

Arrow Formulations on Volunteer Roundup Ready Corn.

Trial ID: 11-ARC-13

Location: Agronomy Res. Center

Investigator: Bryan Young, Professor, Southern Illinois University, bgyoung@siu.edu  
 City State Zip Country: Carbondale IL 62901 USA  
 Trial Status: FINAL Initiation Date: 6-7-11

Objectives: Compare the efficacy of the original Arrow 240 with an alternate formulation of clethodim.

Crop 1: GLXMA Soybean Variety: AG 4005 Description: RR  
 Planting Method: SEEDDED Planting Date: 6-7-11  
 Rate, Unit: 75 LB/A Depth, Unit: 1.0 IN  
 Row Spacing, Unit: 30 IN

Pest 1 Type: W Code: ZEAMX Zea mays L. corn, volunteer  
 Pest Description: Roundup Ready corn  
 Pest 2 Type: W Code: PANDI Panicum dichotomiflorum Michx. panicum, fall  
 Pest 3 Type: W Code: AMASS Amaranthus species amaranthus species  
 Pest Description: Mixture of AMATA (20%) and AMARE (80%)

Plot Width, Unit: 10 FT Site Type: FIELD  
 Plot Length, Unit: 30 FT Tillage Type: REDUCED-TILL  
 Replications: 4 Study Design: Randomized Complete Block

Prior Crops, Year  
 1. ZEAMD 2010

Field Prep./Maintenance: N 36 LB/A, P205 92 LB/A, K20 100 LB/A

% OM: 2.2 Texture: SILT LOAM  
 pH: 6.2 Soil Name: WEIR  
 CEC: 7.3 Fert. Level: P1: 63 LB/A, K: 217 LB/A

## Application Description

A

Application Date: 6-30-11  
 Time of Day: 13:00  
 Application Method: Spray  
 Application Timing: 12-18"CN  
 Application Placement: BROFOL  
 Applied By: JRK  
 Air Temperature, Unit: 90 F  
 % Relative Humidity: 49  
 Wind Velocity, Unit: 2 MPH  
 Wind Direction: S  
 Dew Presence (Y/N): N  
 Soil Moisture: ABONOR  
 % Cloud Cover: 0

30-6-11  
 Crop stage at application: V2-V3  
 Height Min, Max (inch): 7 11

## Pest Stage At Each Application

Application Date: 6-30-11  
 Weed Code: ZEAMX  
 Stage Majority (leaves): 5  
 Stage Min, Max: 2 6  
 Height Majority: 17 IN  
 Height Min, Max: 6 18  
 Density, Unit: 1 FT2  
 Weed Code: PANDI  
 Stage Majority (leaves): 2  
 Stage Min, Max: 1 4  
 Height Majority: 2 IN  
 Height Min, Max: 1 5  
 Density, Unit: 1 FT2  
 Weed Code: AMASS  
 Stage Majority (leaves): 4  
 Stage Min, Max: coty 8  
 Height Majority: 2 IN  
 Height Min, Max: 0.5 4  
 Density, Unit: 1 FT2

## Application Equipment

Appl. Equipment: CO2 sprayer  
 Operating Pressure: 30 PSI  
 Nozzle Type: Flat fan  
 Nozzle Size: XR 8002  
 Boom Length, Unit: 6.67 FT  
 Spray Volume, Unit: 15 GPA

## Arrow Formulations on Volunteer Roundup Ready Corn.

Trial ID: 11-ARC-13

Location: Agronomy Res. Center

Pest Code	GLXMA	GLXMA	GLXMA	GLXMA
Crop Code	7-7-11	7-14-11	7-21-11	7-28-11
Rating Date	Injury	Injury	Injury	Injury
Rating Data Type	Percent	Percent	Percent	Percent
Rating Unit				
Rating Timing				
Trt-Eval Interval	7 DA-A	14 DA-A	21 DA-A	28 DA-A

