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Impact of cover crop on management of glyphoste-resistant Palmer amaranth in Roundup Ready cotton.

Trial ID: C3-07

Protocol ID:

Location: Macon County

Study Director: Stanley Culpepper

Investigator: Stanley Culpepper

Reps: 4

Plots: 12 by 25 feet

Spray vol: 14.8 gal/ac

Mix size: 2 liters (min 1.5434)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Growth Unit	Appl Stage	Amt Product to Measure	Plot No. By Rep				
									1	2	3	4	
1	Wheat 4 WBP No herbicide								101	204	309	412	
2	Wheat 4 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA	3.8 2 4.5 3.2 4 6	L L L L L L		2.1 1 22 1.7 2 2	PT/A PT/A OZ/A OZ/A PT/A LB A/A	PRE PRE POST POST PD PD	A A B B C C	35.47 ml/mx 16.89 ml/mx 23.23 ml/mx 1.795 ml/mx 33.78 ml/mx 45.04 ml/mx	102	203	310	411
3	Wheat 2 WBP No herbicide								103	202	311	410	
4	Wheat 2 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA	3.8 2 4.5 3.2 4 6	L L L L L L		2.1 1 22 1.7 2 2	PT/A PT/A OZ/A OZ/A PT/A LB A/A	PRE PRE POST POST PD PD	A A B B C C	35.47 ml/mx 16.89 ml/mx 23.23 ml/mx 1.795 ml/mx 33.78 ml/mx 45.04 ml/mx	104	201	312	409
5	Rye 4 WBP No herbicide								105	208	307	405	
6	Rye 4 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA	3.8 2 4.5 3.2 4 6	L L L L L L		2.1 1 22 1.7 2 2	PT/A PT/A OZ/A OZ/A PT/A LB A/A	PRE PRE POST POST PD PD	A A B B C C	35.47 ml/mx 16.89 ml/mx 23.23 ml/mx 1.795 ml/mx 33.78 ml/mx 45.04 ml/mx	106	207	306	408
7	Rye 2 WBP No herbicide								107	206	305	407	
8	Rye 2 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA	3.8 2 4.5 3.2 4 6	L L L L L L		2.1 1 22 1.7 2 2	PT/A PT/A OZ/A OZ/A PT/A LB A/A	PRE PRE POST POST PD PD	A A B B C C	35.47 ml/mx 16.89 ml/mx 23.23 ml/mx 1.795 ml/mx 33.78 ml/mx 45.04 ml/mx	108	205	308	406
9	No cover 4 WBP No herbicide								109	212	303	404	

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Reps: 4 Plots: 12 by 25 feet
 Spray vol: 14.8 gal/ac Mix size: 2 liters (min 1.5434)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Growth Unit	Appl Code	Amt Product to Measure	Plot No. By Rep			
									1	2	3	4
10	No cover 4 WBP								110	211	301	403
	Prowl H20	3.8	L		2.1 PT/A	PRE	A	35.47 ml/mx				
	Reflex	2	L		1 PT/A	PRE	A	16.89 ml/mx				
	Roudup WeatherMax	4.5	L		22 OZ/A	POST	B	23.23 ml/mx				
	Staple	3.2	L		1.7 OZ/A	POST	B	1.795 ml/mx				
	Direx	4	L		2 PT/A	PD	C	33.78 ml/mx				
	MSMA	6	L		2 LB A/A	PD	C	45.04 ml/mx				
11	No cover 2 WBP No herbicide								111	210	302	401
12	No cover 2 WBP								112	209	304	402
	Prowl H20	3.8	L		2.1 PT/A	PRE	A	35.47 ml/mx				
	Reflex	2	L		1 PT/A	PRE	A	16.89 ml/mx				
	Roudup WeatherMax	4.5	L		22 OZ/A	POST	B	23.23 ml/mx				
	Staple	3.2	L		1.7 OZ/A	POST	B	1.795 ml/mx				
	Direx	4	L		2 PT/A	PD	C	33.78 ml/mx				
	MSMA	6	L		2 LB A/A	PD	C	45.04 ml/mx				

