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Prowl, Outlook, and Dual evaluation in RR cotton

Trial ID: C19-03 Study Dir.: Stanley Culpepper
Location: Ponder farm Investigator: Stanley Culpepper

GENERAL TRIAL INFORMATION

Study Director: Stanley Culpepper **Title:** Ext. weed science
Affiliation: University of Georgia **Postal Code:** 31794
Investigator: Stanley Culpepper **Title:** Ext.weed science
Affiliation: University of Georgia **Postal Code:** 31794

Trial Status: completed **Initiation Date:** May-05-03 **Country:** U.S.A.
City: TyTy **State/Prov.:** Ga **Postal Code:** 31795
Conducted Under GLP (Y/N): N **Conducted Under GEP (Y/N):** N

CROP AND PEST DESCRIPTION

Weed 1.XANST common cocklebur **2.**PANTE Texas panicum
Weed 3.CASOB sicklepod **4.**AMAPA Palmer amaranth

Crop 1:GOSHI cotton **Variety:** DP 555 B/RR **Planting Date:** May-05-03
Planting Method: conventional **Rate:** 3.5 seed/ft **Depth:** 0.5 in
Row Spacing: 36 inch **Seed Bed:** bedded
Soil Temperature: 88 F **Soil Moisture:** moist **Emergence Date:** May-10-03

Plot Width, Unit: 6 FT **Plot Length, Unit:** 25 FT **Reps:** 4
Site Type: research station
Tillage Type: conventional **Study Design:** RANDOMIZED COMPLETE BLOCK

SOIL DESCRIPTION

Texture: Sand **% OM:** 1.3 **% Sand:** 94 **% Silt:** 2 **% Clay:** 4
pH: 5.7 **Soil Name:** Tifton sandy lao

APPLICATION DESCRIPTION

	A	B	C	D	E	F
Application Date:	May-06-03	May-14-03	May-28-03	Jun-14-03		
Time of Day:	6:00pm	8:00am	7:30pm	11:00am		
Application Method:	Broadcast	Broadcast	Broadcast	Broadcast		
Application Timing:	PRE	1-leaf	4-leaf	layby		
Applic. Placement:	on soil	overtop	overtop	directed		
Air Temp., Unit:	89 F	76 F	80 F	85 F		
% Relative Humidity:	54	56	33	68		
Wind Velocity, Unit:	0 mph	0 mph	2 mph	3 mph		
Dew Presence (Y/N):	n	y	n	n		
Soil Temp., Unit:	90 F	80 F	82 F	84 F		
Soil Moisture:	moist	moist	moist	moist		
% Cloud Cover:	40	100	20	40		

CROP STAGE AT EACH APPLICATION

	A	B	C	D	E	F
Crop 1 GOSHI Stage:	PRE	1-leaf	4-leaf	layby		
Stage Scale:	.	V1	V4-V5	V11		
Height, Unit:	0. .	1.5 inch	5 inch	22 inch		

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WEED STAGE AT EACH APPLICATION

	A	B	C	D	E	F
Weed 1 XANST Stage:	PRE	1-leaf	4-leaf	layby		
Stage Scale:	.	.	<3 inch	<4 inch		
Density, Unit:	. .	. .	2 ydsq	. .		
Weed 2 PANTE Stage:	PRE	1-leaf	4-leaf	layby		
Stage Scale:	.	<0.25"	<3", 3T	<4 inch		
Density, Unit:	. .	. .	46 ydsq	. .		
Weed 3 CASOB Stage:	PRE	1-leaf	4-leaf	layby		
Stage Scale:	.	<0.25"	<3"	<4 inch		
Density, Unit:	. .	. .	3 ydsq	. .		
Weed 4 AMAPA Stage:	PRE	1-leaf	4-leaf	layby		
Stage Scale:	.	<0.25"	<4 inch	<4 inch		
Density, Unit:	. .	. .	2 ydsq	. .		

