

# University of Georgia

Weed management in Liberty Link cotton.

Trial ID: C20-03  
Location: Attapulcus

Study Dir.: Culpepper  
Investigator: Stanley Culpepper

## GENERAL TRIAL INFORMATION

**Study Director:** 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 **Country:** U.S.A.  
**City:** Moultrie **State/Prov.:** Ga  
**Conducted Under GLP (Y/N):** N **Conducted Under GEP (Y/N):** N

## CROP AND PEST DESCRIPTION

**Weed 1:** IPOLA pitted morningglory **2:** DIGSA Large crabgrass  
**Weed 3:** CYPES yellow nutsedge **4:** MOLVE carpetweed

**Crop 1:** GOSHI cotton **Variety:** FM 966LL **Planting Date:** May-09-04  
**Planting Method:** conventional **Rate:** 3 per foot **Depth:** 0.5 in  
**Row Spacing:** 36 inch **Seed Bed:** low bed  
**Soil Temperature:** 83 F **Soil Moisture:** moist **Emergence Date:** May-14-03

**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

**Texture:** sandy loam **% OM:** 1.2 **% Sand:** 88 **% Silt:** 12 **% Clay:** 0  
**pH:** 5.9 **CEC:** 0. **Soil Name:** . **Fertility Level:** .

## APPLICATION DESCRIPTION

	A	B	C	D	E	F
<b>Application Date:</b>	May-09-03	May-24-03	Jun-13-03	Jun-28-03		
<b>Time of Day:</b>	10 am	2 pm	9 am	10 am		
<b>Application Method:</b>	Broadcast	Broadcast	Broadcast	Broadcast		
<b>Application Timing:</b>	PRE	EPOST	MPOST	PDIR		
<b>Applic. Placement:</b>	on soil	overtop	overtop	directed		
<b>Air Temp., Unit:</b>	85 F	83 F	80 F	83 F		
<b>% Relative Humidity:</b>	52	40	79	63		
<b>Wind Velocity, Unit:</b>	3 mph	2 mph	1 mph	2 mph		
<b>Dew Presence (Y/N):</b>	n	n	n	n		
<b>Soil Temp., Unit:</b>	83 F	81 F	82 F	85 F		
<b>Soil Moisture:</b>	good	wet	wet	moist		
<b>% Cloud Cover:</b>	40	30	10	40		

## CROP STAGE AT EACH APPLICATION

	A	B	C	D	E	F
<b>Crop 1 GOSHI Stage:</b>	PRE	EPOST	MPOST	LPD		
<b>Stage Scale:</b>	.	V1-V2	V7	V10		
<b>Height, Unit:</b>	0. .	2 inch	10 inch	18 inch		

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WEED STAGE AT EACH APPLICATION						
	A	B	C	D	E	F
<b>Weed 1 IPOLA Stage:</b>	PRE	EPOST	MPOST	LPD		
<b>Stage Scale:</b>	.	<4 inch	4"	2-3 inch		
<b>Density, Unit:</b>	. .	8 ydsq	. .	. .		
<b>Weed 2 DIGSA Stage:</b>	PRE	EPOST	MPOST	LPD		
<b>Stage Scale:</b>	.	3T, 5"	3-5T, 8"	12"		
<b>Density, Unit:</b>	. .	35 ydsq	. .	. .		
<b>Weed 3 CYPES Stage:</b>	PRE	EPOST	MPOST	LPD		
<b>Stage Scale:</b>	.	6 blade	6 blade	8 blade		
<b>Density, Unit:</b>	. .	8 ydsq	5 ydsq	. .		
<b>Weed 4 MOLVE Stage:</b>	PRE	EPOST	MPOST	LPD		
<b>Stage Scale:</b>	.	2 inch	.	.		
<b>Density, Unit:</b>	. .	4 ydsq	. .	. .		

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

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Weed Code				IPOLA	IPOLA	IPOLA	IPOLA	IPOLA			
Crop Code											
Rating Data Type				control	control	control	control	control			
Rating Unit				percent	percent	percent	percent	percent			
Rating Date				May-30-03	Jun-21-03	Jul-04-03	Jul-15-03	Sep-08-03			
Trt-Eval Interval											
PRM Data Type											
# Subsamples, Dec.											
Trt No.	Treatment Name	Rate	Rate Unit	1	2	3	4	5	6	7	8
12	Prowl	2.4	pt/a	3.8	0.0	0.0	99.0	99.0	97.5	98.8	89.0
	Staple	0.8	oz/a								
	Liberty	32	fl oz/a								
	Liberty	32	fl oz/a								
LSD (P=.05)				3.59	0.00	0.00	3.16	0.42	3.02	2.13	8.88
Standard Deviation				2.48	0.00	0.00	2.19	0.29	2.09	1.47	6.15
CV				154.87	0.0	0.0	2.42	0.32	2.33	1.63	7.1
Bartlett's X2				3.609	0.0	0.0	23.886	0.0	2.243	9.696	44.254
P(Bartlett's X2)				0.729	.	.	0.001*	.	0.523	0.021*	0.001*

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



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Weed Code	DIGSA	DIGSA	DIGSA	DIGSA	DIGSA	MOLVE	CYPES	CYPES
Crop Code								
Rating Data Type	control	control	control	control	control	control	control	control
Rating Unit	percent	percent	percent	percent	percent	percent	percent	percent
Rating Date	May-30-03	Jun-21-03	Jul-04-03	Jul-15-03	Sep-08-03	May-30-03	May-30-03	Jun-21-03
Trt-Eval Interval								
PRM Data Type								
# Subsamples, Dec.								
Trt No.	9	10	11	12	13	14	15	16
Treatment Name								
Rate								
Unit								
12 Prowl	96.8	98.0	90.5	84.5	86.8	99.0	88.3	73.8
Staple								
Liberty								
Liberty								
LSD (P=.05)	7.82	12.76	5.92	7.77	14.94	0.28	6.48	12.53
Standard Deviation	5.42	8.84	4.10	5.38	10.35	0.19	4.49	8.68
CV	6.51	11.08	5.15	6.86	13.62	0.21	5.94	13.38
Bartlett's X2	15.365	19.157	2.182	18.538	29.476	0.0	5.849	14.356
P(Bartlett's X2)	0.081	0.024*	0.949	0.047*	0.001*	0.001*	0.828	0.157

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

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Weed Code	CYPES	Seed	Seed			
Crop Code	control	GOSHI	GOSHI			
Rating Data Type	percent	yield	yield			
Rating Unit	Jul-04-03	lb/plot	lb/A			
Rating Date		Oct-07-03	Oct-07-03			
Trt-Eval Interval						
PRM Data Type			TY1			
# Subsamples, Dec.			1			
Trt No.	Treatment Name	Rate	Unit	17	18	19
1	Untreated			0.0	0.0	0.0
2	Liberty	32 fl oz/a		52.5	3.4	2174.8
	Liberty	32 fl oz/a				
3	Liberty	32 fl oz/a		86.3	3.8	2428.9
	Liberty	32 fl oz/a				
	MSMA 6.6	2.4 pt/a				
4	Liberty	32 fl oz/a		86.0	4.8	3023.9
	Liberty	32 fl oz/a				
	Caparol	2 pt/a				
	MSMA 6.6	2.4 pt/a				
	Surfac 820	0.25 % v/v				
5	Liberty	32 fl oz/a		78.8	4.2	2670.4
	Liberty	32 fl oz/a				
	Liberty	16 fl oz/a				
	MSMA 6.6	2.4 pt/a				
6	Prowl	2.4 pt/a		87.5	4.9	3096.5
	Liberty	32 fl oz/a				
	Liberty	32 fl oz/a				
	Liberty	16 fl oz/a				
	MSMA 6.6	2.4 pt/a				
7	Prowl	2.4 pt/a		94.5	4.6	2880.3
	Cotoran	1.0 qt/a				
	Liberty	32 fl oz/a				
	Liberty	32 fl oz/a				
	Liberty	16 fl oz/a				
	MSMA 6.6	2.4 pt/a				
8	Prowl	2.4 pt/a		89.0	4.9	3074.5
	Liberty	32 fl oz/a				
	Liberty	32 fl oz/a				
	Staple	0.6 oz/a				
	Liberty	16 fl oz/a				
	MSMA 6.6	2.4 pt/a				
9	Prowl	2.4 pt/a		86.8	4.8	3046.0
	Liberty	32 fl oz/a				
	AMA	1.5 lb/a				
	Liberty	32 fl oz/a				
	AMS	1.5 lb/a				
	Liberty	16 fl oz/a				
	MSMA 6.6	2.4 pt/a				
10	Liberty	24 fl oz/a		84.5	4.4	2746.2
	Liberty	32 fl oz/a				
	Liberty	24 fl oz/a				
	MSMA 6.6	2.4 pt/a				
11	Prowl	2.4 pt/a		74.5	4.6	2872.4
	Cotoran	1.0 qt/a				
	Liberty	32 fl oz/a				
	Liberty	32 fl oz/a				

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Weed Code	CYPES	Seed	Seed
Crop Code		GOSHI	GOSHI
Rating Data Type	control	yield	yield
Rating Unit	percent	lb/plot	lb/A
Rating Date	Jul-04-03	Oct-07-03	Oct-07-03
Trt-Eval Interval			
PRM Data Type			TY1
# Subsamples, Dec.			1
Trt No.	Treatment	Rate	
	Name	Unit	
			17
			18
			19
12	Prowl	2.4 pt/a	70.0
	Staple	0.8 oz/a	
	Liberty	32 fl oz/a	
	Liberty	32 fl oz/a	
LSD (P=.05)		9.12	0.93
Standard Deviation		6.32	0.64
CV		8.52	15.73
Bartlett's X2		10.661	18.471
P(Bartlett's X2)		0.385	0.048*

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

Column 19: TY1 = 631.3043\*[C18]

## Trial Comments

**OBJECTIVE:** Evaluate Liberty Link cotton weed management systems.

**RESULTS:**

**Crop Response:**

- 1) Little no no injury was noted from any herbicide system.
- 2) No injury was noted with the Liberty + Staple application to 7-leaf cotton.

**Weed Control:**

**Morningglory:**

- 1) Liberty applications and Liberty systems provided excellent control.
- 2) By late-season, control was less in systems including only 2 POT Liberty applications compared to systems with 3 POST applications or a PRE followed by 2 POST applications.

**Large crabgrass:**

- 1) Liberty provided good "burndown" of grasses. However, much of this grass did not die from the application and kept coming back. Five inch crabgrass was too large to start POST applications.
- 2) Greater than 90% control was only noted with Prowl followed by three POST applications.
- 3) Late-season control was only 50% with two POT Liberty applications.
- 4) Caparol + MSMA was 15% more effective than Liberty + MSMA at layby.

**Yellow nutsedge:**

- 1) Plant desiccation by Liberty is good. However, the weed is rarely killed from Liberty alone.
- 2) Rust took nutsedge out at mid-season.
- 3) Nutsedge control will be an issue in Liberty Link cotton.
- 4) MSMA in the program improved control.

**Seed Yield:**

- 1) Yield followed trends in crabgrass control.
- 2) Lowest yields were noted with two applications of Liberty at EPOST and MPOST. The addition of MSMA alone at layby did not improve control.
- 3) Total POST treatments including three applications or a PRE followed by two POST applications provided similar yields.
- 4) Applying Staple with Liberty MPOST did not affect yield.

**CONCLUSIONS:**

- 1) Studies should be conducted in weed free and weedy cotton focusing on applications of Liberty + Dual and Liberty + Staple applied POT to cotton at various stages of growth in various environmental conditions.
- 2) Prowl, Cotoran, Prowl + Cotoran, or Prowl + Staple needs to be included with all Liberty programs.



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- 3) Although Prowl needs to be included in the system, additional grass residual herbicides will be needed.
- 4) A study needs to be conducted focusing on grass evaluating where residual herbicides should be placed in the system (Prowl, Dual, Direx or Caparol).