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Weed Management In Horticultural Crops

RESEARCH RESULTS 2013

THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Douglas J. Doohan
Rick Edwards

Department of Horticulture and Crop Science
The Ohio State University
Ohio Agricultural Research and Development Center
Ohio State Extension

This report contains the results of research on horticultural crop weed management in Ohio for 2013. This report and other resources are available on the Internet at: **www.oardc.ohio-state.edu/weedworkshop**

This bulletin does not constitute endorsement or specific recommendations. Apology is expressed for any inadvertent errors found in this report.

Final copies of commercial advertisement that will contain data from these results are subject to the author's approval before publication.

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Research Associates

Dr. Roger Downer
Rick Edwards

Graduate Students

Yin Chen, Katie Linder

Post-Doctoral Researcher

Dr. Mohsen Mohseni-Moghadam

Summer Student Interns

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LIST OF CROP BAYER CODES USED IN THIS REPORT:

AGRASS* = Annual grasses
LYPES = Tomato
MABSD = Apple
RUBID = Red raspberry
RUBOC = Black raspberry
RUBSG = Brambles (raspberries and blackberries)
VACMY = Blackberry
ZEAMX = Sweet corn
* not official Bayer Code.

LIST OF ABBREVIATIONS AND DEFINITIONS USED IN THIS REPORT:

AVE = Average
BURN = Necrotic tissue
CHLOROSIS = Yellow coloration or bleaching of foliage
CONTROL = Herbicide efficacy
DAT= Days after treatment
DOR = Dormant
DIAM = Diameter
GROWTH = Annual increase in length of shoot
INJURY = Composite assessment of stunting, chlorosis, and other visible effects
MKTB = Marketable fruit
MSP = Mid-spring
NO = Number
OZ = Ounces
POST = Post-emergent application
POSTTP = Post-transplant
PRE = Pre-emergent application
PRETP = Pre-transplant
RACOBL = Randomized Complete Block Design
UNMKTB = Unmarketable fruit; green (tomatoes), diseased or cull
WAT = Weeks after treatment

METHODS OF ASSESSING CROP INJURY, WEED CONTROL, AND DENSITY:

Unless otherwise stated, crop injury and weed control were assessed visually. The 0-100 linear scale was used, in which 0 = no crop injury/no control, and 100 = death of crop/complete weed control.

For weed density: LOW = Scattered, just a few weeds
MEDIUM = 1 weed per 3 feet of row
HIGH = More than 1 weed per 3 feet of row

METEORLOGICAL DATA: Meteorological Data for each research station may be found at www.oardc.ohio-state.edu/newweather/

A LIST OF WEEDS WITH BAYER CODES USED IN THIS REPORT:

BAYER CODE	COMMON NAME	BOTANICAL NAME
ABUTH	velvetleaf	*Abutilon theophrasti* Medicus
ACCVI	Virginia copperleaf	*Acalypha virginica* L.
AGRASS*	foxtail, crabgrass spp.	*Setaria, Digitaria* spp.
AGGRE	quackgrass	*Elytrigia repens* (L.) Nevski
AMABL	prostrate pigweed	*Amaranthus blitoides* S. Wats.
AMARE	redroot pigweed	*Amaranthus retroflexus* L.
AMAXX	pigweed spp.	*Amaranthus* spp.
AMBEL	common ragweed	*Ambrosia artemisiifolia* L.
AMBTR	giant ragweed	*Ambrosia trifida* L.
CAGSE	hedge bindweed	*Calystegia sepium* (L.) R. Br.
CAPBP	shepherd's purse	*Capsella bursa-pastoris* (L.) Medicus
CARHI	hairy bittercress	*Cardamine pratensis* L.
CERVU	mouseear chickweed	*Cerastium vulgatum* L.
CHEAL	common lambsquarters	*Chenopodium album* L.
CIRAR	Canada thistle	*Cirsium arvense* (L.) Scop.
CYAOV	Shagbark hickory	*Carya ovata* (MILL) K.KOCH
CYPES	yellow nutsedge	*Cyperus esculentes* L.
DACGL	orchardgrass	*Dactylis glomerata* L.
DAUCA	wild carrot	*Daucus carota* L.
DIGSA	large crabgrass	*Digitaria sanguinalis* (L.) Scop.
GLEHE	ground ivy	*Glechoma hederacea* L.
MALNE	common mallow	*Malva neglecta* Wallr.
OXAST	yellow woodsorrel	*Oxalis stricta* L.
PANDI	fall panicum	*Panicum dichotomiflorum* Michx.
PLALA	buckhorn plantain	*Plantago lanceolata* L.
PLAMA	broadleaf plantain	*Plantago major* L.
POANN	annual bluegrass	*Poa annua* L.
POLPY	Pennsylvania smartweed	*Polygonum pensylvanicum* L.
POROL	common purslane	*Portulaca oleracea* L.
PRTQU	Virginia creeper	*Parthenocissus quinquifolia* (L.) Planch.
RORIS	marsh yellowcress	*Rorippa islandica* L.

RUBFR	bramble	*Rubus fruticosis* L.
RUMOB	broadleaf dock	*Rumex obtusifolius* L.
SETFA	giant foxtail	*Setaria faberii* L.
SENVU	common groundsel	*Senecio vularis* L.
SOLPT	Eastern black nightshade	*Solanum ptycanthum* Dun.
SOOCA	Canada goldenrod	*Solidago canadensis* L.
STEME	common chickweed	*Stellaria media* (L.) Vill
TAROF	dandelion	*Taraxacum officinale* Weber in Wiggers
TOXRA	poison ivy	*Toxicodendron* radicans (L.) Ktze.
TRFPR	red clover	*Trifolium pratense* L.
TRFRE	white clover	*Trifolium repens* L.

* not official Bayer Code.

HERBICIDE LIST

TRADE NAME	COMMON NAME	FORM	MANUFACTURER
AIM	carfentrazone	2 EC	FMC Corporation
Alion	indaziflan	200 SL	Bayer CropScience
Anthem ATZ	atrizine	4 SC	FMC Corporation
Authority MTZ	sulfentrazone and metribuzin	45 WG	FMC Corporation
Bicyclopyrone	N/A	200 L	Syngenta Crop Protection, Inc.
Dual Magnum	s-metolachlor	7.62 EC	Syngenta Crop Protection, Inc.
Emerion 7000	Ammonium Nonanoate	40 L	Emery Oleochemicals
Gramoxone	paraquat dichloride	2L	Syngenta Crop Protection, Inc.
Karmex	diuron	80 DF	Griffin LLC
MAT-28	N/A	50 SG	DuPont Crop Protection
Matrix	rimsulfuron	25 DF	DuPont Crop Protection
Perspective	aminocyclopyrachlor		DuPont Crop Protection
Prowl H_2O	pendimethalin	3.8 L	BASF Ag Products
Pursuit	Imazethapyr	2L	BASF Corporation
Reflex	fomesafen	2L	Syngenta Crop Protection, Inc.
Rely 280	glufosinate ammonium	200 SL	Bayer CropScience
Roundup PowerMax	glyphosate	4.5 L	Monsanto Company
Sandea	halosulfuron-methyl	75 DF	Gowan Company
Select	clethodim	2 L	Valent U.S.A. Corp. Agr. Products
Sencor	metribuzin	75 DF	Bayer CropScience
Sinbar	terbacil	80 WP	Tessenderlo Kerley, Inc.
Spartan	sulfentrazone	75 DF	FMC Corporation
Stinger	clopyralid	3 L	Dow AgroSciences LLC
Strategy	ethalfluralin+clomozone	2.1 L	Loveland Products, Inc.
Surflan	oryzalin	4L	Dow AgroSciences LLC
Treevix	saflufenacil	70 WG	BASF Ag Products
Weedone LV4	2, 4 -D ester	3.8 EC	NuFarm

ADJUVANT LIST

NAME	ABBREVIATION	DESCRIPTION
Ammonium sulfate	AMS	Spray grade fertilizer
Crop Oil Concentrate	COC	Paraffin base petroleum oil
Induce	NIS	Nonionic surfactant
MSO	MSO	Methylated seed oil
28% N	UAN	Urea ammonia nitrate

The Ohio State University

Alion on Apples - Bayer - 2013

Trial ID: HP13USAMZT Protocol ID:
Location: WOOSTER, OH Study Director:
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Asssociate
Investigator: Dr. Douglas J. Doohan **Title:** Professor

Discipline: H herbicide
Trial Status: F one-year/final **Trial Reliability:** RELIABLE
Initiation Date: Apr-30-2013 **Planned Completion Date:** Dec-31-2013

Trial Location

City: Wooster **Latitude of LL Corner °:** 40.7380888 N
State/Prov.: Ohio **Longitude of LL Corner °:** 81.90309444 W
Postal Code: 44691 **Altitude of LL Corner, Unit:** 1169.00 FT
Country: USA

Objectives:

Technical Questions

1. Demonstrate the weed control performance from Alion-only treatment compared to the other treatments including the strengths and weaknesses.
2. What length of control did Alion provide (months)?
3 . Describe the crop tolerance observed in this trial.

Applications/Assessments

The objective of this protocol is to demonstrate the performance of Alion alone to customers and key influencers, comparing Alion plus glyphosate or glufosinate plus glyphosate to competitive treatments listed in this protocol.

A1: 30 days after application
A2: 90 days after application
A3: 150 days after application
A4: 270 days after application

Conclusions:

At 31 days post treatment all treatments were comparable for weed control with the following exceptions. Treatment 1 (Roundup PowerMax, Rely 280) had no significant change from the untreated check for control of Green foxtail and had significantly less control of Yellow wood sorrel and White clover than the other treated plots. Also, treatment 2 (Alion, Rely 280, Roundup PowerMAX, ams) had lower efficacy for control of Green foxtail and White clover compared to other treatments (exclusive of treatment 1, as noted above).
At 156 days following treatment, the Roundup PowerMAX, Rely 280, AMS treatment had no significant difference from the untreated plots for control of annual grasses, wood sorrel or clover. At that date the Prowl H2O/Treevix/Rely 280/Roundup PowerMAX treatment had significantly reduced weed control. This treatment showed reduced efficacy in control of White clover, compared to the other treatments.

The comparative weed control efficacy of the treatments in this trial would be: 1) Chateau/Prowl H20/Rely 280/Roundup PowerMax; 2) other treatments (excluding treatment 1(see below) were similar, the Matrix/Prowl H20/Rely 280/Roundup PowerMax treatment possibly with more overall control. The The Alion/Rely 280/ Roundup PowerMax treatment showed less control of clover at 38 days after treatment as well as lower control, not statistically significant, of annual grasses at the156 day assessment. The Prowl H20/ Treevix/Rely 280/Roundup PowerMax had reduced control of White clover at the 156 day after treatment. 3) The Roundup PowerMax/Rely 280 treatment (treatment 1) had the least control of all treatments in this trial.

The Ohio State University

Personnel

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Asssociate
Affiliation: OARDC/The Ohio State University
Address: 1680 Madison Ave.
Location: Wooster, Ohio
Postal Code: 44691
Investigator: Dr. Douglas J. Doohan **Title:** Professor
Affiliation: OARDC/The Ohio State University

Crop Description

Crop 1: MABSS Malus sp. Apple
Variety: Golden Delicious
BBCH Scale: BDIC

Pest Description

Pest 1 Type: W **Code:** SETVI Setaria viridis
Common Name: Green foxtail

Pest 2 Type: W **Code:** OXAST Oxalis stricta
Common Name: Common yellow wood sorrel

Pest 3 Type: W **Code:** TRFRE Trifolium repens
Common Name: White clover

Pest 4 Type: W **Code:** PLAMA Plantago major
Common Name: Broadleaf plantain

Site and Design

Plot Width, Unit: 8 FT **Site Type:** ORCHAR orchard
Plot Length, Unit: 18 FT **Experimental Unit:** 1 PLOT plot
Plot Area, Unit: 144 FT2
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Soil Description

Description Name: SILT LOAM
% Sand: 16 **% OM:** 3 **Texture:** SIL silt loam
% Silt: 72 **pH:** 6.0 **Soil Name:** WOOSTER SILT LOAM
% Clay: 12 **CEC:** 14 **Fert. Level:** G good
Soil Drainage: G good

Moisture and Weather Conditions

Overall Moisture Conditions: NORMAL normal
Closest Weather Station: HORT UNIT 2 **Distance, Unit:** 1000 m

Application Description

	A
Application Date:	Apr-30-2013
Time of Day:	0730
Application Method:	SPRAY
Application Timing:	PREMEA
Application Placement:	BROADC
Air Temperature, Unit:	47.4 F
% Relative Humidity:	98.5
Wind Velocity, Unit:	0 NA
Dew Presence (Y/N):	Y yes
Soil Temperature, Unit:	52.2 F
Soil Moisture:	GOOD
% Cloud Cover:	5
Next Rain Occurred On:	May-8-2013

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	MABSS BDIC
Stage Scale Used:	DESC
Stage Majority, Percent:	Mature 100
Height, Unit:	25 FT

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Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	SETVI W
Stage Majority, Percent:	03 100
Pest 2 Code, Type, Scale:	OXAST W
Stage Majority, Percent:	03 100
Pest 3 Code, Type, Scale:	TRFRE W
Stage Majority, Percent:	03 100
Pest 4 Code, Type, Scale:	PLAMA W
Stage Majority, Percent:	03 100

Application Equipment

	A
Equipment Type:	BACCAI
Operation Pressure, Unit:	30 PSI
Nozzle Size:	8002
Nozzle Spacing, Unit:	16 IN
Nozzles/Row:	4
Boom Height, Unit:	36 IN
Ground Speed, Unit:	2 MPH
Carrier:	WATER
Mix Size, Unit:	2 liters

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Alion on Apples - Bayer - 2013

Trial ID: HP13USAMZT Protocol ID:
Location: WOOSTER, OH Study Director:
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	W Weed SETVI Jun-7-2013 CONTRO %	W Weed OXAST Jun-7-2013 CONTRO %	W Weed TRFRE Jun-7-2013 CONTRO %	W Weed PLAMA Jun-7-2013 CONTRO %	W Weed POLPY Jun-7-2013 CONTRO %	W Weed SENVU Jun-7-2013 CONTRO %	W Weed GGGAN Oct-3-2013 CONTRO %	W Weed OXAST Oct-3-2013 CONTRO %
	Pest Type										
	Pest Code										
	Rating Date										
	Rating Type										
	Rating Unit										
	Pest Stage Majority			13							
	Days After First/Last Applic.			38 38	38 38	38 38	38 38	38 38	38 38	156 156	156 156
	Trt-Eval Interval			38 DA-A	38 DA-A	38 DA-A	38 DA-A	38 DA-A	38 DA-A	156 DA-A	156 DA-A
1	Roundup Powermax	1	QT/A	0 c	30 b	23 c	98 a	75 a	98 a	8 b	13 b
	Rely 280	64	FL OZ/A								
	AMS	0.25	% V/V								
2	Alion	5	FL OZ/A	64 b	68 a	65 b	100 a	98 a	99 a	58 a	73 a
	Rely 280	64	FL OZ/A								
	Roundup Powermax	1	QT/A								
	AMS	0.25	% V/V								
3	Matrix	4	OZ WT/A	100 a	100 a	100 a	100 a	100 a	100 a	88 a	88 a
	Prowl H2O	4	QT/A								
	Rely 280	64	FL OZ/A								
	Roundup Powermax	1	QT/A								
	AMS	0.25	% V/V								
4	Chateau	12	OZ WT/A	100 a	100 a	100 a	100 a	100 a	100 a	90 a	93 a
	Prowl H2O	4	QT/A								
	Rely 280	64	FL OZ/A								
	Roundup Powermax	1	QT/A								
	AMS	0.25	% V/V								
5	Pindar gt	3	PT/A	100 a	100 a	100 a	100 a	100 a	100 a	63 a	70 a
	Rely 280	64	FL OZ/A								
	Roundup Powermax	1	QT/A								
	AMS	0.25	% V/V								
6	Goal 2xl	4	PT/A	100 a	100 a	100 a	100 a	100 a	100 a	88 a	68 a
	Prowl H2O	4	QT/A								
	Rely 280	64	FL OZ/A								
	Roundup Powermax	1	QT/A								
	AMS	0.25	% V/V								
7	Prowl H2O	4	QT/A	99 a	100 a	95 a	100 a	100 a	100 a	75 a	55 a
	Treevix	1	OZ WT/A								
	Rely 280	64	FL OZ/A								
	Roundup Powermax	1	QT/A								
	AMS	0.25	% V/V								
8	Untreated			0 c	0 c	0 d	0 b	0 b	0 b	0 b	0 b
	LSD (P=.05)			17.0	25.9	14.8	2.6	26.3	3.0	35.8	39.4
	Standard Deviation			11.6	17.6	10.1	1.8	17.8	2.0	24.3	26.8
	CV			16.45	23.58	13.87	2.03	21.23	2.31	41.65	46.84
	Grand Mean			70.31	74.69	72.81	87.19	84.06	87.03	58.44	57.19

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates = Yates (9)

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Trt No.	Treatment Name	Rate	Rate Unit	
	Pest Type			W Weed
	Pest Code			TRFRE
	Rating Date			Oct-3-2013
	Rating Type			CONTRO
	Rating Unit			%
	Pest Stage Majority			
	Days After First/Last Applic.			156 156
	Trt-Eval Interval			156 DA-A
1	Roundup Powermax	1	QT/A	18 bc
	Rely 280	64	FL OZ/A	
	AMS	0.25	% V/V	
2	Alion	5	FL OZ/A	68 a
	Rely 280	64	FL OZ/A	
	Roundup Powermax	1	QT/A	
	AMS	0.25	% V/V	
3	Matrix	4	OZ WT/A	83 a
	Prowl H2O	4	QT/A	
	Rely 280	64	FL OZ/A	
	Roundup Powermax	1	QT/A	
	AMS	0.25	% V/V	
4	Chateau	12	OZ WT/A	98 a
	Prowl H2O	4	QT/A	
	Rely 280	64	FL OZ/A	
	Roundup Powermax	1	QT/A	
	AMS	0.25	% V/V	
5	Pindar gt	3	PT/A	73 a
	Rely 280	64	FL OZ/A	
	Roundup Powermax	1	QT/A	
	AMS	0.25	% V/V	
6	Goal 2xl	4	PT/A	63 a
	Prowl H2O	4	QT/A	
	Rely 280	64	FL OZ/A	
	Roundup Powermax	1	QT/A	
	AMS	0.25	% V/V	
7	Prowl H2O	4	QT/A	48 ab
	Treevix	1	OZ WT/A	
	Rely 280	64	FL OZ/A	
	Roundup Powermax	1	QT/A	
	AMS	0.25	% V/V	
8	Untreated			0 c
	LSD (P=.05)			33.9
	Standard Deviation			23.0
	CV			41.08
	Grand Mean			55.95

The Ohio State University

Alion on Grapes - Bayer - 2013

Trial ID: HP13NARMZ1 Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Associate
Investigator: Dr. Douglas J. Doohan

Discipline: H herbicide
Trial Status: F one-year/final
Initiation Date: May-8-2013 **Planned Completion Date:** Nov-23-2013

Trial Location

City: Wooster **Country:** USA United States
State/Prov.: Ohio
Postal Code: 44691

Latitude of LL Corner °: 40.779762 N
Longitude of LL Corner °: 81.923947 W
Altitude of LL Corner, Unit: 1169.00 FT

Objectives:

Technical Questions

1. Describe the weed control from the Alion treatments compared to other treatments including the strengths and weaknesses.
2. What length of control did Alion provide (months)?
3. Please describe the crop tolerance observed in this trial.

Assessments:

A1: 30 days after application
A2: 90 days after application
A3: 150 days after application
A4: 270 days after application

Conclusions:

All treatments had similar weed control at 30 days after treatment, except the standard (Chateau) which showed comparatively reduced control of Virginia pepperweed. Phytotoxicity assessment was not recorded, however no damage to the vines in any plot was noted at subsequent observations.

At 96 days after treatment, all treatments showed similar control of Canada thistle (73-88%), Canada horseweed (63-95%) and Virginia pepperweed (3-30%). The Alion/Rely 280/Roundup WeatherMax treatment showed significantly greater control of the monocots (Yellow foxtail, Crabgrass and Perenial Ryegrass) as well as Dandelion and White clover than the other treatments. However, at this time, due to the high incidence of Virginia pepperweed and Yellow foxtail in all plots, an increased incidence of thistle and crabgrass in most plots, plots were mowed and no further assessments for weed control were taken.

The rate of efficacy of treatments was in this order 1) Alion/Rely 280/Roundup WeatherMax 2)Rely 280/Roundup WeatherMax and 3) Chateau.

There did not appear to be any phytotoxic effect on the grape vines or leaves.

