Weed Science Program
2023 Weed Control Results

Welcome to the 2023 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 2023 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 2023 report, use <control> “f” to expose the “Find” search box on the toolbar.

Program personnel:

Prashant Jha, Professor, Extension Weed Specialist
Damian Franzenburg, Research Scientist
Ithtiphonh Macvilay, Agricultural Research Specialist
Ryan Hamberg, Graduate Research Assistant
Ramawatar Yadav, Postdoc Research Fellow

Contact information:

Weed Science Program
Department of Agronomy
2104 Agronomy Hall
Iowa State University
Ames, IA 50011
Office: (515) 294-7028

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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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- ADAMA US
- Albaugh, LLC
- AMVAC Chemical Corporation
- BASF Corporation
- Bayer CropScience
- Belchim Crop Protection USA
- CHS Agronomy
- Committee for Agricultural Development
- Corteva Agriscience
- FMC Corporation
- Gowan Company, LLC
- Helm Agro US, Inc.
- Iowa Soybean Association
- Iowa State University Crop Performance Testing
- Iowa State University Extension
- Iowa State University Research Farms
- Nufarm Americas, Inc.
- Sipcam Agro USA, 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 **2023 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
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 2023 Research Program

Commercial Name or Experimental Number	Common Name or Experimental Number	Company
	Herbicide	
AAtrex 4L SC	atrazine	Syngenta
Accent 75 DF	Nicosulfuron	Corteva Agriscience
Armezon	topramezone	BASF Corporation
Assure II 0.88 EC	quizalofop	Amvac Chemical
Blanket 4 SC	sulfentrazone	Tenkoz, Inc.
Callisto 4 SC	mesotrione	Syngenta
Cerazone		Summit Agro USA
Clarity 4 SL	dicamba	BASF Corporation
Diflexx 4 L	dicamba	Bayer CropScience
Dimetric DF 75	metribuzin	WinField United
Dual II Magnum 7.64 EC	s-metolachlor	Syngenta
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
Fearless 7 L	acetochlor	Helm Agro US, Inc.
FirstRate 84 WG	clhoransulam-methyl	Corteva Agriscience
GWN 0014196 50 D		Gowan Company
Interline 2.34 SL	glufosinate	UPL NA Inc.
Liberty 280 2.34 SL	glufosinate	Bayer CropScience
Liberty Ultra 1.76 SL	glufosinate	BASF Corporation
Lo-Vol 4 2,4-D	2,4-D	Tenkoz, Inc.
Mauler 4 SC	metribuzin	Valent
Moccasin II Plus 7.64 EC	s-metolachlor	UPL NA Inc.
Motif	mesotrione	UPL NA Inc.
Outlook 6 EC	dimethenamid-P	BASF Corporation
Permit 75 WG	halosulfuron	Gowan Company
Pursuit 2 AS	imazethapyr	BASF Corporation
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
Shieldex 3.33 SC	tolpyralate	Summit Agro USA
Surmise 5	glufosinate	Albaugh, LLC
Temper	glufosinate	ADAMA
Temper HL	glufosinate	ADAMA
Tough 5EC	pyridate	Belchim Crop Protection
TriCor 75 DF	metribuzin	UPL NA Inc.
Warrant 3 CS	acetochlor	Bayer CropScience
Xtendimax wVGT 2.9 SL (lb ae.) (Xtendimax with Vaporgrip Technology)	dicamba	Bayer CropScience
Zidua SC 4.17	pyroxasulfone	BASF Corporation

Products used in 2023 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
Acuron Flexi 3.26 ZC	s-metolachlor & mesotrione & bicyclopyrone	Syngenta
Acuron GT 4.29 L	s-metolachlor & glyphosate & mesotrione & Bicyclopyrone	Syngenta
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
BAS 821..H	pyroxasulfone & saflufenacil	BASF Corporation
Bicep II Magnum 5.5 SC	atrazine & s-metolachlor	Syngenta
Boundary 6.5 EC	s-metolachlor & metribuzin	Syngenta
Broadaxe XC 7 EC	sulfentrazone & s-metolachlor	Syngenta
Caballero 2.01 L	clopyralid & flumetsulam	Albaugh, LLC
Durus	acetochlor & atrazine & mesotrione	Albaugh, LLC
Degree Xtra	acetochlor & atrazine	Corteva Agriscience
Distinct 70 WG	dicamba & diflufenzopyr	BASF Corporation
Enlist DUO	glyphosate & 2,4-D	Corteva Agriscience
Fierce EZ 3 SC	flumioxazin & pyroxasulfone	Valent
Fierce MTZ SC 2.64	flumioxazin & pyroxasulfone & metribuzin	Valent
HA-02142018-240-S		Helm Agro US, Inc.
Halex GT 4.39 CS	s-metolachlor & glyphosate & mesotrione	Syngenta
Helmet MTZ 6.5 EC	metolachlor & metribuzin	Helm Agro US, Inc.
Hornet 68.5 WG	clopyralid & flumetsulam	Amvac Chemical
ImpactZ 4.26 SC	topramezone & atrazine	Amvac Chemical
Impact Core 7.15 EC	acetochlor & topramezone	Amvac Chemical
Katagon 2 OD	tolpyralate & nicosulfuron	Helm Agro US, Inc.
Keystone NXT 5.6 SE	acetochlor & atrazine	Corteva Agriscience
Kyber 2.64 SC	flumioxazin & metribuzin & pyroxasulfone	Corteva Agriscience
Kyro 3.07 L	acetochlor & topramezone & clopryalid	Corteva Agriscience
Impact Core 7.15 EC	topramezone & acetolchlor	Amvac Chemical
Lexar EZ 3.7	atrazine & s-metolachlor & mesotrione	Syngenta
Maverick 2 SC	clopyralid & mesotrione & pyroxasulfone	Valent
Parallel Plus	atrazine & metoloachlor	ADAMA
Perpetuo 2.3 SC	flumiclorac & pyroxasulfone	Valent
Prefix 5.29 EC	s-metolachlor & fomesafen	Syngenta
Priority MA	atrazine & metolachlor & mesotrione	Albaugh, LLC
Resicore 3.29 L	acetochlor & mesotrione & clopyralid	Corteva Agriscience
Resicore XL 3.26 L	acetochlor & mesotrione & clopyralid	Corteva Agriscience
Restraint 480 SL	acetochlor & tolpyralate	Summit Agro USA
SAUSX08		Summit Agro USA
Sinate 2.57 SL	topramezone & glufosinate	Amvac Chemical

Products used in 2023 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
Status 56 WG	diflufenzopyr & dicamba	BASF Corporation
Storen 3.22 ZC	s-metolachlor & mesotrione & pyroxasulfone & Bicyclopyrone	Syngenta
SureStart II 4.25 SE	acetochlor & flumetsulam & clopyralid	Corteva Agriscience
Tailwind 6.5 L	metribuzin & metolachlor	ADAMA
Temper More	glufosinate & s-metolachlor	ADAMA
Tendovo 4.14 ZC	cloransulam-methyl & metribuzin & s-metoloachlor	Syngenta
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
Yukon 67.5 WG	dicamba & halosulfuron	Gowan Company
Zalo 2.57 SL	glufosinate & quizalofop	Amvac Chemical
Zidua PRO 4 SC	pyroxasulfone & saflufenacil & imazethapyr	BASF Corporation
	Additives, Fertilizers & Classification	
AMS (Ammonium sulfate)	sprayable ammonium sulfate	American Plant Food
AMS Liquid (Amsol)	liquid ammonium sulfate	Winfield United
Aegos	volatility reduction agent	BASF Corporation
COC (Prime Oil)	oil-surfactant adjuvant	Winfield United
Destiny HC	high surfactant oil concentrate	Winfield United
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
Poweral	adjuvant	
Vaporgrip Xtra Agent	volatility reduction agent	Bayer CropScience

Weather Data – Year 2023

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, 2023
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	31	42	0.00	61	39	53	0.00	78	64	72	0.40	75	67	77	0.00	85	63	87	0.00
2	72	33	44	0.00	65	39	55	0.00	87	67	77	0.00	85	66	80	0.00	79	69	82	0.00
3	53	36	44	0.00	73	36	59	0.00	87	66	76	0.00	87	64	83	0.00	84	70	86	0.00
4	63	39	46	0.00	81	43	63	0.00	88	65	76	0.30	88	66	86	0.00	85	66	87	0.00
5	43	28	42	0.00	70	49	62	1.10	86	64	75	0.00	78	59	80	0.00	84	65	88	0.00
6	54	21	40	0.00	73	56	61	0.00	91	61	76	0.00	75	53	79	0.00	78	64	77	2.00
7	67	30	46	0.00	77	53	64	0.60	79	64	74	0.00	67	54	72	0.30	81	62	77	0.00
8	70	37	50	0.00	76	59	67	0.40	76	59	71	0.00	77	53	74	0.00	84	62	79	0.00
9	73	39	53	0.00	72	55	64	0.00	79	54	72	0.00	80	54	78	0.00	81	64	76	0.40
10	72	47	57	0.00	81	55	67	0.00	80	59	73	0.00	87	57	83	0.00	84	62	80	0.00
11	81	44	60	0.00	82	61	71	0.20	72	53	70	0.00	84	65	85	0.00	88	62	82	0.80
12	85	59	64	0.00	79	64	71	0.00	78	48	71	0.00	76	63	78	2.20	86	62	82	0.00
13	85	51	65	0.00	76	66	71	0.80	85	55	75	0.00	84	61	80	0.00	77	64	78	0.00
14	83	47	65	0.00	68	52	64	0.00	88	58	80	0.00	81	65	79	0.00	73	59	72	0.00
15	55	36	55	0.55	62	51	59	0.00	90	61	82	0.00	82	62	80	0.00	79	55	73	0.00
16	40	32	43	0.00	80	55	66	0.00	79	57	79	0.00	79	61	79	0.00	82	55	76	0.00
17	59	33	45	0.00	78	55	69	0.00	85	58	79	1.20	76	57	80	0.00	75	59	77	0.00
18	64	31	48	0.00	84	54	71	0.00	82	62	77	0.00	78	54	81	0.00	78	53	76	0.00
19	74	50	55	0.00	62	46	66	0.00	85	63	80	0.00	83	60	84	0.00	92	63	82	0.00
20	59	37	53	1.80	73	42	67	0.00	85	64	80	0.00	81	62	84	0.00	90	73	87	0.00
21	44	33	44	0.00	77	50	71	0.00	86	61	81	0.00	83	58	83	0.00	89	68	87	0.00
22	40	31	40	0.00	79	55	73	0.00	90	65	86	0.00	86	59	84	0.00	94	72	87	0.00
23	49	27	42	0.00	82	55	75	0.00	89	65	87	0.00	87	63	85	0.00	96	74	89	0.00
24	63	29	47	0.00	86	58	76	0.00	81	66	79	0.65	87	62	84	0.00	97	76	90	0.00
25	58	34	52	0.00	79	56	74	0.00	76	62	73	0.00	86	67	88	0.00	88	70	88	0.00
26	63	33	54	0.00	77	47	72	0.00	77	61	72	0.00	92	70	87	0.00	80	62	83	0.00
27	71	40	58	0.00	80	49	73	0.00	82	58	76	0.00	85	70	85	0.20	77	57	81	0.00
28	70	46	59	0.00	83	50	74	0.00	83	66	78	0.00	96	70	85	0.00	84	56	81	0.00
29	56	37	53	0.00	85	57	75	0.00	87	67	81	0.00	84	66	84	0.00	83	62	81	0.00
30	57	38	50	0.00	86	62	75	0.30	85	67	82	0.00	85	63	84	0.00	81	57	80	0.00
31					85	62	75	0.00					83	62	85	0.00	80	55	78	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
	62	37	50	2.35	77	53	68	3.40	83	61	77	2.55	82	62	82	2.70	84	63	82	3.20

Air Temperature, 4-inch Soil Temperature and Precipitation, 2023
Iowa State University Research Farms, Nashua, 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	43	25	41	0.00	59	36	50	0.00	78	61	73	0.00	82	64	76	0.00	86	57	79	0.00
2	67	27	42	0.00	62	32	52	0.00	87	63	74	0.00	86	58	78	0.00	80	61	77	0.00
3	52	32	42	0.00	69	27	54	0.00	91	61	75	0.00	89	60	81	0.00	88	60	78	0.00
4	62	37	43	0.00	82	40	57	0.00	90	62	78	0.00	88	65	79	0.22	90	61	80	0.00
5	58	26	42	0.00	76	50	59	0.00	88	57	78	0.00	78	57	74	0.11	84	63	79	0.00
6	49	19	38	0.00	67	54	59	0.25	88	61	75	0.00	74	48	72	0.00	74	65	73	0.29
7	63	31	43	0.00	72	53	60	0.00	79	62	75	0.00	71	43	69	0.00	81	60	74	0.00
8	68	38	48	0.00	75	55	62	0.27	79	54	76	0.00	78	46	71	0.00	84	56	76	0.00
9	71	40	51	0.00	72	49	62	0.00	83	47	76	0.00	80	49	74	0.00	82	54	74	0.00
10	75	45	54	0.00	80	52	63	0.00	78	62	74	0.00	88	55	76	0.00	88	56	77	0.00
11	74	41	51	0.00	81	57	64	0.00	70	44	72	0.00	79	61	77	0.00	88	63	78	0.66
12	77	43	52	0.00	71	60	65	0.21	77	41	69	0.00	76	58	72	0.34	84	56	77	0.00
13	79	45	54	0.00	76	59	64	0.22	84	53	72	0.00	84	57	73	0.00	71	56	71	0.21
14	82	47	55	0.00	64	49	58	0.72	88	50	75	0.00	82	60	74	0.10	77	55	71	0.10
15	84	48	56	0.20	70	47	60	0.00	84	55	76	0.00	82	58	74	0.00	79	51	71	0.00
16	86	50	57	0.00	81	46	61	0.00	77	47	75	0.00	79	55	74	0.00	82	53	74	0.00
17	89	52	59	0.00	70	49	61	0.00	82	48	75	0.11	76	49	74	0.00	76	49	76	0.00
18	91	53	60	0.00	84	48	61	0.00	80	60	74	0.10	79	49	75	0.00	79	43	74	0.00
19	94	55	61	0.26	60	46	60	0.00	88	59	77	0.00	84	53	76	0.00	92	61	78	0.00
20	96	57	62	1.02	74	40	61	0.00	87	60	79	0.00	80	57	78	0.00	91	70	81	0.00
21	44	30	42	0.10	80	42	63	0.00	88	60	79	0.00	84	52	77	0.00	93	69	81	0.00
22	36	29	39	0.00	81	46	64	0.00	90	64	80	0.00	85	51	78	0.00	96	68	83	0.00
23	45	25	40	0.00	83	51	66	0.00	91	56	81	0.00	88	53	79	0.00	102	76	86	0.00
24	57	22	43	0.00	85	50	67	0.00	81	60	75	0.41	90	54	80	0.00	98	72	87	0.00
25	54	30	46	0.00	76	51	67	0.00	74	61	71	0.36	93	57	81	0.00	88	68	81	0.28
26	60	25	49	0.00	78	43	67	0.00	77	61	72	0.00	93	67	81	0.10	77	59	77	0.00
27	71	41	53	0.00	81	46	69	0.00	84	53	74	0.00	92	66	82	0.00	79	53	74	0.00
28	73	41	54	1.40	84	51	71	0.00	84	62	75	0.16	96	67	84	0.18	85	49	75	0.00
29	56	36	50	0.00	86	51	74	0.00	88	62	76	0.00	87	59	78	0.00	83	55	77	0.00
30	51	37	46	0.17	89	62	76	0.00	84	62	75	0.25	85	53	78	0.00	80	54	75	0.00
31					91	60	78	0.10				0.00	83	57	79	0.00	81	42	73	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
67	38	49	3.15	76	49	63	1.77	83	57	75	1.39	84	56	77	1.05	84	59	77	1.54

Study Directory

Ames, IA – Corn studies

Minimum-tillage

ACC1	Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
ACC2	Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.
ACC3	Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.
ACC4	Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.
ACC5	Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.
ACC6	Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
ACC7	Yukon Green Snap in Corn, Ames, IA, 2023.
ACC8	Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.
ACC9	Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.
ACC10	Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
ACC11	Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.
ACS4	Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.
ACS5	AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Study Directory

Ames, IA – Soybean studies

Minimum-tillage

ASC1	Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.
ASC2	Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2023.
ASC3	Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
ASC4	Residual Weed Control Evaluating Zidua PRO and Tendovo in Soybean, Ames, IA, 2023.
ASC6	Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.
ASC7	Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
ASC8	Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Ames, IA, 2023.
ASC9	Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
ASC10	Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
ASC11	University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.
ASC12	Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.
ASC13	Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.
ASC14	Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.
ASE7	Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.

No-tillage

ASN2	Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.

Study Directory

Nashua, IA – Corn study

Minimum tillage

NCC	Residual PRE & POST Corn Herbicides with BAS 821, Nashua, IA, 2023.

Nashua, IA – Soybean studies

Minimum tillage

NSC1	Liberty Ultra POST Application Timing for Weed Control in an Enlist Soybean System, Nashua, IA, 2023.
NSC2	Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Iowa State University

Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/2/2023
Initiation Date: 5/3/2023
Completion Date: 6/29/2023

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

Latitude of LL Corner °: 42.004818 N
Longitude of LL Corner °: -93.676335 W

Regulations
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.

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/3/2023 **Planting Rate:** 35000 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: 60 F **Soil Moisture:** DRY dry
Emergence Date: 5/12/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/10/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/10/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/10/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 8/10/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 5 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 8/10/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 8 **Plots:** 24 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

Iowa State University

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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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 43
% Sand: 32 **% OM:** 6.1 **Texture:** C clay
% Silt: 25 **Soil Name:** CANISTEO
% Clay: 43 **Fert. Level:** E excellent
pH: 7.5 **CEC:** 39.4
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.1 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
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Investigator:

Application Description

	A	B	C
Application Date	5/5/2023	5/18/2023	6/5/2023
Appl. Start Time	11:00 AM	1:59 PM	4:30 PM
Appl. Stop Time	11:29 AM	2:10 PM	4:39 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	EPOST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Applied By	Macvilay	Franzenburg	Macvilay
Appl. Entry Date	7/24/2023	7/24/2023	7/24/2023
Air Temperature Start, Stop	62, 63 F	83, 83 F	86, 86 F
% Relative Humidity Start, Stop	69, 69	33, 33	48, 48
Wind Velocity+Dir. Start	10 MPH, SSE	4 MPH, SSW	9 MPH, E
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	52 F	72 F	80 F
Soil Moisture	DRY	DRY	DRY
Soil Surface Condition	MEDIUM		
% Cloud Cover	100	30	0
Next Moisture Occurred On	5/5/2023	5/30/2023	6/17/2023
Time to Next Moisture	7.0 HR	12.0 DAY	12.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	1.1, IN	0, IN	0, IN
Moisture 1 Week after Appl.	1.9 IN	0 IN	0 IN
Problems with Application?	N, no	N, no	N, no

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-7	6	24
Stage Majority, Percent		V1, -	V5, -
Stage Minimum, Percent		V1, -	V5, -
Stage Maximum, Percent		V1, -	V6, -
Height Average		3 IN	16 IN
Height Minimum, Maximum			14, 18

Iowa State University

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Trial ID: ACC1
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Project ID: Project ID 2: Project ID 3:
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Investigator:

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	SETFA, W, NOSC	SETFA, W, NOSC	SETFA, W, NOSC
Pest 2 Code, Type, Scale	ABUTH, W, NOSC	ABUTH, W, NOSC	ABUTH, W, NOSC
Stage Majority, Percent		1 LEAF, -	4 LEAF, -
Stage Minimum, Percent		1 LEAF, -	3 LEAF, -
Stage Maximum, Percent		1 LEAF, -	5 LEAF, -
Height Average		1 IN	2 IN
Height Minimum, Maximum		0.5, 1.5	1, 3
Density Average		30 PLOT	8 PLOT
Density Minimum, Maximum			5, 10
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		1 LEAF, -	6 LEAF, -
Stage Minimum, Percent		COTYLE, -	4 LEAF, -
Stage Maximum, Percent		2 LEAF, -	9 LEAF, -
Height Average		0.25 IN	2.5 IN
Height Minimum, Maximum		0.125, 0.5	1, 4
Density Average		40 FT2	12 PLOT
Density Minimum, Maximum			10, 15
Pest 4 Code, Type, Scale	CHEAL, W, DESC	CHEAL, W, DESC	CHEAL, W, DESC
Stage Majority, Percent		2 LEAF, -	
Stage Minimum, Percent		2 LEAF, -	
Stage Maximum, Percent		2 LEAF, -	
Height Average		0.25 IN	
Height Minimum, Maximum		0.25, 0.5	
Density Average		20 FT2	
Pest 5 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		COTYLE, -	3 LEAF, -
Stage Minimum, Percent		COTYLE, -	COTYLE, -
Stage Maximum, Percent		COTYLE, -	7 LEAF, -
Height Average		0.5 IN	4.5 IN
Height Minimum, Maximum		0.25, 1	1, 8
Density Average		15 PLOT	27 PLOT
Density Minimum, Maximum			25, 30

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	TT	TT
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
Ground Speed	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

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Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
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Investigator:

Notes

Context	Date	By	Notes
STATUS	4/22/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/15/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Corn injury from the herbicide treaments appeared as necrotic speckling on the lower leaves.

Ivyleaf morningglory pressure was light and somewhat variable.

Weed counts were taken ahead of the POST applications on June 5 from 3- 1ft2 random quadrats between rows 2 & 3 of each plot and the average was recorded.

Iowa State University

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Project ID: Project ID 2: Project ID 3:
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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								5/15/2023	5/15/2023	5/15/2023	5/15/2023	5/15/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								VC	0.125 IN	0.125 IN	0.125 IN	0.125 IN
Trt-Eval Interval								10 DA-A	10 DA-A	10 DA-A	10 DA-A	10 DA-A
1	Untreated Check							0	0	0	0	0
2	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	0	99	99	99	99
	Callisto	4	SC	6	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Anthem Maxx	4.3	SC	4	FL OZ/A	EPOST	B	0	0	0	0	0
	Callisto	4	SC	3	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	0	99	93	99	99
5	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	99	99	99	99
6	Acuron Flexi	3.26	ZC	2	QT/A	PRE	A	0	99	99	99	99
	Zidua SC	4.17	SC	2.5	FL OZ/A	PRE	A					
7	Restraint	6.5	EC	36	FL OZ/A	PRE	A	0	99	80	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
8	Restraint	6.5	EC	36	FL OZ/A	PRE	A	0	99	83	99	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	20	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
LSD P=.05								.	.	11.9	.	.
Standard Deviation								0.0	0.0	6.8	0.0	0.0
CV								0.0	0.0	9.86	0.0	0.0

Missing data estimates are included in columns:Average=22,30,35,40
Could not calculate LSD (% mean diff) for columns 1,2,4,5,7,8,10,11,13,15,18,31,36 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	IPOHE 5/15/2023 CONTRO % 0.125 IN 10 DA-A	ZEAMD 5/19/2023 PHYGEN % V1 14 DA-A	SETFA 5/19/2023 CONTRO % 0.125 IN 14 DA-A	ABUTH 5/19/2023 CONTRO % 0.125 IN 14 DA-A	AMATA 5/19/2023 CONTRO % 0.125 IN 14 DA-A
								6	7	8	9	10
1	Untreated Check							0	0	0	0	0
2	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	77	0	99	99	99
	Callisto	4	SC	6	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Anthem Maxx	4.3	SC	4	FL OZ/A	EPOST	B	0	0	0	0	0
	Callisto	4	SC	3	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	60	0	99	93	99
5	Maverick	2.04	SC	18	FL OZ/A	PRE	A	87	0	99	99	99
6	Acuron Flexi	3.26	ZC	2	QT/A	PRE	A	87	0	99	99	99
	Zidua SC	4.17	SC	2.5	FL OZ/A	PRE	A					
7	Restraint	6.5	EC	36	FL OZ/A	PRE	A	43	0	99	80	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
8	Restraint	6.5	EC	36	FL OZ/A	PRE	A	60	0	99	83	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	20	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
LSD P=.05								31.6	.	.	11.9	.
Standard Deviation								18.0	0.0	0.0	6.8	0.0
CV								34.92	0.0	0.0	9.86	0.0

Missing data estimates are included in columns:Average=22,30,35,40
Could not calculate LSD (% mean diff) for columns 1,2,4,5,7,8,10,11,13,15,18,31,36 because error mean square = 0.
^Calculated from residual.

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Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							CHEAL	IPOHE	ZEAMD	ABUTH	AMATA
	Rating Date							5/19/2023	5/19/2023	5/28/2023	5/28/2023	5/28/2023
	Rating Type							CONTRO	CONTRO	PHYNEC	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0.125 IN	0.125 IN	V4	0.25 IN	
	Trt-Eval Interval							14 DA-A	14 DA-A	10 DA-B	10 DA-B	10 DA-B
1	Untreated Check							0	0	0	0	0
2	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	99	77	0	96	99
	Callisto	4	SC	6	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Anthem Maxx	4.3	SC	4	FL OZ/A	EPOST	B	0	0	5	99	99
	Callisto	4	SC	3	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	99	60	0	93	99
5	Maverick	2.04	SC	18	FL OZ/A	PRE	A	99	87	0	88	99
6	Acuron Flexi	3.26	ZC	2	QT/A	PRE	A	99	83	0	98	99
	Zidua SC	4.17	SC	2.5	FL OZ/A	PRE	A					
7	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	43	0	90	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
8	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	60	0	90	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	20	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	LSD P=.05							.	31.5	.	7.9	.
	Standard Deviation							0.0	18.0	0.0	4.5	0.0
	CV							0.0	35.14	0.0	5.52	0.0

Missing data estimates are included in columns:Average=22,30,35,40
Could not calculate LSD (% mean diff) for columns 1,2,4,5,7,8,10,11,13,15,18,31,36 because error mean square = 0.
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Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16	17	18	19	20
	Pest Code							CHEAL	IPOHE	ZEAMD	ABUTH	AMATA
	Rating Date							5/28/2023	5/28/2023	6/3/2023	6/3/2023	6/3/2023
	Rating Type							CONTRO	CONTRO	PHYNEC	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0.125 IN	1 IN	V5	0.25 IN	
	Trt-Eval Interval							10 DA-B	10 DA-B	16 DA-B	16 DA-B	16 DA-B
1	Untreated Check							0	0	0	0	0
2	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	99	83	0	92	96
	Callisto	4	SC	6	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Anthem Maxx	4.3	SC	4	FL OZ/A	EPOST	B	99	99	5	95	93
	Callisto	4	SC	3	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	99	75	0	98	98
5	Maverick	2.04	SC	18	FL OZ/A	PRE	A	96	83	0	83	96
6	Acuron Flexi	3.26	ZC	2	QT/A	PRE	A	99	83	0	98	99
	Zidua SC	4.17	SC	2.5	FL OZ/A	PRE	A					
7	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	40	0	90	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
8	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	63	0	93	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	20	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	LSD P=.05							3.2	27.1	.	7.3	5.0
	Standard Deviation							1.8	15.5	0.0	4.1	2.9
	CV							2.13	23.55	0.0	5.12	3.37

Missing data estimates are included in columns:Average=22,30,35,40
Could not calculate LSD (% mean diff) for columns 1,2,4,5,7,8,10,11,13,15,18,31,36 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	21	22	23	24	25
Pest Code								CHEAL	IPOHE	ABUTH	AMATA	CHEAL
Rating Date								6/3/2023	6/3/2023	6/5/2023	6/5/2023	6/5/2023
Rating Type								CONTRO	CONTRO	COUPLA	COUPLA	COUPLA
Rating Unit/Min/Max								%	%	FT2	FT2	FT2
Pest Stage Majority/Min/Max								0.125 IN	1 IN			
Trt-Eval Interval								16 DA-B	16 DA-B	0 DA-C	0 DA-C	0 DA-C
1	Untreated Check							0	0	1	17	6
2	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	99	80	0	0	0
	Callisto	4	SC	6	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Anthem Maxx	4.3	SC	4	FL OZ/A	EPOST	B	99	83	0	0	0
	Callisto	4	SC	3	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	99	72	0	0	0
5	Maverick	2.04	SC	18	FL OZ/A	PRE	A	93	78	0	0	0
6	Acuron Flexi	3.26	ZC	2	QT/A	PRE	A	98	85	0	0	0
	Zidua SC	4.17	SC	2.5	FL OZ/A	PRE	A					
7	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	25	0	0	0
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
8	Restraint	6.5	EC	36	FL OZ/A	PRE	A	99	60	0	0	0
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	20	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
LSD P=.05								4.8	20.2	0.4	5.0	2.7
Standard Deviation								2.8	11.4	0.2	2.8	1.5
CV								3.22	18.93	244.95	130.74	205.48

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^Calculated from residual.

Iowa State University

Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	IPOHE 6/5/2023 COUPLA FT2 0 DA-C 26	ABUTH 6/12/2023 CONTRO % 1-6 IN 25 DA-B 27	AMATA 6/12/2023 CONTRO % 1-6 IN 25 DA-B 28	CHEAL 6/12/2023 CONTRO % 1-4 IN 25 DA-B 29	IPOHE 6/12/2023 CONTRO % 1-7 IN 25 DA-B 30
1	Untreated Check							0	0	0	0	0
2	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	0	92	93	99	77
	Callisto	4	SC	6	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Anthem Maxx	4.3	SC	4	FL OZ/A	EPOST	B	0	96	95	99	83
	Callisto	4	SC	3	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	1	98	96	99	75
5	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	82	88	93	78
6	Acuron Flexi	3.26	ZC	2	QT/A	PRE	A	0	98	98	98	82
	Zidua SC	4.17	SC	2.5	FL OZ/A	PRE	A					
7	Restraint	6.5	EC	36	FL OZ/A	PRE	A	3	99	99	99	83
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
8	Restraint	6.5	EC	36	FL OZ/A	PRE	A	1	99	99	99	91
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	20	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
LSD P=.05								2.0	4.9	6.8	4.8	17.7
Standard Deviation								1.1	2.8	3.9	2.8	10.0
CV								158.22	3.39	4.66	3.22	14.13

Missing data estimates are included in columns:Average=22,30,35,40
Could not calculate LSD (% mean diff) for columns 1,2,4,5,7,8,10,11,13,15,18,31,36 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 6/23/2023 PHYNEC % V10 49 DA-A	ABUTH 6/23/2023 CONTRO % 6-20 IN 49 DA-A	AMATA 6/23/2023 CONTRO % 6-20 IN 49 DA-A	CHEAL 6/23/2023 CONTRO % 6-20 IIN 49 DA-A	IPOHE 6/23/2023 CONTRO % 6-20 IN 49 DA-A
	Pest Code											
	Rating Date							6/23/2023	6/23/2023	6/23/2023	6/23/2023	6/23/2023
	Rating Type							PHYNEC	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V10	6-20 IN	6-20 IN	6-20 IIN	6-20 IN
	Trt-Eval Interval							49 DA-A	49 DA-A	49 DA-A	49 DA-A	49 DA-A
								31	32	33	34	35
1	Untreated Check							0	0	0	0	0
2	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	0	93	92	98	77
	Callisto	4	SC	6	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Anthem Maxx	4.3	SC	4	FL OZ/A	EPOST	B	0	99	95	99	83
	Callisto	4	SC	3	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	0	98	96	99	77
5	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	78	85	91	77
6	Acuron Flexi	3.26	ZC	2	QT/A	PRE	A	0	98	98	98	77
	Zidua SC	4.17	SC	2.5	FL OZ/A	PRE	A					
7	Restraint	6.5	EC	36	FL OZ/A	PRE	A	0	99	99	99	83
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
8	Restraint	6.5	EC	36	FL OZ/A	PRE	A	0	99	99	99	93
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	20	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	LSD P=.05							.	6.7	7.1	5.1	17.5
	Standard Deviation							0.0	3.8	4.1	2.9	9.9
	CV							0.0	4.63	4.89	3.42	14.02

Missing data estimates are included in columns:Average=22,30,35,40
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Iowa State University

Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.
Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 6/29/2023 PHYNEC % V11 55 DA-A	ABUTH 6/29/2023 CONTRO % 9-30 IN 55 DA-A	AMATA 6/29/2023 CONTRO % 9-25 IN 55 DA-A	CHEAL 6/29/2023 CONTRO % 9-25 IN 55 DA-A	IPOHE 6/29/2023 CONTRO % 1-30 IN 55 DA-A
	Pest Code											
	Rating Date							6/29/2023	6/29/2023	6/29/2023	6/29/2023	6/29/2023
	Rating Type							PHYNEC	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V11	9-30 IN	9-25 IN	9-25 IN	1-30 IN
	Trt-Eval Interval							55 DA-A	55 DA-A	55 DA-A	55 DA-A	55 DA-A
								36	37	38	39	40
1	Untreated Check							0	0	0	0	0
2	Anthem Maxx	4.3	SC	4	FL OZ/A	PRE	A	0	93	93	96	77
	Callisto	4	SC	6	FL OZ/A	PRE	A					
	Aatrex 4L	4	F	1	QT/A	PRE	A					
3	Anthem Maxx	4.3	SC	4	FL OZ/A	EPOST	B	0	99	95	99	83
	Callisto	4	SC	3	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	Induce		L	0.25	% V/V	EPOST	B					
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	0	98	96	99	77
5	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	78	85	91	73
6	Acuron Flexi	3.26	ZC	2	QT/A	PRE	A	0	98	98	98	68
	Zidua SC	4.17	SC	2.5	FL OZ/A	PRE	A					
7	Restraint	6.5	EC	36	FL OZ/A	PRE	A	0	99	99	99	80
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
8	Restraint	6.5	EC	36	FL OZ/A	PRE	A	0	99	99	99	93
	Aatrex 4L	4	F	1	QT/A	PRE	A					
	Shieldex	3.33	SC	1.35	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX	4.5	SL	20	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	LSD P=.05							.	6.7	6.4	5.1	15.8
	Standard Deviation							0.0	3.8	3.7	2.9	8.9
	CV							0.0	4.63	4.39	3.43	12.96

Missing data estimates are included in columns:Average=22,30,35,40
Could not calculate LSD (% mean diff) for columns 1,2,4,5,7,8,10,11,13,15,18,31,36 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluating Anthem Maxx Programs Compared to Competitive Offerings for Control of Difficult Weeds in Corn, Ames, IA, 2023.

Trial ID: ACC1
Protocol ID: USA-23-033 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
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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
PHYNEC = phytotoxicity - necrosis /burn
COUPLA = count - plant / emergence - objective

Rating Unit/Min/Max
%, 0, 100 = percent
FT2, , = square foot

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC2
Protocol ID: 23-200 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/6/2023
Initiation Date: 5/3/2023
Completion Date: 7/14/2023

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

Latitude of LL Corner °: 42.004864 N
Longitude of LL Corner °: -93.675573 W

Regulations
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.

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/3/2023 **Planting Rate:** 35000 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: 63 F **Soil Moisture:** DRY dry
Emergence Date: 5/12/2023

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/13/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/13/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/13/2023
Common Name: Common lambsquarters **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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 5 **Plots:** 15 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC2
Protocol ID: 23-200 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Soil Description

Description Name: 43
% Sand: 32 **% OM:** 6.1 **Texture:** C clay
% Silt: 25 **Soil Name:** CANISTEO
% Clay: 43 **Fert. Level:** E excellent
pH: 7.5 **CEC:** 39.4
Soil Drainage: F fair

Weather Conditions

Overall Moisture Conditions: DRY dry
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Application Description

	A
Application Date	6/2/2023
Appl. Start Time	1:14 PM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROFOL
Applied By	Macvilay
Appl. Entry Date	7/24/2023
Air Temperature Start, Stop	84, 85 F
% Relative Humidity Start, Stop	60, 60
Wind Velocity+Dir. Start	7 MPH, SE
Wet Leaves (Y/N)	N, no
Soil Temperature	67 F
Soil Moisture	SLIWET
Soil Surface Condition	MEDIUM
% Cloud Cover	10
Next Moisture Occurred On	6/4/2023
Time to Next Moisture	2.0 DAY
Moisture 6 Hours after Appl.	0 IN
Moisture 24 Hours after Appl.	0, IN
Moisture 1 Week after Appl.	0.3 IN
Problems with Application?	N, no

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.
Trial ID: ACC2
Protocol ID: 23-200 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMD, BCOR
Days after Emergence	21
Stage Majority, Percent	V3, -
Stage Minimum, Percent	V3, -
Stage Maximum, Percent	V4, -
Height Average	6 IN
Height Minimum, Maximum	5, 7

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	ABUTH, W, DESC
Stage Majority, Percent	5 LEAF, -
Stage Minimum, Percent	4 LEAF, -
Stage Maximum, Percent	6 LEAF, -
Height Average	3 IN
Height Minimum, Maximum	2, 4
Density Average	1 FT2
Density Minimum, Maximum	1, 2
Pest 2 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	8 LEAF, -
Stage Minimum, Percent	6 LEAF, -
Stage Maximum, Percent	10 LEA, -
Height Average	4 IN
Height Minimum, Maximum	3, 5
Density Average	23 FT2
Density Minimum, Maximum	20, 25
Pest 3 Code, Type, Scale	CHEAL, W, DESC
Stage Majority, Percent	6 LEAF, -
Stage Minimum, Percent	4 LEAF, -
Stage Maximum, Percent	8 LEAF, -
Height Average	2 IN
Height Minimum, Maximum	1, 3
Density Average	3 FT2
Density Minimum, Maximum	1, 5

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.
Trial ID: ACC2
Protocol ID: 23-200 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

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
Ground Speed	3 MPH
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/13/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

The PRE application of Moccasin II PLUS was not applied to allow more common waterhemp emergence for POST treatments evaluations.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC2
Protocol ID: 23-200 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

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	ABUTH	AMATA	CHEAL	ZEAMD
Rating Date								6/10/2023	6/10/2023	6/10/2023	6/10/2023	6/16/2023
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	V8
Trt-Eval Interval								8 DA-A	8 DA-A	8 DA-A	8 DA-A	14 DA-A
1	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		0	99	23	99	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		0	99	57	99	0
	Motif	4	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		0	99	78	99	0
	Tough 5EC	5	EC	8	FL OZ/A	POST	A					
	Motif	4	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		0	99	80	99	0
	Tough R	5	EC	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		0	99	90	99	0
	Tough R	5	EC	16	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								.	.	9.1	.	.
Standard Deviation								0.0	0.0	4.8	0.0	0.0
CV								0.0	0.0	7.36	0.0	0.0

Could not calculate LSD (% mean diff) for columns 1,2,4,5,6,8,9,11,12,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC2
Protocol ID: 23-200 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

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	CHEAL	ABUTH	AMATA
Rating Date								6/16/2023	6/16/2023	6/16/2023	7/1/2023	7/1/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								3-7 IN	3-7 IN	3-7 IN		3-15 IN
Trt-Eval Interval								14 DA-A	14 DA-A	14 DA-A	29 DA-A	29 DA-A
1	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	23	99	99	20
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A					
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A					
2	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	82	99	99	90
	Motif	4	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	95	99	99	99
	Tough 5EC	5	EC	8	FL OZ/A	POST	A					
	Motif	4	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	96	99	99	98
	Tough R	5	EC	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	99	99	99	99
	Tough R	5	EC	16	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								.	8.8	.	.	7.8
Standard Deviation								0.0	4.7	0.0	0.0	4.1
CV								0.0	5.9	0.0	0.0	5.09

Could not calculate LSD (% mean diff) for columns 1,2,4,5,6,8,9,11,12,14 because error mean square = 0.
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Iowa State University

Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC2
Protocol ID: 23-200 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14
Pest Code								CHEAL	ABUTH	AMATA	CHEAL
Rating Date								7/1/2023	7/14/2023	7/14/2023	7/14/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%
Pest Stage Majority/Min/Max										4-18 IN	
Trt-Eval Interval								29 DA-A	42 DA-A	42 DA-A	42 DA-A
1	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	99	20	99
	Roundup PowerMAX 3	4.8	SL	20	FL OZ/A	POST	A				
	N-Pak AMS Liquid		L	2.5	% V/V	POST	A				
2	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	99	90	99
	Motif	4	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	99	99	99
	Tough 5EC	5	EC	8	FL OZ/A	POST	A				
	Motif	4	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	99	98	99
	Tough R	5	EC	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	Moccasin II PLUS	7.64	EC	0.67	PT/A	PRE		99	99	99	99
	Tough R	5	EC	16	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								.	.	5.0	.
Standard Deviation								0.0	0.0	2.7	0.0
CV								0.0	0.0	3.28	0.0

Could not calculate LSD (% mean diff) for columns 1,2,4,5,6,8,9,11,12,14 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Tough R and Tough R + Atrazine for POST Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC2
Protocol ID: 23-200 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

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 Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.
Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/2/2023
Initiation Date: 5/3/2023
Completion Date: 10/17/2023

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

Latitude of LL Corner °: 42.00486 N
Longitude of LL Corner °: -93.675427 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to showcase efficacy of ADAMA's Temper, Temper HL and Temper More for control of troublesome weeds in corn.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/22/2023 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/3/2023 **Planting Rate:** 35000 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: 66 F **Soil Moisture:** DRY dry
Emergence Date: 5/12/2023
Harvest Date: 10/17/2023 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 15.5 **Harvested Length:** 22 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/22/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/22/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/22/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/22/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 7 **Plots:** 28 **Study Design:** RACOBL Randomized Complete Block (RCB)

Iowa State University

Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

No.	Previous Crop	Year
1.	GLXMA	2022

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 17%.

Soil Description
Description Name: 43
% Sand: 32 **% OM:** 6.1 **Texture:** C clay
% Silt: 25 **Soil Name:** CANISTEO
% Clay: 43 **Fert. Level:** E excellent
pH: 7.5 **CEC:** 39.4
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.5 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN
17.	9/10/2023	0.4	IN
18.	9/19/2023	1.3	IN
19.	9/22/2023	0.1	IN
20.	10/12/2023	0.4	IN
21.	10/13/2023	1.4	IN

Iowa State University

Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/7/2023	6/5/2023
Appl. Start Time	12:00 PM	5:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Applied By	Franzenburg	Macvilay
Appl. Entry Date	9/22/2023	9/22/2023
Air Temperature Start, Stop	69, 69 F	86, 86 F
% Relative Humidity Start, Stop	75, 75	37, 37
Wind Velocity+Dir. Start	2 MPH, ESE	7 MPH, SE
Wet Leaves (Y/N)		N, no
Soil Temperature	66 F	80 F
Soil Moisture	WET	DRY
Soil Surface Condition	MEDIUM	MEDIUM
% Cloud Cover	50	0
Next Moisture Occurred On	5/7/2023	6/17/2023
Time to Next Moisture	12.0 HR	12.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	0.4, IN	0, IN
Moisture 1 Week after Appl.	1.4 IN	0 IN
Problems with Application?	N, no	N, no

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-5	24
Stage Majority, Percent		V6, -
Stage Minimum, Percent		V5, -
Stage Maximum, Percent		V6, -
Height Average		19 IN
Height Minimum, Maximum		17, 20

Iowa State University

Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.
Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		6 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		8 LEAF, -
Height Average		5 IN
Height Minimum, Maximum		2, 9
Density Average		17 PLOT
Density Minimum, Maximum		15, 20
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		6 LEAF, -
Stage Minimum, Percent		4 LEAF, -
Stage Maximum, Percent		7 LEAF, -
Height Average		4 IN
Height Minimum, Maximum		2, 5
Density Average		28 PLOT
Density Minimum, Maximum		25, 30
Pest 3 Code, Type, Scale	CHEAL, W, DESC	CHEAL, W, DESC
Pest 4 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		COTYLE, -
Stage Maximum, Percent		7 LEAF, -
Height Average		3 IN
Height Minimum, Maximum		1, 5
Density Average		23 PLOT
Density Minimum, Maximum		20, 25

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
Ground Speed	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/17/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/22/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Iowa State University

Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	ABUTH	AMATA	CHEAL	IPOHE
Rating Date								6/13/2023	6/13/2023	6/13/2023	6/13/2023	6/13/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								V8	3-8 IN	3-12 IN	3-8 IN	3-8 IN
Trt-Eval Interval								8 DA-B	8 DA-B	8 DA-B	8 DA-B	8 DA-B
1	Untreated Check							0	0	0	0	0
2	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	73	76	99	68
3	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	96	99	99	95
	Temper		SL	31	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
4	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	94	99	99	96
	Temper HL		SL	25	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
5	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	97	99	99	95
	Temper More		SL	41	FL OZ/A	POST	B					
	Poweral		L	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
6	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	96	99	99	98
	Temper More		SL	41	FL OZ/A	POST	B					
	Callisto	4	SC	3	FL OZ/A	POST	B					
	Poweral		L	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
7	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	97	90	99	85
	Halex GT	4.39	CS	64	FL OZ/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
LSD P=.05								.	8.3	4.3	.	7.3
Standard Deviation								0.0	5.6	2.9	0.0	4.9
CV								0.0	7.08	3.6	0.0	6.46

Could not calculate LSD (% mean diff) for columns 1,4,6,11 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	ABUTH	AMATA	CHEAL	IPOHE
Rating Date								6/20/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								V9	6-20 IN	3-12 IN	3-8 IN	1-20 IN
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	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	70	76	98	65
3	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	97	99	99	96
	Temper		SL	31	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
4	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	97	99	99	97
	Temper HL		SL	25	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
5	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	98	99	99	94
	Temper More		SL	41	FL OZ/A	POST	B					
	Poweral		L	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
6	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	99	99	99	98
	Temper More		SL	41	FL OZ/A	POST	B					
	Callisto	4	SC	3	FL OZ/A	POST	B					
	Poweral		L	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
7	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	99	95	99	93
	Halex GT	4.39	CS	64	FL OZ/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
LSD P=.05								.	10.7	3.3	1.1	8.4
Standard Deviation								0.0	7.2	2.2	0.8	5.7
CV								0.0	8.99	2.73	0.89	7.33

Could not calculate LSD (% mean diff) for columns 1,4,6,11 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	ABUTH	AMATA	CHEAL	IPOHE
Rating Date								7/3/2023	7/3/2023	7/3/2023	7/3/2023	7/3/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max									12-60 IN	10-40 IN	10-40 IN	1-60 IN
Trt-Eval Interval								28 DA-B	28 DA-B	28 DA-B	28 DA-B	28 DA-B
1	Untreated Check							0	0	0	0	0
2	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	65	76	94	64
3	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	97	99	99	93
	Temper		SL	31	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
4	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	96	99	99	96
	Temper HL		SL	25	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
5	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	98	99	99	92
	Temper More		SL	41	FL OZ/A	POST	B					
	Poweral		L	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
6	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	99	99	99	95
	Temper More		SL	41	FL OZ/A	POST	B					
	Callisto	4	SC	3	FL OZ/A	POST	B					
	Poweral		L	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
7	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	0	99	97	99	91
	Halex GT	4.39	CS	64	FL OZ/A	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
LSD P=.05								.	7.9	3.0	5.3	9.0
Standard Deviation								0.0	5.3	2.0	3.6	6.0
CV								0.0	6.72	2.52	4.27	7.97

Could not calculate LSD (% mean diff) for columns 1,4,6,11 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 6/28/2023 STAOBJ 17.5 ft V12 23 DA-B 16	ZEAMD 10/17/2023 YIELD bu/ac R6 134 DA-B 17
1	Untreated Check							35	165
2	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	38	267
3	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	36	275
	Temper		SL	31	FL OZ/A	POST	B		
	AMS		SG	17	LB/100 GAL	POST	B		
4	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	37	259
	Temper HL		SL	25	FL OZ/A	POST	B		
	AMS		SG	17	LB/100 GAL	POST	B		
5	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	38	268
	Temper More		SL	41	FL OZ/A	POST	B		
	Poweral		L	8	FL OZ/A	POST	B		
	AMS		SG	17	LB/100 GAL	POST	B		
6	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	33	285
	Temper More		SL	41	FL OZ/A	POST	B		
	Callisto	4	SC	3	FL OZ/A	POST	B		
	Poweral		L	8	FL OZ/A	POST	B		
	AMS		SG	17	LB/100 GAL	POST	B		
7	Parallel Plus	5.5	EC	48	FL OZ/A	PRE	A	35	281
	Halex GT	4.39	CS	64	FL OZ/A	POST	B		
	NIS		L	0.25	% V/V	POST	B		
	AMS		SG	17	LB/100 GAL	POST	B		
LSD P=.05								3.2	28.8
Standard Deviation								2.1	19.4
CV								5.96	7.55

Could not calculate LSD (% mean diff) for columns 1,4,6,11 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Temper, Temper HL & Temper More for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC3
Protocol ID: 22007223 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = 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

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.
Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 12/5/2023
Initiation Date: 5/30/2023
Completion Date: 10/17/2023

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

Latitude of LL Corner °: 42.004474 N
Longitude of LL Corner °: -92.675094 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Maverick efficacy in a two-pass program compared to other commercially available programs.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/19/2023 **Stage Scale:** VR
Variety: Syngenta NK0472-DV-EZ1
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/30/2023 **Planting Rate:** 35600 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: 77 F **Soil Moisture:** DRY dry
Emergence Date: 6/4/2023
Harvest Date: 10/17/2023 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 15.5 **Harvested Length:** 20 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/19/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/19/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/19/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/19/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 7 **Plots:** 28 **Study Design:** RACOBL Randomized Complete Block (RCB)

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

No.	Previous Crop	Year
1.	GLXMA	2022

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included one pass with a field cultivator on each May 22 and May 30 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 13%.

Soil Description
Description Name: 37
% Sand: 43 **% OM:** 4.4 **Texture:** CL clay loam
% Silt: 24 **Soil Name:** NICOLLET
% Clay: 33 **Fert. Level:** E excellent
pH: 6.6 **CEC:** 23.3
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN
17.	9/10/2023	0.4	IN
18.	9/19/2023	1.3	IN
19.	9/22/2023	0.1	IN
20.	10/12/2023	0.4	IN
21.	10/13/2023	1.4	IN

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/31/2023	6/16/2023
Appl. Start Time	4:30 PM	12:40 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Applied By	Franzenburg	Macvilay
Appl. Entry Date	9/19/2023	9/19/2023
Air Temperature Start, Stop	85, 85 F	72, 73 F
% Relative Humidity Start, Stop	49, 49	53, 53
Wind Velocity+Dir. Start	9 MPH, S	7 MPH, E
Wet Leaves (Y/N)		N, no
Soil Temperature	75 F	73 F
Soil Moisture	DRY	DRY
Soil Surface Condition	MEDIUM	
% Cloud Cover	40	100
Next Moisture Occurred On	6/1/2023	6/17/2023
Time to Next Moisture	1.0 DAY	1.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	0.4, IN	1.2, IN
Moisture 1 Week after Appl.	0.7 IN	1.2 IN
Problems with Application?	N, no	N, no

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-4	12
Stage Majority, Percent		V3, -
Stage Minimum, Percent		V3, -
Stage Maximum, Percent		V4, -
Height Average		6 IN
Height Minimum, Maximum		5, 7

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent		2 LEAF, -
Stage Minimum, Percent		1 LEAF, -
Stage Maximum, Percent		3 LEAF, -
Height Average		2 IN
Height Minimum, Maximum		1, 3
Density Average		6 FT2
Density Minimum, Maximum		3, 9
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		1 LEAF, -
Stage Minimum, Percent		COTYLE, -
Stage Maximum, Percent		2 LEAF, -
Height Average		1.5 IN
Height Minimum, Maximum		1, 2
Density Average		3 FT2
Density Minimum, Maximum		0, 5
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		3 LEAF, -
Height Average		1 IN
Density Average		2 FT2
Density Minimum, Maximum		1, 3
Pest 4 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		2 LEAF, -
Stage Minimum, Percent		1 LEAF, -
Stage Maximum, Percent		3 LEAF, -
Height Average		2 IN
Height Minimum, Maximum		1, 3
Density Average		4 FT2
Density Minimum, Maximum		2, 6

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
Ground Speed	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Notes

Context	Date	By	Notes
STATUS	4/15/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/19/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	12/5/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Ivyleaf morningglory pressure was very heavy in some areas of the experiment.

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE
	Rating Date							6/14/2023	6/14/2023	6/14/2023	6/14/2023	6/14/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V3	1-2 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	Acuron	3.44	ZC	1.5	QT/A	PRE	A	0	91	96	95	33
	Acuron	3.44	ZC	1.5	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	0	90	60	90	28
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	0	94	88	97	30
	Resicore XL	3.26	ZC	1.4	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	0	92	91	96	30
	Kyro	3.07	L	45	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	70	92	96	33
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	86	90	97	33
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							.	9.1	13.1	5.3	19.4
	Standard Deviation							0.0	6.0	8.8	3.6	13.0
	CV							0.0	8.1	11.95	4.36	49.31

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

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE
	Rating Date							6/23/2023	6/30/2023	6/30/2023	6/30/2023	6/30/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V7				1 IN
	Trt-Eval Interval							7 DA-B	14 DA-B	14 DA-B	14 DA-B	14 DA-B
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	1.5	QT/A	PRE	A	9	99	99	99	90
	Acuron	3.44	ZC	1.5	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	0	97	99	99	80
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	0	99	99	99	79
	Resicore XL	3.26	ZC	1.4	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	0	99	99	99	78
	Kyro	3.07	L	45	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	99	99	99	90
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	99	99	99	94
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							1.4	2.7	.	.	9.3
	Standard Deviation							0.9	1.8	0.0	0.0	6.3
	CV							75.59	2.13	0.0	0.0	8.64

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

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE
	Rating Date							7/8/2023	7/8/2023	7/8/2023	7/8/2023	7/8/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V9	3-10 IN	1-3 IN	1-8 IN	1-10 IN
	Trt-Eval Interval							22 DA-B	22 DA-B	22 DA-B	22 DA-B	22 DA-B
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	1.5	QT/A	PRE	A	5	99	99	98	84
	Acuron	3.44	ZC	1.5	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	0	97	99	99	78
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	0	99	99	99	78
	Resicore XL	3.26	ZC	1.4	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	0	98	98	98	76
	Kyro	3.07	L	45	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	97	99	99	89
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	Maverick	2.04	SC	18	FL OZ/A	PRE	A	0	99	99	99	94
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							.	2.9	1.2	1.4	11.7
	Standard Deviation							0.0	2.0	0.8	1.0	7.8
	CV							0.0	2.33	0.92	1.15	11.03

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

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE	SETFA
	Rating Date							7/14/2023	7/14/2023	7/14/2023	7/14/2023	10/6/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-10 IN	1-4 IN	1-17 IN	1-18 IN	3-10 IN
	Trt-Eval Interval							28 DA-B	28 DA-B	28 DA-B	28 DA-B	112 DA-B
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	1.5	QT/A	PRE	A	99	99	98	84	99
	Acuron	3.44	ZC	1.5	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	97	99	98	73	97
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	99	99	99	78	99
	Resicore XL	3.26	ZC	1.4	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	98	98	98	71	99
	Kyro	3.07	L	45	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Maverick	2.04	SC	18	FL OZ/A	PRE	A	97	99	99	88	97
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	Maverick	2.04	SC	18	FL OZ/A	PRE	A	99	99	99	93	99
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							2.9	1.2	1.9	13.0	1.6
	Standard Deviation							2.0	0.8	1.3	8.8	1.1
	CV							2.33	0.92	1.52	12.67	1.27

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

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE	ZEAMD	ZEAMD
	Rating Date							10/6/2023	10/6/2023	10/6/2023	7/7/2023	10/17/2023
	Rating Type							CONTRO	CONTRO	CONTRO	STAOBJ	YIELD
	Rating Unit/Min/Max							%	%	%	17.5 ft	bu/ac
	Pest Stage Majority/Min/Max							1-4 IN	1-17 IN	5-60 IN	V18	R6
	Trt-Eval Interval							112 DA-B	112 DA-B	112 DA-B	21 DA-B	123 DA-B
1	Untreated Check							0	0	0	31	182
2	Acuron	3.44	ZC	1.5	QT/A	PRE	A	99	98	84	33	246
	Acuron	3.44	ZC	1.5	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
3	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	99	98	73	31	234
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
4	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	99	99	73	32	242
	Resicore XL	3.26	ZC	1.4	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
5	Resicore XL	3.26	ZC	1.4	QT/A	PRE	A	98	99	69	32	225
	Kyro	3.07	L	45	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
6	Maverick	2.04	SC	18	FL OZ/A	PRE	A	99	99	88	34	243
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	Maverick	2.04	SC	18	FL OZ/A	PRE	A	99	99	91	33	239
	Maverick	2.04	SC	14	FL OZ/A	POST	B					
	Aatrex 4L	4	F	1	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							1.2	1.6	12.3	2.8	15.9
	Standard Deviation							0.8	1.1	8.3	1.9	10.6
	CV							0.92	1.3	12.18	5.86	4.62

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

Iowa State University

Maverick Two-Pass Comparisons with Acuron, Resicore XL, Kyro & Bicep II Magnum in Conventional Tillage, Ames, IA, 2023.

Trial ID: ACC 4
Protocol ID: VUSA2023MAVERICHMD6802 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = 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

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.
Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Discipline: H herbicide
Status: I one-year/interim
ARM Trial Created On: 5/2/2023
Initiation Date: 5/3/2023 **Planned Completion Date:** 11/1/2023

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

Latitude of LL Corner °: 42.004833 N
Longitude of LL Corner °: -93.6746 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare Albaugh residual corn herbicides to other standards.

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/18/2023 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/3/2023 **Planting Rate:** 35000 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: 60 F **Soil Moisture:** DRY dry
Emergence Date: 5/12/2023
Harvest Date: 10/17/2023 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 15.5 **Harvested Length:** 20 FT
Weighing Equipment: HARVESTMASTER

Site and Design
Treated Plot Width: 6.7 m **Site Type:** FIELD field
Treated Plot Length: 25 m **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 167.5 m2 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 9 **Plots:** 36 **Study Design:** RACOBL Randomized Complete Block (RCB)

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 44
% Sand: 45 **% OM:** 4.8 **Texture:** CL clay loam
% Silt: 20 **Soil Name:** CANISTEO
% Clay: 35 **Fert. Level:** E excellent
pH: 7.2 **CEC:** 32.9
Soil Drainage: F fair

Iowa State University

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.
Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN
17.	9/10/2023	0.4	IN
18.	9/19/2023	1.3	IN
19.	9/22/2023	0.1	IN
20.	10/12/2023	0.4	IN
21.	10/13/2023	1.4	IN

Iowa State University

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.
Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Application Description

	A
Application Date	5/5/2023
Appl. Start Time	12:24 PM
Appl. Stop Time	12:49 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROSOI
Applied By	Franzenburg
Appl. Entry Date	9/18/2023
Air Temperature Start, Stop	68, 69 F
% Relative Humidity Start, Stop	69, 69
Wind Velocity+Dir. Start	9 MPH, S
Soil Temperature	59 F
Soil Moisture	DRY
Soil Surface Condition	MEDIUM
% Cloud Cover	90
Next Moisture Occurred On	5/5/2023
Time to Next Moisture	6.0 HR
Moisture 6 Hours after Appl.	0 IN
Moisture 24 Hours after Appl.	1.1, IN
Moisture 1 Week after Appl.	2.3 IN
Problems with Application?	N, no

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMD, BCOR
Days after Emergence	-7

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
Ground Speed	3 MPH
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/18/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/18/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).

Iowa State University

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.
Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trial Comments

Plenty of rainfall occurred immediately following PRE applications for herbicide incorporation.

Iowa State University

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

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	ABUTH	AMATA	CHEAL	IPOHE	ZEAMD
Rating Date								5/15/2023	5/15/2023	5/15/2023	5/15/2023	5/15/2023	5/22/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	PHYGEN
Rating Unit/Min/Max								%	%	%	%	%	%
Pest Stage Majority/Min/Max								VC	0.125 IN	0.125 IN	0.125 IN	0.125 IN	V2
Trt-Eval Interval								10 DA-A	10 DA-A	10 DA-A	10 DA-A	10 DA-A	17 DA-A
1	Durus	5.07	SC	2.6	QT/A	PRE	A	0	97	99	99	75	0
2	Durus	5.07	SC	2.6	QT/A	PRE	A	0	99	99	99	70	0
	Caballero	2	L	6	FL OZ/A	PRE	A						
3	Priority MA	3.58	SC	3.5	QT/A	PRE	A	0	97	99	99	75	0
4	Priority MA	3.58	SC	3.5	QT/A	PRE	A	0	98	99	99	75	0
	Caballero	2	L	6	FL OZ/A	PRE	A						
5	SureStart II	4.25	SE	1.5	PT/A	PRE	A	0	68	99	99	60	0
6	Acuron	3.44	ZC	3	QT/A	PRE	A	0	99	99	99	70	0
7	Resicore	3.29	L	2.75	QT/A	PRE	A	0	99	99	99	65	0
8	Maverick	2.04	SC	28	FL OZ/A	PRE	A	0	98	99	99	70	0
9	Untreated Check							0	0	0	0	0	0
LSD P=.05								.	5.7	.	.	17.8	.
Standard Deviation								0.0	3.9	0.0	0.0	12.2	0.0
CV								0.0	4.65	0.0	0.0	19.62	0.0

Could not calculate LSD (% mean diff) for columns 1,3,4,6,8,9,10 because error mean square = 0.
^Calculated from residual.

Iowa State University

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

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	ZEAMD	ABUTH	AMATA
Rating Date								5/22/2023	5/22/2023	5/22/2023	5/28/2023	5/28/2023	5/28/2023
Rating Type								CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%	%
Pest Stage Majority/Min/Max								0.5 IN	0.5 IN	0.5 IN	V4	0.5 IN	0.5 IN
Trt-Eval Interval								17 DA-A	17 DA-A	17 DA-A	23 DA-A	23 DA-A	23 DA-A
1	Durus	5.07	SC	2.6	QT/A	PRE	A	97	99	99	0	90	99
2	Durus	5.07	SC	2.6	QT/A	PRE	A	99	99	99	0	96	99
	Caballero	2	L	6	FL OZ/A	PRE	A						
3	Priority MA	3.58	SC	3.5	QT/A	PRE	A	99	99	99	0	91	98
4	Priority MA	3.58	SC	3.5	QT/A	PRE	A	99	99	99	0	96	99
	Caballero	2	L	6	FL OZ/A	PRE	A						
5	SureStart II	4.25	SE	1.5	PT/A	PRE	A	85	99	99	0	90	95
6	Acuron	3.44	ZC	3	QT/A	PRE	A	99	99	99	0	95	98
7	Resicore	3.29	L	2.75	QT/A	PRE	A	99	99	99	0	93	99
8	Maverick	2.04	SC	28	FL OZ/A	PRE	A	98	99	99	0	95	97
9	Untreated Check							0	0	0	0	0	0
LSD P=.05								5.6	.	.	.	6.2	1.8
Standard Deviation								3.8	0.0	0.0	0.0	4.3	1.2
CV								4.42	0.0	0.0	0.0	5.15	1.41

Could not calculate LSD (% mean diff) for columns 1,3,4,6,8,9,10 because error mean square = 0.
^Calculated from residual.

Iowa State University

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	CHEAL 5/28/2023 CONTRO % 0.5 IN 23 DA-A	IPOHE 5/28/2023 CONTRO % 1.0 IN 23 DA-A	ABUTH 6/3/2023 CONTRO % 1-3 IN 29 DA-A	AMATA 6/3/2023 CONTRO % 2-5 IN 29 DA-A	CHEAL 6/3/2023 CONTRO % 1-2 IN 29 DA-A	IPOHE 6/3/2023 CONTRO % 1-6 IN 29 DA-A
								13	14	15	16	17	18
1	Durus	5.07	SC	2.6	QT/A	PRE	A	99	85	89	99	99	85
2	Durus	5.07	SC	2.6	QT/A	PRE	A	99	97	98	99	99	89
	Caballero	2	L	6	FL OZ/A	PRE	A						
3	Priority MA	3.58	SC	3.5	QT/A	PRE	A	99	85	95	97	99	80
4	Priority MA	3.58	SC	3.5	QT/A	PRE	A	99	90	96	97	99	83
	Caballero	2	L	6	FL OZ/A	PRE	A						
5	SureStart II	4.25	SE	1.5	PT/A	PRE	A	99	71	93	91	99	70
6	Acuron	3.44	ZC	3	QT/A	PRE	A	99	89	98	93	99	81
7	Resicore	3.29	L	2.75	QT/A	PRE	A	99	83	93	97	99	78
8	Maverick	2.04	SC	28	FL OZ/A	PRE	A	98	87	94	94	98	84
9	Untreated Check							0	0	0	0	0	0
LSD P=.05								1.0	14.6	4.3	4.2	1.0	15.5
Standard Deviation								0.7	10.0	3.0	2.9	0.7	10.6
CV								0.76	13.11	3.53	3.37	0.76	14.71

Could not calculate LSD (% mean diff) for columns 1,3,4,6,8,9,10 because error mean square = 0.
^Calculated from residual.

Iowa State University

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ABUTH 6/12/2023 CONTRO % 2-7 IN 38 DA-A	AMATA 6/12/2023 CONTRO % 1-12 IN 38 DA-A	CHEAL 6/12/2023 CONTRO % 1-4 IN 38 DA-A	IPOHE 6/12/2023 CONTRO % 1-12 IN 38 DA-A
	Pest Code										
	Rating Date							6/12/2023	6/12/2023	6/12/2023	6/12/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%
	Pest Stage Majority/Min/Max							2-7 IN	1-12 IN	1-4 IN	1-12 IN
	Trt-Eval Interval							38 DA-A	38 DA-A	38 DA-A	38 DA-A
								19	20	21	22
1	Durus	5.07	SC	2.6	QT/A	PRE	A	88	93	98	78
2	Durus	5.07	SC	2.6	QT/A	PRE	A	98	98	99	84
	Caballero	2	L	6	FL OZ/A	PRE	A				
3	Priority MA	3.58	SC	3.5	QT/A	PRE	A	90	86	97	76
4	Priority MA	3.58	SC	3.5	QT/A	PRE	A	96	91	99	74
	Caballero	2	L	6	FL OZ/A	PRE	A				
5	SureStart II	4.25	SE	1.5	PT/A	PRE	A	90	85	99	70
6	Acuron	3.44	ZC	3	QT/A	PRE	A	97	88	99	78
7	Resicore	3.29	L	2.75	QT/A	PRE	A	88	94	99	69
8	Maverick	2.04	SC	28	FL OZ/A	PRE	A	93	86	95	80
9	Untreated Check							0	0	0	0
	LSD P=.05							7.0	7.7	3.1	13.8
	Standard Deviation							4.8	5.2	2.1	9.5
	CV							5.88	6.56	2.42	14.0

Could not calculate LSD (% mean diff) for columns 1,3,4,6,8,9,10 because error mean square = 0.
^Calculated from residual.

Iowa State University

Preemergence Herbicides Including Durus, Caballero, Priority MA, SureStart II, Acruon, Resicore & Maverick for Weed Control in Corn, Ames, IA, 2023.

Trial ID: ACC5
Protocol ID: Albaugh Corn Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator:

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
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

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/2/2023
Initiation Date: 5/3/2023
Completion Date: 6/30/2023

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

Latitude of LL Corner °: 42.004867 N
Longitude of LL Corner °: -93.674653 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Maverick for PRE weed control in comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/3/2023 **Planting Rate:** 35000 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: 63 F **Soil Moisture:** DRY dry
Emergence Date: 5/12/2023

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/18/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/18/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/18/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/18/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 8 **Plots:** 24 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

Iowa State University

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 44
% Sand: 45 **% OM:** 4.8 **Texture:** CL clay loam
% Silt: 20 **Soil Name:** CANISTEO
% Clay: 35 **Fert. Level:** E excellent
pH: 7.2 **CEC:** 32.9
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN

Iowa State University

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/4/2023	6/15/2023
Appl. Start Time	4:59 PM	10:44 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Applied By	Macvilay	Macvilay
Appl. Entry Date	7/24/2023	7/24/2023
Air Temperature Start, Stop	79, 79 F	82, 83 F
% Relative Humidity Start, Stop	20, 20	40, 40
Wind Velocity+Dir. Start	10 MPH, SSW	6 MPH, NW
Wet Leaves (Y/N)		N, no
Soil Temperature	59 F	67 F
Soil Moisture	DRY	DRY
Soil Surface Condition	MEDIUM	
% Cloud Cover	0	100
Next Moisture Occurred On	5/5/2023	6/17/2023
Time to Next Moisture	1.0 DAY	2.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	1.1, IN	0, IN
Moisture 1 Week after Appl.	2.3 IN	1.2 IN
Problems with Application?	N, no	N, no

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-8	34
Stage Majority, Percent		V3, -
Stage Minimum, Percent		V3, -
Stage Maximum, Percent		V4, -
Height Average		6 IN
Height Minimum, Maximum		5, 7

Iowa State University

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		7 LEAF, -
Stage Minimum, Percent		4 LEAF, -
Stage Maximum, Percent		9 LEAF, -
Height Average		14 IN
Height Minimum, Maximum		10, 18
Density Average		5 PLOT
Density Minimum, Maximum		0, 9
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		8 LEAF, -
Stage Minimum, Percent		4 LEAF, -
Stage Maximum, Percent		9 LEAF, -
Height Average		8 IN
Height Minimum, Maximum		4, 13
Density Average		5 PLOT
Density Minimum, Maximum		0, 8
Pest 3 Code, Type, Scale	CHEAL, W, DESC	CHEAL, W, DESC
Stage Majority, Percent		NUMERO, -
Stage Minimum, Percent		NUMERO, -
Stage Maximum, Percent		NUMERO, -
Height Average		9 IN
Height Minimum, Maximum		7, 12
Density Average		2 PLOT
Density Minimum, Maximum		0, 3
Pest 4 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		5 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		7 LEAF, -
Height Average		7 IN
Height Minimum, Maximum		3, 11
Density Average		2 FT2
Density Minimum, Maximum		0, 5

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
Ground Speed	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Iowa State University

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Notes

Context	Date	By	Notes
STATUS	4/14/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/18/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Plenty of rainfall occurred shortly after PRE applications for herbicide incorporation.

Iowa State University

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	ZEAMD	ABUTH	AMATA	CHEAL
	Rating Date							5/19/2023	6/5/2023	6/5/2023	6/5/2023	6/5/2023
	Rating Type							PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V1	V6	2-6 IN	1-4 IN	1-3 IN
	Trt-Eval Interval							15 DA-A	32 DA-A	32 DA-A	32 DA-A	32 DA-A
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	3	QT/A	PRE	A	0	0	99	95	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					
3	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	0	0	37	78	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	Resicore XL	3.26	ZC	88	FL OZ/A	PRE	A	0	0	99	95	98
	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	Maverick	2.04	SC	24	FL OZ/A	PRE	A	0	0	99	93	96
	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
	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	96	98	98
	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	SC	20	FL OZ/A	PRE	A	0	0	99	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					
	LSD P=.05							.	.	4.4	6.8	2.4
	Standard Deviation							0.0	0.0	2.5	3.9	1.4
	CV							0.0	0.0	3.19	4.73	1.61

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

Iowa State University

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	IPOHE	ABUTH	AMATA	CHEAL	IPOHE
	Pest Code							IPOHE	ABUTH	AMATA	CHEAL	IPOHE
	Rating Date							6/5/2023	6/15/2023	6/15/2023	6/15/2023	6/15/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0.5-6 IN	2-20 IN	3-18 IN	2-10 IN	1-15 IN
	Trt-Eval Interval							32 DA-A	42 DA-A	42 DA-A	42 DA-A	42 DA-A
								6	7	8	9	10
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	3	QT/A	PRE	A	70	99	88	99	65
	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					
3	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	40	37	75	98	40
	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	Resicore XL	3.26	ZC	88	FL OZ/A	PRE	A	53	99	90	98	48
	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	Maverick	2.04	SC	24	FL OZ/A	PRE	A	57	99	90	93	50
	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	63	96	95	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					
7	Maverick	2.04	SC	1	QT/A	PRE	A	72	95	93	95	65
	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	SC	20	FL OZ/A	PRE	A	70	99	95	99	67
	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							14.8	4.4	9.4	2.7	17.9
	Standard Deviation							8.4	2.5	5.4	1.5	10.2
	CV							15.89	3.21	6.86	1.8	20.6

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

Iowa State University

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ABUTH 6/30/2023 CONTRO % 2-20 IN 57 DA-A	AMATA 6/30/2023 CONTRO % 3-18 IN 57 DA-A	CHEAL 6/30/2023 CONTRO % 2-10 IN 57 DA-A	IPOHE 6/30/2023 CONTRO % 1-15 IN 57 DA-A
	Pest Code										
	Rating Date							6/30/2023	6/30/2023	6/30/2023	6/30/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%
	Pest Stage Majority/Min/Max							2-20 IN	3-18 IN	2-10 IN	1-15 IN
	Trt-Eval Interval							57 DA-A	57 DA-A	57 DA-A	57 DA-A
								11	12	13	14
1	Untreated Check							0	0	0	0
2	Acuron	3.44	ZC	3	QT/A	PRE	A	99	82	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				
3	Bicep II Magnum	5.5	SC	2.1	QT/A	PRE	A	92	63	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				
4	Resicore XL	3.26	ZC	88	FL OZ/A	PRE	A	99	83	98	65
	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	Maverick	2.04	SC	24	FL OZ/A	PRE	A	99	82	96	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				
6	Maverick	2.04	SC	1	QT/A	PRE	A	99	93	99	77
	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	98	90	99	73
	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	SC	20	FL OZ/A	PRE	A	99	95	99	77
	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							2.2	10.7	1.9	12.8
	Standard Deviation							1.3	6.1	1.1	7.3
	CV							1.47	8.35	1.29	11.66

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

Iowa State University

Maverick for PRE Weed Control in Comparison with Bicep II Magnum, Acuron, Resicore XL & TriVolt, Ames, IA, 2023.
Trial ID: ACC6
Protocol ID: VUSA2023MAVERICHMD68.01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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
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

Yukon Green Snap in Corn, Ames, IA, 2023.

Trial ID: ACC7
Protocol ID: YUK-23-01 Greensnap Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/2/2023
Initiation Date: 5/3/2023
Completion Date: 8/1/2023

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

Latitude of LL Corner °: 42.00483 N
Longitude of LL Corner °: -93.674052 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate various herbicide treatments on corn stand.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/22/2023 **Stage Scale:** VR
Variety: Dekalb DKC 60-88 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/3/2023 **Planting Rate:** 32000 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: 66 F **Soil Moisture:** DRY dry
Emergence Date: 5/12/2023

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 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 10 **Plots:** 40 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

Maintenance

No.	Date	Type	Maintenance Product Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Tank Mix Code	Tank Mix
1.	5/7/2023	HERB	Harness Xtra 5.6	5.6	LBA/GAL	L	2.3	QT/A	N	no

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 18%.

Harness Xtra 5.6 was applied PRE to the entire trial to maintain weed-free conditions.

Iowa State University

Yukon Green Snap in Corn, Ames, IA, 2023.

Trial ID: ACC7
Protocol ID: YUK-23-01 Greensnap Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Soil Description
Description Name: 46
% Sand: 45 **% OM:** 4.7 **Texture:** CL clay loam
% Silt: 21 **Soil Name:** CANISTEO
% Clay: 34 **Fert. Level:** E excellent
pH: 6.7 **CEC:** 31.9
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.5 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Application Description

	A
Application Date	6/5/2023
Appl. Start Time	4:30 PM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROFOL
Applied By	Macvilay
Appl. Entry Date	7/10/2023
Air Temperature Start, Stop	85, 85 F
% Relative Humidity Start, Stop	42, 42
Wind Velocity+Dir. Start	6 MPH, E
Wet Leaves (Y/N)	N, no
Soil Temperature	81 F
Soil Moisture	SLIWET
Soil Surface Condition	MEDIUM
% Cloud Cover	0
Next Moisture Occurred On	6/17/2023
Time to Next Moisture	12.0 DAY
Moisture 6 Hours after Appl.	0 IN
Moisture 24 Hours after Appl.	0, IN
Moisture 1 Week after Appl.	0 IN
Problems with Application?	N, no

Iowa State University

Yukon Green Snap in Corn, Ames, IA, 2023.

Trial ID: ACC7
Protocol ID: YUK-23-01 Greensnap Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMD, BCOR
Stage Majority, Percent	V5, -
Stage Minimum, Percent	V4, -
Stage Maximum, Percent	V6, -
Height Average	17 IN
Height Minimum, Maximum	15, 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	19 IN
Boom Length	10 FT
Ground Speed	3 MPH
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/4/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/10/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/10/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.
STATUS	9/22/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Green snap, root damage and root fusion data are total plant counts from rows 2 & 3 per plot that show the denoted damage. Stand counts were corn plant stand numbers averaged for 17.5 feet of row for rows 2 & 3.

Green snap was achieved by walking a pipe held at approximately 45% of corn plant height over rows 2 & 3 of each plot. Finding a percentage of plant height was necessary because a plant height gradient existed from one end of the study to the other. This height percentage was established by finding a height that caused significant snapping of corn in untreated areas.

"Root damage" data counted corn plants with any abnormal brace root growth including extended, curly or fused brace roots, and "root fusing" data counted plants with any fusing of two or more brace roots.

Iowa State University

Yukon Green Snap in Corn, Ames, IA, 2023.

Trial ID: ACC7
Protocol ID: YUK-23-01 Greensnap Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4
Pest Code								ZEAMD	ZEAMD	ZEAMD	ZEAMD
Rating Date								6/23/2023	7/3/2023	8/1/2023	6/28/2023
Rating Type								GREEN SNAP	root damage	root fusing	STAOBJ
Rating Unit/Min/Max								NUMBER	NUMBER	NUMBER	17.5 ft
Pest Stage Majority/Min/Max								45-60 IN	V16	R2	V15
Trt-Eval Interval								18 DA-A	28 DA-A	57 DA-A	23 DA-A
1	Untreated Check							16	6	4	26
2	Yukon	67.5	WG	4	OZ WT/A	POST	A	12	16	4	30
3	Yukon	67.5	WG	4	OZ WT/A	POST	A	13	15	4	30
	GWN 0014196	50	D	13.8	g/A	POST	A				
4	Permit	75	WG	0.5	OZ WT/A	POST	A	13	16	24	30
	Clarity	4	SL	16	FL OZ/A	POST	A				
5	Permit	75	WG	0.5	OZ WT/A	POST	A	13	21	17	30
	Clarity	4	SL	16	FL OZ/A	POST	A				
	GWN 0014196	50	D	50.4	g/A	POST	A				
6	Status	56	WG	5	OZ WT/A	POST	A	19	14	3	29
7	Distinct	70	WG	4	OZ WT/A	POST	A	14	15	6	29
8	Clarity	4	SL	4.4	FL OZ/A	POST	A	9	13	6	31
9	Clarity	4	SL	16	FL OZ/A	POST	A	13	19	30	31
10	DiFlexx	4	SC	16	FL OZ/A	POST	A	12	17	2	32
LSD P=.05								11.8	9.3	5.7	5.6
Standard Deviation								8.1	6.4	3.9	3.9
CV								60.96	42.17	39.62	13.1

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
Rating Type
STAOBJ = stand - objective (based on counts)
Rating Unit/Min/Max
NUMBER, , = number

^Calculated from residual.

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/2/2023
Initiation Date: 5/3/2023
Completion Date: 7/1/2023

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

Latitude of LL Corner °: 42.005048 N
Longitude of LL Corner °: -93.674445 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate BAS 821 and other standard corn herbicides with atrazine applied preemergence and postemergence for residual weed control.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Dekalb DKC 59-81 RIB
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/3/2023 **Planting Rate:** 35000 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: 63 F **Soil Moisture:** DRY dry
Emergence Date: 5/12/2023

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/5/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/5/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/5/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/5/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 11 **Plots:** 44 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivation on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 46
% Sand: 45 **% OM:** 4.7 **Texture:** CL clay loam
% Silt: 21 **Soil Name:** CANISTEO
% Clay: 34 **Fert. Level:** E excellent
pH: 6.7 **CEC:** 31.9
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C
Application Date	5/4/2023	5/18/2023	6/2/2023
Appl. Start Time	10:30 PM	3:00 PM	6:29 PM
Appl. Stop Time	10:59 PM		
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	EPOST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Applied By	Franzenburg	Franzenburg	Franzenburg
Appl. Entry Date	7/24/2023	7/24/2023	7/24/2023
Air Temperature Start, Stop	66, 66 F	83, 83 F	84, 84 F
% Relative Humidity Start, Stop	33, 33	33, 33	54, 54
Wind Velocity+Dir. Start	8 MPH, S	8 MPH, S	8 MPH, SE
Wind Velocity+Dir. Stop	8 MPH, S		
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	65 F	72 F	81 F
Soil Moisture	DRY	DRY	SLIWET
Soil Surface Condition	MEDIUM		
% Cloud Cover	20	80	50
Next Moisture Occurred On	5/5/2023	5/30/2023	6/4/2023
Time to Next Moisture	1.0 DAY	12.0 DAY	2.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	1.1, IN	0, IN	0, IN
Moisture 1 Week after Appl.	2.1 IN	0 IN	0.3 IN
Problems with Application?	N, no	N, no	N, no

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-8	6	21
Stage Majority, Percent		V1, -	V5, -
Stage Minimum, Percent		V1, -	V5, -
Stage Maximum, Percent		V1, -	V6, -
Height Average		3 IN	13 IN

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		1 LEAF, -	3 LEAF, -
Stage Minimum, Percent		COTYLE, -	1 LEAF, -
Stage Maximum, Percent		2 LEAF, -	4 LEAF, -
Height Average		0.25 IN	2 IN
Height Minimum, Maximum		0.125, 0.25	0.5, 3
Density Average		2 FT2	5 PLOT
Density Minimum, Maximum			0, 10
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		1 LEAF, -	3 LEAF, -
Stage Minimum, Percent		COTYLE, -	2 LEAF, -
Stage Maximum, Percent		2 LEAF, -	4 LEAF, -
Height Average		0.125 IN	1 IN
Height Minimum, Maximum		0.125, 0.25	0.5, 2
Density Average		15 FT2	3 PLOT
Density Minimum, Maximum			0, 5
Pest 3 Code, Type, Scale	CHEAL, W, DESC	CHEAL, W, DESC	CHEAL, W, DESC
Stage Majority, Percent		2 LEAF, -	6 LEAF, -
Stage Minimum, Percent		COTYLE, -	4 LEAF, -
Stage Maximum, Percent		4 LEAF, -	8 LEAF, -
Height Average		0.125 IN	1.5 IN
Height Minimum, Maximum		0.125, 0.25	0.5, 2
Density Average		4 FT2	1 PLOT
Density Minimum, Maximum			0, 2
Pest 4 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		COTYLE, -	
Stage Minimum, Percent		COTYLE, -	
Stage Maximum, Percent		COTYLE, -	
Height Average		1 IN	
Density Average		8 PLOT	

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	AIXR	AIXR
Nozzle TradeName	TeeJet		
Nozzle Tip Size, Color	-, GREEN		
Nozzle Spacing	19 IN	19 IN	19.0 IN
Boom Length	10 FT	10 FT	10.0 FT
Ground Speed	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Notes

Context	Date	By	Notes
STATUS	3/15/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/5/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Corn injury appeared as necrosis and stunting for Trt.9. Trt. 10 injury appeared as chlorosis and plant stunting, and Trt 11 showed lodging and stunting.

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	ABUTH	AMATA	CHEAL	IPOHE
	Rating Date							5/22/2023	5/22/2023	5/22/2023	5/22/2023	5/22/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V2	0.5 IN	0.5 IN	0.5 IN	0.5 IN
	Trt-Eval Interval							4 DA-B	4 DA-B	4 DA-B	4 DA-B	4 DA-B
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	0	99	99	99	53
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	0	75	99	99	43
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	0	97	99	99	58
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	99	99	99	99
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	0	99	99	99	99
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	26	99	99	98	95
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	99	99	99	99
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	99	99	99	99
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							2.1	3.3	.	0.9	8.5
	Standard Deviation							1.4	2.3	0.0	0.6	5.9
	CV							60.48	2.59	0.0	0.67	7.65

Could not calculate LSD (% mean diff) for columns 3 because error mean square = 0.
^Calculated from residual.

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 6/2/2023 PHYGEN % V5 15 DA-B	ABUTH 6/2/2023 CONTRO % 0.5 IN 0 DA-C	AMATA 6/2/2023 CONTRO % 0.5 IN 0 DA-C	CHEAL 6/2/2023 CONTRO % 0.5 IN 0 DA-C	IPOHE 6/2/2023 CONTRO % 0.5 IN 0 DA-C
	Pest Code											
	Rating Date							6/2/2023	6/2/2023	6/2/2023	6/2/2023	6/2/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V5	0.5 IN	0.5 IN	0.5 IN	0.5 IN
	Trt-Eval Interval							15 DA-B	0 DA-C	0 DA-C	0 DA-C	0 DA-C
	Trt No. Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	0	99	94	99	50
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	0	68	95	97	40
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	0	98	96	99	58
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	97	99	99	97
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	98	99	99	98
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	0	99	98	99	98
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	0	97	99	99	98
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	29	97	93	98	91
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	99	99	99	98
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	98	98	98	99
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							2.1	5.4	3.2	1.5	8.2
	Standard Deviation							1.4	3.8	2.2	1.0	5.7
	CV							55.22	4.37	2.55	1.14	7.59

Could not calculate LSD (% mean diff) for columns 3 because error mean square = 0.
^Calculated from residual.

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	ZEAMD	ABUTH	AMATA	CHEAL
	Rating Date							6/6/2023	6/8/2023	6/8/2023	6/8/2023	6/8/2023
	Rating Type							PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V6	V7	0.5 IN	0.5 IN	0.5 IN
	Trt-Eval Interval							4 DA-C	35 DA-A	35 DA-A	35 DA-A	35 DA-A
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	0	0	99	89	99
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	0	0	65	94	97
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	0	0	98	95	99
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	0	97	98	99
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	0	98	98	99
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	0	0	98	97	99
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	0	0	97	99	99
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	24	23	96	90	98
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	9	6	99	99	99
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	18	13	99	98	98
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							1.8	2.7	6.7	3.5	1.5
	Standard Deviation							1.3	1.9	4.7	2.4	1.0
	CV							28.08	49.51	5.44	2.81	1.14

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^Calculated from residual.

Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16	17	18	19	20
	Pest Code							IPOHE	ZEAMD	ABUTH	AMATA	CHEAL
	Rating Date							6/8/2023	6/16/2023	6/16/2023	6/16/2023	6/16/2023
	Rating Type							CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0.5 IN	V8	4-20 IN	4-20 IN	3-15 IN
	Trt-Eval Interval							35 DA-A	14 DA-C	43 DA-A	43 DA-A	43 DA-A
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	45	0	99	83	99
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	38	0	65	89	96
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	60	0	98	90	99
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	97	0	97	97	98
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	98	0	98	98	99
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	98	0	97	95	99
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	98	0	97	99	99
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	90	21	96	84	98
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	98	13	99	99	99
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	99	14	99	99	99
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							8.6	2.0	6.8	6.0	1.6
	Standard Deviation							6.0	1.4	4.7	4.1	1.1
	CV							7.98	31.55	5.52	4.87	1.2

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Iowa State University

Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	21	22	23	24	25
	Pest Code							IPOHE	ZEAMD	ABUTH	AMATA	CHEAL
	Rating Date							6/16/2023	7/1/2023	7/1/2023	7/1/2023	7/1/2023
	Rating Type							CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-20 IN	V12	12-40 IN	12-40 IN	12-40 IN
	Trt-Eval Interval							43 DA-A	29 DA-C	58 DA-A	58 DA-A	58 DA-A
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	43	0	99	84	99
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	35	0	65	89	96
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	60	0	98	89	99
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	96	0	97	97	98
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	99	0	98	98	99
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	97	0	98	95	99
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	98	0	98	99	99
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	91	10	97	84	99
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	98	3	99	99	99
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	98	1	99	99	99
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							6.9	2.5	6.5	6.1	1.3
	Standard Deviation							4.8	1.8	4.5	4.2	0.9
	CV							6.47	140.13	5.19	4.99	1.0

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Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	26
	Pest Code							IPOHE
	Rating Date							7/1/2023
	Rating Type							CONTRO
	Rating Unit/Min/Max							%
	Pest Stage Majority/Min/Max							1-50 IN
	Trt-Eval Interval							58 DA-A
1	Untreated Check							0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	43
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	33
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	64
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	97
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	98
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A	
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	97
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	98
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A	
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	91
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B	
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B	
	AMS		SG	8.5	LB/100 GAL	EPOST	B	
	COC		L	1	% V/V	EPOST	B	
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	97
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C	
	Aatrex 4L	4	F	16	FL OZ/A	POST	C	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	
	AMS		SG	8.5	LB/100 GAL	POST	C	
	COC		L	1	% V/V	POST	C	
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	97
	Status	56	WG	5	OZ WT/A	POST	C	
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	
	AMS		SG	8.5	LB/100 GAL	POST	C	
	Induce		L	0.25	% V/V	POST	C	
	LSD P=.05							7.9
	Standard Deviation							5.4
	CV							7.36

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Residual Preemergence & Postemergence Corn Herbicides with BAS 821, Ames, IA, 2023.

Trial ID: ACC8
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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
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

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/3/2023
Initiation Date: 5/3/2023
Completion Date: 7/17/2023

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

Latitude of LL Corner °: 42.005984 N
Longitude of LL Corner °: -93.673685 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate crop safety and weed control with Kyro and Resicore XL in corn.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 7/23/2023 **Stage Scale:** VR
Variety: Bravant B97T04SXE-NI02
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/3/2023 **Planting Rate:** 35000 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: 71 F **Soil Moisture:** DRY dry
Emergence Date: 5/12/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/4/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/4/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 8/4/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 7 **Plots:** 21 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a field cultivatoion on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%.

Soil Description
Description Name: 51
% Sand: 44 **% OM:** 4.8 **Texture:** CL clay loam
% Silt: 23 **Soil Name:** CANISTEO
% Clay: 33 **Fert. Level:** E excellent
pH: 6.3 **CEC:** 27.5
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C
Application Date	5/5/2023	5/18/2023	6/5/2023
Appl. Start Time	10:30 AM	2:30 PM	6:00 PM
Appl. Stop Time	11:00 AM	2:39 PM	6:29 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	EPOST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Applied By	Macvilay	Franzenburg	Macvilay
Appl. Entry Date	7/23/2023	7/23/2023	7/23/2023
Air Temperature Start, Stop	62, 63 F	83, 83 F	82, 82 F
% Relative Humidity Start, Stop	69, 69	33, 33	44, 44
Wind Velocity+Dir. Start	10 MPH, SSE	8 MPH, S	7 MPH, SE
Wind Velocity+Dir. Max		10 MPH, S	
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	52 F	72 F	80 F
Soil Moisture	DRY	DRY	DRY
Soil Surface Condition	MEDIUM		
% Cloud Cover	100	70	0
Next Moisture Occurred On	5/5/2023	5/30/2023	6/17/2023
Time to Next Moisture	8.0 HR	12.0 DAY	12.0 DAY
Moisture 6 Hours after Appl.	0 IN		
Moisture 24 Hours after Appl.	1.1, IN		
Moisture 1 Week after Appl.	2.3 IN		
Problems with Application?	N, no		

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-7	6	24
Stage Majority, Percent		V1, -	V5, -
Stage Minimum, Percent		V1, -	V5, -
Stage Maximum, Percent		V1, -	V6, -
Height Average		3 IN	17 IN
Height Minimum, Maximum		3, 3	15, 20

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
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Study Director: Sponsor Contact:
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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, -
Stage Minimum, Percent			3 LEAF, -
Stage Maximum, Percent			5 LEAF, -
Height Average			6 IN
Height Minimum, Maximum			5, 7
Density Average			17 PLOT
Density Minimum, Maximum			15, 20
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		COTYL, -	5 LEAF, -
Stage Minimum, Percent		COTYL, -	4 LEAF, -
Stage Maximum, Percent		1 LEAF, -	6 LEAF, -
Height Average		0.25 IN	4 IN
Height Minimum, Maximum		0.25, 0.5	3, 5
Density Average		7 FT2	18 PLOT
Density Minimum, Maximum			15, 20
Pest 3 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		COTYL, -	3 LEAF, -
Stage Minimum, Percent		COTYL, -	COTYL, -
Stage Maximum, Percent		1 LEAF, -	5 LEAF, -
Height Average		1 FT	3 IN
Height Minimum, Maximum		1, 1	2, 5
Density Average		15 FT2	20 FT2
Density Minimum, Maximum			10, 50

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	TT	TT
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
Ground Speed	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/13/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/23/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).
STATUS	7/23/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	8/4/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trial Comments

Heavy rain that occurred after planting caused some excessively wet areas and soil crusting in the trial. Ratings on corn stunting due to herbicide treatment was difficult because of the resulting uneven plant heights.

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
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Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 6/8/2023 PHYGEN % V7 3 DA-C	ZEAMD 6/8/2023 PHYNEC % V7 3 DA-C	ZEAMD 6/8/2023 PHYCHL % V7 3 DA-C	ZEAMD 6/8/2023 PHYSTU % V7 3 DA-C	SETFA 6/8/2023 CONTRO % 1-4 IN 3 DA-C
	Pest Code											
	Rating Date							6/8/2023	6/8/2023	6/8/2023	6/8/2023	6/8/2023
	Rating Type							PHYGEN	PHYNEC	PHYCHL	PHYSTU	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V7	V7	V7	V7	1-4 IN
	Trt-Eval Interval							3 DA-C	3 DA-C	3 DA-C	3 DA-C	3 DA-C
								1	2	3	4	5
1	Resicore XL	3.29	L	3	QT/A	PRE	A	0	0	0	0	96
	Aatrex 4L	4	F	1	QT/A	PRE	A					
2	Resicore XL	3.29	L	2	QT/A	EPOST	B	2	0	2	0	95
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	EPOST	B					
	COC		L	0.25	% V/V	EPOST	B					
	Liquid AMS	3.4	L	2.5	% V/V	EPOST	B					
3	Resicore XL	3.29	L	2	QT/A	PRE	A	5	3	2	3	96
	Kyro	3	L	45	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
4	SureStart II	4.25	SE	32	FL OZ/A	PRE	A	13	7	8	8	99
	Kyro	3	L	45	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
5	Keystone NXT	5.6	SE	2	QT/A	PRE	A	10	5	5	2	98
	Kyro	3	L	45	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
6	Keystone NXT	5.6	SE	2	QT/A	PRE	A	7	5	3	0	98
	Kyro	3	L	60	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Accent	75	WG	0.727	OZ WT/A	POST	C					
	Isoxadifen-ethyl	50	WG	0.137	OZ WT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
7	Untreated Check							0	0	0	0	0
	LSD P=.05							5.9	2.6	3.2	6.7	3.2
	Standard Deviation							3.3	1.5	1.8	3.8	1.8
	CV							63.64	51.71	62.36	197.05	2.14

^Calculated from residual.

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE	ZEAMD	ZEAMD	ZEAMD
	Rating Date							6/8/2023	6/8/2023	6/13/2023	6/13/2023	6/13/2023
	Rating Type							CONTRO	CONTRO	PHYGEN	PHYNEC	PHYCHL
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-4 IN	1-8 IN	V8	V8	V8
	Trt-Eval Interval							3 DA-C	3 DA-C	8 DA-C	8 DA-C	8 DA-C
1	Resicore XL	3.29	L	3	QT/A	PRE	A	99	50	0	0	0
	Aatrex 4L	4	F	1	QT/A	PRE	A					
2	Resicore XL	3.29	L	2	QT/A	EPOST	B	99	62	2	0	2
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	EPOST	B					
	COC		L	0.25	% V/V	EPOST	B					
	Liquid AMS	3.4	L	2.5	% V/V	EPOST	B					
3	Resicore XL	3.29	L	2	QT/A	PRE	A	99	58	5	3	2
	Kyro	3	L	45	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
4	SureStart II	4.25	SE	32	FL OZ/A	PRE	A	98	30	18	5	8
	Kyro	3	L	45	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
5	Keystone NXT	5.6	SE	2	QT/A	PRE	A	70	37	10	5	8
	Kyro	3	L	45	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
6	Keystone NXT	5.6	SE	2	QT/A	PRE	A	70	48	10	7	3
	Kyro	3	L	60	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Accent	75	WG	0.727	OZ WT/A	POST	C					
	Isoxadifen-ethyl	50	WG	0.137	OZ WT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
7	Untreated Check							0	0	0	0	0
	LSD P=.05							13.8	22.0	4.0	2.6	3.7
	Standard Deviation							7.7	12.4	2.3	1.5	2.1
	CV							10.13	30.4	35.33	51.71	62.68

^Calculated from residual.

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	ZEAMD	SETFA	ABUTH	IPOHE
	Rating Date							6/13/2023	6/21/2023	6/21/2023	6/21/2023	6/21/2023
	Rating Type							PHYSTU	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V8	V9	1-4 IN	1-4 IN	1-8 IN
	Trt-Eval Interval							8 DA-C	16 DA-C	16 DA-C	16 DA-C	16 DA-C
1	Resicore XL	3.29	L	3	QT/A	PRE	A	0	0	96	99	40
	Aatrex 4L	4	F	1	QT/A	PRE	A					
2	Resicore XL	3.29	L	2	QT/A	EPOST	B	0	7	95	99	53
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	EPOST	B					
	COC		L	0.25	% V/V	EPOST	B					
	Liquid AMS	3.4	L	2.5	% V/V	EPOST	B					
3	Resicore XL	3.29	L	2	QT/A	PRE	A	3	8	99	99	98
	Kyro	3	L	45	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
4	SureStart II	4.25	SE	32	FL OZ/A	PRE	A	13	17	99	99	98
	Kyro	3	L	45	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
5	Keystone NXT	5.6	SE	2	QT/A	PRE	A	3	10	99	99	93
	Kyro	3	L	45	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
6	Keystone NXT	5.6	SE	2	QT/A	PRE	A	2	10	99	98	93
	Kyro	3	L	60	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Accent	75	WG	0.727	OZ WT/A	POST	C					
	Isoxadifen-ethyl	50	WG	0.137	OZ WT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
7	Untreated Check							0	0	0	0	0
	LSD P=.05							5.1	5.6	1.6	1.6	11.0
	Standard Deviation							2.9	3.1	0.9	0.9	6.2
	CV							93.26	42.67	1.04	1.03	9.08

^Calculated from residual.

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE	SETFA	ABUTH
Rating Date								7/3/2023	7/3/2023	7/3/2023	7/17/2023	7/17/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								5-12 IN		1-50 IN	5-18 IN	
Trt-Eval Interval								28 DA-C	28 DA-C	28 DA-C	42 DA-C	42 DA-C
1	Resicore XL	3.29	L	3	QT/A	PRE	A	96	99	40	96	99
	Aatrex 4L	4	F	1	QT/A	PRE	A					
2	Resicore XL	3.29	L	2	QT/A	EPOST	B	95	99	53	95	99
	Aatrex 4L	4	F	1	QT/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	EPOST	B					
	COC		L	0.25	% V/V	EPOST	B					
	Liquid AMS	3.4	L	2.5	% V/V	EPOST	B					
3	Resicore XL	3.29	L	2	QT/A	PRE	A	99	99	85	99	99
	Kyro	3	L	45	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
4	SureStart II	4.25	SE	32	FL OZ/A	PRE	A	99	99	85	99	99
	Kyro	3	L	45	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
5	Keystone NXT	5.6	SE	2	QT/A	PRE	A	99	99	78	99	99
	Kyro	3	L	45	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
6	Keystone NXT	5.6	SE	2	QT/A	PRE	A	99	98	85	99	98
	Kyro	3	L	60	FL OZ/A	POST	C					
	Aatrex 4L	4	F	1	QT/A	POST	C					
	Accent	75	WG	0.727	OZ WT/A	POST	C					
	Isoxadifen-ethyl	50	WG	0.137	OZ WT/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
7	Untreated Check							0	0	0	0	0
LSD P=.05								1.6	1.6	9.8	1.6	1.6
Standard Deviation								0.9	0.9	5.5	0.9	0.9
CV								1.04	1.03	9.07	1.04	1.03

^Calculated from residual.

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	21
	Pest Code							IPOHE
	Rating Date							7/17/2023
	Rating Type							CONTRO
	Rating Unit/Min/Max							%
	Pest Stage Majority/Min/Max							1-60 IN
	Trt-Eval Interval							42 DA-C
1	Resicore XL	3.29	L	3	QT/A	PRE	A	40
	Aatrex 4L	4	F	1	QT/A	PRE	A	
2	Resicore XL	3.29	L	2	QT/A	EPOST	B	53
	Aatrex 4L	4	F	1	QT/A	EPOST	B	
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	EPOST	B	
	COC		L	0.25	% V/V	EPOST	B	
	Liquid AMS	3.4	L	2.5	% V/V	EPOST	B	
3	Resicore XL	3.29	L	2	QT/A	PRE	A	83
	Kyro	3	L	45	FL OZ/A	POST	C	
	Aatrex 4L	4	F	1	QT/A	POST	C	
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C	
	COC		L	1	% V/V	POST	C	
	Liquid AMS	3.4	L	2.5	% V/V	POST	C	
4	SureStart II	4.25	SE	32	FL OZ/A	PRE	A	85
	Kyro	3	L	45	FL OZ/A	POST	C	
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C	
	Aatrex 4L	4	F	1	QT/A	POST	C	
	COC		L	1	% V/V	POST	C	
	Liquid AMS	3.4	L	2.5	% V/V	POST	C	
5	Keystone NXT	5.6	SE	2	QT/A	PRE	A	77
	Kyro	3	L	45	FL OZ/A	POST	C	
	Roundup PowerMAX 3	4.8	SL	26.7	FL OZ/A	POST	C	
	Aatrex 4L	4	F	1	QT/A	POST	C	
	COC		L	1	% V/V	POST	C	
	Liquid AMS	3.4	L	2.5	% V/V	POST	C	
6	Keystone NXT	5.6	SE	2	QT/A	PRE	A	82
	Kyro	3	L	60	FL OZ/A	POST	C	
	Aatrex 4L	4	F	1	QT/A	POST	C	
	Accent	75	WG	0.727	OZ WT/A	POST	C	
	Isoxadifen-ethyl	50	WG	0.137	OZ WT/A	POST	C	
	COC		L	1	% V/V	POST	C	
	Liquid AMS	3.4	L	2.5	% V/V	POST	C	
7	Untreated Check							0
	LSD P=.05							9.1
	Standard Deviation							5.1
	CV							8.56

^Calculated from residual.

Iowa State University

Efficacy of Resicore XL & Kyro Tank-Mixtures in Field Corn, Ames, IA, 2023.

Trial ID: ACC9
Protocol ID: NA23T9E003H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US

Rating Type
PHYGEN = phytotoxicity - general / injury
PHYNEC = phytotoxicity - necrosis /burn
PHYCHL = phytotoxicity - chlorosis
PHYSTU = phytotoxicity - stunting
CONTRO = control / burndown or knockdown

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

Iowa State University

Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
Trial ID: ACC 10
Protocol ID: 2023-H-US12 Katagon Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/3/2023
Initiation Date: 5/22/2023
Completion Date: 8/30/2023

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

Latitude of LL Corner °: 42.005963 N
Longitude of LL Corner °: -93.676279 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Katagon & HA-02142018-240-S for crop injury and weed control in sweet corn.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMS Zea mays saccharata Sweet corn
Entry Date: 9/22/2023 **Stage Scale:** VR
Variety: Ambrosia
Planting Date: 5/22/2023 **Planting Rate:** 26000 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: 71 F **Soil Moisture:** DRY dry
Emergence Date: 5/28/2023

Pest Description
Pest 1 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/22/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 5 **Plots:** 15 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included one pass with a field cultivator on each May 3 and May 22 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 13%.

Iowa State University

Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
Trial ID: ACC 10
Protocol ID: 2023-H-US12 Katagon Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Soil Description
Description Name: 49
% Sand: 51 **% OM:** 3.7 **Texture:** SCL sandy clay loam
% Silt: 22 **Soil Name:** NICOLLET, CANISTEO
% Clay: 27 **Fert. Level:** E excellent
pH: 5.2 **CEC:** 21.8

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN

Iowa State University

Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
Trial ID: ACC 10
Protocol ID: 2023-H-US12 Katagon Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C	D
Application Date	5/23/2023	6/12/2023	6/15/2023	6/21/2023
Appl. Start Time	12:45 PM	4:30 PM	3:40 PM	10:09 AM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	POST1	POST2	POST3
Application Placement	BROSOI	BROFOL	BROFOL	BROFOL
Applied By	Macvilay	Macvilay	Macvilay	Hamberg
Appl. Entry Date	9/22/2023	9/22/2023	9/22/2023	9/22/2023
Air Temperature Start, Stop	80, 80 F	78, 78 F	89, 89 F	78, 78 F
% Relative Humidity Start, Stop	37, 37	28, 28	40, 40	68, 68
Wind Velocity+Dir. Start	8 MPH, SSE	13 MPH, -	9 MPH, NNW	10 MPH, SE
Wet Leaves (Y/N)		N, no	N, no	N, no
Soil Temperature	- F	72 F	79 F	72 F
Soil Moisture	DRY	DRY	DRY	DRY
Soil Surface Condition	MEDIUM			
% Cloud Cover	5	0	0	0
Next Moisture Occurred On	5/30/2023	6/17/2023	6/17/2023	6/24/2023
Time to Next Moisture	7.0 DAY	5.0 DAY	2.0 DAY	3.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0.3 IN	1.2 IN	1.2 IN	0.65 IN
Problems with Application?	N, no	N, no	N, no	N, no

Crop Stage At Each Application

	A	B	C	D
Crop 1 Code, BBCH Scale	ZEAMS, BCOR	ZEAMS, BCOR	ZEAMS, BCOR	ZEAMS, BCOR
Days after Emergence	-5	15	18	24
Stage Majority, Percent		V5, -	V5, -	V7, -
Stage Minimum, Percent		V4, -	V4, -	V6, -
Stage Maximum, Percent		V6, -	V6, -	V7, -
Height Average		10 IN	12 IN	19 IN
Height Minimum, Maximum		9, 11	10, 15	15, 22

Pest Stage At Each Application

	A	B	C	D
Pest 1 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		4 LEAF, -	6 LEAF, -	9 LEAF, -
Stage Minimum, Percent		COTYLE, -	COTYLE, -	COTELY, -
Stage Maximum, Percent		7 LEAF, -	8 LEAF, -	12 LEA, -
Height Average		3 IN	4 IN	7 IN
Height Minimum, Maximum		1, 5	1, 5	1, 10

Iowa State University

Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
Trial ID: ACC 10
Protocol ID: 2023-H-US12 Katagon Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Equipment

	A	B	C	D
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	110015	110015	110015
Nozzle Type	TTI	TT	TT	TT
Nozzle TradeName	TeeJet	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19 IN	19.0 IN	19.0 IN
Boom Length	10 FT	10 FT	10.0 FT	10.0 FT
Ground Speed	3 MPH	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/25/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/19/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

The PRE application of Fearless controlled much of the grass and small-seeded broadleaf weeds. Only ivyleaf morningglory emerged with a high enough population for control ratings.

Herbicide treatment injury to sweetcorn appeared as necrotic speckling and stunting.

Five ears from each plot were evaluated from each plot for pinching or "Coke Bottle Effects" after dent stage. None of the plot ears showed damage, and the data is recorded in the assessment data.

Iowa State University

Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
Trial ID: ACC 10
Protocol ID: 2023-H-US12 Katagon Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							ZEAMS	IPOHE	ZEAMS	IPOHE	ZEAMS
	Rating Date							6/20/2023	6/20/2023	6/23/2023	6/23/2023	6/26/2023
	Rating Type							PHYGEN	CONTRO	PHYGEN	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V7	3-8 IN	V7	3-8 IN	V8
	Trt-Eval Interval							8 DA-B	8 DA-B	8 DA-C	8 DA-C	14 DA-B
1	Fearless	7	L	1.25	PT/A	PRE	A	28	68	25	78	22
	Katagon	2	OD	3.2	FL OZ/A	POST2	C					
	Destiny HC		L	1	% V/V	POST2	C					
2	Fearless	7	L	1.25	PT/A	PRE	A	22	93	18	98	17
	Katagon	2	OD	3.2	FL OZ/A	POST1	B					
	Aatrex 4L	4	F	0.5	QT/A	POST1	B					
	Destiny HC		L	1	% V/V	POST1	B					
3	Fearless	7	L	1.25	PT/A	PRE	A	0	0	0	0	15
	HA-02142018-240-S	2	L	3.2	FL OZ/A	POST3	D					
	Destiny HC		L	1	% V/V	POST3	D					
4	Fearless	7	L	1.25	PT/A	PRE	A	17	90	12	98	7
	HA-02142018-240-S	2	L	3.2	FL OZ/A	POST1	B					
	Aatrex 4L	4	F	0.5	QT/A	POST1	B					
	Destiny HC		L	1	% V/V	POST1	B					
5	Fearless	7	L	1.25	PT/A	PRE	A	0	0	0	0	0
	LSD P=.05							4.0	3.1	3.8	3.9	4.2
	Standard Deviation							2.1	1.6	2.0	2.0	2.2
	CV							16.06	3.23	18.56	3.74	18.63

Missing data estimates are included in columns:Average=2,4,6,8,10,12,14
Could not calculate LSD (% mean diff) for columns 13,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
Trial ID: ACC 10
Protocol ID: 2023-H-US12 Katagon Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	ZEAMS	IPOHE	ZEAMS	IPOHE
	Rating Date							6/26/2023	6/28/2023	6/28/2023	7/3/2023	7/3/2023
	Rating Type							CONTRO	PHYGEN	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-12 IN	V8	3-12 IN		3-12 IN
	Trt-Eval Interval							14 DA-B	13 DA-C	13 DA-C	21 DA-B	21 DA-B
1	Fearless	7	L	1.25	PT/A	PRE	A	78	17	80	7	80
	Katagon	2	OD	3.2	FL OZ/A	POST2	C					
	Destiny HC		L	1	% V/V	POST2	C					
2	Fearless	7	L	1.25	PT/A	PRE	A	98	13	95	10	95
	Katagon	2	OD	3.2	FL OZ/A	POST1	B					
	Aatrex 4L	4	F	0.5	QT/A	POST1	B					
	Destiny HC		L	1	% V/V	POST1	B					
3	Fearless	7	L	1.25	PT/A	PRE	A	63	13	57	7	57
	HA-02142018-240-S	2	L	3.2	FL OZ/A	POST3	D					
	Destiny HC		L	1	% V/V	POST3	D					
4	Fearless	7	L	1.25	PT/A	PRE	A	96	5	96	3	95
	HA-02142018-240-S	2	L	3.2	FL OZ/A	POST1	B					
	Aatrex 4L	4	F	0.5	QT/A	POST1	B					
	Destiny HC		L	1	% V/V	POST1	B					
5	Fearless	7	L	1.25	PT/A	PRE	A	0	0	0	0	0
	LSD P=.05							6.7	7.5	7.1	4.5	8.4
	Standard Deviation							3.5	4.0	3.7	2.4	4.4
	CV							5.19	41.16	5.59	45.29	6.69

Missing data estimates are included in columns:Average=2,4,6,8,10,12,14
Could not calculate LSD (% mean diff) for columns 13,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
Trial ID: ACC 10
Protocol ID: 2023-H-US12 Katagon Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							ZEAMS	IPOHE	ZEAMS	IPOHE	ZEAMS
	Rating Date							7/6/2023	7/6/2023	7/14/2023	7/14/2023	8/30/2023
	Rating Type							PHYGEN	CONTRO	PHYGEN	CONTRO	pinched ear
	Rating Unit/Min/Max							%	%	%	%	NUMBER
	Pest Stage Majority/Min/Max							V13	3-12 fIN	R1	3-12 IN	R6
	Trt-Eval Interval							21 DA-C	21 DA-C	23 DA-D	23 DA-D	99 DA-A
1	Fearless	7	L	1.25	PT/A	PRE	A	2	80	0	80	0
	Katagon	2	OD	3.2	FL OZ/A	POST2	C					
	Destiny HC		L	1	% V/V	POST2	C					
2	Fearless	7	L	1.25	PT/A	PRE	A	5	95	5	95	0
	Katagon	2	OD	3.2	FL OZ/A	POST1	B					
	Aatrex 4L	4	F	0.5	QT/A	POST1	B					
	Destiny HC		L	1	% V/V	POST1	B					
3	Fearless	7	L	1.25	PT/A	PRE	A	0	57	0	57	0
	HA-02142018-240-S	2	L	3.2	FL OZ/A	POST3	D					
	Destiny HC		L	1	% V/V	POST3	D					
4	Fearless	7	L	1.25	PT/A	PRE	A	2	95	0	95	0
	HA-02142018-240-S	2	L	3.2	FL OZ/A	POST1	B					
	Aatrex 4L	4	F	0.5	QT/A	POST1	B					
	Destiny HC		L	1	% V/V	POST1	B					
5	Fearless	7	L	1.25	PT/A	PRE	A	0	0	0	0	0
	LSD P=.05							3.6	8.4	.	8.4	.
	Standard Deviation							1.9	4.4	0.0	4.4	0.0
	CV							116.19	6.69	0.0	6.69	0.0

Missing data estimates are included in columns:Average=2,4,6,8,10,12,14
Could not calculate LSD (% mean diff) for columns 13,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Evaluation of Katagon & HA-02142018-240-S for Crop Injury and Weed Control in Sweet Corn, Ames, IA, 2023.
Trial ID: ACC 10
Protocol ID: 2023-H-US12 Katagon Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
ZEAMS, Zea mays saccharata, Sweet corn = 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
NUMBER, , = number

Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.
Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/5/2023
Initiation Date: 5/4/2023
Completion Date: 10/17/2023

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

Latitude of LL Corner °: 42.003152 N
Longitude of LL Corner °: -93.674364 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare A23980 at foundation and full rates plus atrazine to competitive product tank mixes for weed control in corn.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 8/28/2023 **Stage Scale:** VR
Variety: Syngenta NK0472-DV-EZ1
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/4/2023 **Planting Rate:** 35600 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: 60 F **Soil Moisture:** DRY dry
Emergence Date: 5/13/2023
Harvest Date: 10/17/2023 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 15.5 **Harvested Length:** 22 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/28/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/28/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/28/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 8/28/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.
Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Site and Design
Treated Plot Width: 10 FT
Treated Plot Length: 25 FT
Treated Plot Area: 250.0 FT2
Replications: 4 **Treatments:** 14 **Plots:** 56
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	2022

Field Prep./Maintenance:
Tillage included a field cultivation on May 3 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 15%. Fertilization included 21-70-120-17.5-1.75 of N-P-K-S-Zn, respectively, applied as dry fertilizer in the fall, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Soil Description
Description Name: 31
% Sand: 46 **% OM:** 3.9 **Texture:** SCL sandy clay loam
% Silt: 22 **Soil Name:** NICOLLET
% Clay: 32 **Fert. Level:** E excellent
pH: 6.3 **CEC:** 20
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.5 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN
17.	9/10/2023	0.4	IN
18.	9/19/2023	1.3	IN
19.	9/22/2023	0.1	IN

Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.
Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/5/2023	5/23/2023
Appl. Start Time	9:30 AM	2:30 PM
Appl. Stop Time	10:15 AM	
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Applied By	Franzenburg	Macvilay
Appl. Entry Date	8/28/2023	8/28/2023
Air Temperature Start, Stop	64, 66 F	80, 80 F
% Relative Humidity Start, Stop	70, 70	37, 37
Wind Velocity+Dir. Start	6 MPH, S	8 MPH, SSE
Wet Leaves (Y/N)		N, no
Soil Temperature	57 F	63 F
Soil Moisture	DRY	DRY
Soil Surface Condition	MEDIUM	
% Cloud Cover	90	10
Next Moisture Occurred On	5/5/2023	5/30/2023
Time to Next Moisture	8.0 HR	7.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	1.1, IN	0, IN
Moisture 1 Week after Appl.	2.3 IN	0.3 IN
Problems with Application?	N, no	N, no

Comment:
Very few weeds were present at the POST application because of herbicide activity from the PRE applications.

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-8	10
Stage Majority, Percent		V2, -
Stage Minimum, Percent		V1, -
Stage Maximum, Percent		V2, -
Height Average		3 IN

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Pest 4 Code, Type, Scale	CHEAL, W, DESC	CHEAL, W, DESC

Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.

Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	TTI	TT
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	20 IN	19 IN
Boom Length	10 FT	10 FT
Ground Speed	2.8 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/14/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	8/28/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Common waterhemp is at least 80 percent resistant to glyphosate in the trial area.

Few weeds were present in plots receiving the POST application on May 23 for recording weed sizes and densities.

Corn injury from the POST herbicide treatment appeared as a chlorotic flash on lower leaves for Trts. 11 & 12 on June 1.

Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.

Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 5/25/2023 PHYGEN % V2 20 DA-A	SETFA 5/25/2023 CONTRO % 2 IN 20 DA-A	ABUTH 5/25/2023 CONTRO % 1.5 IN 20 DA-A	AMATA 5/25/2023 CONTRO % 1 IN 20 DA-A	CHEAL 5/25/2023 CONTRO % 1 IN 20 DA-A
								1	2	3	4	5
1	Untreated Check							0	0	0	0	0
2	Storen	3.22	ZC	2.1	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
3	Storen	3.22	ZC	2.4	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
4	Acuron	3.44	ZC	3	QT/A	PRE	A	0	99	99	99	99
5	Resicore	3.29	L	2.5	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
6	Resicore	3.29	L	3	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
7	TriVolt	3.65	L	17.5	FL OZ/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
8	TriVolt	3.65	L	20	FL OZ/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
9	Maverick	2.04	SC	24	FL OZ/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
10	Maverick	2.04	SC	32	FL OZ/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
11	Storen	3.22	ZC	1.05	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	Storen	3.22	ZC	1.05	QT/A	POST	B					
	Aatrex 4L	4	F	0.374	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
12	Storen	3.22	ZC	1.2	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	Storen	3.22	ZC	1.2	QT/A	POST	B					
	Aatrex 4L	4	F	0.374	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
13	Storen	3.22	ZC	1.2	QT/A	PRE	A	0	99	99	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	Aatrex 4L	4	F	0.5	QT/A	POST	B					
	Halex GT	4.39	CS	4	PT/A	POST	B					
14	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	0	99	99	99	99
	Amsol	3.4	L	2.5	% V/V	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	Aatrex 4L	4	F	0.748	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	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

Could not calculate LSD (% mean diff) for columns 1,2,3,4,5,7,11,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.

Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 6/1/2023 PHYGEN % V5 9 DA-B	ZEAMD 6/20/2023 PHYGEN % V9 28 DA-B	SETFA 6/20/2023 CONTRO % 4-20 IN 28 DA-B	ABUTH 6/20/2023 CONTRO % 2-20 IN 28 DA-B	AMATA 6/20/2023 CONTRO % 3-20 IN 28 DA-B
	Pest Code											
	Rating Date							6/1/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023
	Rating Type							PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V5	V9	4-20 IN	2-20 IN	3-20 IN
	Trt-Eval Interval							9 DA-B	28 DA-B	28 DA-B	28 DA-B	28 DA-B
								6	7	8	9	10
1	Untreated Check							0	0	0	0	0
2	Storen	3.22	ZC	2.1	QT/A	PRE	A	0	0	97	99	98
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
3	Storen	3.22	ZC	2.4	QT/A	PRE	A	0	0	96	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
4	Acuron	3.44	ZC	3	QT/A	PRE	A	0	0	94	99	99
5	Resicore	3.29	L	2.5	QT/A	PRE	A	0	0	94	99	97
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
6	Resicore	3.29	L	3	QT/A	PRE	A	0	0	95	97	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
7	TriVolt	3.65	L	17.5	FL OZ/A	PRE	A	0	0	90	93	84
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
8	TriVolt	3.65	L	20	FL OZ/A	PRE	A	0	0	95	97	89
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
9	Maverick	2.04	SC	24	FL OZ/A	PRE	A	0	0	78	95	95
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
10	Maverick	2.04	SC	32	FL OZ/A	PRE	A	0	0	86	99	98
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
11	Storen	3.22	ZC	1.05	QT/A	PRE	A	5	0	95	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	Storen	3.22	ZC	1.05	QT/A	POST	B					
	Aatrex 4L	4	F	0.374	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
12	Storen	3.22	ZC	1.2	QT/A	PRE	A	10	0	96	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	Storen	3.22	ZC	1.2	QT/A	POST	B					
	Aatrex 4L	4	F	0.374	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
13	Storen	3.22	ZC	1.2	QT/A	PRE	A	0	0	95	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	Aatrex 4L	4	F	0.5	QT/A	POST	B					
	Halex GT	4.39	CS	4	PT/A	POST	B					
14	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	3	0	95	99	98
	Amsol	3.4	L	2.5	% V/V	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	Aatrex 4L	4	F	0.748	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
	LSD P=.05							1.9	.	6.3	3.1	4.9
	Standard Deviation							1.3	0.0	4.4	2.1	3.4
	CV							106.9	0.0	5.11	2.35	3.8

Could not calculate LSD (% mean diff) for columns 1,2,3,4,5,7,11,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.

Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	CHEAL 6/20/2023 CONTRO % 28 DA-B	SETFA 7/18/2023 CONTRO % 4-35 IN 56 DA-B	ABUTH 7/18/2023 CONTRO % 8-30 IN 56 DA-B	AMATA 7/18/2023 CONTRO % 10-36 IN 56 DA-B	CHEAL 7/18/2023 CONTRO % 56 DA-B
								11	12	13	14	15
1	Untreated Check							0	0	0	0	0
2	Storen	3.22	ZC	2.1	QT/A	PRE	A	99	96	99	98	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
3	Storen	3.22	ZC	2.4	QT/A	PRE	A	99	96	99	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
4	Acuron	3.44	ZC	3	QT/A	PRE	A	99	92	99	99	99
5	Resicore	3.29	L	2.5	QT/A	PRE	A	99	92	98	97	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
6	Resicore	3.29	L	3	QT/A	PRE	A	99	95	96	99	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
7	TriVolt	3.65	L	17.5	FL OZ/A	PRE	A	99	90	90	80	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
8	TriVolt	3.65	L	20	FL OZ/A	PRE	A	99	94	94	89	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
9	Maverick	2.04	SC	24	FL OZ/A	PRE	A	99	78	95	96	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
10	Maverick	2.04	SC	32	FL OZ/A	PRE	A	99	85	99	98	99
	Aatrex 4L	4	F	0.75	QT/A	PRE	A					
11	Storen	3.22	ZC	1.05	QT/A	PRE	A	99	92	99	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	Storen	3.22	ZC	1.05	QT/A	POST	B					
	Aatrex 4L	4	F	0.374	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
12	Storen	3.22	ZC	1.2	QT/A	PRE	A	99	96	99	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	Storen	3.22	ZC	1.2	QT/A	POST	B					
	Aatrex 4L	4	F	0.374	QT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B					
13	Storen	3.22	ZC	1.2	QT/A	PRE	A	99	94	99	99	99
	Aatrex 4L	4	F	0.374	QT/A	PRE	A					
	Amsol	3.4	L	2.5	% V/V	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	Aatrex 4L	4	F	0.5	QT/A	POST	B					
	Halex GT	4.39	CS	4	PT/A	POST	B					
14	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	99	94	99	98	99
	Amsol	3.4	L	2.5	% V/V	POST	B					
	NIS		L	0.25	% V/V	POST	B					
	Aatrex 4L	4	F	0.748	QT/A	POST	B					
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B					
LSD P=.05								.	6.4	3.8	5.1	.
Standard Deviation								0.0	4.5	2.7	3.5	0.0
CV								0.0	5.25	2.97	3.96	0.0

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Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.

Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 6/29/2023 STAOBJ 17.5 ft V12 37 DA-B 16	ZEAMD 10/17/2023 YIELD bu/ac R6 147 DA-B 17
1	Untreated Check							36	184
2	Storen	3.22	ZC	2.1	QT/A	PRE	A	39	242
	Aatrex 4L	4	F	0.75	QT/A	PRE	A		
3	Storen	3.22	ZC	2.4	QT/A	PRE	A	38	239
	Aatrex 4L	4	F	0.75	QT/A	PRE	A		
4	Acuron	3.44	ZC	3	QT/A	PRE	A	40	244
5	Resicore	3.29	L	2.5	QT/A	PRE	A	38	244
	Aatrex 4L	4	F	0.75	QT/A	PRE	A		
6	Resicore	3.29	L	3	QT/A	PRE	A	40	254
	Aatrex 4L	4	F	0.75	QT/A	PRE	A		
7	TriVolt	3.65	L	17.5	FL OZ/A	PRE	A	40	249
	Aatrex 4L	4	F	0.75	QT/A	PRE	A		
8	TriVolt	3.65	L	20	FL OZ/A	PRE	A	41	243
	Aatrex 4L	4	F	0.75	QT/A	PRE	A		
9	Maverick	2.04	SC	24	FL OZ/A	PRE	A	40	259
	Aatrex 4L	4	F	0.75	QT/A	PRE	A		
10	Maverick	2.04	SC	32	FL OZ/A	PRE	A	39	244
	Aatrex 4L	4	F	0.75	QT/A	PRE	A		
11	Storen	3.22	ZC	1.05	QT/A	PRE	A	40	241
	Aatrex 4L	4	F	0.374	QT/A	PRE	A		
	Amsol	3.4	L	2.5	% V/V	POST	B		
	Storen	3.22	ZC	1.05	QT/A	POST	B		
	Aatrex 4L	4	F	0.374	QT/A	POST	B		
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B		
12	Storen	3.22	ZC	1.2	QT/A	PRE	A	39	246
	Aatrex 4L	4	F	0.374	QT/A	PRE	A		
	Amsol	3.4	L	2.5	% V/V	POST	B		
	Storen	3.22	ZC	1.2	QT/A	POST	B		
	Aatrex 4L	4	F	0.374	QT/A	POST	B		
	Roundup PowerMAX 3	4.8	SL	28	FL OZ/A	POST	B		
13	Storen	3.22	ZC	1.2	QT/A	PRE	A	39	236
	Aatrex 4L	4	F	0.374	QT/A	PRE	A		
	Amsol	3.4	L	2.5	% V/V	POST	B		
	NIS		L	0.25	% V/V	POST	B		
	Aatrex 4L	4	F	0.5	QT/A	POST	B		
	Halex GT	4.39	CS	4	PT/A	POST	B		
14	Lexar EZ	3.7	ZC	1.75	QT/A	PRE	A	38	230
	Amsol	3.4	L	2.5	% V/V	POST	B		
	NIS		L	0.25	% V/V	POST	B		
	Aatrex 4L	4	F	0.748	QT/A	POST	B		
	Acuron GT	4.29	ZC	3.75	PT/A	POST	B		
LSD P=.05								2.4	21.4
Standard Deviation								1.7	15.0
CV								4.22	6.26

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^Calculated from residual.

Iowa State University

Storen vs. Acuron and Competitors PRE and PRE followed by POST for Crop Safety, Weed Control and Yield, Ames, Iowa, 2023.

Trial ID: ACC11
Protocol ID: HBI001B4-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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

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

Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.
Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD059US Location: Trial Year: 2023
Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

General Trial Information
Study Director: Richard Zollinger, Ph.D. **Title:** Product Development Manager - North
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/5/2023
Initiation Date: 5/22/2023
Completion Date: 7/18/2023

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

Latitude of LL Corner °: 42.006024 N
Longitude of LL Corner °: -93.674125 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate AMV5233D in Enlist + LL corn.

Contacts
Role: STYDIR study director
Country: USA United States
State/Prov: WA
Role: INVEST investigator

Crop Description
Crop 1: C ZEAMX Zea mays Corn **BBCH Scale:** BCOR
Entry Date: 6/26/2023 **Stage Scale:** VR
Variety: Miller M06-62PC
Attributes: glyphosate, glufosinate, 2,4-D & FOP
Planting Date: 5/22/2023 **Planting Rate:** 30200 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: 65 F **Soil Moisture:** DRY dry
Emergence Date: 5/28/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 6/26/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 6/26/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 6/26/2023
Common Name: Ivyleaf morningglory **Stage Scale:** DESC

Iowa State University

Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.
Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD059US Location: Trial Year: 2023
Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Site and Design
Treated Plot Width: 6.67 FT
Treated Plot Length: 25 FT
Treated Plot Area: 166.75 FT2
Replications: 4 **Treatments:** 10 **Plots:** 40
Site Type: FIELD field
Experimental Unit: 4 ROW row
Tillage Type: MINTIL minimum-till
Study Design: RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a single pass with a field cultivator on each May 3 and 22 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 10%.

Soil Description
Description Name: 51
% Sand: 44 **% OM:** 4.8 **Texture:** CL clay loam
% Silt: 23 **Soil Name:** CANISTEO
% Clay: 33 **Fert. Level:** E excellent
pH: 6.3 **CEC:** 27.5
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.5 m

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.
Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
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Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Application Description

	A	B	C
Application Date	5/23/2023	6/12/2023	6/20/2023
Appl. Start Time	12:45 PM	4:00 PM	1:59 PM
Application Method	BROADC	BROADC	BROADC
Application Timing	PRE	EPOST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Applied By	Macvilay	Macvilay	Macvilay
Appl. Entry Date	6/26/2023	6/26/2023	6/26/2023
Air Temperature Start, Stop	80, - F	80, 80 F	85, 85 F
% Relative Humidity Start, Stop	37, 37	27, 27	41, 41
Wind Velocity+Dir. Start	8 MPH, SSE	13 MPH, -	7 MPH, ESE
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	68 F	72 F	75 F
Soil Moisture	DRY	DRY	DRY
Soil Surface Condition	MEDIUM		
% Cloud Cover	5	0	0
Next Moisture Occurred On	5/30/2023	6/17/2023	6/24/2023
Time to Next Moisture	7.0 DAY	5.0 DAY	4.0 DAY
Moisture 1 Week after Appl.	0.3 IN	1.2 IN	0.65 IN
Problems with Application?	N, no	N, no	N, no

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMX, BCOR	ZEAMX, BCOR	ZEAMX, BCOR
Days after Emergence	-5	15	23
Stage Majority, Percent		V4, -	V6, -
Stage Minimum, Percent		V3, -	V5, -
Stage Maximum, Percent		V4, -	V6, -
Height Average		10 IN	22 IN
Height Minimum, Maximum		7, 12	20, 24

Iowa State University

Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.
Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD059US Location: Trial Year: 2023
Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

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		4 LEAF, -	6 LEAF, -
Stage Minimum, Percent		2 LEAF, -	4 LEAF, -
Stage Maximum, Percent		6 LEAF, -	8 LEAF, -
Height Average		4 IN	10 IN
Height Minimum, Maximum		2, 6	6, 15
Density Average		10 FT2	8 FT2
Density Minimum, Maximum		0, 19	6, 10
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH	ABUTH, W, BBCH
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		9 PLOT	
Density Minimum, Maximum		5, 12	
Pest 3 Code, Type, Scale	IPOHE, W, BBCH	IPOHE, W, BBCH	IPOHE, W, BBCH
Stage Majority, Percent		NUMERO, -	NUMERO, -
Stage Minimum, Percent		NUMERO, -	NUMERO, -
Stage Maximum, Percent		NUMERO, -	NUMERO, -
Height Average		6 IN	7 IN
Height Minimum, Maximum		1, 8	4, 9
Density Average		10 FT2	4 FT2
Density Minimum, Maximum		5, 20	3, 6

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	TT & AIXR	TT & AIXR
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	20 IN	20.0 IN
Boom Length	10 FT	6.7 FT	6.7 FT
Ground Speed	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Equipment Comment:AIXR Nozzles were used for all treatments containing Enlist Products.

Iowa State University

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Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD059US Location: Trial Year: 2023
Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Notes

Context	Date	By	Notes
STATUS	3/28/2023	Richard M Porter	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	6/26/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	6/26/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.
STATUS	9/5/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Statistical Analysis:

Trial Comments

Weed control ratings up to June 23 evaluated only burndown. July 6 and 18 ratings account for both burndown and residual control of weeds emerging after applications.

Crop injury for the POST applications appeared as stunting.

Iowa State University

Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.

Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD059US Location: Trial Year: 2023
Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
Pest Code								ZEAMD	SETFA	ABUTH	IPOHE	ZEAMD
Rating Date								6/23/2023	6/23/2023	6/23/2023	6/23/2023	7/6/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								V7	4-10 IN	3-8 IN	3-8 IN	V13
Trt-Eval Interval								11 DA-B	11 DA-B	11 DA-B	11 DA-B	16 DA-C
1	Liberty 280 SL	280	SL	32	FL OZ/A	EPOST	B	0	99	99	98	0
	AMS	100	D	3	LB/A	EPOST	B					
2	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	13	99	99	98	7
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
3	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	5	99	99	99	5
	Atrazine 4 F	4	F	2	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
4	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	4	99	99	99	4
	Dual II Magnum 7.64 EC	7.64	EC	1.33	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
5	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	8	98	99	99	5
	Dual II Magnum 7.64 EC	7.64	EC	1.33	PT/A	EPOST	B					
	Atrazine 4 F	4	F	2	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
6	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	15	96	99	99	8
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
7	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	1	73	73	83	0
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
8	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	9	73	74	83	15
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
9	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	9	73	78	88	11
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Enlist One 3.8 SL	3.8	SL	2	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
10	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	5	73	79	88	10
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	DiFlexx 4 SC	480	SC	0.5	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
LSD P=.05								5.2	2.5	3.3	3.7	4.3
Standard Deviation								3.6	1.7	2.2	2.6	3.0
CV								52.31	1.97	2.5	2.76	46.1

Missing data estimates are included in columns:Average=1,3,5,7,9,10,11,12
^Calculated from residual.

Iowa State University

Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.

Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD059US Location: Trial Year: 2023
Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							SETFA	ABUTH	IPOHE	ZEAMD	SETFA
	Rating Date							7/6/2023	7/6/2023	7/6/2023	7/18/2023	7/18/2023
	Rating Type							CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							4-10 IN	3-8 IN	3-8 IN	R1	4-15 IN
	Trt-Eval Interval							16 DA-C	16 DA-C	16 DA-C	28 DA-C	28 DA-C
1	Liberty 280 SL	280	SL	32	FL OZ/A	EPOST	B	99	99	98	0	82
	AMS	100	D	3	LB/A	EPOST	B					
2	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	99	98	5	90
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
3	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	99	99	5	90
	Atrazine 4 F	4	F	2	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
4	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	99	99	5	96
	Dual II Magnum 7.64 EC	7.64	EC	1.33	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
5	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	99	99	5	97
	Dual II Magnum 7.64 EC	7.64	EC	1.33	PT/A	EPOST	B					
	Atrazine 4 F	4	F	2	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
6	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	97	99	99	6	91
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
7	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	99	98	94	0	94
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
8	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	98	99	97	8	97
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
9	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	98	99	99	8	98
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Enlist One 3.8 SL	3.8	SL	2	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
10	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	96	99	95	3	97
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	DiFlexx 4 SC	480	SC	0.5	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
	LSD P=.05							3.1	0.9	2.6	2.6	4.0
	Standard Deviation							2.2	0.6	1.8	1.8	2.7
	CV							2.2	0.61	1.82	40.41	2.9

Missing data estimates are included in columns:Average=1,3,5,7,9,10,11,12
^Calculated from residual.

Iowa State University

Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.

Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD059US Location: Trial Year: 2023
Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	ABUTH 7/18/2023 CONTRO % 3-8 IN 28 DA-C	IPOHE 7/18/2023 CONTRO % 2-25 IN 28 DA-C
	Pest Code							ABUTH	IPOHE
	Rating Date							7/18/2023	7/18/2023
	Rating Type							CONTRO	CONTRO
	Rating Unit/Min/Max							%	%
	Pest Stage Majority/Min/Max							3-8 IN	2-25 IN
	Trt-Eval Interval							28 DA-C	28 DA-C
1	Liberty 280 SL	280	SL	32	FL OZ/A	EPOST	B	99	53
	AMS	100	D	3	LB/A	EPOST	B		
2	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	58
	COC	100	SL	1	% V/V	EPOST	B		
	AMS	100	D	3	LB/A	EPOST	B		
3	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	60
	Atrazine 4 F	4	F	2	PT/A	EPOST	B		
	COC	100	SL	1	% V/V	EPOST	B		
	AMS	100	D	3	LB/A	EPOST	B		
4	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	58
	Dual II Magnum 7.64 EC	7.64	EC	1.33	PT/A	EPOST	B		
	COC	100	SL	1	% V/V	EPOST	B		
	AMS	100	D	3	LB/A	EPOST	B		
5	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	60
	Dual II Magnum 7.64 EC	7.64	EC	1.33	PT/A	EPOST	B		
	Atrazine 4 F	4	F	2	PT/A	EPOST	B		
	COC	100	SL	1	% V/V	EPOST	B		
	AMS	100	D	3	LB/A	EPOST	B		
6	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	99	73
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	EPOST	B		
	COC	100	SL	1	% V/V	EPOST	B		
	AMS	100	D	3	LB/A	EPOST	B		
7	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	95	68
	Zalo	2.57	SL	32	FL OZ/A	POST	C		
	COC	100	SL	1	% V/V	POST	C		
	AMS	100	D	3	LB/A	POST	C		
8	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	99	73
	Zalo	2.57	SL	32	FL OZ/A	POST	C		
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POST	C		
	COC	100	SL	1	% V/V	POST	C		
	AMS	100	D	3	LB/A	POST	C		
9	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	99	90
	Zalo	2.57	SL	32	FL OZ/A	POST	C		
	Enlist One 3.8 SL	3.8	SL	2	PT/A	POST	C		
	COC	100	SL	1	% V/V	POST	C		
	AMS	100	D	3	LB/A	POST	C		
10	Bicep II Magnum	5.5	SC	1.3	QT/A	PRE	A	99	80
	Zalo	2.57	SL	32	FL OZ/A	POST	C		
	DiFlexx 4 SC	480	SC	0.5	PT/A	POST	C		
	COC	100	SL	1	% V/V	POST	C		
	AMS	100	D	3	LB/A	POST	C		
	LSD P=.05							1.9	9.9
	Standard Deviation							1.3	6.8
	CV							1.31	10.06

Missing data estimates are included in columns:Average=1,3,5,7,9,10,11,12
^Calculated from residual.

Iowa State University

Demonstration of Zalo for Weed Control in Enlist + Liberty Tolerant Corn, Ames, IA, 2023.

Trial ID: ACS4 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD059US Location: Trial Year: 2023
Project ID: 059 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Pest Code
ZEAMD, Zea mays indentata, Dent corn = US
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = 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

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.
Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

General Trial Information
Study Director: Joe Bruce **Title:** Technical Services Manager
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final **Usage/Type:** DEV Development/Registration
ARM Trial Created On: 5/6/2023
Initiation Date: 5/22/2023 **Planned Completion Date:** 9/30/2023
Completion Date: 7/26/2023

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

Latitude of LL Corner °: 42.006017 N
Longitude of LL Corner °: -93.674295 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate AMV5233D weed control in Enlist + LL corn.

Contacts
Role: STYDIR study director
State/Prov: IL
Role: INVEST investigator

Crop Description
Crop 1: C ZEAMX Zea mays Corn **BBCH Scale:** BCOR
Entry Date: 6/26/2023 **Stage Scale:** VR
Variety: Miller M06-62PC
Attributes: glyphosate, glufosinate, 2,4-D & FOP
Planting Date: 5/22/2023 **Planting Rate:** 30200 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: 65 F **Soil Moisture:** DRY dry
Emergence Date: 5/28/2023

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Pest Description

Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/5/2023
Common Name: Giant foxtail **Stage Scale:** DESC
no

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/5/2023
Common Name: Velvetleaf **Stage Scale:** DESC
no

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 6/26/2023
Common Name: Common waterhemp **Stage Scale:** DESC
no

Pest 4 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/5/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 5 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 6/26/2023
Common Name: Ivyleaf morningglory **Stage Scale:** DESC
no

Site and Design

Treated Plot Width: 6.7 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 4 ROW row
Treated Plot Area: 167.5 FT2 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 12 **Plots:** 48 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

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, 2022. 150 lbs of actual N was applied as 32% UAN in the spring, 2023. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included a single pass with a field cultivator on each May 3 and 22 to prepare the seedbed for planting. Crop residue on the soil surface at planting was approximately 10%.

Soil Description

Description Name: 50-51
% Sand: 38 **% OM:** 5.4 **Texture:** CL clay loam
% Silt: 26 **Soil Name:** CANISTEO
% Clay: 36 **Fert. Level:** E excellent
pH: 6.8 **CEC:** 33
Soil Drainage: F fair

Weather Conditions

Overall Moisture Conditions: BELNOR below normal

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Application Description

	A
Application Date	6/14/2023
Appl. Start Time	12:29 PM
Application Method	BROADC
Application Timing	POSPOS
Application Placement	BROFOL
Applied By	Macvilay
Appl. Entry Date	6/26/2023
Air Temperature Start, Stop	81, 81 F
% Relative Humidity Start, Stop	41, 41
Wind Velocity+Dir. Start	6 MPH, NW
Wet Leaves (Y/N)	N, no
Soil Temperature	72 F
Soil Moisture	DRY
% Cloud Cover	40
Next Moisture Occurred On	6/17/2023
Time to Next Moisture	3.0 DAY
Moisture 1 Week after Appl.	1.2 IN
Problems with Application?	Y, yes

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	ZEAMX, BCOR
Days after Emergence	17
Stage Majority, Percent	V5, -
Stage Minimum, Percent	V3, -
Stage Maximum, Percent	V5, -
Height Average	12 IN
Height Minimum, Maximum	10, 13

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	SETFA, W, BBCH
Stage Majority, Percent	3 LEAF, -
Stage Minimum, Percent	2 LEAF, -
Stage Maximum, Percent	4 LEAF, -
Height Average	5 IN
Height Minimum, Maximum	2, 6
Density Average	10 PLOT
Density Minimum, Maximum	5, 15
Pest 2 Code, Type, Scale	ABUTH, W, BBCH
Stage Majority, Percent	4 LEAF, -
Stage Minimum, Percent	1 LEAF, -
Stage Maximum, Percent	5 LEAF, -
Height Average	5 IN
Height Minimum, Maximum	3, 6
Density Average	3 PLOT
Density Minimum, Maximum	0, 3
Pest 3 Code, Type, Scale	AMATA, W, BBCH
Height Average	4 IN
Height Minimum, Maximum	3, 6
Density Average	7 PLOT
Density Minimum, Maximum	0, 3
Pest 4 Code, Type, Scale	CHEAL, W, DESC
Height Average	- cm
Pest 5 Code, Type, Scale	IPOHE, W, BBCH
Stage Majority, Percent	NUMERO, -
Stage Minimum, Percent	NUMERO, -
Stage Maximum, Percent	NUMERO, -
Height Average	5 IN
Height Minimum, Maximum	1, 6
Density Average	6 FT2
Density Minimum, Maximum	5, 8

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
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Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

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
Ground Speed	3 MPH
Application Amount	20 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/28/2023	Richard M Porter	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	6/26/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	6/26/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.
STATUS	9/5/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Weed control ratings up to June 28 evaluated only burndown. July 12 and 26 ratings account for both burndown and residual control of weeds emerging after applications.

The far right side of the experiment (11th and 12th frames) had significantly lower ivyleaf morningglory pressure.

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

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	ZEAMD	SETFA	ABUTH	AMATA
Rating Date								6/21/2023	6/28/2023	6/28/2023	6/28/2023	6/28/2023
Rating Type								PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								V7	V9	3-9 IN	3-7 IN	3-7 IN
Trt-Eval Interval								7 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
1	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	50	40	90	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
2	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	13	10	89	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
3	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	39	30	99	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Roundup PowerMax 3	4.8	SL	30	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
4	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	28	21	80	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Hornet 68.5 WG	68.5	WG	3	OZ/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
5	Impact Core 7.15 EC	7.15	EC	24	FL OZ/A	POSPOS	A	10	8	91	99	99
	ImpactZ 4.26 SC	4.26	SC	4.27	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	1.74	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
6	Sinate 2.57 L	2.57	L	24	FL OZ/A	POSPOS	A	13	8	99	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
7	Sinate 2.57 L	2.57	L	24	FL OZ/A	POSPOS	A	0	0	97	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
8	Sinate 2.57 L	2.57	L	21	FL OZ/A	POSPOS	A	10	9	95	99	99
	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
9	Sinate 2.57 L	2.57	L	21	FL OZ/A	POSPOS	A	14	9	98	99	99
	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					

Missing data estimates are included in columns:Average=3,8,13
Could not calculate LSD (% mean diff) for columns 4,5,6,10,11,15,16 because error mean square = 0.
^Calculated from residual.

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

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	ZEAMD	SETFA	ABUTH	AMATA
	Rating Date							6/21/2023	6/28/2023	6/28/2023	6/28/2023	6/28/2023
	Rating Type							PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V7	V9	3-9 IN	3-7 IN	3-7 IN
	Trt-Eval Interval							7 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
10	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A	6	3	80	99	99
	ImpactZ 4.26 SC	4.26	SC	10.7	FL OZ/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
11	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A	8	3	98	99	99
	Zalo	2.57	SL	43	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
12	Halex GT 4.39 F	4.39	F	3.6	PT/A	POSPOS	A	5	3	98	99	99
	Atrazine 4 F	4	F	1	PT/A	POSPOS	A					
	NIS	100	SL	0.25	% v/v	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
	LSD P=.05							4.4	3.7	7.7	.	.
	Standard Deviation							3.0	2.5	5.3	0.0	0.0
	CV							18.82	21.58	5.73	0.0	0.0

Missing data estimates are included in columns:Average=3,8,13
Could not calculate LSD (% mean diff) for columns 4,5,6,10,11,15,16 because error mean square = 0.
^Calculated from residual.

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	CHEAL 6/28/2023 CONTRO % 3-7 IN 14 DA-A	IPOHE 6/28/2023 CONTRO % 3-7 IN 14 DA-A	SETFA 7/12/2023 CONTRO % 3-9 IN 28 DA-A	ABUTH 7/12/2023 CONTRO % 3-7 IN 28 DA-A	AMATA 7/12/2023 CONTRO % 28 DA-A
	Pest Code							CHEAL	IPOHE	SETFA	ABUTH	AMATA
	Rating Date							6/28/2023	6/28/2023	7/12/2023	7/12/2023	7/12/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-7 IN	3-7 IN	3-9 IN	3-7 IN	
	Trt-Eval Interval							14 DA-A	14 DA-A	28 DA-A	28 DA-A	28 DA-A
								6	7	8	9	10
1	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	91	91	98	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
2	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	88	94	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
3	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	95	99	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Roundup PowerMax 3	4.8	SL	30	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
4	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	93	90	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Hornet 68.5 WG	68.5	WG	3	OZ/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
5	Impact Core 7.15 EC	7.15	EC	24	FL OZ/A	POSPOS	A	99	89	95	99	99
	ImpactZ 4.26 SC	4.26	SC	4.27	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	1.74	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
6	Sinate 2.57 L	2.57	L	24	FL OZ/A	POSPOS	A	99	97	96	98	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
7	Sinate 2.57 L	2.57	L	24	FL OZ/A	POSPOS	A	99	98	97	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
8	Sinate 2.57 L	2.57	L	21	FL OZ/A	POSPOS	A	99	98	96	99	99
	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
9	Sinate 2.57 L	2.57	L	21	FL OZ/A	POSPOS	A	99	99	98	99	99
	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					

Missing data estimates are included in columns:Average=3,8,13
Could not calculate LSD (% mean diff) for columns 4,5,6,10,11,15,16 because error mean square = 0.
^Calculated from residual.

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	6	7	8	9	10
	Pest Code							CHEAL	IPOHE	SETFA	ABUTH	AMATA
	Rating Date							6/28/2023	6/28/2023	7/12/2023	7/12/2023	7/12/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-7 IN	3-7 IN	3-9 IN	3-7 IN	
	Trt-Eval Interval							14 DA-A	14 DA-A	28 DA-A	28 DA-A	28 DA-A
10	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A	99	86	95	99	99
	ImpactZ 4.26 SC	4.26	SC	10.7	FL OZ/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
11	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A	99	98	98	99	99
	Zalo	2.57	SL	43	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
12	Halex GT 4.39 F	4.39	F	3.6	PT/A	POSPOS	A	99	92	98	99	99
	Atrazine 4 F	4	F	1	PT/A	POSPOS	A					
	NIS	100	SL	0.25	% v/v	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
	LSD P=.05							.	5.9	4.9	1.2	.
	Standard Deviation							0.0	4.1	3.4	0.8	0.0
	CV							0.0	4.36	3.53	0.84	0.0

Missing data estimates are included in columns:Average=3,8,13
Could not calculate LSD (% mean diff) for columns 4,5,6,10,11,15,16 because error mean square = 0.
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Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	CHEAL 7/12/2023 CONTRO % 28 DA-A	IPOHE 7/12/2023 CONTRO % 3-30 IN 28 DA-A	SETFA 7/26/2023 CONTRO % 3-9 IN 42 DA-A	ABUTH 7/26/2023 CONTRO % 3-7 IN 42 DA-A	AMATA 7/26/2023 CONTRO % 42 DA-A
								11	12	13	14	15
1	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	58	93	98	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
2	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	60	96	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
3	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	61	99	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Roundup PowerMax 3	4.8	SL	30	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
4	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	74	95	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Hornet 68.5 WG	68.5	WG	3	OZ/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
5	Impact Core 7.15 EC	7.15	EC	24	FL OZ/A	POSPOS	A	99	64	96	99	99
	ImpactZ 4.26 SC	4.26	SC	4.27	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	1.74	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
6	Sinate 2.57 L	2.57	L	24	FL OZ/A	POSPOS	A	99	74	98	98	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
7	Sinate 2.57 L	2.57	L	24	FL OZ/A	POSPOS	A	99	66	99	99	99
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
8	Sinate 2.57 L	2.57	L	21	FL OZ/A	POSPOS	A	99	65	98	99	99
	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
9	Sinate 2.57 L	2.57	L	21	FL OZ/A	POSPOS	A	99	78	98	99	99
	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A					
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					

Missing data estimates are included in columns:Average=3,8,13
Could not calculate LSD (% mean diff) for columns 4,5,6,10,11,15,16 because error mean square = 0.
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Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							CHEAL	IPOHE	SETFA	ABUTH	AMATA
	Rating Date							7/12/2023	7/12/2023	7/26/2023	7/26/2023	7/26/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max								3-30 IN	3-9 IN	3-7 IN	
	Trt-Eval Interval							28 DA-A	28 DA-A	42 DA-A	42 DA-A	42 DA-A
10	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A	99	60	99	99	99
	ImpactZ 4.26 SC	4.26	SC	10.7	FL OZ/A	POSPOS	A					
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
11	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A	99	71	99	99	99
	Zalo	2.57	SL	43	FL OZ/A	POSPOS	A					
	MSO	100	L	0.5	% V/V	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
12	Halex GT 4.39 F	4.39	F	3.6	PT/A	POSPOS	A	99	75	98	99	99
	Atrazine 4 F	4	F	1	PT/A	POSPOS	A					
	NIS	100	SL	0.25	% v/v	POSPOS	A					
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A					
	LSD P=.05							.	13.7	3.2	1.2	.
	Standard Deviation							0.0	9.5	2.2	0.8	0.0
	CV							0.0	14.17	2.26	0.84	0.0

Missing data estimates are included in columns:Average=3,8,13
Could not calculate LSD (% mean diff) for columns 4,5,6,10,11,15,16 because error mean square = 0.
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Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	CHEAL 7/26/2023 CONTRO % 42 DA-A	IPOHE 7/26/2023 CONTRO % 3-30 IN 42 DA-A
	Pest Code								
	Rating Date							7/26/2023	7/26/2023
	Rating Type							CONTRO	CONTRO
	Rating Unit/Min/Max							%	%
	Pest Stage Majority/Min/Max								3-30 IN
	Trt-Eval Interval							42 DA-A	42 DA-A
1	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	45
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
2	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	56
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A		
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
3	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	54
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A		
	Roundup PowerMax 3	4.8	SL	30	FL OZ/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
4	Impact Core 7.15 EC	7.15	EC	30	FL OZ/A	POSPOS	A	99	69
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A		
	Hornet 68.5 WG	68.5	WG	3	OZ/A	POSPOS	A		
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
5	Impact Core 7.15 EC	7.15	EC	24	FL OZ/A	POSPOS	A	99	59
	ImpactZ 4.26 SC	4.26	SC	4.27	FL OZ/A	POSPOS	A		
	Atrazine 4 F	4	F	1.74	PT/A	POSPOS	A		
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
6	Sinate 2.57 L	2.57	L	24	FL OZ/A	POSPOS	A	99	70
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A		
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
7	Sinate 2.57 L	2.57	L	24	FL OZ/A	POSPOS	A	99	63
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A		
	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A		
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
8	Sinate 2.57 L	2.57	L	21	FL OZ/A	POSPOS	A	99	60
	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A		
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
9	Sinate 2.57 L	2.57	L	21	FL OZ/A	POSPOS	A	99	70
	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A		
	Atrazine 4 F	4	F	2	PT/A	POSPOS	A		
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		

Missing data estimates are included in columns:Average=3,8,13
Could not calculate LSD (% mean diff) for columns 4,5,6,10,11,15,16 because error mean square = 0.
^Calculated from residual.

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	CHEAL 7/26/2023 CONTRO % 42 DA-A	IPOHE 7/26/2023 CONTRO % 3-30 IN 42 DA-A
	Pest Code							CHEAL	IPOHE
	Rating Date							7/26/2023	7/26/2023
	Rating Type							CONTRO	CONTRO
	Rating Unit/Min/Max							%	%
	Pest Stage Majority/Min/Max								3-30 IN
	Trt-Eval Interval							42 DA-A	42 DA-A
								16	17
10	Dual II Magnum 7.64 EC	7.64	EC	1	PT/A	POSPOS	A	99	54
	ImpactZ 4.26 SC	4.26	SC	10.7	FL OZ/A	POSPOS	A		
	Assure II 0.88 EC	0.88	EC	8	FL OZ/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
11	Impact Core 7.15 EC	7.15	EC	20	FL OZ/A	POSPOS	A	99	68
	Zalo	2.57	SL	43	FL OZ/A	POSPOS	A		
	MSO	100	L	0.5	% V/V	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
12	Halex GT 4.39 F	4.39	F	3.6	PT/A	POSPOS	A	99	69
	Atrazine 4 F	4	F	1	PT/A	POSPOS	A		
	NIS	100	SL	0.25	% v/v	POSPOS	A		
	Ammonium sulfate	21	SG	2.5	LB/A	POSPOS	A		
	LSD P=.05							.	16.3
	Standard Deviation							0.0	11.4
	CV							0.0	18.54

Missing data estimates are included in columns:Average=3,8,13
Could not calculate LSD (% mean diff) for columns 4,5,6,10,11,15,16 because error mean square = 0.
^Calculated from residual.

Iowa State University

AMVAC Weed Control Systems Utilizing Assure II in Enlist/LL Corn Production, Ames, IA, 2023.

Trial ID: ACS5 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HC033US Location: Ames Trial Year: 2023
Project ID: 033 Project ID 2: Project ID 3:
Study Director: Joe Bruce Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

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

Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC1 Official Trial ID: Cooperator Trial ID:
Protocol ID: HN23USADHD Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/25/2023
Completion Date: 6/29/2023

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

Latitude of LL Corner °: 42.002216 N
Longitude of LL Corner °: -93.673644 W

Regulations
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.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/20/2023 **Stage Scale:** VR
Variety: Asgrow AG21XF3
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/25/2023 **Planting Rate:** 140000 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: CLODDY cloddy
Soil Temperature: 63 F **Soil Moisture:** DRY dry
Emergence Date: 6/1/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 7/20/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 7/20/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 7/20/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 7/20/2023
Common Name: Ivyleaf morningglory **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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 10 **Plots:** 30 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC1 Official Trial ID: Cooperator Trial ID:
Protocol ID: HN23USADHD Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Field Prep./Maintenance:
Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description
Description Name: 3
% Sand: 42 **% OM:** 4.4 **Texture:** CL clay loam
% Silt: 26 **Soil Name:** WEBSTER
% Clay: 32 **Fert. Level:** E excellent
pH: 6.1 **CEC:** 22
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN

Iowa State University

Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC1 Official Trial ID: Cooperator Trial ID:
Protocol ID: HN23USADHD Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

Application Description

	A
Application Date	5/26/2023
Appl. Start Time	10:15 AM
Appl. Stop Time	10:44 AM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROSOI
Applied By	Macvilay
Appl. Entry Date	7/21/2023
Air Temperature Start, Stop	69, 70 F
% Relative Humidity Start, Stop	34, 34
Wind Velocity+Dir. Start	9 MPH, SE
Wind Velocity+Dir. Stop	9 MPH, SE
Soil Temperature	59 F
Soil Moisture	DRY
Soil Surface Condition	ROUGH
% Cloud Cover	0
Next Moisture Occurred On	5/30/2023
Time to Next Moisture	4.0 DAY
Moisture 6 Hours after Appl.	0 IN
Moisture 24 Hours after Appl.	0, IN
Moisture 1 Week after Appl.	0.7 IN
Problems with Application?	N, no

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	-6

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
Pest 4 Code, Type, Scale	IPOHE, W, BBCH

Iowa State University

Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC1 Official Trial ID: Cooperator Trial ID:
Protocol ID: HN23USADHD Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

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
Ground Speed	3 MPH
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/5/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/20/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	11/16/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Iowa State University

Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC1 Official Trial ID: Cooperator Trial ID:
Protocol ID: HN23USADHD Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

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								6/9/2023	6/9/2023	6/9/2023	6/9/2023	6/9/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								VC	0.5 in	0.25 in	0.25 in	0.25 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	3	95	33	99	10
	Mauler	4	SC	8	FL OZ/A	PRE	A					
3	Warrant	3	CS	48	FL OZ/A	PRE	A	2	92	27	99	10
4	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	3	95	23	99	0
5	Warrant	3	CS	48	FL OZ/A	PRE	A	7	98	78	99	90
	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					
6	Warrant	3	CS	48	FL OZ/A	PRE	A	2	96	80	99	96
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
7	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	2	98	83	99	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					
8	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	2	87	77	94	70
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	3	95	90	99	53
10	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	2	98	98	99	94
	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					
LSD P=.05								4.7	6.4	11.5	4.4	15.1
Standard Deviation								2.7	3.7	6.7	2.6	8.6
CV								109.54	4.39	11.39	2.88	17.01

Missing data estimates are included in columns:Average=5,9,14
^Calculated from residual.

Iowa State University

Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC1 Official Trial ID: Cooperator Trial ID:
Protocol ID: HN23USADHD Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

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	IPOHE	SETFA
Rating Date								6/15/2023	6/15/2023	6/15/2023	6/15/2023	6/29/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								1-3 in	1-2 in	1-2 in	1-2 in	6-12 in
Trt-Eval Interval								20 DA-A	20 DA-A	20 DA-A	20 DA-A	34 DA-A
1	Untreated Check							0	0	0	0	0
2	Warrant	3	CS	48	FL OZ/A	PRE	A	93	33	98	10	82
	Mauler	4	SC	8	FL OZ/A	PRE	A					
3	Warrant	3	CS	48	FL OZ/A	PRE	A	90	27	98	10	80
4	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	88	23	99	0	73
5	Warrant	3	CS	48	FL OZ/A	PRE	A	96	72	99	80	88
	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					
6	Warrant	3	CS	48	FL OZ/A	PRE	A	96	70	99	95	90
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A					
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
7	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	95	77	98	80	83
	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					
8	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	80	67	80	65	63
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	87	87	98	53	72
10	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	95	93	99	94	82
	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					
LSD P=.05								8.2	12.6	6.2	13.9	14.5
Standard Deviation								4.8	7.4	3.6	7.8	8.5
CV								5.83	13.43	4.16	16.08	11.89

Missing data estimates are included in columns:Average=5,9,14
^Calculated from residual.

Iowa State University

Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC1 Official Trial ID: Cooperator Trial ID:
Protocol ID: HN23USADHD Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

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	IPOHE
Rating Date								6/29/2023	6/29/2023	6/29/2023	6/29/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%
Pest Stage Majority/Min/Max								3-10 in	2-9 in	2-9 in	1-12 in
Trt-Eval Interval								34 DA-A	34 DA-A	34 DA-A	34 DA-A
1	Untreated Check							0	0	0	0
2	Warrant	3	CS	48	FL OZ/A	PRE	A	30	92	47	10
	Mauler	4	SC	8	FL OZ/A	PRE	A				
3	Warrant	3	CS	48	FL OZ/A	PRE	A	17	85	23	10
4	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	23	99	65	0
5	Warrant	3	CS	48	FL OZ/A	PRE	A	60	99	91	73
	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				
6	Warrant	3	CS	48	FL OZ/A	PRE	A	50	96	85	83
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A				
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
7	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	63	96	88	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				
8	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PRE	A	53	60	67	60
	Vaporgrip Xtra Agent		SL	20	FL OZ/A	PRE	A				
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	73	93	60	53
10	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	80	94	80	91
	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				
LSD P=.05								16.1	8.8	14.8	14.8
Standard Deviation								9.4	5.1	8.6	8.3
CV								20.91	6.3	14.23	18.05

Missing data estimates are included in columns:Average=5,9,14
^Calculated from residual.

Iowa State University

Xtendimax Herbicide with Vaporgrip Technology Paired with Residual Programs for Extending Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC1 Official Trial ID: Cooperator Trial ID:
Protocol ID: HN23USADHD Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha Trial Origin: Conducted Under GEP: No

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
AMBEL, Ambrosia artemisiifolia, Common ragweed = 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, 2023.
Trial ID: ASC2
Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/25/2023
Completion Date: 7/21/2023

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

Latitude of LL Corner °: 42.002172 N
Longitude of LL Corner °: -93.673956 W

Regulations
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.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Asgrow AG21XF3
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/25/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 65 F **Soil Moisture:** DRY dry
Emergence Date: 6/1/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/15/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/15/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/15/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/15/2023
Common Name: Common ragweed **Stage Scale:** DESC

Pest 5 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/15/2023
Common Name: Ivyleaf morningglory **Stage Scale:** DESC

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2023.
Trial ID: ASC2
Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Site and Design
Treated Plot Width: 10 FT
Treated Plot Length: 25 FT
Treated Plot Area: 250.0 FT2
Replications: 3 **Treatments:** 10 **Plots:** 30
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.	ZEAMD	2022

Field Prep./Maintenance:
Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description
Description Name: 7
% Sand: 39 **% OM:** 4.7 **Texture:** CL clay loam
% Silt: 25 **Soil Name:** WEBSTER
% Clay: 36 **Fert. Level:** E excellent
pH: 7 **CEC:** 28.2
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: DRY dry
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2023.
Trial ID: ASC2
Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/26/2023	6/21/2023
Appl. Start Time	10:30 AM	1:00 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Applied By	Franzenburg	Macvilay
Appl. Entry Date	7/24/2023	7/24/2023
Air Temperature Start, Stop	69, 70 F	85, 85 F
% Relative Humidity Start, Stop	34, 34	46, 46
Wind Velocity+Dir. Start	6 MPH, SE	5 MPH, ESE
Wet Leaves (Y/N)		N, no
Soil Temperature	59 F	77 F
Soil Moisture	DRY	DRY
Soil Surface Condition	ROUGH	
% Cloud Cover	0	0
Next Moisture Occurred On	5/30/2023	6/24/2023
Time to Next Moisture	4.0 DAY	3.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN
Moisture 1 Week after Appl.	0.7 IN	0.65 IN
Problems with Application?	N, no	N, no

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-6	20
Stage Majority, Percent		V3, -
Stage Minimum, Percent		V2, -
Stage Maximum, Percent		V3, -
Height Average		8 IN
Height Minimum, Maximum		8, 9

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2023.
Trial ID: ASC2
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Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

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

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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	TTI	TT & TTI
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	20 IN	19 IN
Boom Length	10 FT	10 FT
Ground Speed	2.8 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/16/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/15/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Treatments 7-10 were added to the original protocol.

Weed counts were taken ahead of the POST applications on June 20 from 3- 1ft2 random quadrats between rows 2 & 3 of each plot, and the average was recorded.

Iowa State University

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Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 6/9/2023 PHYNEC % VC 14 DA-A	SETFA 6/9/2023 CONTRO % 0.5 IN 14 DA-A	ABUTH 6/9/2023 CONTRO % 0.25 IN 14 DA-A	AMATA 6/9/2023 CONTRO % 0.25 IN 14 DA-A	IPOHE 6/9/2023 CONTRO % 0.25 IN 14 DA-A
	Pest Code											
	Rating Date							6/9/2023	6/9/2023	6/9/2023	6/9/2023	6/9/2023
	Rating Type							PHYNEC	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							VC	0.5 IN	0.25 IN	0.25 IN	0.25 IN
	Trt-Eval Interval							14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
								1	2	3	4	5
1	Untreated Check							0	0	0	0	0
2	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	0	65	63	99	90
	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					
3	Kyber	2.64	SC	16	FL OZ/A	PRE	A	0	37	0	47	0
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	0	72	47	99	27
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	0	88	95	98	93
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	0	75	45	85	65
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	0	63	67	98	40
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	Fierce MTZ SC	2.64	SC	16	FL OZ/A	PRE	A	0	67	83	99	35
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	2	70	70	99	10
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
10	Fierce MTZ SC	2.64	SC	1	PT/A	PRE	A	0	75	60	99	33
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							1.6	16.1	13.4	7.3	27.4
	Standard Deviation							0.9	9.3	7.8	4.2	15.5
	CV							563.6	15.24	14.63	5.17	39.48

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
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^Calculated from residual.

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Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 6/19/2023 PHYNEC % V3 24 DA-A	SETFA 6/19/2023 CONTRO % 2-6 IN 24 DA-A	ABUTH 6/19/2023 CONTRO % 1-4 IN 24 DA-A	AMATA 6/19/2023 CONTRO % 1-4 IN 24 DA-A	AMBEL 6/19/2023 CONTRO % 2-4 IN 24 DA-A
	Pest Code											
	Rating Date							6/19/2023	6/19/2023	6/19/2023	6/19/2023	6/19/2023
	Rating Type							PHYNEC	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V3	2-6 IN	1-4 IN	1-4 IN	2-4 IN
	Trt-Eval Interval							24 DA-A	24 DA-A	24 DA-A	24 DA-A	24 DA-A
1	Untreated Check							0	0	0	0	0
2	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	0	43	43	93	40
	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					
3	Kyber	2.64	SC	16	FL OZ/A	PRE	A	0	17	0	33	27
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	0	50	37	95	63
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	0	77	90	98	90
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	0	60	40	80	55
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	2	43	57	91	55
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	Fierce MTZ SC	2.64	SC	16	FL OZ/A	PRE	A	0	47	70	96	47
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	2	60	67	95	43
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
10	Fierce MTZ SC	2.64	SC	1	PT/A	PRE	A	0	53	60	93	63
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							2.4	21.7	20.5	18.0	19.9
	Standard Deviation							1.4	12.6	11.9	10.4	11.4
	CV							409.45	28.01	25.67	13.47	23.66

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
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Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	IPOHE 6/19/2023 CONTRO % 1-4 IN 24 DA-A	SETFA 6/20/2023 COUPLA FT2 2-6 IN -1 DA-B	ABUTH 6/20/2023 COUPLA FT2 1-4 IN -1 DA-B	AMATA 6/20/2023 COUPLA FT2 1-4 IN -1 DA-B	AMBEL 6/20/2023 COUPLA FT2 2-4 IN -1 DA-B
	Pest Code											
	Rating Date							6/19/2023	6/20/2023	6/20/2023	6/20/2023	6/20/2023
	Rating Type							CONTRO	COUPLA	COUPLA	COUPLA	COUPLA
	Rating Unit/Min/Max							%	FT2	FT2	FT2	FT2
	Pest Stage Majority/Min/Max							1-4 IN	2-6 IN	1-4 IN	1-4 IN	2-4 IN
	Trt-Eval Interval							24 DA-A	-1 DA-B	-1 DA-B	-1 DA-B	-1 DA-B
								11	12	13	14	15
1	Untreated Check							0	13	2	6	3
2	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	80	18	2	0	2
	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					
3	Kyber	2.64	SC	16	FL OZ/A	PRE	A	0	17	2	5	1
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	27	11	2	0	1
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	85	9	0	0	0
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	45	8	2	1	2
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	40	10	1	0	1
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	Fierce MTZ SC	2.64	SC	16	FL OZ/A	PRE	A	30	10	1	1	1
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	10	9	1	0	2
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
10	Fierce MTZ SC	2.64	SC	1	PT/A	PRE	A	33	10	1	1	2
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							29.1	8.3	2.2	2.5	2.7
	Standard Deviation							16.5	4.8	1.3	1.4	1.6
	CV							47.1	41.6	86.14	100.2	97.69

Missing data estimates are included in
columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
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^Calculated from residual.

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Trial ID: ASC2
Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	IPOHE 6/20/2023 COUPLA FT2 1-4 IN -1 DA-B	SETFA 6/30/2023 CONTRO % 2-6 IN 35 DA-A	ABUTH 6/30/2023 CONTRO % 1-4 IN 35 DA-A	AMATA 6/30/2023 CONTRO % 1-4 IN 35 DA-A	AMBEL 6/30/2023 CONTRO % 2-4 IN 35 DA-A
	Pest Code											
	Rating Date											
	Rating Type											
	Rating Unit/Min/Max											
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval											
								16	17	18	19	20
1	Untreated Check							1	0	0	0	0
2	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	1	99	99	99	99
	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					
3	Kyber	2.64	SC	16	FL OZ/A	PRE	A	2	99	96	96	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	3	99	98	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	1	99	99	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	2	99	95	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	1	99	99	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	Fierce MTZ SC	2.64	SC	16	FL OZ/A	PRE	A	1	99	99	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	1	99	98	96	95
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
10	Fierce MTZ SC	2.64	SC	1	PT/A	PRE	A	1	99	96	98	93
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							1.6	.	2.7	2.3	3.1
	Standard Deviation							1.0	0.0	1.6	1.3	1.8
	CV							70.69	0.0	1.8	1.53	2.01

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
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Trial ID: ASC2
Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	IPOHE 6/30/2023 CONTRO % 1-4 IN 35 DA-A	GLXMA 7/8/2023 PHYCHL % V7 43 DA-A	GLXMA 7/8/2023 PHYNEC % V7 43 DA-A	GLXMA 7/8/2023 PHYSTU % V7 43 DA-A	GLXMA 7/8/2023 PHYGEN % V7 43 DA-A
	Pest Code											
	Rating Date											
	Rating Type											
	Rating Unit/Min/Max											
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval											
								21	22	23	24	25
1	Untreated Check							0	0	0	0	0
2	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	99	7	17	10	23
	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					
3	Kyber	2.64	SC	16	FL OZ/A	PRE	A	99	5	0	10	15
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	99	3	0	10	12
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	99	0	0	0	0
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	99	0	0	0	0
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	99	8	15	12	25
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	Fierce MTZ SC	2.64	SC	16	FL OZ/A	PRE	A	99	10	18	12	30
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	95	8	12	8	22
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
10	Fierce MTZ SC	2.64	SC	1	PT/A	PRE	A	96	7	13	12	25
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							1.5	3.8	3.3	4.5	4.9
	Standard Deviation							0.9	2.2	1.9	2.6	2.9
	CV							0.97	45.35	25.39	35.47	18.81

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
Could not calculate LSD (% mean diff) for columns 17,26 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, 2023.

Trial ID: ASC2
Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	SETFA 7/8/2023 CONTRO % 2-6 IN 43 DA-A	ABUTH 7/8/2023 CONTRO % 1-4 IN 43 DA-A	AMATA 7/8/2023 CONTRO % 1-4 IN 43 DA-A	AMBEL 7/8/2023 CONTRO % 2-4 IN 43 DA-A	IPOHE 7/8/2023 CONTRO % 1-4 IN 43 DA-A
	Pest Code											
	Rating Date							7/8/2023	7/8/2023	7/8/2023	7/8/2023	7/8/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							2-6 IN	1-4 IN	1-4 IN	2-4 IN	1-4 IN
	Trt-Eval Interval							43 DA-A	43 DA-A	43 DA-A	43 DA-A	43 DA-A
								26	27	28	29	30
1	Untreated Check							0	0	0	0	0
2	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	99	99	99	99	99
	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					
3	Kyber	2.64	SC	16	FL OZ/A	PRE	A	99	99	96	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	99	99	99	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	99	99	99	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	99	95	99	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	99	99	99	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	Fierce MTZ SC	2.64	SC	16	FL OZ/A	PRE	A	99	99	99	99	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	99	98	99	96	97
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
10	Fierce MTZ SC	2.64	SC	1	PT/A	PRE	A	99	98	98	98	98
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							.	1.7	1.9	3.5	2.1
	Standard Deviation							0.0	1.0	1.1	2.0	1.2
	CV							0.0	1.13	1.26	2.27	1.34

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
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^Calculated from residual.

Iowa State University

Evaluating Authority Edge, Anthem Maxx and other Standard Preemergence Programs for Residual Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC2
Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	SETFA 7/21/2023 CONTRO % 2-6 IN 56 DA-A	ABUTH 7/21/2023 CONTRO % 1-4 IN 56 DA-A	AMATA 7/21/2023 CONTRO % 1-4 IN 56 DA-A	AMBEL 7/21/2023 CONTRO % 2-4 IN 56 DA-A	IPOHE 7/21/2023 CONTRO % 1-4 IN 56 DA-A
	Pest Code											
	Rating Date							7/21/2023	7/21/2023	7/21/2023	7/21/2023	7/21/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							2-6 IN	1-4 IN	1-4 IN	2-4 IN	1-4 IN
	Trt-Eval Interval							56 DA-A	56 DA-A	56 DA-A	56 DA-A	56 DA-A
								31	32	33	34	35
1	Untreated Check							0	0	0	0	0
2	Authority Edge	4.25	SC	7	FL OZ/A	PRE	A	98	96	99	96	95
	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					
3	Kyber	2.64	SC	16	FL OZ/A	PRE	A	87	92	73	92	95
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
4	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	93	95	98	98	95
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
5	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	96	99	99	99	98
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
6	Authority Edge	4.25	SC	9	FL OZ/A	PRE	A	97	97	99	97	99
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	AMS		SG	3	LB/A	POST	B					
7	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	96	96	98	99	95
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
8	Fierce MTZ SC	2.64	SC	16	FL OZ/A	PRE	A	99	99	99	98	93
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	AMS		SG	3	LB/A	POST	B					
9	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	98	98	99	99	95
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
10	Fierce MTZ SC	2.64	SC	1	PT/A	PRE	A	98	99	96	99	96
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B					
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	Intact		L	0.5	% V/V	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							4.5	3.8	3.9	4.3	4.0
	Standard Deviation							2.6	2.2	2.3	2.5	2.3
	CV							3.05	2.54	2.65	2.83	2.64

Missing data estimates are included in columns:Average=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35
Could not calculate LSD (% mean diff) for columns 17,26 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, 2023.
Trial ID: ASC2
Protocol ID: USA-23-017 FIERCE6401 & 6405 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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
AMBEL, Ambrosia artemisiifolia, Common ragweed = US
Rating Type
PHYNEC = phytotoxicity - necrosis /burn
CONTRO = control / burndown or knockdown
COUPLA = count - plant / emergence - objective
PHYCHL = phytotoxicity - chlorosis
PHYSTU = phytotoxicity - stunting
PHYGEN = phytotoxicity - general / injury
Rating Unit/Min/Max
%, 0, 100 = percent
FT2, , = square foot

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/24/2023
Completion Date: 7/21/2023

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

Latitude of LL Corner °: 42.001845 N
Longitude of LL Corner °: -93.674302 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Enlist One and Liberty tank mixtures applied PRE and POST in Enlist conventional till soybean.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/24/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 65 F **Soil Moisture:** DRY dry
Emergence Date: 5/31/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/11/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/11/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/11/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/11/2023
Common Name: Common 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 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 13 **Plots:** 52 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Field Prep./Maintenance:
Soil testing indicated soil fertility to be optimum for all nutrients. Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description
Description Name: 9
% Sand: 39 **% OM:** 4.4 **Texture:** CL clay loam
% Silt: 25 **Soil Name:** CLARION, WEBSTER
% Clay: 36 **Fert. Level:** E excellent
pH: 5.5 **CEC:** 24.6
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: DRY dry
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C	D
Application Date	5/25/2023	6/15/2023	6/15/2023	6/29/2023
Appl. Start Time	4:45 PM	6:15 PM	6:14 PM	4:45 PM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	POST	POST	LPOST
Application Placement	BROSOI	BROFOL	BROFOL	BROFOL
Applied By	Hamberg	Franzenburg	Franzenburg	Macvilay
Appl. Entry Date	7/24/2023	7/24/2023	7/24/2023	7/24/2023
Air Temperature Start, Stop	75, 75 F	88, 87 F	88, 87 F	88, 88 F
% Relative Humidity Start, Stop	36, 36	30, 30	30, 30	55, 55
Wind Velocity+Dir. Start	7 MPH, ESE	1 MPH, WNW	1 MPH, WNW	6 MPH, N
Wet Leaves (Y/N)		N, no	N, no	N, no
Soil Temperature	72 F	79 F	79 F	79 F
Soil Moisture	DRY	DRY	DRY	DRY
Soil Surface Condition	ROUGH			
% Cloud Cover	5	20	20	10
Next Moisture Occurred On	5/30/2023	6/17/2023	6/17/2023	7/7/2023
Time to Next Moisture	5.0 DAY	2.0 DAY	2.0 DAY	8.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0.7 IN	1.2 IN	1.2 IN	0 IN
Problems with Application?	N, no	N, no	N, no	N, no

Comment:
Plot 101 data was not taken.

Crop Stage At Each Application

	A	B	C	D
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-6	15	15	29
Stage Majority, Percent		V2, -	V2, -	V5, -
Stage Minimum, Percent		V2, -	V2, -	V4, -
Stage Maximum, Percent		V2, -	V2, -	V6, -
Height Average		6 IN	6 IN	13 IN
Height Minimum, Maximum		5, 7	5, 7	10, 16

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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		3 LEAF, -	3 LEAF, -	
Stage Minimum, Percent		2 LEAF, -	2 LEAF, -	
Stage Maximum, Percent		4 LEAF, -	4 LEAF, -	
Height Average		3 IN	3 IN	10 IN
Height Minimum, Maximum		2, 4	2, 4	4, 14
Density Average		2 FT2	2 FT2	4 FT2
Density Minimum, Maximum		0, 3	0, 3	0, 8
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		4 LEAF, -	4 LEAF, -	7 LEAF, -
Stage Minimum, Percent		2 LEAF, -	2 LEAF, -	5 LEAF, -
Stage Maximum, Percent		6 LEAF, -	6 LEAF, -	10 LEA, -
Height Average		2 IN	2 IN	6 IN
Height Minimum, Maximum		0.5, 3	0.5, 3	4, 8
Density Average		1 FT2	1 FT2	3 PLOT
Density Minimum, Maximum		0, 2	0, 2	0, 5
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		4 LEAF, -	4 LEAF, -	12 LEA, -
Stage Minimum, Percent		2 LEAF, -	2 LEAF, -	6 LEAF, -
Stage Maximum, Percent		5 LEAF, -	5 LEAF, -	16 LEA, -
Height Average		1 IN	1 IN	8 IN
Height Minimum, Maximum		0.25, 2	0.25, 2	6, 11
Density Average		4 FT2	4 FT2	2 FT2
Density Minimum, Maximum		0, 8	0, 8	0, 4
Pest 4 Code, Type, Scale	AMBEL, W, DESC	AMBEL, W, DESC	AMBEL, W, DESC	AMBEL, W, DESC
Stage Majority, Percent		4 LEAF, -	4 LEAF, -	14 LEA, -
Stage Minimum, Percent		2 LEAF, -	2 LEAF, -	8 LEAF, -
Stage Maximum, Percent		6 LEAF, -	6 LEAF, -	18 LEA, -
Height Average		2 IN	2 IN	10 IN
Height Minimum, Maximum		1, 3	1, 3	5, 15
Density Average		0.5 FT2	0.5 FT2	3 FT2
Density Minimum, Maximum		0, 1	0, 1	0, 5

Application Equipment

	A	B	C	D
Appl. Equipment	ATV	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER
Equipment Type	ALTEVE	BACMAN	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	11002	11002
Nozzle Type	TTI	TTI	TT	TT
Nozzle TradeName		TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color		-, GREEN	-, YELLOW	-, YELLOW
Nozzle Spacing	20 IN	19 IN	19 IN	19.0 IN
Boom Length	10 FT	10 FT	10 FT	10.0 FT
Ground Speed	2.8 MPH	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	20 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2	COMCO2

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Notes

Context	Date	By	Notes
STATUS	3/20/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/11/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Giant foxtail and common ragweed had not emerged to the extent that control could be evaluated at the June 9 rating. Dry soil conditions probably contributed to slow emergence. Giant foxtail pressure was light in some areas of the experiment and could not be evaluated for all plots.

Woolly cugrass was present in parts of the experiment and was not included in the ratings. Some common ragweed survived tillage for seedbed preparation and was also ignored for control ratings.

Plot 101 data was not taken.

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	SETFA
Rating Date								6/9/2023	6/9/2023	6/9/2023	6/25/2023	6/25/2023
Rating Type								PHYNEC	CONTRO	CONTRO	PHYNEC	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								VC-V1	0.25 IN	0.25 IN	V4	1-9 IN
Trt-Eval Interval								15 DA-A	15 DA-A	15 DA-A	31 DA-A	31 DA-A
1	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	0	83	88	0	
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
2	Enlist One	3.8	EC	32	FL OZ/A	PRE	A	0	78	92	0	85
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	0	81	79	0	90
4	Enlist One	3.8	EC	32	FL OZ/A	PRE	A	0	80	91	0	
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
5	Verdict	5.57	EC	5	FL OZ/A	PRE	A	0	85	93	0	80
	MSO		L	0.714	% V/V	PRE	A					
	AMS Liquid	3.4	L	1.07	% W/V	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
6	Dimetric DF 75	75	DF	4	OZ WT/A	PRE	A	0	75	90	0	77
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
7	Enlist One	3.8	EC	32	FL OZ/A	POST	B	0	0	0	26	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	B					
	Pursuit	2	AS	4	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
8	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	0	0	0	21	99
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Pursuit	2	AS	4	FL OZ/A	POST	C					
9	Prefix	5.29	EC	32	FL OZ/A	POST	C	0	0	0	30	99
	COC		L	0.535	% V/V	POST	C					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
10	Anthem Maxx	4.3	SC	3.16	FL OZ/A	POST	C	0	0	0	21	99
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
11	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	C	0	0	0	6	99
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
12	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	0	86	86	0	83
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	D					
	Outlook	6	EC	12	FL OZ/A	LPOST	D					
	AMS Liquid	3.4	L	48	FL OZ/A	LPOST	D					
13	Untreated Check							0	0	0	0	0
LSD P=.05								.	14.0	11.4	3.4	8.5
Standard Deviation								0.0	9.8	7.9	2.4	5.8
CV								0.0	22.36	16.62	29.74	7.02

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

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ABUTH 6/25/2023 CONTRO % 1-7 IN 31 DA-A	AMATA 6/25/2023 CONTRO % 1-6 IN 31 DA-A	AMBEL 6/25/2023 CONTRO % 1-6 IN 31 DA-A	GLXMA 7/10/2023 PHYNEC % R2 46 DA-A	SETFA 7/10/2023 CONTRO % 1-28 IN 46 DA-A
	Pest Code											
	Rating Date							6/25/2023	6/25/2023	6/25/2023	7/10/2023	7/10/2023
	Rating Type							CONTRO	CONTRO	CONTRO	PHYNEC	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-7 IN	1-6 IN	1-6 IN	R2	1-28 IN
	Trt-Eval Interval							31 DA-A	31 DA-A	31 DA-A	46 DA-A	46 DA-A
								6	7	8	9	10
1	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	70	67	73	0	
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
2	Enlist One	3.8	EC	32	FL OZ/A	PRE	A	70	73	69	0	84
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	63	68	68	0	90
4	Enlist One	3.8	EC	32	FL OZ/A	PRE	A	73	80	60	0	
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
5	Verdict	5.57	EC	5	FL OZ/A	PRE	A	70	84	78	0	80
	MSO		L	0.714	% V/V	PRE	A					
	AMS Liquid	3.4	L	1.07	% W/V	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
6	Dimetric DF 75	75	DF	4	OZ WT/A	PRE	A	77	67	63	0	77
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
7	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	99	99	16	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	B					
	Pursuit	2	AS	4	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
8	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	99	98	99	13	99
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Pursuit	2	AS	4	FL OZ/A	POST	C					
9	Prefix	5.29	EC	32	FL OZ/A	POST	C	99	99	99	18	97
	COC		L	0.535	% V/V	POST	C					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
10	Anthem Maxx	4.3	SC	3.16	FL OZ/A	POST	C	99	99	99	11	99
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
11	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	C	99	99	99	4	98
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
12	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	85	71	70	10	99
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	D					
	Outlook	6	EC	12	FL OZ/A	LPOST	D					
	AMS Liquid	3.4	L	48	FL OZ/A	LPOST	D					
13	Untreated Check							0	0	0	0	0
	LSD P=.05							10.9	9.8	10.0	3.2	7.4
	Standard Deviation							7.6	6.8	6.9	2.3	5.1
	CV							9.84	8.88	9.23	41.13	6.1

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

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	AMBEL	GLXMA	SETFA
Rating Date								7/10/2023	7/10/2023	7/10/2023	7/21/2023	7/21/2023
Rating Type								CONTRO	CONTRO	CONTRO	PHYNEC	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								1-30 IN	1-30 IN	1-30 IN	R2	1-35 IN
Trt-Eval Interval								46 DA-A	46 DA-A	46 DA-A	57 DA-A	57 DA-A
1	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	70	60	70	0	
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
2	Enlist One	3.8	EC	32	FL OZ/A	PRE	A	65	66	65	0	84
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	60	63	65	0	90
4	Enlist One	3.8	EC	32	FL OZ/A	PRE	A	68	68	60	0	
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
5	Verdict	5.57	EC	5	FL OZ/A	PRE	A	67	74	76	0	80
	MSO		L	0.714	% V/V	PRE	A					
	AMS Liquid	3.4	L	1.07	% W/V	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
6	Dimetric DF 75	75	DF	4	OZ WT/A	PRE	A	77	60	63	0	77
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
7	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	97	99	8	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	B					
	Pursuit	2	AS	4	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
8	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	99	95	99	6	99
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Pursuit	2	AS	4	FL OZ/A	POST	C					
9	Prefix	5.29	EC	32	FL OZ/A	POST	C	95	99	99	13	97
	COC		L	0.535	% V/V	POST	C					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
10	Anthem Maxx	4.3	SC	3.16	FL OZ/A	POST	C	98	97	97	9	99
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
11	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	C	95	89	96	1	97
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
12	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	99	98	99	6	99
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	D					
	Outlook	6	EC	12	FL OZ/A	LPOST	D					
	AMS Liquid	3.4	L	48	FL OZ/A	LPOST	D					
13	Untreated Check							0	0	0	0	0
LSD P=.05								9.9	10.4	9.6	3.4	7.4
Standard Deviation								6.9	7.3	6.7	2.3	5.1
CV								9.07	9.78	8.8	71.7	6.05

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
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^Calculated from residual.

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ABUTH 7/21/2023 CONTRO % 5-40 IN 57 DA-A	AMATA 7/21/2023 CONTRO % 10-40 IN 57 DA-A	AMBEL 7/21/2023 CONTRO % 10-40 IN 57 DA-A
	Pest Code									
	Rating Date							7/21/2023	7/21/2023	7/21/2023
	Rating Type							CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%
	Pest Stage Majority/Min/Max							5-40 IN	10-40 IN	10-40 IN
	Trt-Eval Interval							57 DA-A	57 DA-A	57 DA-A
								16	17	18
1	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	70	60	68
	Pursuit	2	AS	4	FL OZ/A	PRE	A			
2	Enlist One	3.8	EC	32	FL OZ/A	PRE	A	60	66	65
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A			
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	60	61	65
4	Enlist One	3.8	EC	32	FL OZ/A	PRE	A	68	65	55
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A			
	Pursuit	2	AS	4	FL OZ/A	PRE	A			
5	Verdict	5.57	EC	5	FL OZ/A	PRE	A	65	74	74
	MSO		L	0.714	% V/V	PRE	A			
	AMS Liquid	3.4	L	1.07	% W/V	PRE	A			
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A			
	Pursuit	2	AS	4	FL OZ/A	PRE	A			
6	Dimetric DF 75	75	DF	4	OZ WT/A	PRE	A	75	55	61
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A			
	Pursuit	2	AS	4	FL OZ/A	PRE	A			
7	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	98	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	B			
	Pursuit	2	AS	4	FL OZ/A	POST	B			
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B			
8	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	98	95	98
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C			
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C			
	Pursuit	2	AS	4	FL OZ/A	POST	C			
9	Prefix	5.29	EC	32	FL OZ/A	POST	C	93	98	99
	COC		L	0.535	% V/V	POST	C			
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C			
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C			
10	Anthem Maxx	4.3	SC	3.16	FL OZ/A	POST	C	96	97	97
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C			
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C			
11	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST	C	95	88	93
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C			
12	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	99	98	99
	Pursuit	2	AS	4	FL OZ/A	PRE	A			
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	D			
	Outlook	6	EC	12	FL OZ/A	LPOST	D			
	AMS Liquid	3.4	L	48	FL OZ/A	LPOST	D			
13	Untreated Check							0	0	0
	LSD P=.05							8.9	11.2	10.6
	Standard Deviation							6.2	7.8	7.4
	CV							8.2	10.62	9.86

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

Iowa State University

Enlist One and Liberty Tank Mixtures Applied PRE and POST in Enlist Conventional Tillage Soybean, Ames, IA, 2023.
Trial ID: ASC3
Protocol ID: MKD-H-2023-US-D64-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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

Iowa State University

Residual Weed Control Evaluating Zidua PRO and Tendovo in Soybean, Ames, IA, 2023.

Trial ID: ASC 4
Protocol ID: MKD-H-2023-US-D31-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/25/2023
Completion Date: 7/10/2023

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

Latitude of LL Corner °: 42.002172 N
Longitude of LL Corner °: -93.674263 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare residual weed control in soybean with PRE products.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Asgrow AG21XF3
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/25/2023 **Planting Rate:** 140000 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: 68 F **Soil Moisture:** DRY dry
Emergence Date: 6/1/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/11/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/11/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/11/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/11/2023
Common Name: Common ragweed **Stage Scale:** DESC

Pest 5 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/11/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 6 **Plots:** 18 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Residual Weed Control Evaluating Zidua PRO and Tendovo in Soybean, Ames, IA, 2023.

Trial ID: ASC 4
Protocol ID: MKD-H-2023-US-D31-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Field Prep./Maintenance:

Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description

Description Name: 10
% Sand: 35 **% OM:** 4.7 **Texture:** CL clay loam
% Silt: 27 **Soil Name:** WEBSTER
% Clay: 38 **Fert. Level:** E excellent
pH: 7.4 **CEC:** 30.4
Soil Drainage: F fair

Weather Conditions

Overall Moisture Conditions: DRY dry
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN

Application Description

	A
Application Date	5/26/2023
Appl. Start Time	10:15 AM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROSOI
Applied By	Macvilay
Appl. Entry Date	7/24/2023
Air Temperature Start, Stop	69, 69 F
% Relative Humidity Start, Stop	34, 34
Wind Velocity+Dir. Start	6 MPH, SE
Soil Temperature	59 F
Soil Moisture	DRY
Soil Surface Condition	ROUGH
% Cloud Cover	0
Next Moisture Occurred On	5/30/2023
Time to Next Moisture	4.0 DAY
Moisture 6 Hours after Appl.	0 IN
Moisture 24 Hours after Appl.	0, IN
Moisture 1 Week after Appl.	0.7 IN
Problems with Application?	N, no

Iowa State University

Residual Weed Control Evaluating Zidua PRO and Tendovo in Soybean, Ames, IA, 2023.

Trial ID: ASC 4
Protocol ID: MKD-H-2023-US-D31-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	-6

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
Pest 4 Code, Type, Scale	AMBEL, W, DESC
Pest 5 Code, Type, Scale	IPOHE, 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
Ground Speed	3 MPH
Application Amount	15 GAL/AC
Propellant	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/29/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	11/30/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Soybean injury was not evaluated in the experiment. However, no injury was observed by any of the treatments.

Below normal rainfall occurred for the entire growing season. Marginal soil moisture for herbicide incorporation was available following planting and PRE applications.

Iowa State University

Residual Weed Control Evaluating Zidua PRO and Tendovo in Soybean, Ames, IA, 2023.

Trial ID: ASC 4
Protocol ID: MKD-H-2023-US-D31-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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								SETFA	ABUTH	AMATA	IPOHE	SETFA	ABUTH
Rating Date								6/10/2023	6/10/2023	6/10/2023	6/10/2023	6/25/2023	6/25/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%	%
Pest Stage Majority/Min/Max								0.5 IN	0.5 IN	0.5 IN	0.5 IN	3-6 IN	2-3 IN
Trt-Eval Interval								15 DA-A	15 DA-A	15 DA-A	15 DA-A	30 DA-A	30 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	92	93	99	88	65	90
3	Zidua PRO	4	SC	4.5	FL OZ/A	PRE	A	85	95	99	90	62	95
4	Tendovo	4.14	ZC	48	FL OZ/A	PRE	A	90	88	99	75	68	88
5	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	92	95	99	63	65	93
6	Tendovo	4.14	ZC	67.2	FL OZ/A	PRE	A	93	92	98	65	68	92
LSD P=.05								7.5	7.0	1.7	10.8	15.0	7.2
Standard Deviation								4.1	3.9	0.9	5.7	8.2	3.9
CV								5.51	5.01	1.15	9.03	15.08	5.16

Missing data estimates are included in columns:Average=4,8,9,13,14
^Calculated from residual.

Iowa State University

Residual Weed Control Evaluating Zidua PRO and Tendovo in Soybean, Ames, IA, 2023.

Trial ID: ASC 4
Protocol ID: MKD-H-2023-US-D31-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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								AMATA	AMBEL	IPOHE	SETFA	ABUTH	AMATA
Rating Date								6/25/2023	6/25/2023	6/25/2023	7/10/2023	7/10/2023	7/10/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%	%
Pest Stage Majority/Min/Max									2-3 IN	1-9 IN	10-25 IN	10-22 IN	
Trt-Eval Interval								30 DA-A	30 DA-A	30 DA-A	45 DA-A	45 DA-A	45 DA-A
1	Untreated Check							0	0	0	0	0	0
2	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	98	93	85	60	90	98
3	Zidua PRO	4	SC	4.5	FL OZ/A	PRE	A	99	95	80	60	93	98
4	Tendovo	4.14	ZC	48	FL OZ/A	PRE	A	98	95	70	63	88	93
5	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	98	95	60	60	93	95
6	Tendovo	4.14	ZC	67.2	FL OZ/A	PRE	A	98	95	63	67	92	96
LSD P=.05								3.7	4.2	19.9	17.3	6.8	6.1
Standard Deviation								2.0	2.2	10.0	9.5	3.7	3.4
CV								2.48	2.84	16.75	18.36	4.9	4.2

Missing data estimates are included in columns:Average=4,8,9,13,14
^Calculated from residual.

Iowa State University

Residual Weed Control Evaluating Zidua PRO and Tendovo in Soybean, Ames, IA, 2023.

Trial ID: ASC 4
Protocol ID: MKD-H-2023-US-D31-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	13	14
Pest Code								AMBEL	IPOHE
Rating Date								7/10/2023	7/10/2023
Rating Type								CONTRO	CONTRO
Rating Unit/Min/Max								%	%
Pest Stage Majority/Min/Max								10-22 IN	10-22 IN
Trt-Eval Interval								45 DA-A	45 DA-A
1	Untreated Check							0	0
2	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	92	80
3	Zidua PRO	4	SC	4.5	FL OZ/A	PRE	A	95	70
4	Tendovo	4.14	ZC	48	FL OZ/A	PRE	A	93	70
5	Tendovo	4.14	ZC	56	FL OZ/A	PRE	A	95	60
6	Tendovo	4.14	ZC	67.2	FL OZ/A	PRE	A	95	50
LSD P=.05								4.7	22.6
Standard Deviation								2.5	11.3
CV								3.21	20.55

Missing data estimates are included in columns:Average=4,8,9,13,14
^Calculated from residual.

Iowa State University

Residual Weed Control Evaluating Zidua PRO and Tendovo in Soybean, Ames, IA, 2023.

Trial ID: ASC 4
Protocol ID: MKD-H-2023-US-D31-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
IPOHE, Ipomoea hederacea, Ivyleaf morningglory = US
AMBEL, Ambrosia artemisiifolia, Common ragweed = US

Rating Type
CONTRO = control / burndown or knockdown

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

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.
Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/25/2023
Completion Date: 7/21/2023

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

Latitude of LL Corner °: 42.00267 N
Longitude of LL Corner °: -93.674812 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate Engenia and Liberty tank mixtures applied PRE and POST in XtendFlex conventional till soybean.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Asgrow AG21XF3
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/25/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 72 F **Soil Moisture:** DRY dry
Emergence Date: 6/1/2023

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/11/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/11/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/11/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 13 **Plots:** 52 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.

Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Field Prep./Maintenance:

Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description

Description Name: 11
% Sand: 39 **% OM:** 4.5 **Texture:** CL clay loam
% Silt: 25 **Soil Name:** WEBSTER
% Clay: 36 **Fert. Level:** E excellent
pH: 7.6 **CEC:** 26.7
Soil Drainage: F fair

Weather Conditions

Overall Moisture Conditions: DRY dry
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.

Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C	D
Application Date	5/26/2023	6/16/2023	6/16/2023	6/29/2023
Appl. Start Time	4:00 PM	10:44 AM	10:44 AM	3:00 PM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	POST	POST	LPOST
Application Placement	BROSOI	BROFOL	BROFOL	BROFOL
Applied By	Franzenburg	Macvilay	Macvilay	Macvilay
Appl. Entry Date	7/24/2023	7/24/2023	7/24/2023	7/24/2023
Air Temperature Start, Stop	75, 75 F	66, 67 F	66, 67 F	84, 84 F
% Relative Humidity Start, Stop	22, 22	58, 58	58, 58	67, 67
Wind Velocity+Dir. Start	8 MPH, ESE	8 MPH, E	8 MPH, E	7 MPH, N
Wet Leaves (Y/N)		N, no	N, no	N, no
Soil Temperature	78 F	70 F	70 F	75 F
Soil Moisture	DRY	DRY	DRY	DRY
Soil Surface Condition	ROUGH			
% Cloud Cover	50	100	100	20
Next Moisture Occurred On	5/30/2023	6/17/2023	6/17/2023	7/7/2023
Time to Next Moisture	4.0 DAY	1.0 DAY	1.0 DAY	8.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	1.2, IN	1.2, IN	0, IN
Moisture 1 Week after Appl.	0.7 IN	1.2 IN	1.2 IN	0 IN
Problems with Application?	N, no	N, no	N, no	N, no

Crop Stage At Each Application

	A	B	C	D
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-6	15	15	28
Stage Majority, Percent		V2, -	V2, -	V4, -
Stage Minimum, Percent		V1, -	V1, -	V4, -
Stage Maximum, Percent		V2, -	V2, -	V5, -
Height Average		5 IN	5 IN	14 IN
Height Minimum, Maximum		4, 6	4, 6	12, 15

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.

Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

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

Application Equipment

	A	B	C	D
Appl. Equipment	ATV	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER
Equipment Type	ALTEVE	BACMAN	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	11002	11002
Nozzle Type	TTI	TTI	TT	TT
Nozzle TradeName		TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color		-, GREEN	-, YELLOW	-, YELLOW
Nozzle Spacing	20 IN	19 IN	19 IN	19.0 IN
Boom Length	10 FT	10 FT	10 FT	10.0 FT
Ground Speed	2.8 MPH	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	20 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/20/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/11/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.

Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE	GLXMA
Rating Date								6/12/2023	6/12/2023	6/12/2023	6/12/2023	6/25/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								V1	0.5 IN	0.5 IN	0.5 IN	V3-V4
Trt-Eval Interval								17 DA-A	17 DA-A	17 DA-A	17 DA-A	30 DA-A
1	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	0	91	96	78	0
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	0	90	99	90	0
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	0	27	99	37	0
4	Engenia	5	SL	12.8	FL OZ/A	PRE	A	0	98	98	91	0
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
5	Verdict	5.57	EC	5	FL OZ/A	PRE	A	0	92	99	93	0
	MSO		L	0.714	% V/V	PRE	A					
	AMS Liquid	3.4	L	48	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
6	Dimetric DF 75	75	DF	4	OZ WT/A	PRE	A	0	80	99	78	0
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
7	Engenia	5	SL	12.8	FL OZ/A	POST	B	0	0	0	0	18
	Aegos	5.8	SL	8	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	B					
	Pursuit	2	AS	4	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
8	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	0	0	0	0	25
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Pursuit	2	AS	4	FL OZ/A	POST	C					
9	Prefix	5.29	EC	32	FL OZ/A	POST	C	0	0	0	0	31
	COC		L	0.535	% V/V	POST	C					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
10	Anthem Maxx	4.3	SC	3.16	FL OZ/A	POST	C	0	0	0	0	28
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
11	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	0	0	0	0	0
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
12	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	0	90	98	76	0
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	D					
	Outlook	6	EC	12	FL OZ/A	LPOST	D					
	AMS Liquid	3.4	L	48	FL OZ/A	LPOST	D					
13	Untreated Check							0	0	0	0	0
LSD P=.05								.	9.1	2.1	7.9	2.6
Standard Deviation								0.0	6.3	1.5	5.5	1.8
CV								0.0	14.55	2.81	13.29	23.12

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

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.

Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE	GLXMA	ABUTH
Rating Date								6/25/2023	6/25/2023	6/25/2023	7/10/2023	7/10/2023
Rating Type								CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								1-5 IN	1-5 IN	1-9 IN	R1	5-25 IN
Trt-Eval Interval								30 DA-A	30 DA-A	30 DA-A	45 DA-A	45 DA-A
1	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	89	88	73	0	83
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	87	99	81	0	76
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	27	82	37	0	27
4	Engenia	5	SL	12.8	FL OZ/A	PRE	A	95	99	84	0	94
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
5	Verdict	5.57	EC	5	FL OZ/A	PRE	A	90	99	88	0	77
	MSO		L	0.714	% V/V	PRE	A					
	AMS Liquid	3.4	L	48	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
6	Dimetric DF 75	75	DF	4	OZ WT/A	PRE	A	79	96	75	0	74
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
7	Engenia	5	SL	12.8	FL OZ/A	POST	B	99	99	97	11	99
	Aegos	5.8	SL	8	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	B					
	Pursuit	2	AS	4	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
8	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	99	99	99	14	99
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Pursuit	2	AS	4	FL OZ/A	POST	C					
9	Prefix	5.29	EC	32	FL OZ/A	POST	C	99	99	99	21	93
	COC		L	0.535	% V/V	POST	C					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
10	Anthem Maxx	4.3	SC	3.16	FL OZ/A	POST	C	99	99	99	15	97
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
11	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	99	98	99	0	94
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
12	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	89	90	76	9	99
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	D					
	Outlook	6	EC	12	FL OZ/A	LPOST	D					
	AMS Liquid	3.4	L	48	FL OZ/A	LPOST	D					
13	Untreated Check							0	0	0	0	0
LSD P=.05								9.4	3.4	7.3	3.2	8.4
Standard Deviation								6.6	2.4	5.1	2.2	5.8
CV								8.13	2.71	6.55	41.07	7.49

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

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.

Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	IPOHE	GLXMA	ABUTH	AMATA
	Rating Date							7/10/2023	7/10/2023	7/21/2023	7/21/2023	7/21/2023
	Rating Type							CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							5-25 IN	5-25 IN	R2	10-40 IN	10-40 IN
	Trt-Eval Interval							45 DA-A	45 DA-A	56 DA-A	56 DA-A	56 DA-A
1	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	76	65	0	83	75
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	96	79	0	73	95
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	73	37	0	27	70
4	Engenia	5	SL	12.8	FL OZ/A	PRE	A	96	76	0	91	95
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
5	Verdict	5.57	EC	5	FL OZ/A	PRE	A	97	80	0	73	95
	MSO		L	0.714	% V/V	PRE	A					
	AMS Liquid	3.4	L	48	FL OZ/A	PRE	A					
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
6	Dimetric DF 75	75	DF	4	OZ WT/A	PRE	A	90	70	0	74	85
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
7	Engenia	5	SL	12.8	FL OZ/A	POST	B	95	98	9	99	93
	Aegos	5.8	SL	8	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	B					
	Pursuit	2	AS	4	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
8	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	94	97	9	99	91
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Pursuit	2	AS	4	FL OZ/A	POST	C					
9	Prefix	5.29	EC	32	FL OZ/A	POST	C	97	85	15	89	96
	COC		L	0.535	% V/V	POST	C					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
10	Anthem Maxx	4.3	SC	3.16	FL OZ/A	POST	C	96	92	8	97	91
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C					
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
11	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	83	86	1	90	74
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C					
12	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	99	99	8	99	98
	Pursuit	2	AS	4	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	D					
	Outlook	6	EC	12	FL OZ/A	LPOST	D					
	AMS Liquid	3.4	L	48	FL OZ/A	LPOST	D					
13	Untreated Check							0	0	0	0	0
	LSD P=.05							5.4	7.8	3.3	10.3	7.1
	Standard Deviation							3.7	5.4	2.3	7.2	4.9
	CV							4.45	7.33	62.04	9.42	6.06

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

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.

Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16
	Pest Code							IPOHE
	Rating Date							7/21/2023
	Rating Type							CONTRO
	Rating Unit/Min/Max							%
	Pest Stage Majority/Min/Max							10-40 IN
	Trt-Eval Interval							56 DA-A
1	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	60
	Pursuit	2	AS	4	FL OZ/A	PRE	A	
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	73
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	
3	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	37
4	Engenia	5	SL	12.8	FL OZ/A	PRE	A	68
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	
	Pursuit	2	AS	4	FL OZ/A	PRE	A	
5	Verdict	5.57	EC	5	FL OZ/A	PRE	A	74
	MSO		L	0.714	% V/V	PRE	A	
	AMS Liquid	3.4	L	48	FL OZ/A	PRE	A	
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	
	Pursuit	2	AS	4	FL OZ/A	PRE	A	
6	Dimetric DF 75	75	DF	4	OZ WT/A	PRE	A	61
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	
	Pursuit	2	AS	4	FL OZ/A	PRE	A	
7	Engenia	5	SL	12.8	FL OZ/A	POST	B	97
	Aegos	5.8	SL	8	FL OZ/A	POST	B	
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	B	
	Pursuit	2	AS	4	FL OZ/A	POST	B	
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	
8	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	94
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C	
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	
	Pursuit	2	AS	4	FL OZ/A	POST	C	
9	Prefix	5.29	EC	32	FL OZ/A	POST	C	76
	COC		L	0.535	% V/V	POST	C	
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C	
10	Anthem Maxx	4.3	SC	3.16	FL OZ/A	POST	C	84
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C	
11	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	C	81
	AMS Liquid	3.4	L	48	FL OZ/A	POST	C	
12	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	99
	Pursuit	2	AS	4	FL OZ/A	PRE	A	
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	D	
	Outlook	6	EC	12	FL OZ/A	LPOST	D	
	AMS Liquid	3.4	L	48	FL OZ/A	LPOST	D	
13	Untreated Check							0
	LSD P=.05							9.4
	Standard Deviation							6.5
	CV							9.41

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

Iowa State University

Engenia and Liberty Tank Mixtures Applied PRE and POST in XtendFlex Soybean, Ames, IA, 2023.

Trial ID: ASC6
Protocol ID: MKD-H-2023-US-D62-A-01.0 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
GLXMA, Glycine max, Soybean = 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

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/24/2023
Completion Date: 10/23/2023

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

Latitude of LL Corner °: 42.001335 N
Longitude of LL Corner °: -93.675103 W

Regulations
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.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/23/2023 **Stage Scale:** VR
Variety: PIONEER P28A65E
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/24/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 74 F **Soil Moisture:** DRY dry
Emergence Date: 5/31/2023
Harvest Date: 10/23/2023 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 13.0 **Harvested Length:** 20 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/4/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/4/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/4/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 10 **Plots:** 30 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop
1.	ZEAMD

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Field Prep./Maintenance:
Soil testing indicated soil fertility to be at least optimum for all nutrients.

Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description
Description Name: 14
% Sand: 45 **% OM:** 4.2 **Texture:** CL clay loam
% Silt: 24 **Soil Name:** CLARION
% Clay: 31 **Fert. Level:** E excellent
pH: 5.4 **CEC:** 21.2
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN
17.	9/10/2023	0.4	IN
18.	9/19/2023	1.3	IN
19.	9/22/2023	0.1	IN
20.	10/12/2023	0.4	IN
21.	10/13/2023	1.4	IN

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
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Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/25/2023	6/21/2023
Appl. Start Time	3:29 PM	11:29 AM
Appl. Stop Time	3:45 PM	
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Applied By	Macvilay	Macvilay
Appl. Entry Date	7/23/2023	7/23/2023
Air Temperature Start, Stop	75, 76 F	80, 81 F
% Relative Humidity Start, Stop	36, 36	55, 55
Wind Velocity+Dir. Start	10 MPH, ESE	7 MPH, SE
Wet Leaves (Y/N)	N, no	N, no
Soil Temperature	72 F	72 F
Soil Moisture	DRY	DRY
Soil Surface Condition	ROUGH	
% Cloud Cover	5	0
Next Moisture Occurred On	5/30/2023	6/24/2023
Time to Next Moisture	5.0 DAY	3.0 DAY
Moisture 1 Week after Appl.	0.7 IN	0.65 IN
Problems with Application?	N, no	Y, yes

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-6	21
Stage Majority, Percent		V2, -
Stage Minimum, Percent		V1, -
Stage Maximum, Percent		V2, -
Height Average		7 IN
Height Minimum, Maximum		6, 8

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		2 LEAF, -
Stage Maximum, Percent		5 LEAF, -
Height Average		5 IN
Height Minimum, Maximum		2, 8
Density Average		20 FT2
Density Minimum, Maximum		10, 30
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		5 LEAF, -
Height Average		4 IN
Height Minimum, Maximum		3, 6
Density Average		1 FT2
Density Minimum, Maximum		0, 3
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		6 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		8 LEAF, -
Height Average		5 IN
Height Minimum, Maximum		3, 8
Density Average		5 FT2

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	AIXR
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
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/13/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/23/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	8/4/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).
STATUS	8/4/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	11/30/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trial Comments

Weed pressure was somewhat variable in the trial area.

Weed control ratings from July12 through July 19 included residual control of weeds that emerged after the POST applications.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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								6/22/2023	6/22/2023	6/22/2023	6/22/2023	6/28/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								V3	3-8 IN	3-8 IN	3-8 IN	V4-V5
Trt-Eval Interval								1 DA-B	1 DA-B	1 DA-B	1 DA-B	7 DA-B
1	Untreated Check							0	0	0	0	0
2	Sonic	70	DF	6	OZ WT/A	PRE	A	0	0	87	88	12
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
3	Sonic	70	DF	6	OZ WT/A	PRE	A	0	0	83	87	15
	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	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
4	Sonic	70	DF	3	OZ WT/A	PRE	A	0	0	73	73	8
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
5	Sonic	70	DF	3	OZ WT/A	PRE	A	0	0	67	77	8
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
6	Sonic	70	DF	3	OZ WT/A	PRE	A	0	0	73	77	15
	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	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
7	Sonic	70	DF	3	OZ WT/A	PRE	A	0	0	60	70	12
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	EverpreX	7.62	EC	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
8	Sonic	70	DF	3	OZ WT/A	PRE	A	0	0	70	80	20
	Flexstar	1.88	SL	1	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
9	Sonic	70	DF	3	OZ WT/A	PRE	A	0	0	77	73	20
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Flexstar	1.88	SL	1	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
10	Sonic	70	DF	3	OZ WT/A	PRE	A	0	0	70	60	13
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
LSD P=.05								.	.	13.7	18.9	3.2
Standard Deviation								0.0	0.0	8.0	11.0	1.9
CV								0.0	0.0	12.06	16.08	15.19

Missing data estimates are included in columns:Average=5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21
Could not calculate LSD (% mean diff) for columns 1,2,10,11,12,14,16 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, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	SETFA 6/28/2023 CONTRO % 3-8 IN 7 DA-B	ABUTH 6/28/2023 CONTRO % 3-8 IN 7 DA-B	AMATA 6/28/2023 CONTRO % 3-8 IN 7 DA-B	GLXMA 7/6/2023 PHYGEN % V7 15 DA-B	SETFA 7/6/2023 CONTRO % 3-8 IN 15 DA-B
	Pest Code							SETFA	ABUTH	AMATA	GLXMA	SETFA
	Rating Date							6/28/2023	6/28/2023	6/28/2023	7/6/2023	7/6/2023
	Rating Type							CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-8 IN	3-8 IN	3-8 IN	V7	3-8 IN
	Trt-Eval Interval							7 DA-B	7 DA-B	7 DA-B	15 DA-B	15 DA-B
								6	7	8	9	10
1	Untreated Check							0	0	0	0	0
2	Sonic	70	DF	6	OZ WT/A	PRE	A	90	95	98	5	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
3	Sonic	70	DF	6	OZ WT/A	PRE	A	90	95	98	12	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	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
4	Sonic	70	DF	3	OZ WT/A	PRE	A	90	93	97	5	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
5	Sonic	70	DF	3	OZ WT/A	PRE	A	90	93	92	5	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
6	Sonic	70	DF	3	OZ WT/A	PRE	A	90	95	95	13	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	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
7	Sonic	70	DF	3	OZ WT/A	PRE	A	90	93	88	10	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	EverpreX	7.62	EC	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
8	Sonic	70	DF	3	OZ WT/A	PRE	A	90	95	99	17	99
	Flexstar	1.88	SL	1	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
9	Sonic	70	DF	3	OZ WT/A	PRE	A	92	95	96	15	99
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Flexstar	1.88	SL	1	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
10	Sonic	70	DF	3	OZ WT/A	PRE	A	92	95	90	12	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
	LSD P=.05							2.2	4.5	5.4	3.2	.
	Standard Deviation							1.3	2.6	3.1	1.8	0.0
	CV							1.59	3.07	3.67	19.81	0.0

Missing data estimates are included in columns:Average=5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21
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^Calculated from residual.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	GLXMA	SETFA	ABUTH
Rating Date								7/6/2023	7/6/2023	7/12/2023	7/12/2023	7/12/2023
Rating Type								CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								3-8 IN	3-8 IN	R1		1-2 IN
Trt-Eval Interval								15 DA-B	15 DA-B	21 DA-B	21 DA-B	21 DA-B
1	Untreated Check							0	0	0	0	0
2	Sonic	70	DF	6	OZ WT/A	PRE	A	99	99	5	99	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
3	Sonic	70	DF	6	OZ WT/A	PRE	A	99	99	7	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	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
4	Sonic	70	DF	3	OZ WT/A	PRE	A	99	99	5	99	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
5	Sonic	70	DF	3	OZ WT/A	PRE	A	99	99	5	99	96
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
6	Sonic	70	DF	3	OZ WT/A	PRE	A	99	99	13	99	97
	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	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
7	Sonic	70	DF	3	OZ WT/A	PRE	A	99	99	12	99	98
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	EverpreX	7.62	EC	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
8	Sonic	70	DF	3	OZ WT/A	PRE	A	99	99	12	99	96
	Flexstar	1.88	SL	1	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
9	Sonic	70	DF	3	OZ WT/A	PRE	A	99	99	10	99	98
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Flexstar	1.88	SL	1	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
10	Sonic	70	DF	3	OZ WT/A	PRE	A	99	99	10	99	98
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
LSD P=.05								.	.	3.1	.	3.2
Standard Deviation								0.0	0.0	1.8	0.0	1.9
CV								0.0	0.0	23.09	0.0	2.13

Missing data estimates are included in columns:Average=5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21
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^Calculated from residual.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	GLXMA	SETFA	ABUTH	AMATA
Rating Date								7/12/2023	7/19/2023	7/19/2023	7/19/2023	7/19/2023
Rating Type								CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max									R2		1-4 IN	
Trt-Eval Interval								21 DA-B	28 DA-B	28 DA-B	28 DA-B	28 DA-B
1	Untreated Check							0	0	0	0	0
2	Sonic	70	DF	6	OZ WT/A	PRE	A	99	2	99	99	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
3	Sonic	70	DF	6	OZ WT/A	PRE	A	99	3	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	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
4	Sonic	70	DF	3	OZ WT/A	PRE	A	99	3	97	99	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
5	Sonic	70	DF	3	OZ WT/A	PRE	A	99	2	99	96	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
6	Sonic	70	DF	3	OZ WT/A	PRE	A	99	8	99	97	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	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
7	Sonic	70	DF	3	OZ WT/A	PRE	A	99	8	99	98	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	EverpreX	7.62	EC	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
8	Sonic	70	DF	3	OZ WT/A	PRE	A	99	5	99	96	98
	Flexstar	1.88	SL	1	PT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
9	Sonic	70	DF	3	OZ WT/A	PRE	A	99	7	99	98	98
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Flexstar	1.88	SL	1	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
10	Sonic	70	DF	3	OZ WT/A	PRE	A	99	7	99	98	99
	Enlist One	3.8	EC	2	PT/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B					
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	EverpreX	7.62	EC	1.3	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
LSD P=.05								.	3.4	1.2	3.2	1.9
Standard Deviation								0.0	2.0	0.7	1.9	1.1
CV								0.0	45.91	0.75	2.13	1.27

Missing data estimates are included in columns:Average=5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21
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^Calculated from residual.

Iowa State University

Enlist Weed Control System Demonstration with PRE Followed by POST Herbicide Programs, Ames, IA, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	21
	Pest Code							GLXMA
	Rating Date							10/23/2023
	Rating Type							YIELD
	Rating Unit/Min/Max							bu/ac
	Pest Stage Majority/Min/Max							R8
	Trt-Eval Interval							124 DA-B
1	Untreated Check							37
2	Sonic	70	DF	6	OZ WT/A	PRE	A	68
	Enlist One	3.8	EC	2	PT/A	POST	B	
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
3	Sonic	70	DF	6	OZ WT/A	PRE	A	59
	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	1.3	PT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
4	Sonic	70	DF	3	OZ WT/A	PRE	A	66
	Enlist One	3.8	EC	2	PT/A	POST	B	
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
5	Sonic	70	DF	3	OZ WT/A	PRE	A	63
	Enlist One	3.8	EC	2	PT/A	POST	B	
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
6	Sonic	70	DF	3	OZ WT/A	PRE	A	70
	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	1.3	PT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
7	Sonic	70	DF	3	OZ WT/A	PRE	A	67
	Enlist One	3.8	EC	2	PT/A	POST	B	
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B	
	EverpreX	7.62	EC	1.3	PT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
8	Sonic	70	DF	3	OZ WT/A	PRE	A	71
	Flexstar	1.88	SL	1	PT/A	POST	B	
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
9	Sonic	70	DF	3	OZ WT/A	PRE	A	64
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B	
	Flexstar	1.88	SL	1	PT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
10	Sonic	70	DF	3	OZ WT/A	PRE	A	61
	Enlist One	3.8	EC	2	PT/A	POST	B	
	Roundup PowerMAX 3	4.8	SL	1	QT/A	POST	B	
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B	
	EverpreX	7.62	EC	1.3	PT/A	POST	B	
	Liquid AMS	3.4	L	2.5	% V/V	POST	B	
	LSD P=.05							23.2
	Standard Deviation							13.4
	CV							21.5

Missing data estimates are included in columns:Average=5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21
Could not calculate LSD (% mean diff) for columns 1,2,10,11,12,14,16 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, 2023.
Trial ID: ASC7
Protocol ID: NA23K1A011H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Ames, IA, 2023.
Trial ID: ASC8
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/24/2023
Completion Date: 7/20/2023

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

Latitude of LL Corner °: 42.001639 N
Longitude of LL Corner °: -93.674861 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to demonstrate the efficacy of applying Liberty first, EPOST, in the Enlist One System.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/24/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 65 F **Soil Moisture:** DRY dry
Emergence Date: 5/31/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/12/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/12/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/12/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/12/2023
Common Name: Common ragweed **Stage Scale:** DESC

Pest 5 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/12/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Ames, IA, 2023.
Trial ID: ASC8
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Site and Design
Treated Plot Width: 10 FT
Treated Plot Length: 25 FT
Treated Plot Area: 250.0 FT2
Replications: 3 **Treatments:** 8 **Plots:** 24
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.	ZEAMD	2022

Maintenance

No.	Date	Type	Maintenance Product Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Tank Mix Code	Tank Mix
1.	5/26/2023	HERB	Verdict	5.57	LBA/GAL	EC	5	FL OZ/A	N	no

Comment: Verdict was applied preemergence to all plots following planting on May 26.

Field Prep./Maintenance:
Soil testing indicated soil fertility to be optimum for all nutrients. Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description
Description Name: 14
% Sand: 45 **% OM:** 4.2 **Texture:** CL clay loam
% Silt: 24 **Soil Name:** CLARION
% Clay: 31 **Fert. Level:** E excellent
pH: 5.4 **CEC:** 21.2
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: DRY dry
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

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Application Description

	A	B	C
Application Date	6/22/2023	6/22/2023	7/3/2023
Appl. Start Time	12:00 PM	12:00 PM	11:29 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	POST	POST	SPOST2
Application Placement	BROFOL	BROFOL	BROFOL
Applied By	Macvilay	Macvilay	Franzenburg
Appl. Entry Date	9/12/2023	9/12/2023	7/24/2023
Air Temperature Start, Stop	87, 88 F	87, 88 F	83, 84 F
% Relative Humidity Start, Stop	40, 40	40, 40	48, 48
Wind Velocity+Dir. Start	5 MPH, SSE	5 MPH, SSE	4 MPH, SW
Wet Leaves (Y/N)	N, no	N, no	N, no
Soil Temperature	77 F	77 F	77 F
Soil Moisture	DRY	DRY	DRY
% Cloud Cover	0	0	20
Next Moisture Occurred On	6/24/2023	6/24/2023	7/7/2023
Time to Next Moisture	2.0 DAY	2.0 DAY	4.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0.65 IN	0.65 IN	0.3 IN
Problems with Application?	N, no	N, no	N, no

Comment:
The original protocol POST application was divided into two application codes (A & B) to describe the different application methods needed for that application timing.

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	22	22	33
Stage Majority, Percent	V2, -	V2, -	R1, -
Stage Minimum, Percent	V1, -	V1, -	V6, -
Stage Maximum, Percent	V2, -	V2, -	R1, -
Height Average	6 IN	6 IN	18 IN
Height Minimum, Maximum	5, 7	5, 7	

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Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC	SETFA, W, DESC
Stage Minimum, Percent	2 LEAF, -	2 LEAF, -	
Stage Maximum, Percent	8 LEAF, -	8 LEAF, -	
Height Average	7 IN	7 IN	
Height Minimum, Maximum	1, 10	1, 10	
Density Average	5 FT2	5 FT2	
Density Minimum, Maximum	0, 10	0, 10	
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent	6 LEAF, -	6 LEAF, -	
Stage Minimum, Percent	4 LEAF, -	4 LEAF, -	
Stage Maximum, Percent	8 LEAF, -	8 LEAF, -	
Height Average	4 IN	4 IN	
Height Minimum, Maximum	1, 7	1, 7	
Density Average	1 FT2	1 FT2	
Density Minimum, Maximum	0, 6	0, 6	
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent	12 LEA, -	12 LEA, -	7 LEAF, -
Stage Minimum, Percent	7 LEAF, -	7 LEAF, -	6 LEAF, -
Stage Maximum, Percent	14 LEA, -	14 LEA, -	8 LEAF, -
Height Average	8 IN	8 IN	4 IN
Height Minimum, Maximum	4, 13	4, 13	1, 6
Density Average	2 FT2	2 FT2	1 PLOT
Density Minimum, Maximum	0, 3	0, 3	
Pest 4 Code, Type, Scale	AMBEL, W, DESC	AMBEL, W, DESC	AMBEL, W, DESC
Stage Majority, Percent	8 LEAF, -	8 LEAF, -	
Stage Minimum, Percent	7 LEAF, -	7 LEAF, -	
Stage Maximum, Percent	10 LEA, -	10 LEA, -	
Height Average	8 IN	8 IN	
Height Minimum, Maximum	4, 13	4, 13	
Density Average	1 FT2	1 FT2	
Density Minimum, Maximum	0, 2	0, 2	
Pest 5 Code, Type, Scale	CHEAL, W, DESC	CHEAL, W, DESC	CHEAL, W, DESC

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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	11002	110015	11002
Nozzle Type	TT	AIXR	TT
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, YELLOW	-, GREEN	-, YELLOW
Nozzle Spacing	19 IN	19 IN	19.0 IN
Boom Length	10 FT	10 FT	10.0 FT
Ground Speed	3 MPH	3 MPH	3 MPH
Application Amount	20 GAL/AC	15 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Equipment Comment: The original protocol POST application was divided into two application codes (A & B) to describe the different application methods needed for that application timing.

Notes

Context	Date	By	Notes
STATUS	3/22/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/12/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

This trial differs from the original protocol; the POST application for the trial was divided into two application codes to describe different application equipment and volume needed for that timing.

The SPOST1 application was not needed due to adequate weed control provided by the POST application that preceeded it.

Ratings through July 8 demonstrated only burndown control of weeds by the herbicide treatments. Ratings on July 14 and 20 reflected residual control of weeds emerging after postemergence applications.

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Project ID: Project ID 2: Project ID 3:
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Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							SETFA	ABUTH	AMATA	AMBEL	CHEAL
	Rating Date							6/29/2023	6/29/2023	6/29/2023	6/29/2023	6/29/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							2-8 IN	2-6 IN	2-6 IN	2-6 IN	2-6 IN
	Trt-Eval Interval							7 DA-A	7 DA-A	7 DA-A	7 DA-A	7 DA-A
1	Untreated Check							0	0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	96	95	98	98	99
	Select Max	0.97	EC	12	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
	COC		L	1	% V/V	POST	A					
3	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	99	95	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
4	Enlist One	3.8	EC	32	FL OZ/A	POST	B	53	70	70	75	75
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
5	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	96	92	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
6	Enlist One	3.8	EC	32	FL OZ/A	POST	B	96	95	99	99	99
	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
7	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	99	95	98	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
	Enlist One	3.8	EC	32	FL OZ/A	SPOST1						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST1						
	AMS		SG	1.5	LB/A	SPOST1						
8	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	99	96	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
	Liberty Ultra	1.76	SL	24	FL OZ/A	SPOST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST2	C					
	AMS		SG	1.5	LB/A	SPOST2	C					
	LSD P=.05							4.3	1.4	4.2	3.4	3.2
	Standard Deviation							2.5	0.8	2.4	1.9	1.8
	CV							3.07	1.01	2.98	2.3	2.19

Missing data estimates are included in columns:Average=4,5,9,10,14,15,19,20
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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	CHEAL
	Rating Date							7/8/2023	7/8/2023	7/8/2023	7/8/2023	7/8/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-12 IN	2-6 IN	2-6 IN		
	Trt-Eval Interval							16 DA-A	16 DA-A	16 DA-A	16 DA-A	16 DA-A
1	Untreated Check							0	0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	98	99	98	99	99
	Select Max	0.97	EC	12	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
	COC		L	1	% V/V	POST	A					
3	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	99	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
4	Enlist One	3.8	EC	32	FL OZ/A	POST	B	77	92	98	99	99
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
5	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
6	Enlist One	3.8	EC	32	FL OZ/A	POST	B	98	99	99	99	99
	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
7	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	99	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
	Enlist One	3.8	EC	32	FL OZ/A	SPOST1						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST1						
	AMS		SG	1.5	LB/A	SPOST1						
8	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
	Liberty Ultra	1.76	SL	24	FL OZ/A	SPOST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST2	C					
	AMS		SG	1.5	LB/A	SPOST2	C					
	LSD P=.05							4.1	1.8	1.9	.	.
	Standard Deviation							2.3	1.0	1.1	0.0	0.0
	CV							2.77	1.19	1.24	0.0	0.0

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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	AMBEL	CHEAL
	Rating Date							7/14/2023	7/14/2023	7/14/2023	7/14/2023	7/14/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-12 IN	1-7 IN	2-9 IN		
	Trt-Eval Interval							22 DA-A	22 DA-A	22 DA-A	22 DA-A	22 DA-A
1	Untreated Check							0	0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	98	95	93	99	99
	Select Max	0.97	EC	12	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
	COC		L	1	% V/V	POST	A					
3	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	99	95	98	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
4	Enlist One	3.8	EC	32	FL OZ/A	POST	B	92	93	98	99	99
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
5	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	99	96	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
6	Enlist One	3.8	EC	32	FL OZ/A	POST	B	98	95	99	99	99
	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
7	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	98	95	98	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
	Enlist One	3.8	EC	32	FL OZ/A	SPOST1						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST1						
	AMS		SG	1.5	LB/A	SPOST1						
8	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
	Liberty Ultra	1.76	SL	24	FL OZ/A	SPOST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST2	C					
	AMS		SG	1.5	LB/A	SPOST2	C					
	LSD P=.05							4.4	1.8	3.2	.	.
	Standard Deviation							2.5	1.0	1.8	0.0	0.0
	CV							2.98	1.22	2.14	0.0	0.0

Missing data estimates are included in columns:Average=4,5,9,10,14,15,19,20
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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	AMBEL	CHEAL
	Rating Date							7/20/2023	7/20/2023	7/20/2023	7/20/2023	7/20/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-12 IN	1-7 IN	2-9 IN		
	Trt-Eval Interval							28 DA-A	28 DA-A	28 DA-A	28 DA-A	28 DA-A
1	Untreated Check							0	0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	98	95	93	99	99
	Select Max	0.97	EC	12	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
	COC		L	1	% V/V	POST	A					
3	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	99	95	98	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
4	Enlist One	3.8	EC	32	FL OZ/A	POST	B	93	93	96	99	99
	Select Max	0.97	EC	12	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	COC		L	1	% V/V	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
5	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	95	98	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
6	Enlist One	3.8	EC	32	FL OZ/A	POST	B	98	95	98	99	99
	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
7	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	98	93	98	98	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A					
	AMS		SG	1.5	LB/A	POST	A					
	Enlist One	3.8	EC	32	FL OZ/A	SPOST1						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST1						
	AMS		SG	1.5	LB/A	SPOST1						
8	Enlist One	3.8	EC	32	FL OZ/A	POST	B	99	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B					
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B					
	AMS		SG	1.5	LB/A	POST	B					
	Liberty Ultra	1.76	SL	24	FL OZ/A	SPOST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST2	C					
	AMS		SG	1.5	LB/A	SPOST2	C					
	LSD P=.05							3.2	3.7	3.0	1.5	.
	Standard Deviation							1.8	2.1	1.7	0.8	0.0
	CV							2.14	2.52	2.04	0.98	0.0

Missing data estimates are included in columns:Average=4,5,9,10,14,15,19,20
Could not calculate LSD (% mean diff) for columns 9,10,14,15,20 because error mean square = 0.
^Calculated from residual.

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Ames, IA, 2023.
Trial ID: ASC8
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
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
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/24/2023
Completion Date: 10/23/2023

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

Latitude of LL Corner °: 42.002107 N
Longitude of LL Corner °: -93.674966 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
Showcasing efficacy of ADAMA's Temper, Temper HL, and Temper More for control of troublesome weeds in soybean. Also comparisons with Fierce EZ, FirstRate and Perpetuo.

Highlighting control of glyphosate resistant weeds with glufosinate.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/19/2023 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/24/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 74 F **Soil Moisture:** DRY dry
Emergence Date: 5/31/2023
Harvest Date: 10/23/2023 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 13.0 **Harvested Length:** 20 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/19/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/19/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/19/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/19/2023
Common Name: Common ragweed **Stage Scale:** DESC

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Site and Design
Treated Plot Width: 10 FT
Treated Plot Length: 25 FT
Treated Plot Area: 250.0 FT2
Replications: 4 **Treatments:** 7 **Plots:** 28
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.	ZEAMD	2022

Field Prep./Maintenance:
Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting. Soil testing indicated soil fertility to be at least optimum for all nutrients.

Soil Description
Description Name: 15
% Sand: 45 **% OM:** 4.4 **Texture:** CL clay loam
% Silt: 20 **Soil Name:** WEBSTER
% Clay: 35 **Fert. Level:** E excellent
pH: 5.5 **CEC:** 24.1
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN
17.	9/10/2023	0.4	IN
18.	9/19/2023	1.3	IN
19.	9/22/2023	0.1	IN
20.	10/12/2023	0.4	IN
21.	10/13/2023	1.4	IN

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/25/2023	6/23/2023
Appl. Start Time	3:29 PM	11:19 AM
Appl. Stop Time	3:45 PM	
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Applied By	Macvilay	Macvilay
Appl. Entry Date	9/19/2023	9/19/2023
Air Temperature Start, Stop	75, 76 F	87, 88 F
% Relative Humidity Start, Stop	36, 36	43, 43
Wind Velocity+Dir. Start	10 MPH, ESE	3 MPH, SSE
Wet Leaves (Y/N)		N, no
Soil Temperature	- F	73 F
Soil Moisture	DRY	DRY
Soil Surface Condition	ROUGH	
% Cloud Cover	5	0
Next Moisture Occurred On	5/30/2023	6/24/2023
Time to Next Moisture	5.0 DAY	1.0 DAY
Moisture 1 Week after Appl.	0.7 IN	0.65 IN
Problems with Application?	N, no	Y, yes

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-6	23
Stage Majority, Percent		V3, -
Stage Minimum, Percent		V2, -
Stage Maximum, Percent		V3, -
Height Average		8 IN
Height Minimum, Maximum		6, 9

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent		5 LEAF, -
Stage Minimum, Percent		1 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		6 IN
Height Minimum, Maximum		2, 10
Density Average		6 FT2
Density Minimum, Maximum		0, 11
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		5 LEAF, -
Stage Minimum, Percent		4 LEAF, -
Stage Maximum, Percent		6 LEAF, -
Height Average		4 IN
Height Minimum, Maximum		2, 5
Density Average		3 FT2
Density Minimum, Maximum		0, 6
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		6 LEAF, -
Stage Minimum, Percent		4 LEAF, -
Stage Maximum, Percent		7 LEAF, -
Height Average		3 IN
Height Minimum, Maximum		2, 4
Density Average		1 FT2
Density Minimum, Maximum		0, 2
Pest 4 Code, Type, Scale	AMBEL, W, DESC	AMBEL, W, DESC
Stage Majority, Percent		10 LEA, -
Stage Minimum, Percent		4 LEAF, -
Stage Maximum, Percent		16 LEA, -
Height Average		8 IN
Height Minimum, Maximum		3, 13
Density Average		1 FT2
Density Minimum, Maximum		0, 3

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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 & 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
Ground Speed	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/26/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/19/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	11/30/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Common waterhemp in the experiment area have demonstrated at least 70% of the population resistant to glyphosate.

Some of the common ragweed plants in the study survived tillage for seedbed prep and were large in size.

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 6/23/2023 PHYGEN % V4 0 DA-B	SETFA 6/23/2023 CONTRO % 3-8 IN 0 DA-B	ABUTH 6/23/2023 CONTRO % 1-7 IN 0 DA-B	AMATA 6/23/2023 CONTRO % 1-3 IN 0 DA-B	AMBEL 6/23/2023 CONTRO % 1-3 IN 0 DA-B
								1	2	3	4	5
1	Nontreated Check							0	0	0	0	0
2	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	78	0	84	75
3	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	73	5	86	73
	Temper	2.33	L	31	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
4	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	68	0	88	73
	Temper HL	2.92	L	24.8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
5	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	75	5	86	75
	Temper More	4.8	L	41	FL OZ/A	POST	B					
	Poweral	90	SL	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
6	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	5	66	75	96	82
	Enlist One	3.8	EC	1	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	FirstRate	84	WG	0.6	OZ WT/A	PRE	A	5	65	84	99	86
	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	1	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
LSD P=.05								.	13.6	10.3	7.3	14.3
Standard Deviation								0.0	9.1	6.9	4.9	9.7
CV								0.0	15.07	28.77	6.38	14.58

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

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 6/30/2023 PHYGEN % V5 7 DA-B	SETFA 6/30/2023 CONTRO % 3-20 IN 7 DA-B	ABUTH 6/30/2023 CONTRO % 6-18 IN 7 DA-B	AMATA 6/30/2023 CONTRO % 3-9 IN 7 DA-B	AMBEL 6/30/2023 CONTRO % 3-9 IN 7 DA-B
	Pest Code											
	Rating Date							6/30/2023	6/30/2023	6/30/2023	6/30/2023	6/30/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V5	3-20 IN	6-18 IN	3-9 IN	3-9 IN
	Trt-Eval Interval							7 DA-B	7 DA-B	7 DA-B	7 DA-B	7 DA-B
								6	7	8	9	10
1	Nontreated Check							0	0	0	0	0
2	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	75	0	81	73
3	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	95	95	97	95
	Temper	2.33	L	31	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
4	Tailwind	6.5	L	24	FL OZ/A	PRE	A	1	97	95	99	99
	Temper HL	2.92	L	24.8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
5	Tailwind	6.5	L	24	FL OZ/A	PRE	A	1	95	95	98	97
	Temper More	4.8	L	41	FL OZ/A	POST	B					
	Poweral	90	SL	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
6	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	23	99	99	99	98
	Enlist One	3.8	EC	1	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	FirstRate	84	WG	0.6	OZ WT/A	PRE	A	18	99	99	99	99
	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	1	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							2.9	3.5	.	5.5	5.9
	Standard Deviation							2.0	2.4	0.0	3.7	4.0
	CV							32.4	2.94	0.0	4.55	4.99

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

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 7/8/2023 PHYGEN % R1 15 DA-B	SETFA 7/8/2023 CONTRO % 8-24 IN 15 DA-B	ABUTH 7/8/2023 CONTRO % 8-22 IN 15 DA-B	AMATA 7/8/2023 CONTRO % 8-22 IN 15 DA-B	AMBEL 7/8/2023 CONTRO % 8-22 IN 15 DA-B
	Pest Code											
	Rating Date							7/8/2023	7/8/2023	7/8/2023	7/8/2023	7/8/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							R1	8-24 IN	8-22 IN	8-22 IN	8-22 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	Nontreated Check							0	0	0	0	0
2	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	71	0	81	71
3	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	97	97	98	99
	Temper	2.33	L	31	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
4	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	99	96	99	99
	Temper HL	2.92	L	24.8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
5	Tailwind	6.5	L	24	FL OZ/A	PRE	A	5	97	99	98	99
	Temper More	4.8	L	41	FL OZ/A	POST	B					
	Poweral	90	SL	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
6	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	23	99	99	99	99
	Enlist One	3.8	EC	1	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	FirstRate	84	WG	0.6	OZ WT/A	PRE	A	16	99	99	99	99
	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	1	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							2.2	2.2	1.6	5.0	5.8
	Standard Deviation							1.5	1.4	1.1	3.3	3.9
	CV							24.17	1.8	1.57	4.07	4.82

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

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 7/24/2023 PHYGEN % R1 31 DA-B	SETFA 7/24/2023 CONTRO % 8-24 IN 31 DA-B	ABUTH 7/24/2023 CONTRO % 8-22 IN 31 DA-B	AMATA 7/24/2023 CONTRO % 8-22 IN 31 DA-B	AMBEL 7/24/2023 CONTRO % 8-22 IN 31 DA-B
	Pest Code											
	Rating Date							7/24/2023	7/24/2023	7/24/2023	7/24/2023	7/24/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							R1	8-24 IN	8-22 IN	8-22 IN	8-22 IN
	Trt-Eval Interval							31 DA-B	31 DA-B	31 DA-B	31 DA-B	31 DA-B
								16	17	18	19	20
1	Nontreated Check							0	0	0	0	0
2	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	71	0	81	68
3	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	96	95	96	98
	Temper	2.33	L	31	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
4	Tailwind	6.5	L	24	FL OZ/A	PRE	A	0	97	95	97	98
	Temper HL	2.92	L	24.8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
5	Tailwind	6.5	L	24	FL OZ/A	PRE	A	4	97	98	98	99
	Temper More	4.8	L	41	FL OZ/A	POST	B					
	Poweral	90	SL	8	FL OZ/A	POST	B					
	AMS		SG	17	LB/100 GAL	POST	B					
6	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	14	98	98	99	99
	Enlist One	3.8	EC	1	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
7	FirstRate	84	WG	0.6	OZ WT/A	PRE	A	10	99	99	99	99
	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A					
	Enlist One	3.8	EC	1	QT/A	POST	B					
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B					
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
	Induce		L	0.25	% V/V	POST	B					
	LSD P=.05							3.8	2.8	2.2	5.2	5.7
	Standard Deviation							2.6	1.9	1.5	3.5	3.8
	CV							65.63	2.32	2.19	4.26	4.78

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

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.
Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	GLXMA 10/23/2023 YIELD bu/ac R8 122 DA-B 21
	Pest Code							GLXMA
	Rating Date							10/23/2023
	Rating Type							YIELD
	Rating Unit/Min/Max							bu/ac
	Pest Stage Majority/Min/Max							R8
	Trt-Eval Interval							122 DA-B
1	Nontreated Check							32
2	Tailwind	6.5	L	24	FL OZ/A	PRE	A	40
3	Tailwind	6.5	L	24	FL OZ/A	PRE	A	69
	Temper	2.33	L	31	FL OZ/A	POST	B	
	AMS		SG	17	LB/100 GAL	POST	B	
4	Tailwind	6.5	L	24	FL OZ/A	PRE	A	68
	Temper HL	2.92	L	24.8	FL OZ/A	POST	B	
	AMS		SG	17	LB/100 GAL	POST	B	
5	Tailwind	6.5	L	24	FL OZ/A	PRE	A	69
	Temper More	4.8	L	41	FL OZ/A	POST	B	
	Poweral	90	SL	8	FL OZ/A	POST	B	
	AMS		SG	17	LB/100 GAL	POST	B	
6	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	65
	Enlist One	3.8	EC	1	QT/A	POST	B	
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B	
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	
	AMS		SG	8.5	LB/100 GAL	POST	B	
	Induce		L	0.25	% V/V	POST	B	
7	FirstRate	84	WG	0.6	OZ WT/A	PRE	A	65
	Fierce EZ	3.04	SC	6	FL OZ/A	PRE	A	
	Enlist One	3.8	EC	1	QT/A	POST	B	
	Roundup PowerMAX	4.5	SL	1	QT/A	POST	B	
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	
	AMS		SG	8.5	LB/100 GAL	POST	B	
	Induce		L	0.25	% V/V	POST	B	
	LSD P=.05							9.1
	Standard Deviation							6.1
	CV							10.47

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

Iowa State University

Evaluation of Temper, Temper HL, Temper More, Fierce, FirstRate & Perpetuo for Weed Control in an Enlist Soybean System, Ames, IA, 2023.

Trial ID: ASC9
Protocol ID: 22007223_Glufosinate FIERCEMD6404 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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

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 Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 6/3/2023
Initiation Date: 5/24/2023
Completion Date: 7/18/2023

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

Latitude of LL Corner °: 42.001323 N
Longitude of LL Corner °: -93.675565 W

Regulations
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 each Liberty and Enlist One.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/23/2023 **Stage Scale:** VR
Variety: PIONEER P28A65E
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/24/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 72 F **Soil Moisture:** DRY dry
Emergence Date: 5/31/2023

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/11/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/11/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 10 **Plots:** 30 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
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Field Prep./Maintenance:
Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil testing indicated soil fertility to be at least optimum for all nutrients.

Soil Description
Description Name: 17
% Sand: 53 **% OM:** 3.1 **Texture:** SCL sandy clay loam
% Silt: 20 **Soil Name:** CLARION
% Clay: 27 **Fert. Level:** E excellent
pH: 5.4 **CEC:** 16.4
Soil Drainage: E excellent

Weather Conditions
Overall Moisture Conditions: BELNOR below normal

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C	D	E	F
Application Date	6/27/2023	6/27/2023	6/27/2023	6/27/2023	6/27/2023	6/27/2023
Appl. Start Time	7:00 PM	6:59 PM	6:59 PM	6:59 PM	6:59 PM	6:59 PM
Appl. Stop Time	7:30 PM	7:30 PM	7:30 PM	7:30 PM	7:30 PM	7:30 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
Applied By	Franzenburg	Franzenburg	Franzenburg	Franzenburg	Franzenburg	Franzenburg
Appl. Entry Date	7/23/2023	7/23/2023	7/23/2023	7/23/2023	7/23/2023	7/23/2023
Air Temperature Start, Stop	81, 79 F	81, 79 F	81, 79 F	81, 79 F	81, 79 F	81, 79 F
% Relative Humidity Start, Stop	50, 50	50, 50	50, 50	50, 50	50, 50	50, 50
Wind Velocity+Dir. Start	0 MPH, SE	0 MPH, SE	0 MPH, SE	0 MPH, SE	0 MPH, SE	0 MPH, SE
Wet Leaves (Y/N)	N, no	N, no	N, no	N, no	N, no	N, no
Soil Temperature	77 F	77 F	77 F	77 F	77 F	77 F
Soil Moisture	DRY	DRY	DRY	DRY	DRY	DRY
% Cloud Cover	75	75	75	75	75	75
Next Moisture Occurred On	7/7/2023	7/7/2023	7/7/2023	7/7/2023	7/7/2023	7/7/2023
Time to Next Moisture	10.0 DAY	10.0 DAY	10.0 DAY	10.0 DAY	10.0 DAY	10.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0 IN	0 IN	0 IN	0 IN	0 IN	0 IN
Problems with Application?	N, no	N, no	N, no	N, no	N, no	N, no

	G	H	I
Application Date	6/27/2023	6/27/2023	6/27/2023
Appl. Start Time	6:59 PM	6:59 PM	6:59 PM
Appl. Stop Time	7:30 PM	7:30 PM	7:30 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	POST	POST	POST
Application Placement	BROFOL	BROFOL	BROFOL
Applied By	Franzenburg	Franzenburg	Franzenburg
Appl. Entry Date	7/23/2023	7/23/2023	7/23/2023
Air Temperature Start, Stop	81, 79 F	81, 79 F	81, 79 F
% Relative Humidity Start, Stop	50, 50	50, 50	50, 50
Wind Velocity+Dir. Start	0 MPH, SE	0 MPH, SE	0 MPH, SE
Wet Leaves (Y/N)	N, no	N, no	N, no
Soil Temperature	77 F	77 F	77 F
Soil Moisture	DRY	DRY	DRY
% Cloud Cover	75	75	75
Next Moisture Occurred On	7/7/2023	7/7/2023	7/7/2023
Time to Next Moisture	10.0 DAY	10.0 DAY	10.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0 IN	0 IN	0 IN
Problems with Application?	N, no	N, no	N, no

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Crop Stage At Each Application

	A	B	C	D	E	F
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	27	27	27	27	27	27
Stage Majority, Percent	V4, -	V4, -	V4, -	V4, -	V4, -	V4, -
Stage Minimum, Percent	V3, -	V3, -	V3, -	V3, -	V3, -	V3, -
Stage Maximum, Percent	V4, -	V4, -	V4, -	V4, -	V4, -	V4, -
Height Average	10 IN	10 IN	10 IN	10 IN	10 IN	10 IN
Height Minimum, Maximum	9, 12	9, 12	9, 12	9, 12	9, 12	9, 12

	G	H	I
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	27	27	27
Stage Majority, Percent	V4, -	V4, -	V4, -
Stage Minimum, Percent	V3, -	V3, -	V3, -
Stage Maximum, Percent	V4, -	V4, -	V4, -
Height Average	10 IN	10 IN	10 IN
Height Minimum, Maximum	9, 12	9, 12	9, 12

Pest Stage At Each Application

	A	B	C	D
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, 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	6 IN	6 IN	6 IN	6 IN
Height Minimum, Maximum	4, 8	4, 8	4, 8	4, 8
Density Average	10 PLOT	10 PLOT	10 PLOT	10 PLOT
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent	8 LEAF, -	8 LEAF, -	8 LEAF, -	8 LEAF, -
Stage Minimum, Percent	5 LEAF, -	5 LEAF, -	5 LEAF, -	5 LEAF, -
Stage Maximum, Percent	9 LEAF, -	9 LEAF, -	9 LEAF, -	9 LEAF, -
Height Average	6 IN	6 IN	6 IN	6 IN
Height Minimum, Maximum	3, 9	3, 9	3, 9	3, 9
Density Average	10 FT2	10 FT2	10 FT2	10 FT2
Density Minimum, Maximum	5, 15	5, 15	5, 15	5, 15

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

	E	F	G	H
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, 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	6 IN	6 IN	6 IN	6 IN
Height Minimum, Maximum	4, 8	4, 8	4, 8	4, 8
Density Average	10 PLOT	10 PLOT	10 PLOT	10 PLOT
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent	8 LEAF, -	8 LEAF, -	8 LEAF, -	8 LEAF, -
Stage Minimum, Percent	5 LEAF, -	5 LEAF, -	5 LEAF, -	5 LEAF, -
Stage Maximum, Percent	9 LEAF, -	9 LEAF, -	9 LEAF, -	9 LEAF, -
Height Average	6 IN	6 IN	6 IN	6 IN
Height Minimum, Maximum	3, 9	3, 9	3, 9	3, 9
Density Average	10 FT2	10 FT2	10 FT2	10 FT2
Density Minimum, Maximum	5, 15	5, 15	5, 15	5, 15

	I
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	10 PLOT
Pest 2 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	8 LEAF, -
Stage Minimum, Percent	5 LEAF, -
Stage Maximum, Percent	9 LEAF, -
Height Average	6 IN
Height Minimum, Maximum	3, 9
Density Average	10 FT2
Density Minimum, Maximum	5, 15

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
Ground Speed	4.3 MPH	4.3 MPH	4.3 MPH	3 MPH	3 MPH
Application Amount	10 GAL/AC	10 GAL/AC	10 GAL/AC	15 GAL/AC	15 GAL/AC

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

	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	110015	110015
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
Ground Speed	3 MPH	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	20 GAL/AC	20 GAL/AC	20 GAL/AC

Notes

Context	Date	By	Notes
STATUS	3/13/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/23/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/23/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.
STATUS	7/23/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	8/11/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

The left two frames (plot widths) of the experiment contained smaller waterhemp than the rest of the trial. Plot numbers included in these frames were 101,102, 201, 202, 301 & 302.

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment	1	2	3	4
Pest Code									GLXMA	GLXMA	ABUTH	AMATA
Rating Date									7/6/2023	7/11/2023	7/11/2023	7/11/2023
Rating Type									PHYGEN	PHYGEN	CONTRO	CONTRO
Rating Unit/Min/Max									%	%	%	%
Pest Stage Majority/Min/Max									V6	R1	3-8 IN	3-8 IN
Trt-Eval Interval									9 DA-A	14 DA-A	14 DA-A	14 DA-A
1	Liberty 280 SL	2.34	SL	2	PT/A	POST	A	XR 10 GPA	5	5	98	87
	Liquid AMS	3.4	L	2.5	% V/V	POST	A					
2	Enlist One	3.8	EC	2	PT/A	POST	B	AIXR 10 GPA	8	5	99	92
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B					
	Liquid AMS	3.4	L	2.5	% V/V	POST	B					
3	Enlist One	3.8	EC	2	PT/A	POST	C	TTI 10GPA	8	5	98	88
	Liberty 280 SL	2.34	SL	2	PT/A	POST	C					
	Liquid AMS	3.4	L	2.5	% V/V	POST	C					
4	Liberty 280 SL	2.34	SL	2	PT/A	POST	D	XR 15GPA	3	5	99	93
	Liquid AMS	3.4	L	2.5	% V/V	POST	D					
5	Enlist One	3.8	EC	2	PT/A	POST	E	AIXR 15GPA	5	5	99	93
	Liberty 280 SL	2.34	SL	2	PT/A	POST	E					
	Liquid AMS	3.4	L	2.5	% V/V	POST	E					
6	Enlist One	3.8	EC	2	PT/A	POST	F	TTI 15GPA	5	5	99	88
	Liberty 280 SL	2.34	SL	2	PT/A	POST	F					
	Liquid AMS	3.4	L	2.5	% V/V	POST	F					
7	Liberty 280 SL	2.34	SL	2	PT/A	POST	G	XR 20 GPA	3	3	99	90
	Liquid AMS	3.4	L	2.5	% V/V	POST	G					
8	Enlist One	3.8	EC	2	PT/A	POST	H	AIXR 20 GPA	3	3	99	93
	Liberty 280 SL	2.34	SL	2	PT/A	POST	H					
	Liquid AMS	3.4	L	2.5	% V/V	POST	H					
9	Enlist One	3.8	EC	2	PT/A	POST	I	TTI 20GPA	3	3	99	92
	Liberty 280 SL	2.34	SL	2	PT/A	POST	I					
	Liquid AMS	3.4	L	2.5	% V/V	POST	I					
10	Untreated Check								0	0	0	0
LSD P=.05									3.3	2.4	1.7	6.0
Standard Deviation									1.9	1.4	1.0	3.5
CV									42.23	34.86	1.1	4.27

^Calculated from residual.

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment	GLXMA 7/18/2023 PHYGEN % R2 21 DA-A	ABUTH 7/18/2023 CONTRO % 3-8 IN 21 DA-A	AMATA 7/18/2023 CONTRO % 3-8 IN 21 DA-A
									5	6	7
1	Liberty 280 SL	2.34	SL	2	PT/A	POST	A	XR 10 GPA	0	96	85
	Liquid AMS	3.4	L	2.5	% V/V	POST	A				
2	Enlist One	3.8	EC	2	PT/A	POST	B	AIXR 10 GPA	5	99	92
	Liberty 280 SL	2.34	SL	2	PT/A	POST	B				
	Liquid AMS	3.4	L	2.5	% V/V	POST	B				
3	Enlist One	3.8	EC	2	PT/A	POST	C	TTI 10GPA	3	96	90
	Liberty 280 SL	2.34	SL	2	PT/A	POST	C				
	Liquid AMS	3.4	L	2.5	% V/V	POST	C				
4	Liberty 280 SL	2.34	SL	2	PT/A	POST	D	XR 15GPA	3	99	92
	Liquid AMS	3.4	L	2.5	% V/V	POST	D				
5	Enlist One	3.8	EC	2	PT/A	POST	E	AIXR 15GPA	2	99	95
	Liberty 280 SL	2.34	SL	2	PT/A	POST	E				
	Liquid AMS	3.4	L	2.5	% V/V	POST	E				
6	Enlist One	3.8	EC	2	PT/A	POST	F	TTI 15GPA	2	99	88
	Liberty 280 SL	2.34	SL	2	PT/A	POST	F				
	Liquid AMS	3.4	L	2.5	% V/V	POST	F				
7	Liberty 280 SL	2.34	SL	2	PT/A	POST	G	XR 20 GPA	2	96	88
	Liquid AMS	3.4	L	2.5	% V/V	POST	G				
8	Enlist One	3.8	EC	2	PT/A	POST	H	AIXR 20 GPA	2	99	96
	Liberty 280 SL	2.34	SL	2	PT/A	POST	H				
	Liquid AMS	3.4	L	2.5	% V/V	POST	H				
9	Enlist One	3.8	EC	2	PT/A	POST	I	TTI 20GPA	2	98	93
	Liberty 280 SL	2.34	SL	2	PT/A	POST	I				
	Liquid AMS	3.4	L	2.5	% V/V	POST	I				
10	Untreated Check								0	0	0
LSD P=.05									4.3	2.6	6.2
Standard Deviation									2.5	1.5	3.6
CV									124.54	1.72	4.44

^Calculated from residual.

Iowa State University

Evaluation of Spray Volume and Nozzle Tip Selection for Enlist One & Liberty Applications, Ames, IA, 2023.
Trial ID: ASC10
Protocol ID: NA23K1A005H Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.
Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

General Trial Information
Study Director: Chuck Foresman
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/25/2023
Completion Date: 7/17/2023

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

Latitude of LL Corner °: 42.002209 N
Longitude of LL Corner °: -93.675114 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate PRE and early POST herbicide formulations for weed control in soybean.

Contacts
Role: STYDIR study director
Role: INVEST investigator
Role: SPONSR sponsor
Sponsor: Jay Turner

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 8/10/2023 **Stage Scale:** VR
Variety: Asgrow AG21XF3
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/25/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 68 F **Soil Moisture:** DRY dry
Emergence Date: 6/1/2023

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/10/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/10/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 8/10/2023
Common Name: Ivyleaf morningglory **Stage Scale:** DESC

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.
Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

Site and Design

Treated Plot Width: 6.67 FT
Treated Plot Length: 25 FT
Treated Plot Area: 166.75 FT2
Replications: 3 **Treatments:** 11 **Plots:** 33
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.	ZEAMD	2022

Field Prep./Maintenance:
Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description

Description Name: 15
% Sand: 45 **% OM:** 4.4 **Texture:** CL clay loam
% Silt: 20 **Soil Name:** WEBSTER
% Clay: 35 **Fert. Level:** E excellent
pH: 5.5 **CEC:** 24.1
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.
Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/26/2023	6/15/2023
Appl. Start Time	4:30 PM	9:59 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROSOI	BROFOL
Applied By	Hamberg	Macvilay
Appl. Entry Date	8/10/2023	8/10/2023
Air Temperature Start, Stop	79, 79 F	81, 81 F
% Relative Humidity Start, Stop	18, 18	40, 40
Wind Velocity+Dir. Start	10 MPH, NW	6 MPH, NW
Wet Leaves (Y/N)		N, no
Soil Temperature	68 F	67 F
Soil Moisture	DRY	DRY
Soil Surface Condition	ROUGH	
% Cloud Cover	0	100
Next Moisture Occurred On	5/30/2023	6/17/2023
Time to Next Moisture	4.0 DAY	2.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN
Moisture 1 Week after Appl.	0.7 IN	1.2 IN
Problems with Application?	N, no	N, no

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-6	14
Stage Majority, Percent		V2, -
Stage Minimum, Percent		V1, -
Stage Maximum, Percent		V2, -
Height Average		6 IN
Height Minimum, Maximum		5, 7

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.
Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		1 LEAF, -
Stage Minimum, Percent		COTYL, -
Stage Maximum, Percent		1 LEAF, -
Height Average		1.5 IN
Height Minimum, Maximum		1, 2
Density Average		0.5 FT2
Density Minimum, Maximum		0, 4
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		1 LEAF, -
Stage Minimum, Percent		COTYLE, -
Stage Maximum, Percent		1 LEAF, -
Height Average		0.5 IN
Height Minimum, Maximum		0.125, 0.5
Density Average		5 PLOT
Density Minimum, Maximum		0, 7
Pest 3 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		3 LEAF, -
Stage Minimum, Percent		COTYLE, -
Stage Maximum, Percent		4 LEAF, -
Height Average		2 IN
Height Minimum, Maximum		1, 3
Density Average		3 FT2
Density Minimum, Maximum		1, 6

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	20 IN	20 IN
Boom Length	6.7 FT	6.7 FT
Ground Speed	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.
Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

Notes

Context	Date	By	Notes
STATUS	3/29/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	8/10/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	9/18/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

The common waterhemp population in the study area has demonstrated up to 80% resistance to glyphosate prior to 2023.

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.

Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

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	IPOHE	GLXMA
Rating Date								6/10/2023	6/10/2023	6/10/2023	6/10/2023	6/15/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								VC	0.5 IN	0.125 IN	0.5 IN	V1
Trt-Eval Interval								15 DA-A	15 DA-A	15 DA-A	15 DA-A	20 DA-A
1	Untreated Check							0	0	0	0	0
2	Blanket	4	SC	8	FL OZ/A	PRE	A	0	60	99	88	0
	COC			1	% V/V	PRE	A					
3	Cerazone	2.5	SC	12.8	FL OZ/A	PRE	A	0	82	99	82	0
	COC			1	% V/V	PRE	A					
4	SAUSX08	4.97	SE	32	FL OZ/A	PRE	A	0	92	99	87	0
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
5	Tendovo	4.18	ZC	48	FL OZ/A	PRE	A	0	75	99	80	0
6	Zidua Pro	4.09	SC	5	FL OZ/A	PRE	A	0	96	99	93	2
	MSO			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
7	SAUSX08	4.97	SE	32	FL OZ/A	PRE	A	0	93	99	93	2
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Tendovo	4.18	ZC	48	FL OZ/A	PRE	A	0	55	99	60	0
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
9	Zidua Pro	4.09	SC	5	FL OZ/A	PRE	A	0	96	99	95	0
	MSO			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
10	SAUSX08	4.97	SE	16	FL OZ/A	PRE	A	0	91	99	83	0
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	SAUSX08	4.97	SE	16	FL OZ/A	POST	B					
	NIS			0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
11	Prefix	4.34	SE	32	FL OZ/A	POST	B	0	0	0	0	0
	NIS			0.25	% V/V	POST	B					
LSD P=.05								.	14.3	.	11.5	2.1
Standard Deviation								0.0	8.3	0.0	6.7	1.3
CV								0.0	12.31	0.0	9.63	416.23

Missing data estimates are included in columns:Average=2,4,6,8,11,13,15,17,18,20
Could not calculate LSD (% mean diff) for columns 1,3,9 because error mean square = 0.
^Calculated from residual.

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.

Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

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	IPOHE	GLXMA	GLXMA
Rating Date								6/15/2023	6/15/2023	6/15/2023	6/19/2023	6/23/2023
Rating Type								CONTRO	CONTRO	CONTRO	PHYGEN	PHYGEN
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								0.5 IN	0.15 IN	0.5 IN	V3	V3
Trt-Eval Interval								20 DA-A	20 DA-A	20 DA-A	4 DA-B	8 DA-B
1	Untreated Check							0	0	0	0	0
2	Blanket	4	SC	8	FL OZ/A	PRE	A	57	99	80	0	0
	COC			1	% V/V	PRE	A					
3	Cerazone	2.5	SC	12.8	FL OZ/A	PRE	A	77	98	77	0	0
	COC			1	% V/V	PRE	A					
4	SAUSX08	4.97	SE	32	FL OZ/A	PRE	A	88	99	85	0	0
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
5	Tendovo	4.18	ZC	48	FL OZ/A	PRE	A	70	99	70	0	0
6	Zidua Pro	4.09	SC	5	FL OZ/A	PRE	A	91	99	93	0	0
	MSO			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
7	SAUSX08	4.97	SE	32	FL OZ/A	PRE	A	93	99	88	0	0
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Tendovo	4.18	ZC	48	FL OZ/A	PRE	A	53	93	53	0	0
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
9	Zidua Pro	4.09	SC	5	FL OZ/A	PRE	A	96	99	95	0	0
	MSO			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
10	SAUSX08	4.97	SE	16	FL OZ/A	PRE	A	85	99	83	15	15
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	SAUSX08	4.97	SE	16	FL OZ/A	POST	B					
	NIS			0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
11	Prefix	4.34	SE	32	FL OZ/A	POST	B	0	0	0	20	22
	NIS			0.25	% V/V	POST	B					
LSD P=.05								14.6	5.8	13.1	.	1.5
Standard Deviation								8.6	3.4	7.6	0.0	0.9
CV								13.26	4.25	11.59	0.0	26.11

Missing data estimates are included in columns:Average=2,4,6,8,11,13,15,17,18,20
Could not calculate LSD (% mean diff) for columns 1,3,9 because error mean square = 0.
^Calculated from residual.

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.

Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

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	IPOHE	GLXMA	ABUTH
Rating Date								6/23/2023	6/23/2023	6/23/2023	6/29/2023	6/29/2023
Rating Type								CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								1-6 IN	1-3 IN	1-8 IN	V4	3-10 IN
Trt-Eval Interval								8 DA-B	8 DA-B	8 DA-B	14 DA-B	14 DA-B
1	Untreated Check							0	0	0	0	0
2	Blanket	4	SC	8	FL OZ/A	PRE	A	53	98	73	0	53
	COC			1	% V/V	PRE	A					
3	Cerazone	2.5	SC	12.8	FL OZ/A	PRE	A	75	96	75	0	70
	COC			1	% V/V	PRE	A					
4	SAUSX08	4.97	SE	32	FL OZ/A	PRE	A	88	99	85	0	87
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
5	Tendovo	4.18	ZC	48	FL OZ/A	PRE	A	75	99	68	0	88
6	Zidua Pro	4.09	SC	5	FL OZ/A	PRE	A	93	99	93	0	91
	MSO			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
7	SAUSX08	4.97	SE	32	FL OZ/A	PRE	A	99	99	99	0	99
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Tendovo	4.18	ZC	48	FL OZ/A	PRE	A	99	88	80	0	98
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
9	Zidua Pro	4.09	SC	5	FL OZ/A	PRE	A	96	99	99	0	99
	MSO			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
10	SAUSX08	4.97	SE	16	FL OZ/A	PRE	A	99	99	93	17	98
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	SAUSX08	4.97	SE	16	FL OZ/A	POST	B					
	NIS			0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
11	Prefix	4.34	SE	32	FL OZ/A	POST	B	90	98	68	20	83
	NIS			0.25	% V/V	POST	B					
LSD P=.05								10.7	8.9	12.8	1.5	15.0
Standard Deviation								6.3	5.2	7.4	0.9	8.8
CV								7.95	5.88	9.83	26.11	11.13

Missing data estimates are included in columns:Average=2,4,6,8,11,13,15,17,18,20
Could not calculate LSD (% mean diff) for columns 1,3,9 because error mean square = 0.
^Calculated from residual.

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.

Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

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	IPOHE	ABUTH	AMATA	IPOHE
	Rating Date							6/29/2023	6/29/2023	7/7/2023	7/7/2023	7/7/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-10 IN	1-15 IN	8-22 IN	8-22 IN	8-22 IN
	Trt-Eval Interval							14 DA-B	14 DA-B	22 DA-B	22 DA-B	22 DA-B
1	Untreated Check							0	0	0	0	0
2	Blanket	4	SC	8	FL OZ/A	PRE	A	96	73	53	93	73
	COC			1	% V/V	PRE	A					
3	Cerazone	2.5	SC	12.8	FL OZ/A	PRE	A	95	75	63	91	75
	COC			1	% V/V	PRE	A					
4	SAUSX08	4.97	SE	32	FL OZ/A	PRE	A	99	85	85	98	82
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
5	Tendovo	4.18	ZC	48	FL OZ/A	PRE	A	99	68	85	99	68
6	Zidua Pro	4.09	SC	5	FL OZ/A	PRE	A	98	90	88	98	85
	MSO			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
7	SAUSX08	4.97	SE	32	FL OZ/A	PRE	A	99	99	99	99	96
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
8	Tendovo	4.18	ZC	48	FL OZ/A	PRE	A	86	78	96	83	77
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
9	Zidua Pro	4.09	SC	5	FL OZ/A	PRE	A	99	98	99	99	98
	MSO			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	RUPPM3	4.8	SC	20	FL OZ/A	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
10	SAUSX08	4.97	SE	16	FL OZ/A	PRE	A	99	90	98	99	87
	COC			1	% V/V	PRE	A					
	AMS		SG	8.5	LB/100 GAL	PRE	A					
	SAUSX08	4.97	SE	16	FL OZ/A	POST	B					
	NIS			0.25	% V/V	POST	B					
	AMS		SG	8.5	LB/100 GAL	POST	B					
11	Prefix	4.34	SE	32	FL OZ/A	POST	B	98	62	75	98	60
	NIS			0.25	% V/V	POST	B					
	LSD P=.05							8.8	10.7	15.5	11.4	11.1
	Standard Deviation							5.2	6.2	9.1	6.7	6.5
	CV							5.9	8.4	11.84	7.67	8.92

Missing data estimates are included in columns:Average=2,4,6,8,11,13,15,17,18,20
Could not calculate LSD (% mean diff) for columns 1,3,9 because error mean square = 0.
^Calculated from residual.

Iowa State University

University Soybean PRE Herbicide Comparisons Including Blanket, Cerazone, Prefix, SAUSX08, Tendovo & Zidua PRO, Ames, IA, 2023.
Trial ID: ASC11
Protocol ID: SAUSX08 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Chuck Foresman Sponsor Contact: Jay Turner
Investigator: Prashant Jha

Pest Code
GLXMA, Glycine max, Soybean = 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

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/25/2023
Completion Date: 7/20/2023

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

Latitude of LL Corner °: 42.002868 N
Longitude of LL Corner °: -93.676778 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to compare glufosinate formulations for weed control in soybean.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Asgrow AG21XF3
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/25/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 72 F **Soil Moisture:** DRY dry
Emergence Date: 6/1/2023

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/14/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/14/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/14/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/14/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 8 **Plots:** 24 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Maintenance

No.	Date	Type	Maintenance Product Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Tank Mix Code	Tank Mix
1.	5/26/2023	HERB	Dual II Magnum	7.64	LBA/GAL	EC	0.75	PT/A	N	no

Field Prep./Maintenance:

Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting. Dual II Magnum was applied PRE at 0.75 pints per acre to all plots on May 26 to achieve a level of giant foxtail control.

Soil Description

Description Name: 25
% Sand: 44 **% OM:** 4 **Texture:** CL clay loam
% Silt: 26 **Soil Name:** WEBSTER
% Clay: 30 **Fert. Level:** E excellent
pH: 5.6 **CEC:** 22
Soil Drainage: G good

Weather Conditions

Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	6/15/2023	6/22/2023
Appl. Start Time	3:49 PM	12:29 PM
Application Method	SPRAY	SPRAY
Application Timing	EPOST	MPOST
Application Placement	BROFOL	BROFOL
Applied By	Macvilay	Macvilay
Appl. Entry Date	7/24/2023	7/24/2023
Air Temperature Start, Stop	89, 89 F	86, 86 F
% Relative Humidity Start, Stop	42, 42	40, 40
Wind Velocity+Dir. Start	6 MPH, NW	5 MPH, E
Wet Leaves (Y/N)	N, no	N, no
Soil Temperature	77 F	78 F
Soil Moisture	DRY	DRY
Soil Surface Condition	ROUGH	
% Cloud Cover	0	0
Next Moisture Occurred On	6/17/2023	6/24/2023
Time to Next Moisture	2.0 DAY	2.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN
Moisture 1 Week after Appl.	1.2 IN	0.65 IN
Problems with Application?	N, no	N, no

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	14	21
Stage Majority, Percent	V1, -	V2, -
Stage Minimum, Percent	V1, -	V2, -
Stage Maximum, Percent	V2, -	V3, -
Height Average	4.5 IN	7 IN
Height Minimum, Maximum	4, 5	5, 8

Iowa State University

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent	3 LEAF, -	5 LEAF, -
Stage Minimum, Percent	2 LEAF, -	4 LEAF, -
Stage Maximum, Percent	4 LEAF, -	6 LEAF, -
Height Average	1.5 IN	5 IN
Height Minimum, Maximum	1, 2	2, 7
Density Average	4 FT2	4 FT2
Density Minimum, Maximum	0, 7	2, 6
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent	4 LEAF, -	6 LEAF, -
Stage Minimum, Percent	3 LEAF, -	4 LEAF, -
Stage Maximum, Percent	5 LEAF, -	8 LEAF, -
Height Average	1 IN	2.5 IN
Height Minimum, Maximum	1, 1.5	2, 3
Density Average	4 PLOT	4 FT2
Density Minimum, Maximum	0, 5	0, 7
Pest 3 Code, Type, Scale	CHEAL, W, DESC	CHEAL, W, DESC
Stage Majority, Percent	4 LEAF, -	14 LEA, -
Stage Minimum, Percent	2 LEAF, -	6 LEAF, -
Stage Maximum, Percent	6 LEAF, -	24 LEA, -
Height Average	1 IN	6 IN
Height Minimum, Maximum	0.5, 1.5	3, 8
Density Average	2 PLOT	3 FT2
Density Minimum, Maximum	0, 4	0, 5
Pest 4 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent	3 LEAF, -	11 LEA, -
Stage Minimum, Percent	COTYLE, -	COTYLE, -
Stage Maximum, Percent	5 LEAF, -	22 LEA, -
Height Average	2 IN	6 IN
Height Minimum, Maximum	1, 3	1, 10
Density Average	10 FT2	10 FT2
Density Minimum, Maximum	5, 17	5, 15

Application Equipment

	A	B
Appl. Equipment	HAND SPRAYER	HAND SPRAYER
Equipment Type	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI
Nozzle Model	11002	11002
Nozzle Type	TT	TT
Nozzle Spacing	19 IN	19.0 IN
Boom Length	10 FT	10.0 FT
Ground Speed	3 MPH	3 MPH
Application Amount	20 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2

Iowa State University

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Notes

Context	Date	By	Notes
STATUS	3/25/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/14/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Burndown weed control was evaluated up to July 14. The July 20 rating factored residual control of weeds that emerged since the POST applications into the values.

Iowa State University

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
Pest Code								ABUTH	AMATA	CHEAL	IPOHE	ABUTH
Rating Date								6/29/2023	6/29/2023	6/29/2023	6/29/2023	7/8/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								2-7 IN	2-7 IN	2-7 IN	2-7 IN	3-12 IN
Trt-Eval Interval								7 DA-B	7 DA-B	7 DA-B	7 DA-B	16 DA-B
1	Untreated Check							0	0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	MPOST	B	82	83	99	95	83
3	Surmise 5	4.59	SL	16.4	FL OZ/A	MPOST	B	80	83	70	96	73
4	Interline	2.34	SL	32	FL OZ/A	MPOST	B	77	78	93	95	77
5	Liberty Ultra	1.76	SL	24	FL OZ/A	MPOST	B	90	83	99	95	99
	AMS		SG	1.5	LB/A	MPOST	B					
6	Surmise 5	4.59	SL	16.4	FL OZ/A	MPOST	B	85	78	68	95	95
	AMS		SG	1.5	LB/A	MPOST	B					
7	Interline	2.34	SL	32	FL OZ/A	MPOST	B	90	88	93	95	95
	AMS		SG	1.5	LB/A	MPOST	B					
8	Liberty Ultra	1.76	SL	24	FL OZ/A	EPOST	A	99	99	99	98	98
	Zidua SC	4.17	SC	2.5	FL OZ/A	EPOST	A					
	AMS		SG	1.5	LB/A	EPOST	A					
LSD P=.05								8.0	7.3	14.3	1.9	11.4
Standard Deviation								4.6	4.1	7.9	1.1	6.5
CV								6.08	5.59	10.21	1.33	8.4

Missing data estimates are included in columns:Average=2,3,7,11,15
^Calculated from residual.

Iowa State University

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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								AMATA	CHEAL	IPOHE	ABUTH	AMATA	CHEAL
Rating Date								7/8/2023	7/8/2023	7/8/2023	7/14/2023	7/14/2023	7/14/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%	%
Pest Stage Majority/Min/Max								3-10 IN	4-12 IN	1-12 IN	3-17 IN	3-17 IN	3-17 IN
Trt-Eval Interval								16 DA-B	16 DA-B	16 DA-B	22 DA-B	22 DA-B	22 DA-B
1	Untreated Check							0	0	0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	MPOST	B	90	99	98	83	87	99
3	Surmise 5	4.59	SL	16.4	FL OZ/A	MPOST	B	92	73	98	68	90	65
4	Interline	2.34	SL	32	FL OZ/A	MPOST	B	88	93	96	77	82	88
5	Liberty Ultra	1.76	SL	24	FL OZ/A	MPOST	B	95	99	96	98	92	99
	AMS		SG	1.5	LB/A	MPOST	B						
6	Surmise 5	4.59	SL	16.4	FL OZ/A	MPOST	B	90	75	98	93	83	75
	AMS		SG	1.5	LB/A	MPOST	B						
7	Interline	2.34	SL	32	FL OZ/A	MPOST	B	92	93	96	92	87	92
	AMS		SG	1.5	LB/A	MPOST	B						
8	Liberty Ultra	1.76	SL	24	FL OZ/A	EPOST	A	98	96	99	98	98	96
	Zidua SC	4.17	SC	2.5	FL OZ/A	EPOST	A						
	AMS		SG	1.5	LB/A	EPOST	A						
LSD P=.05								5.5	12.1	3.4	12.6	10.2	8.4
Standard Deviation								3.2	6.7	1.9	7.2	5.8	4.7
CV								3.93	8.58	2.26	9.44	7.56	6.12

Missing data estimates are included in columns:Average=2,3,7,11,15
^Calculated from residual.

Iowa State University

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	12	13	14	15	16
Pest Code								IPOHE	ABUTH	AMATA	CHEAL	IPOHE
Rating Date								7/14/2023	7/20/2023	7/20/2023	7/20/2023	7/20/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								1-12 IN	3-23 IN	5-20 IN	5-20 IN	1-18 IN
Trt-Eval Interval								22 DA-B	28 DA-B	28 DA-B	28 DA-B	28 DA-B
1	Untreated Check							0	0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	MPOST	B	96	67	77	90	90
3	Surmise 5	4.59	SL	16.4	FL OZ/A	MPOST	B	98	62	87	55	95
4	Interline	2.34	SL	32	FL OZ/A	MPOST	B	95	60	77	77	87
5	Liberty Ultra	1.76	SL	24	FL OZ/A	MPOST	B	96	95	85	88	88
	AMS		SG	1.5	LB/A	MPOST	B					
6	Surmise 5	4.59	SL	16.4	FL OZ/A	MPOST	B	98	85	80	70	90
	AMS		SG	1.5	LB/A	MPOST	B					
7	Interline	2.34	SL	32	FL OZ/A	MPOST	B	96	85	82	85	90
	AMS		SG	1.5	LB/A	MPOST	B					
8	Liberty Ultra	1.76	SL	24	FL OZ/A	EPOST	A	99	88	93	88	78
	Zidua SC	4.17	SC	2.5	FL OZ/A	EPOST	A					
	AMS		SG	1.5	LB/A	EPOST	A					
LSD P=.05								3.1	15.8	12.8	15.7	6.0
Standard Deviation								1.8	9.0	7.3	8.7	3.4
CV								2.09	13.34	10.12	12.66	4.41

Missing data estimates are included in columns:Average=2,3,7,11,15
^Calculated from residual.

Iowa State University

Evaluation of Glufosinate Formulations for Weed Control in Soybean, Ames, IA, 2023.

Trial ID: ASC12
Protocol ID: MKD-H-2023-US-D41 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
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
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/25/2023
Initiation Date: 5/25/2023
Completion Date: 8/30/2023

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

Latitude of LL Corner °: 42.002565 N
Longitude of LL Corner °: -93.676752 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate early applications of Engenia in a Xtendflex Soybean Program.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Asgrow AG21XF3
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/25/2023 **Planting Rate:** 140000 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: ROUGH rough
Soil Temperature: 70 F **Soil Moisture:** DRY dry
Emergence Date: 6/1/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/6/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/6/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/6/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** IPOHE Ipomoea hederacea **Entry Date:** 9/6/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 9 **Plots:** 27 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Field Prep./Maintenance:
Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description
Description Name: 25
% Sand: 44 **% OM:** 4 **Texture:** CL clay loam
% Silt: 26 **Soil Name:** WEBSTER
% Clay: 30 **Fert. Level:** E excellent
pH: 5.6 **CEC:** 22
Soil Drainage: G good

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C	D	E
Application Date	5/26/2023	6/9/2023	6/27/2023	6/27/2023	7/3/2023
Appl. Start Time	4:00 PM	2:44 PM	3:08 PM	3:08 PM	11:45 AM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	EPOST	POST	POST	LPOST
Application Placement	BROSOI	BROFOL	BROFOL	BROFOL	BROFOL
Applied By	Franzenburg	Macvilay	Macvilay	Macvilay	Franzenburg
Appl. Entry Date	7/24/2023	7/24/2023	7/24/2023	7/24/2023	7/24/2023
Air Temperature Start, Stop	75, 75 F	79, 79 F	82, 83 F	82, 83 F	83, 83 F
% Relative Humidity Start, Stop	22, 22	35, 35	44, 44	44, 44	48, 48
Wind Velocity+Dir. Start	8 MPH, ESE	8 MPH, S	7 MPH, SE	7 MPH, SE	4 MPH, SW
Wet Leaves (Y/N)		N, no	N, no	N, no	N, no
Soil Temperature	78 F	75 F	74 F	74 F	77 F
Soil Moisture	DRY	DRY	DRY	DRY	DRY
Soil Surface Condition	ROUGH				
% Cloud Cover	50	100	0	0	20
Next Moisture Occurred On	5/30/2023	6/17/2023	7/7/2023	7/7/2023	7/7/2023
Time to Next Moisture	4.0 DAY	8.0 DAY	11.0 DAY	11.0 DAY	4.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0.7 IN	0 IN	0 IN	0 IN	0.3 IN
Problems with Application?	N, no	N, no	N, no	N, no	N, no

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
Days after Emergence	-6	8	26	26	32
Stage Majority, Percent		VC, -	V4, -	V4, -	V6, -
Stage Minimum, Percent		VC, -	V3, -	V3, -	V6, -
Stage Maximum, Percent		V1, -	V4, -	V4, -	R1, -
Height Average		3 IN	11 IN	11 IN	17 FT
Height Minimum, Maximum		2, 4	9, 13	9, 13	15, 19

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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		2 LEAF, -	3 LEAF, -	3 LEAF, -
Stage Minimum, Percent		1 LEAF, -	1 LEAF, -	1 LEAF, -
Stage Maximum, Percent		2 LEAF, -	4 LEAF, -	4 LEAF, -
Height Average		2 IN	9 IN	9 IN
Height Minimum, Maximum		1, 3	3, 15	3, 15
Density Average		3 FT2	15 FT2	15 FT2
Density Minimum, Maximum		1, 4	0, 28	0, 28
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		1 LEAF, -	6 LEAF, -	6 LEAF, -
Stage Minimum, Percent		COTYLE, -	3 LEAF, -	3 LEAF, -
Stage Maximum, Percent		1 LEAF, -	8 LEAF, -	8 LEAF, -
Height Average		1 IN	6 IN	6 IN
Height Minimum, Maximum			4, 9	4, 9
Density Average		10 FT2	4 FT2	4 FT2
Density Minimum, Maximum		1, 20	0, 7	0, 7
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		1 LEAF, -	10 LEA, -	10 LEA, -
Stage Minimum, Percent		COTYLE, -	6 LEAF, -	6 LEAF, -
Stage Maximum, Percent		1 LEAF, -	12 LEA, -	12 LEA, -
Height Average		0.5 IN	6 IN	6 IN
Height Minimum, Maximum		0.25, 1	4, 8	4, 8
Density Average		7 FT2	2 FT2	2 FT2
Density Minimum, Maximum		5, 10	0, 4	0, 4
Pest 4 Code, Type, Scale	IPOHE, W, DESC	IPOHE, W, DESC	IPOHE, W, DESC	IPOHE, W, DESC
Stage Majority, Percent		2 LEAF, -	7 LEAF, -	7 LEAF, -
Stage Minimum, Percent		COTYLE, -	COTYLE, -	COTYLE, -
Stage Maximum, Percent		3 LEAF, -	11 LEA, -	11 LEA, -
Height Average		1.5 IN	6 IN	6 IN
Height Minimum, Maximum		1, 2	1, 8	1, 8
Density Average		6 FT2	4 FT2	4 FT2
Density Minimum, Maximum		4, 8	0, 8	0, 8

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASC13
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Study Director: Sponsor Contact:
Investigator: Prashant Jha

	E
Pest 1 Code, Type, Scale	SETFA, W, DESC
Stage Majority, Percent	8 LEAF, -
Stage Minimum, Percent	6 LEAF, -
Stage Maximum, Percent	9 LEAF, -
Height Average	13 IN
Height Minimum, Maximum	11, 14
Density Average	1 FT2
Density Minimum, Maximum	0, 3
Pest 2 Code, Type, Scale	ABUTH, W, DESC
Stage Majority, Percent	10 LEA, -
Stage Minimum, Percent	8 LEAF, -
Stage Maximum, Percent	12 LEA, -
Height Average	9 IN
Height Minimum, Maximum	6, 13
Density Average	1 FT2
Density Minimum, Maximum	0, 2
Pest 3 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	NUMERO, -
Stage Minimum, Percent	NUMERO, -
Stage Maximum, Percent	NUMERO, -
Height Average	9 IN
Height Minimum, Maximum	5, 13
Density Average	10 PLOT
Density Minimum, Maximum	0, 20
Pest 4 Code, Type, Scale	IPOHE, W, DESC
Stage Majority, Percent	
Stage Minimum, Percent	
Stage Maximum, Percent	
Height Average	
Height Minimum, Maximum	
Density Average	
Density Minimum, Maximum	

Application Equipment

	A	B	C	D	E
Appl. Equipment	ATV	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER	HAND SPRAYER
Equipment Type	ALTEVE	BACMAN	BACMAN	BACMAN	BACMAN
Operation Pressure	35 PSI	35 PSI	35 PSI	35 PSI	35 PSI
Nozzle Model	110015	110015	110015	11002	11002
Nozzle Type	TTI	TTI	TTI	XR	XR
Nozzle TradeName	TeeJet	TeeJet	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN	-, YELLOW	-, YELLOW
Nozzle Spacing	20 IN	19 IN	19 IN	19 IN	19.0 IN
Boom Length	10 FT	10 FT	10 FT	10 FT	10.0 FT
Ground Speed	2.8 MPH	3 MPH	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC	20 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2	COMCO2	COMCO2

Iowa State University

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Study Director: Sponsor Contact:
Investigator: Prashant Jha

Notes

Context	Date	By	Notes
STATUS	3/27/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	9/6/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Soybean in the study grew very tall and developed a good canopy by August 8.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 6/16/2023 CONTRO % 1-3 IN 21 DA-A	ABUTH 6/16/2023 CONTRO % 0.5-2 IN 21 DA-A	AMATA 6/16/2023 CONTRO % 0.5-2 IN 21 DA-A	IPOHE 6/16/2023 CONTRO % 0.5-2 IN 21 DA-A
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								6/16/2023	6/16/2023	6/16/2023	6/16/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								1-3 IN	0.5-2 IN	0.5-2 IN	0.5-2 IN
	Trt-Eval Interval								21 DA-A	21 DA-A	21 DA-A	21 DA-A
									1	2	3	4
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	90	75	96	70
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	88	67	95	75
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	0	70	70	77
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	0	70	70	77
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	73	72	99	75
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	63	33	95	50
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	78	67	95	70
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								6/16/2023	6/16/2023	6/16/2023	6/16/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								1-3 IN	0.5-2 IN	0.5-2 IN	0.5-2 IN
	Trt-Eval Interval								21 DA-A	21 DA-A	21 DA-A	21 DA-A
									1	2	3	4
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	83	43	98	27
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant	3	CS	3	PT/A	POST	C	TTI				
	LSD P=.05								12.8	12.1	4.8	15.2
	Standard Deviation								7.4	7.0	2.8	8.8
	CV								13.93	12.62	3.48	15.16

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
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Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 6/25/2023 CONTRO % 3-9 IN 16 DA-B 5	ABUTH 6/25/2023 CONTRO % 2-8 IN 16 DA-B 6	AMATA 6/25/2023 CONTRO % 1-6 IN 16 DA-B 7	IPOHE 6/25/2023 CONTRO % 5-20 IN 16 DA-B 8
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	87	67	95	63
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	88	60	93	63
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	0	93	92	93
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	0	93	95	95
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	67	70	96	72
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	60	33	88	50
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	77	60	92	70
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								6/25/2023	6/25/2023	6/25/2023	6/25/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								3-9 IN	2-8 IN	1-6 IN	5-20 IN
	Trt-Eval Interval								16 DA-B	16 DA-B	16 DA-B	16 DA-B
	Trt No. / Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	5	6	7	8
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	83	37	96	10
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant	3	CS	3	PT/A	POST	C	TTI				
	LSD P=.05								9.7	11.9	4.2	10.4
	Standard Deviation								5.6	6.9	2.4	6.0
	CV								10.88	12.08	2.94	10.45

^Calculated from residual.

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Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 7/11/2023 CONTRO % 5-20 IN 14 DA-C	ABUTH 7/11/2023 CONTRO % 4-15 IN 14 DA-C	AMATA 7/11/2023 CONTRO % 4-15 IN 14 DA-C	IPOHE 7/11/2023 CONTRO % 4-15 IN 14 DA-C
	Pest Code											
	Rating Date								7/11/2023	7/11/2023	7/11/2023	7/11/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								5-20 IN	4-15 IN	4-15 IN	4-15 IN
	Trt-Eval Interval								14 DA-C	14 DA-C	14 DA-C	14 DA-C
									9	10	11	12
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	99	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	93	98	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	98	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	67	85	96	93
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	73	60	93	96
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	99	98	99	99
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								7/11/2023	7/11/2023	7/11/2023	7/11/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								5-20 IN	4-15 IN	4-15 IN	4-15 IN
	Trt-Eval Interval								14 DA-C	14 DA-C	14 DA-C	14 DA-C
									9	10	11	12
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	99	95	98	88
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant	3	CS	3	PT/A	POST	C	TTI				
	LSD P=.05								5.0	2.5	3.0	4.4
	Standard Deviation								2.9	1.4	1.7	2.6
	CV								3.54	1.79	1.98	2.98

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 7/17/2023 CONTRO % 5-20 IN 14 DA-E	ABUTH 7/17/2023 CONTRO % 4-15 IN 14 DA-E	AMATA 7/17/2023 CONTRO % 4-15 IN 14 DA-E	IPOHE 7/17/2023 CONTRO % 4-15 IN 14 DA-E
	Pest Code											
	Rating Date								7/17/2023	7/17/2023	7/17/2023	7/17/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								5-20 IN	4-15 IN	4-15 IN	4-15 IN
	Trt-Eval Interval								14 DA-E	14 DA-E	14 DA-E	14 DA-E
									13	14	15	16
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	99	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	99	98	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	70	88	98	93
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	78	62	95	95
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	99	99	99	99
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								7/17/2023	7/17/2023	7/17/2023	7/17/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								5-20 IN	4-15 IN	4-15 IN	4-15 IN
	Trt-Eval Interval								14 DA-E	14 DA-E	14 DA-E	14 DA-E
									13	14	15	16
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	99	95	99	88
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant	3	CS	3	PT/A	POST	C	TTI				
	LSD P=.05								4.4	3.8	3.2	4.3
	Standard Deviation								2.5	2.2	1.8	2.5
	CV								3.09	2.68	2.09	2.92

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 7/24/2023 CONTRO % 8-25 IN 21 DA-E	ABUTH 7/24/2023 CONTRO % 4-15 IN 21 DA-E	AMATA 7/24/2023 CONTRO % 4-15 IN 21 DA-E	IPOHE 7/24/2023 CONTRO % 4-15 IN 21 DA-E
	Pest Code											
	Rating Date								7/24/2023	7/24/2023	7/24/2023	7/24/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								8-25 IN	4-15 IN	4-15 IN	4-15 IN
	Trt-Eval Interval								21 DA-E	21 DA-E	21 DA-E	21 DA-E
									17	18	19	20
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	99	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	98	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	96
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	75	90	98	93
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	80	67	95	93
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	99	99	99	95
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								7/24/2023	7/24/2023	7/24/2023	7/24/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								8-25 IN	4-15 IN	4-15 IN	4-15 IN
	Trt-Eval Interval								21 DA-E	21 DA-E	21 DA-E	21 DA-E
									17	18	19	20
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	98	93	99	88
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant	3	CS	3	PT/A	POST	C	TTI				
	LSD P=.05								5.3	4.2	3.2	3.9
	Standard Deviation								3.0	2.4	1.8	2.2
	CV								3.65	2.93	2.09	2.65

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 8/8/2023 CONTRO % 8-25 IN 42 DA-C 21	ABUTH 8/8/2023 CONTRO % 4-15 IN 42 DA-C 22	AMATA 8/8/2023 CONTRO % 4-15 IN 42 DA-C 23	IPOHE 8/8/2023 CONTRO % 4-15 IN 42 DA-C 24
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	99	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	98	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	95
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	77	92	98	95
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	80	70	95	93
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	99	99	99	95
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
Pest Code									SETFA	ABUTH	AMATA	IPOHE
Rating Date									8/8/2023	8/8/2023	8/8/2023	8/8/2023
Rating Type									CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max									%	%	%	%
Pest Stage Majority/Min/Max									8-25 IN	4-15 IN	4-15 IN	4-15 IN
Trt-Eval Interval									42 DA-C	42 DA-C	42 DA-C	42 DA-C
									21	22	23	24
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	96	93	98	88
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant	3	CS	3	PT/A	POST	C	TTI				
LSD P=.05									7.3	3.2	3.6	3.9
Standard Deviation									4.2	1.8	2.1	2.3
CV									5.08	2.2	2.39	2.7

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 8/15/2023 CONTRO % 20-40 IN 43 DA-E	ABUTH 8/15/2023 CONTRO % 4-15 IN 43 DA-E	AMATA 8/15/2023 CONTRO % 4-15 IN 43 DA-E	IPOHE 8/15/2023 CONTRO % 4-15 IN 43 DA-E
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								8/15/2023	8/15/2023	8/15/2023	8/15/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								20-40 IN	4-15 IN	4-15 IN	4-15 IN
	Trt-Eval Interval								43 DA-E	43 DA-E	43 DA-E	43 DA-E
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	98	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	98	96
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	95
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	77	92	98	95
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	80	75	95	93
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	99	99	99	95
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								8/15/2023	8/15/2023	8/15/2023	8/15/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								20-40 IN	4-15 IN	4-15 IN	4-15 IN
	Trt-Eval Interval								43 DA-E	43 DA-E	43 DA-E	43 DA-E
									25	26	27	28
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	96	93	98	88
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant	3	CS	3	PT/A	POST	C	TTI				
	LSD P=.05								7.3	4.3	3.8	3.8
	Standard Deviation								4.2	2.5	2.2	2.2
	CV								5.08	2.96	2.54	2.61

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 8/24/2023 CONTRO % 20-40 IN 58 DA-C	ABUTH 8/24/2023 CONTRO % 4-15 IN 58 DA-C	AMATA 8/24/2023 CONTRO % 4-15 IN 58 DA-C	IPOHE 8/24/2023 CONTRO % 4-15 IN 58 DA-C
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	98	96
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	98	96
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	95
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	77	92	98	95
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	80	75	95	93
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	99	99	99	95
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
Pest Code									SETFA	ABUTH	AMATA	IPOHE
Rating Date									8/24/2023	8/24/2023	8/24/2023	8/24/2023
Rating Type									CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max									%	%	%	%
Pest Stage Majority/Min/Max									20-40 IN	4-15 IN	4-15 IN	4-15 IN
Trt-Eval Interval									58 DA-C	58 DA-C	58 DA-C	58 DA-C
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	96	93	98	88
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant		3 CS		3 PT/A	POST	C	TTI				
LSD P=.05									7.3	4.3	3.8	4.1
Standard Deviation									4.2	2.5	2.2	2.3
CV									5.08	2.96	2.54	2.78

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 8/30/2023 CONTRO % 20-55 IN 58 DA-E	ABUTH 8/30/2023 CONTRO % 4-22 IN 58 DA-E	AMATA 8/30/2023 CONTRO % 4-22 IN 58 DA-E	IPOHE 8/30/2023 CONTRO % 4-22 IN 58 DA-E
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								8/30/2023	8/30/2023	8/30/2023	8/30/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								20-55 IN	4-22 IN	4-22 IN	4-22 IN
	Trt-Eval Interval								58 DA-E	58 DA-E	58 DA-E	58 DA-E
									33	34	35	36
1	Untreated Check								0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	98	96
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI	99	98	98	96
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	95
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Outlook	6	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	TTI	99	99	99	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B	TTI				
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E	XR				
	Outlook	6	EC	12	FL OZ/A	LPOST	E	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E	XR				
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	TTI	77	92	98	95
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Outlook	6	EC	12	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	80	75	95	93
	Engenia	5	SL	12.8	FL OZ/A	POST	C	TTI				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Select Max	0.97	EC	12	FL OZ/A	POST	C	TTI				
	COC		L	1	% V/V	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	TTI	99	99	99	95
	Engenia	5	SL	12.8	FL OZ/A	PRE	A	TTI				
	Aegos	5.8	SL	8	FL OZ/A	PRE	A	TTI				
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D	XR				
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D	XR				
	Select Max	0.97	EC	12	FL OZ/A	POST	D	XR				
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D	XR				
	COC		L	0.5	% V/V	POST	D	XR				
	Intact		L	0.5	% V/V	POST	D	XR				

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA	ABUTH	AMATA	IPOHE
	Pest Code								SETFA	ABUTH	AMATA	IPOHE
	Rating Date								8/30/2023	8/30/2023	8/30/2023	8/30/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								20-55 IN	4-22 IN	4-22 IN	4-22 IN
	Trt-Eval Interval								58 DA-E	58 DA-E	58 DA-E	58 DA-E
									33	34	35	36
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	TTI	96	93	98	88
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C	TTI				
	Aegos	5.8	SL	8	FL OZ/A	POST	C	TTI				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C	TTI				
	Intact		L	0.5	% V/V	POST	C	TTI				
	Warrant	3	CS	3	PT/A	POST	C	TTI				
	LSD P=.05								7.3	4.3	3.8	4.1
	Standard Deviation								4.2	2.5	2.2	2.3
	CV								5.08	2.96	2.54	2.78

^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASC13
Protocol ID: MKD-H-2023-US-D61 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
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
CONTRO = control / burndown or knockdown
Rating Unit/Min/Max
%, 0, 100 = percent

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.
Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 12/4/2023
Initiation Date: 5/24/2023
Completion Date: 10/23/2023

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

Latitude of LL Corner °: 42.001717 N
Longitude of LL Corner °: -93.675503 W

Regulations
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 the gap for POST timing of Enlist and residual herbicides.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 7/24/2023 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/24/2023 **Planting Rate:** 140000 S/A
Depth: 1.75 IN
Rows per Plot: 4
Row Spacing: 30 IN **Planting Method:** DIRDRI direct drilled
Planting Equipment: FPP finger pickup planter
Seed Bed: ROUGH rough
Soil Temperature: 64 F **Soil Moisture:** DRY dry
Emergence Date: 5/31/2023
Harvest Date: 10/23/2023 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: HARVESTMASTER **Harvested Width:** 10 FT
% Standard Moisture: 13.0 **Harvested Length:** 20 FT
Weighing Equipment: HARVESTMASTER

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 8/28/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 8/28/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 8/28/2023
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 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 15 **Plots:** 60 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.
Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Field Prep./Maintenance:
Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 35% at planting.

Soil Description
Description Name: 18
% Sand: 45 **% OM:** 4.5 **Texture:** CL clay loam
% Silt: 24 **Soil Name:** WEBSTER
% Clay: 31 **Fert. Level:** E excellent
pH: 5.5 **CEC:** 23.3
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.5 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN
14.	8/6/2023	2	IN
15.	8/9/2023	0.4	IN
16.	8/11/2023	0.8	IN

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.
Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C
Application Date	5/27/2023	6/22/2023	7/3/2023
Appl. Start Time	4:30 PM	11:39 AM	11:00 AM
Appl. Stop Time	5:30 PM		
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	POST1	POST2
Application Placement	BROSOI	BROFOL	BROFOL
Applied By	Franzenburg	Macvilay	Franzenburg
Appl. Entry Date	7/24/2023	7/24/2023	7/24/2023
Air Temperature Start, Stop	79, 79 F	87, 88 F	83, 84 F
% Relative Humidity Start, Stop	23, 23	39, 39	48, 48
Wind Velocity+Dir. Start	7 MPH, ESE	5 MPH, SE	4 MPH, SW
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	80 F	77 F	77 F
Soil Moisture	DRY	DRY	DRY
Soil Surface Condition	ROUGH		
% Cloud Cover	0	0	20
Next Moisture Occurred On	5/30/2023	6/24/2023	7/7/2023
Time to Next Moisture	3.0 DAY	2.0 DAY	4.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0.7 IN	0.65 IN	0.3 IN
Problems with Application?	N, no	N, no	N, no

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-4	22	33
Stage Majority, Percent		V2, -	V6, -
Stage Minimum, Percent		V1, -	V6, -
Stage Maximum, Percent		V2, -	R1, -
Height Average		7 IN	18 IN
Height Minimum, Maximum		5, 8	16, 19

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.
Trial ID: ASC 14
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Project ID: Project ID 2: Project ID 3:
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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		5 LEAF, -	NUMERO, -
Stage Minimum, Percent		3 LEAF, -	
Stage Maximum, Percent		6 LEAF, -	
Height Average		9 IN	15 IN
Height Minimum, Maximum		2, 16	12, 17
Density Average		5 FT2	3 FT2
Density Minimum, Maximum		0, 10	1, 5
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		5 LEAF, -	10 LEA, -
Stage Minimum, Percent		3 LEAF, -	8 LEAF, -
Stage Maximum, Percent		6 LEAF, -	12 LEA, -
Height Average		3 IN	13 IN
Height Minimum, Maximum		1, 5	10, 16
Density Average		3 FT2	1 FT2
Density Minimum, Maximum		0, 7	
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		7 LEAF, -	NUMERO, -
Stage Minimum, Percent		4 LEAF, -	
Stage Maximum, Percent		9 LEAF, -	
Height Average		3 IN	13 IN
Height Minimum, Maximum		1, 5	10, 16
Density Average		9 FT2	6 PLOT
Density Minimum, Maximum		0, 17	0, 10

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	TTI	TTI
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
Ground Speed	2.8 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/14/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	7/24/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	8/28/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.
Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trial Comments

Soybean injury appeared as leaf crinkling.

Weed control ratings from July 20 & August 21 included residual control of weeds emerging since the POST applications.

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.

Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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							6/21/2023	6/21/2023	6/21/2023	6/21/2023	6/29/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V3	2-5 IN	1-3 IN	1-2 IN	V5
	Trt-Eval Interval							25 DA-A	25 DA-A	25 DA-A	25 DA-A	7 DA-B
1	Untreated Check							0	0	0	0	0
2	Boundary	6.5	EC	2	PT/A	PRE	A	5	90	33	89	10
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	4	87	49	89	10
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	5	91	40	98	10
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	6	79	50	91	10
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
6	Sonic	70	DF	6	OZ WT/A	PRE	A	0	33	58	83	10
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
7	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	4	80	53	89	10
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
8	Tendovo Herbicide	4.14	ZC	4	PT/A	PRE	A	4	84	73	93	10
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1.33	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A	3	86	35	91	0
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	3	83	35	85	1
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					

Missing data estimates are included in columns:Average=2,6
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^Calculated from residual.

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.

Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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							6/21/2023	6/21/2023	6/21/2023	6/21/2023	6/29/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V3	2-5 IN	1-3 IN	1-2 IN	V5
	Trt-Eval Interval							25 DA-A	25 DA-A	25 DA-A	25 DA-A	7 DA-B
11	Prefix	5.29	EC	2	PT/A	PRE	A	0	86	55	98	0
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	4	85	60	94	0
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
13	Sonic	70	DF	6	OZ WT/A	PRE	A	0	43	79	79	0
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
14	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	6	88	56	90	1
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
15	Tendovo Herbicide	4.14	ZC	4	PT/A	PRE	A	4	80	65	95	0
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1.5	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
	LSD P=.05							2.6	14.8	16.4	7.8	1.3
	Standard Deviation							1.8	10.4	11.5	5.5	0.9
	CV							59.91	14.22	23.31	6.51	18.2

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Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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							6/29/2023	6/29/2023	6/29/2023	7/7/2023	7/7/2023
	Rating Type							CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							6-18 IN	5-12 IN	5-12 IN	R1	
	Trt-Eval Interval							7 DA-B	7 DA-B	7 DA-B	15 DA-B	15 DA-B
1	Untreated Check							0	0	0	0	0
2	Boundary	6.5	EC	2	PT/A	PRE	A	99	99	99	5	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	99	99	99	5	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	99	99	99	5	99
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	99	99	5	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
6	Sonic	70	DF	6	OZ WT/A	PRE	A	99	99	99	5	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
7	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	99	99	5	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
8	Tendovo Herbicide	4.14	ZC	4	PT/A	PRE	A	99	99	99	5	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1.33	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A	81	30	84		
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	75	30	73		
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					

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Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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							6/29/2023	6/29/2023	6/29/2023	7/7/2023	7/7/2023
	Rating Type							CONTRO	CONTRO	CONTRO	PHYGEN	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							6-18 IN	5-12 IN	5-12 IN	R1	
	Trt-Eval Interval							7 DA-B	7 DA-B	7 DA-B	15 DA-B	15 DA-B
11	Prefix	5.29	EC	2	PT/A	PRE	A	75	44	89		
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	79	50	85		
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
13	Sonic	70	DF	6	OZ WT/A	PRE	A	40	64	65		
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
14	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	80	51	80		
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
15	Tendovo Herbicide	4.14	ZC	4	PT/A	PRE	A	79	51	90		
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1.5	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
	LSD P=.05							10.5	8.8	6.9	.	.
	Standard Deviation							7.3	6.2	4.8	0.0	0.0
	CV							9.17	9.18	5.73	0.0	0.0

Missing data estimates are included in columns:Average=2,6
Could not calculate LSD (% mean diff) for columns 9,10,12,18 because error mean square = 0.
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Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.
Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	GLXMA	SETFA	ABUTH
Rating Date								7/7/2023	7/7/2023	7/20/2023	7/20/2023	7/20/2023
Rating Type								CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								1-3 IN		R2	5-20 IN	1-3 IN
Trt-Eval Interval								15 DA-B	15 DA-B	28 DA-B	28 DA-B	28 DA-B
1	Untreated Check							0	0	0	0	0
2	Boundary	6.5	EC	2	PT/A	PRE	A	99	99	3	98	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	99	99	4	99	98
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	99	99	4	99	98
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	98	99	5	99	97
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
6	Sonic	70	DF	6	OZ WT/A	PRE	A	99	99	4	99	99
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
7	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	99	4	96	97
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
8	Tendovo Herbicide	4.14	ZC	4	PT/A	PRE	A	99	99	5	99	98
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1.33	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A			11	99	99
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A			11	99	99
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					

Missing data estimates are included in columns:Average=2,6
Could not calculate LSD (% mean diff) for columns 9,10,12,18 because error mean square = 0.
^Calculated from residual.

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.

Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	GLXMA	SETFA	ABUTH
	Rating Date							7/7/2023	7/7/2023	7/20/2023	7/20/2023	7/20/2023
	Rating Type							CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-3 IN		R2	5-20 IN	1-3 IN
	Trt-Eval Interval							15 DA-B	15 DA-B	28 DA-B	28 DA-B	28 DA-B
11	Prefix	5.29	EC	2	PT/A	PRE	A			10	99	99
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A			10	99	99
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
13	Sonic	70	DF	6	OZ WT/A	PRE	A			10	99	99
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
14	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A			9	98	99
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
15	Tendovo Herbicide	4.14	ZC	4	PT/A	PRE	A			10	99	99
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1.5	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
	LSD P=.05							1.0	.	2.6	1.3	1.8
	Standard Deviation							0.7	0.0	1.8	0.9	1.2
	CV							0.82	0.0	27.9	0.99	1.35

Missing data estimates are included in columns:Average=2,6
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Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.

Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	SETFA	ABUTH	AMATA	GLXMA
	Rating Date							7/20/2023	8/21/2023	8/21/2023	8/21/2023	10/23/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	YIELD
	Rating Unit/Min/Max							%	%	%	%	bu/ac
	Pest Stage Majority/Min/Max							6-14 IN	5-20 IN	1-3 IN	6-14 in	R8
	Trt-Eval Interval							28 DA-B	60 DA-B	60 DA-B	60 DA-B	123 DA-B
1	Untreated Check							0	0	0	0	38
2	Boundary	6.5	EC	2	PT/A	PRE	A	99	99	99	99	74
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
3	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	99	99	99	99	75
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
4	Prefix	5.29	EC	2	PT/A	PRE	A	99	99	99	99	73
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
5	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	99	99	99	74
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
6	Sonic	70	DF	6	OZ WT/A	PRE	A	99	99	99	99	78
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
7	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	97	99	99	74
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
8	Tendovo Herbicide	4.14	ZC	4	PT/A	PRE	A	99	99	99	99	71
	Enlist One	3.8	EC	2	PT/A	POST1	B					
	Dual II Magnum	7.64	EC	1.33	PT/A	POST1	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST1	B					
	AMS Liquid	3.4	L	2.5	% V/V	POST1	B					
9	Boundary	6.5	EC	2	PT/A	PRE	A	99	99	99	99	69
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
10	BroadAxe XC	7	EC	32	FL OZ/A	PRE	A	96	99	99	98	72
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					

Missing data estimates are included in columns:Average=2,6
Could not calculate LSD (% mean diff) for columns 9,10,12,18 because error mean square = 0.
^Calculated from residual.

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.

Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMATA 7/20/2023 CONTRO % 6-14 IN 28 DA-B	SETFA 8/21/2023 CONTRO % 5-20 IN 60 DA-B	ABUTH 8/21/2023 CONTRO % 1-3 IN 60 DA-B	AMATA 8/21/2023 CONTRO % 6-14 in 60 DA-B	GLXMA 10/23/2023 YIELD bu/ac R8 123 DA-B
	Pest Code							AMATA	SETFA	ABUTH	AMATA	GLXMA
	Rating Date							7/20/2023	8/21/2023	8/21/2023	8/21/2023	10/23/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	YIELD
	Rating Unit/Min/Max							%	%	%	%	bu/ac
	Pest Stage Majority/Min/Max							6-14 IN	5-20 IN	1-3 IN	6-14 in	R8
	Trt-Eval Interval							28 DA-B	60 DA-B	60 DA-B	60 DA-B	123 DA-B
								16	17	18	19	20
11	Prefix	5.29	EC	2	PT/A	PRE	A	99	99	99	99	74
	TriCor DF	75	DF	5.7	OZ WT/A	PRE	A					
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
12	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	98	99	99	99	71
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
13	Sonic	70	DF	6	OZ WT/A	PRE	A	95	99	99	99	73
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
14	Tendovo Herbicide	4.14	ZC	3.5	PT/A	PRE	A	99	99	99	99	73
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Liberty 280 SL	2.34	SL	32	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
15	Tendovo Herbicide	4.14	ZC	4	PT/A	PRE	A	99	99	99	99	67
	Enlist One	3.8	EC	2	PT/A	POST2	C					
	Dual II Magnum	7.64	EC	1.5	PT/A	POST2	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST2	C					
	AMS Liquid	3.4	L	2.5	% V/V	POST2	C					
	LSD P=.05							1.7	0.9	.	0.7	9.2
	Standard Deviation							1.2	0.6	0.0	0.5	6.4
	CV							1.28	0.65	0.0	0.56	9.15

Missing data estimates are included in columns:Average=2,6
Could not calculate LSD (% mean diff) for columns 9,10,12,18 because error mean square = 0.
^Calculated from residual.

Iowa State University

Application Timing Effects on Syngenta Soybean Residual Herbicides for Weed Control in the Enlist Cropping System, Ames, IA, 2023.

Trial ID: ASC 14
Protocol ID: H080SMAD-2023US Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

General Trial Information
Study Director: Richard Zollinger, Ph.D. **Title:** Product Development Manager - North
Investigator: Prashant Jha

Discipline: H herbicide
Status: E established
ARM Trial Created On: 5/25/2023
Initiation Date: 5/24/2023
Completion Date: 7/24/2023

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

Latitude of LL Corner °: 42.001698 N
Longitude of LL Corner °: -93.674617 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate AMV5233D in Enlist + LL soybean.

Contacts
Role: STYDIR study director
Country: USA United States
State/Prov: WA
Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean **BBCH Scale:** BSOY
Entry Date: 6/26/2023 **Stage Scale:** VR
Variety: Syngenta NKS26-E3
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/24/2023 **Planting Rate:** 140000 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: CLOTRA cloddy/trashy
Soil Temperature: 69 F **Soil Moisture:** DRY dry
Emergence Date: 5/31/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 6/26/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 6/26/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 6/26/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 6/26/2023
Common Name: Common ragweed **Stage Scale:** DESC

Pest 5 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 6/26/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Iowa State University

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Site and Design

Treated Plot Width: 6.7 FT
Treated Plot Length: 25 FT
Treated Plot Area: 167.5 FT2
Replications: 3 **Treatments:** 10 **Plots:** 30
Site Type: FIELD field
Experimental Unit: 4 ROW row
Tillage Type: MINTIL minimum-till
Study Design: RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Field Prep./Maintenance:
Tillage included chisel plowing in the fall and field cultivation on May 22 to prepare the seedbed for planting. Crop residue on the soil surface was 25 to 40% at planting.

Soil Description

Description Name: 12
% Sand: 41 **% OM:** 4.8 **Texture:** CL clay loam
% Silt: 26 **Soil Name:** CLARION, WEBSTER
% Clay: 33 **Fert. Level:** E excellent
pH: 5.6 **CEC:** 25.5
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: BELNOR below normal

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Application Description

	A	B	C
Application Date	5/27/2023	6/20/2023	6/27/2023
Appl. Start Time	9:59 AM	1:00 PM	2:44 PM
Application Method	BROADC	BROADC	BROADC
Application Timing	PRE	EPOST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Applied By	Franzenburg	Macvilay	Macvilay
Appl. Entry Date	6/26/2023	6/26/2023	9/5/2023
Air Temperature Start, Stop	68, 68 F	84, 84 F	82, 82 F
% Relative Humidity Start, Stop	38, 38		44, 44
Wind Velocity+Dir. Start	7 MPH, E	4 MPH, ESE	7 MPH, SE
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	69 F	74 F	75 F
Soil Moisture	DRY	SLIWET	DRY
Soil Surface Condition	CLOTRA		
% Cloud Cover	50	0	0
Next Moisture Occurred On	5/30/2023	6/24/2023	7/7/2023
Time to Next Moisture	3.0 DAY	4.0 DAY	10.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0.7 IN	0.65 IN	0 IN
Problems with Application?	N, no	N, no	Y, yes

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-4	20	27
Stage Majority, Percent		V3, -	V4, -
Stage Minimum, Percent		V3, -	V3, -
Stage Maximum, Percent		V4, -	V5, -
Height Average		8 IN	11 IN
Height Minimum, Maximum		7, 9	8, 13

Iowa State University

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

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		2 LEAF, -	4 LEAF, -
Stage Minimum, Percent		1 LEAF, -	2 LEAF, -
Stage Maximum, Percent		3 LEAF, -	6 LEAF, -
Height Average		4 IN	9 IN
Height Minimum, Maximum		2, 6	5, 12
Density Average		3 FT2	12 FT2
Density Minimum, Maximum		1, 5	0, 25
Pest 2 Code, Type, Scale	ABUTH, W, BBCH	ABUTH, W, BBCH	ABUTH, W, BBCH
Stage Majority, Percent		3 LEAF, -	6 LEAF, -
Stage Minimum, Percent		1 LEAF, -	4 LEAF, -
Stage Maximum, Percent		4 LEAF, -	8 LEAF, -
Height Average		2 IN	7 IN
Height Minimum, Maximum		1, 3	3, 10
Density Average		3 FT2	6 FT2
Density Minimum, Maximum		2, 5	0, 12
Pest 3 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH	AMATA, W, BBCH
Stage Majority, Percent		6 LEAF, -	NUMERO, -
Stage Minimum, Percent		4 LEAF, -	NUMERO, -
Stage Maximum, Percent		8 LEAF, -	NUMERO, -
Height Average		2.5 IN	7 IN
Height Minimum, Maximum		1, 4	2, 12
Density Average		2 FT2	3 FT2
Density Minimum, Maximum		1, 3	
Pest 4 Code, Type, Scale	AMBEL, W, BBCH	AMBEL, W, BBCH	AMBEL, W, BBCH
Stage Majority, Percent		6 LEAF, -	NUMERO, -
Stage Minimum, Percent		4 LEAF, -	NUMERO, -
Stage Maximum, Percent		8 LEAF, -	NUMERO, -
Height Average		3 IN	12 IN
Height Minimum, Maximum		2, 4	6, 18
Density Average		7 PLOT	3 FT2
Density Minimum, Maximum		3, 10	0, 6
Pest 5 Code, Type, Scale	CHEAL, W, BBCH	CHEAL, W, BBCH	CHEAL, W, BBCH
Stage Majority, Percent		NUMERO, -	NUMERO, -
Stage Minimum, Percent		NUMERO, -	NUMERO, -
Stage Maximum, Percent		NUMERO, -	NUMERO, -
Height Average		3 IN	14 IN
Height Minimum, Maximum		2, 4	10, 18
Density Average		3 PLOT	1 FT2
Density Minimum, Maximum			0, 2

Iowa State University

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.
Tial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

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	TT & AIXR	TT & AIXR
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	20 IN	20 IN	20.0 IN
Boom Length	6.7 FT	6.7 FT	6.7 FT
Ground Speed	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/28/2023	Richard M Porter	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	6/26/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	6/26/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

Statistical Analysis:

Trial Comments

Weed control ratings on June 30 and July 11 evaluated only burndown. July 24 ratings account for both burndown and residual control of weeds that may have emerged after postemergence applications.

Iowa State University

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							GLXMA	SETFA	ABUTH	AMATA	AMBEL
	Rating Date							6/30/2023	6/30/2023	6/30/2023	6/30/2023	6/30/2023
	Rating Type							PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							V5	4-10 IN	3-7 IN	3-7 IN	3-7 IN
	Trt-Eval Interval							10 DA-B	10 DA-B	10 DA-B	10 DA-B	10 DA-B
1	Liberty 280 SL	280	SL	32	FL OZ/A	EPOST	B	0	99	99	93	99
	AMS	100	D	3	LB/A	EPOST	B					
2	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	2	99	99	96	99
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
3	Zalo	2.57	SL	43	FL OZ/A	EPOST	B	2	99	99	98	99
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
4	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	8	99	98	99	99
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
5	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	12	99	98	98	99
	Dual II Magnum	7.64	EC	1.33	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
6	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	15	99	95	99	99
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
7	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	5	40	40	40	40
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
8	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	10	40	40	40	40
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Dual II Magnum	7.64	EC	1.33	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
9	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	8	53	60	60	57
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Enlist One 3.8 SL	3.8	SL	2	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
10	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	10	60	70	70	70
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
	LSD P=.05							4.6	3.1	6.1	7.1	3.1
	Standard Deviation							2.7	1.8	3.6	4.2	1.8
	CV							37.02	2.32	4.49	5.25	2.28

Missing data estimates are included in columns:Average=6,7,8,9,10,11,12,13,14,15
Could not calculate LSD (% mean diff) for columns 7,10 because error mean square = 0.
^Calculated from residual.

Iowa State University

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	GLXMA	SETFA	ABUTH	AMATA	AMBEL
Pest Code								GLXMA	SETFA	ABUTH	AMATA	AMBEL
Rating Date								7/11/2023	7/11/2023	7/11/2023	7/11/2023	7/11/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								R1	4-10 IN	3-7 IN	3-7 IN	3-7 IN
Trt-Eval Interval								14 DA-C	14 DA-C	14 DA-C	14 DA-C	14 DA-C
								6	7	8	9	10
1	Liberty 280 SL	280	SL	32	FL OZ/A	EPOST	B	0	99	99	96	99
	AMS	100	D	3	LB/A	EPOST	B					
2	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	2	99	99	98	99
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
3	Zalo	2.57	SL	43	FL OZ/A	EPOST	B	3	99	99	99	99
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
4	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	7	99	99	99	99
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
5	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	12	99	99	96	99
	Dual II Magnum	7.64	EC	1.33	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
6	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	10	99	98	99	99
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
7	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	5	99	99	99	99
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
8	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	12	99	99	99	99
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Dual II Magnum	7.64	EC	1.33	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
9	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	8	99	99	99	99
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Enlist One 3.8 SL	3.8	SL	2	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
10	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	7	99	98	99	99
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
LSD P=.05								4.4	.	1.9	3.5	.
Standard Deviation								2.6	0.0	1.1	2.0	0.0
CV								40.02	0.0	1.11	2.06	0.0

Missing data estimates are included in columns:Average=6,7,8,9,10,11,12,13,14,15
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^Calculated from residual.

Iowa State University

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.
Trial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	GLXMA	SETFA	ABUTH	AMATA	AMBEL
Pest Code								GLXMA	SETFA	ABUTH	AMATA	AMBEL
Rating Date								7/24/2023	7/24/2023	7/24/2023	7/24/2023	7/24/2023
Rating Type								PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								R2	4-20 IN	3-15 IN	3-12 IN	3-15 IN
Trt-Eval Interval								27 DA-C	27 DA-C	27 DA-C	27 DA-C	27 DA-C
								11	12	13	14	15
1	Liberty 280 SL	280	SL	32	FL OZ/A	EPOST	B	0	92	93	90	91
	AMS	100	D	3	LB/A	EPOST	B					
2	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	0	95	91	87	95
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
3	Zalo	2.57	SL	43	FL OZ/A	EPOST	B	0	98	92	92	96
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
4	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	2	98	96	98	99
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
5	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	3	96	93	95	99
	Dual II Magnum	7.64	EC	1.33	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
6	Zalo	2.57	SL	32	FL OZ/A	EPOST	B	0	95	95	96	95
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	EPOST	B					
	COC	100	SL	1	% V/V	EPOST	B					
	AMS	100	D	3	LB/A	EPOST	B					
7	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	0	99	99	99	99
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
8	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	5	99	99	98	98
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Dual II Magnum	7.64	EC	1.33	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
9	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	3	99	99	99	99
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Enlist One 3.8 SL	3.8	SL	2	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
10	Dual II Magnum	7.64	EC	1.33	PT/A	PRE	A	2	99	98	99	99
	Zalo	2.57	SL	32	FL OZ/A	POST	C					
	Enlist Duo 3.3 SL	3.3	SL	4.75	PT/A	POST	C					
	COC	100	SL	1	% V/V	POST	C					
	AMS	100	D	3	LB/A	POST	C					
LSD P=.05								2.9	2.8	5.2	5.7	5.2
Standard Deviation								1.7	1.6	3.0	3.3	3.0
CV								120.55	1.67	3.15	3.45	3.14

Missing data estimates are included in columns:Average=6,7,8,9,10,11,12,13,14,15
Could not calculate LSD (% mean diff) for columns 7,10 because error mean square = 0.
^Calculated from residual.

Iowa State University

Demonstration of Zalo in Enlist & Liberty Tolerant Soybean, Ames, IA, 2023.

Trial ID: ASE7 Official Trial ID: Cooperator Trial ID:
Protocol ID: 23HD055US Location: Ames, IA Trial Year: 2023
Project ID: 055 Project ID 2: Project ID 3:
Study Director: Richard Zollinger, Ph.D. Sponsor Contact:
Investigator: Prashant Jha Trial Origin: P public institution trial Conducted Under GEP: No

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

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

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

Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.
Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/8/2023
Initiation Date: 5/12/2023
Completion Date: 7/17/2023

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

Latitude of LL Corner °: 42.005173 N
Longitude of LL Corner °: -93.670797 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate burndown weed control with Reviton and residual weed control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in no-till soybean.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/19/2023 **Stage Scale:** VR
Variety: Asgrow AG22XF3
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/22/2023 **Planting Rate:** 178000 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: 65 F **Soil Moisture:** DRY dry
Emergence Date: 5/29/2023

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/19/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/19/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/19/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 4 Type: W **Code:** AMBTR Ambrosia trifida **Entry Date:** 9/19/2023
Common Name: Giant ragweed **Stage Scale:** DESC

Pest 5 Type: W **Code:** LAMAM Lamium amplexicaule **Entry Date:** 9/19/2023
Common Name: Henbit deadnettle **Stage Scale:** DESC

Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.
Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Site and Design
Treated Plot Width: 6.7 FT
Treated Plot Length: 25 FT
Treated Plot Area: 167.5 FT2
Replications: 3 **Treatments:** 6 **Plots:** 18
Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: NOTILL no-till
Study Design: RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2022

Field Prep./Maintenance:
The trial site was left un-tilled from the 2022 crop season. Crop residue that remained on the soil surface at planting was approximately 70%. The trial site was left un-tilled from the 2022 crop season. Soil testing indicated soil fertility to be optimum for all nutrients.

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

Weather Conditions
Overall Moisture Conditions: BELNOR below normal
Weather Station Name: ISU CURTISS FARM **Distance:** 0.5 MI

No.	Date	Moisture Total	Unit
1.	5/5/2023	1.1	IN
2.	5/7/2023	0.6	IN
3.	5/8/2023	0.4	IN
4.	5/11/2023	0.2	IN
5.	5/13/2023	0.8	IN
6.	5/30/2023	0.3	IN
7.	6/1/2023	0.4	IN
8.	6/4/2023	0.3	IN
9.	6/17/2023	1.2	IN
10.	6/24/2023	0.65	IN
11.	7/7/2023	0.3	IN
12.	7/12/2023	2.2	IN
13.	7/27/2023	0.2	IN

Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.

Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B
Application Date	5/12/2023	6/15/2023
Appl. Start Time	4:59 PM	3:20 PM
Appl. Stop Time	5:15 PM	
Application Method	SPRAY	SPRAY
Application Timing	PREPLA	POST
Application Placement	BROFOL	BROFOL
Applied By	Franzenburg	Macvilay
Appl. Entry Date	9/19/2023	9/19/2023
Air Temperature Start, Stop	78, 78 F	89, 89 F
% Relative Humidity Start, Stop	72, 72	38, 38
Wind Velocity+Dir. Start	9 MPH, S	9 MPH, NW
Wet Leaves (Y/N)	N, no	N, no
Soil Temperature	68 F	79 F
Soil Moisture	WET	DRY
Soil Surface Condition	SMOTRA	
% Cloud Cover	40	0
Next Moisture Occurred On	5/13/2023	6/17/2023
Time to Next Moisture	1.0 DAY	2.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	0.8, IN	0, IN
Moisture 1 Week after Appl.	0.8 IN	1.2 IN
Problems with Application?	N, no	N, no

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-17	17
Stage Majority, Percent		V2, -
Stage Minimum, Percent		V2, -
Stage Maximum, Percent		V3, -
Height Average		5 IN
Height Minimum, Maximum		3, 6

Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.
Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	SETFA, W, DESC	SETFA, W, DESC
Stage Majority, Percent		3 LEAF, -
Stage Minimum, Percent		1 LEAF, -
Stage Maximum, Percent		4 LEAF, -
Height Average		3 IN
Height Minimum, Maximum		1, 5
Density Average		3 FT2
Density Minimum, Maximum		0, 5
Pest 2 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		2 LEAF, -
Stage Minimum, Percent		COTYLE, -
Stage Maximum, Percent		3 LEAF, -
Height Average		1.5 IN
Height Minimum, Maximum		1, 1.5
Density Average		0.5 FT2
Density Minimum, Maximum		0, 5
Pest 3 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		4 LEAF, -
Stage Minimum, Percent		3 LEAF, -
Stage Maximum, Percent		5 LEAF, -
Height Average		2.5 IN
Height Minimum, Maximum		2, 3
Density Average		0.5 FT2
Density Minimum, Maximum		0, 2
Pest 4 Code, Type, Scale	AMBTR, W, DESC	AMBTR, W, DESC
Stage Majority, Percent	4 LEAF, -	
Stage Minimum, Percent	4 LEAF, -	
Stage Maximum, Percent	6 LEAF, -	
Height Average	4 IN	
Height Minimum, Maximum	3, 5	
Density Average	17 FT2	
Density Minimum, Maximum	15, 20	
Pest 5 Code, Type, Scale	LAMAM, W, DESC	LAMAM, W, DESC
Stage Majority, Percent	NUMERO, -	
Stage Minimum, Percent	NUMERO, -	
Stage Maximum, Percent	NUMERO, -	
Height Average	5 IN	
Height Minimum, Maximum	3, 7	
Density Average	3 PLOT	
Density Minimum, Maximum	0, 5	

Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.

Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	TTI
Nozzle TradeName	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN
Nozzle Spacing	20 IN	20.0 IN
Boom Length	6.7 FT	6.7 FT
Ground Speed	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	4/16/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/19/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Common Henbit evaluations were difficult to execute because of low pressure in many of the plots.

Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.

Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	AMBTR 5/19/2023 CONTRO % 3-5 IN 7 DA-A	LAMAM 5/19/2023 CONTRO % 7 IN 7 DA-A	AMBTR 5/28/2023 CONTRO % 3-5 IN 16 DA-A	LAMAM 5/28/2023 CONTRO % 7 IN 16 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	Untreated Check								0	0	0	0
2	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	99	80	94	99
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Helmet MTZ	6.5	EC	2.7	PT/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
3	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	99	67	93	99
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Zone Elite	7	L	32	FL OZ/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
4	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	99	80	99	99
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Helmet MTZ	6.5	EC	2.7	PT/A	PREPLA	A	TT tips				
	Lo-Vol 4 2,4-D	3.8	L	1	PT/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
5	Roundup PowerMAX	4.5	SL	32	FL OZ/A	PREPLA	A	TTI tips	85	60	92	88
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	TTI tips				
	Fierce EZ	3.04	SC	6	FL OZ/A	PREPLA	A	TTI tips				
	Induce		L	0.25	% V/V	PREPLA	A	TTI tips				
	Intact		L	0.5	% V/V	PREPLA	A	TTI tips				
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B	TTI tips				
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B	TTI tips				
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	TTI tips				
	Intact		L	0.5	% V/V	POST	B	TTI tips				
	Induce		L	0.25	% V/V	POST	B	TTI tips				
6	Roundup PowerMAX	4.5	SL	32	FL OZ/A	PREPLA	A	TTI tips	96	73	98	98
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	TTI tips				
	Fierce MTZ SC	2.64	SC	1	PT/A	PREPLA	A	TTI tips				
	Induce		L	0.25	% V/V	PREPLA	A	TTI tips				
	Intact		L	0.5	% V/V	PREPLA	A	TTI tips				
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B	TTI tips				
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B	TTI tips				
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	TTI tips				
	Intact		L	0.5	% V/V	POST	B	TTI tips				
	Induce		L	0.25	% V/V	POST	B	TTI tips				
	LSD P=.05								1.7	6.7	8.7	10.3
	Standard Deviation								0.9	3.5	4.8	5.5
	CV								1.18	5.89	6.02	6.8

Missing data estimates are included in columns:Average=2,4,6,9,10,11,13,14,15
Could not calculate LSD (% mean diff) for columns 10,11,14,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.

Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	AMBTR 6/2/2023 CONTRO % 3-5 IN 21 DA-A	LAMAM 6/2/2023 CONTRO % 7 IN 21 DA-A	AMBTR 6/9/2023 CONTRO % 3-5 IN 28 DA-A	AMBTR 7/3/2023 CONTRO % 5-25 IN 52 DA-A
	Pest Code											
	Rating Date											
	Rating Type											
	Rating Unit/Min/Max											
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval											
									5	6	7	8
1	Untreated Check								0	0	0	0
2	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	91	99	85	53
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Helmet MTZ	6.5	EC	2.7	PT/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
3	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	88	99	80	50
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Zone Elite	7	L	32	FL OZ/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
4	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	99	99	98	90
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Helmet MTZ	6.5	EC	2.7	PT/A	PREPLA	A	TT tips				
	Lo-Vol 4 2,4-D	3.8	L	1	PT/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
5	Roundup PowerMAX	4.5	SL	32	FL OZ/A	PREPLA	A	TTI tips	96	92	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	TTI tips				
	Fierce EZ	3.04	SC	6	FL OZ/A	PREPLA	A	TTI tips				
	Induce		L	0.25	% V/V	PREPLA	A	TTI tips				
	Intact		L	0.5	% V/V	PREPLA	A	TTI tips				
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B	TTI tips				
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B	TTI tips				
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	TTI tips				
	Intact		L	0.5	% V/V	POST	B	TTI tips				
	Induce		L	0.25	% V/V	POST	B	TTI tips				
6	Roundup PowerMAX	4.5	SL	32	FL OZ/A	PREPLA	A	TTI tips	99	98	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	TTI tips				
	Fierce MTZ SC	2.64	SC	1	PT/A	PREPLA	A	TTI tips				
	Induce		L	0.25	% V/V	PREPLA	A	TTI tips				
	Intact		L	0.5	% V/V	PREPLA	A	TTI tips				
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B	TTI tips				
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B	TTI tips				
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	TTI tips				
	Intact		L	0.5	% V/V	POST	B	TTI tips				
	Induce		L	0.25	% V/V	POST	B	TTI tips				
	LSD P=.05								6.0	3.5	10.0	12.4
	Standard Deviation								3.3	1.8	5.5	6.8
	CV								4.18	2.28	7.18	10.44

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Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.

Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 7/3/2023 CONTRO % 10-25 IN 52 DA-A	ABUTH 7/3/2023 CONTRO % 10-20 IN 52 DA-A	AMATA 7/3/2023 CONTRO % 10-20 IN 52 DA-A	AMBTR 7/17/2023 CONTRO % 10=36 IN 66 DA-A
	Pest Code											
	Rating Date											
	Rating Type											
	Rating Unit/Min/Max											
	Pest Stage Majority/Min/Max											
	Trt-Eval Interval											
1	Untreated Check								0	0	0	0
2	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	0	0	0	53
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Helmet MTZ	6.5	EC	2.7	PT/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
3	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	15	0	0	47
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Zone Elite	7	L	32	FL OZ/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
4	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	0	0	0	93
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips				
	Helmet MTZ	6.5	EC	2.7	PT/A	PREPLA	A	TT tips				
	Lo-Vol 4 2,4-D	3.8	L	1	PT/A	PREPLA	A	TT tips				
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips				
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips				
5	Roundup PowerMAX	4.5	SL	32	FL OZ/A	PREPLA	A	TTI tips	99	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	TTI tips				
	Fierce EZ	3.04	SC	6	FL OZ/A	PREPLA	A	TTI tips				
	Induce		L	0.25	% V/V	PREPLA	A	TTI tips				
	Intact		L	0.5	% V/V	PREPLA	A	TTI tips				
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B	TTI tips				
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B	TTI tips				
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	TTI tips				
	Intact		L	0.5	% V/V	POST	B	TTI tips				
	Induce		L	0.25	% V/V	POST	B	TTI tips				
6	Roundup PowerMAX	4.5	SL	32	FL OZ/A	PREPLA	A	TTI tips	99	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	TTI tips				
	Fierce MTZ SC	2.64	SC	1	PT/A	PREPLA	A	TTI tips				
	Induce		L	0.25	% V/V	PREPLA	A	TTI tips				
	Intact		L	0.5	% V/V	PREPLA	A	TTI tips				
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B	TTI tips				
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B	TTI tips				
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	TTI tips				
	Intact		L	0.5	% V/V	POST	B	TTI tips				
	Induce		L	0.25	% V/V	POST	B	TTI tips				
	LSD P=.05								11.9	.	.	14.1
	Standard Deviation								6.5	0.0	0.0	7.7
	CV								18.18	0.0	0.0	11.89

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Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.

Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 7/17/2023 CONTRO % 10-30 IN 66 DA-A	ABUTH 7/17/2023 CONTRO % 10-25 IN 66 DA-A	AMATA 7/17/2023 CONTRO % 10-25 IN 66 DA-A
	Pest Code								SETFA	ABUTH	AMATA
	Rating Date								7/17/2023	7/17/2023	7/17/2023
	Rating Type								CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%
	Pest Stage Majority/Min/Max								10-30 IN	10-25 IN	10-25 IN
	Trt-Eval Interval								66 DA-A	66 DA-A	66 DA-A
1	Untreated Check								0	0	0
2	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	0	0	0
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips			
	Helmet MTZ	6.5	EC	2.7	PT/A	PREPLA	A	TT tips			
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips			
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips			
3	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	15	0	0
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips			
	Zone Elite	7	L	32	FL OZ/A	PREPLA	A	TT tips			
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips			
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips			
4	Reviton	2.83	SC	1	FL OZ/A	PREPLA	A	TT tips	0	0	0
	Roundup PowerMAX	4.5	SL	22	FL OZ/A	PREPLA	A	TT tips			
	Helmet MTZ	6.5	EC	2.7	PT/A	PREPLA	A	TT tips			
	Lo-Vol 4 2,4-D	3.8	L	1	PT/A	PREPLA	A	TT tips			
	AMS		SG	8.5	LB/100 GAL	PREPLA	A	TT tips			
	Helm MSO Standard 1		L	1	% V/V	PREPLA	A	TT tips			
5	Roundup PowerMAX	4.5	SL	32	FL OZ/A	PREPLA	A	TTI tips	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	TTI tips			
	Fierce EZ	3.04	SC	6	FL OZ/A	PREPLA	A	TTI tips			
	Induce		L	0.25	% V/V	PREPLA	A	TTI tips			
	Intact		L	0.5	% V/V	PREPLA	A	TTI tips			
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B	TTI tips			
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B	TTI tips			
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	TTI tips			
	Intact		L	0.5	% V/V	POST	B	TTI tips			
	Induce		L	0.25	% V/V	POST	B	TTI tips			
6	Roundup PowerMAX	4.5	SL	32	FL OZ/A	PREPLA	A	TTI tips	99	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	PREPLA	A	TTI tips			
	Fierce MTZ SC	2.64	SC	1	PT/A	PREPLA	A	TTI tips			
	Induce		L	0.25	% V/V	PREPLA	A	TTI tips			
	Intact		L	0.5	% V/V	PREPLA	A	TTI tips			
	Roundup PowerMAX	4.5	SL	32	FL OZ/A	POST	B	TTI tips			
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	B	TTI tips			
	Perpetuo	2.3	SC	6	FL OZ/A	POST	B	TTI tips			
	Intact		L	0.5	% V/V	POST	B	TTI tips			
	Induce		L	0.25	% V/V	POST	B	TTI tips			
	LSD P=.05								11.9	.	.
	Standard Deviation								6.5	0.0	0.0
	CV								18.18	0.0	0.0

Missing data estimates are included in columns:Average=2,4,6,9,10,11,13,14,15
Could not calculate LSD (% mean diff) for columns 10,11,14,15 because error mean square = 0.
^Calculated from residual.

Iowa State University

Burndown Weed Control with Reviton and Residual Weed Control with Helmet MTZ, Zone Elite, Fierce EZ, Fierce MTZ & Perpetuo in No-Till Soybean, Ames, IA, 2023.

Trial ID: ASN2
Protocol ID: 2023-H-US05 & FIERCEMD6402 Location: Ames Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
AMBTR, Ambrosia trifida, Giant ragweed = US
LAMAM, Lamium amplexicaule, Henbit deadnettle = US
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

Residual PRE & POST Corn Herbicides with BAS 821, Nashua, IA, 2023.

Trial ID: NCC
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/8/2023
Initiation Date: 5/8/2023
Completion Date: 10/16/2023

Trial Location
City: Nashua **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50658-9270

Latitude of LL Corner °: 42.941111 N
Longitude of LL Corner °: -92.570166 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate BAS 821 and other standard corn herbicides with atrazine applied preemergence and postemergence for residual weed control.

Role: INVEST investigator

Crop Description
Crop 1: C ZEAMD Zea mays indentata Dent corn
Entry Date: 9/6/2023 **Stage Scale:** VR
Variety: Pioneer P0622Q
Attributes: glyphosate & glufosinate tolerant
Planting Date: 5/8/2023 **Planting Rate:** 33674 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: 63 F **Soil Moisture:** DRY dry
Emergence Date: 5/18/2023
Harvest Date: 10/16/2023 **Harvest Equipment:** JOHN DEERE 9450
Moisture Meter: SHIVVERS **Harvested Width:** 10 FT
% Standard Moisture: 15.5 **Harvested Length:** 23 FT
Weighing Equipment: WEIGHTRONIX

Pest Description
Pest 1 Type: W **Code:** ABUTH Abutilon theophrasti **Entry Date:** 9/6/2023
Common Name: velvetleaf **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/6/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** CHEAL Chenopodium album **Entry Date:** 9/6/2023
Common Name: Common lambsquarters **Stage Scale:** DESC

Pest 4 Type: W **Code:** POLPY Persicaria pensylvanica **Entry Date:** 9/6/2023
Common Name: Pennsylvania smartweed **Stage Scale:** DESC

Iowa State University

Residual PRE & POST Corn Herbicides with BAS 821, Nashua, IA, 2023.

Trial ID: NCC
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Site and Design

Treated Plot Width: 10 FT
Treated Plot Length: 25 FT
Treated Plot Area: 250.0 FT2
Replications: 4 **Treatments:** 11 **Plots:** 44
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	2022

Field Prep./Maintenance:
Fertilization included 150 lbs/A actual N applied as anhydrous ammonia in the spring. Tillage included a single pass with a field cultivator on May 7 to prepare the seedbed for planting. Crop residue remaining on the soil surface was approximately 40% at planting.

Soil Description

Description Name: Nashua North Corn
% Sand: 35 **% OM:** 5.6 **Texture:** CL clay loam
% Silt: 37.5 **Soil Name:** CLYDE
% Clay: 27.5 **Fert. Level:** E excellent
pH: 6 **CEC:** 21.7
Soil Drainage: F fair

Weather Conditions

Overall Moisture Conditions: VERDRY very dry
Weather Station Name: NE RESEARCH FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/6/2023	0.25	IN
2.	5/8/2023	0.27	IN
3.	5/12/2023	0.21	IN
4.	5/13/2023	0.22	IN
5.	5/14/2023	0.72	IN
6.	5/31/2023	0.1	IN
7.	6/17/2023	0.11	IN
8.	6/18/2023	0.1	IN
9.	6/24/2023	0.41	IN
10.	6/25/2023	0.36	IN
11.	6/28/2023	0.16	IN
12.	6/30/2023	0.25	IN
13.	7/4/2023	0.22	IN
14.	7/5/2023	0.11	IN
15.	7/12/2023	0.34	IN
16.	7/14/2023	0.1	IN
17.	7/26/2023	0.1	IN
18.	7/28/2023	0.18	IN
19.	8/6/2023	0.29	IN
20.	8/11/2023	0.66	IN
21.	8/13/2023	0.21	IN
22.	8/14/2023	0.1	IN
23.	8/25/2023	0.28	IN

Iowa State University

Residual PRE & POST Corn Herbicides with BAS 821, Nashua, IA, 2023.

Trial ID: NCC
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C
Application Date	5/9/2023	5/30/2023	6/5/2023
Appl. Start Time	2:15 PM	6:00 PM	3:29 PM
Appl. Stop Time	2:35 PM	6:04 PM	3:40 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	EPOST	POST
Application Placement	BROSOI	BROFOL	BROFOL
Applied By	Franzenburg	Franzenburg	Franzenburg
Appl. Entry Date	9/6/2023	9/6/2023	9/6/2023
Air Temperature Start, Stop	70, 70 F	85, 85 F	87, 87 F
% Relative Humidity Start, Stop	63, 63	33, 33	32, 32
Wind Velocity+Dir. Start	9 MPH, SE	8 MPH, S	4 MPH, SE
Wet Leaves (Y/N)		N, no	N, no
Soil Temperature	63 F	77 F	81 F
Soil Moisture	SLIWET	DRY	DRY
Soil Surface Condition	MEDIUM		
% Cloud Cover	70	70	70
Next Moisture Occurred On	5/12/2023	5/31/2023	6/17/2023
Time to Next Moisture	3.0 DAY	1.0 DAY	12.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0.1, IN	0, IN
Moisture 1 Week after Appl.	1.15 IN	0.1 IN	0 IN
Problems with Application?	N, no	N, no	N, no

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMD, BCOR	ZEAMD, BCOR	ZEAMD, BCOR
Days after Emergence	-9	12	18
Stage Majority, Percent		V3, -	V4, -
Stage Minimum, Percent		V3, -	V4, -
Stage Maximum, Percent		V3, -	V4, -
Height Average		6 IN	11 IN
Height Minimum, Maximum		5, 7	10, 12

Iowa State University

Residual PRE & POST Corn Herbicides with BAS 821, Nashua, IA, 2023.

Trial ID: NCC
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Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale	ABUTH, W, DESC	ABUTH, W, DESC	ABUTH, W, DESC
Stage Majority, Percent		3 LEAF, -	3 LEAF, -
Stage Minimum, Percent		2 LEAF, -	1 LEAF, -
Stage Maximum, Percent		4 LEAF, -	5 LEAF, -
Height Average		1.5 IN	2 IN
Height Minimum, Maximum		1, 2	1, 3
Density Average		20 PLOT	3 PLOT
Density Minimum, Maximum		5, 40	1, 5
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent		4 LEAF, -	5 LEAF, -
Stage Minimum, Percent		2 LEAF, -	2 LEAF, -
Stage Maximum, Percent		6 LEAF, -	8 LEAF, -
Height Average		0.75 IN	1.5 IN
Height Minimum, Maximum		0.5, 1	0.5, 2.5
Density Average		12 FT2	15 PLOT
Density Minimum, Maximum		5, 20	3, 25
Pest 3 Code, Type, Scale	CHEAL, W, DESC	CHEAL, W, DESC	CHEAL, W, DESC
Stage Majority, Percent		6 LEAF, -	8 LEAF, -
Stage Minimum, Percent		4 LEAF, -	4 LEAF, -
Stage Maximum, Percent		8 LEAF, -	10 LEA, -
Height Average		0.75 IN	2 IN
Height Minimum, Maximum		0.5, 1	1, 3
Density Average		6 FT2	12 PLOT
Density Minimum, Maximum		3, 10	5, 20
Pest 4 Code, Type, Scale	POLPY, W, DESC	POLPY, W, DESC	POLPY, W, DESC
Stage Majority, Percent		4 LEAF, -	4 LEAF, -
Stage Minimum, Percent		2 LEAF, -	2 LEAF, -
Stage Maximum, Percent		4 LEAF, -	6 LEAF, -
Height Average		1.25 IN	1.5 IN
Height Minimum, Maximum		0.5, 2	1, 2
Density Average		1 FT2	20 PLOT
Density Minimum, Maximum		0, 2	3, 40

Iowa State University

Residual PRE & POST Corn Herbicides with BAS 821, Nashua, IA, 2023.

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Investigator: Prashant Jha

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	AIXR	AIXR
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN
Nozzle Spacing	19 IN	19 IN	19.0 IN
Boom Length	10 FT	10 FT	10.0 FT
Ground Speed	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Notes

Context	Date	By	Notes
STATUS	3/15/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/6/2023	Prashant Jha	Automatically added by ARM: Status changed to: I: changed by (EIAJHP).
STATUS	11/8/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Trial Comments

Rainfall was very limited at this site in 2023. Approximately 25% of normal precipitation occurred each month from May through August.

Iowa State University

Residual PRE & POST Corn Herbicides with BAS 821, Nashua, IA, 2023.

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Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
Pest Code								SETFA	ABUTH	AMATA	CHEAL	POLPY
Rating Date								5/30/2023	5/30/2023	5/30/2023	5/30/2023	5/30/2023
Rating Type								CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max								%	%	%	%	%
Pest Stage Majority/Min/Max								1-2 IN	1-2 IN	1-2 IN	1-2 IN	1-2 IN
Trt-Eval Interval								21 DA-A	21 DA-A	21 DA-A	21 DA-A	21 DA-A
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	64	95	95	98	97
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	91	74	90	91	77
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	89	91	91	98	93
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	78	96	97	97	92
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	74	91	94	98	95
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	83	92	92	95	98
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	76	80	88	95	92
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	0	0	0	0	0
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	69	86	95	96	92
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	70	87	95	91	96
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
LSD P=.05								14.3	11.2	7.1	5.2	10.6
Standard Deviation								9.9	7.8	4.9	3.6	7.3
CV								15.73	10.8	6.51	4.63	9.7

Missing data estimates are included in columns:Average=20,23,25,28
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Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	ZEAMD 6/3/2023 PHYGEN % V4 4 DA-B	SETFA 6/5/2023 CONTRO % 1-2 IN 0 DA-C	ABUTH 6/5/2023 CONTRO % 1-2 IN 0 DA-C	AMATA 6/5/2023 CONTRO % 1-2 IN 0 DA-C	CHEAL 6/5/2023 CONTRO % 1-2 IN 0 DA-C
								6	7	8	9	10
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	0	61	92	86	96
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	0	89	71	83	84
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	0	88	87	79	98
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	75	92	97	96
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	70	86	78	96
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	0	76	90	84	94
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	0	76	80	84	94
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	25	95	99	94	99
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	65	86	91	93
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	0	69	84	86	89
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
LSD P=.05								.	13.2	12.3	9.8	8.1
Standard Deviation								0.0	9.2	8.5	6.8	5.6
CV								0.0	13.19	10.79	8.67	6.55

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Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							POLPY	ZEAMD	SETFA	ABUTH	AMATA
	Rating Date							6/5/2023	6/13/2023	6/13/2023	6/13/2023	6/13/2023
	Rating Type							CONTRO	PHYGEN	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-2 IN	V6	4-12 IN	2-8 IN	2-12 IN
	Trt-Eval Interval							0 DA-C	14 DA-B	35 DA-A	35 DA-A	35 DA-A
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	97	0	59	92	84
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	79	0	88	71	81
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	93	0	84	87	73
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	92	0	73	91	95
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	95	0	70	86	74
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	98	0	71	89	83
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	92	0	76	81	80
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	99	19	99	99	96
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	92	0	96	99	98
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	96	3	99	99	98
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							10.4	2.4	10.5	11.0	10.1
	Standard Deviation							7.2	1.7	7.3	7.6	7.0
	CV							8.46	86.08	9.87	9.39	8.94

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Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	16	17	18	19	20
	Pest Code							CHEAL	POLPY	ZEAMD	SETFA	ABUTH
	Rating Date							6/13/2023	6/13/2023	6/22/2023	6/22/2023	6/22/2023
	Rating Type							CONTRO	CONTRO	PHYGEN	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							1-8 IN	2-12 IN	V8	4-20 IN	4-18 IN
	Trt-Eval Interval							35 DA-A	35 DA-A	17 DA-C	44 DA-A	44 DA-A
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	96	97	0	50	90
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	80	79	0	85	69
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	98	93	0	79	86
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	95	92	0	66	88
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	95	95	0	63	79
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	94	98	0	65	87
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	94	92	0	76	81
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	99	99	15	99	99
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	99	97	0	99	99
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	99	99	3	99	99
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							5.6	10.3	2.8	11.5	12.8
	Standard Deviation							3.9	7.1	1.9	7.9	8.8
	CV							4.48	8.32	122.34	11.19	11.1

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Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	21	22	23	24	25
	Pest Code							AMATA	CHEAL	POLPY	SETFA	ABUTH
	Rating Date							6/22/2023	6/22/2023	6/22/2023	7/5/2023	7/5/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							4-18 IN	3-18 IN	3-20 IN	20-30 IN	15-30 IN
	Trt-Eval Interval							44 DA-A	44 DA-A	44 DA-A	57 DA-A	57 DA-A
1	Untreated Check							0	0	0	0	0
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	76	95	97	45	90
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	78	76	72	81	65
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	68	98	93	70	86
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	89	91	92	63	88
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	69	93	95	55	76
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	79	89	98	58	87
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	78	94	92	70	81
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A					
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	97	99	99	99	99
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B					
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B					
	AMS		SG	8.5	LB/100 GAL	EPOST	B					
	COC		L	1	% V/V	EPOST	B					
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	99	99	99	99	99
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C					
	Aatrex 4L	4	F	16	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	COC		L	1	% V/V	POST	C					
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	99	99	99	99	99
	Status	56	WG	5	OZ WT/A	POST	C					
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	AMS		SG	8.5	LB/100 GAL	POST	C					
	Induce		L	0.25	% V/V	POST	C					
	LSD P=.05							12.7	7.3	9.2	11.3	13.7
	Standard Deviation							8.8	5.1	6.4	7.8	9.5
	CV							11.7	5.97	7.5	11.65	11.99

Missing data estimates are included in columns:Average=20,23,25,28
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Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMATA 7/5/2023 CONTRO % 15-30 IN 57 DA-A	CHEAL 7/5/2023 CONTRO % 15-30 IN 57 DA-A	POLPY 7/5/2023 CONTRO % 15-30 IN 57 DA-A	ZEAMD 10/16/2023 YIELD bu/ac R6 160 DA-A
	Pest Code							AMATA	CHEAL	POLPY	ZEAMD
	Rating Date							7/5/2023	7/5/2023	7/5/2023	10/16/2023
	Rating Type							CONTRO	CONTRO	CONTRO	YIELD
	Rating Unit/Min/Max							%	%	%	bu/ac
	Pest Stage Majority/Min/Max							15-30 IN	15-30 IN	15-30 IN	R6
	Trt-Eval Interval							57 DA-A	57 DA-A	57 DA-A	160 DA-A
								26	27	28	29
1	Untreated Check							0	0	0	115
2	Acuron	3.44	ZC	48	FL OZ/A	PRE	A	73	90	97	153
3	Degree Xtra	4.04	CS	64	FL OZ/A	PRE	A	71	71	72	180
4	TriVolt	3.65	L	12	FL OZ/A	PRE	A	56	98	93	198
5	BAS 821..H		SC	14	FL OZ/A	PRE	A	81	89	92	168
6	BAS 821..H		SC	14	FL OZ/A	PRE	A	65	92	95	168
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A				
7	BAS 821..H		SC	17	FL OZ/A	PRE	A	74	85	98	189
8	BAS 821..H		SC	17	FL OZ/A	PRE	A	64	94	92	194
	Aatrex 4L	4	F	32	FL OZ/A	PRE	A				
9	BAS 821..H		SC	14	FL OZ/A	EPOST	B	91	99	99	204
	Armezon	2.8	SC	0.75	FL OZ/A	EPOST	B				
	Aatrex 4L	4	F	32	FL OZ/A	EPOST	B				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	EPOST	B				
	AMS		SG	8.5	LB/100 GAL	EPOST	B				
	COC		L	1	% V/V	EPOST	B				
10	BAS 821..H		SC	14	FL OZ/A	PRE	A	98	99	99	207
	Armezon PRO	5.35	EC	16	FL OZ/A	POST	C				
	Aatrex 4L	4	F	16	FL OZ/A	POST	C				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C				
	AMS		SG	8.5	LB/100 GAL	POST	C				
	COC		L	1	% V/V	POST	C				
11	BAS 821..H		SC	14	FL OZ/A	PRE	A	99	99	99	208
	Status	56	WG	5	OZ WT/A	POST	C				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	C				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C				
	AMS		SG	8.5	LB/100 GAL	POST	C				
	Induce		L	0.25	% V/V	POST	C				
	LSD P=.05							15.6	10.7	9.2	32.2
	Standard Deviation							10.8	7.4	6.4	22.3
	CV							15.35	8.92	7.5	12.38

Missing data estimates are included in columns:Average=20,23,25,28
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.
^Calculated from residual.

Iowa State University

Residual PRE & POST Corn Herbicides with BAS 821, Nashua, IA, 2023.

Trial ID: NCC
Protocol ID: MKD-H-2023-US-C23-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
SETFA, Setaria faberi, Giant foxtail = US
ABUTH, Abutilon theophrasti, velvetleaf = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
CHEAL, Chenopodium album, Common lambsquarters = US
POLPY, Persicaria pensylvanica, Pennsylvania smartweed = US
ZEAMD, Zea mays indentata, Dent corn = US

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

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

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/16/2023
Initiation Date: 5/16/2023
Completion Date: 10/5/2023

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

Latitude of LL Corner °: 42.940508 N
Longitude of LL Corner °: -92.57015 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to demonstrate the efficacy of applying Liberty, first, EPOST, in the Enlist One System.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/14/2023 **Stage Scale:** VR
Variety: Pioneer P33674
Attributes: glyphosate & glufosinate & 2,4-D tolerant
Planting Date: 5/16/2023 **Planting Rate:** 189417 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 Moisture: DRY dry
Emergence Date: 5/22/2023
Harvest Date: 10/5/2023 **Harvest Equipment:** JOHN DEERE 4420
Moisture Meter: SHIVVERS **Harvested Width:** 10 FT
% Standard Moisture: 13.0 **Harvested Length:** 23 FT
Weighing Equipment: WEIGHTRONIX

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/14/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/14/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/14/2023
Common Name: Common 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 **Tillage Type:** MINTIL minimum-till
Replications: 3 **Treatments:** 8 **Plots:** 24 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Field Prep./Maintenance:
Soil testing indicated soil fertility to be optimum for all nutrients. Tillage included two passes with a field cultivator in the spring just ahead of planting to prepare the seedbed following the 2022 crop. Crop residue on the soil surface at planting was approximately 50 to 55%.

Soil Description
Description Name: Nashua North Soybean
% Sand: 40 **% OM:** 3.9 **Texture:** CL clay loam
% Silt: 32.5 **Soil Name:** FLOYD
% Clay: 27.5 **Fert. Level:** E excellent
pH: 5.4 **CEC:** 16.9
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: VERDRY very dry
Weather Station Name: NE RESEARCH FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/6/2023	0.25	IN
2.	5/8/2023	0.27	IN
3.	5/12/2023	0.21	IN
4.	5/13/2023	0.22	IN
5.	5/14/2023	0.72	IN
6.	5/31/2023	0.1	IN
7.	6/17/2023	0.11	IN
8.	6/18/2023	0.1	IN
9.	6/24/2023	0.41	IN
10.	6/25/2023	0.36	IN
11.	6/28/2023	0.16	IN
12.	6/30/2023	0.25	IN
13.	7/4/2023	0.22	IN
14.	7/5/2023	0.11	IN
15.	7/12/2023	0.34	IN
16.	7/14/2023	0.1	IN
17.	7/26/2023	0.1	IN
18.	7/28/2023	0.18	IN
19.	8/6/2023	0.29	IN
20.	8/11/2023	0.66	IN
21.	8/13/2023	0.21	IN
22.	8/14/2023	0.1	IN
23.	8/25/2023	0.28	IN

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C
Application Date	6/13/2023	6/13/2023	7/5/2023
Appl. Start Time	3:15 PM	3:15 PM	6:29 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	POST	POST	SPOST2
Application Placement	BROFOL	BROFOL	BROFOL
Applied By	Franzenburg	Franzenburg	Franzenburg
Appl. Entry Date	9/14/2023	9/14/2023	9/14/2023
Air Temperature Start, Stop	83, 83 F	83, 83 F	77, 77 F
% Relative Humidity Start, Stop	26, 26	26, 26	61, 61
Wind Velocity+Dir. Start	10 MPH, NW	10 MPH, NW	8 MPH, NW
Wet Leaves (Y/N)	N, no	N, no	N, no
Soil Temperature	75 F	75 F	73 F
Soil Moisture	DRY	DRY	SLIWET
Soil Surface Condition	MEDIUM		
% Cloud Cover	70	70	50
Next Moisture Occurred On	6/17/2023	6/17/2023	7/12/2023
Time to Next Moisture	4.0 DAY	4.0 DAY	7.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0.1 IN	0.1 IN	0.35 IN
Problems with Application?	N, no	N, no	N, no

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	22	22	44
Stage Majority, Percent	V1, -	V1, -	V7, -
Stage Minimum, Percent	V1, -	V1, -	V6, -
Stage Maximum, Percent	V1, -	V1, -	V7, -
Height Average	5 IN	5 IN	16 IN
Height Minimum, Maximum	4, 6	4, 6	15, 17

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	5 LEAF, -	5 LEAF, -	
Stage Minimum, Percent	4 LEAF, -	4 LEAF, -	
Stage Maximum, Percent	7 LEAF, -	7 LEAF, -	
Height Average	6 IN	6 IN	
Height Minimum, Maximum	4, 7	4, 7	
Density Average	0.5 FT2	0.5 FT2	
Density Minimum, Maximum	0, 1	0, 1	
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent	4 LEAF, -	4 LEAF, -	regrow, -
Stage Minimum, Percent	2 LEAF, -	2 LEAF, -	
Stage Maximum, Percent	6 LEAF, -	6 LEAF, -	
Height Average	2 IN	2 IN	3 IN
Height Minimum, Maximum	1, 3	1, 3	2, 4
Density Average	30 PLOT	30 PLOT	3 PLOT
Density Minimum, Maximum	20, 40	20, 40	
Pest 3 Code, Type, Scale	AMBEL, W, DESC	AMBEL, W, DESC	AMBEL, W, DESC
Stage Majority, Percent	6 LEAF, -	6 LEAF, -	
Stage Minimum, Percent	4 LEAF, -	4 LEAF, -	
Stage Maximum, Percent	8 LEAF, -	8 LEAF, -	
Height Average	3.5 IN	3.5 IN	
Height Minimum, Maximum	2, 5	2, 5	
Density Average	60 PLOT	60 PLOT	
Density Minimum, Maximum	50, 70	50, 70	

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	11002	110015	11002
Nozzle Type	TT	AIXR	TT
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, YELLOW	-, GREEN	-, YELLOW
Nozzle Spacing	19.0 IN	19.0 IN	19.0 IN
Boom Length	10.0 FT	10.0 FT	10.0 FT
Ground Speed	3 MPH	3 MPH	3 MPH
Application Amount	20 GAL/AC	15 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2

Equipment Comment: The original protocol POST application was divided into two application codes (A & B) to describe the different application methods needed for that application timing.

Notes

Context	Date	By	Notes
STATUS	3/22/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/14/2023	Prashant Jha	Automatically added by ARM: Status changed to: E: changed by (EIAJHP).
STATUS	9/14/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.
STATUS	9/14/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trial Comments

This trial differs from the original protocol; the POST application for the trial was divided into two application codes to describe different application equipment and volume needed for that timing. Also, the original protocol called for a blanket application of Verdict which was not applied to allow weed emergence.

The SPOST1 application was not needed due to adequate weed control provided by the POST application that preceeded it.

Ratings through July 12 demonstrated only burndown control of weeds by the herbicide treatments. Ratings on July 18 reflected residual control of weeds emerging after postemergence applications.

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	1	2	3	4
	Pest Code								SETFA	AMATA	AMBEL	SETFA
	Rating Date								6/22/2023	6/22/2023	6/22/2023	6/27/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								3-10 IN	1-5 IN	2-10 IN	3-10 IN
	Trt-Eval Interval								9 DA-A	9 DA-A	9 DA-A	14 DA-A
1	Untreated Check								0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	98	99	99	98
	Select Max	0.97	EC	12	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
	COC		L	1	% V/V	POST	A	TT				
3	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
4	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	80	93	90	83
	Select Max	0.97	EC	12	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	COC		L	1	% V/V	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
5	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	83	92	98
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
6	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	98	99	99	98
	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	B	AIXR				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
7	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
	Enlist One	3.8	EC	32	FL OZ/A	SPOST1						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST1						
	AMS		SG	1.5	LB/A	SPOST1						
8	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	75	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
	Liberty Ultra	1.76	SL	24	FL OZ/A	SPOST2	C	TT				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST2	C	TT				
	AMS		SG	1.5	LB/A	SPOST2	C	TT				
	LSD P=.05								1.9	5.6	1.8	2.3
	Standard Deviation								1.1	3.1	1.0	1.3
	CV								1.27	3.9	1.21	1.57

Missing data estimates are included in columns:Average=2,5,8,11,14
^Calculated from residual.

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	AMATA 6/27/2023 CONTRO % 1-5 IN 14 DA-A	AMBEL 6/27/2023 CONTRO % 2-10 IN 14 DA-A	SETFA 7/5/2023 CONTRO % 1-5 IN 22 DA-A	AMATA 7/5/2023 CONTRO % 1-5 IN 22 DA-A
	Pest Code											
	Rating Date								6/27/2023	6/27/2023	7/5/2023	7/5/2023
	Rating Type								CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max								%	%	%	%
	Pest Stage Majority/Min/Max								1-5 IN	2-10 IN	1-5 IN	1-5 IN
	Trt-Eval Interval								14 DA-A	14 DA-A	22 DA-A	22 DA-A
									5	6	7	8
1	Untreated Check								0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	99	99	98	99
	Select Max	0.97	EC	12	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
	COC		L	1	% V/V	POST	A	TT				
3	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
4	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	95	96	98	96
	Select Max	0.97	EC	12	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	COC		L	1	% V/V	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
5	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	80	98	99	87
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
6	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	99	98	98
	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	B	AIXR				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
7	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
	Enlist One	3.8	EC	32	FL OZ/A	SPOST1						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST1						
	AMS		SG	1.5	LB/A	SPOST1						
8	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	88	99	99	88
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
	Liberty Ultra	1.76	SL	24	FL OZ/A	SPOST2	C	TT				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST2	C	TT				
	AMS		SG	1.5	LB/A	SPOST2	C	TT				
	LSD P=.05								5.5	2.2	2.5	8.9
	Standard Deviation								3.1	1.2	1.4	5.1
	CV								3.77	1.43	1.64	6.06

Missing data estimates are included in columns:Average=2,5,8,11,14
^Calculated from residual.

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	AMBEL 7/5/2023 CONTRO % 22 DA-A (9)	SETFA 7/12/2023 CONTRO % 1-5 IN 29 DA-A (10)	AMATA 7/12/2023 CONTRO % 1-5 IN 29 DA-A (11)	AMBEL 7/12/2023 CONTRO % 29 DA-A (12)
1	Untreated Check								0	0	0	0
2	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	99	98	99	99
	Select Max	0.97	EC	12	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
	COC		L	1	% V/V	POST	A	TT				
3	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	99	96	98	98
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
4	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	96	99	96	96
	Select Max	0.97	EC	12	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	COC		L	1	% V/V	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
5	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	99	85	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
6	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	96	95	98
	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	B	AIXR				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
7	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	99	96	99	98
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
	Enlist One	3.8	EC	32	FL OZ/A	SPOST1						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST1						
	AMS		SG	1.5	LB/A	SPOST1						
8	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	99	99	99
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
	Liberty Ultra	1.76	SL	24	FL OZ/A	SPOST2	C	TT				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST2	C	TT				
	AMS		SG	1.5	LB/A	SPOST2	C	TT				
LSD P=.05									1.4	3.0	6.4	2.4
Standard Deviation									0.8	1.7	3.6	1.3
CV									0.95	2.01	4.34	1.57

Missing data estimates are included in columns:Average=2,5,8,11,14
^Calculated from residual.

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	Comment 1	SETFA 7/18/2023 CONTRO % 3-12 IN 35 DA-A 13	AMATA 7/18/2023 CONTRO % 3-11 IN 35 DA-A 14	AMBEL 7/18/2023 CONTRO % 2-6 IN 35 DA-A 15	GLXMA 10/5/2023 YIELD bu/ac R8 114 DA-A 16
1	Untreated Check								0	0	0	36
2	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	96	99	98	49
	Select Max	0.97	EC	12	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
	COC		L	1	% V/V	POST	A	TT				
3	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	95	96	93	46
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
4	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	96	96	48
	Select Max	0.97	EC	12	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	COC		L	1	% V/V	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
5	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	85	98	48
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
6	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	95	95	98	48
	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	B	AIXR				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
7	Liberty Ultra	1.76	SL	24	FL OZ/A	POST	A	TT	96	98	96	49
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	A	TT				
	Zidua SC	4.17	SC	2.5	FL OZ/A	POST	A	TT				
	AMS		SG	1.5	LB/A	POST	A	TT				
	Enlist One	3.8	EC	32	FL OZ/A	SPOST1						
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST1						
	AMS		SG	1.5	LB/A	SPOST1						
8	Enlist One	3.8	EC	32	FL OZ/A	POST	B	AIXR	99	99	99	50
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	B	AIXR				
	Dual II Magnum	7.64	EC	16	FL OZ/A	POST	B	AIXR				
	AMS		SG	1.5	LB/A	POST	B	AIXR				
	Liberty Ultra	1.76	SL	24	FL OZ/A	SPOST2	C	TT				
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	SPOST2	C	TT				
	AMS		SG	1.5	LB/A	SPOST2	C	TT				
LSD P=.05									3.3	6.3	4.0	5.8
Standard Deviation									1.9	3.6	2.3	3.3
CV									2.25	4.3	2.7	7.1

Missing data estimates are included in columns:Average=2,5,8,11,14
^Calculated from residual.

Iowa State University

Liberty Ultra POST Application Timing for Weed Control in an Enlist One Soybean System, Nashua, IA, 2023.
Trial ID: NSC 1
Protocol ID: MKD-H-2023-US-D44-A-01 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
SETFA, Setaria faberi, Giant foxtail = US
AMATA, Amaranthus tamariscinus, Common waterhemp = US
AMBEL, Ambrosia artemisiifolia, Common ragweed = US
GLXMA, Glycine max, Soybean = US
Rating Type
CONTRO = control / burndown or knockdown
YIELD = yield
Rating Unit/Min/Max
%, 0, 100 = percent
bu/ac, , = bushels per acre

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.
Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

General Trial Information
Investigator: Prashant Jha

Discipline: H herbicide
Status: F one-year/final
ARM Trial Created On: 5/16/2023
Initiation Date: 5/16/2023
Completion Date: 10/5/2023

Trial Location
City: Nashua **Country:** USA United States
State/Prov.: Iowa
Postal Code: 50658-9270

Latitude of LL Corner °: 42.940761 N
Longitude of LL Corner °: -92.570169 W

Regulations
Conducted Under GLP: No
Conducted Under GEP: No

Objectives:
The purpose of this study was to evaluate early applications of Engenia in a Xtendflex Soybean Program.

Role: INVEST investigator

Crop Description
Crop 1: C GLXMA Glycine max Soybean
Entry Date: 9/7/2023 **Stage Scale:** VR
Variety: Asgrow AG24XF1
Attributes: glyphosate & glufosinate & dicamba
Planting Date: 5/16/2023 **Planting Rate:** 189417 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 Moisture: DRY dry
Emergence Date: 5/22/2023
Harvest Date: 10/5/2023 **Harvest Equipment:** JOHN DEERE 4420
Moisture Meter: SHIVVERS **Harvested Width:** 10 FT
% Standard Moisture: 13.0 **Harvested Length:** 23 FT
Weighing Equipment: WEIGHTRONIX

Pest Description
Pest 1 Type: W **Code:** SETFA Setaria faberi **Entry Date:** 9/7/2023
Common Name: Giant foxtail **Stage Scale:** DESC

Pest 2 Type: W **Code:** AMATA Amaranthus tamariscinus **Entry Date:** 9/7/2023
Common Name: Common waterhemp **Stage Scale:** DESC

Pest 3 Type: W **Code:** AMBEL Ambrosia artemisiifolia **Entry Date:** 9/7/2023
Common Name: Common 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 **Tillage Type:** MINTIL minimum-till
Replications: 4 **Treatments:** 9 **Plots:** 36 **Study Design:** RACOBL Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2022

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Field Prep./Maintenance:
Tillage included two passes with a field cultivator in the spring just ahead of planting to prepare the seedbed following the 2022 crop. Crop residue on the soil surface at planting was approximately 50 to 55%.

Soil Description
Description Name: Nashua North Soybean
% Sand: 40 **% OM:** 3.9 **Texture:** CL clay loam
% Silt: 32.5 **Soil Name:** FLOYD
% Clay: 27.5 **Fert. Level:** E excellent
pH: 5.4 **CEC:** 16.9
Soil Drainage: F fair

Weather Conditions
Overall Moisture Conditions: VERDRY very dry
Weather Station Name: NE RESEARCH FARM **Distance:** 0.25 MI

No.	Date	Moisture Total	Unit
1.	5/6/2023	0.25	IN
2.	5/8/2023	0.27	IN
3.	5/12/2023	0.21	IN
4.	5/13/2023	0.22	IN
5.	5/14/2023	0.72	IN
6.	5/31/2023	0.1	IN
7.	6/17/2023	0.11	IN
8.	6/18/2023	0.1	IN
9.	6/24/2023	0.41	IN
10.	6/25/2023	0.36	IN
11.	6/28/2023	0.16	IN
12.	6/30/2023	0.25	IN
13.	7/4/2023	0.22	IN
14.	7/5/2023	0.11	IN
15.	7/12/2023	0.34	IN
16.	7/14/2023	0.1	IN
17.	7/26/2023	0.1	IN
18.	7/28/2023	0.18	IN
19.	8/6/2023	0.29	IN
20.	8/11/2023	0.66	IN
21.	8/13/2023	0.21	IN
22.	8/14/2023	0.1	IN
23.	8/25/2023	0.28	IN

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.
Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Application Description

	A	B	C	D	E
Application Date	5/17/2023	6/5/2023	6/22/2023	6/22/2023	7/5/2023
Appl. Start Time	11:45 AM	3:29 PM	5:30 PM	5:30 PM	5:30 PM
Appl. Stop Time	12:00 PM				
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	EPOST	POST	POST	LPOST
Application Placement	BROSOI	BROFOL	BROFOL	BROFOL	BROFOL
Applied By	Franzenburg	Franzenburg	Franzenburg	Franzenburg	Franzenburg
Appl. Entry Date	9/7/2023	9/7/2023	9/7/2023	9/7/2023	9/7/2023
Air Temperature Start, Stop	62, 62 F	87, - F	88, - F	88, - F	77, - F
% Relative Humidity Start, Stop	50, 50	32, 32	30, 30	30, 30	61, 61
Wind Velocity+Dir. Start	9 MPH, E	4 MPH, SE	6 MPH, E	6 MPH, E	9 MPH, NW
Wet Leaves (Y/N)		N, no	N, no	N, no	N, no
Soil Temperature	55 F	81 F	75 F	75 F	73 F
Soil Moisture	DRY	DRY	DRY	DRY	SLIWET
Soil Surface Condition	MEDTRA				
% Cloud Cover	80	70	10	10	50
Next Moisture Occurred On	5/31/2023	6/17/2023	6/24/2023	6/24/2023	7/12/2023
Time to Next Moisture	14.0 DAY	12.0 DAY	2.0 DAY	2.0 DAY	7.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0, IN	0, IN	0, IN	0, IN	0, IN
Moisture 1 Week after Appl.	0 IN	0 IN	0.93 IN	0.93 IN	0.34 IN
Problems with Application?	N, no	N, no	N, no	N, no	N, no

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
Days after Emergence	-5	14	31	31	44
Stage Majority, Percent		VC, -	V3, -	V3, -	V6, -
Stage Minimum, Percent		VC, -	V3, -	V3, -	V6, -
Stage Maximum, Percent		VC, -	V4, -	V4, -	V6, -
Height Average		3 IN	8 IN	8 IN	15 IN
Height Minimum, Maximum		3, 4	7, 9	7, 9	13, 17

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.
Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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, -
Stage Minimum, Percent			3 LEAF, -	3 LEAF, -
Stage Maximum, Percent			9 LEAF, -	9 LEAF, -
Height Average			9 IN	9 IN
Height Minimum, Maximum			6, 11	6, 11
Density Average			3 FT2	3 FT2
Density Minimum, Maximum			2, 5	2, 5
Pest 2 Code, Type, Scale	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC	AMATA, W, DESC
Stage Majority, Percent			9 LEAF, -	9 LEAF, -
Stage Minimum, Percent			6 LEAF, -	6 LEAF, -
Stage Maximum, Percent			12 LEA, -	12 LEA, -
Height Average			5 IN	5 IN
Height Minimum, Maximum			2, 7	2, 7
Density Average			10 PLOT	10 PLOT
Density Minimum, Maximum			5, 15	5, 15
Pest 3 Code, Type, Scale	AMBEL, W, DESC	AMBEL, W, DESC	AMBEL, W, DESC	AMBEL, W, DESC
Stage Majority, Percent			10 LEA, -	10 LEA, -
Stage Minimum, Percent			6 LEAF, -	6 LEAF, -
Stage Maximum, Percent			14 LEA, -	14 LEA, -
Height Average			7 IN	7 IN
Height Minimum, Maximum			3, 10	3, 10
Density Average			30 PLOT	30 PLOT
Density Minimum, Maximum			10, 50	10, 50

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.
Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

	E
Pest 1 Code, Type, Scale	SETFA, W, DESC
Stage Majority, Percent	10 LEA, -
Stage Minimum, Percent	8 LEAF, -
Stage Maximum, Percent	12 LEA, -
Height Average	17 IN
Height Minimum, Maximum	14, 20
Density Average	3 FT2
Density Minimum, Maximum	1, 5
Pest 2 Code, Type, Scale	AMATA, W, DESC
Stage Majority, Percent	11 LEA, -
Stage Minimum, Percent	9 LEAF, -
Stage Maximum, Percent	12 LEA, -
Height Average	15 IN
Height Minimum, Maximum	11, 18
Density Average	15 PLOT
Density Minimum, Maximum	5, 30
Pest 3 Code, Type, Scale	AMBEL, W, DESC
Stage Majority, Percent	12 LEA, -
Stage Minimum, Percent	10 LEA, -
Stage Maximum, Percent	14 LEA, -
Height Average	15 IN
Height Minimum, Maximum	12, 18
Density Average	15 PLOT
Density Minimum, Maximum	0, 60

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	11002	11002
Nozzle Type	TTI	TTI	TTI	TT	XR
Nozzle TradeName	TeeJet	TeeJet	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	-, GREEN	-, GREEN	-, GREEN	-, YELLOW	-, YELLOW
Nozzle Spacing	19 IN	19 IN	19 IN	19 IN	19 IN
Boom Length	10 FT	10 FT	10 FT	10 FT	10 FT
Ground Speed	3 MPH	3 MPH	3 MPH	3 MPH	3 MPH
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC	20 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2	COMCO2	COMCO2

Equipment Comment: Application Code D for POST applications should have been applied with XR spray tips; TT tips were mistakenly used instead of the XR tips.

Notes

Context	Date	By	Notes
STATUS	3/27/2023	Prashant Jha	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	9/7/2023	Prashant Jha	Automatically added by ARM: Status changed to: F: changed by (EIAJHP).

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trial Comments

Very dry conditions persisted through the season for this trial site. No weed emergence was noted at the EPOST application. Weed control evaluations demonstrated variable control by the residual herbicide treatments.

Soybean in the trial never quite achieved a closed canopy through the end of August.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							SETFA	AMBEL	SETFA	AMATA	AMBEL
	Rating Date							6/5/2023	6/5/2023	6/22/2023	6/22/2023	6/22/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0.5-2 IN	0.5-2 IN	1-10 IN	1-5 IN	2-10 IN
	Trt-Eval Interval							19 DA-A	19 DA-A	17 DA-B	17 DA-B	17 DA-B
1	Untreated Check							0	0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	40	40	40	48	50
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	45	0	45	28	8
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	0	0	0	95	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	0	0	0	97	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	45	0	45	33	0
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Outlook	6	EC	12	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	53	45	53	20	45
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	80	58	70	60	58
	Engenia	5	SL	12.8	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D					
	Select Max	0.97	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
	COC		L	0.5	% V/V	POST	D					
	Intact		L	0.5	% V/V	POST	D					

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	1	2	3	4	5
	Pest Code							SETFA	AMBEL	SETFA	AMATA	AMBEL
	Rating Date							6/5/2023	6/5/2023	6/22/2023	6/22/2023	6/22/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							0.5-2 IN	0.5-2 IN	1-10 IN	1-5 IN	2-10 IN
	Trt-Eval Interval							19 DA-A	19 DA-A	17 DA-B	17 DA-B	17 DA-B
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	73	48	68	55	48
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	Intact		L	0.5	% V/V	POST	C					
	Warrant	3	CS	3	PT/A	POST	C					
	LSD P=.05							18.6	22.8	16.8	25.9	17.4
	Standard Deviation							12.7	15.6	11.5	17.7	11.9
	CV							34.15	73.79	32.45	36.75	26.38

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	AMATA	AMBEL	SETFA	AMATA
	Rating Date							7/5/2023	7/5/2023	7/5/2023	7/12/2023	7/12/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							8-20 IN	8-20 IN	8-20 IN	8-20 IN	8-20 IN
	Trt-Eval Interval							13 DA-C	13 DA-C	13 DA-C	20 DA-C	20 DA-C
1	Untreated Check							0	0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	99	86	99	99	93
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	45	28	8	90	91
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	99	97	99	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	0	97	99	90	96
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	65	65	70	71	68
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Outlook	6	EC	12	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	68	67	78	78	70
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	99	78	98	99	83
	Engenia	5	SL	12.8	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D					
	Select Max	0.97	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
	COC		L	0.5	% V/V	POST	D					
	Intact		L	0.5	% V/V	POST	D					

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	AMATA	AMBEL	SETFA	AMATA
	Rating Date							7/5/2023	7/5/2023	7/5/2023	7/12/2023	7/12/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							8-20 IN	8-20 IN	8-20 IN	8-20 IN	8-20 IN
	Trt-Eval Interval							13 DA-C	13 DA-C	13 DA-C	20 DA-C	20 DA-C
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	99	89	97	99	90
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	Intact		L	0.5	% V/V	POST	C					
	Warrant	3	CS	3	PT/A	POST	C					
	LSD P=.05							5.6	15.3	10.6	4.4	9.7
	Standard Deviation							3.8	10.4	7.2	3.0	6.7
	CV							6.04	15.53	10.04	3.71	8.68

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMBEL	SETFA	AMATA	AMBEL	SETFA
	Rating Date							7/12/2023	7/18/2023	7/18/2023	7/18/2023	7/25/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							8-20 IN	3-20 IN	3-20 IN	3-20 IN	3-26 IN
	Trt-Eval Interval							20 DA-C	13 DA-E	13 DA-E	13 DA-E	20 DA-E
1	Untreated Check							0	0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	99	99	91	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	89	99	95	96	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	99	99	99	99	98
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	99	99	99	99	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	80	76	71	93	76
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Outlook	6	EC	12	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	85	78	70	97	78
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	99	98	74	99	98
	Engenia	5	SL	12.8	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D					
	Select Max	0.97	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
	COC		L	0.5	% V/V	POST	D					
	Intact		L	0.5	% V/V	POST	D					

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	11	12	13	14	15
	Pest Code							AMBEL	SETFA	AMATA	AMBEL	SETFA
	Rating Date							7/12/2023	7/18/2023	7/18/2023	7/18/2023	7/25/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							8-20 IN	3-20 IN	3-20 IN	3-20 IN	3-26 IN
	Trt-Eval Interval							20 DA-C	13 DA-E	13 DA-E	13 DA-E	20 DA-E
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	99	99	91	99	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	Intact		L	0.5	% V/V	POST	C					
	Warrant	3	CS	3	PT/A	POST	C					
	LSD P=.05							4.5	4.6	11.3	5.2	4.8
	Standard Deviation							3.1	3.2	7.7	3.6	3.3
	CV							3.69	3.83	10.06	4.1	3.97

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMATA 7/25/2023 CONTRO % 3-24 IN 20 DA-E	AMBEL 7/25/2023 CONTRO % 3-20 IN 20 DA-E	SETFA 8/1/2023 CONTRO % 3-26 IN 40 DA-C	AMATA 8/1/2023 CONTRO % 3-24 IN 40 DA-C	AMBEL 8/1/2023 CONTRO % 3-20 IN 40 DA-C
	Pest Code							AMATA	AMBEL	SETFA	AMATA	AMBEL
	Rating Date							7/25/2023	7/25/2023	8/1/2023	8/1/2023	8/1/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-24 IN	3-20 IN	3-26 IN	3-24 IN	3-20 IN
	Trt-Eval Interval							20 DA-E	20 DA-E	40 DA-C	40 DA-C	40 DA-C
								16	17	18	19	20
1	Untreated Check							0	0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	91	99	99	90	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	94	99	98	90	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	99	99	97	97	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	98	99	98	97	99
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	69	97	74	69	97
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Outlook	6	EC	12	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	70	99	78	70	99
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	73	98	97	71	98
	Engenia	5	SL	12.8	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D					
	Select Max	0.97	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
	COC		L	0.5	% V/V	POST	D					
	Intact		L	0.5	% V/V	POST	D					

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	AMBEL	SETFA	AMATA	AMBEL
	Rating Date							7/25/2023	7/25/2023	8/1/2023	8/1/2023	8/1/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							3-24 IN	3-20 IN	3-26 IN	3-24 IN	3-20 IN
	Trt-Eval Interval							20 DA-E	20 DA-E	40 DA-C	40 DA-C	40 DA-C
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	90	99	99	89	99
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	Intact		L	0.5	% V/V	POST	C					
	Warrant	3	CS	3	PT/A	POST	C					
	LSD P=.05							12.4	2.3	5.0	12.4	2.3
	Standard Deviation							8.5	1.6	3.4	8.4	1.6
	CV							11.19	1.78	4.14	11.31	1.78

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	AMATA	AMBEL	SETFA	AMATA
	Rating Date							8/16/2023	8/16/2023	8/16/2023	8/30/2023	8/30/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							10-35 IN	10-40 IN	8-25 IN	10-52 IN	10-45 IN
	Trt-Eval Interval							55 DA-C	55 DA-C	55 DA-C	56 DA-E	56 DA-E
1	Untreated Check							0	0	0	0	0
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	98	89	98	98	89
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	97	84	99	97	83
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	96	97	98	97	96
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Outlook	6	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	97	97	99	96	97
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B					
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E					
	Outlook	6	EC	12	FL OZ/A	LPOST	E					
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E					
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	74	70	97	73	69
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Outlook	6	EC	12	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	76	70	99	75	68
	Engenia	5	SL	12.8	FL OZ/A	POST	C					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Select Max	0.97	EC	12	FL OZ/A	POST	C					
	COC		L	1	% V/V	POST	C					
	Intact		L	0.5	% V/V	POST	C					
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	94	70	98	93	69
	Engenia	5	SL	12.8	FL OZ/A	PRE	A					
	Aegos	5.8	SL	8	FL OZ/A	PRE	A					
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D					
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D					
	Select Max	0.97	EC	12	FL OZ/A	POST	D					
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D					
	COC		L	0.5	% V/V	POST	D					
	Intact		L	0.5	% V/V	POST	D					

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

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	AMATA	AMBEL	SETFA	AMATA
	Rating Date							8/16/2023	8/16/2023	8/16/2023	8/30/2023	8/30/2023
	Rating Type							CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit/Min/Max							%	%	%	%	%
	Pest Stage Majority/Min/Max							10-35 IN	10-40 IN	8-25 IN	10-52 IN	10-45 IN
	Trt-Eval Interval							55 DA-C	55 DA-C	55 DA-C	56 DA-E	56 DA-E
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	98	89	99	99	89
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C					
	Aegos	5.8	SL	8	FL OZ/A	POST	C					
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C					
	Intact		L	0.5	% V/V	POST	C					
	Warrant	3	CS	3	PT/A	POST	C					
	LSD P=.05							5.2	13.4	2.7	5.2	14.9
	Standard Deviation							3.5	9.2	1.9	3.6	10.2
	CV							4.37	12.38	2.13	4.4	13.9

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMBEL 8/30/2023 CONTRO % 8-30 IN 56 DA-E	GLXMA 10/5/2023 YIELD bu/ac R8 92 DA-E
1	Untreated Check							0	32
2	Engenia	5	SL	12.8	FL OZ/A	PRE	A	97	56
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A		
	Aegos	5.8	SL	8	FL OZ/A	PRE	A		
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D		
	Outlook	6	EC	12	FL OZ/A	POST	D		
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D		
3	Engenia	5	SL	12.8	FL OZ/A	PRE	A	99	53
	Zidua SC	4.17	SC	3.25	FL OZ/A	PRE	A		
	Aegos	5.8	SL	8	FL OZ/A	PRE	A		
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E		
	Outlook	6	EC	12	FL OZ/A	LPOST	E		
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E		
4	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	98	55
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B		
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B		
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D		
	Outlook	6	EC	12	FL OZ/A	POST	D		
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D		
5	Engenia	5	SL	12.8	FL OZ/A	EPOST	B	99	54
	Zidua SC	4.17	SC	3.25	FL OZ/A	EPOST	B		
	Aegos	5.8	SL	8	FL OZ/A	EPOST	B		
	Liberty 280 SL	2.34	SL	36	FL OZ/A	LPOST	E		
	Outlook	6	EC	12	FL OZ/A	LPOST	E		
	AMS Liquid	3.4	L	112	FL OZ/A	LPOST	E		
6	Zidua PRO	4	SC	6	FL OZ/A	PRE	A	97	58
	Engenia	5	SL	12.8	FL OZ/A	POST	C		
	Outlook	6	EC	12	FL OZ/A	POST	C		
	Aegos	5.8	SL	8	FL OZ/A	POST	C		
	Select Max	0.97	EC	12	FL OZ/A	POST	C		
	COC		L	1	% V/V	POST	C		
	Intact		L	0.5	% V/V	POST	C		
7	Verdict	5.57	EC	5	FL OZ/A	PRE	A	99	57
	Engenia	5	SL	12.8	FL OZ/A	POST	C		
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	C		
	Aegos	5.8	SL	8	FL OZ/A	POST	C		
	Select Max	0.97	EC	12	FL OZ/A	POST	C		
	COC		L	1	% V/V	POST	C		
	Intact		L	0.5	% V/V	POST	C		
8	Verdict	5.57	EC	5	FL OZ/A	PRE	A	97	56
	Engenia	5	SL	12.8	FL OZ/A	PRE	A		
	Aegos	5.8	SL	8	FL OZ/A	PRE	A		
	Liberty 280 SL	2.34	SL	36	FL OZ/A	POST	D		
	Zidua SC	4.17	SC	3.25	FL OZ/A	POST	D		
	Select Max	0.97	EC	12	FL OZ/A	POST	D		
	AMS Liquid	3.4	L	112	FL OZ/A	POST	D		
	COC		L	0.5	% V/V	POST	D		
	Intact		L	0.5	% V/V	POST	D		

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Trt No.	Treatment Name	Form Conc	Form Type	Other Rate	Other Rate Unit	Appl Timing	Appl Code	AMBEL 8/30/2023 CONTRO % 8-30 IN 56 DA-E 26	GLXMA 10/5/2023 YIELD bu/ac R8 92 DA-E 27
9	Warrant Ultra	3.45	CS	50	FL OZ/A	PRE	A	99	54
	Xtendimax wVGT	2.9	SL	22	FL OZ/A	POST	C		
	Aegos	5.8	SL	8	FL OZ/A	POST	C		
	Roundup PowerMAX 3	4.8	SL	30	FL OZ/A	POST	C		
	Intact		L	0.5	% V/V	POST	C		
	Warrant		3 CS	3	PT/A	POST	C		
LSD P=.05								3.4	7.2
Standard Deviation								2.3	5.0
CV								2.67	9.43

Missing data estimates are included in columns:Average=1,2,4,5,7,8,10,11,13,16,19,22,25
^Calculated from residual.

Iowa State University

Engenia Applied PRE & Early POST for Weed Control in Dicamba-Tolerant Soybean, Nashua, IA, 2023.

Trial ID: NSC2
Protocol ID: MKD-H-2023-US-D61 Location: Nashua Trial Year: 2023
Project ID: Project ID 2: Project ID 3:
Study Director: Sponsor Contact:
Investigator: Prashant Jha

Pest Code
SETFA, Setaria faberi, Giant foxtail = 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
YIELD = yield

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