

# Purdue University

## Evaluate the effect of MSO with AMS and other water conditioners on the the burndown performance of Sharpen

Trial ID: 12S-SEP-NTF-14      Protocol ID: 12S-SEP-NTF-14  
 Location: SEPAC      Study Director: Paul Marquardt  
 Project ID: Sharpen Adjuvant      Investigator: Dr. Bill Johnson  
    Sponsor Contact: Gery Welker

### General Trial Information

**Study Director:** Paul Marquardt      **Title:** Research Associate  
**Investigator:** Dr. Bill Johnson      **Title:** Professor

**Discipline:** H herbicide  
**Trial Status:** E established  
**Initiation Date:** 3-20-2012

### Trial Location

**City:** Butleville  
**State/Prov.:** IN  
**Postal Code:** 47223  
**Country:** USA

### Personnel

**Study Director:** Paul Marquardt      **Title:** Research Associate  
**Affiliation:** Purdue University  
**Address:** 915 W. State Street  
**Location:** West Lafayette, IN  
**Postal Code:** 47907      **E-mail:** pmarquar@purdue.edu  
**Phone No.:** 765-494-0891      **Mobile No.:** 765-409-6369  
**Investigator:** Dr. Bill Johnson      **Title:** Professor  
**Affiliation:** Purdue University  
**Address:** 915 W. State Street  
**Location:** West Lafayette, IN  
**Postal Code:** 47907      **E-mail:** wgj@purdue.edu  
**Phone No.:** 765-494-4656      **Mobile No.:** 765-404-9801

### Cooperator/Landowner

**Cooperator:** Don Biehle      **Role:** Director  
**Organization:** Southeast Purdue Agricultural Center      **Org. Type:** University  
**Address 1:** 4425 E. CR 350 N  
**City:** Butleville      **Phone No.:** 812-458-6977  
**State/Prov.:** IN      **Fax No.:** 812-458-6979  
**Postal Code:** 47223      **Mobile No.:** 812-592-8426  
**Country:** USA      United States      **E-mail:** biehled@purdue.edu

### Pest Description

**Pest 1 Type:** W      **Code:** ERICA      *Conyza canadensis*  
**Common Name:** Canada horseweed

**Pest 2 Type:** W      **Code:** VICVI      *Vicia villosa*  
**Common Name:** Hairy vetch

**Pest 3 Type:** W      **Code:** LOLMG      *Lolium multiflorum gaudini*  
**Common Name:** Annual ryegrass

**Pest 4 Type:** W      **Code:** TAROF      *Taraxacum officinale*  
**Common Name:** Common dandelion

**Pest 5 Type:** W      **Code:** ALLVI      *Allium vineale*  
**Common Name:** Wild garlic

### Site and Design

**Plot Width, Unit:** 10 FT      **Site Type:** FIELD      field  
**Plot Length, Unit:** 30 FT      **Experimental Unit:** 1      PLOT plot  
**Plot Area, Unit:** 300 FT2      **Tillage Type:** NOTILL      no-till  
**Replications:** 4      **Study Design:** RACOB      Randomized Complete Block (RCB)  
**Untreated Arrangement:** INCLUDED      single control randomized in each block

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## Soil Description

**Description Name:** SEPAC-Field U41

**% Sand:** 20      **% OM:** 1.3      **Texture:** SIL silt loam  
**% Silt:** 65      **pH:** 6.5      **Soil Name:** Avonburg  
**% Clay:** 15      **CEC:** 5.7      **Fert. Level:** G good  
**Soil Drainage:** P poor

## Application Description

	A
<b>Application Date:</b>	4-12-2012
<b>Time of Day:</b>	12:00 PM
<b>Application Method:</b>	SPRAY
<b>Application Timing:</b>	POSPOS
<b>Application Placement:</b>	FOLIAR
<b>Applied By:</b>	JR
<b>Air Temperature, Unit:</b>	62 F
<b>% Relative Humidity:</b>	32
<b>Wind Velocity, Unit:</b>	3 MPH
<b>Wind Direction:</b>	N
<b>Dew Presence (Y/N):</b>	N no
<b>Soil Temperature, Unit:</b>	57 F
<b>Soil Moisture:</b>	DRY
<b>% Cloud Cover:</b>	0

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## Pest Stage At Each Application