Sort Order: Treatment

Product quantities required for listed treatments and applications in one trial:

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
266.019	ml	Prowl H20	3.8	L	
126.676	ml	Reflex	2	L	
174.198	ml	Roudup WeatherMax	4.5	L	
13.461	ml	Staple	3.2	L	
253.352	ml	Direx	4	L	
337.802	ml	MSMA	6	L	

* 'Per area' calculations based on spray volume= 14.8 gal/ac, mix size= 2 liters (mix size basis).

* Product amount calculations increased 25 % for overage adjustment.

Trial Comments

OBJECTIVE: Determine the impact of cover crop residue on the ability to manage glyphosate-resistant Palmer amaranth.

NOTE: No rainfall occurred within 17 d of planting; thus, herbicides were not activated until that time.

VISUAL PALMER CONTROL:

1. At 27 d after planting, cover crops alone provided 70 to 78% control compared to the tilled plots.
2. At 42 d after planting, cover crops were still providing 62 to 69% control compared to the tilled plots.
3. Little visual control was noted from cover crops by 52 DAT when no herbicides were used.
4. Herbicides on conventionally tilled land had the greatest level of control during mid-season with 81-85% control but control was only 69-71% after layby and only 59-60% late in the season. At harvest, control was greater when using herbicides in rye with both kill dates and with wheat when controlling the cover crop 2 wks of planting (ie more residue than killing it 4 wks ahead of planting).

PALMER EMERGENCE COUNTS:

1. At 27, 42, and 120 days after planting, Palmer plant stands were measured.
2. Killing the wheat 4 WBP led to 2063lb/A of dry matter in early May. This residue reduced emergence 52, 38, and 38% at 27, 42, and 120 d after planting.

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3. Killing the wheat 2 WBP led to 4202 lb/A of dry matter in early May. This residue reduced emergence 65, 50, and 38% at 27, 42, and 120 d after planting.
4. Killing the rye 4 WBP led to 4585 lb/A of liter during July. This residue reduced emergence 65, 50, and 53% at 27, 42, and 120 d after planting.
5. Killing the rye 2 WBP led to 4878 lb/A of liter during July. This residue reduced emergence 68, 60, and 53% at 27, 42, and 120 d after planting.

SEED COTTON YIELD:

1. Yield from the conventional system ranged from 424 to 546 lbs of seed cotton per acre.
2. With cover crops, yields were increased at least 29% when having wheat and killing it 4 WBP.
3. With cover crops, yields were increased at least 52% when having wheat and killing it 2 WBP.
4. With cover crops, yields were increased at least 43% when having wheat and killing it 4 WBP.
5. With cover crops, yields were increased at least 49% when having wheat and killing it 2 WBP.

CONCLUSIONS:

1. When soil applied herbicides are not activated by rainfall or irrigation, cover crops can be used to reduce Palmer emergence.
2. Greater residues tended to reduce pigweed emergence.
3. Greater residues also caused erratic and less than an ideal cotton stand.
4. It is likely that cover crops will be a detriment when herbicides are activated but a bonus when residual herbicides are not activated.

5/15/07

Cover Crop-AMAPA 1-4"; Conventional 1-8"

Late Wheat 4630.97 lb.	Early Wheat 1372.14 lb.	Late Wheat 6774.94 lb.	Early Wheat 1886.69 lb.
Late Rye 8363.52 lb.	Early Rye 5764.89 lb.	Rye Late 5227.2 lb.	Early Rye 4192.65 lb.
Early Wheat 1470.15 lb.	Late Wheat 4802.49 lb.	Early Wheat 5586.57 lb.	Late Wheat 4802.49 lb.
Early Rye 2410.77 lb.	Late Rye 4878.72 lb.	Early Rye 5974.52 lb.	Late Rye 5924.16 lb.

