

University of Georgia

Liberty Link weed management systems.

Trial ID: C21-03
Location: Ponder farm

Study Dir.:
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 LOCATION

City: TyTy **Trial Status:** completed
State/Prov.: Ga **Trial Reliability:** excellent
Postal Code: 31794 **Initiation Date:** May-05-03
Country: U.S.A.

Conducted Under GLP (Y/N): N

Conducted Under GEP (Y/N): N

CROP AND WEED DESCRIPTION

Weed	Code	Common Name	Scientific Name
1.	PANTE	Texas panicum	
2.	CASOB	sicklepod	
3.	IPOLA	pitted morningglory	
4.	AMAPA	Palmer amaranth	
5.	Peanut	Vol. peanut	

Crop 1: GOSHI cotton **Variety:** FM 966 LL
Planting Date: May-05-03 **Planting Method:** conventional
Rate: 3 seed/ft **Depth:** 0.5 in
Row Spacing: 36 in **Spacing Within Row:** 4 inch **Seed Bed:** bedded
Soil Temperature: 83 F **Soil Moisture:** moist **Emergence Date:** May-09-03

SITE AND DESIGN

Plot Width, Unit: 12 FT **Plot Length, Unit:** 23 FT **Reps:** 4
Site Type: research station
Tillage Type: conventional **Study Design:** RANDOMIZED COMPLETE BLOCK

SOIL DESCRIPTION

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

APPLICATION DESCRIPTION

	A	B	C	D	E
Application Date:	May-05-03	May-19-03	Jun-09-03	Jun-14-03	Jun-21-03
Time of Day:	7:00pm	8:00am	8:15am	10:00am	7:00pm
Application Method:	Broadcast	Broadcast	Broadcast	Broadcast	Broadcast
Application Timing:	PRE	EPOT	MPOT	LPD	LPD2
Applic. Placement:	on soil	overtop	overtop	directed	directed
Air Temp., Unit:	82 F	70 F	82 F	83 F	84 F
% Relative Humidity:	59	75	65	70	52
Wind Velocity, Unit:	7 mph	3 mph	3 mph	3 mph	3 mph
Dew Presence (Y/N):	n	y	y	n	n
Soil Temp., Unit:	80 F	74 F	79 F	81 F	84 F
Soil Moisture:	wet	wet	wet	wet	wet
% Cloud Cover:	100	100	50	40	60

CROP STAGE AT EACH APPLICATION

	A	B	C	D
Crop 1 Code, Stage:	GOSHI PRE	GOSHI EPOT	GOSHI MPOT	GOSHI LPD
Stage Scale:	.	V1-V2	V9	V11
Height, Unit:	0. .	2.5 inch	15 inch	18 inch

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	E
Crop 1 Code, Stage:	GOSHI LPD2
Stage Scale:	V12
Height, Unit:	22 inch

WEED STAGE AT EACH APPLICATION

	A	B	C	D
Weed 1 Code, Stage:	PANTE PRE	PANTE EPOT	PANTE MPOT	PANTE LPD
Stage Scale:	.	<4", <3T	<4", 3T	<5", 5T
Density, Unit:	. .	9 ydsq	. .	. .
Weed 2 Code, Stage:	CASOB PRE	CASOB EPOT	CASOB MPOT	CASOB LPD
Stage Scale:	.	<4", <3lf	<4", 4lf	<8", 6lf
Density, Unit:	. .	4 ydsq	. .	. .
Weed 3 Code, Stage:	IPOLA PRE	IPOLA EPOT	IPOLA MPOT	IPOLA LPD
Stage Scale:	.	<2 inch	2", 2lf	<4"
Density, Unit:	. .	3 ydsq	. .	. .
Weed 4 Code, Stage:	AMAPA PRE	AMAPA EPOT	AMAPA MPOT	AMAPA LPD
Stage Scale:	.	<2 inch	<3 inch	<3"
Density, Unit:	. .	1 ydsq	. .	. .
Weed 5 Code, Stage:	Peanu PRE	Peanu EPOT	Peanu MPOT	Peanu LPD
Stage Scale:	.	<4" diame	4"diamete	<2"
Density, Unit:	. .	2 ydsq	. .	. .
	E			
Weed 1 Code, Stage:	PANTE LPD2			
Stage Scale:	<2"			
Density, Unit:	. .			
Weed 2 Code, Stage:	CASOB LPD2			
Stage Scale:	<2"			
Density, Unit:	. .			
Weed 3 Code, Stage:	IPOLA LPD2			
Stage Scale:	<2"			
Density, Unit:	. .			
Weed 4 Code, Stage:	AMAPA LPD2			
Stage Scale:	<2"			
Density, Unit:	. .			
Weed 5 Code, Stage:	Peanu LPD2			
Stage Scale:	<2"			
Density, Unit:	. .			

APPLICATION EQUIPMENT

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

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Liberty Link weed management systems.

Trial ID: C21-03

Study Dir.:

Location: Ponder farm

Investigator: Stanley Culpepper

Weed Code		GOSHI	GOSHI	GOSHI	PANTE	PANTE	PANTE	CASOB	CASOB	
Crop Code		injury	injury	injury	control	control	control	control	control	
Rating Data Type		percent	percent	percent	percent	percent	percent	percent	percent	
Rating Unit										
Rating Date		May-23-03	May-26-03	Jun-23-03	May-26-03	Jun-23-03	Sep-20-03	May-26-03	Jun-23-03	
Trt-Eval Interval		18 DA-A	21 DA-A	49 DA-A						
ARM Action Codes										
# Subsamples, Dec.										
Trt No.	Treatment Name	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	
		Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	
1	Non-treated									
2	Liberty	32 oz/a			97.7	95.7	63.3	99.0	95.3	
	Liberty	32 oz/a								
3	Prowl	32 oz/a			99.0	99.0	85.3	99.0	99.0	
	Liberty	32 oz/a								
	Liberty	32 oz/a								
4	Prowl	32 oz/a			97.3	95.3	84.3	99.0	99.0	
	Liberty	32 oz/a								
	AMS	1.5 lb/a								
	Liberty	32 oz/a								
	AMS	1.5 lb/a								
5	Prowl	32 oz/a			98.3	99.0	83.7	99.0	99.0	
	Staple	0.8 oz/a								
	Liberty	32 oz/a								
	Liberty	32 oz/a								
6	Prowl	32 oz/a			99.0	99.0	80.3	99.0	99.0	
	Cotoran	1 qt/a								
	Liberty	32 oz/a								
	Liberty	32 oz/a								
7	Prowl	32 oz/a			97.3	99.0	84.7	99.0	97.7	
	Liberty	32 oz/a								
	Liberty	32 oz/a								
	Staple	0.6 oz/a								
8	Prowl	32 oz/a	2.0	0.0	97.3	99.0	97.0	99.0	99.0	
	Liberty	32 oz/a								
	Liberty	32 oz/a								
	Liberty	16 oz/a								
9	Prowl	32 oz/a	0.0	0.0	99.0	96.0	81.3	99.0	99.0	
	Liberty	32 oz/a								
	Caparol	32 oz/a								
	MSMA	2.4 pt/a								
10	Prowl	32 oz/a	2.7	0.0	99.0	99.0	82.0	99.0	99.0	
	Staple	0.8 oz/a								
	Liberty	32 oz/a								
	Caparol	32 oz/a								
	MSMA	2.4 pt/a								
11	Prowl	32 oz/a	0.0	0.0	99.0	99.0	85.7	99.0	99.0	
	Cotoran	1 qt/a								
	Liberty	32 oz/a								
	Caparol	32 oz/a								
	MSMA	2.4 pt/a								
12	Prowl	32 oz/a	18.0	8.7	99.0	99.0	92.0	99.0	99.0	
	Liberty	32 oz/a								
	Dual Mag.	1 pt/a								
	Caparol	32 oz/a								
	MSMA	2.4 pt/a								
LSD (P=.05)			3.10	0.56	4.34	2.61	4.35	10.63	0.00	2.13
Standard Deviation			1.83	0.33	2.56	1.54	2.57	6.28	0.00	1.26
CV			96.95	46.15	90.51	1.71	2.86	8.19	0.0	1.39
Bartlett's X2			1.22	0.0	4.001	1.7	0.641	4.779	0.0	0.335
P(Bartlett's X2)			0.543	.	0.261	0.791	0.726	0.853	.	0.563

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Weed Code				PANTE	PANTE	PANTE	CASOB	CASOB
Crop Code								
Rating Data Type	GOSHI	GOSHI	GOSHI					
Rating Unit	injury	injury	injury	control	control	control	control	control
Rating Date	percent	percent	percent	percent	percent	percent	percent	percent
Trt-Eval Interval	May-23-03	May-26-03	Jun-23-03	May-26-03	Jun-23-03	Sep-20-03	May-26-03	Jun-23-03
ARM Action Codes	18 DA-A	21 DA-A	49 DA-A					
# Subsamples, Dec.								

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

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Weed Code Crop Code Rating Data Type Rating Unit Rating Date Trt-Eval Interval ARM Action Codes # Subsamples, Dec.	CASOB control percent Sep-20-03	IPOLA control percent May-26-03	IPOLA control percent Jun-23-03	IPOLA control percent Sep-20-03	AMAPA control percent May-26-03	Peanut control percent May-26-03	AMAPA control percent Jun-23-03	Seed GOSHI yield lb/plot Sep-24-03
Trt Treatment No. Name Rate Unit	9	10	11	12	13	14	15	16
1 Non-treated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 Liberty 32 oz/a	99.0	99.0	96.7	96.3	97.7	99.0	95.3	7.7
3 Prowl 32 oz/a	99.0	99.0	99.0	98.3	99.0	99.0	99.0	9.1
Liberty 32 oz/a								
4 Prowl 32 oz/a	99.0	99.0	99.0	98.3	99.0	99.0	99.0	8.6
Liberty 32 oz/a								
AMS 1.5 lb/a								
Liberty 32 oz/a								
AMS 1.5 lb/a								
5 Prowl 32 oz/a	99.0	99.0	99.0	94.3	99.0	99.0	99.0	8.5
Staple 0.8 oz/a								
Liberty 32 oz/a								
Liberty 32 oz/a								
6 Prowl 32 oz/a	99.0	99.0	99.0	99.0	99.0	99.0	99.0	8.3
Cotoran 1 qt/a								
Liberty 32 oz/a								
Liberty 32 oz/a								
7 Prowl 32 oz/a	99.0	99.0	99.0	99.0	99.0	99.0	99.0	9.0
Liberty 32 oz/a								
Liberty 32 oz/a								
Staple 0.6 oz/a								
8 Prowl 32 oz/a	99.0	99.0	99.0	99.0	99.0	99.0	86.0	9.0
Liberty 32 oz/a								
Liberty 32 oz/a								
Liberty 16 oz/a								
9 Prowl 32 oz/a	94.0	99.0	99.0	99.0	99.0	99.0	99.0	8.3
Liberty 32 oz/a								
Caparol 32 oz/a								
MSMA 2.4 pt/a								
10 Prowl 32 oz/a	97.0	99.0	99.0	97.0	99.0	99.0	99.0	8.4
Staple 0.8 oz/a								
Liberty 32 oz/a								
Caparol 32 oz/a								
MSMA 2.4 pt/a								
11 Prowl 32 oz/a	97.3	99.0	99.0	99.0	99.0	99.0	99.0	8.7
Cotoran 1 qt/a								
Liberty 32 oz/a								
Caparol 32 oz/a								
MSMA 2.4 pt/a								
12 Prowl 32 oz/a	98.3	99.0	99.0	99.0	99.0	99.0	99.0	9.1
Liberty 32 oz/a								
Dual Mag. 1 pt/a								
Caparol 32 oz/a								
MSMA 2.4 pt/a								
LSD (P=.05)	4.87	0.00	1.98	4.36	1.13	0.00	11.57	1.13
Standard Deviation	2.88	0.00	1.17	2.57	0.67	0.00	6.83	0.66
CV	3.2	0.0	1.29	2.86	0.74	0.0	7.65	8.42
Bartlett's X2	6.71	0.0	0.0	8.897	0.0	0.0	2.543	12.055
P(Bartlett's X2)	0.082	.	.	0.064	.	.	0.111	0.281

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		
ARM Action Codes		TY1
# Subsamples, Dec.		1
Trt No.	Treatment Name	Rate Unit
		17
1	Non-treated	0.0
2	Liberty	32 oz/a
	Liberty	32 oz/a
2434.7		
3	Prowl	32 oz/a
	Liberty	32 oz/a
	Liberty	32 oz/a
2868.2		
4	Prowl	32 oz/a
	Liberty	32 oz/a
	AMS	1.5 lb/a
	Liberty	32 oz/a
	AMS	1.5 lb/a
2723.0		
5	Prowl	32 oz/a
	Staple	0.8 oz/a
	Liberty	32 oz/a
	Liberty	32 oz/a
2683.0		
6	Prowl	32 oz/a
	Cotoran	1 qt/a
	Liberty	32 oz/a
	Liberty	32 oz/a
2626.2		
7	Prowl	32 oz/a
	Liberty	32 oz/a
	Liberty	32 oz/a
	Staple	0.6 oz/a
2834.6		
8	Prowl	32 oz/a
	Liberty	32 oz/a
	Liberty	32 oz/a
	Liberty	16 oz/a
2845.1		
9	Prowl	32 oz/a
	Liberty	32 oz/a
	Caparol	32 oz/a
	MSMA	2.4 pt/a
2617.8		
10	Prowl	32 oz/a
	Staple	0.8 oz/a
	Liberty	32 oz/a
	Caparol	32 oz/a
	MSMA	2.4 pt/a
2651.5		
11	Prowl	32 oz/a
	Cotoran	1 qt/a
	Liberty	32 oz/a
	Caparol	32 oz/a
	MSMA	2.4 pt/a
2746.2		
12	Prowl	32 oz/a
	Liberty	32 oz/a
	Dual Mag.	1 pt/a
	Caparol	32 oz/a
	MSMA	2.4 pt/a
2878.7		
LSD (P=.05)		355.17
Standard Deviation		209.73
CV		8.41
Bartlett's X2		12.057
P(Bartlett's X2)		0.281

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

Column 17: TY1 = 315.6522*[16]

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Liberty Link weed management systems.

Trial ID: C21-03

Study Dir.:

Location: Ponder farm

Investigator: Stanley Culpepper

Trial Comments

OBJECTIVE: Evaluate Liberty Link weed management systems.

RESULTS AND DISCUSSION:

CROP RESPONSE:

- 1) Mixing Dual Mag. with Liberty caused 18% injury at 5 DAT. Injury was similar to that often noted with glyphosate + Dual with pin point necrotic spots. Cotton recovered fairly quickly, although pin point speckles were still noted at 37 DAT.
- 2) No other herbicide application visually injured cotton.

WEED RESPONSE:

Texas panicum:

- 1) Liberty provided excellent control of emerged panicum during early season. Panicum was small at time of EPOT.
- 2) By seasons end, two applications of Liberty provided only 63% control. Adding Prowl PRE to the system improved control by 23%.
- 3) Only two programs provided acceptable late-season control. 1) Prowl PRE plus three applications of Liberty and 2) Prowl PRE followed by Liberty + Dual EPOT and Caparol + MSMA at layby. Most programs were not acceptable even with 80 to 85% control because late-season emergence allowed seed head productions sticking through the cotton canopy. Residual grass control after cotton emergence or an additional POST application will be required to manage grass in Liberty Link cotton..

Sicklepod:

- 1) Liberty and Liberty programs provided excellent control.

Pitted Morningglory:

- 1) Liberty and Liberty programs provided excellent control.

Palmer amaranth:

- 1) Liberty and Liberty programs provided excellent control. The weed was ALWAYS less than 3 inches at time of application.

Peanut:

- 1) Liberty and Liberty programs provided excellent control.

SEED YIELD:

- 1) Yields followed trends in panicum control. Less than 80% late-season panicum control only was noted with two applications of Liberty and this treatment provided the lowest yields. Yields from other systems were similar.

CONCLUSIONS:

- 1) Studies must be conducted in weed free and weedy environments focusing on Liberty plus Staple and Liberty plus Dual Magnum applied overtop of cotton at various growth stages and environments.
- 2) Grasses and nutsedge appear to be the greatest weed management threats to this technology. Grass control is a huge concern!!!!