APPLICATION EQUIPMENT

	A	B	C	D	E	F
Appl. Equipment:	backpack	backpack	backpack	backpack		
Operating Pressure:	23	23	23	18		
Nozzle Type:	flat fan	flat fan	flat fan	flat fan		
Nozzle Size:	11002	11002	11002	11002		
Nozzle Spacing, Unit:	18 inch	18 inch	18 inch	12 inch		
Nozzles/Row:	2	2	2	3		
Boom Length, Unit:	4.5 feet	4.5 feet	4.5 feet	2 feet		
Boom Height, Unit:	15 inch	15 inch	15 inch	12 inch		
Ground Speed, Unit:	3 mph	3 mph	3 mph	3 mph		
Carrier:	water	water	water	water		
Spray Volume, Unit:	14.8 GPA	14.8 GPA	14.8 GPA	14.8 GPA		
Propellant:	CO2	CO2	CO2	CO2		
Tank Mix (Y/N):	Y	Y	Y	Y		

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Prowl, Outlook, and Dual evaluation in RR cotton

Trial ID: C19-03 Study Dir.: Stanley Culpepper
Location: Ponder farm Investigator: Stanley Culpepper

Trt No.	Treatment Name	Rate	Rate Unit	1	2	3	4	5	6	7
Weed Code				GOSHI	GOSHI	GOSHI	PANTE	PANTE	PANTE	CASOB
Crop Code										
Rating Data Type				injury	injury	injury	control	control	control	control
Rating Unit				percent	percent	percent	percent	percent	percent	percent
Rating Date				May-31-03	Jun-08-03	Jun-22-03	May-31-03	Jun-22-03	Sep-20-03	May-31-03
Trt-Eval Interval				25 DA-A	33 DA-A	47 DA-A				
PRM Data Type										
# Subsamples, Dec.										
1	Untreated			0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Roundup Weathermax	16	fl oz/a	0.8	0.0	0.0	95.3	99.0	98.5	96.0
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
3	Roundup Weathermax	22	fl oz/a	2.3	0.0	0.0	30.0	98.0	97.8	31.3
	Roundup Weathermax	22	fl oz/a							
4	Prowl EC	2	pt/a	4.3	0.0	0.0	46.3	99.0	98.5	32.5
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
5	Prowl H20	1.75	pt/a	1.3	0.0	3.0	55.8	99.0	98.5	57.0
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
6	Dual Magnum	16	fl oz/a	0.0	0.0	3.3	56.3	98.5	99.0	44.0
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
7	Outlook	14	fl oz/a	0.5	0.0	4.0	67.5	98.5	96.8	43.5
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
8	Roundup Weathermax	16	fl oz/a	10.0	29.3	24.3	97.0	99.0	97.3	97.0
	Roundup Weathermax	22	fl oz/a							
	Prowl EC	2	pt/a							
	Roundup Weathermax	22	fl oz/a							
9	Roundup Weathermax	16	fl oz/a	6.5	19.8	5.5	97.0	99.0	99.0	97.0
	Roundup Weathermax	22	fl oz/a							
	Prowl H2O	1.75	pt/a							
	Roundup Weathermax	22	fl oz/a							
10	Roundup Weathermax	16	fl oz/a	9.5	0.8	5.0	97.0	99.0	99.0	97.0
	Roundup Weathermax	22	fl oz/a							
	Dual Magnum	16	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
11	Roundup Weathermax	16	fl oz/a	6.0	0.0	2.8	97.3	99.0	96.3	97.3
	Roundup Weathermax	22	fl oz/a							
	Outlook	14	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
12	Roundup Weathermax	16	fl oz/a	19.5	3.8	3.0	97.3	99.0	99.0	97.3
	Roundup Weathermax	22	fl oz/a							
	Stalwart C	26	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
13	Roundup Weathermax	16	fl oz/a	2.3	0.0	1.5	97.3	99.0	99.0	97.3
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
	Prowl EC	2	pt/a							
14	Roundup Weathermax	16	fl oz/a	0.3	0.0	1.8	97.0	99.0	99.0	97.0
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
	Prowl H2O	1.75	pt/a							
15	Roundup Weathermax	16	fl oz/a	1.0	0.0	0.8	97.0	98.5	98.5	97.0
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
	Dual Magnum	16	fl oz/a							

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Weed Code										
Crop Code								PANTE	PANTE	PANTE	CASOB
Rating Data Type											
Rating Unit								control	control	control	control
Rating Date								percent	percent	percent	percent
Trt-Eval Interval								May-31-03	Jun-22-03	Sep-20-03	May-31-03
PRM Data Type											
# Subsamples, Dec.											
Trt No.	Treatment Name	Rate	Rate Unit								
16	Roundup Weathermax	16	fl oz/a	0.0	0.0	1.5	96.5	99.0	99.0	96.5
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
	Outlook	14	fl oz/a							
LSD (P=.05)				2.76	2.60	4.27	13.17	0.72	2.43	14.12
Standard Deviation				1.93	1.82	2.99	9.22	0.50	1.70	9.88
CV				48.3	54.36	84.92	12.05	0.54	1.85	13.43
Bartlett's X2				12.527	4.232	12.629	77.055	0.095	16.121	77.494
P(Bartlett's X2)				0.404	0.237	0.318	0.001*	0.992	0.024*	0.001*

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

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Weed Code				CASOB	CASOB	XANST	XANST	AMAPA	AMAPA	Seed
Crop Code										GOSHI
Rating Data Type				control	control	control	control	control	control	yield
Rating Unit				percent	percent	percent	percent	percent	percent	lb/plot
Rating Date				May-31-03	Jun-22-03	Jun-22-03	Sep-20-03	May-31-03	Sep-20-03	Sep-24-03
Trt-Eval Interval										
PRM Data Type										
# Subsamples, Dec.										
Trt No.	Treatment Name	Rate	Rate Unit	8	9	10	11	12	13	14
1	Untreated			0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Roundup Weathermax	16	fl oz/a	99.0	99.0	99.0	99.0	96.8	99.0	10.2
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
3	Roundup Weathermax	22	fl oz/a	99.0	99.0	98.5	99.0	88.8	99.0	7.9
	Roundup Weathermax	22	fl oz/a							
4	Prowl EC	2	pt/a	99.0	98.3	99.0	99.0	90.0	99.0	9.1
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
5	Prowl H20	1.75	pt/a	99.0	99.0	99.0	99.0	89.8	99.0	8.8
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
6	Dual Magnum	16	fl oz/a	99.0	99.0	99.0	99.0	90.0	99.0	9.3
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
7	Outlook	14	fl oz/a	99.0	99.0	99.0	99.0	92.3	99.0	9.5
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
8	Roundup Weathermax	16	fl oz/a	99.0	97.5	99.0	99.0	99.0	99.0	6.2
	Roundup Weathermax	22	fl oz/a							
	Prowl EC	2	pt/a							
	Roundup Weathermax	22	fl oz/a							
9	Roundup Weathermax	16	fl oz/a	99.0	99.0	99.0	99.0	99.0	99.0	8.6
	Roundup Weathermax	22	fl oz/a							
	Prowl H2O	1.75	pt/a							
	Roundup Weathermax	22	fl oz/a							
10	Roundup Weathermax	16	fl oz/a	99.0	99.0	99.0	99.0	99.0	99.0	10.0
	Roundup Weathermax	22	fl oz/a							
	Dual Magnum	16	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
11	Roundup Weathermax	16	fl oz/a	99.0	99.0	99.0	99.0	99.0	99.0	9.4
	Roundup Weathermax	22	fl oz/a							
	Outlook	14	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
12	Roundup Weathermax	16	fl oz/a	99.0	99.0	99.0	99.0	99.0	99.0	9.6
	Roundup Weathermax	22	fl oz/a							
	Stalwart C	26	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
13	Roundup Weathermax	16	fl oz/a	99.0	99.0	99.0	99.0	99.0	99.0	9.1
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
	Prowl EC	2	pt/a							
14	Roundup Weathermax	16	fl oz/a	99.0	99.0	99.0	99.0	99.0	99.0	9.5
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
	Prowl H2O	1.75	pt/a							
15	Roundup Weathermax	16	fl oz/a	99.0	99.0	98.5	99.0	99.0	99.0	9.4
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
	Dual Magnum	16	fl oz/a							

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Weed Code				CASOB	CASOB	XANST	XANST	AMAPA	AMAPA	Seed
Crop Code										GOSHI
Rating Data Type				control	control	control	control	control	control	yield
Rating Unit				percent	percent	percent	percent	percent	percent	lb/plot
Rating Date				May-31-03	Jun-22-03	Jun-22-03	Sep-20-03	May-31-03	Sep-20-03	Sep-24-03
Trt-Eval Interval										
PRM Data Type										
# Subsamples, Dec.										
Trt No.	Treatment Name	Rate	Rate Unit	8	9	10	11	12	13	14
16	Roundup Weathermax	16	fl oz/a	99.0	99.0	99.0	99.0	95.5	99.0	9.5
	Roundup Weathermax	22	fl oz/a							
	Roundup Weathermax	22	fl oz/a							
	Outlook	14	fl oz/a							
LSD (P=.05)				0.00	1.17	0.49	0.00	3.67	0.00	1.02
Standard Deviation				0.00	0.82	0.34	0.00	2.57	0.00	0.72
CV				0.0	0.88	0.37	0.0	2.86	0.0	8.42
Bartlett's X2				0.0	1.325	0.0	0.0	12.981	0.0	48.047
P(Bartlett's X2)				.	0.25	1.00	.	0.011*	.	0.001*

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

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Weed Code				Seed
Crop Code				GOSHI
Rating Data Type				yield
Rating Unit				lb/A
Rating Date				Sep-24-03
Trt-Eval Interval				
PRM Data Type				TY1
# Subsamples, Dec.				1
Trt No.	Treatment Name	Rate	Rate Unit	15
1	Untreated			0.7
2	Roundup Weathermax	16	fl oz/a	2966.4
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
3	Roundup Weathermax	22	fl oz/a	2294.2
	Roundup Weathermax	22	fl oz/a	
4	Prowl EC	2	pt/a	2633.9
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
5	Prowl H20	1.75	pt/a	2559.9
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
6	Dual Magnum	16	fl oz/a	2708.0
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
7	Outlook	14	fl oz/a	2761.7
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
8	Roundup Weathermax	16	fl oz/a	1813.5
	Roundup Weathermax	22	fl oz/a	
	Prowl EC	2	pt/a	
	Roundup Weathermax	22	fl oz/a	
9	Roundup Weathermax	16	fl oz/a	2494.5
	Roundup Weathermax	22	fl oz/a	
	Prowl H2O	1.75	pt/a	
	Roundup Weathermax	22	fl oz/a	
10	Roundup Weathermax	16	fl oz/a	2901.1
	Roundup Weathermax	22	fl oz/a	
	Dual Magnum	16	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
11	Roundup Weathermax	16	fl oz/a	2718.9
	Roundup Weathermax	22	fl oz/a	
	Outlook	14	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
12	Roundup Weathermax	16	fl oz/a	2789.3
	Roundup Weathermax	22	fl oz/a	
	Stalwart C	26	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
13	Roundup Weathermax	16	fl oz/a	2647.0
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
	Prowl EC	2	pt/a	
14	Roundup Weathermax	16	fl oz/a	2761.7
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
	Prowl H2O	1.75	pt/a	
15	Roundup Weathermax	16	fl oz/a	2724.0
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
	Dual Magnum	16	fl oz/a	

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Weed Code				Seed
Crop Code				GOSHI
Rating Data Type				yield
Rating Unit				lb/A
Rating Date				Sep-24-03
Trt-Eval Interval				
PRM Data Type				TY1
# Subsamples, Dec.				1
Trt No.	Treatment Name	Rate	Rate Unit	15
16	Roundup Weathermax	16	fl oz/a	2763.9
	Roundup Weathermax	22	fl oz/a	
	Roundup Weathermax	22	fl oz/a	
	Outlook	14	fl oz/a	
LSD (P=.05)				297.29
Standard Deviation				208.03
CV				8.42
Bartlett's X2				48.048
P(Bartlett's X2)				0.001*

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)
Column 15: TY1 = 290.4*[C14]

Trial Comments

OBJECTIVE: Evaluate Prowl EC, Prowl H20, Dual Magnum, Stalwart C, and Outlook in a RR cotton weed management programs.

RESULTS:

Visual Crop Response:
1) Prowl EC or H20, Outlook, or Dual Magnum applied PRE caused insignificant stunting (<5%). Injury from Dual and Outlook was avoided because no significant rain occurred within 5 days of planting.
2) Prowl EC mixed with glyphosate and applied POT of 4-leaf cotton injured cotton 10, 29 and 24% at 17,25, and 39 DAT, respectively. Injury was still detectable at harvest. Prowl H20 was safer than Prowl EC but injury was still detectable late in the season.
3) Dual Magnum and Outlook applied overtop of 4-leaf cotton with glyphosate caused 6 to 10% initial speckling but recovered very quickly.
4) Injury from Stalwart C applied overtop of 4-leaf cotton was twice that of Dual Magnum at 17 DAT, however, cotton recovered very quickly from the necrotic spotting.
5) Neither Prowl EC, Prowl H20, Outlook, nor Dual Magnum caused any visual injury when directed to the base of the cotton plant.

Weed Control:
1) Texas panicum:
- a) Initial control from PRE treatments was weak because of little no no rain after application.
- b) All glyphosate mixtures provided excellent control.
- c) Late-season control was excellent with all programs.

2) Sicklepod:
- a) As expected, PRE's provided poor control.
- b) All glyphosate mixtures provided excellent control.
- c) Late-season control was excellent with all programs.

3) Common cocklebur:
- a) Cocklebur emerged a little late, thus glyphosate was applied prior to being able to rate PRE activity.
- b) All glyphosate programs provided excellent control.
- c) Late-season control was excellent with all programs.

4) Palmer amaranth:
- a) PRE's provided excellent early season control even without rainfall.
- b) All glyphosate applications provided excellent control.
- c) Late-season control was excellent with all programs.

COTTON YIELDS:

1) Treatments obtaining 3 applications of glyphosate generally yielded higher than a PRE followed by two glyphosate applications. This was likely do to poor panicum control from PRE's allowing early-season weed competition to occur prior to the 4-leaf glyphsoate application.

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2) Early season competition was extreme. Starting the glyphosate application at 4-leaf compared to 1-leaf (even when maintaining plots weed free with additional glyphosate applications) reduced yields 23%.
3) Applying Prowl EC overtop in mixture with glyphosate reduced yields 39% when compared to the same system without Prowl EC. Less yield loss was noted with Prowl H20 but yields were still reduced 16%.
4) Dual Magnum, Outlook, or Stalwart C mixed with glyphosate and appliedtopically to 4-leaf cotton had no negative impact on cotton yield.
5) Layby applications including Prowl H20, Dual Magnum, or Outlook had no negative effects on seed cotton yield.

CONCLUSIONS:
1) Prowl H20 is much safter to cotton when foliar contact is made as compared to Prowl EC. A study should be conducted comparing these formulations of Prowl applied PRE and then causing a splash foliar injury affect.
2) Mixing Dual or Outlook with glyphosate and applying topically had no negative effects on cotton.
3) Sequential glyphosate applications provided excellent control, thus, residual herbicides were not needed at this location.