

University of Georgia

INFLUENCE OF TRACTOR SPEED AND SPRAY BOOM HEIGHT ON
 SPRAY COVERAGE AND VMD
 Trial ID: NZ-01-15 Study Dir.: GLEN RAINS
 Location: PONDER FARM Investigator: Eric P. Prostko

Reps: 5 Plots: 10 by 40 feet
 Spray vol: 20 GAL/AC Mix Size: 3 liters (calculated mix size 3.476)

Trt No.	Treatment Name	Amt Product to Measure	Rep 1	2	3	4	5
1	L1 4.4 MPH 30' BOOM HEIGHT		101	217	318	402	501
2	L1 4.4 MPH 45" BOOM HEIGHT		102	211	309	407	502
3	L1 4.4 MPH 60" BOOM HEIGHT		103	204	313	416	503
4	L1 6.5 MPH 30' BOOM HEIGHT		104	212	305	404	504
5	L1 6.5 MPH 45" BOOM HEIGHT		105	214	312	413	505
6	L1 6.5 MPH 60" BOOM HEIGHT		106	205	303	415	506
7	L1 9.5 MPH 30' BOOM HEIGHT		107	218	302	405	507
8	L1 9.5 MPH 45" BOOM HEIGHT		108	210	311	418	508
9	L1 9.5 MPH 60" BOOM HEIGHT		109	203	317	410	509
10	L0 4.4 MPH 30' BOOM HEIGHT		110	206	314	417	510
11	L0 4.4 MPH 45" BOOM HEIGHT		111	213	315	411	511
12	L0 4.4 MPH 60" BOOM HEIGHT		112	207	308	406	512
13	L0 6.5 MPH 30' BOOM HEIGHT		113	209	310	414	513
14	L0 6.5 MPH 45" BOOM HEIGHT		114	215	316	403	514
15	L0 6.5 MPH 60" BOOM HEIGHT		115	208	304	401	515
16	L0 9.5 MPH 30' BOOM HEIGHT		116	201	306	408	516
17	L0 9.5 MPH 45" BOOM HEIGHT		117	202	307	412	517
18	L0 9.5 MPH 60" BOOM HEIGHT		118	216	301	409	518

Sort Order: Treatment

University of Georgia

INFLUENCE OF TRACTOR SPEED AND SPRAY BOOM HEIGHT ON

SPRAY COVERAGE AND VMD

Trial ID: NZ-01-15 Study Dir.: GLEN RAINS
 Location: PONDER FARM Investigator: Eric P. Prostko

Trial Comments

- July 24, 2015
- Melroe 3430 Spra-Coupe
- Tractor Speeds
 - *4.4, 6.5, and 9.5 MPH*
- Boom Heights
 - *30, 45, 60 in*
 - *Wind < 5 MPH*
- 15 GPA (water + dye)
- DG TeeJet Drift Guard Nozzle Tips (20" spacing)
 - *8002DG, 8003DG, 8004DG*
 - *40-53 PSI*
 - *Medium Droplet Size*
- 2 locations in sprayer path
 - *8' from tractor center (L1)*
 - *30" parallel from L1 (L0)*
- 5 Kromekote cards (2" X 3")
 - *10' apart*
- Dropletscan (*WRK of Arkansas, LLC*)

SUMMARY:

1) KROMEKOTE CARD LOCATION WAS SIGNIFICANT FOR COVERAGE. COVERAGE AT L1 (8' FROM TRACTOR CENTER) WAS LESS THAN COVERAGE AT L0 (30" PARALLEL FROM L1).

2) THERE WAS A SIGNIFICANT INTERACTION FOR COVERAGE AND VMD50 BETWEEN TRACTOR SPEED AND BOOM HEIGHT.