Contacts

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Associate
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, Ohio
Postal Code: 44691

Investigator: Dr. Douglas J. Doohan

Crop Description

Crop 1: VITSS Vitis sp. Grape
Variety: Traminette **BBCH Scale:** BGRA

The Ohio State University

Alion on Grapes - Bayer - 2013

Trial ID: HP13NARMZ1 Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Pest Description

Pest 1 Type: W **Code:** POASS Poa sp.
Common Name: Bluegrass

Pest 2 Type: W **Code:** CAPBP Capsella bursa-pastoris
Common Name: Shepherd's purse

Pest 3 Type: W **Code:** LEPBO Lepidium bonariense
Common Name: Pepperweed

Pest 4 Type: W **Code:** ERICA Conyza canadensis
Common Name: Canada horseweed

Pest 5 Type: W **Code:** TRFRE Trifolium repens
Common Name: White clover

Pest 6 Type: W **Code:** CERVU Cerastium fontanum vulgare
Common Name: Mouse-ear chickweed

Site and Design

Treated Plot Width: 8 FT
Treated Plot Length: 18 FT
Treated Plot Area: 144 FT2 **Treatments:** 4
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Application Description

	A
Application Date:	May-8-2013
Appl. Start Time:	1300
Application Method:	SPRAY
Application Placement:	BROSOI
Air Temperature, Unit:	66.9 F
% Relative Humidity:	65.5
Wind Velocity, Unit:	4 MPH
Wind Direction:	NE
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	60.9 F

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	VITSS BGRA
Stage Scale Used:	BBCH
Stage Majority, Percent:	07 100

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Alion on Grapes - Bayer - 2013

Trial ID: HP13NARMZ1 Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	POASS W
Stage Majority, Percent:	07 100
Pest 2 Code, Type, Scale:	CAPBP W
Stage Majority, Percent:	10 100
Pest 3 Code, Type, Scale:	LEPBO W
Stage Majority, Percent:	10 100
Pest 4 Code, Type, Scale:	ERICA W
Stage Majority, Percent:	10 100
Pest 5 Code, Type, Scale:	TRFRE W
Stage Majority, Percent:	10 100
Pest 6 Code, Type, Scale:	CERVU W
Stage Majority, Percent:	12 100

Application Equipment

	A
Equipment Type:	BACCAI
Operation Pressure, Unit:	30 PSI
Nozzle Size:	8002
Nozzles/Row:	1
% Coverage:	100.0
Boom Height, Unit:	36 IN
Ground Speed, Unit:	2 MPH
Carrier:	WATER
Spray Volume, Unit:	25 gal/ac
Mix Size, Unit:	2 liters

The Ohio State University

Alion on Grapes - Bayer - 2013

Trial ID: HP13NARMZ1 Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1	2	3	4	5	6	7	8
	Pest Code				POASS	CAPBP	LEPBO	ERICA	TRFRE	CERVU	SETPU	CIRAR
	Crop Code				VITSS	VITSS	VITSS	VITSS	VITSS	VITSS	VITSS	VITSS
	BBCH Scale				BGRA	BGRA	BGRA	BGRA	BGRA	BGRA	BGRA	BGRA
	Rating Date				Jun-7-2013	Jun-7-2013	Jun-7-2013	Jun-7-2013	Jun-7-2013	Jun-7-2013	Aug-12-2013	Aug-12-2013
	Rating Type				CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit				0-100	0-100	0-100	0-100	0-100	0-100	0-100	0-100
	Days After First/Last Applic.				30 30	30 30	30 30	30 30	30 30	30 30	96 96	96 96
	Trt-Eval Interval				30 DA-A	30 DA-A	30 DA-A	30 DA-A	30 DA-A	30 DA-A	96 DA-A	96 DA-A
1	Untreated			A	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
2	Rely 280	64	fl oz/a	A	100.0 a	100.0 a	99.4 a	100.0 a	100.0 a	100.0 a	0.0 b	72.5 a
	roundup weathermax	1	qt/a	A								
	AMS	0.25	% v/v	A								
3	alion	5	fl oz/a	A	100.0 a	100.0	97.4 a	97.5 a	92.5 a	100.0	85.0 a	87.5 a
	rely 280	64	fl oz/a	A								
	roundup weathermax	1	qt/a	A								
	ams	0.25	% v/v	A								
4	chateau	12	oz wt/a	A	97.5	100.0 a	88.4 a	82.5 a	97.9 a	100.0 a	17.5 b	72.5 a
	LSD (P=.05)				0.00	0.00	12.78t	15.08	15.66t	0.00	28.74	57.56
	Standard Deviation				0.00	0.00	7.99t	9.43	9.79t	0.00	17.97	35.99
	CV				0.0	0.0	13.53	13.47	15.93	0.0	70.13	61.91

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Alion on Grapes - Bayer - 2013

Trial ID: HP13NARMZ1 Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	TRFRE VITSS BGRA Aug-12-2013 CONTRO 0-100 96 96 96 DA-A	ERICA VITSS BGRA Aug-12-2013 CONTRO 0-100 96 96 96 DA-A	LOLSS VITSS BGRA Aug-12-2013 CONTRO 0-100 96 96 96 DA-A	LEPBO VITSS BGRA Aug-12-2013 CONTRO 0-100 96 96 96 DA-A	DIGSS VITSS BGRA Aug-12-2013 CONTRO 0-100 96 96 96 DA-A	TARSS VITSS BGRA Aug-12-2013 CONTRO 0-100 96 96 96 DA-A
					9	10	11	12	13	14
1	Untreated			A	0.0 b	0.0 b	0.0 b	0.0 a	0.0 b	0.0 b
2	Rely 280	64	fl oz/a	A	40.0 b	65.0 a	14.6 b	2.0 a	0.0 b	25.0 b
	roundup weathermax	1	qt/a	A						
	AMS	0.25	% v/v	A						
3	alion	5	fl oz/a	A	97.5 a	95.0 a	98.7 a	6.8 a	25.2 a	72.5 a
	rely 280	64	fl oz/a	A						
	roundup weathermax	1	qt/a	A						
	ams	0.25	% v/v	A						
4	chateau	12	oz wt/a	A	17.5 b	62.5 a	38.5 b	0.8 a	0.8 b	25.0 b
LSD (P=.05)					32.54	37.72	41.42t	1.27t	0.84t	23.58
Standard Deviation					20.34	23.58	25.90t	0.79t	0.53t	14.74
CV					52.5	42.4	71.83	194.57	125.82	48.14

The Ohio State University

Alion on Grapes - Bayer - 2013

Trial ID: HP13NARMZ1 Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Pest Code
POASS, Poa sp., = US
CAPBP, Capsella bursa-pastoris, = US
LEPBO, Lepidium bonariense, = US
ERICA, Conyza canadensis, = US
TRFRE, Trifolium repens, = US
CERVU, Cerastium fontanum vulgare, = US
SETPU, Setaria pumila, = US
CIRAR, Cirsium arvense, = US
LOLSS, Lolium sp., = US
DIGSS, Digitaria sp., = US
TARSS, Taraxacum sp., = US
Crop Code
VITSS, BGRA, Vitis sp., = US
Rating Type
CONTRO = control / burndown or knockdown
Rating Unit
0-100 = 0-100 index/scale-percent

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2013/SWEET CORN/ANTHEM/ANTHEM ATZ/

Trial ID: FLUT.SCOR.13.JPR.03 Protocol ID: FLUT.SCOR.13.JPR.03
Location: Fremont, Ohio Study Director: Doug Doohan
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Associate
Investigator: Dr. Douglas J. Doohan

Discipline: H herbicide
Trial Status: F one-year/final **Trial Reliability:** Reliable
Initiation Date: Jun-19-2013 **Planned Completion Date:** Dec-31-2013

Trial Location

City: Fremont **Latitude of LL Corner °:** 41.35028 N
State/Prov.: Ohio **Longitude of LL Corner °:** 83.12194 W
Postal Code: 43420 **Altitude of LL Corner, Unit:** 636.00 FT
Country: USA United States

Objectives:

OBJECTIVE: Observe FMC herbicides in sweet corn weed control programs.

TREATMENTS: See Attached Treatment List

TIMING: There are two timings in this protocol:

A = APBCPR = At Plant Broadcast Pre-Emergence
B = EPOST = Post Emergence Broadcast, no later than V-4 when weeds are 2 to 4 inches tall.

PARAMETERS:

Weed Control Ratings taken 7, 14, 30, 60 and 90 days after sweet corn emergence for At-Plant Pre emergence Applications and again after Post emergence applications.

Sweet Corn Injury Ratings taken 14, and 30 days after crop emergence and then again after postemergence applications.

Conclusions:

All treatments provided good weed control, compared to the untreated check. This trial location experience an unusual abundance of rain during the growing period from June through July. Replicate 1 was severely stunted by water and was not used in this trial. The later part of summer saw a return to warm weather with normal rainfall. The crop performed well, although there was some stunting in some plots. Most of this damage is seen in plot 205, and this appeared to be not significant, and can be attributed to poor drainage in that area of the field.

Personnel

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Associate
Affiliation: OARDC/The Ohio State University
Address: 1680 Madison Ave.
Location: Wooster, Ohio
Postal Code: 44691
Investigator: Dr. Douglas J. Doohan

Cooperator/Landowner

Cooperator: Matt Hofelich **Role:** Manager
Organization: North Central Agricultural Research
Address 1: 1165 County Road 43
City: Fremont
State/Prov: OH
Postal Code: 43420

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Crop Description

Crop 1: ZEAMS Zea mays saccharata Sweet corn
Variety: SV90125D
BBCH Scale: BCOR **Planting Date:** Jun-19-2013
Planting Method: PLANTD planted
Row Spacing, Unit: 9 IN
Harvest Date: Sep-3-2013

Pest Description

Pest 1 Type: W **Code:** POROL Portulaca oleracea
Common Name: Common purslane

Site and Design

Plot Width, Unit: 5 FT
Plot Length, Unit: 25 FT
Plot Area, Unit: 125 FT2 **Tillage Type:** NOTILL no-till
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Field Prep./Maintenance:

Date	Description of Operation
10/11/2012	sprayed Roundup Powermax @ 32 oz/A to edges of soybean stubble
10/12/2012	Ripped with JD 6190R and Landol Ripper
4/9/2013	worked plot area with Landall Finish-all
5/6/2013	spread fertilizer 200 lbs / acre of 46-0-0, 150 lbs / acre of 10-52-0, 300 lbs / acre of 0-0-60, and 7 lbs / acre of 14% Boron, double spread
6/19/2013	planted trial with 4 row MonoStem planter 1 varietey from Seminis include: SV90125D Roundup Ready with an in row seed spacing of 9 inches

Soil Description

Description Name: Fremont
% Sand: 50 **% OM:** 2.5 **Texture:** FSL fine sandy loam
% Silt: 40 **pH:** 7 **Soil Name:** Kibble
% Clay: 10 **CEC:** 9.3 **Fert. Level:** G good

Moisture and Weather Conditions

Overall Moisture Conditions: VERWET very wet

Application Description

	A	B
Application Date:	Jun-19-2013	Jul-8-2013
Application Method:	SPRAY	SPRAY
Application Timing:	ATPLAN	POEMCR
Application Placement:	BROADC	BROADC
Air Temperature, Unit:	66.3 F	73.4 F
% Relative Humidity:	74.14	88
Wind Velocity, Unit:	0 MPH	4.98 MPH
Wind Direction:		S
Dew Presence (Y/N):	N no	N no
Soil Temperature, Unit:	64.5 F	72.8 F
Soil Moisture:	NORMAL	NORMAL

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale:	ZEAMS BCOR	ZEAMS BCOR
Stage Scale Used:	BBCH	BBCH
Stage Majority, Percent:	00	15

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Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale:	POROL W	POROL W
Stage Majority, Percent:	11 100	14 100

Application Equipment

	A	B
Equipment Type:	BACCAI	BACCAI
Operation Pressure, Unit:	30 PSI	30 PSI
Nozzle Size:	8002	8002
Nozzle Spacing, Unit:	16 IN	16 IN
Nozzles/Row:	4	4
Boom Height, Unit:	36 IN	36 IN
Ground Speed, Unit:	2 MPH	2 MPH
Carrier:	WATER	WATER
Mix Size, Unit:	2 liters	2 liters

The Ohio State University

2013/SWEET CORN/ANTHEM/ANTHEM ATZ/

Trial ID: FLUT.SCOR.13.JPR.03 Protocol ID: FLUT.SCOR.13.JPR.03
Location: Fremont, Ohio Study Director: Doug Doohan
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit								
Pest Type					W Weed			W Weed			
Pest Code					POROL			POROL			
Pest Scientific Name					Portulaca oleracea			Portulaca oleracea			
Pest Name					Common purslane			Common purslane			
Crop Code				ZEAMS		ZEAMS			ZEAMS		
BBCH Scale				BCOR		BCOR			BCOR		
Crop Scientific Name				Zea mays saccharata		Zea mays saccharata			Zea mays saccharata		
Crop Name				Sweet corn		Sweet corn			Sweet corn		
Part Rated				PLANT -		PLANT -					
Rating Date				Jul-18-2013	Jul-18-2013	Aug-14-2013		Aug-14-2013	Sep-9-2013		
Rating Type				DAMAGE	CONTRO	DAMAGE		CONTRO	MRKTBLE		
Rating Unit				0-100	%	0-100		%	NUMBER		
Sample Size, Unit				1 PLOT	1 PLOT	1 PLOT		1 PL	1 EAR		
Days After First/Last Applic.				29 10	29 10	56 37		56 37	82 63		
Trt-Eval Interval				29 DA-A	29 DA-A	37 DA-B		37 DA-B	63 DA-B		
1	UNTREATED			0 b	0 b	0 a		0 b	31 a		
2	ANTHEM ATZ	32	OZ/A	0 b	97 a	23 a		92 a	27 a		
3	ANTHEM	8	OZ/A	0 b	67 a	0 a		90 a	27 a		
	AATREX	32	OZ/A								
	COC	1	% V/V								
4	DUAL II MAGNUM	1.2	PT/A	3 ab	82 a	0 a		70 a	31 a		
	CADET	0.6	OZ/A								
	COC	1	% V/V								
5	DUAL II MAGNUM	1.2	PT/A	5 a	98 a	0 a		57 a	31 a		
	CADET	0.6	OZ/A								
	AATREX	32	OZ/A								
	COC	1	% V/V								
LSD (P=.05)				2.7	51.9	34.0		46.3	4.4		
Standard Deviation				1.4	27.6	18.1		24.6	2.3		
CV				82.81	40.13	387.3		39.89	7.95		
Grand Mean				1.67	68.67	4.67		61.67	29.4		
Bartlett's X2				0.0	15.385	0.0		5.761	4.577		
P(Bartlett's X2)				.	0.002*	.		0.124	0.333		
Friedman's X2				6.667	7.267	0.667		6.467	6.867		
P(Friedman's X2)				0.155	0.122	0.955		0.167	0.143		

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates = Average (1)

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Pest Type			
Pest Code			
Pest Scientific Name			
Pest Name			
Crop Code			ZEAMS
BBCH Scale			BCOR
Crop Scientific Name			Zea mays saccharata
Crop Name			Sweet corn
Part Rated			
Rating Date			Sep-9-2013
Rating Type			UNMRKTBLE
Rating Unit			NUMBER
Sample Size, Unit			1 EAR
Days After First/Last Applic.			82 63
Trt-Eval Interval			63 DA-B
Trt No.	Treatment Name	Rate Rate Unit	
1	UNTREATED		4 a
2	ANTHEM ATZ	32 OZ/A	1 a
3	ANTHEM	8 OZ/A	2 a
	AATREX	32 OZ/A	
	COC	1 % V/V	
4	DUAL II MAGNUM	1.2 PT/A	3 a
	CADET	0.6 OZ/A	
	COC	1 % V/V	
5	DUAL II MAGNUM	1.2 PT/A	1 a
	CADET	0.6 OZ/A	
	AATREX	32 OZ/A	
	COC	1 % V/V	
LSD (P=.05)			3.4
Standard Deviation			1.8
CV			81.52
Grand Mean			2.2
Bartlett's X2			3.592
P(Bartlett's X2)			0.464
Friedman's X2			6.533
P(Friedman's X2)			0.163

The Ohio State University

2013/APPLES/SPARTAN/TANKMIXES/RESISTANCE MANAGEMENT

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan **Title:** Professor
Investigator: Dr. Douglas J. Doohan **Title:** Professor

Discipline: H herbicide
Trial Status: I one-year/interim **Trial Reliability:** Reliable

Trial Location

City: Wooster **Country:** USA United States
State/Prov.: Ohio
Postal Code: 44691

Latitude of LL Corner °: 40.779762 N
Longitude of LL Corner °: 81.923947 W USAOH 42.3271331 - 38.4034194
Altitude of LL Corner, Unit: 1092.00 FT -80.5184478 - -84.8203125

Objectives:
OBJECTIVES: Observe various sulfentrazone + carfentrazone tankmixes for weed control in apples.

TARGETS: Grasses, Broadleaves such as lambsquarters, marestail, morninigglories, mugwhort, poison ivy and others as well as yellow nutsedge.

PARAMETERS: Use the appropriate weed control rating timimng and note any phytotoxicity.

Contacts

Study Director: Doug Doohan **Title:** Professor
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, OH
Postal Code: 44691

Investigator: Dr. Douglas J. Doohan **Title:** Professor

Crop Description

Crop 1: MABSS Malus sp. Apple
BBCH Scale: BDIC

Site and Design

Treated Plot Width: 10 FT **Site Type:** ORCHAR orchard
Treated Plot Length: 20 FT **Experimental Unit:** 2 TREE tree
Treated Plot Area: 200 FT2 **Treatments:** 5
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Field Prep./Maintenance:
Trial was maintained by the OARDC Hort and Crop Science Manager as outlined in 2011 OSU Treee Fruit Spray Guide.

Soil Description

Description Name: Unit 2 HCS OARDC
% Sand: 11 **% OM:** 3.0 **Texture:** SIL silt loam
% Silt: 75 **pH:** 6.99 **Soil Name:** WOOSTER SILT LOAM
% Clay: 14 **CEC:** 8.3 **Fert. Level:** G good
Soil Drainage: G good

The Ohio State University

2013/APPLES/SPARTAN/TANKMIXES/RESISTANCE MANAGEMENT

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Application Description

	A	B
Application Date:	Apr-26-2013	
Appl. Start Time:	1200	
Application Method:	SPRAY	
Application Timing:	APRIL	
Application Placement:	BROADC	
Air Temperature, Unit:	51.3 F	
% Relative Humidity:	49.97	
Wind Velocity, Unit:	4.5 MPH	
Wind Direction:	ESE	
Dew Presence (Y/N):	N no	
Soil Temperature, Unit:	47.3 F	
Next Moisture Occurred On:	Apr-27-2013	

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale:	MABSS BDIC	MABSS BDIC

Application Equipment

	A	B
Appl. Equipment:	SPRAY	
Equipment Type:	BACKPK	
Operation Pressure, Unit:	40 PSI	
Nozzle Type:	FLATFAN	
Nozzle Size:	8001 VS	
Nozzle Spacing, Unit:	15 IN	
Nozzles/Row:	4	
Band Width, Unit:	60 IN	
Boom Height, Unit:	18 IN	
Ground Speed, Unit:	3.3 MPH	
Carrier:	WATER	
Spray Volume, Unit:	10 GPA	
Mix Size, Unit:	1 liters	
Propellant:	CO2	

The Ohio State University

2013/APPLES/SPARTAN/TANKMIXES/RESISTANCE MANAGEMENT

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1	2	3	4	5	6
	Pest Type					W Weed	W Weed	W Weed	W Weed	W Weed
	Pest Code					CHEAL	TRFRE	TARSS	SOLPT	AMACH
	Pest Scientific Name					Chenopodium al>	Trifolium repe>	Taraxacum sp.	Solanum ptycan>	Amaranthus hyb>
	Pest Name					Common lambsqu>	White clover	Dandelion	Eastern black >	Smooth pigweed
	Crop Code				MABSS					
	BBCH Scale				BDIC					
	Crop Scientific Name				Malus sp.					
	Crop Name				Apple					
	Part Rated				PLANT C					
	Rating Date				May-30-2013	May-30-2013	May-30-2013	May-30-2013	May-30-2013	May-30-2013
	Rating Type					PERCEN	PERCEN	PERCEN	PERCEN	PERCEN
	Rating Unit				PHYGEN	0-100	0-100	0-100	0-100	0-100
	Days After First/Last Applic.				34 34	34 34	34 34	34 34	34 34	34 34
	Trt-Eval Interval				34 DA-A	34 DA-A	34 DA-A	34 DA-A	34 DA-A	34 DA-A
1	SPARTAN CHARGE	10	oz/a	A	7.0 a	.		90.0 a	.	
	SINBAR	16	oz/a	A						
	ROUNDUP POWERMAX	22	oz/a	A						
	AMS	2.5	% v/v	A						
2	SPARTAN CHARGE	10	oz/a	A	12.9 a	100.0	100.0 a	95.0 a	100.0	95.0 a
	ALION	5	oz/a	A						
	ROUNDUP POWERMAX	22	oz/a	A						
	AMS	2.5	% v/v	A						
3	SPARTAN CHARGE	6	oz/a	A	5.5 a	.			.	
	KARMEX	3.8	lb/a	A						
	ROUNDUP POWERMAX	22	oz/a	A						
	AMMONIUM SULFATE	2.5	% v/v	A						
	SPARTAN CHARGE	6	oz/a	B						
	MATRIX	1	oz/a	B						
	NIS	0.25	% v/v	B						
4	SPARTAN CHARGE	6	oz/a	A	0.3 a	.	92.5 a		.	
	ALION	5	oz/a	A						
	ROUNDUP POWERMAX	22	oz/a	A						
	AMMONIUM SULFATE	2.5	% v/v	A						
	SPARTAN CHARGE	6	oz/a	B						
	SANDEA	1	oz/a	B						
	NIS	0.25	% v/v	B						
5	Untreated Check				0.6 a	0.0	0.0 b	0.0 b	0.0	0.0 b
	LSD (P=.05)				13.78t	.	25.94	51.87	.	44.92
	Standard Deviation				8.94t	.	2.89	5.77	.	5.00
	CV				77.44	.	4.5	9.36	.	10.53
	Replicate F				1.395		0.167	0.167		0.333
	Replicate Prob(F)				0.2919		0.9083	0.9083		0.8183
	Treatment F				2.821		1489.000	343.000		722.000
	Treatment Prob(F)				0.0732		0.0183	0.0382		0.0237

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns:Yates=12,15,16; Average=3,4,6

The Ohio State University

2013/APPLES/SPARTAN/TANKMIXES/RESISTANCE MANAGEMENT

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	7	8	9	10	11	12
	Pest Type				W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
	Pest Code				GGGAN	CIRAR	AMBEL	GGGAN	TRFRE	TARSS
	Pest Scientific Name				Annual grasses	Cirsium arvense	Ambrosia artem>	Annual grasses	Trifolium repe>	Taraxacum sp.
	Pest Name				Annual grasses	Canada thistle	Common ragweed	Annual grasses	White clover	Dandelion
	Crop Code									
	BBCH Scale									
	Crop Scientific Name									
	Crop Name									
	Part Rated									
	Rating Date				May-30-2013	May-30-2013	May-30-2013	Oct-4-2013	Oct-4-2013	Oct-4-2013
	Rating Type				PERCEN	PERCEN	PERCEN	PERCEN	PERCEN	PERCEN
	Rating Unit				0-100	0-100	0-100	0-100	0-100	0-100
	Days After First/Last Applic.				34 34	34 34	34 34	161 161	161 161	161 161
	Trt-Eval Interval				34 DA-A	34 DA-A	34 DA-A	161 DA-A	161 DA-A	161 DA-A
1	SPARTAN CHARGE	10	oz/a	A		.	.	35.0	25.0 bc	37.0 b
	SINBAR	16	oz/a	A						
	ROUNDUP POWERMAX	22	oz/a	A						
	AMS	2.5	% v/v	A						
2	SPARTAN CHARGE	10	oz/a	A	100.0	90.0	100.0	85.0 a	82.5 a	85.4 a
	ALION	5	oz/a	A						
	ROUNDUP POWERMAX	22	oz/a	A						
	AMS	2.5	% v/v	A						
3	SPARTAN CHARGE	6	oz/a	A		.	.	70.0 a	82.5 a	90.6 a
	KARMEX	3.8	lb/a	A						
	ROUNDUP POWERMAX	22	oz/a	A						
	AMMONIUM SULFATE	2.5	% v/v	A						
	SPARTAN CHARGE	6	oz/a	B						
	MATRIX	1	oz/a	B						
	NIS	0.25	% v/v	B						
4	SPARTAN CHARGE	6	oz/a	A	90.0	.	.	85.0 a	52.5 ab	96.2 a
	ALION	5	oz/a	A						
	ROUNDUP POWERMAX	22	oz/a	A						
	AMMONIUM SULFATE	2.5	% v/v	A						
	SPARTAN CHARGE	6	oz/a	B						
	SANDEA	1	oz/a	B						
	NIS	0.25	% v/v	B						
5	Untreated Check				0.0	0.0	0.0	0.0 b	0.0 c	0.0 c
	LSD (P=.05)				.	.	.	18.47	38.44	26.77t
	Standard Deviation				.	.	.	11.55	24.95	17.20t
	CV				.	.	.	19.25	51.44	33.61
	Replicate F							2.500	2.386	0.620
	Replicate Prob(F)							0.1255	0.1202	0.6164
	Treatment F							49.500	8.406	14.450
	Treatment Prob(F)							0.0001	0.0018	0.0002

The Ohio State University

2013/APPLES/SPARTAN/TANKMIXES/RESISTANCE MANAGEMENT

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	W Weed PLAMA Plantago major Broadleaf plan> 13	W Weed CHEAL Chenopodium al> Common lambsqu> 14	W Weed SOLPT Solanum ptycan> Eastern black > 15	W Weed AMAAL Amaranthus alb> Tumbleweed ama> 16
	Pest Type				W Weed	W Weed	W Weed	W Weed
	Pest Code				PLAMA	CHEAL	SOLPT	AMAAL
	Pest Scientific Name				Plantago major	Chenopodium al>	Solanum ptycan>	Amaranthus alb>
	Pest Name				Broadleaf plan>	Common lambsqu>	Eastern black >	Tumbleweed ama>
	Crop Code							
	BBCH Scale							
	Crop Scientific Name							
	Crop Name							
	Part Rated							
	Rating Date				Oct-4-2013	Oct-4-2013	Oct-4-2013	Oct-4-2013
	Rating Type				PERCEN	PERCEN	PERCEN	PERCEN
	Rating Unit				0-100	0-100	0-100	0-100
	Days After First/Last Applic.				161 161	161 161	161 161	161 161
	Trt-Eval Interval				161 DA-A	161 DA-A	161 DA-A	161 DA-A
1	SPARTAN CHARGE	10	oz/a	A	39.5 b	42.5 b	100.0 a	18.5 b
	SINBAR	16	oz/a	A				
	ROUNDUP POWERMAX	22	oz/a	A				
	AMS	2.5	% v/v	A				
2	SPARTAN CHARGE	10	oz/a	A	97.4 a	100.0 a	100.0 a	97.4 a
	ALION	5	oz/a	A				
	ROUNDUP POWERMAX	22	oz/a	A				
	AMS	2.5	% v/v	A				
3	SPARTAN CHARGE	6	oz/a	A	61.5 b	87.5 a	83.3 a	30.9 b
	KARMEX	3.8	lb/a	A				
	ROUNDUP POWERMAX	22	oz/a	A				
	AMMONIUM SULFATE	2.5	% v/v	A				
	SPARTAN CHARGE	6	oz/a	B				
	MATRIX	1	oz/a	B				
	NIS	0.25	% v/v	B				
4	SPARTAN CHARGE	6	oz/a	A	98.7 a	95.0 a	100.0 a	99.1 a
	ALION	5	oz/a	A				
	ROUNDUP POWERMAX	22	oz/a	A				
	AMMONIUM SULFATE	2.5	% v/v	A				
	SPARTAN CHARGE	6	oz/a	B				
	SANDEA	1	oz/a	B				
	NIS	0.25	% v/v	B				
5	Untreated Check				0.0 c	0.0 c	0.0 b	0.0 b
	LSD (P=.05)				20.15t	32.53	18.19	32.96t
	Standard Deviation				13.08t	21.11	11.55	21.18t
	CV				25.67	32.48	15.06	47.19
	Replicate F				2.462	1.869	0.833	0.069
	Replicate Prob(F)				0.1127	0.1886	0.5056	0.9751
	Treatment F				27.377	16.514	56.665	11.970
	Treatment Prob(F)				0.0001	0.0001	0.0001	0.0005

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2013/APPLES/SPARTAN/TANKMIXES/RESISTANCE MANAGEMENT

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Pest Type
W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop
Pest Code
CHEAL, Chenopodium album, = US
TRFRE, Trifolium repens, = US
TARSS, Taraxacum sp., = US
SOLPT, Solanum ptycanthum, = US
AMACH, Amaranthus hybridus, = US
GGGAN, Annual grasses, = US
CIRAR, Cirsium arvense, = US
AMBEL, Ambrosia artemisiifolia, = US
PLAMA, Plantago major, = US
AMAAL, Amaranthus albus, = US
Crop Code
MABSS, BDIC, Malus sp., = US
Part Rated
PLANT = plant
C = Crop is Part Rated
Rating Type
PERCEN = percent
Rating Unit
0-100 = 0-100 index/scale-percent

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Bicyclopyrone evaluation for tolerance in minor crops

Trial ID: HBI960A3-2013US Protocol ID: HBI960A3-2013US
Location: Study Director:
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

General Trial Information

Study Director: Rick Edwards/ Yin Chen **Title:** Research Associate/PhD Student
Investigator: Dr. Douglas J. Doohan

Discipline: H herbicide
Trial Status: F one-year/final
Initiation Date: Aug-19-2013

Trial Location

City: Willard **Latitude of LL Corner °:** 41.0049 N
State/Prov.: Ohio **Longitude of LL Corner °:** 82.7307 W
Postal Code: 44890
Country: USA United States

Objectives:

On potential minor crops for a bicyclopyrone label,
1. Determine if crop has acceptable tolerance to bicyclopyrone when applied PRE, POST, or POST Directed.
2. Evaluate weed control from bicyclopyrone.
3. Compare performance (weed control and crop injury) to a local standard.

Conclusions:

At 16 days after treatment A (PRE emergent) those plots that were treated at this time all showed significantly better weed control compared to the non-treated checks. There was no damage noted to any of the crops. At that time, the POST treatment plots were not evaluated as they had not received an application. At 7 days after treatments B/C (POST/POSTdirected) there was significant crop damage noted on all plots treated with both rates of A16003 as a broadcast POST emergent application. The POST directed and PRE emergent treatments showed no crop damage. The weed control of A16003 was significantly better in the POST and POST directed treatments plots compared to the pre-emergent and non treated check plots.
At 14 days after treatment B/C (POST/ POST directed) there was still significant damage seen in all crops which received the POST application. There also was some damage noted on the POST directed as well as the PRE emergent treated plots in radish. Statistically there was no difference in any of the treated or un-treated plots for damage in radish. However, it can be seen that there is a diminishing amount of damage seen between the POST broadcast treatments to the POST directed and the PRE treated plots. Weed control at the 14 Day after treatment B/C was still effective forthe POST and POST directed plots, while there was little or no control in the PRE plots.
At 28 Days after treatment B/C the trend continued showing that the POST broadcast treatment had the most damage to the crops. The POST directed and PRE treatments showed very little damage to crops. The weed control in the POST directed plots at this time was statistically better than the POST and the PRE treated plots.

Personnel

Study Director: Rick Edwards/ Yin Chen **Title:** Research Associate/PhD Student
Affiliation: OARDC/The Ohio State University
Address: 1680 Madison Ave
Location: Wooster
Postal Code: 44691
Investigator: Dr. Douglas J. Doohan
Affiliation: OARDC/The Ohio State University

Cooperator/Landowner

Cooperator: Robert Filburn **Role:** Farm Manager
Organization: OARDC/Muck Crops
City: Willard
State/Prov: OH

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Crop Description

Crop 1: ALLPO Allium porrum Common leek
Variety: New Belt
BBCH Scale: BVBT **Planting Date:** Aug-19-2013
Planting Method: SEEDED seeded
Row Spacing, Unit: 16 IN
Seed Bed: VERFIN very fine
Emergence Date: Aug-29-2014

Crop 2: AFEGR Anethum graveolens Dill
Variety: Dukat
BBCH Scale: BDIC **Planting Date:** Aug-19-2013
Planting Method: SEEDED seeded
Row Spacing, Unit: 16 IN
Emergence Date: Aug-29-2013

Crop 3: PAVSA Pastinaca sativa Parsnip
Variety: Lancer
BBCH Scale: BDIC **Planting Date:** Aug-19-2013
Row Spacing, Unit: 16 IN
Seed Bed: VERFIN very fine
Emergence Date: Aug-30-2013

Crop 4: RAPSN Raphanus sativus var. niger Garden radish
Variety: Crimson Giant
BBCH Scale: BVRT **Planting Date:** Aug-19-2013
Row Spacing, Unit: 16 IN
Emergence Date: Aug-23-2013

Crop 5: DAUCS Daucus carota subsp. sativus Garden carrot
Variety: Scarlet Nantes
BBCH Scale: BVRT **Planting Date:** Aug-19-2013
Row Spacing, Unit: 16 IN
Emergence Date: Aug-29-2013

Crop 6: ALLXS Allium cepa (direct-seeded) Direct seeded onion
Variety: Tokyo Long
BBCH Scale: BVBT **Planting Date:** Aug-19-2013
Row Spacing, Unit: 16 IN
Emergence Date: Aug-29-2013

Pest Description

Pest 1 Type: W **Code:** POROL Portulaca oleracea
Common Name: Common purslane

Pest 2 Type: W **Code:** AMACH Amaranthus hybridus
Common Name: Smooth pigweed

Pest 3 Type: W **Code:** ABUTH Abutilon theophrasti
Common Name: velvetleaf

Site and Design

Plot Width, Unit: 20 FT **Site Type:** FIELD field
Plot Length, Unit: 7.5 FT **Experimental Unit:** 1 PLOT plot
Plot Area, Unit: 150 FT2
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block

Maintenance

No.	Date	Maintenance Treatment Name	Rate	Rate Unit
1.	Aug-19-2013	Diazinon	1.5	QT/A

Comment: Applied to onion rows

Field Prep./Maintenance:
Field was planted in sweet corn on 5/16/2013. The corn was cut down and residue was plowed on 8/15/2013. On 8/16 and 8/18/2013 field was disked and beds were formed. This trial was planted on 8/19/2013. On 8/26/2013 the trial was irrigated for 1 hour at 0.75 inch.

Moisture and Weather Conditions

Overall Moisture Conditions: SLIWET slightly wet

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Application Description

	A	B	C
Application Date:	Aug-21-2013	Sep-6-2013	Sep-6-2013
Time of Day:	1300	1300	
Application Method:	SPRAY	SPRAY	SPRAY
Application Timing:	PREMCR	POEMCR	POEMCR
Application Placement:	BROADC	BROADC	BRODIR
Applied By:	R. Edwards	R. Edwards	Yin Chen
Air Temperature, Unit:	86 F	70.8 F	70.8 F
% Relative Humidity:		45	45
Wind Velocity, Unit:	9 MPH	3 MPH	3 MPH
Wind Direction:	SSE	SSE	SSE
Dew Presence (Y/N):	N no	N no	N no
Soil Temperature, Unit:		81 F	81 F
Soil Moisture:	SLIWET	SLIDRY	SLIDRY
Next Rain Occurred On:	Aug-23-2013	Sep-12-2013	Sep-12-2013

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale:	ALLPO BVBT	ALLPO BVBT	ALLPO BVBT
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	00 100	11 80	11 80
Crop 2 Code, BBCH Scale:	AFEGR BDIC	AFEGR BDIC	AFEGR BDIC
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	00 100	11 80	11 80
Crop 3 Code, BBCH Scale:	PAVSA BDIC	PAVSA BDIC	PAVSA BDIC
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	00 100	11 80	11 80
Crop 4 Code, BBCH Scale:	RAPSN BVRT	RAPSN BVRT	RAPSN BVRT
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	00 100	11 80	11 80
Crop 5 Code, BBCH Scale:	DAUCS BVRT	DAUCS BVRT	DAUCS BVRT
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	00 100	11 80	11 80
Crop 6 Code, BBCH Scale:	ALLXS BVBT	ALLXS BVBT	ALLXS BVBT
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	00 100	11 80	11 80

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale:	POROL W	POROL W	POROL W
Stage Majority, Percent:	00 100	11 80	11 80
Pest 2 Code, Type, Scale:	AMACH W	AMACH W	AMACH W
Stage Majority, Percent:	00 100	11 80	11 80
Pest 3 Code, Type, Scale:	ABUTH W	ABUTH W	ABUTH W
Stage Majority, Percent:	00 100	11 80	11 80

Application Equipment

	A	B	C
Equipment Type:	BACCAI	BACCAI	BACCAI
Operation Pressure, Unit:	30 PSI	30 PSI	30 PSI
Nozzle Size:	8002	8002	8002
Nozzle Spacing, Unit:	16 IN	16 IN	
Nozzles/Row:	4	4	1
Boom Height, Unit:	36 IN	36 IN	
Ground Speed, Unit:	2 MPH	2 MPH	
Carrier:	WATER	WATER	WATER
Mix Size, Unit:	2 liters	2 liters	2 liters

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Trt No	Treatment Application Comment
6	PLOT 404 was misapplied. Will not be evaluated.

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Bicyclopyrone evaluation for tolerance in minor crops

Trial ID: HBI960A3-2013US Protocol ID: HBI960A3-2013US
Location: Study Director:
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	AFEGR	PAVSA	RAPSN	DAUCS
	Pest Type						
	Pest Code						
	Crop Code			AFEGR	PAVSA	RAPSN	DAUCS
	BBCH Scale			BDIC	BDIC	BVRT	BVRT
	Crop Scientific Name			Anethum graveolens	Pastinaca sativa	Raphanus sativus var. niger	Daucus carota subsp. sativus
	Rating Date			Sep-13-2013	Sep-13-2013	Sep-13-2013	Sep-13-2013
	Rating Type			PHYGEN	PHYGEN	PHYGEN	PHYGEN
	Rating Unit			%	%	%	%
	Days After First/Last Applic.			23 7	23 7	23 7	23 7
	Trt-Eval Interval			7 DA-B	7 DA-B	7 DA-B	7 DA-B
1				0 b	0 b	0 b	0 b
2	A16003	37.5	g AI/ha	0 b	0 b	0 b	0 b
3	A16003	50.0	g AI/ha	0 b	0 b	0 b	0 b
4	A16003	37.5	g AI/ha	66 a	93 a	53 a	94 a
	NIS	0.25	% V/V				
5	A16003	50.0	g AI/ha	69 a	90 a	50 a	95 a
	NIS	0.25	% V/V				
6	A16003	37.5	g AI/ha	0 b	0 b	4 b	0 b
	NIS	0.25	% V/V				
7	A16003	50.0	g AI/ha	0 b	0 b	4 b	1 b
	NIS	0.25	% V/V				
8	Dual EC	1.0	L/ha	0 b	0 b	0 b	0 b
	LSD (P=.05)			9.1	5.1	7.7	6.3
	Standard Deviation			6.1	3.5	5.2	4.3
	CV			36.25	15.13	37.82	18.04
	Grand Mean			16.93	22.86	13.78	23.78

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates = Yates (1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28)

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Trt No.	Treatment Name	Rate	Rate Unit								
Pest Type					W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code					POROL	AMACH	ABUTH	POROL	AMACH	ABUTH	
Crop Code				ALLXS							
BBCH Scale				BVBT							
Crop Scientific Name				Allium cepa (direct-seeded)							
Rating Date				Sep-13-2013	Sep-6-2013	Sep-6-2013	Sep-6-2013	Sep-13-2013	Sep-13-2013	Sep-13-2013	
Rating Type				PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	
Rating Unit				%	%	%	%	%	%	%	
Days After First/Last Applic.				23 7	16 16	16 16	16 16	23 7	23 7	23 7	
Trt-Eval Interval				7 DA-B	16 DA-A	16 DA-A	16 DA-A	7 DA-B	7 DA-B	7 DA-B	
1				0 b	0 b	0 b	0 b	0 b	0 c	0 b	
2	A16003	37.5	g AI/ha	0 b	46 a	46 a	100 a	0 b	0 c	0 b	
3	A16003	50.0	g AI/ha	0 b	45 a	36 a	95 a	6 b	6 bc	6 b	
4	A16003	37.5	g AI/ha	58 a				75 a	83 a	78 a	
	NIS	0.25	% V/V								
5	A16003	50.0	g AI/ha	46 a				71 a	71 a	64 a	
	NIS	0.25	% V/V								
6	A16003	37.5	g AI/ha	0 b				74 a	73 a	63 a	
	NIS	0.25	% V/V								
7	A16003	50.0	g AI/ha	0 b				91 a	91 a	84 a	
	NIS	0.25	% V/V								
8	Dual EC	1.0	L/ha	0 b	76 a	78 a	100 a	19 b	21 b	15 b	
LSD (P=.05)				17.3	26.5	34.3	4.6	17.4	15.3	27.8	
Standard Deviation				11.7	16.6	21.5	2.9	11.8	10.4	18.9	
CV				90.38	39.55	53.68	3.91	28.0	24.0	48.89	
Grand Mean				12.97	41.88	40.0	73.75	42.11	43.21	38.6	

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Pest Type						
Pest Code						
Crop Code		ALLPO	AFEGR	PAVSA	RAPSN	DAUCS
BBCH Scale		BVBT	BDIC	BDIC	BVRT	BVRT
Crop Scientific Name		Allium porrum	Anethum graveolens	Pastinaca sativa	Raphanus sativus var. niger	Daucus carota subsp. sativus
Rating Date		Sep-20-2013	Sep-20-2013	Sep-20-2013	Sep-20-2013	Sep-20-2013
Rating Type		PHYGEN	PHYGEN	PHYGEN	PHYGEN	PHYGEN
Rating Unit		%	%	%	%	%
Days After First/Last Applic.		30 14	30 14	30 14	30 14	30 14
Trt-Eval Interval		14 DA-C	14 DA-C	14 DA-C	14 DA-C	14 DA-C
Trt No.	Treatment Name / Rate	Rate Unit					
1			0 c	0 b	0 c	0 a	0 b
2	A16003	37.5 g AI/ha	0 c	0 b	0 c	3 a	0 b
3	A16003	50.0 g AI/ha	0 c	0 b	0 c	18 a	0 b
4	A16003	37.5 g AI/ha	90 a	78 a	100 a	60 a	95 a
	NIS	0.25 % V/V					
5	A16003	50.0 g AI/ha	80 b	76 a	85 b	55 a	95 a
	NIS	0.25 % V/V					
6	A16003	37.5 g AI/ha	0 c	1 b	1 c	13 a	0 b
	NIS	0.25 % V/V					
7	A16003	50.0 g AI/ha	3 c	0 b	0 c	23 a	0 b
	NIS	0.25 % V/V					
8	Dual EC	1.0 L/ha	0 c	0 b	0 c	0 a	0 b
LSD (P=.05)			7.8	11.9	12.7	45.8	6.4
Standard Deviation			5.3	8.0	8.6	31.2	4.3
CV			24.66	41.72	37.08	146.69	18.23
Grand Mean			21.56	19.29	23.21	21.25	23.75

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Trt No.	Treatment Name	Rate	Rate Unit						
Pest Type					W Weed	W Weed	W Weed		
Pest Code					POROL	AMACH	ABUTH		
Crop Code				ALLXS				ALLPO	AFEGR
BBCH Scale				BVBT				BVBT	BDIC
Crop Scientific Name				Allium cepa (direct-seeded)				Allium porrum	Anethum graveolens
Rating Date				Sep-20-2013	Sep-20-2013	Sep-20-2013	Sep-20-2013	Oct-4-2013	Oct-4-2013
Rating Type				PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN	PHYGEN
Rating Unit				%	%	%	%		
Days After First/Last Applic.				30 14	30 14	30 14	30 14	44 28	44 28
Trt-Eval Interval				14 DA-C	14 DA-C	14 DA-C	14 DA-C	28 DA-C	28 DA-C
1				0 b	0 c	0 b	0 b	0 b	0 a
2	A16003	37.5	g AI/ha	0 b	0 c	0 b	0 b	0 b	25 a
3	A16003	50.0	g AI/ha	0 b	3 c	3 b	3 b	0 b	8 a
4	A16003	37.5	g AI/ha	48 a	81 b	65 a	88 a	49 a	45 a
	NIS	0.25	% V/V						
5	A16003	50.0	g AI/ha	45 a	76 b	76 a	76 a	45 ab	64 a
	NIS	0.25	% V/V						
6	A16003	37.5	g AI/ha	0 b	80 b	81 a	77 a	0 b	-2 a
	NIS	0.25	% V/V						
7	A16003	50.0	g AI/ha	0 b	93 a	96 a	85 a	0 b	0 a
	NIS	0.25	% V/V						
8	Dual EC	1.0	L/ha	0 b	0 c	0 b	0 b	0 b	11 a
LSD (P=.05)				8.5	9.2	25.1	20.2	30.0	42.3
Standard Deviation				5.8	6.2	17.0	13.7	20.3	28.6
CV				49.65	15.0	42.44	33.32	173.88	152.29
Grand Mean				11.61	41.58	40.09	41.04	11.7	18.81

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Trt No.	Treatment Name	Rate	Rate Unit					
Pest Type								W Weed
Pest Code								POROL
Crop Code				PAVSA	RAPSN	DAUCS	ALLXS	
BBCH Scale				BDIC	BVRT	BVRT	BVBT	
Crop Scientific Name				Pastinaca sativa	Raphanus sativus var. niger	Daucus carota subsp. sativus	Allium cepa (direct-seeded)	
Rating Date				Oct-4-2013	Oct-4-2013	Oct-4-2013	Oct-4-2013	Oct-4-2013
Rating Type				PHYGEN	PHYGEN	PHYGEN	PHYGEN	CONTRO
Rating Unit								
Days After First/Last Applic.				44 28	44 28	44 28	44 28	44 28
Trt-Eval Interval				28 DA-C	28 DA-C	28 DA-C	28 DA-C	28 DA-C
1				0 b	4 b	0 c	0 a	-1 c
2	A16003	37.5	g AI/ha	0 b	0 b	0 c	0 a	0 c
3	A16003	50.0	g AI/ha	14 b	20 ab	5 c	0 a	0 c
4	A16003	37.5	g AI/ha	49 ab	29 ab	55 b	20 a	43 b
	NIS	0.25	% V/V					
5	A16003	50.0	g AI/ha	61 a	45 a	82 a	26 a	60 ab
	NIS	0.25	% V/V					
6	A16003	37.5	g AI/ha	25 ab	16 ab	-3 c	3 a	63 ab
	NIS	0.25	% V/V					
7	A16003	50.0	g AI/ha	5 b	0 b	0 c	0 a	78 a
	NIS	0.25	% V/V					
8	Dual EC	1.0	L/ha	3 b	18 ab	13 c	0 a	0 c
LSD (P=.05)				34.7	26.9	26.3	19.5	23.9
Standard Deviation				23.5	18.3	17.7	13.2	16.1
CV				120.2	111.13	93.37	214.0	53.22
Grand Mean				19.55	16.43	19.01	6.19	30.34

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Pest Type			W Weed
Pest Code			AMACH
Crop Code			
BBCH Scale			
Crop Scientific Name			
Rating Date			Oct-4-2013
Rating Type			CONTRO
Rating Unit			
Days After First/Last Applic.			44 28
Trt-Eval Interval			28 DA-C
Trt No.	Treatment Name	Rate Rate Unit	
1			1 b
2	A16003	37.5 g AI/ha	0 b
3	A16003	50.0 g AI/ha	0 b
4	A16003	37.5 g AI/ha	40 a
	NIS	0.25 % V/V	
5	A16003	50.0 g AI/ha	38 ab
	NIS	0.25 % V/V	
6	A16003	37.5 g AI/ha	64 a
	NIS	0.25 % V/V	
7	A16003	50.0 g AI/ha	60 a
	NIS	0.25 % V/V	
8	Dual EC	1.0 L/ha	0 b
LSD (P=.05)			26.4
Standard Deviation			17.9
CV			70.47
Grand Mean			25.34

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Crop Tolerability of 3 Varieties of Sweet Corn Using Laudis - 2013

Trial ID: HP13USABLV Location: Fremont, Ohio Trial Year: 2013
Protocol ID: HP13USABLV Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan **Title:** Professor
Investigator: Rick Edwards **Title:** Research Associate

Discipline: H herbicide
Trial Status: R reviewed and reported **Trial Reliability:** LOW
Initiation Date: Jun-19-2013
Completion Date: Sep-10-2013

Trial Location

City: Fremont **Country:** USA United States
State/Prov.: Ohio

Objectives:
This trial was maintained as weed free to minimize variance between plots using an un-safened pre-emerge herbicide for weed control (Define + atrazine).

APPLICATION: Select locally grown hybrids or inbreds. Plant 4 or more hybrids/inbreds per trial.

Timing: At application, record crop and target growth stages.

ASSESSMENT: Please provide labeled digital photographs of all treatments and the checks.

Crop Tolerance: PE11NC1, crop phyto, UTC should be 0.

A2 - 7 days after application (range 6-10 days)
A3 - 14 days after application (range 11-18 days)
A5 - 35 days after application (range 26-44 days)

Conclusions:
Due to unusually heavy rain during late June through July of this season, two of the replicates were washed out. Therefore, the statistical analysis of the remaining two replications are of limited value. There was not a harvest conducted.

Contacts

Study Director: Doug Doohan **Title:** Professor
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, Ohio
Postal Code: 44691

Investigator: Rick Edwards **Title:** Research Associate
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, Ohio
Postal Code: 44691

Cooperator/Landowner

Cooperator: Matt Hofelich **Role:** Manager
Organization: North Central Agricultural Research
Address 1: 1165 County Road 43
City: Fremont
State/Prov: OH
Postal Code: 43420

The Ohio State University

Crop Tolerability of 3 Varieties of Sweet Corn Using Laudis - 2013

Trial ID: HP13USABLV Location: Fremont, Ohio Trial Year: 2013
Protocol ID: HP13USABLV Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact:

Soil Description

Description Name: Fremont
% Sand: 50 **% OM:** 2.5 **Texture:** FSL fine sandy loam
% Silt: 40 **pH:** 7 **Soil Name:** Kibble
% Clay: 10 **CEC:** 9.3 **Fert. Level:** G good

Moisture and Weather Conditions

Overall Moisture Conditions: VERWET very wet

Application Description

	A
Application Date:	Jul-12-2013
Application Method:	SPRAY
Application Timing:	ACCRST
Application Placement:	BROADC

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	ZEAMS BCOR
Stage Scale Used:	BBCH
Stage Majority, Percent:	00
Crop 2 Code, BBCH Scale:	ZEAMS BCOR
Crop 3 Code, BBCH Scale:	ZEAMS BCOR
Stage Scale Used:	BBCH

The Ohio State University

Crop Tolerability of 3 Varieties of Sweet Corn Using Laudis - 2013

Trial ID: HP13USABLV Location: Fremont, Ohio Trial Year: 2013
Protocol ID: HP13USABLV Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1	2	3	4
	Pest Type					W Weed		W Weed
	Pest Code					POROL		POROL
	Pest Scientific Name					Portulaca oler>		Portulaca oler>
	Pest Name					Common purslane		Common purslane
	Crop Code				ZEAMS		ZEAMS	
	BBCH Scale				BCOR		BCOR	
	Crop Scientific Name				Zea mays sacch>		Zea mays sacch>	
	Crop Name				Sweet corn		Sweet corn	
	Part Rated				PLOT C	PLOT p	PLANT C	
	Rating Date				Jul-17-2013	Jul-17-2013	Jul-17-2013	Aug-14-2013
	Rating Type				PHYGEN	CONTRO	LENGTH	CONTRO
	Rating Unit				%	%	cm	%
	Sample Size, Unit				1 PLOT	1 PLOT	1 SHOOT	1 PLOT
	Trt-Eval Interval				5 DA-A	5 DA-A	5 DA-A	33 DA-A
1	Untreated Check V1			A	2.3 a	30.0 a	81.0	25.6
2	Laudis V1	3	fl oz/a	A	0.0 a	40.0 a	83.0	25.6
	MSO	1	% v/v	A				
	UAN 28%	1	qt/a	A				
3	Laudis V1	6	fl oz/a	A	0.0 a	48.3 a	85.5	48.9
	MSO	1	% v/v	A				
	UAN 28%	1	qt/a	A				
4	Untreated Check V2			A	2.3 a	22.5 a	80.0	28.3
5	Laudis V2	3	fl oz/a	A	1.4 a	77.5 a	85.0	100.0
	MSO	1	% v/v	A				
	UAN 28%	1	qt/a	A				
6	Laudis V2	6	fl oz/a	A	10.0 a	77.5 a	86.0	100.0
	MSO	1	% v/v	A				
	UAN 28%	1	qt/a	A				
7	Untreated Check V3			A	0.0 a	18.3 a	86.5	17.0
8	Laudis V3	3	fl oz/a	A	1.4 a	40.0 a	89.0	25.6
	MSO	1	% v/v	A				
	UAN 28%	1	qt/a	A				
9	Laudis V3	6	fl oz/a	A	0.0 a	35.0 a	83.5	28.3
	MSO	1	% v/v	A				
	UAN 28%	1	qt/a	A				
	LSD (P=.05)				0.98t	76.33	.	.
	Standard Deviation				0.43t	41.33	.	.
	CV				133.88	95.58	.	.
	Replicate F				1.331	0.599		
	Replicate Prob(F)				0.2820	0.5697		
	Treatment F				1.408	0.810		
	Treatment Prob(F)				0.3199	0.6117		

Pest Type
W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop
Pest Code
POROL, Portulaca oleracea, = US
Crop Code
ZEAMS, BCOR, Zea mays saccharata, = US
Part Rated
PLOT = plot
PLANT = plant
C = Crop is Part Rated
p = Pest is Part Rated
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
LENGTH = length
Rating Unit
% = percent
cm = centimeter

PLOT = total plot
SHOOT = shoot

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns:Average=2
Excluded replicate 2 in column 3

The Ohio State University

Crop Tolerability of 3 Varieties of Sweet Corn Using Laudis - 2013

Trial ID: HP13USABLV Location: Fremont, Ohio Trial Year: 2013
Protocol ID: HP13USABLV Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact:

Crop Description

Crop 1: ZEAMS Zea mays saccharata Sweet corn
Variety: SV9014SB **BBCH Scale:** BCOR
Planting Method: DRILLE drilled
Seed Bed: SMOOTH smooth

Crop 2: ZEAMS Zea mays saccharata Sweet corn
Variety: SV9010SA **BBCH Scale:** BCOR
Planting Date: Jun-19-2013
Planting Method: DRILLE drilled
Row Spacing, Unit: 9 IN

Crop 3: ZEAMS Zea mays saccharata Sweet corn
Variety: SV9012SD **BBCH Scale:** BCOR
Planting Date: Jun-19-2013
Planting Method: DRILLE drilled

Site and Design

Treated Plot Width: 4 m
Treated Plot Length: 6 m
Treated Plot Area: 24 m2 **Treatments:** 9 **Tillage Type:** NOTILL no-till
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Field Prep./Maintenance:

Date	Field ID	Description of Operation
10/12/2012	CS	Ripped with JD 6190R and Landol Ripper
4/2/2013	CS	worked plot area with JD 6125R and Landall Finish-all
5/6/2013	CS	flagged for spreading fertilizer
5/6/2013	CS	spread fertilizer 200 lbs / acre of 46-0-0, 150 lbs / acre of 10-52-0, 300 lbs / acre of 0-0-60, and 7 lbs / acre of 14% Boron, double spread
5/6/2013	CS	worked plot area with Landall Finish-all
5/22/2013	CS	worked plot area with kongskilde and packer
6/19/2013	CS	worked plot area with kongskilde and packer
6/19/2013	CS	layed out staked and drove for planting
6/19/2013	CS	planted trial with 4 row MonoStem planter 3 varieties from Seminis include:SV9014SB, SV9010SA, SV9012SD all are Roundup Ready with an in row seed spacing of 9 inches
6/20/2013	CS	set out plot stakes
6/25/2013	CS	trial received .5" rain and pea sized hail
6/27/2013	CS	trial received 1.85" rainfall
6/28/2013	CS	trial received .4" rainfall
6/29/2013	CS	trial received .4" rainfall
7/1/2013	CS	trial received 2.7 inches of rain
7/2/2013	CS	trenched water off of trial
7/4/2013	CS	trial received .4" rainfall
7/5/2013	CS	trial received .8" rain
7/8/2013	CS	trial received .7 inches
7/9/2013	CS	trial received .8 inches
7/10/2013	CS	Gibbs applied sevinXLR Plus @ 32oz/A
7/10/2013	CS	trial received 1.6" rainfall
7/11/2013	CS	trial received .25" rainfall
7/12/2013	CS	applied post treatments # 2&3 corn was at V5-V6 sprayed reps 1 & 3
7/18/2013	CS	applied Roundup powermax @ 32 oz/A, Choice@ 8oz/A,
7/27/2013	CS	trial received .65 inches of rainfall
8/7/2013	CS	applied Lanate @ 1.5 pt/A
8/12/2013	CS	trial received .65 inches of rainfall
8/14/2013	CS	applied Spintor @ 8 oz/A
8/22/2013	CS	applied Coragen @ 5 oz/A
8/23/2013	CS	trial received .6 inches of rain
9/3/2013	CS	Doug Doohan released trial for destruct,
9/10/2013	CS	disked trial under

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Multiflora Rose - Control with MAT28 2012-2013

Trial ID: Protocol ID:
Location: Wooster, Ohio Study Director: Doug Doohan and Scott Wolfe
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan **Title:** Professor
Investigator: Scott Wolfe **Title:** Research Assistant

Discipline: H herbicide
Trial Status: F one-year/final **Trial Reliability:** Reliable
Initiation Date: May-30-2012 **Planned Completion Date:** May-30-2013

Trial Location

City: Wooster **Latitude of LL Corner °:** 40.76185 N
State/Prov.: Ohio **Longitude of LL Corner °:** 81.90262222 W
Postal Code: 44691 **Altitude of LL Corner, Unit:** 1093.00 feet
Country: USA United States

Objectives:

The trial has 2 objectives:

1) Efficacy of 2 aminocyclopyrachlor products at 2 rates each.

2) Crop safety of aminocyclopyrachlor products.

This trial was located in a hilly area that years ago was a pasture, with good multiflora rose pressure.

The "crop" was pasture grass species consisting of orchardgrass, timothy, and velvetgrass.

The "target weed" is multiflora rose, sprayed before bloom.

Crop injury and weed control were assessed visually. The 0-100 linear scale was used, in which 0 = no crop injury/no control, and 100 = death of crop/complete weed control.

Conclusions:

At 30 DAT, treatment 6 (Crossbow) and treatment 4 (RDQ98 low rate) had the best multiflora control at 80% and 53.3% respectively. All treatments had good control of all other weeds and minimal grass injury.

At 62 DAT, treatment 6 had 100% control of multiflora and treatments 2, 3, and 5 all had good control as well at 71.7%, 85.0%, and 73.3% respectively. All other weeds were controlled with minimal damage to the grass species.

At 90 DAT, all treatments had equal control of the multiflora, although RDQ98 at the high and low rate had the lowest control at 53.3% and 50% respectively. MAT28 had good control at high (88.3%) and low (80%) rates. The Crossbow had 100% multiflora control. The Crossbow and high rate of MAT28 had the best blackberry control at 100% and 96.7% respectively. All other weeds were controlled equally by all treatments and minimal grass species injury.

At one year after treatment there was no statistically significant differences in control of multiflora rosa or blackberry with any treatment. There was no damage seen in the grass species at the one-year assessment.

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Personnel

Study Director: Doug Doohan **Title:** Professor
Affiliation: The Ohio State University
Location: Wooster, Ohio
Postal Code: 44691 **E-mail:** doohan.1@osu.edu
Investigator: Scott Wolfe **Title:** Research Assistant
Affiliation: The Ohio State University
Location: Wooster, Ohio
Postal Code: 44691 **E-mail:** wolfe.529@osu.edu

Crop Description

Seed Bed: COMPAC compacted

Site and Design

Plot Width, Unit: 10 FT
Plot Length, Unit: 16 FT
Plot Area, Unit: 160 FT2
Replications: 3
Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: NOTILL no-till
Study Design: RACOBL Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block

Application Description

	A
Application Date:	May-30-2012
Time of Day:	11:00 am
Application Method:	SPRAY
Application Timing:	MAY
Application Placement:	BROADC
Applied By:	Scott Wolfe
Air Temperature, Unit:	73.5 F
% Relative Humidity:	54.64
Wind Velocity, Unit:	4.81 MPH
Wind Direction:	W
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	70.4 F
Soil Moisture:	DRY
% Cloud Cover:	0
Next Rain Occurred On:	Jun-1-2012

Application Equipment

	A
Appl. Equipment:	Handheld
Equipment Type:	MANCAI
Operation Pressure, Unit:	40 PSI
Nozzle Type:	TTJ60
Nozzle Size:	11002
Nozzle Spacing, Unit:	18 inch
Nozzles/Row:	4
Nozzle Calibration, Unit:	25.6 oz/min
Band Width, Unit:	72 inch
% Coverage:	100.0
Row Sides Applied:	1
Boom Length, Unit:	54 inch
Boom Height, Unit:	18 inch
Ground Speed, Unit:	2.64 mph
Carrier:	WATER
Spray Volume, Unit:	25 gal/ac
Mix Size, Unit:	2 liters
Propellant:	COMCO2
Tank Mix (Y/N):	Y yes

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Multiflora Rose - Control with MAT28 2012-2013

Trial ID: Protocol ID:
Location: Wooster, Ohio Study Director: Doug Doohan and Scott Wolfe
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	W Weed RUBSS	W Weed ROSMU	W Weed VENAL	W Weed POATR	W Weed AGRRE	W Weed ACHDI	W Weed FESSS
	Pest Type			W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
	Pest Code			RUBSS	ROSMU	VENAL	POATR	AGRRE	ACHDI	FESSS
	Rating Date			Jun-29-2012	Jun-29-2012	Jun-29-2012	Jun-29-2012	Jun-29-2012	Jun-29-2012	Jun-29-2012
	Rating Type			Damage	Damage	Damage	Damage	Damage	Damage	Damage
	Rating Unit			%	%	%	%	%	%	%
	Days After First/Last Applic.			30 30	30 30	30 30	30 30	30 30	30 30	30 30
	Trt-Eval Interval			30 DA-A	30 DA-A	30 DA-A	30 DA-A	30 DA-A	30 DA-A	30 DA-A
1	UNTREATED CONTROL			0 b	0 d	0 c	0 a	0 a	0 b	0 a
2	MAT 28+	1.0	OZ AI/A	73 ab	13 cd	87 a	0 a	3 a	100 a	0 a
	2, 4-D AMINE+	7.60	OZ AI/A							
	NIS	0.25	% V/V							
3	MAT 28+	2.0	OZ AI/A	87 ab	40 bc	97 a	0 a	0 a	100 a	0 a
	2, 4-D AMINE+	15.20	OZ AI/A							
	NIS	0.25	% V/V							
4	RDQ98+	0.08	LB AI/A	80 ab	53 ab	100 a	0 a	3 a	100 a	0 a
	NIS	0.25	% V/V							
5	RDQ98+	0.128	LB AI/A	40 ab	37 bc	53 b	0 a	0 a	67 ab	0 a
	NIS	0.25	% V/V							
6	CROSSBOW	4.5	LB AI/A	100 a	80 a	100 a	0 a	3 a	67 ab	0 a
	LSD (P=.05)			59.0	28.1	30.0	0.0	8.1	63.6	0.0
	Standard Deviation			32.5	15.5	16.5	0.0	4.5	35.0	0.0
	CV			51.24	41.52	22.67	0.0	268.33	48.41	0.0
	Grand Mean			63.33	37.22	72.78	0.0	1.67	72.22	0.0

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Pest Type			W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code			PHLPB	HPPVU	RUBSS	ROSMU	VENAL	FESSS	DACGL
Rating Date			Jun-29-2012	Jun-29-2012	Jul-31-2012	Jul-31-2012	Jul-31-2012	Jul-31-2012	Jul-31-2012
Rating Type			Damage	Damage	Damage	Damage	Damage	Damage	Damage
Rating Unit			%	%	%	%	%	%	%
Days After First/Last Applic.			30 30	30 30	62 62	62 62	62 62	62 62	62 62
Trt-Eval Interval			30 DA-A	30 DA-A	62 DA-A	62 DA-A	62 DA-A	62 DA-A	62 DA-A
Trt No.	Treatment Name	Rate Rate Unit							
1	UNTREATED CONTROL		0 a	0 b	0 b	0 c	0 b	0 a	0 a
2	MAT 28+	1.0 OZ AI/A	0 a	60 a	63 ab	72 ab	93 a	0 a	0 a
	2, 4-D AMINE+	7.60 OZ AI/A							
	NIS	0.25 % V/V							
3	MAT 28+	2.0 OZ AI/A	0 a	100 a	100 a	85 ab	100 a	0 a	0 a
	2, 4-D AMINE+	15.20 OZ AI/A							
	NIS	0.25 % V/V							
4	RDQ98+	0.08 LB AI/A	3 a	97 a	90 a	52 b	100 a	0 a	0 a
	NIS	0.25 % V/V							
5	RDQ98+	0.128 LB AI/A	0 a	63 a	47 ab	73 ab	97 a	0 a	0 a
	NIS	0.25 % V/V							
6	CROSSBOW	4.5 LB AI/A	0 a	87 a	100 a	100 a	100 a	0 a	0 a
LSD (P=.05)			4.3	40.6	53.7	32.3	8.8	0.0	0.0
Standard Deviation			2.4	22.3	29.5	17.7	4.8	0.0	0.0
CV			424.26	32.95	44.24	27.89	5.91	0.0	0.0
Grand Mean			0.56	67.78	66.67	63.61	81.67	0.0	0.0

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Trt No.	Treatment Name	Rate	Rate Unit	W Weed HPPVU Jul-31-2012 Damage % 62 62 62 DA-A	W Weed PHLPB Jul-31-2012 Damage % 62 62 62 DA-A	W Weed POATR Jul-31-2012 Damage % 62 62 62 DA-A	W Weed DAUCA Jul-31-2012 Damage % 62 62 62 DA-A	W Weed ASCSY Jul-31-2012 Damage % 62 62 62 DA-A	W Weed ROSMU Aug-28-2012 Damage % 90 90 90 DA-A	W Weed BONCH Aug-28-2012 Damage % 90 90 90 DA-A
1	UNTREATED CONTROL			0 b	0 a	0 a	0 b	0 b	0 b	0 b
2	MAT 28+	1.0	OZ AI/A	57 a	3 a	0 a	100 a	100 a	80 a	100 a
	2, 4-D AMINE+	7.60	OZ AI/A							
	NIS	0.25	% V/V							
3	MAT 28+	2.0	OZ AI/A	100 a	0 a	0 a	100 a	100 a	88 a	100 a
	2, 4-D AMINE+	15.20	OZ AI/A							
	NIS	0.25	% V/V							
4	RDQ98+	0.08	LB AI/A	100 a	3 a	0 a	100 a	100 a	50 a	100 a
	NIS	0.25	% V/V							
5	RDQ98+	0.128	LB AI/A	100 a	3 a	0 a	100 a	100 a	53 a	100 a
	NIS	0.25	% V/V							
6	CROSSBOW	4.5	LB AI/A	100 a	0 a	0 a	100 a	100 a	100 a	100 a
LSD (P=.05)				30.0	5.8	0.0	0.0	0.0	36.6	0.0
Standard Deviation				16.5	3.2	0.0	0.0	0.0	20.1	0.0
CV				21.68	189.74	0.0	0.0	0.0	32.48	0.0
Grand Mean				76.11	1.67	0.0	83.33	83.33	61.94	83.33

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Trt No.	Treatment Name	Rate	Rate Unit	W Weed VACMY Aug-28-2012 Damage % 90 90 90 DA-A	W Weed FESSS Aug-28-2012 Damage % 90 90 90 DA-A	W Weed ASTPI Aug-28-2012 Damage % 90 90 90 DA-A	W Weed PHLPB Aug-28-2012 Damage % 90 90 90 DA-A	W Weed POATR Aug-28-2012 Damage % 90 90 90 DA-A	W Weed HPPVU Aug-28-2012 Damage % 90 90 90 DA-A	W Weed ASCSY Aug-28-2012 Damage % 90 90 90 DA-A
1	UNTREATED CONTROL			0 b	0 a	0 b	0 a	0 a	0 c	0 b
2	MAT 28+	1.0	OZ AI/A	67 ab	0 a	100 a	0 a	0 a	83 ab	100 a
	2, 4-D AMINE+	7.60	OZ AI/A							
	NIS	0.25	% V/V							
3	MAT 28+	2.0	OZ AI/A	97 a	0 a	100 a	0 a	0 a	100 a	100 a
	2, 4-D AMINE+	15.20	OZ AI/A							
	NIS	0.25	% V/V							
4	RDQ98+	0.08	LB AI/A	83 ab	0 a	100 a	0 a	0 a	85 ab	67 a
	NIS	0.25	% V/V							
5	RDQ98+	0.128	LB AI/A	57 ab	0 a	100 a	0 a	0 a	33 bc	100 a
	NIS	0.25	% V/V							
6	CROSSBOW	4.5	LB AI/A	100 a	0 a	100 a	33 a	0 a	100 a	100 a
LSD (P=.05)				61.0	0.0	0.0	42.9	0.0	44.9	42.9
Standard Deviation				33.5	0.0	0.0	23.6	0.0	24.7	23.6
CV				49.91	0.0	0.0	424.26	0.0	36.89	30.3
Grand Mean				67.22	0.0	83.33	5.56	0.0	66.94	77.78

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Trt No.	Treatment Name	Rate	Rate Unit	W Weed DAUCA Aug-28-2012 Damage % 90 90 90 DA-A	W Weed VENAL Aug-28-2012 Damage % 90 90 90 DA-A	W Weed RUBSS May-23-2013 Damage % 358 358 358 DA-A	W Weed ROSMU May-23-2013 Damage % 358 358 358 DA-A	W Weed POATR May-23-2013 Damage % 358 358 358 DA-A	W Weed ASCSY May-23-2013 Damage % 358 358 358 DA-A
1	UNTREATED CONTROL			0 b	0 b	0 b	0 a	0 a	0 b
2	MAT 28+	1.0	OZ AI/A	100 a	100 a	70 a	53 a	0 a	100 a
	2, 4-D AMINE+	7.60	OZ AI/A						
	NIS	0.25	% V/V						
3	MAT 28+	2.0	OZ AI/A	100 a	100 a	70 a	53 a	0 a	100 a
	2, 4-D AMINE+	15.20	OZ AI/A						
	NIS	0.25	% V/V						
4	RDQ98+	0.08	LB AI/A	100 a	100 a	43 a	87 a	0 a	100 a
	NIS	0.25	% V/V						
5	RDQ98+	0.128	LB AI/A	100 a	87 a	47 a	60 a	0 a	100 a
	NIS	0.25	% V/V						
6	CROSSBOW	4.5	LB AI/A	100 a	100 a	87 a	93 a	0 a	100 a
LSD (P=.05)				0.0	17.2	32.1	65.6	0.0	0.0
Standard Deviation				0.0	9.4	17.7	36.1	0.0	0.0
CV				0.0	11.62	33.48	62.46	0.0	0.0
Grand Mean				83.33	81.11	52.78	57.78	0.0	83.33

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Wild Mustard - DuPont 2013

Trial ID: #US 490/13/01 Protocol ID: #US 490/13/01
Location: Wooster, Ohio Study Director: Doug Doohan
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Assistant
Investigator: Dr. Douglas J. Doohan **Title:** Professor

Discipline: H herbicide
Trial Status: S setup
Initiation Date: Aug-15-2013

Trial Location

City: Wooster **Latitude of LL Corner °:** 40.7787 N
State/Prov.: Ohio **Longitude of LL Corner °:** 81.9308 W
Postal Code: 44691 **Altitude of LL Corner, Unit:** 311.00 m
Country: USA United States

Objectives:

OBJECTIVE: Determine the level of grass crop tolerance and weed control with various rates of tribenuron and thifensulfuron in combination with MAT28 in common cool season grass pasture grasses and native rangeland grasses.

Evaluate Crop Response at 7, 14, 30, 60 and 90 DAT. Must identify and rate each grass specie in the test.

Record crop response data as: % INJUR.

Evaluate weed control at 7, 14, 30, 60 and 90 DAT. Also report any "extra" weed populations in the test site with consistent, ratable populations.

Record Weed Control data as: PESTCODE % CNTRL.

Critical to record in comments environmental conditions (temperature, moisture, soil conditions, sunlight duration, etc.) at time of application. PLEASE NOTE: Also must record date and amount of first significant rainfall after application.

Conclusions:

At 8 days after treatment the 58 OZ/A rate of RRW97 showed the best control of mustard of all the treatments. The lower rate of 24 OZ/A also showed good control. The other treatments all had statistically similar effects on mustard control, except for the Milestone treatment, which showed the least efficacy of all treatments,

At 32 days after treatment there was no statistical differences of mustard control in any of the treatments. At this time many of the leaves had already turned brown and seed heads were all formed. It was noted by the technician that the mustard in the control plots appeared to have more green in the leaves.

At 48 days after treatment the 58 OZ/A RRW97, the 24 OZ/A RRW97 and the 2.44 OZ/A MAT28 with M6316 (at both 0.551 and 0.306 OZ/A) treatments were statistically superior in control to the 1 OZ/A MAT 28 alone, and the Milestone treatments. The other treatments had statistically similar effects at this stage. It was noted at this stage that in those plots where weed control was rated as less effective the stems and leaves of the mustard plants appeared to have stayed green. Also, there seemed to be some areas in the field where Fall panicum had overtaken the other plants, both mustard and volunteer annual grasses.

In conclusion, either a 58 OZ/A or a 24 OZ/A formula of RRW97 , as well as a 2.4 OZ/A formulation of MAT28 and M6316 are all effective in the control of black mustard in pasture grasses with no observed damage to the volunteer annual grasses. There was not a significant degree of separation in the other treatments.

Personnel

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Assistant
Affiliation: The Ohio State University
Address: 1680 Madison Ave.
Location: Wooster
Postal Code: 44691 **E-mail:** doohan.1@osu.edu
Investigator: Dr. Douglas J. Doohan **Title:** Professor
Affiliation: The Ohio State University

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Cooperator/Landowner

Cooperator: Marsha Martin

Crop Description

Crop 1: BRSNI Brassica nigra Black mustard
BBCH Scale: BDIC
Planting Method: SEEDED seeded

Pest Description

Pest 1 Type: W **Code:** GGGAN Annual grasses
Common Name: Annual grasses

Site and Design

Plot Width, Unit: 10 FT
Plot Length, Unit: 15 FT
Plot Area, Unit: 150 FT2
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)

Moisture and Weather Conditions

Overall Moisture Conditions: SLIDRY slightly dry
Closest Weather Station: OARDC, Wooster

Application Description

	A
Application Date:	Aug-15-2013
Time of Day:	12:00
Application Method:	SPRAY
Application Timing:	AUGUST
Application Placement:	BROADC
Applied By:	R. Edwards
Air Temperature, Unit:	68 F
% Relative Humidity:	57.8
Wind Velocity, Unit:	2.3 MPH
Wind Direction:	SW
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	68.8
Soil Moisture:	NORMAL
% Cloud Cover:	10
Next Rain Occurred On:	Aug-23-2013

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	BRSNI BDIC
Stage Scale Used:	BBCH
Stage Majority, Percent:	61 50
Stage Minimum, Percent:	51 20
Stage Maximum, Percent:	64 30
Height, Unit:	2 FT
Height Minimum, Maximum:	1 3

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	GGGAN W
Stage Majority, Percent:	63 60
Stage Minimum, Percent:	51 20
Stage Maximum, Percent:	65 50
Height, Unit:	2 FT

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Application Equipment

	A
Appl. Equipment:	Handheld
Equipment Type:	MANCAI
Operation Pressure, Unit:	40 PSI
Nozzle Type:	TTJ60
Nozzle Size:	11002
Nozzle Spacing, Unit:	18 in
Nozzles/Row:	4
Band Width, Unit:	72 IN
% Coverage:	100.0
Boom Length, Unit:	54 IN
Boom Height, Unit:	18 IN
Ground Speed, Unit:	2.5 MPH
Carrier:	WATER
Spray Volume, Unit:	25 gal/ac
Mix Size, Unit:	2 liters
Propellant:	COMCO2
Tank Mix (Y/N):	Y yes

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Wild Mustard - DuPont 2013

Trial ID: #US 490/13/01 Protocol ID: #US 490/13/01
Location: Wooster, Ohio Study Director: Doug Doohan
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit										
	Pest Type			W Weed				W Weed				W Weed	
	Pest Code			BRSNI				BRSNI				BRSNI	
	Pest Scientific Name			Brassica nigra				Brassica nigra				Brassica nigra	
	Pest Name			Black mustard				Black mustard				Black mustard	
	Crop Code				GGGAN				GGGAN				GGGAN
	BBCH Scale				BGWE				BGWE				BGWE
	Crop Scientific Name				Annual grasses				Annual grasses				Annual grasses
	Crop Name				Annual grasses				Annual grasses				Annual grasses
	Part Rated			PLATOT P	PLATOT C			PLATOT P	PLATOT C			PLATOT P	PLATOT C
	Rating Date			Aug-23-2013	Aug-23-2013			Sep-16-2013	Sep-16-2013			Oct-2-2013	Oct-2-2013
	Rating Type			CONTRO	DAMAGE			CONTRO	DAMAGE			CONTRO	DAMAGE
	Rating Unit			%	%			%	%			%	%
	Sample Size, Unit			1 PLOT	1 PLOT			1 PLOT	1 PLOT			- PLOT	- PLOT
	Days After First/Last Applic.			8 8	8 8			32 32	32 32			48 48	48 48
	Trt-Eval Interval			8 DA-A	8 DA-A			32 DA-A	32 DA-A			48 DA-A	48 DA-A
1	DPX-RRW97	24	FL OZ/A	47 b	15 a			47 a	0 a			67 a	3 a
	NIS	0.25	% V/V										
2	DPX-MAT28	1	OZ AI/A	22 cd	2 a			65 a	10 a			50 abc	7 a
	DPX-M6316	0.125	OZ AI/A										
	NIS	0.25	% V/V										
3	DPX-MAT28	1.02	OZ AI/A	27 bcd	15 a			63 a	20 a			47 abc	13 a
	DPX-M6316	0.23	OZ AI/A										
	NIS	0.25	% V/V										
4	DPX-MAT28	1	OZ AI/A	23 cd	12 a			50 a	13 a			30 a-d	12 a
	DPX-L5300	0.125	OZ AI/A										
	NIS	0.25	% V/V										
5	Perspective	2.5	OZ WT/A	22 cd	12 a			47 a	13 a			37 a-d	10 a
	NIS	0.25	% V/V										
6	DPX-RDQ98	2.5	OZ WT/A	27 bcd	8 a			70 a	20 a			40 abc	7 a
	NIS	0.25	% V/V										
7	DPX-MAT28	1	OZ AI/A	23 cd	3 a			60 a	2 a			13 cd	3 a
	NIS	0.25	% V/V										
8	RRW97	58	FL OZ/A	63 a	15 a			77 a	10 a			70 a	0 a
	NIS	0.25	% V/V										
9	DPX-MAT28	2.444	OZ AI/A	27 bcd	15 a			67 a	13 a			70 a	10 a
	DPX-M6316	0.306	OZ AI/A										
	NIS	0.25	% V/V										
10	DPX-MAT28	2.449	OZ AI/A	23 cd	18 a			77 a	10 a			63 ab	13 a
	DPX-M6316	0.551	OZ AI/A										
	NIS	0.25	% V/V										
11	DPX-MAT28	2.444	OZ AI/A	33 bc	15 a			73 a	20 a			47 abc	3 a
	DPX-L5300	0.306	OZ AI/A										
	NIS	0.25	% V/V										
12	Milestone	7	FL OZ/A	8 de	0 a			60 a	8 a			23 bcd	0 a
	NIS	0.25	% V/V										
13	Untreated Control			0 e	0 a			0 b	0 a			0 d	0 a
	LSD (P=.05)			14.0	13.8			28.9	16.9			26.1	12.8
	Standard Deviation			8.3	8.2			17.2	10.1			15.5	7.6
	CV			31.35	81.85			29.56	93.35			36.16	120.46
	Grand Mean			26.54	10.0			58.08	10.77			42.82	6.28

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

General Trial Information

Study Director: Doug Doohan **Title:** Professor
Investigator: Scott Wolfe **Title:** Research Associate

Discipline: H herbicide
Trial Status: M multi-year/interim **Trial Reliability:** RELIABLE
Initiation Date: Jun-28-2012 **Planned Completion Date:** Jun-28-2013

Trial Location

City: Wooster **Country:** USA United States
State/Prov.: Ohio
Postal Code: 44691

Latitude of LL Corner °: 40.7597111 N
Longitude of LL Corner °: 81.90311944 W
Altitude of LL Corner, Unit: 1101.00 feet

Objectives:
The objectives are twofold:

1) Efficacy of two aminocycolpyr products at two rates each

2) Crop safety of aminocyclopyr products

The "crop" is pasture grasses, consisting of roughstalk bluegrass, tall fescue, timothy, and velvetgrass.

The "target weed" is tall ironweed.

Crop injury and weed control were assessed visually. The 0 - 100 linear scale was used , in which 0 = no crop injury/no control, and 100 = death of crop/complete weed control.

Conclusions:
At 28 DAT, all treatments had significant control of all weed species present. Tall ironweed control ranged from 77% with the low rate of MAT 28 and 2,4-D AMINE to 92% with high rate of RDQ98, Timothy and Orchard grass were not evenly distributed throughout the trial and there was minimal physical damage to those grasses present.

At 61 DAT, tall ironweed had over 90% control with all rates of RDQ98 and MAT28, but only 67% control with Crossbow. The treatments had no damage on the grass species present and all had good control of all other weed species present.

At 96 DAT, all treatments had 100% control of the tall ironweed and no damage to any grass species. There was good weed control for all other species as well.

At 426 DAT all treatments had significant residual control of tall ironweed with no damage to any grass species.

Contacts

Study Director: Doug Doohan **Title:** Professor
Organization: The Ohio State University
Address: 1680 Madison Ave. **Phone No.:** 3302023593
City+State/Prov: Wooster, Ohio **Mobile No.:** 330-466-4023
Postal Code: 44691 **E-mail:** doohan.1@osu.edu

Investigator: Scott Wolfe **Title:** Research Associate
Organization: The Ohio State University
Address: 1680 Madison Ave. **Phone No.:** 3302023593
City+State/Prov: Wooster, Ohio **Mobile No.:** 330-466-4023
Postal Code: 44691 **E-mail:** wolfe.529@osu.edu

Cooperator/Landowner

Cooperator: Lynn Ault **Role:** Farm Manager
Organization: OARDC **Org. Type:** Research
Address 1: Schaffter Farm
City: Wooster **Phone No.:** 3302623178
State/Prov: OH **Fax No.:** 330-263-3887
Postal Code: 44691 **Mobile No.:** 330-464-2440
Country: USA United States **E-mail:** ault.2@osu.e4du

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Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Crop Description

Crop 1: YNIGF Grassland not used in agric. Grassland not used in agric.
Variety: VARIOUS SPECIES
Description: 2-3' tall
Seed Bed: COMPAC compacted

Pest Description

Pest 1 Type: O **Code:** FESAR Festuca arundinacea
Common Name: Tall fescue
Description: in bloom, 2-3' tall

Pest 2 Type: W **Code:** GLEHE Glechoma hederacea
Common Name: Ground ivy
Description: 4-6" in bloom

Pest 3 Type: O **Code:** PHLPR Phleum pratense
Common Name: Timothy

Pest 4 Type: O **Code:** POATR Poa trivialis
Common Name: Rough-stalk bluegrass
Description: in bloom, 2-3' tall

Pest 5 Type: W **Code:** SOOCA Solidago canadensis
Common Name: Canadian goldenrod
Description: 14-18" tall

Pest 6 Type: W **Code:** VENAL Vernonia altissima
Common Name: Tall ironweed
Description: less than 12" tall

Pest 7 Type: W **Code:** CYPES Cyperus esculentus
Common Name: Yellow nutsedge

Pest 8 Type: O **Code:** HOLLA Holcus lanatus
Common Name: Common velvet grass

Pest 9 Type: W **Code:** ASTPI Symphyotrichum pilosum
Common Name: White heath aster

Site and Design

Treated Plot Width: 10 FT **Site Type:** FIELD field
Treated Plot Length: 16 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 160 FT2 **Treatments:** 6 **Tillage Type:** NOTILL no-till
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)
% Slope: 0.0
Untreated Arrangement: INCLUDED single control randomized in each block

Field Prep./Maintenance:
None

Soil Description

Description Name: LEVEL FIELD
% Sand: 11 **% OM:** 2.0 **Texture:** SIL silt loam
% Silt: 75 **pH:** 4.97 **Soil Name:** Canfield Silt Loam
% Clay: 14 **CEC:** 13.9 **Fert. Level:** G good
Soil Drainage: G good

Moisture and Weather Conditions

Overall Moisture Conditions: NORMAL normal
Closest Weather Station: OARDC **Distance, Unit:** 2 MI

The Ohio State University

Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Application Description

	A
Application Date:	Jun-28-2012
Appl. Start Time:	9:15 am
Application Method:	SPRAY
Application Timing:	JUNE
Application Placement:	BROADC
Applied By:	Scott Wolfe
Air Temperature, Unit:	75.3 F
% Relative Humidity:	61.66
Wind Velocity, Unit:	5.00 mph
Wind Direction:	SW
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	68.0 F
Soil Moisture:	VERDRY
% Cloud Cover:	15
Next Moisture Occurred On:	Jun-29-2012

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	YNIGF

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Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	FESAR O
Stage Majority, Percent:	BLOOM
Height, Unit:	FT
Height Minimum, Maximum:	2 3
Pest 2 Code, Type, Scale:	GLEHE W
Stage Majority, Percent:	BLOOM
Height, Unit:	IN
Height Minimum, Maximum:	4 6
Pest 3 Code, Type, Scale:	PHLPR O
Height, Unit:	FT
Height Minimum, Maximum:	2 3
Pest 4 Code, Type, Scale:	POATR O
Stage Majority, Percent:	BLOOM
Height, Unit:	FT
Height Minimum, Maximum:	2 3
Pest 5 Code, Type, Scale:	SOOCA W
Height, Unit:	IN
Height Minimum, Maximum:	14 18
Pest 6 Code, Type, Scale:	VENAL W
Stage Majority, Percent:	VEG
Height, Unit:	IN
Height Minimum, Maximum:	2 8
Pest 7 Code, Type, Scale:	CYPES W
Height, Unit:	IN
Height Minimum, Maximum:	0 0
Pest 8 Code, Type, Scale:	HOLLA O
Height, Unit:	0 IN
Pest 9 Code, Type, Scale:	ASTPI W

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Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Application Equipment

	A
Equipment Type:	MANCAI
Operation Pressure, Unit:	40 PSI
Nozzle Type:	TTJ60
Nozzle Size:	11002
Nozzle Spacing, Unit:	18 inch
Nozzles/Row:	4
Nozzle Calibration, Unit:	25.6 oz/min
Band Width, Unit:	72 inch
% Coverage:	100.0
Row Sides Applied:	1
Boom Length, Unit:	54 inch
Boom Height, Unit:	18 inch
Ground Speed, Unit:	2.64 mph
Carrier:	WATER
Spray Volume, Unit:	25 gal/ac
Mix Size, Unit:	2 liters
Propellant:	COMCO2
Tank Mix (Y/N):	Y yes

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Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Pest Code				VENAL	FESAR	PHLPB	DAUCA	OXASS	TRFPR	BONCH	PHBPU
Rating Date				Jul-26-2012	Jul-26-2012	Jul-26-2012	Jul-26-2012	Jul-26-2012	Jul-26-2012	Jul-26-2012	Jul-26-2012
Rating Type				DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE
Rating Unit				%	%	%	%	%	%	%	%
Days After First/Last Applic.				28 28	28 28	28 28	28 28	28 28	28 28	28 28	28 28
Trt-Eval Interval				28 DA-A	28 DA-A	28 DA-A	28 DA-A	28 DA-A	28 DA-A	28 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	1	2	3	4	5	6	7	8
1	UNTREATED CONTROL			0.0	0.0 a	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 a
2	MAT 28+	0.625	oz ai/a	76.7 a	0.0 a	43.3 a	100.0 a	100.0 a	100.0 a	100.0 a	33.3 a
	2, 4-D AMINE+	4.75	oz ai/a								
	NIS	0.25	% v/v								
3	MAT 28+	1.0	oz ai/a	80.0 a	0.0 a	63.3 a	90.0 a	100.0 a	100.0 a	86.7 a	66.7 a
	2, 4-D AMINE+	7.60	oz ai/a								
	NIS	0.25	% v/v								
4	RDQ98+	0.048	lb ai/a	85.0 a	0.0 a	56.7 a	100.0 a	100.0 a	100.0 a	93.3 a	100.0 a
	NIS	0.25	% v/v								
5	RDQ98+	0.08	lb ai/a	91.7 a	0.0 a	66.7 a	100.0 a	100.0 a	100.0 a	73.3 a	100.0 a
	NIS	0.25	% v/v								
6	CROSSBOW	1.5	lb ai/a	90.0 a	0.0 a	65.0 a	93.3 a	100.0 a	100.0 a	100.0	66.7 a
LSD (P=.05)				18.11	0.00	28.52	13.96	0.00	0.00	36.38	79.06
Standard Deviation				9.62	0.00	15.68	7.67	0.00	0.00	19.32	43.46
CV				11.36	0.0	31.89	9.53	0.0	0.0	27.34	71.12

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns:Yates=35,36
Excluded replicate 1 in column 2; 1 in 10; 2 in 11

The Ohio State University

Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Trt No.	Treatment Name	Rate	Rate Unit	ACHMI	GLEHE	CYPES	DACGL	POATR	FESAR	OXASS	TRFPR
	Pest Code			ACHMI	GLEHE	CYPES	DACGL	POATR	FESAR	OXASS	TRFPR
	Rating Date			Jul-26-2012	Jul-26-2012	Jul-26-2012	Jul-26-2012	Aug-28-2012	Aug-28-2012	Aug-28-2012	Aug-28-2012
	Rating Type			DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE
	Rating Unit			%	%	%	%	%	%	%	%
	Days After First/Last Applic.			28 28	28 28	28 28	28 28	61 61	61 61	61 61	61 61
	Trt-Eval Interval			28 DA-A	28 DA-A	28 DA-A	28 DA-A	61 DA-A	61 DA-A	61 DA-A	61 DA-A
				9	10	11	12	13	14	15	16
1	UNTREATED CONTROL			0.0 b	0.0 a	0.0 a	0.0 b	0.0 a	0.0 a	0.0 b	0.0 b
2	MAT 28+	0.625	oz ai/a	95.0 a	75.0 a	75.0 a	100.0 a	0.0 a	0.0 a	97.6 a	100.0 a
	2, 4-D AMINE+	4.75	oz ai/a								
	NIS	0.25	% v/v								
3	MAT 28+	1.0	oz ai/a	83.3 a	100.0 a	100.0 a	66.7 ab	0.0 a	0.0 a	58.7 a	100.0 a
	2, 4-D AMINE+	7.60	oz ai/a								
	NIS	0.25	% v/v								
4	RDQ98+	0.048	lb ai/a	93.3 a	100.0 a	100.0 a	66.7 ab	0.0 a	0.0 a	93.3 a	100.0 a
	NIS	0.25	% v/v								
5	RDQ98+	0.08	lb ai/a	91.7 a	100.0 a	100.0 a	100.0 a	0.0 a	0.0 a	100.0 a	100.0 a
	NIS	0.25	% v/v								
6	CROSSBOW	1.5	lb ai/a	100.0 a	50.0 a	50.0 a	66.7 ab	0.0 a	0.0 a	100.0 a	100.0 a
	LSD (P=.05)			21.44	89.37	76.05	57.53	0.00	0.00	35.82t	0.00
	Standard Deviation			11.79	34.76	29.58	31.62	0.00	0.00	19.69t	0.00
	CV			15.26	49.07	41.76	47.43	0.0	0.0	30.6	0.0

The Ohio State University

Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Trt No.	Treatment Name	Rate	Rate Unit	VENAL	PLAMA	DAUCA	GLEHE	ASCSY	ACHMI	CYPES
	Pest Code			VENAL	PLAMA	DAUCA	GLEHE	ASCSY	ACHMI	CYPES
	Rating Date			Aug-28-2012	Aug-28-2012	Aug-28-2012	Aug-28-2012	Aug-28-2012	Aug-28-2012	Aug-28-2012
	Rating Type			DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE	DAMAGE
	Rating Unit			%	%	%	%	%	%	%
	Days After First/Last Applic.			61 61	61 61	61 61	61 61	61 61	61 61	61 61
	Trt-Eval Interval			61 DA-A	61 DA-A	61 DA-A	61 DA-A	61 DA-A	61 DA-A	61 DA-A
				17	18	19	20	21	22	23
1	UNTREATED CONTROL			0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
2	MAT 28+	0.625	oz ai/a	91.7 a	96.7 a	98.3 a	100.0 a	100.0 a	66.7 a	100.0 a
	2, 4-D AMINE+	4.75	oz ai/a							
	NIS	0.25	% v/v							
3	MAT 28+	1.0	oz ai/a	98.3 a	100.0 a	98.3 a	100.0 a	100.0 a	100.0 a	100.0 a
	2, 4-D AMINE+	7.60	oz ai/a							
	NIS	0.25	% v/v							
4	RDQ98+	0.048	lb ai/a	98.3 a	100.0 a	100.0 a	100.0 a	100.0 a	100.0 a	100.0 a
	NIS	0.25	% v/v							
5	RDQ98+	0.08	lb ai/a	98.3 a	93.3 a	100.0 a	100.0 a	100.0 a	100.0 a	100.0 a
	NIS	0.25	% v/v							
6	CROSSBOW	1.5	lb ai/a	66.7	93.3 a	90.0 a	66.7 a	66.7 a	100.0 a	100.0 a
	LSD (P=.05)			9.72	13.15	7.91	42.88	42.88	42.88	0.00
	Standard Deviation			5.16	7.23	4.35	23.57	23.57	23.57	0.00
	CV			6.68	8.97	5.36	30.3	30.3	30.3	0.0

The Ohio State University

Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Trt No.	Treatment Name	Rate	Rate Unit	ASTPI Aug-28-2012 DAMAGE % 61 61 61 DA-A	VENAL Oct-2-2012 DAMAGE % 96 96 96 DA-A	DAUCA Oct-2-2012 DAMAGE % 96 96 96 DA-A	FESAR Oct-2-2012 DAMAGE % 96 96 96 DA-A	GLEHE Oct-2-2012 DAMAGE % 96 96 96 DA-A	POATR Oct-2-2012 DAMAGE % 96 96 96 DA-A	PANDI Oct-2-2012 DAMAGE % 96 96 96 DA-A	ASTPI Oct-2-2012 DAMAGE % 96 96 96 DA-A
				24	25	26	27	28	29	30	31
1	UNTREATED CONTROL			0.0 b	0.0 b	0.0 b	0.0 a	0.0 b	0.0 a	0.0 a	0.0 b
2	MAT 28+	0.625	oz ai/a	100.0 a	100.0 a	76.7 a	0.0 a	100.0 a	0.0 a	0.0 a	100.0 a
	2, 4-D AMINE+	4.75	oz ai/a								
	NIS	0.25	% v/v								
3	MAT 28+	1.0	oz ai/a	100.0 a	100.0 a	83.3 a	0.0 a	100.0 a	0.0 a	0.0 a	100.0 a
	2, 4-D AMINE+	7.60	oz ai/a								
	NIS	0.25	% v/v								
4	RDQ98+	0.048	lb ai/a	100.0 a	100.0 a	100.0 a	0.0 a	100.0 a	0.0 a	0.0 a	100.0 a
	NIS	0.25	% v/v								
5	RDQ98+	0.08	lb ai/a	100.0 a	100.0 a	100.0 a	0.0 a	100.0 a	0.0 a	0.0 a	100.0 a
	NIS	0.25	% v/v								
6	CROSSBOW	1.5	lb ai/a	100.0 a	100.0 a	83.3	0.0 a	68.3 a	0.0 a	0.0 a	100.0 a
LSD (P=.05)				0.00	0.00	27.07	0.00	28.84	0.00	0.00	0.00
Standard Deviation				0.00	0.00	14.38	0.00	15.86	0.00	0.00	0.00
CV				0.0	0.0	19.97	0.0	20.31	0.0	0.0	0.0

The Ohio State University

Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Trt No.	Treatment Name	Rate	Rate Unit	TRFPR Oct-2-2012 DAMAGE % 96 96 96 DA-A	TAROF Oct-2-2012 DAMAGE % 96 96 96 DA-A	OXASS Oct-2-2012 DAMAGE % 96 96 96 DA-A	VENAL Aug-28-2013 DAMAGE % 426 426 426 DA-A	POATR Aug-28-2013 DAMAGE % 426 426 426 DA-A
				32	33	34	35	36
1	UNTREATED CONTROL			0.0 b	0.0 b	0.0 b	0.0	0.0 a
2	MAT 28+	0.625	oz ai/a	100.0 a	100.0 a	93.3 a	96.7 a	0.0 a
	2, 4-D AMINE+	4.75	oz ai/a					
	NIS	0.25	% v/v					
3	MAT 28+	1.0	oz ai/a	100.0 a	100.0 a	96.7 a	88.3 a	0.0 a
	2, 4-D AMINE+	7.60	oz ai/a					
	NIS	0.25	% v/v					
4	RDQ98+	0.048	lb ai/a	100.0 a	93.3 a	93.3 a	86.7 a	0.0 a
	NIS	0.25	% v/v					
5	RDQ98+	0.08	lb ai/a	100.0 a	96.7 a	100.0 a	96.7 a	0.0 a
	NIS	0.25	% v/v					
6	CROSSBOW	1.5	lb ai/a	100.0 a	83.3 a	100.0 a	94.0 a	0.0 a
LSD (P=.05)				0.00	14.73	12.28	13.42	0.00
Standard Deviation				0.00	8.10	6.75	6.95	0.00
CV				0.0	10.26	8.38	7.52	0.0

The Ohio State University

Tall Ironweed - Weed Control with MAT28 2012-2013

Trial ID: TIRONWCMAT28W2012-2013 Location: Wooster, Ohio Trial Year:
Protocol ID: #US 565/12/01 Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan
Sponsor Contact: Marsha Martin

Pest Code
VENAL, Vernonia altissima, = US
FESAR, Festuca arundinacea, = US
DAUCA, Daucus carota, = US
OXASS, Oxalis sp., = US
TRFPR, Trifolium pratense, = US
BONCH, Bongardia chrysogonum, = US
ACHMI, Achillea millefolium, = US
GLEHE, Glechoma hederacea, = US
CYPES, Cyperus esculentus, = US
DACGL, Dactylis glomerata, = US
POATR, Poa trivialis, = US
PLAMA, Plantago major, = US
ASCSY, Asclepias syriaca, = US
ASTPI, Symphyotrichum pilosum, = US
PANDI, Panicum dichotomiflorum, = US
TAROF, Taraxacum officinale, = US
Rating Type
DAMAGE = damage
Rating Unit
% = percent

Trial Comments

On 28 Aug 2013 rating of plot 206 was unable to be performed, as plot had been recently mowed down.

The Ohio State University

Raspberry - Matrix - DuPont - 2013

Trial ID: Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Douglas Doohan
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Assistant
Investigator: Dr. Douglas J. Doohan

Discipline: H herbicide
Trial Status: F one-year/final **Trial Reliability:** MARGINAL
Initiation Date: Apr-8-2013
Completion Date: Jul-4-2013

Trial Location

City: Wooster **Country:** USA United States
State/Prov.: Ohio
Postal Code: 44691

Objectives:

Objective:1) Evaluate weed control efficacy of Matrix and Matrix combined with other compounds (Diuron and Terbacil). 2) Assess crop tolerance in Red Raspberry.

Conclusions:

At 14 days after treatment (DAT) each treatment had phytotoxic effects on the raspberry plants (between 36% to 56% damage). Weed control was similar between each treatment. The best control of broadleaf weeds was treatment 4 (Matrix with Sinbar) which had better control of dandelion and ground ivy than the other treatments.
The assessment at 31 DAT also shows that phytotoxicity persisted in the raspberries. There appears to have been some recovery of vigor in the plots which had treatment 3 (Matrix with Karmex), with a 22.5 % damage rating compared to 65% and 71% damage for treatments 2 and 4. weed control was still comprable, with no differences.
The last assessment, at 60 DAT, showed that there was still good weed control on all treatments, compared to the untreated controls. However, a phytotoxity assessment was not recorded.
The treatments tested all appeared to have unacceptable levels of phytotoxicity to the raspberry crop, when applied as a broadcast treatments at around the time of bloom.

Contacts

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Assistant
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, Ohio
Postal Code: 44691

Investigator: Dr. Douglas J. Doohan

Crop Description

Crop 1: RUBID Rubus idaeus Red raspberry
Variety: Nova **BBCH Scale:** BPER

The Ohio State University

Raspberry - Matrix - DuPont - 2013

Trial ID: Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Douglas Doohan
Sponsor Contact:

Pest Description

Pest 1 Type: W **Code:** CIRAR Cirsium arvense
Common Name: Canada thistle

Pest 2 Type: W **Code:** CERVU Cerastium fontanum vulgare
Common Name: Mouse-ear chickweed

Pest 3 Type: W **Code:** SENVU Senecio vulgaris
Common Name: Common groundsel

Pest 4 Type: W **Code:** TRFRE Trifolium repens
Common Name: White clover

Pest 5 Type: W **Code:** TAROF Taraxacum officinale
Common Name: Common dandelion

Pest 6 Type: W **Code:** POASS Poa sp.
Common Name: Bluegrass

Pest 7 Type: W **Code:** ERICA Conyza canadensis
Common Name: Canada horseweed

Site and Design

Treated Plot Width: 8 FT
Treated Plot Length: 20 FT
Treated Plot Area: 160 FT2 **Treatments:** 4
Replications: 4
Site Type: ORCHAR orchard
Experimental Unit: 1 PLOT plot
Study Design: RACOBL Randomized Complete Block (RCB)

Application Description

	A
Application Date:	May-3-2013
Appl. Start Time:	09:40
Application Method:	SPRAY
Application Placement:	PLOT
Air Temperature, Unit:	60.2 F
% Relative Humidity:	59.71
Wind Velocity, Unit:	3.98 MPH
Wind Direction:	SE
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	56.7 F
% Cloud Cover:	60
Next Moisture Occurred On:	May-8-2013

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	RUBID BPER

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Raspberry - Matrix - DuPont - 2013

Trial ID: Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Douglas Doohan
Sponsor Contact:

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	CIRAR W
Pest 2 Code, Type, Scale:	CERVU W
Pest 3 Code, Type, Scale:	SENVU W
Pest 4 Code, Type, Scale:	TRFRE W
Pest 5 Code, Type, Scale:	TAROF W
Pest 6 Code, Type, Scale:	POASS W
Pest 7 Code, Type, Scale:	ERICA W

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Raspberry - Matrix - DuPont - 2013

Trial ID: Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Douglas Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	1	2	3	4	5	6	7	8
	Pest Code				CIRAR	CERVU	SENVU	TRFRE	TAROF	POASS	GLEHE
	Crop Code			RUBID							
	BBCH Scale			BPER							
	Rating Date			May-17-2013	May-17-2013	May-17-2013	May-17-2013	May-17-2013	May-17-2013	May-17-2013	May-17-2013
	Rating Type			DAMAGE	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit			%	%	%	%	%	%	%	%
	Days After First/Last Applic.			14 14	14 14	14 14	14 14	14 14	14 14	14 14	14 14
	Trt-Eval Interval			14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
1	Untreated Control			0.0 a	0.0 a	0.0 b	0.0 b	0.0 b	0.0 c	0.0 a	0.0 b
2	Matrix	4	oz wt/a	36.3 a	35.0 a	55.0 a	87.5 a	62.5 a	22.5 b	0.0 a	31.3 ab
	NIS	0.25	% v/v								
3	Matrix	4	oz wt/a	50.0 a	40.0 a	55.0 a	92.5 a	100.0 a	17.5 bc	0.0 a	28.8 ab
	Karmex	4	lb/a								
	NIS	0.25	% v/v								
4	Matrix	4	oz wt/a	56.3 a	37.5 a	77.5 a	92.5 a	80.0 a	42.5 a	0.0 a	77.5 a
	Sinbar	0.5	lb/a								
	NIS	0.25	% v/v								
	LSD (P=.05)			43.74	38.33	38.10	24.76	53.99	18.13	0.00	49.60
	Standard Deviation			27.35	23.96	23.82	15.48	33.76	11.33	0.00	31.01
	CV			76.77	85.21	50.81	22.72	55.68	54.96	0.0	90.22

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns:Yates=10; Average=11,12,13,14
Excluded replicate 4 in column 7

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Raspberry - Matrix - DuPont - 2013

Trial ID: Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Douglas Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit						
Pest Code					CIRAR	CERVU	ERICA	TRFRE	GLEHE
Crop Code				RUBID					
BBCH Scale				BPER					
Rating Date				Jun-3-2013	Jun-3-2013	Jun-3-2013	Jun-3-2013	Jun-3-2013	Jun-3-2013
Rating Type				DAMAGE	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit				%	%	%	%	%	%
Days After First/Last Applic.				31 31	31 31	31 31	31 31	31 31	31 31
Trt-Eval Interval				31 DA-A	31 DA-A	31 DA-A	31 DA-A	31 DA-A	31 DA-A
				9	10	11	12	13	14
1	Untreated Control			0.0 b	0.0 b	0.0 b	0.0 a	0.0 a	0.0 a
2	Matrix	4	oz wt/a	65.0 a	52.5 a	30.0 b	20.0 a	60.0 a	26.7 a
	NIS	0.25	% v/v						
3	Matrix	4	oz wt/a	22.5 b	55.7 a	80.0 a	75.0 a	25.0 a	25.0 a
	Karmex	4	lb/a						
	NIS	0.25	% v/v						
4	Matrix	4	oz wt/a	71.3 a	31.3 a	80.0 a	80.0 a	50.0 a	20.0 a
	Sinbar	0.5	lb/a						
	NIS	0.25	% v/v						
LSD (P=.05)				28.53	30.49	37.87	165.06	330.11	30.05
Standard Deviation				17.84	18.70	16.83	18.37	36.74	15.31
CV				44.95	53.64	35.44	41.99	108.87	85.45

The Ohio State University

Raspberry - Matrix - DuPont - 2013

Trial ID: Location: Wooster, Ohio Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Douglas Doohan
Sponsor Contact:

Pest Code
CIRAR, Cirsium arvense, = US
CERVU, Cerastium fontanum vulgare, = US
SENVU, Senecio vulgaris, = US
TRFRE, Trifolium repens, = US
TAROF, Taraxacum officinale, = US
POASS, Poa sp., = US
GLEHE, Glechoma hederacea, = US
ERICA, Conyza canadensis, = US
Crop Code
RUBID, BPER, Rubus idaeus, = US
Rating Type
DAMAGE = damage
CONTRO = control / burndown or knockdown
Rating Unit
% = percent

Trial Comments

An assessment conducted on 7/3/2013 recorded the following:

plot 101 [2]; Some control. Grasses seen were fescue, quackgrass, foxtail. Weeds seen were Canada thistle, plantain and clover

plot 102 [1]; Thistle, lambsquarter, Canada horseweed (mare's tail), clover, oxalis

plot 103 [3]; Good control. clean plot. grass, clover. Suppression of thistle.

plot 104 [4]; Control of quackgrass, foxtail and thistle, isn't controlling Canada horseweed.

plot 201 [1]; Observed quackgrass, ground ivy, thistle, horseweed, and clover

plot 202 [4]; Observed horseweed, oxalis, thistle, quackgrass, ground ivy, dandelion

plot 203 [2]; Good control. Ground ivy and thistle. Clean Plot

plot 204 [3]; Supression of thistle, quackgrass and horseweed. Has plantain.

plot 301 [2]; Control of grasses, thistle. Not good control of ground ivy.

plot 302 [1]; Control of grasses and clover, not dandelions. Some thistle

plot 303 [3]; Contol of grasses, ground ivy, plantain. Some thistle

plot 304 [4]; Dead grass. Thistle, some ground ivy.

plot 401 [3]; Good suppression of grasses, ground ivy, thistle

plot 402 [2]; Good control of grass, thistle. Didn't control ground ivy.

plot 403 [4]; Controls goldenrod, thistle, clover, foxtail, grass. Did not control perennial sowthistle.

plot 404 [1]; Quackgrass, thistle, ground ivy, horseweed, dandelion, plantain

The Ohio State University

2012-2013 Fall/Spring Herbicide Applications

Trial ID: Protocol ID:
Location: Study Director:
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Associate
Investigator: Dr. Douglas J. Doohan **Title:** Professor

Discipline: H herbicide
Trial Status: K multi-year/final

Trial Location

City: Wooster **Latitude of LL Corner °:** 40.7787 N
State/Prov.: Ohio **Longitude of LL Corner °:** 81.9308 W
Postal Code: 44691 **Altitude of LL Corner, Unit:** 1020.00 FT
Country: USA United States

Objectives:

OBJECTIVES: Observe Spartan Charge and Authority MTZ DF applied in the fall and sequntially in the spring.

TREATMENTS: See Attached Treatment List.

TIMING: A = FALL
B = SPRING = PRE-TRANSPLANT

TARGETS: Winter annual broadleaves and greasses.

PARAMETERS: Take weed control and crop response rating as per standard practice that is applicable to convey to end users.

Conclusions:

The objective of this study was to observe the crop response and weed control of Spartan Charge and Authority MTZ at either one or two application timings.
There was statistically better weed control between those treatments that were applied at the fall and spring timings compared to the treatments that only had a fall application applied. This was irregardless of treatment.
There was no effect on crop vigor or yield in any treatments.

Personnel

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Associate
Affiliation: OARDC/The Ohio State University
Address: 1680 Madison Ave.
Location: Wooster, Ohio
Postal Code: 44691
Investigator: Dr. Douglas J. Doohan **Title:** Professor
Affiliation: OARDC/ The Ohio State University

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Crop Description

Crop 1: LYPES Solanum lycopersicum Tomato
BBCH Scale: BVSO **Planting Date:** Jun-14-2013
Planting Method: TRAMAC transplanted - machine
Harvest Date: Sep-27-2013

Pest Description

Pest 1 Type: W **Code:** CIRAR Cirsium arvense
Common Name: Canada thistle

Site and Design

Plot Width, Unit: 6 FT
Plot Length, Unit: 25 FT
Plot Area, Unit: 150 FT2
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Maintenance

No.	Date	Maintenance Treatment Name
1.	Jun-15-2013	Tanos 8oz/a; Kocide 2lbs/a; Manzate 1.5lbs/a;Bayth
2.	Jun-20-2013	Bravo Weather Stix 2pt/a
3.	Jul-3-2013	Quadris 5oz/a; Baythroid 2.8oz/a
4.	Jul-12-2014	Tanos 8oz/a; Kocide 2lbs/a; Manzate 1.5lbs/a;Bayth
5.	Jul-15-2013	Hand weeding
6.	Jul-17-2013	Bravo Weather Stix 2pt/a
7.	Jul-25-2013	Quadris 5oz/a; Baythroid 2.8oz/a
8.	Aug-2-2013	Tanos 8oz/a; Kocide 2lbs/a; Manzate 1.5lbs/a;Bayth
9.	Aug-8-2013	Bravo Weather Stix 2pt/a
10.	Aug-20-2013	Ridomil Bravo Gold SC 2pt/a
11.	Aug-30-2013	Quadris 6oz/a
12.	Aug-15-2013	Bravo Weather Stix 2pt/a

Field Prep./Maintenance:

Soil Description

% OM: 2.8 **Texture:** CSL clay sandy loam
pH: 6.4
CEC: 5.6 **Fert. Level:** G good
Soil Drainage: E excellent
Analyzed By:
CLC labs, Westerville, Ohio

Moisture and Weather Conditions

Overall Moisture Conditions: GOOD good
Closest Weather Station: OARDC **Distance, Unit:** 1 MI

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Application Description

	A	B
Application Date:	Oct-18-2012	Jun-13-2013
Time of Day:	6:00 am	12:00 pm
Application Method:	SPRAY	SPRAY
Application Timing:	POEMCA	PRETRA
Application Placement:	BROADC	BROADC
Applied By:	Scott Wolfe	Doug Doohan
Air Temperature, Unit:	57.3 F	63.4 F
% Relative Humidity:	63.84	90.9
Wind Velocity, Unit:	5.92 MPH	7.5 MPH
Wind Direction:	SE	NNW
Dew Presence (Y/N):	N no	N no
Soil Temperature, Unit:	55.4 F	68.9 F
Soil Moisture:	DRY	SLIWET
% Cloud Cover:	50	

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale:	LYPES BVSO	LYPES BVSO
Stage Scale Used:		BBCH
Stage Majority, Percent:		14 90

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale:	CIRAR W	CIRAR W
Stage Majority, Percent:		12 90

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Application Equipment

	A	B
Equipment Type:	BACSPR	BACSPR
Operation Pressure, Unit:	40 PSI	40 PSI
Nozzle Type:	TwinJet	TwinJet
Nozzle Size:	11002	11002
Nozzle Spacing, Unit:	18 IN	18 IN
Nozzles/Row:	2	2
Nozzle Calibration, Unit:	0.2 gl/MIN	0.2 gl/MIN
Band Width, Unit:	36 IN	36 IN
% Coverage:	100.0	100.0
Boom Height, Unit:	18 IN	18 IN
Ground Speed, Unit:	2.64 MPH	2.64 MPH
Carrier:	WATER	WATER
Spray Volume, Unit:	25 gal/ac	25 gal/ac
Mix Size, Unit:	3 liters	3 liters
Propellant:	COMCO2	COMCO2
Tank Mix (Y/N):	Y yes	Y yes

The Ohio State University

2012-2013 Fall/Spring Herbicide Applications

Trial ID: Protocol ID:
Location: Study Director:
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit						
Pest Type						W Weed	W Weed		
Pest Code						CIRAR	AMARE		
Pest Scientific Name						Cirsium arvense	Amaranthus retroflexus		
Pest Name						Canada thistle	Redroot pigweed		
Crop Code				LYPES	LYPES			LYPES	LYPES
BBCH Scale				BVSO	BVSO			BVSO	BVSO
Crop Scientific Name				Solanum lycopersicum	Solanum lycopersicum			Solanum lycopersicum	Solanum lycopersicum
Crop Name				Tomato	Tomato			Tomato	Tomato
Part Rated				PLANT C	PLANT C	PLOT P	PLOT P	PLATOT C	FRUMAR C
Rating Date				Jul-2-2013	Jul-19-2013	Jul-19-2013	Jul-19-2013	Jul-19-2013	Sep-26-2013
Rating Type									
Rating Unit				%	%	%	%	NUMBER	NUMBER
Days After First/Last Applic.				257 19	274 36	274 36	274 36	274 36	343 105
Trt-Eval Interval				19 DA-B	36 DA-B	36 DA-B	36 DA-B	36 DA-B	146 DA-B
Number of Decimals									
1	UNTREATED			3 a	0 a	0 c	0 b	28 a	51 a
2	SPARTAN CHARGE	7.5	OZ/A	3 a	0 a	0 c	0 b	23 a	61 a
	ROUNDUP POWERMAX	32	OZ/A						
3	SPARTAN CHARGE	7.5	OZ/A	5 a	0 a	80 a	80 a	27 a	35 a
	ROUNDUP POWERMAX	32	OZ/A						
	SPARTAN CHARGE	7.5	OZ/A						
	ROUNDUP POWERMAX	32	OZ/A						
4	AUTHORITY MTZ	14	OZ/A	8 a	0 a	45 ab	0 b	28 a	52 a
	ROUNDUP POWERMAX	32	OZ/A						
5	AUTHORITY MTZ	14	OZ/A	11 a	0 a	80 a	88 a	24 a	37 a
	ROUNDUP POWERMAX	32	OZ/A						
	AUTHORITY MTZ	14	OZ/A						
	ROUNDUP POWERMAX	32	OZ/A						
6	AUTHORITY MTZ	14	OZ/A	3 a	0 a	20 bc	28 b	23 a	55 a
	ROUNDUP POWERMAX	32	OZ/A						
	2,4-D LV ESTER	24	OZ/A						
7	AUTHORITY MTZ	14	OZ/A	3 a	0 a	30 bc	78 a	25 a	44 a
	ROUNDUP POWERMAX	32	OZ/A						
	2,4-D LV ESTER	24	OZ/A						
	AUTHORITY MTZ	14	OZ/A						
	ROUNDUP POWERMAX	32	OZ/A						
LSD (P=.05)				10.2	0.0	38.2	31.7	6.8	21.1
Standard Deviation				6.8	0.0	25.7	21.4	4.6	14.2
CV				141.78	0.0	70.54	54.88	18.12	29.65

Means followed by same letter do not significantly differ (P=.05, LSD)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Trt No.	Treatment Name	Rate	Rate Unit				
Pest Type							
Pest Code							
Pest Scientific Name							
Pest Name							
Crop Code				LYPES	LYPES	LYPES	LYPES
BBCH Scale				BVSO	BVSO	BVSO	BVSO
Crop Scientific Name				Solanum lycopersicum	Solanum lycopersicum	Solanum lycopersicum	Solanum lycopersicum
Crop Name				Tomato	Tomato	Tomato	Tomato
Part Rated				FRUUNM C	FRUMAR C	FRUUNM C	FRUIT -
Rating Date				Sep-26-2013	Sep-26-2013	Sep-26-2013	Sep-26-2013
Rating Type							RATIO
Rating Unit				NUMBER	kg	kg	%
Days After First/Last Applic.				343 105	343 105	343 105	343 105
Trt-Eval Interval				146 DA-B	146 DA-B	146 DA-B	146 DA-B
Number of Decimals					2	2	2
1	UNTREATED			119 a	2.49 a	4.23 a	0.62 a
2	SPARTAN CHARGE	7.5	OZ/A	118 a	3.20 a	4.31 a	0.75 a
	ROUNDUP POWERMAX	32	OZ/A				
3	SPARTAN CHARGE	7.5	OZ/A	125 a	1.98 a	5.54 a	0.40 a
	ROUNDUP POWERMAX	32	OZ/A				
	SPARTAN CHARGE	7.5	OZ/A				
	ROUNDUP POWERMAX	32	OZ/A				
4	AUTHORITY MTZ	14	OZ/A	117 a	2.75 a	4.46 a	0.65 a
	ROUNDUP POWERMAX	32	OZ/A				
5	AUTHORITY MTZ	14	OZ/A	132 a	1.93 a	4.94 a	0.43 a
	ROUNDUP POWERMAX	32	OZ/A				
	AUTHORITY MTZ	14	OZ/A				
	ROUNDUP POWERMAX	32	OZ/A				
6	AUTHORITY MTZ	14	OZ/A	123 a	2.83 a	4.99 a	0.60 a
	ROUNDUP POWERMAX	32	OZ/A				
	2,4-D LV ESTER	24	OZ/A				
7	AUTHORITY MTZ	14	OZ/A	133 a	2.51 a	5.58 a	0.51 a
	ROUNDUP POWERMAX	32	OZ/A				
	2,4-D LV ESTER	24	OZ/A				
	AUTHORITY MTZ	14	OZ/A				
	ROUNDUP POWERMAX	32	OZ/A				
LSD (P=.05)				51.1	1.413	2.108	0.385
Standard Deviation				34.4	0.951	1.419	0.259
CV				27.82	37.67	29.2	45.96

The Ohio State University

2013/SPARTAN CHARGE/TOMATOES/OH/MI/

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan **Title:** Professor
Investigator: Rick Edwards **Title:** Research Associate

Discipline: H herbicide
Trial Status: F one-year/final **Trial Reliability:** GOOD
Initiation Date: Jun-13-2013 **Planned Completion Date:** Nov-1-2013
Completion Date: Nov-1-2013

Trial Location

City: Wooster **Country:** USA United States
State/Prov.: Ohio
Postal Code: 44691

Latitude of LL Corner °: 40.7787 N
Longitude of LL Corner °: 81.9308 W USAOH 42.3271331 **-** 38.4034194
Altitude of LL Corner, Unit: 1020.00 FT -80.5184478 **-** -84.8203125

Objectives:

OBJECTIVES: Observe Spartan, Spartan Charge and Authority MTZ DF Pre-Plant Broadcast & Incorporated

TIMING:
A = PPBC = Pre-plant Broadcast (no-incoporation)
B = PPBIC = Pre-plant Broadcast, incorporation
C = 1" weeds, apply postemergence after tomato transplants have come out of shock and weeds are no more than 1 inch tall.

TARGETS: Winter annual broadleaves and grasses.

PARAMETERS: Take weed control and crop response rating as per standard practice that is applicable to convey to end users.

Conclusions:

The objective of this study was to observe the crop response and weed control of the respective treatments and whether pre-plant broadcast or pre-plant incorporated.
There was a statistical lower level of weed control in the 6 OZ/A Spartan non-incorporated treatment at 36 days after the pre-plant treatment. This treatment also showed less weed control (not statistically significant) in both the non-incorporated and incorporated regimen, at 19 days after pre-plant treatment.
The best treatment for weed control was the Authority MTZ treatments, both non-incorporated and incorporated, showing a 97 and 98 percent control, respectively, at 36 days after treatment. This was slightly better than the Spartan Charge treatments (90% and 88% non-incorporated/incorporated respectively).
There was no significant differences in crop damage or yield in any treatments.

Contacts

Study Director: Doug Doohan **Title:** Professor
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, Ohio
Postal Code: 44691

Investigator: Rick Edwards **Title:** Research Associate
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, Ohio
Postal Code: 44691

The Ohio State University

2013/SPARTAN CHARGE/TOMATOES/OH/MI/

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Crop Description

Crop 1: LYPES Solanum lycopersicum Tomato
BBCH Scale: BVSO
Planting Date: Jun-13-2013
Planting Method: TRAMAC transplanted - machine
Harvest Date: Sep-26-2013

Pest Description

Pest 1 Type: W **Code:** CIRAR Cirsium arvense
Common Name: Canada thistle

Site and Design

Treated Plot Width: 5 FT
Treated Plot Length: 20 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 100 FT2 **Treatments:** 7 **Tillage Type:** CONTIL conventional-till
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Maintenance

No.	Date	Maintenance Product Name	Form Conc	Form Type	Rate	Rate Unit
1.	May-22-2013	Roundup	3	AS	1	QT/A
2.	Jun-15-2013	Tanos 8oz/a; Kocide 2lbs/a; Manzate 1.5lbs/a;Bayth				
3.	Jun-20-2013	Bravo Weather Stix 2pt/a				
4.	Jul-3-2013	Quadris 5oz/a; Baythroid 2.8oz/a				
5.	Jul-12-2014	Tanos 8oz/a; Kocide 2lbs/a; Manzate 1.5lbs/a;Bayth				
6.	Jul-15-2013	Hand weeding				
7.	Jul-17-2013	Bravo Weather Stix 2pt/a				
8.	Jul-25-2013	Quadris 5oz/a; Baythroid 2.8oz/a				
9.	Aug-2-2013	Tanos 8oz/a; Kocide 2lbs/a; Manzate 1.5lbs/a;Bayth				
10.	Aug-8-2013	Bravo Weather Stix 2pt/a				
11.	Aug-20-2013	Ridomil Bravo Gold SC 2pt/a				
12.	Aug-30-2013	Quadris 6oz/a				
13.	Aug-15-2013	Bravo Weather Stix 2pt/a				

Field Prep./Maintenance:

Soil Description

% OM: 2.9 **Texture:** CSL clay sandy loam
pH: 6.0
CEC: 6.2 **Fert. Level:** G good
Soil Drainage: E excellent
Analyzed By:
CLC Labs, Westerville, Ohio

Moisture and Weather Conditions

Overall Moisture Conditions: EXCELL excellent
Closest Weather Station: OARDC **Distance, Unit:** 1 MI

The Ohio State University

2013/SPARTAN CHARGE/TOMATOES/OH/MI/

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Application Description

	A	B	C
Application Date:	Jun-13-2013	Jun-13-2013	Jun-21-2013
Application Method:	SPRAY	SPRINC	SPRAY
Application Timing:	PRETRA	PRETRA	POEMW1
Application Placement:	BROADC	BROADC	BROADC
Applied By:	Doug Doohan	Doug Doohan	Doug Doohan
Air Temperature, Unit:	63.4 F	63.4 F	79.1 F
% Relative Humidity:	90.9	90.9	58
Wind Velocity, Unit:	7.5 MPH	7.5 MPH	4.3 MPH
Wind Direction:	NNW	NNW	E
Dew Presence (Y/N):	N no	N no	N no
Soil Temperature, Unit:	68.9 F	68.9 F	71.9 F
Soil Moisture:	SLIWET	SLIWET	SLIDRY
Next Moisture Occurred On:	Jun-16-2013	Jun-16-2013	Jun-26-2013

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale:	LYPES BVSO	LYPES BVSO	LYPES BVSO
Stage Scale Used:			BBCH
Stage Majority, Percent:			15

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale:	CIRAR W	CIRAR W	CIRAR W DESC
Stage Majority, Percent:			12 90
Height, Unit:			1 IN

The Ohio State University

2013/SPARTAN CHARGE/TOMATOES/OH/MI/

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Application Equipment

	A	B	C
Equipment Type:	BACSPR	BACSPR	BACSPR
Operation Pressure, Unit:	40 PSI	40 PSI	40 PSI
Nozzle Type:	TwinJet	TwinJet	TwinJet
Nozzle Size:	11002	11002	11002
Nozzle Spacing, Unit:	18 IN	18 IN	18 IN
Nozzles/Row:	2	2	2
Nozzle Calibration, Unit:	0.2 gl/MIN	0.2 gl/MIN	0.2 gl/MIN
Band Width, Unit:	36 IN	36 IN	36 IN
% Coverage:	100.0	100.0	100.0
Boom Height, Unit:	18 IN	18 IN	18 IN
Ground Speed, Unit:	2.64 MPH	2.64 MPH	2.64 MPH
Carrier:	WATER	WATER	WATER
Spray Volume, Unit:	25 gal/ac	25 gal/ac	25 gal/ac
Mix Size, Unit:	3 liters	3 liters	3 liters
Propellant:	COMCO2	COMCO2	COMCO2
Tank Mix (Y/N):	Y yes	Y yes	Y yes

The Ohio State University

2013/SPARTAN CHARGE/TOMATOES/OH/MI/

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1	2	3	4	5	6	7	8
Pest Code						CIRAR		CIRAR				
Crop Code					LYPES		LYPES		LYPES	LYPES	LYPES	LYPES
BBCH Scale					BVSO		BVSO		BVSO	BVSO	BVSO	BVSO
Part Rated					PLOT -	PLOT -			PLATOT -	FRUMAR C	FRUUNM -	FRUMAR C
Rating Date					Jul-2-2013	Jul-2-2013	Jul-19-2013	Jul-19-2013	Jul-19-2013	Sep-26-2013	Sep-26-2013	Sep-26-2013
Rating Type					PHYGEN	CONTROL	PHYGEN	CONTROL				
Rating Unit					%	%	%	%	NUMBER	NUMBER	NUMBER	kg
Rating Timing					A1							
Days After First/Last Applic.					19 11	19 11	36 28	36 28	36 28	105 97	105 97	105 97
Trt-Eval Interval					19 DA-A	11 DA-C	28 DA-C	28 DA-C	28 DA-C	97 DA-C	97 DA-C	97 DA-C
Number of Decimals												2
1	UNTREATED				18.8 a	0.0 a	2.5 a	0.0 c	21.0 a	63.0 a	59.5 a	3.54 a
2	SPARTAN	6	oz/a	A	10.0 a	10.0 a	2.5 a	25.0 b	22.0 a	69.8 a	73.8 a	3.70 a
	SENCOR	2	oz/a	C								
	MATRIX	1	oz/a	C								
	NIS	0.25	% v/v	C								
3	SPARTAN CHARGE	7.5	oz/a	A	17.5 a	50.0 a	0.0 a	93.3 a	21.5 a	66.5 a	66.1 a	4.07 a
	SENCOR	2	oz/a	C								
	MATRIX	1	oz/a	C								
	NIS	0.25	% v/v	C								
4	AUTHORITY MTZ	12	oz/a	A	10.0 a	66.7 a	0.0 a	98.9 a	22.3 a	77.5 a	80.8 a	5.11 a
	SENCOR	2	oz/a	C								
	MATRIX	1	oz/a	C								
	NIS	0.25	% v/v	C								
5	SPARTAN	6	oz/a	B	21.3 a	31.3 a	0.0 a	92.5 a	22.3 a	74.8 a	117.5 a	4.31 a
	SENCOR	2	oz/a	C								
	MATRIX	1	oz/a	C								
	NIS	0.25	% v/v	C								
6	SPARTAN CHARGE	7.5	oz/a	B	10.0 a	62.5 a	0.0 a	90.6 a	22.3 a	85.5 a	68.7 a	5.11 a
	SENCOR	2	oz/a	C								
	MATRIX	1	oz/a	C								
	NIS	0.25	% v/v	C								
7	AUTHORITY MTZ	12	oz/a	B	28.8 a	65.0 a	2.5 a	99.4 a	21.8 a	79.3 a	95.0 a	4.78 a
	SENCOR	2	oz/a	C								
	MATRIX	1	oz/a	C								
	NIS	0.25	% v/v	C								
LSD (P=.05)					14.16	65.94	4.77	22.82t	3.51	27.33	0.22t	1.647
Standard Deviation					9.53	43.47	3.21	15.05t	2.36	18.40	0.15t	1.108
CV					57.4	106.62	299.79	25.05	10.81	24.95	7.92	25.35

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns:Average=2,4

The Ohio State University

2013/SPARTAN CHARGE/TOMATOES/OH/MI/

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	9	10
	Pest Code					
	Crop Code				LYPES	LYPES
	BBCH Scale				BVSO	BVSO
	Part Rated				FRUUNM C	FRUIT -
	Rating Date				Sep-26-2013	Sep-26-2013
	Rating Type					
	Rating Unit				kg	%
	Rating Timing					
	Days After First/Last Applic.				105 97	105 97
	Trt-Eval Interval				97 DA-C	97 DA-C
	Number of Decimals				2	2
1	UNTREATED				2.22 a	1.55 a
2	SPARTAN	6	oz/a	A	2.61 a	1.43 a
	SENCOR	2	oz/a	C		
	MATRIX	1	oz/a	C		
	NIS	0.25	% v/v	C		
3	SPARTAN CHARGE	7.5	oz/a	A	2.56 a	1.76 a
	SENCOR	2	oz/a	C		
	MATRIX	1	oz/a	C		
	NIS	0.25	% v/v	C		
4	AUTHORITY MTZ	12	oz/a	A	3.48 a	1.49 a
	SENCOR	2	oz/a	C		
	MATRIX	1	oz/a	C		
	NIS	0.25	% v/v	C		
5	SPARTAN	6	oz/a	B	4.86 a	1.00 a
	SENCOR	2	oz/a	C		
	MATRIX	1	oz/a	C		
	NIS	0.25	% v/v	C		
6	SPARTAN CHARGE	7.5	oz/a	B	2.52 a	2.01 a
	SENCOR	2	oz/a	C		
	MATRIX	1	oz/a	C		
	NIS	0.25	% v/v	C		
7	AUTHORITY MTZ	12	oz/a	B	4.15 a	1.17 a
	SENCOR	2	oz/a	C		
	MATRIX	1	oz/a	C		
	NIS	0.25	% v/v	C		
	LSD (P=.05)				0.217t	0.202t
	Standard Deviation				0.146t	0.136t
	CV				23.84	34.62

The Ohio State University

2013/SPARTAN CHARGE/TOMATOES/OH/MI/

Trial ID: Location: Trial Year:
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director:
Sponsor Contact:

Pest Code
CIRAR, Cirsium arvense, = US
Crop Code
LYPES, BVSO, Solanum lycopersicum, = US
Part Rated
PLOT = plot
PLATOT = plant - total
FRUMAR = fruit - marketable
FRUUNM = fruit - unmarketable
FRUIT = fruit
C = Crop is Part Rated
Rating Type
PHYGEN = phytotoxicity - general / injury
Rating Unit
% = percent
NUMBER = number
kg = kilogram
Rating Timing
A1 = 1st Assessment According to Trial Schedule

The Ohio State University

2013/GRAPES/SPARTAN/TANKMIXES/EARLY PRE

Trial ID: SULF.GRAPE.13.JPR.01 Location: WOOSTER, OH Trial Year: 2013
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan **Title:** Professor
Investigator: Rick Edwards **Title:** Research Associate

Discipline: H herbicide
Trial Status: S setup **Trial Reliability:** GOOD

Trial Location

City: Wooster **Country:** USA United States
State/Prov.: Ohio
Postal Code: 44691

Latitude of LL Corner °: 40.740624 N
Longitude of LL Corner °: 81.905408 W
Altitude of LL Corner, Unit: 1020.00 FT

Objectives:
Observe various sulfentrazone + carfentrazone tankmixes for weed control in grapes.

TIMING:
A = EPRE = Late March through Early April
B = SUCKER = Timing for Sucker Control = Suckers must be 8 inches or taller
C = Last POST Timing

TARGETS: Grasses, Broadleaves such as lambsquarters, marestail, morninigglories, mugwhort, poison ivy and others as well as yellow nutsedge.

CROPS: Grapes

Conclusions:
The objective of this trial was to observe weed control with sulfentrazone and carfentrazone applied in three treatment timings: In the EPRE treatment(A), mixtures of Spartan (sulfentrazone) at 10 OZ/A with Matrix and Karmex (treatment 1), or Spartan at 6OZ/A with Prowl H2O (treatment 2 and 3) were combined in tankmixes with Roundup Powermax. The second timing was when suckers were at 8". These treatments consisted of AIM and POAST (treatment 1), AIM with Gramoxone Inteon (treatment 2) or Spartan Charge (treatment 3). The third timing was intended to be applied as a late POST, which was to be Gramoxone Inteon and Karmex for treatment 3 only. Due to continued weed control from the other two treatments, it was determined that this POST treatment was not needed.

At 10 days after treatment A, all treatments had similar efficacy of weed control, although the high rate of Spartan/Matrix/Karmax treatment showed statistically less control of Bluegrass. That same treatment also showed statistically better control of White clover.

At 14 days following the SUCKER treatment, (application timing B) there was good control of suckers withhout damage to the vines. Treatment 3 (which was Spartan Charge at 7.5 OZ/A at the application B timing) showed a statistically lower control of marestail (74% compared to 95% and 91%) and for White clover (79% compared to 100% and 95%) compared to treatments 1 and 2.

At 55 days after the SUCKER treatment, there was overall good weed control through all plots. However, for control of White clover there were statistical differences seen. The best control of White clover was seen with treatment 1 at 98%, then treatment 2 at 83% and finally treatment 3 at 60%.

The Ohio State University

2013/GRAPES/SPARTAN/TANKMIXES/EARLY PRE

Trial ID: SULF.GRAPE.13.JPR.01 Location: WOOSTER, OH Trial Year: 2013
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Contacts

Study Director: Doug Doohan **Title:** Professor
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, Ohio
Postal Code: 44691

Investigator: Rick Edwards **Title:** Research Associate
Organization: OARDC/The Ohio State University
Address: 1680 Madison Ave.
City+State/Prov: Wooster, Ohio
Postal Code: 44691

Crop Description

Crop 1: VITSS Vitis sp. Grape
BBCH Scale: BGRA
Planting Date: Apr-1-2003
Planting Method: ESTABL established
Harvest Date: Oct-4-2013

Pest Description

Pest 1 Type: W **Code:** TAROF Taraxacum officinale
Common Name: Common dandelion

Site and Design

Treated Plot Width: 10 FT **Site Type:** VINEYA vineyard
Treated Plot Length: 20 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 200 FT2 **Treatments:** 4
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Soil Description

Description Name: SILT LOAM
% Sand: 16 **% OM:** 3.0 **Texture:** SIL silt loam
% Silt: 72 **pH:** 6.0 **Soil Name:** WOOSTER SILT LOAM
% Clay: 12 **CEC:** 14 **Fert. Level:** G good
Soil Drainage: G good

Moisture and Weather Conditions

Overall Moisture Conditions: GOOD good
Closest Weather Station: Wooster Station **Distance, Unit:** 4 MI

Application Description

	A	B
Application Date:	May-6-2013	Jun-18-2013
Appl. Start Time:	1000	1200
Application Method:	SPRAY	SPRAY
Application Timing:	PREMEA	SUCKER
Application Placement:	PLOT	PLOT
Air Temperature, Unit:	61 F	74.2 F
% Relative Humidity:	59	79.6
Wind Velocity, Unit:	5.1 MPH	5.9 MPH
Wind Direction:	ESE	NE
Dew Presence (Y/N):	N no	N no
Soil Temperature, Unit:	56.5 F	78 F
% Cloud Cover:	60	
Next Moisture Occurred On:	Oct-8-2013	Jun-25-2013

The Ohio State University

2013/GRAPES/SPARTAN/TANKMIXES/EARLY PRE

Trial ID: SULF.GRAPE.13.JPR.01 Location: WOOSTER, OH Trial Year: 2013
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale:	VITSS BGRA	VITSS BGRA
Stage Scale Used:	BBCH	BBCH
Stage Majority, Percent:	11 70	19 70

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale:	TAROF W	TAROF W

Application Equipment

	A	B
Equipment Type:	BACCAI	BACCAI
Operation Pressure, Unit:	30 PSI	30 PSI
Nozzle Size:	8002	8002
Nozzles/Row:	1	1
% Coverage:	100.0	100.0
Boom Height, Unit:	36 IN	36 IN
Ground Speed, Unit:	2 MPH	2 MPH
Carrier:	WATER	WATER
Spray Volume, Unit:	25 gal/ac	25 gal/ac
Mix Size, Unit:	2 liters	2 liters

Date By Notes
Jul-2-2013 Edwards, R 101 90% overall- 2-3 seedling marestail and dandelion; 103 90% overall- virtually weed free, 1 va. pepperweed; 104 80% overall some va. pepperweed; 204 85% overall some marestail, 203 85% a little clover, possibly boom height issue, water sprouts burn
Jul-2-2013 201 95% overall, clean; 301 90% overall; 302 60% overall,303 90% overall watersprout stem damage, 401 70% overall; 403 100% overall, watersprouts burnt, 404 100% overall

The Ohio State University

2013/GRAPES/SPARTAN/TANKMIXES/EARLY PRE

Trial ID: SULF.GRAPE.13.JPR.01 Location: WOOSTER, OH Trial Year: 2013
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1	2	3	4	5	6	7
	Pest Code				VITSS	TAROF	CAPBP	DAUCA	POASS	MEUAL	CERVU
	Crop Code										
	BBCH Scale				BGRA						
	Part Rated				PLANT	C					
	Rating Date				May-16-2013	May-16-2013	May-16-2013	May-16-2013	May-16-2013	May-16-2013	May-16-2013
	Rating Type				PHYGEN	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit				%	%	%	%	%	%	%
	Days After First/Last Applic.				10 10	10 10	10 10	10 10	10 10	10 10	10 10
	Trt-Eval Interval				10 DA-A	10 DA-A	10 DA-A	10 DA-A	10 DA-A	10 DA-A	10 DA-A
1	Untreated Check				0.0 a	0.0 b	0.0 b	0.0 b	0.0 c	0.0 b	0.0 b
2	SPARTAN	10	oz/a	A	10.6 a	73.8 a	38.8 ab	41.3 ab	27.5 b	80.0 a	55.0 a
	+MATRIX	4	oz/a	A							
	+KARMEX	32	oz/a	A							
	ROUNDUP POWERMAX	32	oz/a	A							
	+AMS	2.5	% v/v	A							
	AIM	1.3	oz/a	B							
	+POAST	32	oz/a	B							
	+COC	1	% v/v	B							
3	SPARTAN	6	oz/a	A	7.6 a	65.0 a	23.8 b	58.8 a	60.0 a	40.0 ab	62.5 a
	+PROWL H2O	4	qt/a	A							
	+ROUNDUP POWERMAX	32	oz/a	A							
	+AMS	2.5	% v/v	A							
	AIM	1.3	oz/a	B							
	+GRAMOXONE INTEON	32	oz/a	B							
	+COC	1	% v/v	B							
4	SPARTAN	6	oz/a	A	6.8 a	62.5 a	67.5 a	47.5 ab	47.5 a	56.3 ab	66.3 a
	+PROWL H2O	4	qt/a	A							
	+ROUNDUP POWERMAX	32	oz/a	A							
	+AMS	2.5	% v/v	A							
	SPARTAN CHARGE	7.5	oz/a	B							
	+COC	1	% v/v	B							
	GRAMOXONE INTEON	32	oz/a	C							
	+KARMEX	32	oz/a	C							
	+COC	1	% v/v	C							
	LSD (P=.05)				2.00t	20.40	32.54	39.38	15.20	47.32	32.33
	Standard Deviation				1.25t	12.75	20.34	24.62	9.50	29.58	20.21
	CV				52.16	25.35	62.6	66.77	28.15	67.14	44.0

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns:Yates=23

The Ohio State University

2013/GRAPES/SPARTAN/TANKMIXES/EARLY PRE

Trial ID: SULF.GRAPE.13.JPR.01 Location: WOOSTER, OH Trial Year: 2013
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Trt No.	Treatment Name	Rate	Unit	Appl Code	LEPVI	AGRRE	HPPVU	MEUAL	CERVU	POASS	PLAMA	PESGL
	Pest Code											
	Crop Code											
	BBCH Scale											
	Part Rated											
	Rating Date				Jul-2-2013	Jul-2-2013	Jul-2-2013	Jul-2-2013	Jul-2-2013	Jul-2-2013	Jul-2-2013	Jul-2-2013
	Rating Type				CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit				%	%	%	%	%	%	%	%
	Days After First/Last Applic.				57 14	57 14	57 14	57 14	57 14	57 14	57 14	57 14
	Trt-Eval Interval				14 DA-B	14 DA-B	14 DA-B	14 DA-B	14 DA-B	14 DA-B	14 DA-B	14 DA-B
					8	9	10	11	12	13	14	15
1	Untreated Check				0.0 c	0.0 b	0.0 c	0.0 c	0.0 b	0.0 b	0.0 b	0.0 b
2	SPARTAN	10	oz/a	A	95.4 a	99.4 a	95.0 a	100.0 a	100.0 a	100.0 a	100.0 a	100.0 a
	+MATRIX	4	oz/a	A								
	+KARMEX	32	oz/a	A								
	ROUNDUP POWERMAX	32	oz/a	A								
	+AMS	2.5	% v/v	A								
	AIM	1.3	oz/a	B								
	+POAST	32	oz/a	B								
	+COC	1	% v/v	B								
3	SPARTAN	6	oz/a	A	96.8 a	96.8 a	91.3 a	91.3 ab	93.8	93.8	93.8	93.8 a
	+PROWL H2O	4	qt/a	A								
	+ROUNDUP POWERMAX	32	oz/a	A								
	+AMS	2.5	% v/v	A								
	AIM	1.3	oz/a	B								
	+GRAMOXONE INTEON	32	oz/a	B								
	+COC	1	% v/v	B								
4	SPARTAN	6	oz/a	A	53.2 b	97.9 a	73.8 b	78.8 b	100.0 a	100.0 a	100.0 a	90.0 a
	+PROWL H2O	4	qt/a	A								
	+ROUNDUP POWERMAX	32	oz/a	A								
	+AMS	2.5	% v/v	A								
	SPARTAN CHARGE	7.5	oz/a	B								
	+COC	1	% v/v	B								
	GRAMOXONE INTEON	32	oz/a	C								
	+KARMEX	32	oz/a	C								
	+COC	1	% v/v	C								
	LSD (P=.05)				25.71t	19.30t	11.15	15.43	0.00	0.00	0.00	18.09
	Standard Deviation				16.07t	12.06t	6.97	9.65	0.00	0.00	0.00	11.31
	CV				31.5	19.56	10.73	14.29	0.0	0.0	0.0	15.95

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2013/GRAPES/SPARTAN/TANKMIXES/EARLY PRE

Trial ID: SULF.GRAPE.13.JPR.01 Location: WOOSTER, OH Trial Year: 2013
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Trt No.	Treatment Name	Rate	Unit	Appl Code	TAROF	AMACH	ERICA	PORSS	MEUAL	LEPVI	DIGSS
	Pest Code				TAROF	AMACH	ERICA	PORSS	MEUAL	LEPVI	DIGSS
	Crop Code										
	BBCH Scale										
	Part Rated										
	Rating Date				Jul-2-2013	Aug-12-2013	Aug-12-2013	Aug-12-2013	Aug-12-2013	Aug-12-2013	Aug-12-2013
	Rating Type				CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit				%	%	%	%	%	%	%
	Days After First/Last Applic.				57 14	98 55	98 55	98 55	98 55	98 55	98 55
	Trt-Eval Interval				14 DA-B	55 DA-B	55 DA-B	55 DA-B	55 DA-B	55 DA-B	55 DA-B
		Rate	Unit	Code	16	17	18	19	20	21	22
1	Untreated Check				0.0 b	0.0 b	0.0 b	0.0 b	0.0 d	0.0 b	0.0 b
2	SPARTAN	10	oz/a	A	100.0 a	99.4 a	100.0 a	82.5 a	97.5 a	93.8	97.5 a
	+MATRIX	4	oz/a	A							
	+KARMEX	32	oz/a	A							
	ROUNDUP POWERMAX	32	oz/a	A							
	+AMS	2.5	% v/v	A							
	AIM	1.3	oz/a	B							
	+POAST	32	oz/a	B							
	+COC	1	% v/v	B							
3	SPARTAN	6	oz/a	A	93.4 a	96.2 a	87.5 a	87.5 a	82.5 b	100.0 a	92.5 a
	+PROWL H2O	4	qt/a	A							
	+ROUNDUP POWERMAX	32	oz/a	A							
	+AMS	2.5	% v/v	A							
	AIM	1.3	oz/a	B							
	+GRAMOXONE INTEON	32	oz/a	B							
	+COC	1	% v/v	B							
4	SPARTAN	6	oz/a	A	97.9 a	100.0 a	81.3 a	100.0 a	60.0 c	100.0 a	87.5 a
	+PROWL H2O	4	qt/a	A							
	+ROUNDUP POWERMAX	32	oz/a	A							
	+AMS	2.5	% v/v	A							
	SPARTAN CHARGE	7.5	oz/a	B							
	+COC	1	% v/v	B							
	GRAMOXONE INTEON	32	oz/a	C							
	+KARMEX	32	oz/a	C							
	+COC	1	% v/v	C							
	LSD (P=.05)				17.68t	20.19t	18.19	22.93	11.92	0.00	23.88
	Standard Deviation				11.06t	12.62t	11.37	14.34	7.45	0.00	14.93
	CV				17.92	19.87	16.93	21.24	12.42	0.0	21.52

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2013/GRAPES/SPARTAN/TANKMIXES/EARLY PRE

Trial ID: SULF.GRAPE.13.JPR.01 Location: WOOSTER, OH Trial Year: 2013
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	23
	Pest Code				PESGL
	Crop Code				
	BBCH Scale				
	Part Rated				
	Rating Date				Aug-12-2013
	Rating Type				CONTRO
	Rating Unit				%
	Days After First/Last Applic.				98 55
	Trt-Eval Interval				55 DA-B
1	Untreated Check				0.0 b
2	SPARTAN	10	oz/a	A	76.6 a
	+MATRIX	4	oz/a	A	
	+KARMEX	32	oz/a	A	
	ROUNDUP POWERMAX	32	oz/a	A	
	+AMS	2.5	% v/v	A	
	AIM	1.3	oz/a	B	
	+POAST	32	oz/a	B	
	+COC	1	% v/v	B	
3	SPARTAN	6	oz/a	A	82.5 a
	+PROWL H2O	4	qt/a	A	
	+ROUNDUP POWERMAX	32	oz/a	A	
	+AMS	2.5	% v/v	A	
	AIM	1.3	oz/a	B	
	+GRAMOXONE INTEON	32	oz/a	B	
	+COC	1	% v/v	B	
4	SPARTAN	6	oz/a	A	87.5 a
	+PROWL H2O	4	qt/a	A	
	+ROUNDUP POWERMAX	32	oz/a	A	
	+AMS	2.5	% v/v	A	
	SPARTAN CHARGE	7.5	oz/a	B	
	+COC	1	% v/v	B	
	GRAMOXONE INTEON	32	oz/a	C	
	+KARMEX	32	oz/a	C	
	+COC	1	% v/v	C	
	LSD (P=.05)				27.55
	Standard Deviation				16.48
	CV				26.72

The Ohio State University

2013/GRAPES/SPARTAN/TANKMIXES/EARLY PRE

Trial ID: SULF.GRAPE.13.JPR.01 Location: WOOSTER, OH Trial Year: 2013
Protocol ID: Investigator: Dr. Douglas J. Doohan
Project ID: Study Director: Doug Doohan/Rick Edwards
Sponsor Contact:

Pest Code
TAROF, Taraxacum officinale, = US
CAPBP, Capsella bursa-pastoris, = US
DAUCA, Daucus carota, = US
POASS, Poa sp., = US
MEUAL, Melilotus alba, = US
CERVU, Cerastium fontanum vulgare, = US
LEPVI, Lepidium virginicum, = US
AGRRE, Elymus repens, = US
HPPVU, Hippuris vulgaris, = US
PLAMA, Plantago major, = US
PESGL, Pennisetum glaucum, = US
AMACH, Amaranthus hybridus, = US
ERICA, Conyza canadensis, = US
PORSS, Portulaca sp., = US
DIGSS, Digitaria sp., = US
Crop Code
VITSS, BGRA, Vitis sp., = US
Part Rated
PLANT = plant
C = Crop is Part Rated
Rating Type
PHYGEN = phytotoxicity - general / injury
CONTRO = control / burndown or knockdown
Rating Unit
% = percent

Footnote 1: 2 - 3 seedling marestail dandelion

Trial Comments

The Ohio State University

Timothy Grass - DuPont 2013

Trial ID: Protocol ID:
Location: Study Director:
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

General Trial Information

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Associate
Investigator: Dr. Douglas J. Doohan **Title:** Proffesor

Discipline: H herbicide
Trial Status: E established **Trial Reliability:** RELIABLE
Initiation Date: Sep-10-2013 **Planned Completion Date:** Dec-31-2013

Trial Location

City: Wooster **Latitude of LL Corner °:** 40.799762 N
State/Prov.: Ohio **Longitude of LL Corner °:** -81.9054 W
Postal Code: 44691 **Altitude of LL Corner, Unit:** 1020.00 FT
Country: USA United States

Objectives:

Determine the level of grass crop tolerance and yield with various rates of tribenuron and thifensulfuron in combination with MAT28 in common cool season grass pasture grasses and native rangeland grasses.

Evaluate Crop Response at 7, 14, 30, 60 and 90 DAT.

Conclusions:

The objective of this experiement was to determine crop (timothy) tolerance to various rates of tribenuron and trifensulfuron combined with MAT28. The pasture in which this trial was conducted was selected because of the predominant grass being timothy. The field was mowed on August 20, 2013. The treatments were applied on September 10th. Prior to the harvest on October 28, 2013, any broadleaved weeds in each plot were removed by hoeing.
There was no significant effect on crop tolerance in any of the herbicide treatments compared to the control plots in this trial.

Personnel

Study Director: Doug Doohan/Rick Edwards **Title:** Professor/Research Associate
Affiliation: The Ohio State University
Address: 1680 Madison Ave.
Location: Wooster, Ohio
Postal Code: 44691
Investigator: Dr. Douglas J. Doohan **Title:** Proffesor

Crop Description

Crop 1: PHLPR Phleum pratense Herdsgrass
BBCH Scale: BGRM
Planting Method: NATPOP natural population
Soil Moisture: DRY dry

Pest Description

Pest 1 Type: W **Code:** SOOVI Solidago virgaurea
Common Name: Common goldenrod

Site and Design

Plot Width, Unit: 10 FT **Site Type:** PASTUR pasture
Plot Length, Unit: 15 FT **Experimental Unit:** 1 PLOT plot
Plot Area, Unit: 150 FT2 **Tillage Type:** NA
Replications: 3 **Study Design:** RACOBL Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block

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Application Description

	A
Application Date:	Sep-10-2013
Time of Day:	12:00
Application Method:	SPRAY
Application Timing:	SEPEMB
Application Placement:	BROADC
Applied By:	R. Edwards
Air Temperature, Unit:	86 F
% Relative Humidity:	71
Wind Velocity, Unit:	8 MPH
Wind Direction:	SW
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	73 F
Soil Moisture:	DRY
% Cloud Cover:	10
Next Rain Occurred On:	Sep-12-2013

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	PHLPR BGRM
Stage Scale Used:	BBCH
Stage Majority, Percent:	14 50
Height, Unit:	10 IN

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	SOOVI W
Stage Majority, Percent:	14 50

Application Equipment

	A
Appl. Equipment:	Handheld
Equipment Type:	MANCAI
Operation Pressure, Unit:	40 PSI
Nozzle Type:	TTJ60
Nozzle Size:	11002
Nozzle Spacing, Unit:	18 in
Nozzles/Row:	4
Band Width, Unit:	72 IN
% Coverage:	100.0
Boom Length, Unit:	54 IN
Boom Height, Unit:	18 IN
Ground Speed, Unit:	2.5 MPH
Carrier:	WATER
Spray Volume, Unit:	25 gal/ac
Mix Size, Unit:	2 liters
Propellant:	COMCO2
Tank Mix (Y/N):	Y yes

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Timothy Grass - DuPont 2013

Trial ID: Protocol ID:
Location: Study Director:
Project ID: Investigator: Dr. Douglas J. Doohan
Sponsor Contact:

Trt No.	Treatment Name	Rate	Rate Unit							
Pest Type									W Weed	W Weed
Pest Code									SOOSS	TRFRE
Crop Code				PHLPR	POASS	AGRRE	DACSS	PESGL		
BBCH Scale				BGRM	BGRM	Elytrigi	Dactylis	Penniset		
Crop Scientific Name				Phleum pratense	Poa sp.	Elytrigia repens	Orchardgrass	Yellow foxtail		
Part Rated				PLOT C	PLOT C	PLOT C	PLOT C	PLOT C	PLOT P	PLOT P
Rating Date				Sep-19-2013	Sep-19-2013	Sep-19-2013	Sep-19-2013	Sep-19-2013	Sep-19-2013	Sep-19-2013
Rating Type				PHYGEN	PHYGEN	PHYGEN	PHYGEN	PHYGEN	CONTRO	CONTRO
Rating Unit				%	%	%	%	%	%	%
Days After First/Last Applic.				9 9	9 9	9 9	9 9	9 9	9 9	9 9
Trt-Eval Interval				9 DA-A	9 DA-A	9 DA-A	9 DA-A	9 DA-A	9 DA-A	9 DA-A
1	DPX-RRW97	24	FL OZ/A	0 a	0 a	0 a	0 a	0 a	70 a	20 a
	NIS	0.25	% V/V							
2	DPX-MAT28	1	OZ AI/A	2 a	0 a	0 a	3 a	10 a	80 a	20 a
	DPX-M6316	0.125	OZ AI/A							
	NIS	0.25	% V/V							
3	DPX-MAT28	1.02	OZ AI/A	3 a	0 a	0 a	2 a	7 a	80 a	30 a
	DPX-M6316	0.23	OZ AI/A							
	NIS	0.25	% V/V							
4	DPX-MAT28	1	OZ AI/A	0 a	0 a	0 a	3 a	3 a	80 a	55 a
	DPX-L5300	0.125	OZ AI/A							
	NIS	0.25	% V/V							
5	Perspective	2.5	OZ/A	3 a	3 a	0 a	3 a	7 a		40 a
	NIS	0.25	% V/V							
6	DPX-RDQ98	2.5	OZ/A	0 a	0 a	0 a	0 a	3 a	90 a	50 a
	NIS	0.25	% V/V							
7	DPX-MAT28	1	OZ AI/A	0 a	0 a	0 a	0 a	0 a		
	NIS	0.25	% V/V							
8	DPX-RRW97	58	FL OZ/A	3 a	0 a	3 a	3 a	7 a	70 a	35 a
	NIS	0.25	% V/V							
9	DPX-MAT28	2.444	OZ AI/A	0 a	0 a	0 a	3 a	7 a	60 a	20 a
	DPX-M6316	0.306	OZ AI/A							
	NIS	0.25	% V/V							
10	DPX-MAT28	2.449	OZ AI/A	2 a	0 a	0 a	2 a	7 a	70 a	25 a
	DPX-M6316	0.551	OZ AI/A							
	NIS	0.25	% V/V							
11	DPX-MAT28	2.444	OZ AI/A	0 a	0 a	0 a	3 a	3 a	65 a	33 a
	DPX-L5300	0.306	OZ AI/A							
	NIS	0.25	% V/V							
12	Milestone	7	FL OZ/A	0 a	0 a	0 a	0 a	0 a	70 a	20 a
	NIS	0.25	% V/V							
13	Untreated Check			0 a	0 a	0 a	0 a	0 a	0 b	0 a
LSD (P=.05)				4.6	2.7	2.7	6.4	10.7	20.7	38.0
Standard Deviation				2.7	1.6	1.6	3.8	6.4	10.4	20.9
CV				265.68	624.5	624.5	211.98	155.31	15.52	71.91
Grand Mean				1.03	0.26	0.26	1.79	4.1	66.82	29.03

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates = Average (6, 7, 13)

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Trt No.	Treatment Name	Rate	Rate Unit							
Pest Type										
Pest Code										
Crop Code				PHLPR	POASS	AGRRE	DACSS	PESGL		
BBCH Scale				BGRM	Poa sp.	Elytrigi	Dactylis	Penniset		
Crop Scientific Name				Phleum pratense	Bluegrass	Quackgrass	Orchardgrass	Yellow foxtail		
Part Rated				PLOT C	PLOT C	PLOT C	PLOT C	PLOT C	PLOT P	YIELD C
Rating Date				Oct-1-2013	Oct-1-2013	Oct-1-2013	Oct-1-2013	Oct-1-2013	Oct-1-2013	Oct-28-2013
Rating Type				PHYGEN	PHYGEN	PHYGEN	PHYGEN	PHYGEN	CONTRO	YIELD
Rating Unit				%	%	%	%	%	%	g
Days After First/Last Applic.				21 21	21 21	21 21	21 21	21 21	21 21	48 48
Trt-Eval Interval				21 DA-A	21 DA-A	21 DA-A	21 DA-A	21 DA-A	21 DA-A	48 DA-A
1	DPX-RRW97	24	FL OZ/A	7 a	7 a	3 a	7 a	0 a	75 ab	107 a
	NIS	0.25	% V/V							
2	DPX-MAT28	1	OZ AI/A	0 a	0 a	0 a	0 a	0 a	52 ab	132 a
	DPX-M6316	0.125	OZ AI/A							
	NIS	0.25	% V/V							
3	DPX-MAT28	1.02	OZ AI/A	0 a	0 a	0 a	0 a	10 a	53 ab	95 a
	DPX-M6316	0.23	OZ AI/A							
	NIS	0.25	% V/V							
4	DPX-MAT28	1	OZ AI/A	0 a	0 a	0 a	0 a	0 a	53 ab	140 a
	DPX-L5300	0.125	OZ AI/A							
	NIS	0.25	% V/V							
5	Perspective	2.5	OZ/A	0 a	0 a	0 a	0 a	0 a	70 ab	152 a
	NIS	0.25	% V/V							
6	DPX-RDQ98	2.5	OZ/A	0 a	7 a	0 a	0 a	7 a	80 ab	138 a
	NIS	0.25	% V/V							
7	DPX-MAT28	1	OZ AI/A	0 a	0 a	0 a	0 a	0 a	75 ab	207 a
	NIS	0.25	% V/V							
8	DPX-RRW97	58	FL OZ/A	0 a	0 a	0 a	0 a	3 a	90 a	178 a
	NIS	0.25	% V/V							
9	DPX-MAT28	2.444	OZ AI/A	7 a	7 a	7 a	10 a	3 a	40 ab	164 a
	DPX-M6316	0.306	OZ AI/A							
	NIS	0.25	% V/V							
10	DPX-MAT28	2.449	OZ AI/A	3 a	0 a	3 a	3 a	0 a	53 ab	154 a
	DPX-M6316	0.551	OZ AI/A							
	NIS	0.25	% V/V							
11	DPX-MAT28	2.444	OZ AI/A	0 a	0 a	7 a	8 a	10 a	70 ab	161 a
	DPX-L5300	0.306	OZ AI/A							
	NIS	0.25	% V/V							
12	Milestone	7	FL OZ/A	0 a	0 a	0 a	0 a	0 a	35 ab	174 a
	NIS	0.25	% V/V							
13	Untreated Check			0 a	0 a	0 a	0 a	0 a	0 b	260 a
LSD (P=.05)				4.4	6.3	6.9	8.3	9.9	44.9	130.8
Standard Deviation				2.6	3.8	4.1	4.9	5.9	26.0	77.6
CV				203.96	244.1	267.06	225.46	228.75	45.19	48.93
Grand Mean				1.28	1.54	1.54	2.18	2.56	57.44	158.59