	A
<b>Pest 1 Code, Type, Scale:</b>	ERICA W
<b>Stage Majority, Percent:</b>	30 100
<b>Height, Unit:</b>	3.5 IN
<b>Height Minimum, Maximum:</b>	1 6
<b>Density, Unit:</b>	7.5 M2
<b>Pest 2 Code, Type, Scale:</b>	VICVI W
<b>Stage Majority, Percent:</b>	24 100
<b>Height, Unit:</b>	5.5 IN
<b>Height Minimum, Maximum:</b>	3 8
<b>Density, Unit:</b>	10 M2
<b>Pest 3 Code, Type, Scale:</b>	LOLMG W
<b>Stage Majority, Percent:</b>	29 100
<b>Height, Unit:</b>	9 IN
<b>Height Minimum, Maximum:</b>	6 12
<b>Density, Unit:</b>	20 M2
<b>Pest 4 Code, Type, Scale:</b>	TAROF W
<b>Stage Majority, Percent:</b>	40 100
<b>Height, Unit:</b>	2 IN
<b>Height Minimum, Maximum:</b>	1 3
<b>Density, Unit:</b>	5 M2
<b>Pest 5 Code, Type, Scale:</b>	ALLVI W
<b>Stage Majority, Percent:</b>	40 100
<b>Height, Unit:</b>	13 IN
<b>Height Minimum, Maximum:</b>	8 18
<b>Density, Unit:</b>	7.5 M2

## Application Equipment

	A
<b>Appl. Equipment:</b>	CO2 Backpack
<b>Equipment Type:</b>	SPRBAC
<b>Operation Pressure, Unit:</b>	17 PSI
<b>Nozzle Type:</b>	Flat Fan
<b>Nozzle Size:</b>	XR11002
<b>Nozzle Spacing, Unit:</b>	15 IN
<b>Boom Length, Unit:</b>	7.5 FT
<b>Boom Height, Unit:</b>	18 IN
<b>Ground Speed, Unit:</b>	3 MPH
<b>Carrier:</b>	H2O
<b>Water Hardness (ppm CaCO3):</b>	150
<b>Spray Volume, Unit:</b>	15 gal/ac
<b>Mix Size, Unit:</b>	1.8 liters
<b>Propellant:</b>	CO2
<b>Tank Mix (Y/N):</b>	N no

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Pest Type	W Weed ERICA	W Weed VICVI	W Weed LOLMG	W Weed TAROF	W Weed ERICA	W Weed VICVI	W Weed LOLMG				
Pest Code	Conyza canadensis	Vicia villosa	Lolium multiflorum	Taraxacum officinale	Conyza canadensis	Vicia villosa	Lolium multiflorum				
Pest Scientific Name	Canada horseweed	Hairy vetch	Annual ryegrass	Common dandelion	Canada horseweed	Hairy vetch	Annual ryegrass				
Pest Name											
Crop Code	FALLOW	FALLOW	FALLOW	FALLOW	FALLOW	FALLOW	FALLOW				
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P				
Rating Date	4-19-2012	4-19-2012	4-19-2012	4-19-2012	4-26-2012	4-26-2012	4-26-2012				
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO				
Rating Unit	%	%	%	%	%	%	%				
Number of Subsamples	1	1	1	1	1	1	1				
Pest Stage Majority	1-6 IN	3-8 IN	6-12 IN	<1-3 IN	1-6 IN	3-8 IN	6-12 IN				
Pest Density, Unit	7.5 M2	12.5M2	27.5M2	5 M2	7.5 M2	12.5M2	27.5M2				
Assessed By	PM/JR	PM/JR	PM/JR	PM/JR	PM/JR	PM/JR	PM/JR				
Days After First/Last Applic.	7 7	7 7	7 7	7 7	14 14	14 14	14 14				
Trt-Eval Interval	7 DA-A	7 DA-A	7 DA-A	7 DA-A	7 DA-A	7 DA-A	7 DA-A				
Trt No.	Treatment	Rate	Appl	1	2	3	4	5	6	7	
No.	Name	Rate	Unit	Code							
1	UNTREATED				0.0 b	0.0 c	0.0 b	0.0 b	0.0 c	0.0 e	0.0 b
2	Sharpen Roundup Original FireZone N-Pak AMS	12.5 g ai/ha 420 g ae/ha 1 % v/v 2.5 % v/v	A A A A		97.5 a	73.1 ab	68.4 a	93.8 a	98.8 a	71.4 abc	66.4 a
3	Sharpen Roundup Original FireZone Quest	12.5 g ai/ha 420 g ae/ha 1 % v/v 0.375 l/100 l	A A A A		97.5 a	63.5 ab	65.2 a	86.3 a	100.0 a	71.7 abc	71.7 a
4	Sharpen Roundup Original FireZone	12.5 g ai/ha 420 g ae/ha 1 % v/v	A A A		100.0 a	71.3 ab	71.4 a	92.5 a	97.0 a	69.5 abc	72.0 a
5	Sharpen Roundup Original Persist Ultra N-Pak AMS	12.5 g ai/ha 420 g ae/ha 1 % v/v 2.5 % v/v	A A A A		92.0 a	54.1 ab	71.7 a	95.0 a	97.5 a	59.8 abc	72.3 a
6	Sharpen Roundup Original Persist Ultra	12.5 g ai/ha 420 g ae/ha 1 % v/v	A A A		98.8 a	64.4 ab	64.5 a	93.3 a	91.3 a	26.0 de	70.1 a
7	Sharpen Roundup Original MSO Lecitech N-Pak AMS	12.5 g ai/ha 420 g ae/ha 1 % v/v 2.5 % v/v	A A A A		97.5 a	81.2 ab	74.7 a	98.8 a	99.5 a	90.6 a	91.0 a
8	Sharpen Roundup Original MSO Lecitech	12.5 g ai/ha 420 g ae/ha 1 % v/v	A A A		97.5 a	79.9 ab	69.9 a	90.0 a	100.0 a	77.9 ab	79.6 a
9	Sharpen Roundup Original Destiny HC N-Pak AMS	12.5 g ai/ha 420 g ae/ha 0.88 l/ha 2.5 % v/v	A A A A		100.0 a	85.2 a	60.1 a	85.0 a	100.0 a	40.8 cd	73.4 a
10	Sharpen Roundup Original Destiny HC	12.5 g ai/ha 420 g ae/ha 0.88 l/ha	A A A		100.0 a	80.5 ab	70.4 a	96.3 a	98.3 a	85.0 ab	72.2 a