Average Late Wheat -- 4202.17 lb.

Average Early Wheat -- 2063.11 lb.

Average Late Rye -- 4878.72 lb.

Average Early Rye -- 4585.71 lb.

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Trial ID: C3-07

Protocol ID:

Location: Macon County

Study Director: Stanley Culpepper

Investigator: Stanley Culpepper

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA
Crop Code							
BBCH Scale							
Rating Date	May-15-07	May-30-07	Jun-09-07	Jul-10-07	Aug-31-07	May-15-07	May-30-07
Rating Data Type	%	%	%	%	%	#	#
Rating Unit	control	control	control	control	control	60 sqft	45 sqft
Days After First/Last Applic.	0	15	0	31	83	0	15
Trt-Eval Interval	27 DA-A	42 DA-A	52 DA-A			27 DA-A	42 DA-A
ARM Action Codes							
Number of Decimals							
Trt No.	Treatment Name	Rate	Rate	Rate	Rate	Rate	Rate
		Unit					
1	Wheat 4 WBP No herbicide						
		74 ab	66 cd	24 b	0 e	0 d	21 b
2	Wheat 4 WBP Prowl H20 2.1 PT/A Reflex 1 PT/A Roudup WeatherMax 22 OZ/A Staple 1.7 OZ/A Direx 2 PT/A MSMA 2 LB A/A						
		81 ab	91 a	68 a	78 c	68 bc	8 b
3	Wheat 2 WBP No herbicide						
		78 ab	69 bcd	21 b	0 e	0 d	14 b
4	Wheat 2 WBP Prowl H20 2.1 PT/A Reflex 1 PT/A Roudup WeatherMax 22 OZ/A Staple 1.7 OZ/A Direx 2 PT/A MSMA 2 LB A/A						
		87 ab	81 abc	83 a	88 b	81 a	10 b
5	Rye 4 WBP No herbicide						
		70 b	58 d	18 b	0 e	0 d	16 b
6	Rye 4 WBP Prowl H20 2.1 PT/A Reflex 1 PT/A Roudup WeatherMax 22 OZ/A Staple 1.7 OZ/A Direx 2 PT/A MSMA 2 LB A/A						
		85 ab	85 ab	78 a	86 b	79 ab	10 b
7	Rye 2 WBP No herbicide						
		75 ab	62 d	25 b	0 e	0 d	13 b

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	
Pest Code	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	
Crop Code								
BBCH Scale								
Rating Date	May-15-07	May-30-07	Jun-09-07	Jul-10-07	Aug-31-07	May-15-07	May-30-07	
Rating Data Type	%	%	%	%	%	#	#	
Rating Unit	control	control	control	control	control	60 sqft	45 sqft	
Days After First/Last Applic.	0	15	0	31	83	0	15	
Trt-Eval Interval	27 DA-A	42 DA-A	52 DA-A			27 DA-A	42 DA-A	
ARM Action Codes								
Number of Decimals								
Trt Treatment	Rate	Rate	Rate	Rate	Rate	Rate	Rate	
No. Name	Rate Unit	1	2	3	4	5	6	7
8 Rye		88 a	89 a	79 a	94 a	87 a	7 b	5 e
2 WBP								
Prowl H20	2.1 PT/A							
Reflex	1 PT/A							
Roudup WeatherMax	22 OZ/A							
Staple	1.7 OZ/A							
Direx	2 PT/A							
MSMA	2 LB A/A							
9 No cover		0 d	0 e	0 c	0 e	0 d	43 a	45 a
4 WBP								
No herbicide								
10 No cover		24 c	85 ab	68 a	69 d	59 c	19 b	12 de
4 WBP								
Prowl H20	2.1 PT/A							
Reflex	1 PT/A							
Roudup WeatherMax	22 OZ/A							
Staple	1.7 OZ/A							
Direx	2 PT/A							
MSMA	2 LB A/A							
11 No cover		0 d	0 e	0 c	0 e	0 d	37 a	40 a
2 WBP								
No herbicide								
12 No cover		31 c	81 abc	66 a	71 d	60 c	15 b	9 e
2 WBP								
Prowl H20	2.1 PT/A							
Reflex	1 PT/A							
Roudup WeatherMax	22 OZ/A							
Staple	1.7 OZ/A							
Direx	2 PT/A							
MSMA	2 LB A/A							
LSD (P=.05)		15.2	15.0	14.7	4.4	11.8	15.0	5.7
Standard Deviation		10.6	10.4	10.2	3.0	8.2	10.4	4.0
CV		18.3	16.33	23.14	7.48	22.67	58.95	21.8
Bartlett's X2		8.28	14.106	8.43	6.904	17.518	22.128	12.297
P(Bartlett's X2)		0.506	0.119	0.491	0.228	0.004*	0.023*	0.342

