

GLC Consulting

BIO MAS F - OWEN TOWNE - COTTON - 2016

Trial ID:	OWEN TOWNE-COTTON-2 016	Location:	QUITMAN,GA	Trial Year:
Protocol ID:		Investigator:	Gary Cloud	
Project ID:		Study Director:		
	Bio I.V. is the Retail product name for Bio-Más	Sponsor Contact:		

Reps: 4

Plots: 6 by 30 feet

Spray vol: 20 GAL/AC

Mix Size: 1.26 liters (calculated mix size 1.2514)

Trt	Treatm ent	Form		Rate	Appl	Amt Product to Measur e	Rep			
No.	Name	Type	Rate	Unit	Code		1	2	3	4
1	UNTRE ATED						101	203	301	403
2	BIO-MA S F	AP	12	oz/a	ABCDE	1.406 g/1 pl	102	201	302	401
3	BIO-MA S F	AP	18	oz/a	ABCDE	2.109 g/1 pl	103	202	303	402

Sort Order: Treatment

Product quantities required for listed treatments and applications of trials included in this table:

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
87.860	g	BIO-MAS F		AP	

* 'Per area' calculations based on 4 replicates of 6 by 30 feet 'Plot' experimental units (area of one treatment).

* 'Per area' calculations based on spray volume= 20 GAL/AC, mix size= 1.26 liters (mix size basis).

* Product amount calculations increased 25 % for overage adjustment.

* Adjusted for multiple applications in treatment list.

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Trial ID:		OWEN TOWNE-COTTON-2016				Location:	QUITMAN,GA	Trial Year:
Protocol ID:						Investigator:	Gary Cloud	
Project ID:						Study Director:		
						Sponsor Contact:		
Crop Code	GO SHI	GO SHI	GO SHI	GO SHI	GO SHI	GOSHI		
BBC H Scale	BC OT	BC OT	BC OT	BC OT	BC OT	BCOT		
Crop Scientific Name	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>		
Crop Name	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>		
Crop Variety	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499		
Description					1=Y ES			
Part Rated	PLANT C	PLANT C	PLANT C	PLANT C	FLOWER C	PLANT C		
Rating Date	Jun-29-2016	Jun-29-2016	Jun-29-2016	Jun-29-2016	Jun-29-2016	Jul-15-2016		
Rating Type	VIGOR	DIA	HEIGHT	GREEN	COUNT	VIGOR		
Rating Unit	1-5	1-5	IN	1-5		1-5		
Sample Size, Unit								
Number of Subsamples	1	1	1	1	1	1		
Days After First/ Last Application	291	291	291	291	291	45 17		
Trt-Eval Interval	29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A		
Plant-Eval Interval	43 DP-1	43 DP-1	43 DP-1	43 DP-1	43 DP-1	59 DP-1		

ARM Actio n Code s																
Num ber of Deci mals																
Trt	Tre atm ent		Rat e	App l												
No.	Na me	Rat e	Unit	Co de	1	2	3	4	5	6						
1	UN TR EA TE D				3.5	a	3.5	a	15. 3	a	3.0	a	0.5	a	3.7 5	a
2	BIO -M AS F	12	oz/ a	AB CD E	3.8	a	3.8	a	16. 0	a	3.5	a	1.0	a	4.0 0	a
3	BIO -M AS F	18	oz/ a	AB CD E	4.0	a	3.8	a	16. 3	a	3.5	a	0.8	a	4.6 3	a
LSD P=.1 0	0.9 4	0.8 9	1.7 6	0.4 6	0.5 1	0.733										
Stan dard Devi ation	0.6 9	0.6 5	1.2 8	0.3 3	0.3 7	0.534										
CV	18. 32	17. 6	8.0 9	10. 0	49. 69	12.94										
Bartl ett's X2	0.7 21	1.3 45	2.2 08	0.0	0.0 59	0.12										
P(Ba rtlett' s X2)	0.6 97	0.5 11	0.3 32	.	0.8 09	0.942										
Skew ness	0.1 703	0.4 387	0.1 811	0.8 124	-1.3 267 *	-0.1387										
Kurto sis	-0.0 913	-0.3 367	-0.4 283	-1.6 5	-0.3 259	0.4252										
Repli cate F	0.6 47	1.6 00	4.4 07	4.0 00	2.2 00	0.268										
Repli cate Prob(F)	0.6 128	0.2 853	0.0 582	0.0 701	0.1 889	0.8462										
Treat ment F	0.5 29	0.2 00	0.6 61	3.0 00	1.8 00	2.854										
Treat ment Prob(F)	0.6 141	0.8 240	0.5 502	0.1 250	0.2 441	0.1346										

Means followed by same letter do not significantly differ (P=.10, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Trial ID:			OWEN TOWNE-COTTON-2016			Location:		QUITMAN,GA		Trial Year:	
Protocol ID:						Investigator:		Gary Cloud			
Project ID:						Study Director:					
						Sponsor Contact:					
Crop Code	GO SHI	GO SHI	GO SHI	GO SHI	GO SHI	GOSHI					
BBC H Scale	BC OT	BC OT	BC OT	BC OT	BC OT	BCOT					
Crop Scientific Name	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>					
Crop Name	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>					
Crop Variety	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499					
Description				1=yes							
Part Rated	PLANT C	PLANT C	PLANT C	FLOWER C	PLANT C	PLANT C					
Rating Date	Jul-15-2016	Jul-15-2016	Jul-15-2016	Jul-15-2016	Aug-18-2016	Aug-18-2016					
Rating Type	DIA	HEIGHT	GREEN	COUNT	VIGOR	GREEN					
Rating Unit	1-5	IN	1-5		1-5	1-5					
Sample Size, Unit											
Number of Subsamples	1	1	1	1	1	1					
Days After First/ Last Application.	45 17	45 17	45 17	45 17	79 23	79 23					
Trt-Eval Interval	29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A					
Plant-Eval Interval	59 DP-1	59 DP-1	59 DP-1	59 DP-1	93 DP-1	93 DP-1					

ARM Action Codes																
Number of Decimals																
Trt	Treatment		Rate	App'l												
No.	Name	Rate	Unit	Code	7	8	9	10	11	12						
1	UNTR EATED				3.63	a	20.0	a	3.75	b	1.0	a	3.63	b	4.25	c
2	BIO-MASF	12	oz/a	ABCDE	4.00	a	22.0	a	4.13	ab	1.0	a	4.38	a	4.63	b
3	BIO-MASF	18	oz/a	ABCDE	4.75	a	22.3	a	4.88	a	1.0	a	4.88	a	5.00	a
LSD P=.10	0.951	2.62	0.801	0.00	0.687	0.343										
Standard Deviation	0.692	1.91	0.583	0.00	0.500	0.250										
CV	16.78	8.91	13.73	0.0	11.65	5.41										
Bartlett's X2	1.077	3.042	2.062	0.0	2.874	0.698										
P(Bartlett's X2)	0.584	0.218	0.357	.	0.238	0.403										
Skewness	-0.2986	0.7367	-0.2883	.	-0.4167	-0.5669										
Kurtosis	-0.8566	-0.4245	-0.6135	.	-1.2152	-1.4465										
Replicate F	0.043	1.183	0.082	0.000	1.417	3.000										
Replicate Prob(F)	0.9868	0.3921	0.9676	1.0000	0.3270	0.1170										
Treatment F	2.739	1.672	3.857	0.000	6.333	9.000										
Treatment Prob(F)	0.1428	0.2648	0.0837	1.0000	0.0332	0.0156										

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Protocol ID:		Investigator:	Gary Cloud		
Project ID:		Study Director:			
		Sponsor Contact:			
Crop Code	GOSHI			GOSHI	
BBCH Scale	BCOT			BCOT	
Crop Scientific Name	Gossypium hirs>			Gossypium hirs>	
Crop Name	American uplan>			American uplan>	
Crop Variety	PHY 499			PHY 499	
Description					
Part Rated	SEECOT C			SEECOT C	
Rating Date	Oct-12-2016			Oct-12-2016	
Rating Type	YIELD			YIELD	
Rating Unit	LB			LB	
Sample Size, Unit	1 PLOT			1 PLOT	
Number of Subsamples	1			1	
Days After First/Last Applic.	134 78			134 78	
Trt-Eval Interval					
Plant-Eval Interval	148 DP-1			148 DP-1	
ARM Action Codes				TY1	
Number of Decimals				1	
Trt	Treatment	Rate	Unit	Appl	
No.	Name	Rate	Unit	Code	13 14
1	UNTREATED				13.400 a 3242.8 a
2	BIO-MAS F	12	oz/a	ABCDE	15.938 a 3856.9 a
3	BIO-MAS F	18	oz/a	ABCDE	16.013 a 3875.0 a
LSD P=.10	2.1673				524.49
Standard Deviation	1.5775				381.75
CV	10.44				10.44
Bartlett's X2	3.946				3.946
P(Bartlett's X2)	0.139				0.139
Skewness	0.2684				0.2684
Kurtosis	-0.5813				-0.5813
Replicate F	1.448				1.448
Replicate Prob(F)	0.3194				0.3194
Treatment F	3.555				3.555
Treatment Prob(F)	0.0959				0.0959

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Protocol ID:		Investigator:	Gary Cloud	
Project ID:		Study Director:		
		Sponsor Contact:		

Crop Code

GOSHI, BCOT, Gossypium hirsutum, = US

Part Rated

PLANT = plant

FLOWER = flower

SEECOT = seed cotton

C = Crop is Part Rated

Rating Type

VIGOR = vigor

HEIGHT = height

GREEN = green

COUNT = count

YIELD = yield

Rating Unit

1-5 = 1-5 index/scale

IN = inch

LB = pound

PLOT = total plot

Plant-Eval Interval

43 DP-1 = 1 GOSHI May-17-2016

59 DP-1 = 1 GOSHI May-17-2016

93 DP-1 = 1 GOSHI May-17-2016

148 DP-1 = 1 GOSHI May-17-2016

ARM Action Codes

TY1 = 242.0*[C13]

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Protocol ID:		Investigator:	Gary Cloud	
Project ID:		Study Director:		
		Sponsor Contact:		

Investigator: Gary Cloud

Discipline:	P/H	Plant health			
Trial Status:	E	established	Trial Reliability:	HIGH	

City: QUITMAN, GA

Conducted Under GLP:	No
Conducted Under GEP:	No

Investigator: Gary Cloud

Crop 1:	GOSH I	Gossypium hirsutum	American upland cotton								
Variety:	PHY499		BBCH Scale:	BCOT							
									Planting Date:	May-17-2016	
Planting Rate, Unit:	3	S/FT		Planting Method:	PLAN TD	planted					
Depth, Unit:	0.75	IN			Planting Equipment:	PP	Plot Planter				
Row Spacing, Unit:	36	IN									
Spacing Within Row, Unit:	4	IN									
								Harvested Width, Unit:	6	FT	
								Harvested Length, Unit:	30	FT	
Soil Moisture:	GOOD	good									

Site and Design

Treated Plot Width:	6	FT				Site Type:	FIELD	field		
Treated Plot Length:	30	FT				Experimental Unit:	1	PLOT	plot	
Treated Plot Area:	180	FT2	Treatments:	3		Tillage Type:	CONTI L	conventional-till		
Replications:	4					Study Design :	RACOB L	Randomized Complete Block (RCB)		

Soil Description

% Sand:	88	% OM:	0.8	Texture:	FSL	fine sandy loam				
% Silt:	10	pH:	7							
% Clay:	2	CEC:	3.81	Fert. Level:	E	excellent				
				Soil Drainage:	E	excellent				

Application Description

	A	B	C	D	E
Application Date:	May-31-2016	Jun-28-2016	Jul-26-2016		
Appl. Start Time:	9:00 AM	10:00 am	9:30 AM		
Appl. Stop Time:	9:15 AM	10:15 AM	9:45 AM		
Application Method:	SPRAY	SPRAY	SPRAY		
Application Timing:	ATGRST	FIINSP	FIINSP		
Application Placement:	BROFOL	BROFOL	BROFOL		
Applied By:	K. BECK	G. CLOUD	K. BECK		
Air Temperature, Unit:	74 F	79 F	82 F		
% Relative Humidity:	55	50	60		
Wind Velocity, Unit:	0.9 MPH	1.2 MPH	1.6 MPH		
Wind Direction:	S	SW	S		
Dew Presence (Y/N):	N no	N no	N no		
Soil Moisture:	GOOD	GOOD	GOOD		
% Cloud Cover:	15	0	0		

Crop Stage At Each Application

	A	B	C	D	E
Crop 1 Code, BBCH Scale:	GOSHI BCOT	GOSHI BCOT	GOSHI BCOT	GOSHI BCOT	GOSHI BCOT

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Protocol ID:		Investigator:	Gary Cloud	
Project ID:		Study Director:		
		Sponsor Contact:		

Application Equipment

	A	B	C	D	E
Equipment Type:	BACCAI	BACCAI	BACCAI		
Operation Pressure, Unit:	42 PSI	42 PSI	42 PSI		
Nozzle Type:	FLAT FAN	FLAT FAN	FLAT FAN		
Nozzle Size:	XR8002	XR8002	XR8002		
Nozzle Spacing, Unit:	18 IN	18 IN	18 IN		
Nozzles/Row:	2	2	2		
% Coverage:	100	100	100		
Boom Length, Unit:	6 FT	6 FT	6 FT		
Boom Height, Unit:	36 IN	36 IN	36 IN		
Ground Speed, Unit:	3 MPH	3 MPH	3 MPH		
Carrier:	WATER	WATER	WATER		
Spray Volume, Unit:	20 GAL/AC	20 GAL/AC	20 GAL/AC		
Mix Size, Unit:	1262 mL	1262 mL	1262 mL		
Spray pH:	7	7	7		
Propellant:	CO2	CO2	CO2		

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Protocol ID:					Investigator:		Gary Cloud				
Project ID:					Study Director:						
					Sponsor Contact:						
Crop Code	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI						
BBCH Scale	BCOT	BCOT	BCOT	BCOT	BCOT						
Crop Scientific Name	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>						
Crop Name	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>						
Crop Variety	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499						
Description					1=YES						
Part Rated	PLANT C	PLANT C	PLANT C	PLANT C	FLOWER C						
Rating Date	Jun-29-2016	Jun-29-2016	Jun-29-2016	Jun-29-2016	Jun-29-2016						
Rating Type	VIGOR	DIA	HEIGHT	GREEN	COUNT						
Rating Unit	1-5	1-5	IN	1-5							
Sample Size, Unit											
Number of Subsamples	1	1	1	1	1						
Days After First/Last Applic.	29 1	29 1	29 1	29 1	29 1						
Trt-Eval Interval	29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A						
Plant-Eval Interval	43 DP-1	43 DP-1	43 DP-1	43 DP-1	43 DP-1						
ARM Action Codes											
Number of Decimals											
Trt	Treatment		Rate	Appl							
No.	Name	Rate	Unit	Code	Plot	1	2	3	4	5	
1	UNTREATED				101	4.0	4.0	15.0	3.0	0.0	
					203	3.0	3.0	14.0	3.0	0.0	
					301	4.0	4.0	16.0	3.0	1.0	
					403	3.0	3.0	16.0	3.0	1.0	
Mean =	3.5	3.5	15.3	3.0	0.5						
2	BIO-MASS F	12	oz/a	ABCDE	102	4.0	4.0	15.0	3.0	1.0	
					201	3.0	3.0	14.0	3.0	1.0	
					302	4.0	4.0	18.0	4.0	1.0	
					401	4.0	4.0	17.0	4.0	1.0	
Mean =	3.8	3.8	16.0	3.5	1.0						
3	BIO-MASS F	18	oz/a	ABCDE	103	3.0	3.0	13.0	3.0	0.0	

					202	4.0	3.0	16.0	3.0	1.0
					303	4.0	4.0	17.0	4.0	1.0
					402	5.0	5.0	19.0	4.0	1.0
Mean =	4.0	3.8	16.3	3.5	0.8					

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Protocol ID:					Investigator:		Gary Cloud			
Project ID:					Study Director:					
					Sponsor Contact:					
Crop Code	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI					
BBCH Scale	BCOT	BCOT	BCOT	BCOT	BCOT					
Crop Scientific Name	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>					
Crop Name	American uplan>	American uplan>	American uplan>	American uplan>	American uplan>					
Crop Variety	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499	PHYTO 499					
Description					1=yes					
Part Rated	PLANT C	PLANT C	PLANT C	PLANT C	FLOWER C					
Rating Date	Jul-15-2016	Jul-15-2016	Jul-15-2016	Jul-15-2016	Jul-15-2016					
Rating Type	VIGOR	DIA	HEIGHT	GREEN	COUNT					
Rating Unit	1-5	1-5	IN	1-5						
Sample Size, Unit										
Number of Subsamples	1	1	1	1	1					
Days After First/Last Applic.	45 17	45 17	45 17	45 17	45 17					
Trt-Eval Interval	29 DA-A	29 DA-A	29 DA-A	29 DA-A	29 DA-A					
Plant-Eval Interval	59 DP-1	59 DP-1	59 DP-1	59 DP-1	59 DP-1					
ARM Action Codes										
Number of Decimals										
Trt	Treatment		Rate	Appl						
No.	Name	Rate	Unit	Code	Plot	6	7	8	9	10
1	UNTREATED				101	4.00	4.00	20.0	4.00	1.0
					203	4.00	3.00	20.0	4.00	1.0
					301	4.00	4.50	21.0	4.00	1.0
					403	3.00	3.00	19.0	3.00	1.0
Mean =	3.75	3.63	20.0	3.75	1.0					
2	BIO-MASS F	12	oz/a	ABCDE	102	3.50	3.50	19.0	3.50	1.0
					201	4.00	4.00	23.0	4.00	1.0
					302	4.00	4.00	21.0	4.00	1.0
					401	4.50	4.50	25.0	5.00	1.0
Mean =	4.00	4.00	22.0	4.13	1.0					
3	BIO-MASS F	18	oz/a	ABCDE	103	4.50	5.00	22.0	5.00	1.0

					202	5.00	5.00	22.0	5.00	1.0
					303	4.00	4.00	20.0	4.50	1.0
					402	5.00	5.00	25.0	5.00	1.0
Mean =	4.63	4.75	22.3	4.88						1.0

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Protocol ID:				Investigator:		Gary Cloud			
Project ID:				Study Director:					
				Sponsor Contact:					
Crop Code	GOSHI	GOSHI	GOSHI	GOSHI					
BBCH Scale	BCOT	BCOT	BCOT	BCOT					
Crop Scientific Name	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>	Gossypium hirs>					
Crop Name	American uplan>	American uplan>	American uplan>	American uplan>					
Crop Variety	PHYTO 499	PHYTO 499	PHY 499	PHY 499					
Description									
Part Rated	PLANT C	PLANT C	SEECOT C	SEECOT C					
Rating Date	Aug-18-2016	Aug-18-2016	Oct-12-2016	Oct-12-2016					
Rating Type	VIGOR	GREEN	YIELD	YIELD					
Rating Unit	1-5	1-5	LB	LB					
Sample Size, Unit			1 PLOT	1	PLOT				
Number of Subsamples	1	1	1	1					
Days After First/Last Applic.	79 23	79 23	134 78	134 78					
Trt-Eval Interval	29 DA-A	29 DA-A							
Plant-Eval Interval	93 DP-1	93 DP-1	148 DP-1	148 DP-1					
ARM Action Codes				TY1					
Number of Decimals				1					
Trt	Treatment		Rate	Appl					
No.	Name	Rate	Unit	Code	Plot	11	12	13	14
1	UNTREATED				101	4.00	4.00	12.700	3073.4
					203	4.00	4.50	14.200	3436.4
					301	3.50	4.00	14.100	3412.2
					403	3.00	4.50	12.600	3049.2
Mean =	3.63	4.25	13.400	3242.8					
2	BIO-MAS F	12	oz/a	ABCDE	102	4.00	4.50	15.450	3738.9
					201	5.00	5.00	14.700	3557.4
					302	3.50	4.00	16.800	4065.6
					401	5.00	5.00	16.800	4065.6
Mean =	4.38	4.63	15.938	3856.9 18.94% increase					
3	BIO-MAS F	18	oz/a	ABCDE	103	5.00	5.00	12.600	3049.2
					202	5.00	5.00	16.500	3993.0
					303	4.50	5.00	16.050	3884.1
					402	5.00	5.00	18.900	4573.8

Mean =	4.88	5.00	16.013	3875.0 19.49% increase
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Protocol ID:		Investigator:	Gary Cloud	
Project ID:		Study Director:		
		Sponsor Contact:		

Crop Code

GOSHI, BCOT, Gossypium hirsutum, = US

Part Rated

PLANT = plant

FLOWER = flower

SEECOT = seed cotton

C = Crop is Part Rated

Rating Type

VIGOR = vigor

HEIGHT = height

GREEN = green

COUNT = count

YIELD = yield

Rating Unit

1-5 = 1-5 index/scale

IN = inch

LB = pound

PLOT = total plot

Plant-Eval Interval

43 DP-1 = 1 GOSHI May-17-2016

59 DP-1 = 1 GOSHI May-17-2016

93 DP-1 = 1 GOSHI May-17-2016

148 DP-1 = 1 GOSHI May-17-2016

ARM Action Codes

TY1 = 242.0*[C13]