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code				
1	ARROW	2	EC	0.0313	lb ai/a	2	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
1	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
2	CLETHODIM ECL	2	EC	0.0313	lb ai/a	2	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
2	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
3	ARROW	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
3	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
4	CLETHODIM ECL	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
4	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
5	ARROW	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
5	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
6	CLETHODIM ECL	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
6	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
7	ARROW	2	EC	0.094	lb ai/a	6	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
7	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
8	CLETHODIM ECL	2	EC	0.094	lb ai/a	6	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
8	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
9	ARROW	2	EC	0.25	lb ai/a	16	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
9	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
10	CLETHODIM ECL	2	EC	0.25	lb ai/a	16	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
10	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A				
11	ARROW	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
11	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A				
12	CLETHODIM ECL	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
12	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A				
13	ARROW	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
13	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A				
14	CLETHODIM ECL	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
14	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A				
15	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A	0 a	0 a	0 a	0 a
16	NONTREATED									0 a	0 a	0 a	0 a
LSD (P=.05)										0.0	0.0	0.0	0.0
Replicate F										0.000	0.000	0.000	0.000
Replicate Prob(F)										1.0000	1.0000	1.0000	1.0000
Treatment F										0.000	0.000	0.000	0.000
Treatment Prob(F)										1.0000	1.0000	1.0000	1.0000

Means followed by same letter do not significantly differ (P=.05, LSD)

Arrow Formulations on Volunteer Roundup Ready Corn.

Trial ID: 11-ARC-13

Location: Agronomy Res. Center

Pest Code										ZEAMX	ZEAMX	ZEAMX	ZEAMX
Crop Code													
Rating Date										7-7-11	7-14-11	7-21-11	7-28-11
Rating Data Type										Control	Control	Control	Control
Rating Unit										Percent	Percent	Percent	Percent
Rating Timing													
Trt-Eval Interval										7 DA-A	14 DA-A	21 DA-A	28 DA-A

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code				
1	ARROW	2	EC	0.0313	lb ai/a	2	fl oz/a	12-18"CN	A	61	de	96	d
1	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			98	a
2	CLETHODIM ECL	2	EC	0.0313	lb ai/a	2	fl oz/a	12-18"CN	A	59	e	96	d
2	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
3	ARROW	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	61	de	98	ab
3	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
4	CLETHODIM ECL	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	61	de	98	bc
4	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
5	ARROW	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	64	bcd	98	ab
5	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
6	CLETHODIM ECL	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	66	b	99	ab
6	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
7	ARROW	2	EC	0.094	lb ai/a	6	fl oz/a	12-18"CN	A	66	b	99	a
7	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
8	CLETHODIM ECL	2	EC	0.094	lb ai/a	6	fl oz/a	12-18"CN	A	70	a	99	a
8	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
9	ARROW	2	EC	0.25	lb ai/a	16	fl oz/a	12-18"CN	A	73	a	99	a
9	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
10	CLETHODIM ECL	2	EC	0.25	lb ai/a	16	fl oz/a	12-18"CN	A	73	a	99	a
10	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
11	ARROW	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	63	cd	96	d
11	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			96	c
12	CLETHODIM ECL	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	61	de	96	d
12	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			95	c
13	ARROW	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	61	de	97	c
13	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			97	b
14	CLETHODIM ECL	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	65	bc	98	ab
14	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			99	a
15	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A	0	f	0	e
16	NONTREATED									0	f	0	e
	LSD (P=.05)									3.6		1.0	
	Replicate F									3.008		3.076	
	Replicate Prob(F)									0.0399		0.0370	
	Treatment F									316.318		9597.762	
	Treatment Prob(F)									0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD)

## Arrow Formulations on Volunteer Roundup Ready Corn.

Trial ID: 11-ARC-13

Location: Agronomy Res. Center

Pest Code									PANDI	PANDI	PANDI	PANDI	
Crop Code													
Rating Date									7-7-11	7-14-11	7-21-11	7-28-11	
Rating Data Type									Control	Control	Control	Control	
Rating Unit									Percent	Percent	Percent	Percent	
Rating Timing													
Trt-Eval Interval									7 DA-A	14 DA-A	21 DA-A	28 DA-A	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code				
1	ARROW	2	EC	0.0313	lb ai/a	2	fl oz/a	12-18"CN	A	63	de	98	b
1	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
2	CLETHODIM ECL	2	EC	0.0313	lb ai/a	2	fl oz/a	12-18"CN	A	61	e	98	b
2	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
3	ARROW	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	64	de	99	ab
3	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
4	CLETHODIM ECL	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	61	e	99	a
4	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
5	ARROW	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	65	de	99	a
5	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
6	CLETHODIM ECL	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	66	d	99	a
6	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
7	ARROW	2	EC	0.094	lb ai/a	6	fl oz/a	12-18"CN	A	66	d	99	a
7	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
8	CLETHODIM ECL	2	EC	0.094	lb ai/a	6	fl oz/a	12-18"CN	A	71	c	99	a
8	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
9	ARROW	2	EC	0.25	lb ai/a	16	fl oz/a	12-18"CN	A	78	b	99	a
9	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
10	CLETHODIM ECL	2	EC	0.25	lb ai/a	16	fl oz/a	12-18"CN	A	76	b	99	a
10	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A			99	a
11	ARROW	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	99	a	99	a
11	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			99	a
12	CLETHODIM ECL	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	99	a	99	a
12	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			99	a
13	ARROW	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	99	a	99	a
13	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			99	a
14	CLETHODIM ECL	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	99	a	99	a
14	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			99	a
15	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A	99	a	99	a
16	NONTREATED									0	f	0	c
	LSD (P=.05)									4.3		1.0	
	Replicate F									1.093		2.718	
	Replicate Prob(F)									0.3617		0.0556	
	Treatment F									279.727		5247.336	
	Treatment Prob(F)									0.0001		0.0001	

Means followed by same letter do not significantly differ (P=.05, LSD)

## Arrow Formulations on Volunteer Roundup Ready Corn.

Trial ID: 11-ARC-13

Location: Agronomy Res. Center

Pest Code	AMASS	AMASS	AMASS	AMASS
Crop Code				
Rating Date	7-7-11	7-14-11	7-21-11	7-28-11
Rating Data Type	Control	Control	Control	Control
Rating Unit	Percent	Percent	Percent	Percent
Rating Timing				
Trt-Eval Interval	7 DA-A	14 DA-A	21 DA-A	28 DA-A

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code							
1	ARROW	2	EC	0.0313	lb ai/a	2	fl oz/a	12-18"CN	A	0	c	0	c			
1	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
2	CLETHODIM ECL	2	EC	0.0313	lb ai/a	2	fl oz/a	12-18"CN	A	0	c	0	c			
2	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
3	ARROW	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	0	c	0	c			
3	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
4	CLETHODIM ECL	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	0	c	0	c			
4	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
5	ARROW	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	0	c	0	c			
5	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
6	CLETHODIM ECL	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	0	c	0	c			
6	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
7	ARROW	2	EC	0.094	lb ai/a	6	fl oz/a	12-18"CN	A	0	c	0	c			
7	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
8	CLETHODIM ECL	2	EC	0.094	lb ai/a	6	fl oz/a	12-18"CN	A	0	c	0	c			
8	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
9	ARROW	2	EC	0.25	lb ai/a	16	fl oz/a	12-18"CN	A	0	c	0	c			
9	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
10	CLETHODIM ECL	2	EC	0.25	lb ai/a	16	fl oz/a	12-18"CN	A	0	c	0	c			
10	COC (PRIME OIL)	100	SL	1	% v/v	1	% v/v	12-18"CN	A							
11	ARROW	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	98	a	99	ab			
11	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			99	a			
12	CLETHODIM ECL	2	EC	0.047	lb ai/a	3	fl oz/a	12-18"CN	A	98	a	99	a			
12	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			99	a			
13	ARROW	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	98	a	98	abc			
13	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			98	ab			
14	CLETHODIM ECL	2	EC	0.0625	lb ai/a	4	fl oz/a	12-18"CN	A	95	b	97	c			
14	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A			97	b			
15	ROUNDUP POWERMAX	4.5	SL	0.77	lb ae/a	22	fl oz/a	12-18"CN	A	95	b	98	bc			
16	NONTREATED									0	c	0	c			
LSD (P=.05)										1.7		0.8		0.8		1.5
Replicate F										2.159		1.542		2.976		2.561
Replicate Prob(F)										0.1061		0.2166		0.0415		0.0667
Treatment F										5807.095		28679.702		25611.196		7958.315
Treatment Prob(F)										0.0001		0.0001		0.0001		0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

## Trial Comments

1. Protocol: MANA (2452711).
2. Ratings: CI/WC at 7, 14, 21, and 28 DAT.
3. Take photos at 0 and 21 DAT.
4. Mixing: Mix in the following order; add one-half of the water, then Arrow or Clethodim ECL, then the final one-half water, and then Roundup PowerMax or adjuvants.
5. Note any mixing or spraying formulation concerns.
6. Target is 12-18 inch volunteer corn and/or 3-8 inch grass weeds.
7. Planting: Broadcast Roundup Ready corn seed and till site prior to planting.

Arrow Formulations on Volunteer Roundup Ready Corn.

Trial ID: 11-ARC-13

Location: Agronomy Res. Center

8. Blanket application after last rating to be determined.
9. AMASS = A mixture of AMATA (20%) and AMARE (80%).