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

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Pest Type	W Weed	Cover	Cover	Cover	Cover	Cover	Dry Matt	SEED	
Pest Code	AMAPA							GOSHI	
Crop Code								BCOT	
BBCH Scale									
Rating Date	Sep-15-07	Jul-14-07	Jul-14-07	Jul-14-07	Jul-14-07	Jul-14-07	Jul-14-07	Nov-02-07	
Rating Data Type	#	oz	%	dry	LB total	Lb moistur	LB dry matt	lb	
Rating Unit	45 sqft	plot	moisture	matter	ACRE	ACRE	ACRE	plot	
Days After First/Last Applic.	98	35	35	35	35	35	35	146	
Trt-Eval Interval									
ARM Action Codes									
Number of Decimals									
Trt Treatment	Rate								
No. Name	Rate Unit	8	9	10	11	12	13	14	
10 No cover		13 e							
4 WBP								1 b	
Prowl H20	2.1 PT/A								
Reflex	1 PT/A								
Roudup WeatherMax	22 OZ/A								
Staple	1.7 OZ/A								
Direx	2 PT/A								
MSMA	2 LB A/A								
11 No cover		54 a							
2 WBP								0 c	
No herbicide									
12 No cover		10 ef							
2 WBP								1 b	
Prowl H20	2.1 PT/A								
Reflex	1 PT/A								
Roudup WeatherMax	22 OZ/A								
Staple	1.7 OZ/A								
Direx	2 PT/A								
MSMA	2 LB A/A								
LSD (P=.05)		6.9	1.5	0.0	0.3	64570.5	4035.7	3753.2	0.2
Standard Deviation		4.8	0.9	0.0	0.2	40369.8	2523.1	2346.5	0.1
CV		20.72	55.33	0.0	23.84	55.33	55.33	55.33	25.16
Bartlett's X2		22.067	1.253	0.0	0.0	1.253	1.253	1.253	2.979
P(Bartlett's X2)		0.024*	0.74	.	.	0.74	0.74	0.74	0.703

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

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Pest Type				SEED
Pest Code				GOSHI
Crop Code				BCOT
BBCH Scale				Nov-02-07
Rating Date				LB
Rating Data Type				ACRE
Rating Unit				146
Days After First/Last Applic.				
Trt-Eval Interval				TY1
ARM Action Codes				1
Number of Decimals				
Trt No.	Treatment Name	Rate	Unit	
				16
1	Wheat 4 WBP No herbicide			0.0 c
2	Wheat 4 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA	2.1 1 22 1.7 2 2	PT/A PT/A OZ/A OZ/A PT/A LB A/A	701.3 a
3	Wheat 2 WBP No herbicide			0.0 c
4	Wheat 2 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA	2.1 1 22 1.7 2 2	PT/A PT/A OZ/A OZ/A PT/A LB A/A	833.4 a
5	Rye 4 WBP No herbicide			0.0 c
6	Rye 4 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA	2.1 1 22 1.7 2 2	PT/A PT/A OZ/A OZ/A PT/A LB A/A	781.2 a
7	Rye 2 WBP No herbicide			0.0 c
8	Rye 2 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA	2.1 1 22 1.7 2 2	PT/A PT/A OZ/A OZ/A PT/A LB A/A	818.9 a
9	No cover 4 WBP No herbicide			0.0 c

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Pest Type				SEED
Pest Code				GOSHI
Crop Code				BCOT
BBCH Scale				Nov-02-07
Rating Date				LB
Rating Data Type				ACRE
Rating Unit				146
Days After First/Last Applic.				
Trt-Eval Interval				TY1
ARM Action Codes				1
Number of Decimals				
Trt No.	Treatment Name	Rate	Unit	
				16
10	No cover 4 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA			424.0 b
		2.1	PT/A	
		1	PT/A	
		22	OZ/A	
		1.7	OZ/A	
		2	PT/A	
		2	LB A/A	
11	No cover 2 WBP No herbicide			0.0 c
12	No cover 2 WBP Prowl H20 Reflex Roudup WeatherMax Staple Direx MSMA			546.0 b
		2.1	PT/A	
		1	PT/A	
		22	OZ/A	
		1.7	OZ/A	
		2	PT/A	
		2	LB A/A	
LSD (P=.05)				124.26
Standard Deviation				86.06
CV				25.16
Bartlett's X2				2.979
P(Bartlett's X2)				0.703

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

Column 16: TY1 = 580.8*[15]

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Trial ID: C3-07

Protocol ID:

Location: Macon County

Study Director: Stanley Culpepper

Investigator: Stanley Culpepper

General Trial Information

Study Director: Stanley Culpepper

Title: Ext. Weed Science

Affiliation: Univ. of Georgia

Postal Code: 31794

E-mail: _____

Investigator: Stanley Culpepper

Title: Ext. Weed Science

Affiliation: Univ. of Georgia

Postal Code: 31794

E-mail: _____

Keywords:

Trial Location

City: Macon County

Trial Status: completed

State/Prov.: Georgia

Trial Reliability: good

Postal Code: _____

Initiation Date: Apr-18-07

Country: USA

Planned Completion Date: _____

-Latitude of LL Corner °: _____

-Longitude of LL Corner °: _____

Altitude of LL Corner: _____ Unit: _____ Angle y-axis to North °: _____

Map Reference: _____

Directions:

Conducted Under GLP: _

Official Trial Code: _____

Conducted Under GEP: _

Other Trial Code: _____

Guideline	Description
1.	

Objectives:

Conclusions:

Cooperator/Landowner

Cooperator: _____ Country: _____

Organization: _____ Phone No: _____

Address 1: _____ Fax No: _____

Address 2: _____

City: _____

State/Prov: _____

Postal Code: _____ E-mail: _____

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Crop Description	
Crop 1: GOSHI <i>Gossypium hirsutum</i>	Cotton, American upland
Variety: DP 555 BRR	Description: _____
BBCH Scale: BCOT	Planting Date: Apr-18-07
Planting Method: hill drop	Rate, Unit: 3 ft
Depth, Unit: 0.75 in	Perennial Age, Unit: _____
Row Spacing, Unit: 36 in	Spacing Within Row, Unit: _____
Seed Bed: bedded	Soil Temperature, Unit: 65 F
Soil Moisture: moist	Emergence Date: Apr-23-07
Harvest Date: _____	Harvest Equipment: _____
Harvested Width, Unit: _____	Harvested Length, Unit: _____
% Standard Moisture: _____	Moisture Meter: _____
Weighing Equipment: _____	

Pest Description	
Pest 1 Type: W Code: AMAPA <i>Amaranth, Palmer</i>	
Common Name: <i>Amaranthus palmeri</i>	
Description: _____	

Site and Design			
Plot Width, Unit: 12	FT	Site Type: on farm	
Plot Length, Unit: 25	FT	Tillage Type: conv/strip-till	
Replications: 4		Study Design: Factorial	
% Slope: _____		Soil Drainage: _	

Trial Initiation Comments:

	Previous Crops	Previous Pesticides	Year
1.			

Maintenance								
No.	Date	Maintenance Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Tank Mix
1.								

Comment:

Field Prep./Maintenance:

Soil Description			
Description Name: _____			
% Sand: 82	% OM: 2.0	Texture: loamy sand	
% Silt: 14	pH: 6.3	Soil Name: _____	
% Clay: 4	CEC: _____	Fert. Level: _____	
Analyzed By: _____			

Additional Measured Elements		
Element	Quantity	Unit

Moisture Conditions		
Overall Moisture Conditions: dry		
Closest Weather Station: _____	Distance: _____	Unit: _____

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	Date	Time	Amount	Unit	Type	Interval	Unit
1.							

Application Description

	A	B	C
Application Date:	Apr-18-07	May-15-07	Jun-09-07
Time of Day:	7:00 pm	6:00 pm	1:00 pm
Application Method:	broadcast	broadcast	broadcast
Application Timing:	PRE	POST	PD
Application Placement:	on soil	overtop	directed
Applied By:	Culpepper	Culpepper	Culpepper
Air Temperature, Unit:	75 F	85 F	94 F
% Relative Humidity:	52	39	41
Wind Velocity, Unit:	2 mph	3 mph	6 mph
Wind Direction:			
Dew Presence (Y/N):	N	N	N
Water Hardness:			
Soil Temperature, Unit:	70 F	88 F	96 F
Soil Moisture:	moist	fair	fair
% Cloud Cover:	0	40	0
Next Rain Occurred On:			

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale:	GOSHI BCOT	GOSHI BCOT	GOSHI BCOT
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	00 100	1 leaf 100	10 leaf 100
Stage Minimum, Percent:	.	1 leaf 100	10 leaf 100
Stage Maximum, Percent:		1 leaf 100	10 leaf 100
Diameter, Unit:			
Height, Unit:	0 in	3 in	10 in
Height Minimum, Maximum:	0 0	2 4	10 10

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Disc., Scale:	AMAPA W PRE	AMAPA W POST	AMAPA W Layb
Stage Majority, Percent:	0 100	.	.
Stage Minimum, Percent:	0 100		
Stage Maximum, Percent:	0 100		
Diameter, Unit:			
Height, Unit:	0 in	4 in	7 in
Height Minimum, Maximum:	0 0	1 8	4 10
Density, Unit:	0. .	0. .	0. .
Coverage, Unit:			

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Application Equipment

	A	B	C
Appl. Equipment:	Backpack	Backpack	Backpack
Operating Pressure, Unit:	24 psi	24 psi	26 psi
Nozzle Type:	flat fan	flat fan	floodjet
Nozzle Size:	11002	11002	TK2
Nozzle Spacing, Unit:	18 in	18 in	36 in
Nozzles/Row:	2	2	1
Nozzle Calibration, Unit:			
Band Width, Unit:			
Boom ID:			
Boom Length, Unit:	4.5 ft	4.5 ft	
Boom Height, Unit:	15 in	15 in	12 in
Ground Speed, Unit:	3 mph	3 mph	3 mph
Incorporation Equip.:			
Hours to Incorp.:			
Incorp. Depth, Unit:			
Carrier:	water	water	water
Spray Volume, Unit:	15 GAL/AC	15 GAL/AC	15 GAL/AC
Mix Size, Unit:			
Spray pH:			
Propellant:	CO2	CO2	CO2
Tank Mix (Y/N):			

Equipment Comment:

Trt No Treatment Application Comment

Date By Notes

Date By Deviations

Reasons: