind Velocity+Dir. Max	10 MPH, NW	10 MPH, NW	10 MPH, NW
Wet Leaves (Y/N)	N, no	N, no	N, no
Soil Temperature	76 F	76 F	76 F
Soil Moisture	DRY	DRY	DRY
Soil Surface Condition	MEDIUM	MEDIUM	MEDIUM
% Cloud Cover	20	20	20
Next Moisture Occurred On	7/23/2022	7/23/2022	7/23/2022
Time to Next Moisture	11.0 DAY	11.0 DAY	11.0 DAY

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.
Trial ID: ASC11 Location: Ames Trial Year: 2022
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Crop Stage At Each Application

	A	B	C	D	E
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Stage Majority, Percent	V6, -	V6, -	V6, -	V6, -	V6, -
Stage Minimum, Percent	V6, -	V6, -	V6, -	V6, -	V6, -
Stage Maximum, Percent	V6, -	V6, -	V6, -	V6, -	V6, -
Height Average	11 IN	11 IN	11 IN	11 IN	11 IN
Height Minimum, Maximum	10, 12	10, 12	10, 12	10, 12	10, 12

	F	G	H	I
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Stage Majority, Percent	V6, -	V6, -	V6, -	V6, -
Stage Minimum, Percent	V6, -	V6, -	V6, -	V6, -
Stage Maximum, Percent	V6, -	V6, -	V6, -	V6, -
Height Average	11 IN	11 IN	11 IN	11 IN
Height Minimum, Maximum	10, 12	10, 12	10, 12	10, 12

Pest Stage At Each Application

	A	B	C	D
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent	6 LEAF, -	6 LEAF, -	6 LEAF, -	6 LEAF, -
Stage Minimum, Percent	5 LEAF, -	5 LEAF, -	5 LEAF, -	5 LEAF, -
Stage Maximum, Percent	7 LEAF, -	7 LEAF, -	7 LEAF, -	7 LEAF, -
Height Average	16 IN	16 IN	16 IN	16 IN
Height Minimum, Maximum	15, 18	15, 18	15, 18	15, 18
Density Average	12 FT2	12 FT2	12 FT2	12 FT2
Density Minimum, Maximum	5, 20	5, 20	5, 20	5, 20
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent	8 LEAF, -	8 LEAF, -	8 LEAF, -	8 LEAF, -
Height Average	11 IN	11 IN	11 IN	11 IN
Height Minimum, Maximum	9, 13	9, 13	9, 13	9, 13
Density Average	3 FT2	3 FT2	3 FT2	3 FT2
Density Minimum, Maximum	1, 5	1, 5	1, 5	1, 5
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent	NUMERO, -	NUMERO, -	NUMERO, -	NUMERO, -
Height Average	11 IN	11 IN	11 IN	11 IN
Height Minimum, Maximum	9, 13	9, 13	9, 13	9, 13
Density Average	5 FT2	5 FT2	5 FT2	5 FT2
Density Minimum, Maximum	3, 8	3, 8	3, 8	3, 8

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.
Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

	E	F	G	H
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent	6 LEAF, -	6 LEAF, -	6 LEAF, -	6 LEAF, -
Stage Minimum, Percent	5 LEAF, -	5 LEAF, -	5 LEAF, -	5 LEAF, -
Stage Maximum, Percent	7 LEAF, -	7 LEAF, -	7 LEAF, -	7 LEAF, -
Height Average	16 IN	16 IN	16 IN	16 IN
Height Minimum, Maximum	15, 18	15, 18	15, 18	15, 18
Density Average	12 FT2	12 FT2	12 FT2	12 FT2
Density Minimum, Maximum	5, 20	5, 20	5, 20	5, 20
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent	8 LEAF, -	8 LEAF, -	8 LEAF, -	8 LEAF, -
Height Average	11 IN	11 IN	11 IN	11 IN
Height Minimum, Maximum	9, 13	9, 13	9, 13	9, 13
Density Average	3 FT2	3 FT2	3 FT2	3 FT2
Density Minimum, Maximum	1, 5	1, 5	1, 5	1, 5
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent	NUMERO, -	NUMERO, -	NUMERO, -	NUMERO, -
Height Average	11 IN	11 IN	11 IN	11 IN
Height Minimum, Maximum	9, 13	9, 13	9, 13	9, 13
Density Average	5 FT2	5 FT2	5 FT2	5 FT2
Density Minimum, Maximum	3, 8	3, 8	3, 8	3, 8

	I
Pest 1 Code, Type, Scale	SETFA, W, DESC
Stage Majority, Percent	6 LEAF, -
Stage Minimum, Percent	5 LEAF, -
Stage Maximum, Percent	7 LEAF, -
Height Average	16 IN
Height Minimum, Maximum	15, 18
Density Average	12 FT2
Density Minimum, Maximum	5, 20
Pest 2 Code, Type, Scale	ABUTH, W, DESC
Stage Majority, Percent	8 LEAF, -
Height Average	11 IN
Height Minimum, Maximum	9, 13
Density Average	3 FT2
Density Minimum, Maximum	1, 5
Pest 3 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	NUMERO, -
Height Average	11 IN
Height Minimum, Maximum	9, 13
Density Average	5 FT2
Density Minimum, Maximum	3, 8

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.

Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B	C	D	E
Appl. Equipment	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN	BACMAN	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	110015	110015	110015
Nozzle Type	XR	AIXR	TTI	XR	AIXR
Nozzle TradeName	TeeJet	TeeJet	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19.0 IN	19.0 IN	19.0 IN	19.0 IN
Boom Length	10 FT	10.0 FT	10.0 FT	10.0 FT	10.0 FT
Boom Height	18.0 IN	18.0 IN	18.0 IN	18.0 IN	18.0 IN
Ground Speed	4 MPH	4 MPH	4 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER	WATER	WATER
Application Amount	10 GAL/AC	10 GAL/AC	10 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2	COMCO2	COMCO2

	F	G	H	I
Appl. Equipment	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	11002	11002	11002
Nozzle Type	TTI	XR	AIXR	TTI
Nozzle TradeName	TeeJet	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, YELLOW	-, YELLOW	-, YELLOW
Nozzle Spacing	19.0 IN	19.0 IN	19.0 IN	19.0 IN
Boom Length	10.0 FT	10.0 FT	10.0 FT	10.0 FT
Boom Height	18.0 IN	18.0 IN	18.0 IN	18.0 IN
Ground Speed	3 MPH	3 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER	WATER
Application Amount	15 GAL/AC	20 GAL/AC	20 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

The "Application Equipment" section contains the details regarding the nozzle tip selection and spray volume for each treatment as denoted by the different application codes.

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.
Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 7/19/2022 CONTRO % 12 IN 7 DA-A	ABUTH 7/19/2022 CONTRO % 12 IN 7 DA-A	AMATA 7/19/2022 CONTRO % 12 IN 7 DA-A	SETFA 7/27/2022 CONTRO % 12 IN 15 DA-A
	Pest Code											
	Rating Date											
	Rating Type											
	Rating Unit/Min/Max											
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval											
									1	2	3	4
1	Liberty 280 SL	2.34	SL	2	PT/A	POST	A	XR 10 GPA	90	93	90	97
	AMS		SG	8.5	LB/100 GAL	POST	A					
2	Enlist One	3.8	EC	2	PT/A	POST	B	AIXR 10 GPA	92	95	90	98
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Enlist One	3.8	EC	2	PT/A	POST	C	TTI 10GPA	92	95	92	99
	Liberty 280 SL	2.34	SL	2	PT/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
4	Liberty 280 SL	2.34	SL	2	PT/A	POST	D	XR 15GPA	92	93	88	98
	AMS		SG	8.5	LB/100 GAL	POST	D					
5	Enlist One	3.8	EC	2	PT/A	POST	E	AIXR 15GPA	93	96	95	99
	Liberty 280 SL	2.34	SL	2	PT/A	POST	E					
	AMS		SG	8.5	LB/100 GAL	POST	E					
6	Enlist One	3.8	EC	2	PT/A	POST	F	TTI 15GPA	92	95	92	99
	Liberty 280 SL	2.34	SL	2	PT/A	POST	F					
	AMS		SG	8.5	LB/100 GAL	POST	F					
7	Liberty 280 SL	2.34	SL	2	PT/A	POST	G	XR 20 GPA	92	93	88	99
	AMS		SG	8.5	LB/100 GAL	POST	G					
8	Enlist One	3.8	EC	2	PT/A	POST	H	AIXR 20 GPA	92	95	95	99
	Liberty 280 SL	2.34	SL	2	PT/A	POST	H					
	AMS		SG	8.5	LB/100 GAL	POST	H					
9	Enlist One	3.8	EC	2	PT/A	POST	I	TTI 20GPA	90	95	88	99
	Liberty 280 SL	2.34	SL	2	PT/A	POST	I					
	AMS		SG	8.5	LB/100 GAL	POST	I					
10	Untreated Check								0	0	0	0
	LSD P=.05								4.5	3.0	6.8	2.3
	Standard Deviation								2.6	1.7	4.0	1.3
	CV								3.16	2.05	4.88	1.48

Missing data estimates are included in columns:Average=1,4,7,10
^Calculated from residual.

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.
Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	5	6	7	8
	Pest Code								ABUTH	AMATA	SETFA	ABUTH
	Rating Date								7/27/2022	7/27/2022	8/3/2022	8/3/2022
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								12 IN	12 IN	12 IN	12 IN
	Trt-Eval Interval								15 DA-A	15 DA-A	22 DA-A	22 DA-A
1	Liberty 280 SL	2.34	SL	2	PT/A	POST	A	XR 10 GPA	95	77	97	88
	AMS		SG	8.5	LB/100 GAL	POST	A					
2	Enlist One	3.8	EC	2	PT/A	POST	B	AIXR 10 GPA	98	92	98	98
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Enlist One	3.8	EC	2	PT/A	POST	C	TTI 10GPA	98	90	99	96
	Liberty 280 SL	2.34	SL	2	PT/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
4	Liberty 280 SL	2.34	SL	2	PT/A	POST	D	XR 15GPA	95	78	98	90
	AMS		SG	8.5	LB/100 GAL	POST	D					
5	Enlist One	3.8	EC	2	PT/A	POST	E	AIXR 15GPA	99	95	99	99
	Liberty 280 SL	2.34	SL	2	PT/A	POST	E					
	AMS		SG	8.5	LB/100 GAL	POST	E					
6	Enlist One	3.8	EC	2	PT/A	POST	F	TTI 15GPA	98	93	99	98
	Liberty 280 SL	2.34	SL	2	PT/A	POST	F					
	AMS		SG	8.5	LB/100 GAL	POST	F					
7	Liberty 280 SL	2.34	SL	2	PT/A	POST	G	XR 20 GPA	92	78	99	85
	AMS		SG	8.5	LB/100 GAL	POST	G					
8	Enlist One	3.8	EC	2	PT/A	POST	H	AIXR 20 GPA	99	95	99	98
	Liberty 280 SL	2.34	SL	2	PT/A	POST	H					
	AMS		SG	8.5	LB/100 GAL	POST	H					
9	Enlist One	3.8	EC	2	PT/A	POST	I	TTI 20GPA	99	92	99	96
	Liberty 280 SL	2.34	SL	2	PT/A	POST	I					
	AMS		SG	8.5	LB/100 GAL	POST	I					
10	Untreated Check								0	0	0	0
	LSD P=.05								4.1	8.4	2.3	7.7
	Standard Deviation								2.4	4.9	1.3	4.5
	CV								2.78	6.19	1.48	5.26

Missing data estimates are included in columns:Average=1,4,7,10
^Calculated from residual.

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.
Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	AMATA 8/3/2022 CONTRO % 12 IN 22 DA-A	SETFA 8/10/2022 CONTRO % 12 IN 29 DA-A	ABUTH 8/10/2022 CONTRO % 12 IN 29 DA-A	AMATA 8/10/2022 CONTRO % 12 IN 29 DA-A
	Pest Code											
	Rating Date											
	Rating Type											
	Rating Unit/Min/Max											
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval											
									9	10	11	12
1	Liberty 280 SL	2.34	SL	2	PT/A	POST	A	XR 10 GPA	62	97	85	53
	AMS		SG	8.5	LB/100 GAL	POST	A					
2	Enlist One	3.8	EC	2	PT/A	POST	B	AIXR 10 GPA	80	98	95	77
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Enlist One	3.8	EC	2	PT/A	POST	C	TTI 10GPA	77	99	95	73
	Liberty 280 SL	2.34	SL	2	PT/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
4	Liberty 280 SL	2.34	SL	2	PT/A	POST	D	XR 15GPA	65	98	85	58
	AMS		SG	8.5	LB/100 GAL	POST	D					
5	Enlist One	3.8	EC	2	PT/A	POST	E	AIXR 15GPA	88	99	98	78
	Liberty 280 SL	2.34	SL	2	PT/A	POST	E					
	AMS		SG	8.5	LB/100 GAL	POST	E					
6	Enlist One	3.8	EC	2	PT/A	POST	F	TTI 15GPA	77	99	98	77
	Liberty 280 SL	2.34	SL	2	PT/A	POST	F					
	AMS		SG	8.5	LB/100 GAL	POST	F					
7	Liberty 280 SL	2.34	SL	2	PT/A	POST	G	XR 20 GPA	65	99	82	58
	AMS		SG	8.5	LB/100 GAL	POST	G					
8	Enlist One	3.8	EC	2	PT/A	POST	H	AIXR 20 GPA	90	99	98	87
	Liberty 280 SL	2.34	SL	2	PT/A	POST	H					
	AMS		SG	8.5	LB/100 GAL	POST	H					
9	Enlist One	3.8	EC	2	PT/A	POST	I	TTI 20GPA	82	99	96	75
	Liberty 280 SL	2.34	SL	2	PT/A	POST	I					
	AMS		SG	8.5	LB/100 GAL	POST	I					
10	Untreated Check								0	0	0	0
	LSD P=.05								10.0	2.3	10.4	11.0
	Standard Deviation								5.8	1.3	6.1	6.4
	CV								8.52	1.48	7.31	10.12

Missing data estimates are included in columns:Average=1,4,7,10
^Calculated from residual.

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2022.

Trial ID: ASC11 Location: Ames Trial Year: 2022
Protocol ID: Enlilst Liberty Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Competitive Soybean Systems Comparison, Ames, IA, 2022.

Trial ID: ASC12 Location: Ames Trial Year: 2022
Protocol ID: HP22USAMGC Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: I one-year/interim
ARM Trial Created On: 6/7/2022
Initiation Date: 6/3/2022
Completion Date: 11/1/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004848 N
Longitude of LL Corner °: -93.672731 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare dicamba and 2,4-D tolerant soybean systems for weed control and yield.

Contacts
Role: STYDIR study director

Crop Description

Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/18/2022
Variety: Asgrow AG21XF1
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 6/3/2022
Depth: 1.75 IN
Rows per Plot: 4
Row Spacing: 30 IN
Soil Temperature: 79 F
Emergence Date: 6/10/2022
Harvest Date: 11/1/2022
Moisture Meter: HARVESTMASTER
% Standard Moisture: 13.0
Weighing Equipment: HARVESTMASTER
Stage Scale: VR
Planting Rate: 154000 S/A
Planting Method: DIRDRI direct drilled
Planting Equipment: FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Moisture: NORMAL normal, adequate
Harvest Equipment: JOHN DEERE 9450
Harvested Width: 5 FT
Harvested Length: 205 FT

Crop 2: C GLXMA Glycine max Soybean
Entry Date: 8/10/2022
Variety: Asgrow AG22XF2
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 6/3/2022
Depth: 1.75 IN
Rows per Plot: 4
Row Spacing: 30 IN
Soil Temperature: 79 F
Emergence Date: 6/10/2022
Harvest Date: 11/1/2022
Moisture Meter: HARVESTMASTER
% Standard Moisture: 13.0
Weighing Equipment: HARVESTMASTER
Stage Scale: VR
Planting Rate: 154000 S/A
Planting Method: DIRDRI direct drilled
Planting Equipment: FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Moisture: NORMAL normal, adequate
Harvest Equipment: JOHN DEERE 9450
Harvested Width: 5 FT
Harvested Length: 205 FT

Crop 3: C GLXMA Glycine max Soybean

Iowa State University

Competitive Soybean Systems Comparison, Ames, IA, 2022.

Trial ID: ASC12 Location: Ames Trial Year: 2022
Protocol ID: HP22USAMGC Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Entry Date: 8/10/2022 **Stage Scale:** VR
Variety: Asgrow AG23XF2
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 6/3/2022 **Planting Rate:** 154000 S/A
Depth: 1.75 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 79 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/10/2022
Harvest Date: 11/1/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 5 FT
% Standard Moisture: 13.0 **Harvested Length:** 205 FT
Weighing Equipment: HARVESTMASTER

Crop 4: C GLXMA Glycine max Soybean
Entry Date: 8/10/2022 **Stage Scale:** VR
Variety: Pioneer P21A53E
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/3/2022 **Planting Rate:** 154000 S/A
Depth: 1.75 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 79 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/10/2022
Harvest Date: 11/1/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 5 FT
% Standard Moisture: 13.0 **Harvested Length:** 205 FT
Weighing Equipment: HARVESTMASTER

Crop 5: C GLXMA Glycine max Soybean
Entry Date: 8/10/2022 **Stage Scale:** VR
Variety: Pioneer P22T86E
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/3/2022 **Planting Rate:** 154000 S/A
Depth: 1.75 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 79 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/10/2022
Harvest Date: 11/1/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 5 FT
% Standard Moisture: 13.0 **Harvested Length:** 205 FT
Weighing Equipment: HARVESTMASTER

Crop 6: C GLXMA Glycine max Soybean
Entry Date: 8/10/2022 **Stage Scale:** VR
Variety: Pioneer P23A40E
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/3/2022 **Planting Rate:** 154000 S/A
Depth: 1.75 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 79 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/10/2022
Harvest Date: 11/1/2022 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 5 FT
% Standard Moisture: 13.0 **Harvested Length:** 205 FT
Weighing Equipment: HARVESTMASTER

Iowa State University

Competitive Soybean Systems Comparison, Ames, IA, 2022.

Trial ID: ASC12 Location: Ames Trial Year: 2022
Protocol ID: HP22USAMGC Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Description

Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/11/2022
Common Name: Giant foxtail **Stage Scale:** BBCH

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/11/2022
Common Name: velvetleaf **Stage Scale:** BBCH

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/11/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Site and Design

Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 205 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 2050.0 FT2 **Treatments:** 6 **Tillage Type:** MINTIL minimum-till
Replications: 1 **Study Design:** NONRAN Non-Randomized

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description

Description Name: 73
% Sand: 38 **% OM:** 4.9 **Texture:** CL clay loam
% Silt: 31 **pH:** 7.4 **Soil Name:** CANISTEO, NICOLLET
% Clay: 31 **CEC:** 24.6 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

Iowa State University

Competitive Soybean Systems Comparison, Ames, IA, 2022.

Trial ID: ASC12 Location: Ames Trial Year: 2022
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/15/2022	0.2	IN
23.	7/24/2022	0.7	IN
24.	7/28/2022	0.3	IN

Iowa State University

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Trial ID: ASC12 Location: Ames Trial Year: 2022
Protocol ID: HP22USAMGC Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B	C
Application Date	6/3/2022	7/5/2022	
Appl. Start Time	7:00 PM	4:30 PM	
Application Method	SPRAY	SPRAY	
Application Timing	PRE	POST	
Application Placement	BROSOI	BROFOL	
Appl. Entry Date	7/18/2022	7/18/2022	
Air Temperature Start, Stop	79, - F	97, 97 F	
% Relative Humidity Start, Stop	23, -	51, 51	
Wind Velocity+Dir. Start	4 MPH, NNE	5 MPH, SW	
Wind Velocity+Dir. Stop		5 MPH, SW	
Wind Velocity+Dir. Max		8 MPH, SW	
Wet Leaves (Y/N)		N, no	
Soil Temperature	81 F		
Soil Moisture	NORMAL	SLIWET	
Soil Surface Condition	MEDIUM		
% Cloud Cover	40	60	
Next Moisture Occurred On	6/5/2022	7/8/2022	
Time to Next Moisture	2.0 DAY	3.0 DAY	

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-7	25	
Stage Majority, Percent		V5, -	
Stage Minimum, Percent		V4, -	
Stage Maximum, Percent		V5, -	
Height Average		12 IN	
Height Minimum, Maximum		10, 14	
Crop 2 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-7	25	
Stage Majority, Percent		V5, -	
Stage Minimum, Percent		V4, -	
Stage Maximum, Percent		V5, -	
Height Average		12 IN	
Height Minimum, Maximum		10, 14	
Crop 3 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-7	25	
Stage Majority, Percent		V5, -	
Stage Minimum, Percent		V4, -	
Stage Maximum, Percent		V5, -	
Height Average		12 IN	

Iowa State University

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Sponsor Contact:

Height Minimum, Maximum		10, 14	
Crop 4 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-7	25	
Stage Majority, Percent		V5, -	
Stage Minimum, Percent		V4, -	
Stage Maximum, Percent		V5, -	
Height Average		12 IN	
Height Minimum, Maximum		10, 14	
Crop 5 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-7	25	
Stage Majority, Percent		V5, -	
Stage Minimum, Percent		V4, -	
Stage Maximum, Percent		V5, -	
Height Average		12 IN	
Height Minimum, Maximum		10, 14	
Crop 6 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-7	25	
Stage Majority, Percent		V5, -	
Stage Minimum, Percent		V4, -	
Stage Maximum, Percent		V5, -	
Height Average		12 IN	
Height Minimum, Maximum		10, 14	

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	SETFA, W, BBCH	SETFA, W, BBCH	SETFA, W, BBCH
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH	ABUTH, W, BBCH
Stage Majority, Percent		7 LEAF, -	
Stage Minimum, Percent		5 LEAF, -	
Stage Maximum, Percent		9 LEAF, -	
Height Average		6 IN	
Height Minimum, Maximum		4, 10	
Density Average		1 FT2	
Density Minimum, Maximum		0, 2	
Pest 3 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH	AMATA, W, BBCH
Stage Majority, Percent		NUMERO, -	
Stage Minimum, Percent		NUMERO, -	
Stage Maximum, Percent		NUMERO, -	
Height Average		9 IN	
Height Minimum, Maximum		7, 11	
Density Average		2 FT2	
Density Minimum, Maximum		0, 4	

Iowa State University

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Trial ID: ASC12 Location: Ames Trial Year: 2022
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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A	B	C
Appl. Equipment	ATV	ATV	
Equipment Type	ALTEVE	ALTEVE	
Operation Pressure	35 PSI	35 PSI	
Nozzle Model	110015	110015	
Nozzle Type	TTI	TTI	
Nozzle Spacing	20 IN	20 IN	
Boom Length	10 FT	10 FT	
Ground Speed	2.8 MPH	2.8 MPH	
Application Amount	15 GAL/AC	15 GAL/AC	

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Treatments 1-3 generally had some velvetleaf pressure that escaped PRE treatments. Treatments 4-6 had some spotty common waterhemp pressure that escaped PRE treatments.

Soybean injury from PRE treatments consisted of light leaf crinkling. POST treatments caused some light necrotic speckling in the lower soybean canopy as observed 15 days after treatment.

The late POST (LPOST (C)) application was not applied because weed control was nearly 100 percent late in the season.

Iowa State University

Competitive Soybean Systems Comparison, Ames, IA, 2022.

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Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	GLXMA
	Rating Date							6/21/2022	6/21/2022	6/21/2022	6/21/2022	7/20/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V2	2 IN	1 IN	1 IN	R2
	Trt-Eval Interval							18 DA-A	18 DA-A	18 DA-A	18 DA-A	15 DA-B
1	Asgrow AG21XF1							5	99	80	99	0
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
2	Asgrow AG22XF2							0	99	70	99	0
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
3	Asgrow AG23XF2							5	99	70	99	0
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					

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Competitive Soybean Systems Comparison, Ames, IA, 2022.

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Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	GLXMA
	Rating Date							6/21/2022	6/21/2022	6/21/2022	6/21/2022	7/20/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V2	2 IN	1 IN	1 IN	R2
	Trt-Eval Interval							18 DA-A	18 DA-A	18 DA-A	18 DA-A	15 DA-B
4	Pioneer P21A53E							0	99	99	99	5
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
5	Pioneer P22T86E							0	99	99	99	5
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
6	Pioneer P23A40E							0	99	99	99	5
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Pioneer P23A40E			32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
	LSD P=.05							.	.	.	.	.
	Standard Deviation							.	.	.	.	.
	CV							.	.	.	.	.

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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							SETFA	ABUTH	AMATA	SETFA	ABUTH
	Rating Date							7/20/2022	7/20/2022	7/20/2022	8/2/2022	8/2/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval							15 DA-B	15 DA-B	15 DA-B	28 DA-B	28 DA-B
1	Asgrow AG21XF1							99	99	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
2	Asgrow AG22XF2							99	99	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
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	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
3	Asgrow AG23XF2							99	99	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					

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Competitive Soybean Systems Comparison, Ames, IA, 2022.

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Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							SETFA	ABUTH	AMATA	SETFA	ABUTH
	Rating Date							7/20/2022	7/20/2022	7/20/2022	8/2/2022	8/2/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval							15 DA-B	15 DA-B	15 DA-B	28 DA-B	28 DA-B
4	Pioneer P21A53E							99	99	99	99	99
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
5	Pioneer P22T86E							99	99	99	99	99
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
6	Pioneer P23A40E							99	99	99	99	99
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Pioneer P23A40E			32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
	LSD P=.05							.	.	.	.	.
	Standard Deviation							.	.	.	.	.
	CV							.	.	.	.	.

Could not calculate LSD (% mean diff) for columns 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Competitive Soybean Systems Comparison, Ames, IA, 2022.

Trial ID: ASC12 Location: Ames Trial Year: 2022
Protocol ID: HP22USAMGC Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMATA	SETFA	ABUTH	AMATA	GLXMA
	Rating Date							8/2/2022	10/14/2022	10/14/2022	10/14/2022	11/1/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	YIELD
	Rating Unit/Min/Max							%	%	%	%	bu/ac
	Pest Stage Majority/Min/Max							5-15 IN			5-15 IN	R8
	Trt-Eval Interval							28 DA-B	101 DA-B	101 DA-B	101 DA-B	119 DA-B
1	Asgrow AG21XF1							99	99	99	99	75
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
2	Asgrow AG22XF2							99	99	99	99	69
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
3	Asgrow AG23XF2							99	99	99	99	65
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Warrant	3	CS	48	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Warrant	3	CS	48	FL OZ/A	POST	B					
	Class Act Ridion		L	1	% V/V	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					

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^Calculated from residual.

Iowa State University

Competitive Soybean Systems Comparison, Ames, IA, 2022.

Trial ID: ASC12 Location: Ames Trial Year: 2022
Protocol ID: HP22USAMGC Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMATA	SETFA	ABUTH	AMATA	GLXMA
	Rating Date							8/2/2022	10/14/2022	10/14/2022	10/14/2022	11/1/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	YIELD
	Rating Unit/Min/Max							%	%	%	%	bu/ac
	Pest Stage Majority/Min/Max							5-15 IN			5-15 IN	R8
	Trt-Eval Interval							28 DA-B	101 DA-B	101 DA-B	101 DA-B	119 DA-B
4	Pioneer P21A53E							95	99	99	95	62
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
5	Pioneer P22T86E							99	99	99	99	67
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
6	Pioneer P23A40E							99	99	99	99	62
	Enlist One	3.8	EC	32	FL OZ/A	PRE	A					
	Sonic	70	DF	4	OZ WT/A	PRE	A					
	Pioneer P23A40E			32	FL OZ/A	POST	B					
	Durango DMA	4	SL	36	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	POST	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	LPOST	C					
	N-Pak AMS Liquid	3.4	L	2.5	% V/V	LPOST	C					
	LSD P=.05							.	.	.	.	.
	Standard Deviation							.	.	.	.	.
	CV							.	.	.	.	.

Could not calculate LSD (% mean diff) for columns 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Competitive Soybean Systems Comparison, Ames, IA, 2022.

Trial ID: ASC12 Location: Ames Trial Year: 2022
Protocol ID: HP22USAMGC Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US

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

Rating Unit/Min/Max
%, 0, 100 = percent
bu/ac, , = bushels per acre

Iowa State University

Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.

Trial ID: ASL2 Location: Ames Trial Year: 2022
Protocol ID: 22-213 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 7/12/2022
Initiation Date: 6/2/2022
Completion Date: 8/10/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004161 N
Longitude of LL Corner °: -93.670389 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Tough alone and in combinations with metribuzin for POST application weed control & reduced crop response in soybean.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/28/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 6/2/2022 **Planting Rate:** 154000 S/A
Depth: 1.25 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDIUM medium
Soil Temperature: 62 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/8/2022

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/28/2022
Common Name: velvetleaf **Stage Scale:** BBCH

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/28/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 6 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.

Trial ID: ASL2 Location: Ames Trial Year: 2022
Protocol ID: 22-213 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included one pass with a field cultivator on May 23 and June 1 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 81
% Sand: 47.5 **% OM:** 3.7 **Texture:** SCL sandy clay loam
% Silt: 27.5 **pH:** 5.7 **Soil Name:** CANISTEO, CLARION
% Clay: 25 **CEC:** 18 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.

Trial ID: ASL2 Location: Ames Trial Year: 2022
Protocol ID: 22-213 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	7/12/2022
Appl. Start Time	2:40 PM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROFOL
Appl. Entry Date	9/28/2022
Air Temperature Start, Stop	83, 83 F
% Relative Humidity Start, Stop	47, 47
Wind Velocity+Dir. Start	10 MPH, NW
Wind Velocity+Dir. Stop	10 MPH, NW
Wind Velocity+Dir. Max	11 MPH, NW
Wet Leaves (Y/N)	N, no
Soil Temperature	79 F
Soil Moisture	DRY
Soil Surface Condition	MEDIUM
% Cloud Cover	30
Next Moisture Occurred On	7/23/2022
Time to Next Moisture	11.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	34
Stage Majority, Percent	V6, -
Stage Minimum, Percent	V6, -
Stage Maximum, Percent	V6, -
Height Average	13 IN
Height Minimum, Maximum	12, 14

Iowa State University

Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.

Trial ID: ASL2 Location: Ames Trial Year: 2022
Protocol ID: 22-213 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	ABUTH, W, DESC
Stage Majority, Percent	6 LEAF, -
Stage Minimum, Percent	5 LEAF, -
Stage Maximum, Percent	7 LEAF, -
Height Average	6 IN
Height Minimum, Maximum	4, 8
Density Average	2 FT2
Density Minimum, Maximum	2, 3
Pest 2 Code, Type, Scale	AMATA, W, BBCH
Stage Majority, Percent	9 LEAF, -
Stage Minimum, Percent	6 LEAF, -
Stage Maximum, Percent	11 LEA, -
Height Average	7 IN
Height Minimum, Maximum	4, 10
Density Average	15 FT2
Density Minimum, Maximum	13, 18

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TT
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	7/12/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.

Iowa State University

Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.

Trial ID: ASL2 Location: Ames Trial Year: 2022
Protocol ID: 22-213 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5	6
	Pest Code							GLXMA	GLXMA	GLXMA	GLXMA	ABUTH	AMATA
	Rating Date							7/22/2022	7/22/2022	7/22/2022	7/22/2022	7/22/2022	7/22/2022
	Rating Type							PHYSTU	PHYCHL	PHYNEC	PHYLDR	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							R2	R2	R2	R2		
	Trt-Eval Interval							10 DA-A	10 DA-A	10 DA-A	10 DA-A	10 DA-A	10 DA-A
1	Tough 5EC	5	EC	7	FL OZ/A	POST	A	13	10	18	20	13	23
	NIS		L	0.25	% V/V	POST	A						
2	TriCor DF	75	DF	2	OZ WT/A	POST	A	17	15	23	20	75	27
	NIS		L	0.25	% V/V	POST	A						
3	Tough 5EC	5	EC	7	FL OZ/A	POST	A	27	20	42	50	90	33
	TriCor DF	75	DF	2	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
4	Tough 5EC	5	EC	5.25	FL OZ/A	POST	A	27	20	30	35	90	33
	TriCor DF	75	DF	2	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
5	Tough 5EC	5	EC	5.25	FL OZ/A	POST	A	20	18	28	27	60	30
	TriCor DF	75	DF	1.5	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
6	Cobra	2	EC	12.5	FL OZ/A	POST	A	13	10	22	0	90	77
	NIS		L	0.25	% V/V	POST	A						
	LSD P=.05							7.7	4.9	8.4	9.9	30.9	14.0
	Standard Deviation							4.2	2.7	4.6	5.5	15.5	7.7
	CV							21.85	17.28	16.99	21.57	22.23	20.62

Missing data estimates are included in columns:Average=5,11,17
Could not calculate LSD (% mean diff) for columns 14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.

Trial ID: ASL2 Location: Ames Trial Year: 2022
Protocol ID: 22-213 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	7	8	9	10	11	12
	Pest Code							GLXMA	GLXMA	GLXMA	GLXMA	ABUTH	AMATA
	Rating Date							7/27/2022	7/27/2022	7/27/2022	7/27/2022	7/27/2022	7/27/2022
	Rating Type							PHYSTU	PHYCHL	PHYNEC	PHYLDR	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							R2	R2	R2	R2	6-15 IN	8-20 IN
	Trt-Eval Interval							15 DA-A	15 DA-A	15 DA-A	15 DA-A	15 DA-A	15 DA-A
1	Tough 5EC	5	EC	7	FL OZ/A	POST	A	13	3	18	22	13	20
	NIS		L	0.25	% V/V	POST	A						
2	TriCor DF	75	DF	2	OZ WT/A	POST	A	17	10	23	22	75	20
	NIS		L	0.25	% V/V	POST	A						
3	Tough 5EC	5	EC	7	FL OZ/A	POST	A	27	17	42	53	93	27
	TriCor DF	75	DF	2	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
4	Tough 5EC	5	EC	5.25	FL OZ/A	POST	A	27	13	27	37	90	33
	TriCor DF	75	DF	2	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
5	Tough 5EC	5	EC	5.25	FL OZ/A	POST	A	25	15	28	32	60	30
	TriCor DF	75	DF	1.5	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
6	Cobra	2	EC	12.5	FL OZ/A	POST	A	15	7	20	0	90	68
	NIS		L	0.25	% V/V	POST	A						
	LSD P=.05							8.1	8.3	8.6	7.6	28.9	10.7
	Standard Deviation							4.4	4.6	4.7	4.2	14.5	5.9
	CV							21.6	42.13	17.86	15.21	20.63	17.83

Missing data estimates are included in columns:Average=5,11,17
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^Calculated from residual.

Iowa State University

Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.

Trial ID: ASL2 Location: Ames Trial Year: 2022
Protocol ID: 22-213 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	13	14	15	16	17	18
	Pest Code							GLXMA	GLXMA	GLXMA	GLXMA	ABUTH	AMATA
	Rating Date							8/10/2022	8/10/2022	8/10/2022	8/10/2022	8/10/2022	8/10/2022
	Rating Type							PHYSTU	PHYCHL	PHYNEC	PHYLDR	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%	%
	Pest Stage Majority/Min/Max							R4	R4	R4	R4	6-15 IN	8-20 IN
	Trt-Eval Interval							29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A
1	Tough 5EC	5	EC	7	FL OZ/A	POST	A	10	0	3	22	3	7
	NIS		L	0.25	% V/V	POST	A						
2	TriCor DF	75	DF	2	OZ WT/A	POST	A	10	0	5	22	78	7
	NIS		L	0.25	% V/V	POST	A						
3	Tough 5EC	5	EC	7	FL OZ/A	POST	A	18	0	5	53	90	13
	TriCor DF	75	DF	2	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
4	Tough 5EC	5	EC	5.25	FL OZ/A	POST	A	17	0	5	37	85	10
	TriCor DF	75	DF	2	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
5	Tough 5EC	5	EC	5.25	FL OZ/A	POST	A	15	0	5	32	60	10
	TriCor DF	75	DF	1.5	OZ WT/A	POST	A						
	NIS		L	0.25	% V/V	POST	A						
6	Cobra	2	EC	12.5	FL OZ/A	POST	A	3	0	5	0	83	40
	NIS		L	0.25	% V/V	POST	A						
	LSD P=.05							5.7	.	2.1	7.6	16.7	6.4
	Standard Deviation							3.1	0.0	1.2	4.2	8.4	3.5
	CV							25.51	0.0	24.96	15.21	12.59	24.2

Missing data estimates are included in columns:Average=5,11,17
Could not calculate LSD (% mean diff) for columns 14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough Alone and in Combinations with Metribuzin for POST Application Weed Control & Reduced crop Response in Soybean, Ames, IA, 2022.

Trial ID: ASL2 Location: Ames Trial Year: 2022
Protocol ID: 22-213 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
PHYSTU = phytotoxicity - stunting
PHYCHL = phytotoxicity - chlorosis
PHYNEC = phytotoxicity - necrosis /burn
PHYLDR = phytotoxicity - leaf drop
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Non-Crop Rainfall Activation Study, Ames, IA, 2022.

Trial ID: ASB1 Location: Ames Trial Year: 2022
Protocol ID: USB NON-CROP Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: K multi-year/final
ARM Trial Created On: 1/20/2023
Initiation Date: 5/19/2022
Completion Date: 6/17/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.006001 N
Longitude of LL Corner °: -93.674864 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare weed control for preemergence herbicides applied at varying dates and time windows between application and rainfall.

Contacts
Role: STYDIR study director

Pest Description
Pest 1 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 1/20/2023
Common Name: Common waterhemp **Stage Scale:** BBCH

Site and Design
Treated Plot Width: 6.7 FT
Treated Plot Length: 25 FT
Treated Plot Area: 167.5 FT2 **Treatments:** 14
Replications: 4
Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: CONTIL conventional-till
Study Design: RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2021

Field Prep./Maintenance:
Tillage included one pass with a field cultivator over the entire experiment for the first preemergence herbicide application on May 19. One pass of tillage occurred adjacent to the previous preemergence application timing for a clean start on one additional date on June 1.

Soil Description
Description Name: 50
% Sand: 33 **% OM:** 6 **Texture:** CL clay loam
% Silt: 28 **pH:** 7.3 **Soil Name:** CANISTEO
% Clay: 39 **CEC:** 39.6 **Fert. Level:** E excellent

Iowa State University

Non-Crop Rainfall Activation Study, Ames, IA, 2022.

Trial ID: ASB1 Location: Ames Trial Year: 2022
Protocol ID: USB NON-CROP Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN

Application Description

	A	B
Application Date	5/19/2022	6/1/2022
Appl. Start Time	6:30 PM	3:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	PRE
Application Placement	BROSOI	BROSOI
Appl. Entry Date	1/20/2023	1/20/2023
Air Temperature Start, Stop	82, 82 F	72, 72 F
% Relative Humidity Start, Stop	20, 20	40, 40
Wind Velocity+Dir. Start	11 MPH, SSW	8 MPH, NNW
Soil Temperature	57 F	66 F
Soil Moisture	SLIWET	NORMAL
Soil Surface Condition	MEDIUM	MEDIUM
% Cloud Cover	50	90
Next Moisture Occurred On	5/24/2022	6/5/2022
Time to Next Moisture	5.0 DAY	4.0 DAY

Iowa State University

Non-Crop Rainfall Activation Study, Ames, IA, 2022.

Trial ID: ASB1 Location: Ames Trial Year: 2022
Protocol ID: USB NON-CROP Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH

Application Equipment

	A	B
Appl. Equipment	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	110015
Nozzle Type	TTI	TTI
Nozzle Spacing	20 IN	20 IN
Boom Length	6.7 FT	6.7 FT
Boom Height	20.0 IN	20.0 IN
Ground Speed	3 MPH	3 MPH
Carrier	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	1/20/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.

Trial Comments

This experiment compared weed control for seven preemergence herbicide treatments at two application dates (A & B) with tillage preceding each timing. The first application date (May 19) was evaluated for residual weed control at approximately 14 and 28 days after application, Treatments for the second application date (June 1) were evaluated only at approximately14 days after application.

Iowa State University

Non-Crop Rainfall Activation Study, Ames, IA, 2022.

Trial ID: ASB1 Location: Ames Trial Year: 2022
Protocol ID: USB NON-CROP Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2
	Pest Code							AMATA	AMATA
	Rating Date							6/7/2022	6/17/2022
	Rating Type							CONTRO	CONTRO
	Rating Unit/Min/Max							%	%
	Pest Stage Majority/Min/Max							0.125 IN	2 IN
	Trt-Eval Interval							14 DAT	28 DAT
1	Untreated Check						A	0	0
2	TriCor DF	75	DF	1	LB/A	PRE	A	99	99
3	Dual II Magnum	7.64	EC	1.67	PT/A	PRE	A	93	92
4	Valor EZ	4	SC	3	FL OZ/A	PRE	A	99	98
5	Zidua SC	4.17	SC	4.9	FL OZ/A	PRE	A	98	97
6	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	75	71
7	Balance Flexx	2	SC	6	FL OZ/A	PRE	A	99	98
8	Untreated Check						B	0	
9	TriCor DF	75	DF	1	LB/A	PRE	B	99	
10	Dual II Magnum	7.64	EC	1.67	PT/A	PRE	B	99	
11	Valor EZ	4	SC	3	FL OZ/A	PRE	B	99	
12	Zidua SC	4.17	SC	4.9	FL OZ/A	PRE	B	99	
13	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	B	65	
14	Balance Flexx	2	SC	6	FL OZ/A	PRE	B	99	
	LSD P=.05							7.3	9.7
	Standard Deviation							5.1	6.5
	CV							6.36	8.19

Pest Code
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

^Calculated from residual.

Iowa State University

Soybean Rainfall Activation Study in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN1 Location: Ames Trial Year: 2022
Protocol ID: USB SOYBEAN Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: K multi-year/final
ARM Trial Created On: 5/17/2022
Initiation Date: 5/4/2022
Completion Date: 7/12/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.004726 N
Longitude of LL Corner °: -93.671119 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
This purpose of this study was to evaluate application timings and rainfall effects for residual herbicides in no-till soybean.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/18/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/19/2022 **Planting Rate:** 154000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: SMOTRA smooth/trashy
Soil Temperature: 59 F **Soil Moisture:** SLIWET slightly wet, moist
Emergence Date: 5/29/2022

Pest Description
Pest 1 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 1/9/2023
Common Name: Common waterhemp **Stage Scale:** BBCH

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 24 **Tillage Type:** NOTILL no-till
Replications: 3 **Study Design:** SPLPLO Split-Plot

No.	Previous Crop	Year
1.	GLXMA	2021

Field Prep./Maintenance:
The study area was left un-tilled from the 2021 crop season. Crop residue on the soil surface at planting was approximately 80% Soil testing indicated soil fertility to be optimum for all nutrients.

A burndown of 32 fl oz./acre of Liberty was broadcast to early pre-plant and preemergence blocks at the respective times that individual treatments were applied to provide a clean start for each plot.

Iowa State University

Soybean Rainfall Activation Study in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN1 Location: Ames Trial Year: 2022
Protocol ID: USB SOYBEAN Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Soil Description

Description Name: 82
% Sand: 40 **% OM:** 4.3 **Texture:** CL clay loam
% Silt: 30 **pH:** 7 **Soil Name:** CANISTEO
% Clay: 30 **CEC:** 22.3 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Soybean Rainfall Activation Study in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN1 Location: Ames Trial Year: 2022
Protocol ID: USB SOYBEAN Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B
Application Date	5/4/2022	5/20/2022
Appl. Start Time	8:00 PM	7:00 PM
Appl. Stop Time	9:00 PM	8:00 PM
Application Method	SPRAY	SPRAY
Application Timing	EPP	PRE
Application Placement	BROSOI	BROSOI
Appl. Entry Date	7/18/2022	1/9/2023
Air Temperature Start, Stop	59, 58 F	63, 62 F
% Relative Humidity Start, Stop	57, 57	30, 30
Wind Velocity+Dir. Start	7 MPH, E	13 MPH, NNW
Wet Leaves (Y/N)	N, no	N, no
Soil Temperature	55 F	59 F
Soil Moisture	SLIWET	SLIWET
Soil Surface Condition	SMOTRA	SMOTRA
% Cloud Cover	70	40
Next Moisture Occurred On	5/8/2022	5/24/2022
Time to Next Moisture	4.0 DAY	4.0 DAY

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-25	-9

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH

Application Equipment

	A	B
Appl. Equipment	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	110015	110015
Nozzle Type	TT	TTI
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19 IN
Boom Length	10 FT	10 FT
Ground Speed	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC

Notes

Context	Date	By	Notes
STATUS	3/27/2021	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.

Iowa State University

Soybean Rainfall Activation Study in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN1 Location: Ames Trial Year: 2022
Protocol ID: USB SOYBEAN Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							AMATA	AMATA	AMATA	AMATA	AMATA
	Rating Date							5/27/2022	6/7/2022	6/13/2022	6/17/2022	7/12/2022
	Rating Type							COPLPA	CONTRO	COPLPA	CONTRO	CONTRO
	Rating Unit/Min/Max							m2	%	m2	%	%
	Pest Stage Majority/Min/Max							0.25 IN	0.5 IN	3 IN	3 IN	15 IN
	Trt-Eval Interval							23 DA-A	34 DA-A	40 DA-A	44 DA-A	69 DA-A
1	EPP Untreated Check							148	0	127	0	0
2	EPP Boundary	6.5	EC	2.4	PT/A	EPP	A	5	87	20	65	63
3	EPP BroadAxe XC	7	EC	32	FL OZ/A	EPP	A	4	85	11	70	63
4	EPP Fierce MTZ SC	2.64	SC	1.5	PT/A	EPP	A	0	98	7	98	99
5	EPP TriCor DF Zidua SC	75 4.17	DF SC	1 4.9	LB/A FL OZ/A	EPP EPP	A A	0	99	0	99	98
6	EPP Authority Supreme	4.16	SC	9	FL OZ/A	EPP	A	0	98	2	98	94
7	EPP Prefix	5.29	EC	2.75	PT/A	EPP	A	1	85	4	78	67
8	EPP Dual II Magnum	7.64	EC	1.67	PT/A	EPP	A	54	63	83	37	35
9	EPP Zidua SC	4.17	SC	4.9	FL OZ/A	EPP	A	3	90	56	80	80
10	EPP TriCor DF	75	DF	1	LB/A	EPP	A	2	91	11	83	90
11	EPP Spartan 4F	4	F	11	FL OZ/A	EPP	A	0	98	2	93	82
12	EPP Valor EZ	4	SC	3	FL OZ/A	EPP	A	0	93	5	85	88
13	PRE Untreated Check								0	99	0	0
14	PRE Boundary	6.5	EC	2.4	PT/A	PRE	B		99	2	98	67
15	PRE BroadAxe XC	7	EC	32	FL OZ/A	PRE	B		98	5	86	60
16	PRE Fierce MTZ SC	2.64	SC	1.5	PT/A	PRE	B		99	3	99	97
17	PRE TriCor DF Zidua SC	75 4.17	DF SC	1 4.9	LB/A FL OZ/A	PRE PRE	B B		99	4	99	95
18	PRE Authority Supreme	4.16	SC	9	FL OZ/A	PRE	B		98	10	95	78
19	PRE Prefix	5.29	EC	2.75	PT/A	PRE	B		99	6	96	62
20	PRE Dual II Magnum	7.64	EC	1.67	PT/A	PRE	B		95	30	78	43
21	PRE Zidua SC	4.17	SC	4.9	FL OZ/A	PRE	B		96	12	96	60
22	PRE TriCor DF	75	DF	1	LB/A	PRE	B		99	2	99	90

Missing data estimates are included in columns:Average=3,5
^Calculated from residual.

Iowa State University

Soybean Rainfall Activation Study in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN1 Location: Ames Trial Year: 2022
Protocol ID: USB SOYBEAN Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							AMATA	AMATA	AMATA	AMATA	AMATA
	Rating Date							5/27/2022	6/7/2022	6/13/2022	6/17/2022	7/12/2022
	Rating Type							COPLPA	CONTRO	COPLPA	CONTRO	CONTRO
	Rating Unit/Min/Max							m2	%	m2	%	%
	Pest Stage Majority/Min/Max							0.25 IN	0.5 IN	3 IN	3 IN	15 IN
	Trt-Eval Interval							23 DA-A	34 DA-A	40 DA-A	44 DA-A	69 DA-A
23	PRE											
	Spartan 4F	4	F	11	FL OZ/A	PRE	B		99	7	98	78
24	PRE											
	Valor EZ	4	SC	3	FL OZ/A	PRE	B		99	7	96	40
	LSD P=.05							66.3	9.4	59.8	15.1	15.2
	Standard Deviation							39.1	5.7	36.3	9.2	9.2
	CV							218.14	6.67	169.58	11.47	13.53

Pest Code
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
COPLPA = count - plant part
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
m2, , = square meter
%, 0, 100 = percent

Missing data estimates are included in columns:Average=3,5
^Calculated from residual.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN3 Location: Ames Trial Year: 2022
Protocol ID: HSM051A4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/17/2022
Initiation Date: 5/19/2022
Completion Date: 6/30/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003092 N
Longitude of LL Corner °: -93.673627 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Tendovo, Boundary and Zidua Pro applied preplant burndown for weed control and crop safety in no-till soybean.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/18/2022 **Stage Scale:** VR
Variety: Asgrow AG21XF1
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 6/1/2022 **Planting Rate:** 154000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: SMOTRA smooth/trashy
Soil Temperature: 66 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/7/2022

Pest Description
Pest 1 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/7/2022
Common Name: Common ragweed

Pest 2 Type: W **Code:** ERICA Conyza canadensis **Entry Date:** 9/7/2022
Common Name: Canada horseweed

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/7/2022
Common Name: Common waterhemp

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 11 **Tillage Type:** NOTILL no-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN3 Location: Ames Trial Year: 2022
Protocol ID: HSM051A4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
The study area was left un-tilled from the 2021 crop season. Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the spring, 2022. Soil testing indicated soil fertility to be optimum for all nutrients.

Soil Description
Description Name: 27
% Sand: 36 **% OM:** 4.6 **Texture:** CL clay loam
% Silt: 28 **pH:** 6.2 **Soil Name:** CANISTEO
% Clay: 36 **CEC:** 29 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN3 Location: Ames Trial Year: 2022
Protocol ID: HSM051A4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	5/19/2022
Appl. Start Time	10:00 AM
Application Method	SPRAY
Application Timing	PREPLA
Application Placement	BROFOL
Appl. Entry Date	7/18/2022
Air Temperature Start, Stop	74, 75 F
% Relative Humidity Start, Stop	30, 30
Wind Velocity+Dir. Start	2 MPH, S
Wind Velocity+Dir. Stop	2 MPH, S
Wet Leaves (Y/N)	N, no
Soil Temperature	55 F
Soil Moisture	WET
Soil Surface Condition	SMOTRA
% Cloud Cover	50
Next Moisture Occurred On	5/24/2022
Time to Next Moisture	5.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	-19

Iowa State University

Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN3 Location: Ames Trial Year: 2022
Protocol ID: HSM051A4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	AMBEL, W, BBCH
Stage Majority, Percent	2 LEAF, -
Stage Minimum, Percent	2 LEAF, -
Stage Maximum, Percent	4 LEAF, -
Height Average	1.5 IN
Height Minimum, Maximum	1, 2
Density Average	10 FT2
Density Minimum, Maximum	5, 15
Pest 2 Code, Type, Scale	ERICA, W, BBCH
Stage Majority, Percent	BOLT, -
Stage Minimum, Percent	BOLT, -
Stage Maximum, Percent	BOLT, -
Height Average	3.5 IN
Height Minimum, Maximum	2, 5
Density Average	10 FT2
Density Minimum, Maximum	5, 15
Pest 3 Code, Type, Scale	AMATA, W, BBCH
Stage Majority, Percent	1 LEAF, -
Stage Minimum, Percent	COTYLE, -
Stage Maximum, Percent	2 LEAF, -
Height Average	0.25 IN
Density Average	15 FT2
Density Minimum, Maximum	0, 30

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	AIXR
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	110015, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Iowa State University

Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN3 Location: Ames Trial Year: 2022
Protocol ID: HSM051A4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Notes

Context	Date	By	Notes
STATUS	4/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

The marestail and common waterhemp populations in the trial contained significant glyphosate resistance (at least 40 percent).

Common ragweed and marestail control ratings on June 17 demonstrate some reduced control since the June 4 rating because of weed regrowth. Common waterhemp ratings on June 17 also demonstrate residual control following the preplant treatments.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN3 Location: Ames Trial Year: 2022
Protocol ID: HSM051A4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							AMBEL	ERICA	GLXMA	AMBEL	ERICA
	Rating Date							6/4/2022	6/4/2022	6/17/2022	6/17/2022	6/17/2022
	Rating Type							CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							2-5 IN	2-5 IN	V1	2-5 IN	2-5 IN
	Trt-Eval Interval							16 DA-A	16 DA-A	29 DA-A	29 DA-A	29 DA-A
1	Untreated Check							0	0	0	0	0
2	NIS		L	0.25	% V/V	PREPLA	A	99	98	0	99	98
	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PREPLA	A					
	Gramoxone SL 3.0	3	SL	2	PT/A	PREPLA	A					
3	Amsol	3.4	L	2.5	% V/V	PREPLA	A	99	72	0	99	72
	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PREPLA	A					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A					
4	Volt-Edge		L	20	FL OZ/A	PREPLA	A	99	85	0	99	88
	Intact		L	0.5	% V/V	PREPLA	A					
	Class Act Ridion		L	1	% V/V	PREPLA	A					
	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PREPLA	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A					
5	NIS		L	0.25	% V/V	PREPLA	A	99	96	0	99	95
	Boundary	6.5	EC	2	PT/A	PREPLA	A					
	Gramoxone SL 3.0	3	SL	2	PT/A	PREPLA	A					
6	Amsol	3.4	L	2.5	% V/V	PREPLA	A	99	73	0	99	60
	Boundary	6.5	EC	2	PT/A	PREPLA	A					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A					
7	Volt-Edge		L	20	FL OZ/A	PREPLA	A	99	88	0	99	92
	Intact		L	0.5	% V/V	PREPLA	A					
	Class Act Ridion		L	1	% V/V	PREPLA	A					
	Boundary	6.5	EC	2	PT/A	PREPLA	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A					
8	Amsol	3.4	L	2.5	% V/V	PREPLA	A	99	88	0	75	80
	Premium MSO		L	1	% V/V	PREPLA	A					
	Zidua PRO	4	SC	4.5	FL OZ/A	PREPLA	A					
	Gramoxone SL 3.0	3	SL	2	PT/A	PREPLA	A					
9	Amsol	3.4	L	2.5	% V/V	PREPLA	A	99	92	0	99	72
	Zidua PRO	4	SC	4.5	FL OZ/A	PREPLA	A					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A					
	Premium MSO		L	1	% V/V	PREPLA	A					
10	Volt-Edge		L	20	FL OZ/A	PREPLA	A	99	98	0	99	98
	Intact		L	0.5	% V/V	PREPLA	A					
	Class Act Ridion		L	1	% V/V	PREPLA	A					
	Zidua PRO	4	SC	4.5	FL OZ/A	PREPLA	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A					
	Premium MSO		L	1	% V/V	PREPLA	A					
11	Weedone LV4	3.8	EC	16	FL OZ/A	PREPLA	A	99	75	0	99	62
	Amsol	3.4	L	2.5	% V/V	PREPLA	A					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A					
	Valor EZ	4	SC	3	FL OZ/A	PREPLA	A					
	NIS		L	0.5	% V/V	PREPLA	A					
	LSD P=.05							.	7.7	.	4.4	9.0
	Standard Deviation							0.0	4.6	0.0	2.6	5.3
	CV							0.0	5.79	0.0	2.97	7.16

Missing data estimates are included in columns:Average=3
Could not calculate LSD (% mean diff) for columns 1,3 because error mean square = 0.
^Calculated from residual.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN3 Location: Ames Trial Year: 2022
Protocol ID: HSM051A4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6
	Pest Code							AMATA
	Rating Date							6/17/2022
	Rating Type							CONTRO
	Rating Unit/Min/Max							%
	Pest Stage Majority/Min/Max							2-5 IN
	Trt-Eval Interval							29 DA-A
1	Untreated Check							0
2	NIS		L	0.25	% V/V	PREPLA	A	92
	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PREPLA	A	
	Gramoxone SL 3.0	3	SL	2	PT/A	PREPLA	A	
3	Amsol	3.4	L	2.5	% V/V	PREPLA	A	83
	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PREPLA	A	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A	
4	Volt-Edge		L	20	FL OZ/A	PREPLA	A	98
	Intact		L	0.5	% V/V	PREPLA	A	
	Class Act Ridion		L	1	% V/V	PREPLA	A	
	Tendovo Herbicide	4.14	ZC	2.1	QT/A	PREPLA	A	
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A	
5	NIS		L	0.25	% V/V	PREPLA	A	87
	Boundary	6.5	EC	2	PT/A	PREPLA	A	
	Gramoxone SL 3.0	3	SL	2	PT/A	PREPLA	A	
6	Amsol	3.4	L	2.5	% V/V	PREPLA	A	67
	Boundary	6.5	EC	2	PT/A	PREPLA	A	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A	
7	Volt-Edge		L	20	FL OZ/A	PREPLA	A	83
	Intact		L	0.5	% V/V	PREPLA	A	
	Class Act Ridion		L	1	% V/V	PREPLA	A	
	Boundary	6.5	EC	2	PT/A	PREPLA	A	
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A	
8	Amsol	3.4	L	2.5	% V/V	PREPLA	A	82
	Premium MSO		L	1	% V/V	PREPLA	A	
	Zidua PRO	4	SC	4.5	FL OZ/A	PREPLA	A	
	Gramoxone SL 3.0	3	SL	2	PT/A	PREPLA	A	
9	Amsol	3.4	L	2.5	% V/V	PREPLA	A	83
	Zidua PRO	4	SC	4.5	FL OZ/A	PREPLA	A	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A	
	Premium MSO		L	1	% V/V	PREPLA	A	
10	Volt-Edge		L	20	FL OZ/A	PREPLA	A	67
	Intact		L	0.5	% V/V	PREPLA	A	
	Class Act Ridion		L	1	% V/V	PREPLA	A	
	Zidua PRO	4	SC	4.5	FL OZ/A	PREPLA	A	
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A	
	Premium MSO		L	1	% V/V	PREPLA	A	
11	Weedone LV4	3.8	EC	16	FL OZ/A	PREPLA	A	80
	Amsol	3.4	L	2.5	% V/V	PREPLA	A	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	PREPLA	A	
	Valor EZ	4	SC	3	FL OZ/A	PREPLA	A	
	NIS		L	0.5	% V/V	PREPLA	A	
	LSD P=.05							23.6
	Standard Deviation							13.9
	CV							18.59

Missing data estimates are included in columns:Average=3
Could not calculate LSD (% mean diff) for columns 1,3 because error mean square = 0.
^Calculated from residual.

Iowa State University

Tendovo: Crop Tolerance and Efficacy in No-Till Soybean, Ames, IA, 2022.

Trial ID: ASN3 Location: Ames Trial Year: 2022
Protocol ID: HSM051A4-2022US Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
AMBEL, Ambrosia artemisiifolia, Common ragweed = US
ERICA, Conyza canadensis, Canada horseweed = US
GLXMA, Glycine max, Soybean = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
CONTRO = control / burndown or knockdown
PHYGEN = phytotoxicity - general / injury
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/17/2022
Initiation Date: 5/17/2022
Completion Date: 6/28/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.00344 N
Longitude of LL Corner °: -93.67365 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Zone Defense and other industry standard herbicides for weed control in soybean.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 10/11/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/17/2022 **Planting Rate:** 154000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: SMOTRA smooth/trashy
Soil Moisture: NORMAL normal, adequate
Emergence Date: 5/27/2022

Pest Description
Pest 1 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 10/11/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Pest 2 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 10/11/2022
Common Name: Common ragweed **Stage Scale:** BBCH

Pest 3 Type: W **Code:** ERICA Conyza canadensis **Entry Date:** 10/11/2022
Common Name: Canada horseweed **Stage Scale:** BBCH

Pest 4 Type: W **Code:** TAROF Taraxacum officinale **Entry Date:** 10/11/2022
Common Name: Common dandelion **Stage Scale:** BBCH

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 6 **Tillage Type:** NOTILL no-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:

The study area was left un-tilled from the 2021 crop season. Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the spring, 2022. Soil testing indicated soil fertility to be optimum for all nutrients.

Soil Description

Description Name: 27
% Sand: 36 **% OM:** 4.6 **Texture:** CL clay loam
% Silt: 28 **pH:** 6.2 **Soil Name:** CANISTEO
% Clay: 36 **CEC:** 29 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	5/19/2022
Appl. Start Time	9:00 AM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROFOL
Appl. Entry Date	7/19/2022
Air Temperature Start, Stop	68, 69 F
% Relative Humidity Start, Stop	84, 84
Wind Velocity+Dir. Start	1 MPH, S
Wind Velocity+Dir. Stop	1 MPH, S
Wet Leaves (Y/N)	N, no
Soil Temperature	59 F
Soil Moisture	WET
Soil Surface Condition	SMOTRA
% Cloud Cover	50
Next Moisture Occurred On	5/24/2022
Time to Next Moisture	5.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	AMATA, W, DESC
Pest 2 Code, Type, Scale	AMBEL, W, DESC
Pest 3 Code, Type, Scale	ERICA, W, DESC
Stage Majority, Percent	BOLT, -
Stage Minimum, Percent	BOLT, -
Stage Maximum, Percent	BOLT, -
Height Average	4 IN
Height Minimum, Maximum	2, 5
Density Average	10 FT2
Density Minimum, Maximum	5, 30
Pest 4 Code, Type, Scale	TAROF, W, DESC
Stage Majority, Percent	Mature, -
Stage Minimum, Percent	Mature, -
Stage Maximum, Percent	Mature, -
Height Average	14 IN
Height Minimum, Maximum	12, 16
Density Average	10 PLOT
Density Minimum, Maximum	1, 20

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TT
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Common waterhemp ratings evaluated only residual control since it had not emerged before the application. Control of common ragweed is a combination of burndown and residual control.

Soybean plant vigor was evaluated on June 7, 11 & 17 using a scale of 1-9 with 1 being extremely poor vigor and 9 being exceptional vigor . Soybean stand counts were also taken per meter of the treated rows on June 13.

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							AMATA	AMBEL	ERICA	TAROF	GLXMA
	Rating Date							6/4/2022	6/4/2022	6/4/2022	6/4/2022	6/7/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0.125 IN	0.125 IN	2-5 IN	1-2 IN	VC
	Trt-Eval Interval							16 DA-A	16 DA-A	16 DA-A	16 DA-A	19 DA-A
1	Untreated Check							0	99	57	90	0
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
2	Zone Defense	77.2	WG	5	OZ WT/A	PRE	A	98	93	53	86	0
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
3	Zone Defense	77.2	WG	5	OZ WT/A	PRE	A	98	98	47	95	0
	Helmet	7.8	EC	1.33	PT/A	PRE	A					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
4	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	99	98	50	90	0
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
5	Authority Supreme	4.16	SC	11.5	FL OZ/A	PRE	A	96	93	43	90	0
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
6	Zone Elite	7	L	38.7	FL OZ/A	PRE	A	98	92	57	90	0
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	LSD P=.05							3.4	6.5	14.7	13.5	.
	Standard Deviation							1.9	3.6	8.1	6.8	0.0
	CV							2.32	3.76	15.84	7.49	0.0

Missing data estimates are included in columns:Average=4,10
Could not calculate LSD (% mean diff) for columns 5,6,11,12,14,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							GLXMA	AMATA	AMBEL	ERICA	TAROF
	Rating Date							6/7/2022	6/11/2022	6/11/2022	6/11/2022	6/11/2022
	Rating Type							VIGOR	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							1-9	%	%	%	%
	Pest Stage Majority/Min/Max							VC	.25-1 IN	.25-1 IN	2-6 IN	1-2 IN
	Trt-Eval Interval							19 DA-A	23 DA-A	23 DA-A	23 DA-A	23 DA-A
1	Untreated Check							5	0	99	53	90
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
2	Zone Defense	77.2	WG	5	OZ WT/A	PRE	A	5	96	92	50	88
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
3	Zone Defense	77.2	WG	5	OZ WT/A	PRE	A	5	98	98	43	95
	Helmet	7.8	EC	1.33	PT/A	PRE	A					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
4	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	5	96	98	53	92
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
5	Authority Supreme	4.16	SC	11.5	FL OZ/A	PRE	A	5	95	93	43	90
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
6	Zone Elite	7	L	38.7	FL OZ/A	PRE	A	5	96	87	53	90
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	LSD P=.05							.	4.9	5.4	13.6	12.6
	Standard Deviation							0.0	2.7	3.0	7.5	6.3
	CV							0.0	3.33	3.16	15.07	6.95

Missing data estimates are included in columns:Average=4,10
Could not calculate LSD (% mean diff) for columns 5,6,11,12,14,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
	Rating Date							6/11/2022	6/11/2022	6/13/2022	6/17/2022	6/17/2022
	Rating Type							PHYGEN	VIGOR	STAOBJ	PHYGEN	VIGOR
	Rating Unit/Min/Max							%	1-9	m	%	1-9
	Pest Stage Majority/Min/Max							V1	V1	V1	V1	V1
	Trt-Eval Interval							23 DA-A	23 DA-A	25 DA-A	29 DA-A	29 DA-A
1	Untreated Check							0	5	26	0	5
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
2	Zone Defense	77.2	WG	5	OZ WT/A	PRE	A	0	5	26	0	5
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
3	Zone Defense	77.2	WG	5	OZ WT/A	PRE	A	0	5	26	0	5
	Helmet	7.8	EC	1.33	PT/A	PRE	A					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
4	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	0	5	27	0	5
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
5	Authority Supreme	4.16	SC	11.5	FL OZ/A	PRE	A	0	5	27	0	5
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
6	Zone Elite	7	L	38.7	FL OZ/A	PRE	A	0	5	26	0	5
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	LSD P=.05							.	.	4.0	.	.
	Standard Deviation							0.0	0.0	2.2	0.0	0.0
	CV							0.0	0.0	8.41	0.0	0.0

Missing data estimates are included in columns:Average=4,10
Could not calculate LSD (% mean diff) for columns 5,6,11,12,14,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMATA 6/28/2022 CONTRO % 2-18 IN 40 DA-A	AMBEL 6/28/2022 CONTRO % 2-14 IN 40 DA-A	ERICA 6/28/2022 CONTRO % 2-20 IN 40 DA-A
	Pest Code									
	Rating Date							6/28/2022	6/28/2022	6/28/2022
	Rating Type							CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%
	Pest Stage Majority/Min/Max							2-18 IN	2-14 IN	2-20 IN
	Trt-Eval Interval							40 DA-A	40 DA-A	40 DA-A
								16	17	18
1	Untreated Check							0	90	43
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A			
	AMS		SG	8.5	LB/100 GAL	PRE	A			
2	Zone Defense	77.2	WG	5	OZ WT/A	PRE	A	95	83	33
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A			
	AMS		SG	8.5	LB/100 GAL	PRE	A			
3	Zone Defense	77.2	WG	5	OZ WT/A	PRE	A	98	98	27
	Helmet	7.8	EC	1.33	PT/A	PRE	A			
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A			
	AMS		SG	8.5	LB/100 GAL	PRE	A			
4	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	95	96	40
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A			
	AMS		SG	8.5	LB/100 GAL	PRE	A			
5	Authority Supreme	4.16	SC	11.5	FL OZ/A	PRE	A	95	88	33
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A			
	AMS		SG	8.5	LB/100 GAL	PRE	A			
6	Zone Elite	7	L	38.7	FL OZ/A	PRE	A	96	63	33
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PRE	A			
	AMS		SG	8.5	LB/100 GAL	PRE	A			
	LSD P=.05							6.4	16.6	12.0
	Standard Deviation							3.5	9.1	6.6
	CV							4.45	10.53	18.81

Missing data estimates are included in columns:Average=4,10
Could not calculate LSD (% mean diff) for columns 5,6,11,12,14,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Zone Defense Herbicide for Preemergence Residual Control of Weeds, Ames, IA, 2022.

Trial ID: ASN4 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US02 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
AMATA, Amaranthus tamariscinus, Common waterhemp = US
AMBEL, Ambrosia artemisiifolia, Common ragweed = US
ERICA, Conyza canadensis, Canada horseweed = US
TAROF, Taraxacum officinale, Common dandelion = US
GLXMA, Glycine max, Soybean = US

Rating Type
CONTRO = control / burndown or knockdown
PHYGEN = phytotoxicity - general / injury
VIGOR = vigor
STAOBJ = stand - objective (based on counts)

Rating Unit/Min/Max
%, 0, 100 = percent
1-9, 1, 9 = 1-9 index/scale
m, , = meter

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.
Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/17/2022
Initiation Date: 5/23/2022
Completion Date: 6/14/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003106 N
Longitude of LL Corner °: -93.673962 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Reviton Herbicide for control of weeds in a burndown management situation with various tank-mix partners.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 10/11/2022 **Stage Scale:** VR
Variety: Asgrow AG21XF1
Attributes: glyphosate & dicamba
Planting Date: 6/1/2022 **Planting Rate:** 154000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: SMOTRA smooth/trashy
Soil Temperature: 66 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: 6/7/2022

Pest Description
Pest 1 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 10/11/2022
Common Name: Common ragweed **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 10/11/2022
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** ERICA Conyza canadensis **Entry Date:** 10/11/2022
Common Name: Canada horseweed **Stage Scale:** DESC

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 9 **Tillage Type:** NOTILL no-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.
Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
The study area was left un-tilled from the 2021 crop season. Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the spring, 2022. Soil testing indicated soil fertility to be optimum for all nutrients.

Soil Description
Description Name: 27
% Sand: 36 **% OM:** 4.6 **Texture:** CL clay loam
% Silt: 28 **pH:** 6.2 **Soil Name:** CANISTEO
% Clay: 36 **CEC:** 29 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.

Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	5/23/2022
Appl. Start Time	12:15 PM
Application Method	SPRAY
Application Timing	PREPLA
Application Placement	BROFOL
Appl. Entry Date	7/19/2022
Air Temperature Start, Stop	61, 61 F
% Relative Humidity Start, Stop	32, 32
Wind Velocity+Dir. Start	6 MPH, NE
Wind Velocity+Dir. Stop	6 MPH, NE
Wind Velocity+Dir. Max	7 MPH, NE
Wet Leaves (Y/N)	N, no
Soil Temperature	61 F
Soil Moisture	NORMAL
Soil Surface Condition	SMOTRA
% Cloud Cover	50
Next Moisture Occurred On	5/24/2022
Time to Next Moisture	1.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.
Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	AMBEL, W, DESC
Stage Majority, Percent	4 LEAF, -
Stage Minimum, Percent	2 LEAF, -
Stage Maximum, Percent	6 LEAF, -
Height Average	3 IN
Height Minimum, Maximum	1, 4
Density Average	2 FT2
Density Minimum, Maximum	0, 3
Pest 2 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	3 LEAF, -
Stage Minimum, Percent	2 LEAF, -
Stage Maximum, Percent	4 LEAF, -
Height Average	0.25 IN
Height Minimum, Maximum	0, 0.5
Density Average	30 FT2
Density Minimum, Maximum	5, 50
Pest 3 Code, Type, Scale	ERICA, W, DESC
Stage Majority, Percent	BOLT, -
Stage Minimum, Percent	BOLT, -
Stage Maximum, Percent	BOLT, -
Height Average	4 IN
Height Minimum, Maximum	2, 6
Density Average	8 FT2
Density Minimum, Maximum	0, 15

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TT
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.

Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Notes

Context	Date	By	Notes
STATUS	4/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

A new cohort of common waterhemp emerged prior to the ratings taken on June 14. Therefore, residual control of new emergence was factored into the weed control evaluation at that time.

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.
Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							AMBEL	AMATA	ERICA	AMBEL	AMATA
	Rating Date							5/26/2022	5/26/2022	5/26/2022	6/4/2022	6/4/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3 IN	0.5 IN	3 IN	3 IN	0.5 IN
	Trt-Eval Interval							3 DA-A	3 DA-A	3 DA-A	12 DA-A	12 DA-A
1	Untreated Check							0	0	0	0	0
2	Reviton	2.83	SC	2	FL OZ/A	PREPLA	A	85	77	68	99	75
	Destiny HC		L	1	% V/V	PREPLA	A					
3	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	85	78	65	96	88
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
4	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	73	77	63	99	95
	Liberty 280 SL	2.34	SL	32	FL OZ/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
5	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	88	80	68	99	99
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A					
	Rancor 4F	4	F	1	PT/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
6	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	80	80	67	99	77
	Arrow 2EC	2	EC	6	FL OZ/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
7	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	87	80	60	96	98
	Weedone LV4	3.8	EC	1	PT/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
8	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	90	80	67	99	96
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A					
	Weedone LV4	3.8	EC	1	PT/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
9	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	90	80	73	99	99
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A					
	Helmet	7.8	EC	2.1	PT/A	PREPLA	A					
	Rancor 4F	4	F	16	FL OZ/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
	LSD P=.05							6.6	3.8	11.7	3.3	10.2
	Standard Deviation							3.8	2.2	6.7	1.9	5.9
	CV							5.02	3.1	11.38	2.19	7.33

Missing data estimates are included in columns:Average=1,3,4,6,9,12
^Calculated from residual.

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.
Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							ERICA	AMBEL	AMATA	ERICA	AMBEL
	Rating Date							6/4/2022	6/7/2022	6/7/2022	6/7/2022	6/14/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							4 IN	3 IN	0.5 IN	4 IN	3 IN
	Trt-Eval Interval							12 DA-A	15 DA-A	15 DA-A	15 DA-A	22 DA-A
1	Untreated Check							0	0	0	0	0
2	Reviton	2.83	SC	2	FL OZ/A	PREPLA	A	68	98	75	65	99
	Destiny HC		L	1	% V/V	PREPLA	A					
3	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	82	98	85	83	98
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
4	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	98	98	92	98	98
	Liberty 280 SL	2.34	SL	32	FL OZ/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
5	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	96	99	99	96	99
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A					
	Rancor 4F	4	F	1	PT/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
6	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	63	98	80	62	98
	Arrow 2EC	2	EC	6	FL OZ/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
7	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	73	96	98	73	96
	Weedone LV4	3.8	EC	1	PT/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
8	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	82	99	95	85	98
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A					
	Weedone LV4	3.8	EC	1	PT/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
9	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	93	99	99	95	99
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A					
	Helmet	7.8	EC	2.1	PT/A	PREPLA	A					
	Rancor 4F	4	F	16	FL OZ/A	PREPLA	A					
	AMS		SG	8.5	LB/100 GAL	PREPLA	A					
	Destiny HC		L	1	% V/V	PREPLA	A					
	LSD P=.05							12.6	2.8	8.2	10.1	2.7
	Standard Deviation							7.2	1.6	4.8	5.8	1.6
	CV							9.93	1.87	5.94	7.95	1.79

Missing data estimates are included in columns:Average=1,3,4,6,9,12
^Calculated from residual.

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.
Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12
	Pest Code							AMATA	ERICA
	Rating Date							6/14/2022	6/14/2022
	Rating Type							CONTRO	CONTRO
	Rating Unit/Min/Max							%	%
	Pest Stage Majority/Min/Max							0.5 IN	4 IN
	Trt-Eval Interval							22 DA-A	22 DA-A
1	Untreated Check							0	0
2	Reviton	2.83	SC	2	FL OZ/A	PREPLA	A	40	55
	Destiny HC		L	1	% V/V	PREPLA	A		
3	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	53	70
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A		
	AMS		SG	8.5	LB/100 GAL	PREPLA	A		
	Destiny HC		L	1	% V/V	PREPLA	A		
4	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	57	98
	Liberty 280 SL	2.34	SL	32	FL OZ/A	PREPLA	A		
	AMS		SG	8.5	LB/100 GAL	PREPLA	A		
	Destiny HC		L	1	% V/V	PREPLA	A		
5	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	80	96
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A		
	Rancor 4F	4	F	1	PT/A	PREPLA	A		
	AMS		SG	8.5	LB/100 GAL	PREPLA	A		
	Destiny HC		L	1	% V/V	PREPLA	A		
6	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	53	50
	Arrow 2EC	2	EC	6	FL OZ/A	PREPLA	A		
	AMS		SG	8.5	LB/100 GAL	PREPLA	A		
	Destiny HC		L	1	% V/V	PREPLA	A		
7	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	67	60
	Weedone LV4	3.8	EC	1	PT/A	PREPLA	A		
	AMS		SG	8.5	LB/100 GAL	PREPLA	A		
	Destiny HC		L	1	% V/V	PREPLA	A		
8	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	70	80
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A		
	Weedone LV4	3.8	EC	1	PT/A	PREPLA	A		
	AMS		SG	8.5	LB/100 GAL	PREPLA	A		
	Destiny HC		L	1	% V/V	PREPLA	A		
9	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	83	95
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A		
	Helmet	7.8	EC	2.1	PT/A	PREPLA	A		
	Rancor 4F	4	F	16	FL OZ/A	PREPLA	A		
	AMS		SG	8.5	LB/100 GAL	PREPLA	A		
	Destiny HC		L	1	% V/V	PREPLA	A		
	LSD P=.05							14.7	11.8
	Standard Deviation							8.5	6.8
	CV							15.19	10.1

Missing data estimates are included in columns:Average=1,3,4,6,9,12
^Calculated from residual.

Iowa State University

Reviton for Control of Weeds in a Burndown Management Situation with Various Tank-Mix Partners, Ames, IA, 2022.

Trial ID: ASN5 Location: Ames Trial Year: 2022
Protocol ID: 2022-H-US01 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
AMBEL, Ambrosia artemisiifolia, Common ragweed = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
ERICA, Conyza canadensis, Canada horseweed = US
Rating Type
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 5/17/2022
Initiation Date: 5/4/2022
Completion Date: 6/30/2022

Trial Location
City: Ames **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50014

Latitude of LL Corner °: 42.003367 N
Longitude of LL Corner °: -93.673976 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate efficacy of burndown programs including Panther MTZ and Panther Pro in no-till soybean.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/19/2022 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/17/2022 **Planting Rate:** 154000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: SMOTRA smooth/trashy
Soil Moisture: NORMAL normal, adequate
Emergence Date: 5/27/2022

Pest Description
Pest 1 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/28/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Pest 2 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/28/2022
Common Name: Common ragweed **Stage Scale:** BBCH

Pest 3 Type: W **Code:** ERICA Conyza canadensis **Entry Date:** 9/28/2022
Common Name: Canada horseweed **Stage Scale:** BBCH

Site and Design
Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 250.0 FT2 **Treatments:** 8 **Tillage Type:** NOTILL no-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:

The study area was left un-tilled from the 2021 crop season. Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the spring, 2022. Soil testing indicated soil fertility to be optimum for all nutrients.

Soil Description

Description Name: 27
% Sand: 36 **% OM:** 4.6 **Texture:** CL clay loam
% Silt: 28 **pH:** 6.2 **Soil Name:** CANISTEO
% Clay: 36 **CEC:** 29 **Fert. Level:** E excellent
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: WET wet
Closest Weather Station: ISU Curtiss Farm **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/13/2022	0.5	IN
2.	4/20/2022	0.5	IN
3.	4/22/2022	1.7	IN
4.	4/23/2022	0.4	IN
5.	4/29/2022	0.2	IN
6.	4/30/2022	0.2	IN
7.	5/8/2022	0.9	IN
8.	5/18/2022	0.9	IN
9.	5/24/2022	1	IN
10.	5/25/2022	0.4	IN
11.	5/31/2022	0.2	IN
12.	6/5/2022	3.4	IN
13.	6/6/2022	0.15	IN
14.	6/10/2022	0.2	IN
15.	6/11/2022	0.3	IN
16.	6/15/2022	3.1	IN
17.	6/24/2022	0.2	IN
18.	7/4/2022	1.2	IN
19.	7/5/2022	0.1	IN
20.	7/8/2022	0.5	IN
21.	7/11/2022	0.2	IN
22.	7/23/2022	0.7	IN
23.	7/28/2022	0.3	IN

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A	B	C
Application Date	5/4/2022	5/19/2022	6/16/2022
Appl. Start Time	7:15 PM	9:00 AM	8:15 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	EPP	PRE	POST
Application Placement	BROFOL	BROFOL	BROFOL
Appl. Entry Date	7/19/2022	7/19/2022	7/19/2022
Air Temperature Start, Stop	60, 59 F	70, 71 F	71, 72 F
% Relative Humidity Start, Stop	57, 57	21, 20	67, 67
Wind Velocity+Dir. Start	7 MPH, E	2 MPH, S	5 MPH, W
Wind Velocity+Dir. Stop	7 MPH, E	2 MPH, S	5 MPH, W
Wind Velocity+Dir. Max	8 MPH, E	3 MPH, S	6 MPH, W
Wet Leaves (Y/N)	N, no	N, no	Y, yes
Soil Temperature	55 F	55 F	61 F
Soil Moisture	SLIWET	WET	WET
Soil Surface Condition	SMOTRA	SMOTRA	SMOTRA
% Cloud Cover	70	50	5
Next Moisture Occurred On	5/8/2022	5/24/2022	6/24/2022
Time to Next Moisture	4.0 DAY	5.0 DAY	8.0 DAY

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-23	-8	20
Stage Majority, Percent			V3, -
Stage Minimum, Percent			V3, -
Stage Maximum, Percent			V3, -
Height Average			5 IN
Height Minimum, Maximum			4, 6

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent			4 LEAF, -
Stage Minimum, Percent			COYTLE, -
Stage Maximum, Percent			6 LEAF, -
Height Average			3 IN
Height Minimum, Maximum			0.125, 5
Density Average			10 PLOT
Density Minimum, Maximum			0, 20
Pest 2 Code, Type, Scale	AMBEL, W, DESC	AMBEL, W, DESC	AMBEL, W, DESC
Stage Majority, Percent			2 LEAF, -
Stage Minimum, Percent			2 LEAF, -
Stage Maximum, Percent			4 LEAF, -
Height Average			2 IN
Height Minimum, Maximum			1, 3
Density Average			2 PLOT
Density Minimum, Maximum			0, 4
Pest 3 Code, Type, Scale	ERICA, W, DESC	ERICA, W, DESC	ERICA, W, DESC
Stage Majority, Percent	rosett, -	rosett, -	
Stage Minimum, Percent	rosett, -	rosett, -	
Stage Maximum, Percent	rosett, -	rosett, -	
Height Average	1 IN	0.5 IN	
Height Minimum, Maximum	1, 1	0.25, 1	
Density Average	6 FT2	10 PLOT	
Density Minimum, Maximum	4, 7	0, 20	

Application Equipment

	A	B	C
Appl. Equipment	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	110015
Nozzle Type	TT	TT	TT
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19.0 IN	19.0 IN
Boom Length	10 FT	10.0 FT	10.0 FT
Boom Height	20.0 IN	20.0 IN	20.0 IN
Ground Speed	3 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Notes

Context	Date	By	Notes
STATUS	4/21/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/19/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Very good weed control was achieved from the preplant (EPP) treatments as observed at the PRE timing on May 19. Some marestail survived some treatments, and common waterhemp began to emerge.

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							ERICA	AMBEL	AMATA	GLXMA	ERICA
	Rating Date							5/19/2022	5/19/2022	5/19/2022	6/4/2022	6/4/2022
	Rating Type							CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							ROSETT	1-2 IN	2 LEAF	VC	
	Trt-Eval Interval							0 DA-B	0 DA-B	0 DA-B	16 DA-B	16 DA-B
1	Untreated Check							0	0	0	0	0
2	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	83	99	87	0	99
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	Enlist One	3.8	EC	16	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
3	Weedone LV4	3.8	EC	16.7	FL OZ/A	EPP	A	87	98	87	0	99
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
4	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	90	98	90	0	99
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	15	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
5	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	83	98	87	0	99
	NIS		L	0.25	% V/V	EPP	A					
	Panther Pro	4.2	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
6	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	90	93	77	0	99
	NIS		L	0.25	% V/V	EPP	A					
	Zidua PRO	4	SC	4.5	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					

Could not calculate LSD (% mean diff) for columns 4,5,9,13,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							ERICA	AMBEL	AMATA	GLXMA	ERICA
	Rating Date							5/19/2022	5/19/2022	5/19/2022	6/4/2022	6/4/2022
	Rating Type							CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							ROSETT	1-2 IN	2 LEAF	VC	
	Trt-Eval Interval							0 DA-B	0 DA-B	0 DA-B	16 DA-B	16 DA-B
7	Enlist One	3.8	EC	1	PT/A	EPP	A	99	99	99	0	99
	Roundup PowerMAX	4.5	SL	1	QT/A	EPP	A					
	Fierce EZ	3.04	SC	6	FL OZ/A	EPP	A					
	Induce		L	0.25	% V/V	EPP	A					
	AMS		SG	1.5	LB/A	EPP	A					
	Enlist One	3.8	EC	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	C					
	AMS		SG	1.5	LB/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
8	Enlist One	3.8	EC	1	PT/A	EPP	A	99	99	99	0	99
	Roundup PowerMAX	4.5	SL	1	QT/A	EPP	A					
	FirstRate	84	WG	0.6	OZ WT/A	EPP	A					
	Fierce EZ	3.04	SC	6	FL OZ/A	EPP	A					
	AMS		SG	1.5	LB/A	EPP	A					
	Induce		L	0.25	% V/V	EPP	A					
	Enlist One	3.8	EC	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	C					
	AMS		SG	1.5	LB/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							6.0	3.8	7.1	.	.
	Standard Deviation							3.5	2.2	4.1	0.0	0.0
	CV							4.37	2.55	5.23	0.0	0.0

Could not calculate LSD (% mean diff) for columns 4,5,9,13,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							AMBEL	AMATA	GLXMA	ERICA	AMBEL
	Rating Date							6/4/2022	6/4/2022	6/16/2022	6/16/2022	6/16/2022
	Rating Type							CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max								0.25 IN	V3		
	Trt-Eval Interval							16 DA-B	16 DA-B	43 DA-A	43 DA-A	43 DA-A
1	Untreated Check							0	0	0	0	0
2	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	99	99	10	99	99
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	Enlist One	3.8	EC	16	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
3	Weedone LV4	3.8	EC	16.7	FL OZ/A	EPP	A	99	99	10	99	99
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
4	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	99	99	10	99	98
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	15	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
5	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	99	99	5	99	99
	NIS		L	0.25	% V/V	EPP	A					
	Panther Pro	4.2	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
6	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	99	98	0	99	98
	NIS		L	0.25	% V/V	EPP	A					
	Zidua PRO	4	SC	4.5	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					

Could not calculate LSD (% mean diff) for columns 4,5,9,13,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							AMBEL	AMATA	GLXMA	ERICA	AMBEL
	Rating Date							6/4/2022	6/4/2022	6/16/2022	6/16/2022	6/16/2022
	Rating Type							CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max								0.25 IN	V3		
	Trt-Eval Interval							16 DA-B	16 DA-B	43 DA-A	43 DA-A	43 DA-A
7	Enlist One	3.8	EC	1	PT/A	EPP	A	99	90	0	99	90
	Roundup PowerMAX	4.5	SL	1	QT/A	EPP	A					
	Fierce EZ	3.04	SC	6	FL OZ/A	EPP	A					
	Induce		L	0.25	% V/V	EPP	A					
	AMS		SG	1.5	LB/A	EPP	A					
	Enlist One	3.8	EC	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	C					
	AMS		SG	1.5	LB/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
8	Enlist One	3.8	EC	1	PT/A	EPP	A	98	92	0	99	96
	Roundup PowerMAX	4.5	SL	1	QT/A	EPP	A					
	FirstRate	84	WG	0.6	OZ WT/A	EPP	A					
	Fierce EZ	3.04	SC	6	FL OZ/A	EPP	A					
	AMS		SG	1.5	LB/A	EPP	A					
	Induce		L	0.25	% V/V	EPP	A					
	Enlist One	3.8	EC	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	C					
	AMS		SG	1.5	LB/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							1.4	2.2	3.1	.	3.6
	Standard Deviation							0.8	1.3	1.8	0.0	2.1
	CV							0.94	1.49	40.41	0.0	2.45

Could not calculate LSD (% mean diff) for columns 4,5,9,13,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMATA	GLXMA	ERICA	AMBEL	AMATA
	Rating Date							6/16/2022	6/30/2022	6/30/2022	6/30/2022	6/30/2022
	Rating Type							CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0-6 IN	V5			0-6 IN
	Trt-Eval Interval							43 DA-A	57 DA-A	57 DA-A	57 DA-A	57 DA-A
1	Untreated Check							0	0	0	0	0
2	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	98	7	99	99	75
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	Enlist One	3.8	EC	16	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
3	Weedone LV4	3.8	EC	16.7	FL OZ/A	EPP	A	98	7	99	99	77
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
4	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	99	7	99	99	83
	NIS		L	0.25	% V/V	EPP	A					
	Panther MTZ	3.67	L	15	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
5	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	95	10	99	99	77
	NIS		L	0.25	% V/V	EPP	A					
	Panther Pro	4.2	L	12	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
6	Amicide Advance	6	L	10.7	FL OZ/A	EPP	A	96	8	99	99	72
	NIS		L	0.25	% V/V	EPP	A					
	Zidua PRO	4	SC	4.5	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	PRE	B					
	AMS		SG	2	LB/A	PRE	B					
	MSO		L	16	FL OZ/A	PRE	B					
	Credit Xtreme	4.5	SL	22	FL OZ/A	POST	C					
	AMS		SG	2	LB/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					

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^Calculated from residual.

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMATA	GLXMA	ERICA	AMBEL	AMATA
	Rating Date							6/16/2022	6/30/2022	6/30/2022	6/30/2022	6/30/2022
	Rating Type							CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0-6 IN	V5			0-6 IN
	Trt-Eval Interval							43 DA-A	57 DA-A	57 DA-A	57 DA-A	57 DA-A
7	Enlist One	3.8	EC	1	PT/A	EPP	A	73	13	99	99	77
	Roundup PowerMAX	4.5	SL	1	QT/A	EPP	A					
	Fierce EZ	3.04	SC	6	FL OZ/A	EPP	A					
	Induce		L	0.25	% V/V	EPP	A					
	AMS		SG	1.5	LB/A	EPP	A					
	Enlist One	3.8	EC	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	C					
	AMS		SG	1.5	LB/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
8	Enlist One	3.8	EC	1	PT/A	EPP	A	77	12	99	99	87
	Roundup PowerMAX	4.5	SL	1	QT/A	EPP	A					
	FirstRate	84	WG	0.6	OZ WT/A	EPP	A					
	Fierce EZ	3.04	SC	6	FL OZ/A	EPP	A					
	AMS		SG	1.5	LB/A	EPP	A					
	Induce		L	0.25	% V/V	EPP	A					
	Enlist One	3.8	EC	1	PT/A	POST	C					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	C					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	C					
	AMS		SG	1.5	LB/A	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							7.3	3.6	.	.	13.4
	Standard Deviation							4.2	2.1	0.0	0.0	7.7
	CV							5.23	26.24	0.0	0.0	11.22

Could not calculate LSD (% mean diff) for columns 4,5,9,13,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

2,4-D Burndown and Panther MTZ Programs for Weed Control in a No-Tillage System with Glufosinate Tolerant Soybean, Ames, IA, 2022.

Trial ID: ASN6 Location: Ames Trial Year: 2022
Protocol ID: Nufarm & Fierce 64.04 NT Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ERICA, Conyza canadensis, Canada horseweed = US
AMBEL, Ambrosia artemisiifolia, Common ragweed = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
GLXMA, Glycine max, Soybean = US
Rating Type
CONTRO = control / burndown or knockdown
PHYGEN = phytotoxicity - general / injury
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.
Trial ID: NSC1 Location: Nashua Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/8/2022
Initiation Date: 5/29/2022
Completion Date: 7/8/2022

Trial Location
City: Nashua **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50658-9270

Latitude of LL Corner °: 42.939449 N
Longitude of LL Corner °: -92.571624 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate residual weed control of preemergence residual herbicides with and without Xtendimax Herbicide.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 8/4/2022 **Stage Scale:** VR
Variety: Asgrow 21XF0
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/29/2022 **Planting Rate:** 182400 S/A
Depth: 1.75 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FPP finger pickup planter
Seed Bed: MEDTRA medium/trashy
Soil Moisture: NORMAL normal, adequate
Emergence Date: 6/3/2022

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/11/2022
Common Name: Giant foxtail **Stage Scale:** BBCH

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/11/2022
Common Name: velvetleaf **Stage Scale:** BBCH

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/11/2022
Common Name: Common waterhemp **Stage Scale:** BBCH

Pest 4 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 8/11/2022
Common Name: Common ragweed **Stage Scale:** BBCH

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 14 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2021

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.
Trial ID: NSC1 Location: Nashua Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included two passes with a field cultivator in the spring just ahead of planting to prepare the seedbed following the 2021 crop. Crop residue on the soil surface was 50 to 55% at planting.

Soil Description
Description Name: Nashua South Field Soybean, N
% Sand: 40 **% OM:** 4.9 **Texture:** L loam
% Silt: 35 **pH:** 6 **Soil Name:** CLYDE
% Clay: 25 **CEC:** 19.5 **Fert. Level:** E excellent
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Closest Weather Station: NORTHEAST ISU RESEARCH FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	4/12/2022	0.84	IN
2.	4/20/2022	0.28	IN
3.	4/22/2022	0.59	IN
4.	4/28/2022	1.4	IN
5.	4/30/2022	0.17	IN
6.	5/3/2022	0.64	IN
7.	5/8/2022	0.65	IN
8.	5/9/2022	0.43	IN
9.	5/19/2022	0.25	IN
10.	5/20/2022	0.11	IN
11.	5/24/2022	0.58	IN
12.	5/25/2022	1.25	IN
13.	6/4/2022	0.27	IN
14.	6/5/2022	0.21	IN
15.	6/6/2022	0.57	IN
16.	6/8/2022	0.62	IN
17.	6/12/2022	0.1	IN
18.	6/13/2022	0.31	IN
19.	6/15/2022	0.33	IN
20.	6/25/2022	2.76	IN
21.	7/4/2022	0.72	IN
22.	7/5/2022	0.79	IN
23.	7/8/2022	0.28	IN
24.	7/15/2022	0.26	IN
25.	7/27/2022	0.21	IN
26.	7/31/2022	0.17	IN

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.

Trial ID: NSC1 Location: Nashua Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Description

	A
Application Date	6/1/2022
Appl. Start Time	6:00 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROSOI
Appl. Entry Date	8/4/2022
Air Temperature Start, Stop	69, - F
% Relative Humidity Start, Stop	42, -
Wind Velocity+Dir. Start	8 MPH, N
Wind Velocity+Dir. Stop	8 MPH, N
Wind Velocity+Dir. Max	10 MPH, N
Soil Temperature	62 F
Soil Moisture	NORMAL
Soil Surface Condition	MEDTRA
% Cloud Cover	60
Next Moisture Occurred On	6/4/2022
Time to Next Moisture	3.0 DAY

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	-2

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	SETFA, W, BBCH
Pest 2 Code, Type, Scale	ABUTH, W, BBCH
Pest 3 Code, Type, Scale	AMATA, W, BBCH
Pest 4 Code, Type, Scale	AMBEL, W, BBCH

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.
Trial ID: NSC1 Location: Nashua Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TTI
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	8/4/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

Trial Comments

Giant foxtail and velvetleaf pressure were variable in the trial area.

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.
Trial ID: NSC1 Location: Nashua Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	AMBEL
	Rating Date							6/15/2022	6/15/2022	6/15/2022	6/15/2022	6/15/2022
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							VC	1 IN	1 IN	1 IN	1 IN
	Trt-Eval Interval							14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
1	Untreated Check							0	0	0	0	0
2	Warrant	3	CS	48	FL OZ/A	PRE	A	2	99	80	99	99
	Mauler	4	SC	8	FL OZ/A	PRE	A					
3	Warrant	3	CS	48	FL OZ/A	PRE	A	0	99	91	99	99
4	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	0	99	96	99	99
5	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	8	99	99	99	99
6	Valor EZ	4	SC	2	FL OZ/A	PRE	A	7	93	99	99	99
7	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	0	96	98	99	99
8	Warrant	3	CS	48	FL OZ/A	PRE	A	0	99	98	99	99
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
9	Warrant	3	CS	48	FL OZ/A	PRE	A	0	98	98	99	98
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
10	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	0	99	96	99	99
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
11	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	10	99	98	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
12	Valor EZ	4	SC	2	FL OZ/A	PRE	A	10	99	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
13	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	0	98	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
14	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	0	0	93	99	90
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	LSD P=.05							2.2	2.3	8.0	.	1.1
	Standard Deviation							1.3	1.4	4.7	0.0	0.7
	CV							50.36	1.61	5.34	0.0	0.74

Missing data estimates are included in columns:Average=2,3,5,6,7,9,11,13,14
Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.
^Calculated from residual.

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.
Trial ID: NSC1 Location: Nashua Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							SETFA	ABUTH	AMATA	AMBEL	SETFA
	Rating Date							6/24/2022	6/24/2022	6/24/2022	6/24/2022	7/8/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1 IN	1 IN	1 IN	1 IN	5-15 IN
	Trt-Eval Interval							23 DA-A	23 DA-A	23 DA-A	23 DA-A	37 DA-A
1	Untreated Check							0	0	0	0	0
2	Warrant	3	CS	48	FL OZ/A	PRE	A	99	80	99	99	99
	Mauler	4	SC	8	FL OZ/A	PRE	A					
3	Warrant	3	CS	48	FL OZ/A	PRE	A	99	70	99	90	93
4	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	98	63	99	99	96
5	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	96	99	99	99	90
6	Valor EZ	4	SC	2	FL OZ/A	PRE	A	92	99	99	99	85
7	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	90	90	99	80	80
8	Warrant	3	CS	48	FL OZ/A	PRE	A	99	90	99	93	96
	Mauler	4	SC	8	FL OZ/A	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
9	Warrant	3	CS	48	FL OZ/A	PRE	A	98	83	99	80	96
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
10	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	99	80	99	99	96
	Intact		L	0.5	% V/V	PRE	A					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
11	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	99	95	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	Intact		L	0.5	% V/V	PRE	A					
12	Valor EZ	4	SC	2	FL OZ/A	PRE	A	96	95	99	99	90
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
13	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	95	96	98	99	83
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
14	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	0	55	77	70	0
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
	LSD P=.05							3.3	17.1	2.8	8.8	8.0
	Standard Deviation							2.0	10.2	1.7	5.2	4.7
	CV							2.36	13.0	1.87	6.04	6.02

Missing data estimates are included in columns:Average=2,3,5,6,7,9,11,13,14
Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.
^Calculated from residual.

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.
Trial ID: NSC1 Location: Nashua Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14
	Pest Code							ABUTH	AMATA	AMBEL	CHEAL
	Rating Date							7/8/2022	7/8/2022	7/8/2022	7/8/2022
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%
	Pest Stage Majority/Min/Max							1-10 IN	1-10 IN	1-12 IN	1-12 IN
	Trt-Eval Interval							37 DA-A	37 DA-A	37 DA-A	37 DA-A
1	Untreated Check							0	0	0	0
2	Warrant	3	CS	48	FL OZ/A	PRE	A	75	99	99	96
	Mauler	4	SC	8	FL OZ/A	PRE	A				
3	Warrant	3	CS	48	FL OZ/A	PRE	A	47	99	90	75
4	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	55	99	96	99
5	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	99	99	99	95
6	Valor EZ	4	SC	2	FL OZ/A	PRE	A	99	99	99	93
7	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	70	91	80	99
8	Warrant	3	CS	48	FL OZ/A	PRE	A	90	99	85	99
	Mauler	4	SC	8	FL OZ/A	PRE	A				
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A				
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
9	Warrant	3	CS	48	FL OZ/A	PRE	A	83	96	73	93
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A				
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
10	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	67	98	99	98
	Intact		L	0.5	% V/V	PRE	A				
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A				
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
11	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	95	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A				
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
	Intact		L	0.5	% V/V	PRE	A				
12	Valor EZ	4	SC	2	FL OZ/A	PRE	A	91	98	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A				
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
13	Authority MTZ DF	45	DF	10	OZ WT/A	PRE	A	91	93	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A				
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
14	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	45	53	50	43
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
	LSD P=.05							17.8	7.9	11.1	7.5
	Standard Deviation							10.5	4.7	6.6	4.4
	CV							14.66	5.39	7.86	5.22

Missing data estimates are included in columns:Average=2,3,5,6,7,9,11,13,14
Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.
^Calculated from residual.

Iowa State University

Addition of Dicamba to Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Nashua, IA, 2022.

Trial ID: NSC1 Location: Nashua Trial Year: 2022
Protocol ID: HN22USADHD Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
GLXMA, Glycine max, Soybean = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
AMBEL, Ambrosia artemisiifolia, Common ragweed = US
CHEAL, Chenopodium album, Common lambsquarters = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Evaluation of Tough 5EC, Laudis and Atrazine Combinations for Glyphosate and HPPD Resistant Common Waterhemp Control in Corn, McCallsburg, IA, 2022.

Trial ID: MCC2 Location: McCallsburg Trial Year: 2022
Protocol ID: 22-111 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

General Trial Information
Study Director: Jha/Franzenburg/Macvilay

Discipline: H herbicide
Trial Status: F one-year/final
ARM Trial Created On: 6/7/2022
Initiation Date: 5/14/2022
Completion Date: 7/15/2022

Trial Location
City: McCallsburg **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50154

Latitude of LL Corner °: 42.146293 N
Longitude of LL Corner °: -93.383933 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate the value of using Tough and Tough + atrazine when used with Laudis to control HPPD and glyphosate resistant common waterhemp.

Contacts
Role: STYDIR study director

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/21/2022 **Stage Scale:** VR
Variety: Dekalb DKC 56-15RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/14/2022
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** DIRDRI direct drilled
Row Spacing: 30 IN **Planting Equipment:** FE field equipment
Seed Bed: MEDIUM medium
Soil Moisture: NORMAL normal, adequate
Emergence Date: 5/21/2022

Pest Description
Pest 1 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/21/2022
Common Name: Common waterhemp

Site and Design
Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 FT2 **Treatments:** 5 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2021

Iowa State University

Evaluation of Tough 5EC, Laudis and Atrazine Combinations for Glyphosate and HPPD Resistant Common Waterhemp Control in Corn, McCallsburg, IA, 2022.

Trial ID: MCC2 Location: McCallsburg Trial Year: 2022
Protocol ID: 22-111 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Field Prep./Maintenance:
Tillage included a field cultivation to prepare the seedbed for planting. Fertiliztion practices were typical for corn production in Iowa.

Soil Description
Description Name: MCCALLSBURG
% Sand: 68 **% OM:** 1.5 **Texture:** SL sandy loam
% Silt: 18 **pH:** 6.8 **Soil Name:** CLARION
% Clay: 14 **CEC:** 11.2 **Fert. Level:** G good

Application Description

	A
Application Date	6/16/2022
Appl. Start Time	9:00 AM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROFOL
Appl. Entry Date	9/22/2022
Air Temperature Start, Stop	77, 78 F
% Relative Humidity Start, Stop	47, 47
Wind Velocity+Dir. Start	7 MPH, W
Wind Velocity+Dir. Stop	7 MPH, W
Wind Velocity+Dir. Max	10 MPH, W
Wet Leaves (Y/N)	N, no
Soil Temperature	66 F
Soil Moisture	VERWET
% Cloud Cover	0

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMD, BCOR
Days after Emergence	26
Stage Majority, Percent	V6, -
Stage Minimum, Percent	V6, -
Stage Maximum, Percent	V6, -
Height Average	16 IN
Height Minimum, Maximum	15, 17

Iowa State University

Evaluation of Tough 5EC, Laudis and Atrazine Combinations for Glyphosate and HPPD Resistant Common Waterhemp Control in Corn, McCallsburg, IA, 2022.

Trial ID: MCC2 Location: McCallsburg Trial Year: 2022
Protocol ID: 22-111 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	AMATA, W, NOSC
Stage Majority, Percent	NUMERO, -
Stage Minimum, Percent	NUMERO, -
Stage Maximum, Percent	NUMERO, -
Height Average	6 IN
Height Minimum, Maximum	5, 7
Density Average	1 FT2
Density Minimum, Maximum	0, 2

Application Equipment

	A
Appl. Equipment	HAND SPRAYER
Equipment Type	BACMAN
Operation Pressure	35 PSI
Nozzle Model	110015
Nozzle Type	TT
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	-, GREEN
Nozzle Spacing	20 IN
Boom Length	6.7 FT
Boom Height	20.0 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2022	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.

Trial Comments

The original protocol included a PRE application of Dual II Magnum to control grass weeds. However, the PRE applications were dropped to avoid controlling common waterhemp.

The common waterhemp populations in the trial contained significant glyphosate resistance (up to 40 percent).

Iowa State University

Evaluation of Tough 5EC, Laudis and Atrazine Combinations for Glyphosate and HPPD Resistant Common Waterhemp Control in Corn, McCallsburg, IA, 2022.

Trial ID: MCC2 Location: McCallsburg Trial Year: 2022
Protocol ID: 22-111 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							ZEAMD	AMATA	ZEAMD	AMATA	ZEAMD
	Rating Date							6/25/2022	6/25/2022	7/1/2022	7/1/2022	7/15/2022
	Rating Type							PHYGEN	CONTRO	PHYGEN	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V8	6-12 IN	V10	6-12 IN	V15
	Trt-Eval Interval							9 DA-A	9 DA-A	15 DA-A	15 DA-A	29 DA-A
1	Laudis	3.5	SC	3	FL OZ/A	POST	A	0	73	0	60	0
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A					
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A					
2	Tough 5EC	5	EC	6	FL OZ/A	POST	A	0	75	0	65	0
	Laudis	3.5	SC	3	FL OZ/A	POST	A					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A					
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A					
3	Tough 5EC	5	EC	8	FL OZ/A	POST	A	0	77	0	68	0
	Laudis	3.5	SC	3	FL OZ/A	POST	A					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A					
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A					
4	Tough 5EC	5	EC	6	FL OZ/A	POST	A	0	83	0	78	0
	Laudis	3.5	SC	3	FL OZ/A	POST	A					
	Aatrex 4L	4	F	16	FL OZ/A	POST	A					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A					
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A					
5	Tough 5EC	5	EC	8	FL OZ/A	POST	A	0	93	0	87	0
	Laudis	3.5	SC	3	FL OZ/A	POST	A					
	Aatrex 4L	4	F	16	FL OZ/A	POST	A					
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A					
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A					
	LSD P=.05							.	10.4	.	10.0	.
	Standard Deviation							0.0	5.5	0.0	5.3	0.0
	CV							0.0	6.87	0.0	7.43	0.0

Could not calculate LSD (% mean diff) for columns 1,3,5 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough 5EC, Laudis and Atrazine Combinations for Glyphosate and HPPD Resistant Common Waterhemp Control in Corn, McCallsburg, IA, 2022.

Trial ID: MCC2 Location: McCallsburg Trial Year: 2022
Protocol ID: 22-111 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6
	Pest Code							AMATA
	Rating Date							7/15/2022
	Rating Type							CONTRO
	Rating Unit/Min/Max							%
	Pest Stage Majority/Min/Max							6-20 IN
	Trt-Eval Interval							29 DA-A
1	Laudis	3.5	SC	3	FL OZ/A	POST	A	53
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A	
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A	
2	Tough 5EC	5	EC	6	FL OZ/A	POST	A	58
	Laudis	3.5	SC	3	FL OZ/A	POST	A	
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A	
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A	
3	Tough 5EC	5	EC	8	FL OZ/A	POST	A	68
	Laudis	3.5	SC	3	FL OZ/A	POST	A	
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A	
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A	
4	Tough 5EC	5	EC	6	FL OZ/A	POST	A	78
	Laudis	3.5	SC	3	FL OZ/A	POST	A	
	Aatrex 4L	4	F	16	FL OZ/A	POST	A	
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A	
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A	
5	Tough 5EC	5	EC	8	FL OZ/A	POST	A	83
	Laudis	3.5	SC	3	FL OZ/A	POST	A	
	Aatrex 4L	4	F	16	FL OZ/A	POST	A	
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A	
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A	
	LSD P=.05							11.3
	Standard Deviation							6.0
	CV							8.81

Could not calculate LSD (% mean diff) for columns 1,3,5 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough 5EC, Laudis and Atrazine Combinations for Glyphosate and HPPD Resistant Common Waterhemp Control in Corn, McCallsburg, IA, 2022.

Trial ID: MCC2 Location: McCallsburg Trial Year: 2022
Protocol ID: 22-111 Investigator (Creator): Prashant Jha
Project ID: Study Director: Jha/Franzenburg/Macvilay
Sponsor Contact:

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent