

The Ohio State University

Marestail dicamba residual tankmix study 14 early pre-plant vs at-plant  
 Trial ID: 18 ERICARESIDUAL      Location: F-9 Middle      Trial Year: 2018  
 Protocol ID: 18 ERICARESIDUAL      Investigator: Dr. Mark M. Loux  
 Project ID:      Study Director: Bryan Reeb  
                                          Sponsor Contact: OSU/MONSANTO

### General Trial Information

**Study Director:** Bryan Reeb  
**Investigator:** Dr. Mark M. Loux

**Discipline:** H      herbicide  
**Initiation Date:** Apr-20-2018

### Trial Location

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

**Latitude of LL Corner °:** 39.85876      N  
**Longitude of LL Corner °:** 83.67165      W  
**Altitude of LL Corner, Unit:** 1084.00 FT

**Conducted Under GLP:** No  
**Conducted Under GEP:** No

### Contacts

**Study Director:** Bryan Reeb  
**Investigator:** Dr. Mark M. Loux

### Crop Description

**Crop 1:** GLXMA      Glycine max      Soybean  
**Variety:** Pioneer 36T36X      **BBCH Scale:** BSOY  
**Description:** Pioneer

**Planting Date:** Apr-30-2018  
**Planting Method:** PLANTD planted  
**Planting Equipment:** FE      field equipment  
**Emergence Date:** May-11-2018

**Planting Rate, Unit:** 166000      S/A  
**Depth, Unit:** 1.25 IN  
**Row Spacing, Unit:** 15      IN

**Harvested Width, Unit:** 6.25 FT  
**Harvested Length, Unit:** 30      FT  
**% Standard Moisture:** 13.5

**Soil Temperature, Unit:** 60      F  
**Soil Moisture:** NORMAL normal, adequate  
**Seed Bed:** MEDTRA medium/trashy

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**Pest Description**

- Pest 1 Type:** W **Code:** STEME *Stellaria media*  
**Common Name:** Common chickweed
- Pest 2 Type:** W **Code:** ERYRE *Erysimum repandum*  
**Common Name:** Bushy wallflower
- Pest 3 Type:** W **Code:** RANAB *Ranunculus abortivus*  
**Common Name:** Smallflower buttercup
- Pest 4 Type:** W **Code:** SENGL *Packera glabella*  
**Common Name:** Cressleaf groundsel
- Pest 5 Type:** W **Code:** ERICA *Erigeron canadensis*  
**Common Name:** Canada horseweed
- Pest 6 Type:** W **Code:** AMBTR *Ambrosia trifida*  
**Common Name:** Giant ragweed
- Pest 7 Type:** W **Code:** ERICA *Erigeron canadensis*  
**Common Name:** Canada horseweed
- Pest 8 Type:** W **Code:** VERAG *Veronica agrestis*  
**Common Name:** Field speedwell
- Pest 9 Type:** W **Code:** ERPSS *Erophila* sp.  
**Common Name:** Whitlowgrass
- Pest10 Type:** W **Code:** SETFA *Setaria faberi*  
**Common Name:** Giant foxtail
- Pest11 Type:** W **Code:** AMBEL *Ambrosia artemisiifolia*  
**Common Name:** Common ragweed
- Pest12 Type:** W **Code:** CHEAL *Chenopodium album*  
**Common Name:** common lambsquarters
- Pest13 Type:** W **Code:** ERICA *Erigeron canadensis*  
**Common Name:** Canada horseweed
- Pest14 Type:** W **Code:** POLPY *Persicaria pensylvanica*  
**Common Name:** annual smartweed
- Pest15 Type:** W **Code:** ECHCG *Echinochloa crus-galli*  
**Common Name:** Common barnyard grass
- Pest16 Type:** W **Code:** IPOHE *Ipomoea hederacea*  
**Common Name:** ivy-leaf morning glory
- Pest17 Type:** W **Code:** AMARE *Amaranthus retroflexus*  
**Common Name:** Redroot pigweed

**Site and Design**

**Treated Plot Width:** 6.67 FT  
**Treated Plot Length:** 30 FT  
**Treated Plot Area:** 200.1 FT<sup>2</sup> **Treatments:** 22  
**Replications:** 3

**Site Type:** FIELD field  
**Experimental Unit:** 1 PLOT plot  
**Tillage Type:** NOTILL no-till  
**Study Design:** RACOB� Randomized Complete Block (RCB)

**No. Previous Crop Year**

1. SOYBEANS 2017

**Soil Description**

**Description Name:** F-9 East  
**% Sand:** 37 **% OM:** 3 **Texture:** L loam  
**% Silt:** 49 **pH:** 6.4 **Soil Name:** Kokomo  
**% Clay:** 15 **CEC:** 17.8 **Fert. Level:** G good  
**Soil Drainage:** G good

**Analyzed By:**

Spectrum - 11-27-17

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**Application Description**

	<b>A</b>	<b>B</b>
<b>Application Date:</b>	Apr-20-2018	Apr-30-2018
<b>Appl. Start Time:</b>	2:00 PM	1:00 PM
<b>Appl. Stop Time:</b>	2:30 PM	1:20 PM
<b>Interval to Prev. Appl., Unit:</b>		10 DAYS
<b>Application Method:</b>	SPRAY	SPRAY
<b>Application Timing:</b>	14 EPP	ATPLAN
<b>Application Placement:</b>	BROSOI	BROSOI
<b>Applied By:</b>	REEB	
<b>Air Temperature, Unit:</b>	56 F	64 F
<b>% Relative Humidity:</b>	31	25
<b>Wind Velocity, Unit:</b>	6 MPH	4 MPH
<b>Wind Direction:</b>	ENE	SW
<b>Dew Presence (Y/N):</b>	N no	N no
<b>Soil Temperature, Unit:</b>	58 F	60 F
<b>Soil Moisture:</b>	SLIWET	NORMAL
<b>% Cloud Cover:</b>	1	20
<b>Next Moisture Occurred On:</b>	Apr-23-2018	May-3-2018
<b>Time to Next Moisture, Unit:</b>	3 DAY	3 DAY
<b>Moisture 1 Week after Appl.:</b>	0.24 IN	0.71 IN

**Crop Stage At Each Application**

	<b>A</b>	<b>B</b>
<b>Crop 1 Code, BBCH Scale:</b>	GLXMA	BSOY GLXMA BSOY

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## Pest Stage At Each Application

	A		B	
<b>Pest 1 Code, Type, Scale:</b>	STEME	W	STEME	W
<b>Stage Majority, Percent:</b>	65	100	65	100
<b>Diameter, Unit:</b>	2	IN	4	IN
<b>Height, Unit:</b>	2.5	IN	4	IN
<b>Height Minimum, Maximum:</b>	2	3	2	6
<b>Pest 2 Code, Type, Scale:</b>	ERYRE	W	ERYRE	W
<b>Stage Majority, Percent:</b>	55	100	19	100
<b>Diameter, Unit:</b>	6	IN	12	IN
<b>Height, Unit:</b>	1	IN	1.5	IN
<b>Height Minimum, Maximum:</b>	1	2	1	2
<b>Pest 3 Code, Type, Scale:</b>	RANAB	W	RANAB	W
<b>Stage Majority, Percent:</b>	19	100		
<b>Diameter, Unit:</b>	3	IN		
<b>Height, Unit:</b>	0.5	IN		
<b>Height Minimum, Maximum:</b>	0.25	1		
<b>Pest 4 Code, Type, Scale:</b>	SENGL	W	SENGL	W
<b>Stage Majority, Percent:</b>	13	100		
<b>Diameter, Unit:</b>	3	IN		
<b>Height, Unit:</b>	1	IN		
<b>Height Minimum, Maximum:</b>	1	1.5		
<b>Pest 5 Code, Type, Scale:</b>	ERICA	W	ERICA	W
<b>Stage Majority, Percent:</b>	51	100		
<b>Diameter, Unit:</b>	6	IN		
<b>Height, Unit:</b>	2.5	IN		
<b>Height Minimum, Maximum:</b>	2	3		
<b>Pest 6 Code, Type, Scale:</b>	AMBTR	W	AMBTR	W
<b>Stage Majority, Percent:</b>	19	100		
<b>Diameter, Unit:</b>	1	IN		
<b>Height, Unit:</b>	0.5	IN		
<b>Height Minimum, Maximum:</b>	0.25	0.5		
<b>Density, Unit:</b>			36	PLA/m2
<b>Pest 7 Code, Type, Scale:</b>	ERICA	W	ERICA	W
<b>Stage Majority, Percent:</b>	10D	100	12	100
<b>Diameter, Unit:</b>			1	IN
<b>Height, Unit:</b>	1	IN	3	IN
<b>Height Minimum, Maximum:</b>	1	2	1.5	3
<b>Density, Unit:</b>			25	PLA/m2
<b>Pest 8 Code, Type, Scale:</b>	VERAG	W	VERAG	W
<b>Stage Majority, Percent:</b>			19	100
<b>Diameter, Unit:</b>			2.5	IN
<b>Height, Unit:</b>			1.5	IN
<b>Height Minimum, Maximum:</b>			1	2
<b>Pest 9 Code, Type, Scale:</b>	ERPSS	W	ERPSS	W
<b>Stage Majority, Percent:</b>			19	100
<b>Diameter, Unit:</b>			5	IN
<b>Height, Unit:</b>			1.5	IN
<b>Height Minimum, Maximum:</b>			1	2
<b>Pest10 Code, Type, Scale:</b>	SETFA	W	SETFA	W
<b>Stage Majority, Percent:</b>			65	100
<b>Diameter, Unit:</b>			2	IN
<b>Height, Unit:</b>			4	IN
<b>Height Minimum, Maximum:</b>			4	5
<b>Pest11 Code, Type, Scale:</b>	AMBEL	W	AMBEL	W
<b>Density, Unit:</b>			185	PLA/m2
<b>Pest12 Code, Type, Scale:</b>	CHEAL	W	CHEAL	W
<b>Density, Unit:</b>			4	PLA/m2
<b>Pest13 Code, Type, Scale:</b>	ERICA	W	ERICA	W
<b>Density, Unit:</b>			1	PLA/m2
<b>Pest14 Code, Type, Scale:</b>	POLPY	W	POLPY	W
<b>Pest15 Code, Type, Scale:</b>	ECHCG	W	ECHCG	W
<b>Density, Unit:</b>			33	PLA/m2
<b>Pest16 Code, Type, Scale:</b>	IPOHE	W	IPOHE	W
<b>Density, Unit:</b>			17	PLA/m2
<b>Pest17 Code, Type, Scale:</b>	AMARE	W	AMARE	W
<b>Density, Unit:</b>			1	PLA/m2
<b>Density, Unit:</b>			15	PLA/m2

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Application Equipment

	A	B
Appl. Equipment:	6' BACKPACK	6' BACKPACK
Equipment Type:	BACCAI	BACCAI
Operation Pressure, Unit:	44 PSI	44 PSI
Nozzle Type:	TTI	TTI
Nozzle Size:	11015	11015
Nozzle Spacing, Unit:	18 IN	18 IN
Nozzles/Row:	4	4
Boom Length, Unit:	6.67 FT	6.67 FT
Boom Height, Unit:	20 IN	20 IN
Ground Speed, Unit:	3 MPH	3 MPH
Carrier:	WATER	WATER
Spray Volume, Unit:	15 gal/ac	15 gal/ac
Mix Size, Unit:	1 L	1 L
Propellant:	COMCO2	COMCO2

Date By Notes  
 Jun-6-2018 Dobbles POST overlay 64oz/acre Buccaneer Plus  
 67 F  
 53% RH  
 5 MPH NNE  
 10% Clouds  
 Soil 65 F

Pest Type	GLXMA	GLXMA	GLXMA	GLXMA
Pest Code	BSOY	BSOY	BSOY	BSOY
Pest Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max
Pest Name	Soybean	Soybean	Soybean	Soybean
Crop Code	Oct-24-2018	Oct-24-2018	Oct-24-2018	Oct-24-2018
BBCH Scale	WEIGHT	MOICON	WEITES	YIELD
Crop Scientific Name	LBS	%	LB/BU	BU
Crop Name	1 PLOT			1 A
Rating Date	Number of Subsamples	1	1	1
Rating Type	Days After First/Last Applic.	187 177	187 177	187 177
Rating Unit	Plant-Eval Interval	177 DP-1	177 DP-1	177 DP-1
Sample Size, Unit	Days After Emergence	166 DE-1	166 DE-1	166 DE-1
Number of Subsamples	ARM Action Codes			TY1
Days After First/Last Applic.	Number of Decimals	1	1	1

Trt No.	Treatment Name	Other Rate	Other Rate	Appl Unit Code	8*	9*	10*	11*
1	Sencor DF	8 oz/a		A	16.6 cd	12.0 -	55.5 -	65.6 cd
	Clarity	16 oz/a		A				
	Roundup Power Max	31.3 oz/a		A				
	N-pak ams	2.25 qt/a		A				
2	Sencor DF	8 oz/a		A	15.9 d	12.1 -	55.5 -	62.6 d
	Sharpen	1.0 oz/a		A				
	Clarity	16 oz/a		A				
	Roundup Power Max	31.3 oz/a		A				
	N-pak ams	2.25 qt/a		A				
	MSO	1.2 pt/a		A				
3	Valor SX	2.5 oz/a		A	17.2 a-d	12.2 -	55.6 -	67.5 a-d
	Clarity	16 oz/a		A				
	Roundup Power Max	31.3 oz/a		A				
	N-pak ams	2.25 qt/a		A				
4	Spartan	5 oz/a		A	16.8 bcd	12.1 -	55.1 -	66.1 bcd
	Clarity	16 oz/a		A				
	Roundup Power Max	31.3 oz/a		A				
	N-pak ams	2.25 qt/a		A				
5	Valor SX	2.5 oz/a		A	17.5 a-d	11.9 -	55.2 -	68.8 a-d
	Sencor DF	8 oz/a		A				
	Clarity	16 oz/a		A				
	Roundup Power Max	31.3 oz/a		A				
	N-pak ams	2.25 qt/a		A				

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Pest Type		GLXMA		GLXMA		GLXMA		GLXMA	
Pest Code		BSOY		BSOY		BSOY		BSOY	
Pest Scientific Name		Glycine max		Glycine max		Glycine max		Glycine max	
Pest Name		Soybean		Soybean		Soybean		Soybean	
Crop Code		Oct-24-2018		Oct-24-2018		Oct-24-2018		Oct-24-2018	
BBCH Scale		WEIGHT		MOICON		WEITES		YIELD	
Crop Scientific Name		LBS		%		LB/BU		BU	
Crop Name		1 PLOT		1		1		1 A	
Rating Date		1		1		1		1	
Rating Type		187 177		187 177		187 177		187 177	
Rating Unit		177 DP-1		177 DP-1		177 DP-1		177 DP-1	
Sample Size, Unit		166 DE-1		166 DE-1		166 DE-1		166 DE-1	
Number of Subsamples		1		1		1		TY1	
Days After First/Last Applic.		1		1		1		1	
Plant-Eval Interval		1		1		1		1	
Days After Emergence		1		1		1		1	
ARM Action Codes		1		1		1		1	
Number of Decimals		1		1		1		1	
Trt No.	Treatment Name	Other Rate	Other Rate	Appl Unit Code	8*	9*	10*	11*	
6	Valor SX	2.5 oz/a		A	16.1 cd	12.0 -	55.7 -	63.5 cd	
	Sharpen	1.0 oz/a		A					
	Clarity	16 oz/a		A					
	Roundup Power Max	31.3 oz/a		A					
	N-pak ams	2.25 qt/a		A					
	MSO	1.2 pt/a		A					
7	Spartan	5 oz/a		A	17.3 a-d	12.1 -	55.4 -	68.1 a-d	
	Sencor DF	8 oz/a		A					
	Clarity	16 oz/a		A					
	Roundup Power Max	31.3 oz/a		A					
	N-pak ams	2.25 qt/a		A					
8	Spartan	5 oz/a		A	16.5 cd	12.0 -	55.7 -	64.9 cd	
	Sharpen	1.0 oz/a		A					
	Clarity	16 oz/a		A					
	Roundup Power Max	31.3 oz/a		A					
	N-pak ams	2.25 qt/a		A					
	MSO	1.2 pt/a		A					
9	Valor SX	2.5 oz/a		A	18.9 a	11.9 -	55.5 -	74.7 a	
	Clarity	32 oz/a		A					
	Roundup Power Max	31.3 oz/a		A					
	N-pak ams	2.25 qt/a		A					
10	Spartan	5 oz/a		A	16.8 bcd	12.1 -	55.2 -	65.9 bcd	
	Clarity	32 oz/a		A					
	Roundup Power Max	31.3 oz/a		A					
	N-pak ams	2.25 qt/a		A					
11	Sencor DF	8 oz/a		A	17.4 a-d	12.0 -	55.4 -	68.7 a-d	
	Clarity	32 oz/a		A					
	Roundup Power Max	31.3 oz/a		A					
	N-pak ams	2.25 qt/a		A					
12	Sencor DF	8 oz/a		B	18.8 a	12.4 -	55.4 -	73.9 a	
	Clarity	16 oz/a		B					
	Roundup Power Max	31.3 oz/a		B					
	N-pak ams	2.25 qt/a		B					
13	Sencor DF	8 oz/a		B	17.4 a-d	12.1 -	55.4 -	68.3 a-d	
	Sharpen	1.0 oz/a		B					
	Clarity	16 oz/a		B					
	Roundup Power Max	31.3 oz/a		B					
	N-pak ams	2.25 qt/a		B					
	MSO	1.2 pt/a		B					
14	Valor SX	2.5 oz/a		B	17.2 a-d	12.0 -	55.5 -	67.7 a-d	
	Clarity	16 oz/a		B					
	Roundup Power Max	31.3 oz/a		B					
	N-pak ams	2.25 qt/a		B					
15	Spartan	5 oz/a		B	18.0 abc	12.2 -	55.6 -	70.9 abc	
	Clarity	16 oz/a		B					
	Roundup Power Max	31.3 oz/a		B					
	N-pak ams	2.25 qt/a		B					
16	Valor SX	2.5 oz/a		B	17.9 a-d	12.1 -	55.4 -	70.2 a-d	
	Sencor DF	8 oz/a		B					
	Clarity	16 oz/a		B					
	Roundup Power Max	31.3 oz/a		B					
	N-pak ams	2.25 qt/a		B					

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Treatment No.	Treatment Name	Other Rate	Other Rate	Appl Unit Code	8*	9*	10*	11*
17	Valor SX	2.5 oz/a		B	15.9 d	12.0 -	55.7 -	62.6 d
	Sharpen	1.0 oz/a		B				
	Clarity	16 oz/a		B				
	Roundup Power Max	31.3 oz/a		B				
	N-pak ams	2.25 qt/a		B				
	MSO	1.2 pt/a		B				
18	Spartan	5 oz/a		B	16.8 bcd	12.1 -	55.8 -	66.1 bcd
	Sencor DF	8 oz/a		B				
	Clarity	16 oz/a		B				
	Roundup Power Max	31.3 oz/a		B				
	N-pak ams	2.25 qt/a		B				
19	Spartan	5 oz/a		B	18.7 ab	12.0 -	55.4 -	73.5 ab
	Sharpen	1.0 oz/a		B				
	Clarity	16 oz/a		B				
	Roundup Power Max	31.3 oz/a		B				
	N-pak ams	2.25 qt/a		B				
	MSO	1.2 pt/a		B				
20	Valor SX	2.5 oz/a		B	19.2 a	12.1 -	55.7 -	75.4 a
	Clarity	32 oz/a		B				
	Roundup Power Max	31.3 oz/a		B				
	N-pak ams	2.25 qt/a		B				
21	Spartan	5 oz/a		B	18.9 a	12.1 -	55.6 -	74.5 a
	Clarity	32 oz/a		B				
	Roundup Power Max	31.3 oz/a		B				
	N-pak ams	2.25 qt/a		B				
22	Sencor DF	8 oz/a		B	18.0 abc	12.0 -	55.3 -	71.0 abc
	Clarity	32 oz/a		B				
	Roundup Power Max	31.3 oz/a		B				
	N-pak ams	2.25 qt/a		B				
	LSD P=.05				1.93	0.35	0.52	7.59
	Standard Deviation				1.17	0.21	0.31	4.61
	CV				6.71	1.74	0.57	6.71
	Levene's F				0.324	0.416	0.466	0.318
	Levene's Prob(F)				0.997	0.984	0.969	0.997
	Skewness				-0.148	0.2134	-0.1316	-0.149
	Kurtosis				-0.4003	-0.3384	-0.466	-0.4127
	Randomized Complete Block (RCB) AIC				261.1251	24.2181	NA	440.6328
	Spatial AIC				SPa	SPb 1.1255	NA	SPa
	Mean Sep. Test				228.1729	LSD.05	SNK.05	409.0599
	Analyzed as				LSD.05	LSD.05	SNK.05	LSD.05
	Replicate F				CRD+SPa	CRD+SPb	RCB	CRD+SPa
	Replicate Prob(F)				1.524	1.037	5.040	1.478
	Treatment F				0.2297	0.3633	0.0109	0.2398
	Treatment Prob(F)				2.581	1.015	0.892	2.553
					0.0044	0.4668	0.6006	0.0048

## Crop Code

GLXMA, BSOY, Glycine max, Soybean = US

## Rating Type

WEIGHT = weight

MOICON = moisture content

WEITES = weight - test

YIELD = yield

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Rating Unit

% = percent  
BU = bushel

PLOT = total plot  
A = acre

Plant-Eval Interval

177 DP-1 = 1 GLXMA Apr-30-2018

ARM Action Codes

TY1 =  $3.872 * [8] * (100 - [9]) / 86.5$

SPa = Nearest row neighbor and column neighbor  
SPb = Nearest column neighbor