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				
Pest Code	TAROF	ALLVI	ERICA	VICVI	LOLMG	TAROF				
Pest Scientific Name	Taraxacum offi>	Allium vineale	Conyza canadens>	Vicia villosa	Lolium multifi>	Taraxacum offi>				
Pest Name	Common dandel>	Wild garlic	Canada horsewe>	Hairy vetch	Annual ryegrass	Common dandel>				
Crop Code	FALLOW	FALLOW	FALLOW	FALLOW	FALLOW	FALLOW				
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P				
Rating Date	4-26-2012	4-26-2012	5-10-2012	5-10-2012	5-10-2012	5-10-2012				
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO				
Rating Unit	%	%	%	%	%	%				
Number of Subsamples	1	1	1	1	1	1				
Pest Stage Majority	<1-3 IN	8-18 IN	2-8 IN	6-24 IN	10-24 IN	2-4 IN				
Pest Density, Unit	5 M2	7.5 M2	7.5 M2	12.5M2	27.5M2	5 M2				
Assessed By	PM/JR	PM/JR	PM	PM	PM	PM				
Days After First/Last Applic.	14 14	14 14	28 28	28 28	28 28	28 28				
Trt-Eval Interval	7 DA-A	7 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A				
Trt No.	Treatment	Rate	Appl	8	9	10	11	12	13	
No.	Name	Rate	Unit	Code						
1	UNTREATED				0.0 b	0.0 c	0.0 b	0.0 c	0.0 c	0.0 b
2	Sharpen	12.5 g ai/ha	A		100.0 a	68.8 a	90.0 a	64.6 a	78.2 a	100.0 a
	Roundup Original	420 g ae/ha	A							
	FireZone	1 % v/v	A							
	N-Pak AMS	2.5 % v/v	A							
3	Sharpen	12.5 g ai/ha	A		96.3 a	73.8 a	100.0 a	42.3 ab	78.4 a	99.5 a
	Roundup Original	420 g ae/ha	A							
	FireZone	1 % v/v	A							
	Quest	0.375 l/100 l	A							
4	Sharpen	12.5 g ai/ha	A		100.0 a	72.5 a	100.0 a	57.5 ab	67.2 ab	93.8 a
	Roundup Original	420 g ae/ha	A							
	FireZone	1 % v/v	A							
5	Sharpen	12.5 g ai/ha	A		98.8 a	66.3 a	92.5 a	32.7 abc	67.5 ab	98.8 a
	Roundup Original	420 g ae/ha	A							
	Persist Ultra	1 % v/v	A							
	N-Pak AMS	2.5 % v/v	A							
6	Sharpen	12.5 g ai/ha	A		97.5 a	52.5 ab	95.0 a	15.6 bc	37.2 b	95.0 a
	Roundup Original	420 g ae/ha	A							
	Persist Ultra	1 % v/v	A							
7	Sharpen	12.5 g ai/ha	A		100.0 a	71.3 a	100.0 a	75.5 a	79.5 a	100.0 a
	Roundup Original	420 g ae/ha	A							
	MSO Lecitech	1 % v/v	A							
	N-Pak AMS	2.5 % v/v	A							
8	Sharpen	12.5 g ai/ha	A		98.8 a	59.5 ab	90.0 a	48.3 ab	82.3 a	99.5 a
	Roundup Original	420 g ae/ha	A							
	MSO Lecitech	1 % v/v	A							
9	Sharpen	12.5 g ai/ha	A		98.8 a	61.3 ab	100.0 a	54.0 ab	66.4 ab	100.0 a
	Roundup Original	420 g ae/ha	A							
	Destiny HC	0.88 l/ha	A							
	N-Pak AMS	2.5 % v/v	A							
10	Sharpen	12.5 g ai/ha	A		98.8 a	40.0 b	100.0 a	51.2 ab	67.9 ab	95.0 a
	Roundup Original	420 g ae/ha	A							
	Destiny HC	0.88 l/ha	A							

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed				
Pest Code	TAROF	ALLVI	ERICA	VICVI	LOLMG	TAROF				
Pest Scientific Name	Taraxacum offi>	Allium vineale	Conyza canaden>	Vicia villosa	Lolium multifi>	Taraxacum offi>				
Pest Name	Common dandel>	Wild garlic	Canada horsewe>	Hairy vetch	Annual ryegrass	Common dandel>				
Crop Code	FALLOW	FALLOW	FALLOW	FALLOW	FALLOW	FALLOW				
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P				
Rating Date	4-26-2012	4-26-2012	5-10-2012	5-10-2012	5-10-2012	5-10-2012				
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO				
Rating Unit	%	%	%	%	%	%				
Number of Subsamples	1	1	1	1	1	1				
Pest Stage Majority	<1-3 IN	8-18 IN	2-8 IN	6-24 IN	10-24 IN	2-4 IN				
Pest Density, Unit	5 M2	7.5 M2	7.5 M2	12.5M2	27.5M2	5 M2				
Assessed By	PM/JR	PM/JR	PM	PM	PM	PM				
Days After First/Last Applic.	14 14	14 14	28 28	28 28	28 28	28 28				
Trt-Eval Interval	7 DA-A	7 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A				
Trt No.	Treatment Name	Rate	Appl Unit	Code	8	9	10	11	12	13
11	Sharpen	12.5 g ai/ha	A		98.8 a	52.5 ab	100.0 a	46.4 ab	73.2 a	100.0 a
	Roundup Original	420 g ae/ha	A							
	Super Kix	2200 ml/ha	A							
	N-Pak AMS	2.5 % v/v	A							
12	Sharpen	12.5 g ai/ha	A		100.0 a	60.0 ab	100.0 a	59.1 a	78.5 a	93.8 a
	Roundup Original	420 g ae/ha	A							
	Super Kix	2200 ml/ha	A							
13	Roundup Original	420 g ae/ha	A		96.3 a	53.8 ab	92.5 a	51.8 ab	74.7 a	93.8 a
	FireZone	1 % v/v	A							
	N-Pak AMS	2.5 % v/v	A							
14	UNTREATED				0.0 b	0.0 c	0.0 b	0.0 c	0.0 c	0.0 b
LSD (P=.05)		3.39			15.11	11.81	24.83	23.40	9.53	
Standard Deviation		2.37			10.57	8.27	16.26	15.32	6.67	
CV		2.8			20.22	9.98	38.02	25.2	7.99	
Bartlett's X2		4.514			9.44	1.648	6.819	9.842	26.283	
P(Bartlett's X2)		0.719			0.581	0.80	0.656	0.363	0.001*	
Replicate F		2.198			12.269	2.858	11.180	17.371	2.210	
Replicate Prob(F)		0.1037			0.0001	0.0493	0.0007	0.0001	0.1022	
Treatment F		914.352			20.674	73.070	7.972	13.377	113.081	
Treatment Prob(F)		0.0001			0.0001	0.0001	0.0003	0.0001	0.0001	

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Project ID: Sharpen Adjuvant      Investigator: Dr. Bill Johnson  
Sponsor Contact: Gery Welker

### Pest Type

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

### Pest Code

ERICA, Conyza canadensis, = US

VICVI, Vicia villosa, = US

LOLMG, Lolium multiflorum gaudini, = US

TAROF, Taraxacum officinale, = US

ALLVI, Allium vineale, = US

### Part Rated

PLOT = plot

P = Pest is Part Rated

### Rating Type

CONTRO = control / burndown or knockdown

### Rating Unit

% = percent

M2 = per square meter