COVERAGE AT 30" AND 60" BOOM HEIGHT: 4.4 MPH > 6.5 MPH > 9.5 MPH

COVERAGE AT 45" BOOM HEIGHT: 4.4 MPH = 6.5 MPH > 9.5 MPH

VMD50 AT 30" BOOM HEIGHT: 4.4 MPH < 6.5 MPH < 9.5 MPH

VMD50 AT 45" BOOM HEIGHT: 4.4 MPH < 6.5 MPH = 9.5 MPH

VMD50 AT 60" BOOM HEIGHT: 4.4 MPH < 9.5 MPH < 6.5 MPH

University of Georgia

INFLUENCE OF TRACTOR SPEED AND SPRAY BOOM HEIGHT ON SPRAY COVERAGE AND VMD		
Trial ID:	NZ-01-15	Study Dir.: GLEN RAINS
Location:	PONDER FARM	Investigator: Eric P. Prostko
Part Rated Rating Data Type Rating Unit # Subsamples, Dec.	SPRAY - COVERAGE PERCENT - 2	VMD50 MICRONS - 2
Trt Treatment No. Name	1	2
TABLE OF R MEANS		
Replicate 1	8.72	320.81
Replicate 2	9.35	320.12
Replicate 3	10.16	319.47
Replicate 4	8.61	326.39
Replicate 5	9.17	326.09
TABLE OF A (LOCATION) MEANS		
1 L1	8.29 b	318.64 a
2 L0	10.11 a	326.51 a
LSD P=.10	1.062	8.214
Standard Deviation	2.363	18.277
CV	25.676	5.666
TABLE OF B (SPEED) MEANS		
1 4.4 MPH	11.10 a	310.98 b
2 6.5 MPH	10.22 b	326.62 a
3 9.5 MPH	6.30 c	330.14 a
LSD P=.10	0.677	4.342
Standard Deviation	1.410	9.044
CV	15.316	2.804
TABLE OF C (BOOM HEIGHT) MEANS		
1 30' BOOM HEIGHT	9.47 a	328.38 a
2 45" BOOM HEIGHT	9.15 a	320.89 b
3 60" BOOM HEIGHT	8.99 a	318.46 b
LSD P=.10	0.456	5.908
Standard Deviation	0.950	12.304
CV	10.323	3.814
TABLE OF A (LOCATION) B (SPEED) MEANS		
1 L1 1 4.4 MPH	10.22 a	305.39 a
2 L0 1 4.4 MPH	11.98 a	316.56 a
1 L1 2 6.5 MPH	9.21 a	322.41 a
2 L0 2 6.5 MPH	11.22 a	330.82 a
1 L1 3 9.5 MPH	5.45 a	328.11 a
2 L0 3 9.5 MPH	7.14 a	332.16 a
LSD P=.10	0.596	4.240
Standard Deviation	0.878	6.244
CV	9.543	1.936
TABLE OF A (LOCATION) C (BOOM HEIGHT) MEANS		
1 L1 1 30' BOOM HEIGHT	8.53 a	324.50 a
2 L0 1 30' BOOM HEIGHT	10.40 a	332.27 a
1 L1 2 45" BOOM HEIGHT	8.22 a	317.41 a
2 L0 2 45" BOOM HEIGHT	10.08 a	324.36 a
1 L1 3 60" BOOM HEIGHT	8.13 a	314.00 a

Means followed by same letter do not significantly differ (P=.10, LSD)

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

University of Georgia

Part Rated Rating Data Type Rating Unit # Subsamples, Dec.	SPRAY - COVERAGE PERCENT - 2	VMD50 MICRONS - 2
Trt Treatment No. Name	1	2
2 L0 3 60" BOOM HEIGHT	9.86 a	322.92 a
LSD P=.10 Standard Deviation CV	0.656 0.966 10.500	5.856 8.624 2.673
TABLE OF B (SPEED) C (BOOM HEIGHT) MEANS		
1 4.4 MPH 1 30' BOOM HEIGHT	11.77 a	315.91 e
2 6.5 MPH 1 30' BOOM HEIGHT	10.71 bc	323.87 cd
3 9.5 MPH 1 30' BOOM HEIGHT	5.91 e	345.38 a
1 4.4 MPH 2 45" BOOM HEIGHT	9.91 c	310.62 f
2 6.5 MPH 2 45" BOOM HEIGHT	10.06 c	327.47 bc
3 9.5 MPH 2 45" BOOM HEIGHT	7.48 d	324.57 bcd
1 4.4 MPH 3 60" BOOM HEIGHT	11.61 ab	306.40 f
2 6.5 MPH 3 60" BOOM HEIGHT	9.88 c	328.52 b
3 9.5 MPH 3 60" BOOM HEIGHT	5.50 e	320.46 de
LSD P=.10 Standard Deviation CV	0.900 1.152 12.523	4.610 5.904 1.830
TABLE OF A (LOCATION) B (SPEED) C (BOOM HEIGHT) MEANS		
1 L1 1 4.4 MPH 1 30' BOOM HEIGHT	10.61 a	308.85 a
2 L0 1 4.4 MPH 1 30' BOOM HEIGHT	12.93 a	322.97 a
1 L1 2 6.5 MPH 1 30' BOOM HEIGHT	9.83 a	320.56 a
2 L0 2 6.5 MPH 1 30' BOOM HEIGHT	11.60 a	327.18 a
1 L1 3 9.5 MPH 1 30' BOOM HEIGHT	5.15 a	344.10 a
2 L0 3 9.5 MPH 1 30' BOOM HEIGHT	6.67 a	346.65 a
1 L1 1 4.4 MPH 2 45" BOOM HEIGHT	9.29 a	306.45 a
2 L0 1 4.4 MPH 2 45" BOOM HEIGHT	10.53 a	314.79 a
1 L1 2 6.5 MPH 2 45" BOOM HEIGHT	9.24 a	322.90 a
2 L0 2 6.5 MPH 2 45" BOOM HEIGHT	10.89 a	332.03 a
1 L1 3 9.5 MPH 2 45" BOOM HEIGHT	6.12 a	322.89 a

University of Georgia

Part Rated Rating Data Type Rating Unit # Subsamples, Dec.	SPRAY - COVERAGE PERCENT - 2	VMD50 MICRONS - 2
Trt Treatment No. Name	1	2
2 L0 3 9.5 MPH 2 45" BOOM HEIGHT	8.83 a	326.25 a
1 L1 1 4.4 MPH 3 60" BOOM HEIGHT	10.74 a	300.87 a
2 L0 1 4.4 MPH 3 60" BOOM HEIGHT	12.47 a	311.93 a
1 L1 2 6.5 MPH 3 60" BOOM HEIGHT	8.57 a	323.78 a
2 L0 2 6.5 MPH 3 60" BOOM HEIGHT	11.18 a	333.25 a
1 L1 3 9.5 MPH 3 60" BOOM HEIGHT	5.07 a	317.34 a
2 L0 3 9.5 MPH 3 60" BOOM HEIGHT	5.93 a	323.58 a
LSD P=.10	1.374	13.856
Standard Deviation	1.245	12.548
CV	13.525	3.890

University of Georgia

COMPLETE FACTORIAL AOV For SPRAY COVERAGE PERCENT 2 (Data Column 1)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.10)
Total	89	653.957690				
R	4	27.515473	6.878868	4.440	0.0133	
A	1	74.729334	74.729334	13.384	0.0216	1.06
RA	4	22.334216	5.583554			
B	2	391.947247	195.973623	98.639	0.0001	0.68
RB	8	15.894187	1.986773			
AB	2	0.408616	0.204308	0.265	0.7738	0.60
RAB	8	6.170818	0.771352			
C	2	3.463440	1.731720	1.919	0.2086	0.46
RC	8	7.220827	0.902603			
AC	2	0.088169	0.044084	0.047	0.9541	0.66
RAC	8	7.469764	0.933721			
BC	4	43.465833	10.866458	8.181	0.0009	0.90
RBC	16	21.250833	1.328177			
ABC	4	7.210811	1.802703	1.164	0.3635	1.37
RABC	16	24.788122	1.549258			

COMPLETE FACTORIAL AOV For VMD50 MICRONS 2 (Data Column 2)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.10)
Total	89	20053.925796				
R	4	823.008462	205.752116	1.307	0.3095	
A	1	1395.390938	1395.390938	4.177	0.1105	8.21
RA	4	1336.156551	334.039138			
B	2	6241.449616	3120.724808	38.154	0.0001	4.34
RB	8	654.344251	81.793031			
AB	2	193.349776	96.674888	2.479	0.1453	4.24
RAB	8	311.946469	38.993309			
C	2	1606.968462	803.484231	5.308	0.0341	5.91
RC	8	1211.090838	151.386355			
AC	2	14.804169	7.402084	0.100	0.9064	5.86
RAC	8	594.932842	74.366605			
BC	4	2535.396818	633.849204	18.186	0.0001	4.61
RBC	16	557.669549	34.854347			
ABC	4	58.060578	14.515144	0.092	0.9836	13.86
RABC	16	2519.356478	157.459780			

University of Georgia

INFLUENCE OF TRACTOR SPEED AND SPRAY BOOM HEIGHT ON SPRAY COVERAGE AND VMD			
Trial ID: NZ-01-15		Study Dir.: GLEN RAINS	
Location: PONDER FARM		Investigator: Eric P. Prostko	
Part Rated Rating Data Type Rating Unit # Subsamples, Dec.		SPRAY - COVERAGE PERCENT - 2	VMD50 MICRONS - 2
Trt Treatment No. Name	Plot	1	2
1 L1	101	10.25	312.52
4.4 MPH	217	11.64	310.35
30' BOOM HEIGHT	318	12.15	295.46
	402	9.19	323.39
	501	9.82	302.52
Mean =		10.61	308.85
2 L1	102	9.75	314.65
4.4 MPH	211	7.03	312.52
45" BOOM HEIGHT	309	10.88	297.26
	407	8.49	307.05
	502	10.32	300.79
Mean =		9.29	306.45
3 L1	103	10.09	299.03
4.4 MPH	204	9.40	294.85
60" BOOM HEIGHT	313	14.28	293.64
	416	9.61	311.44
	503	10.33	305.37
Mean =		10.74	300.87
4 L1	104	9.44	319.34
6.5 MPH	212	10.88	299.03
30' BOOM HEIGHT	305	11.49	326.85
	404	8.21	330.23
	504	9.14	327.34
Mean =		9.83	320.56
5 L1	105	9.00	327.82
6.5 MPH	214	9.09	311.44
45" BOOM HEIGHT	312	9.29	311.98
	413	11.51	340.38
	505	7.31	322.89
Mean =		9.24	322.90
6 L1	106	8.60	327.34
6.5 MPH	205	7.32	317.79
60" BOOM HEIGHT	303	10.93	330.70
	415	7.71	331.65
	506	8.27	311.44
Mean =		8.57	323.78
7 L1	107	6.63	341.27
9.5 MPH	218	4.53	336.77
30' BOOM HEIGHT	302	5.85	327.82
	405	4.46	350.74
	507	4.27	363.92
Mean =		5.15	344.10
8 L1	108	6.53	325.38
9.5 MPH	210	6.05	325.38
45" BOOM HEIGHT	311	7.18	332.60
	418	5.82	326.85
	508	5.04	304.23
Mean =		6.12	322.89
9 L1	109	5.34	316.75
9.5 MPH	203	5.73	322.89
60" BOOM HEIGHT	317	6.24	309.26
	410	3.52	326.36
	509	4.52	311.44
Mean =		5.07	317.34
10 L0	110	12.02	317.28
4.4 MPH	206	12.03	307.05
30' BOOM HEIGHT	314	13.68	327.34
	417	12.47	327.34
	510	14.46	335.85
Mean =		12.93	322.97

University of Georgia

Part Rated Rating Data Type Rating Unit # Subsamples, Dec.		SPRAY - COVERAGE PERCENT - 2	VMD50 MICRONS - 2
Trt Treatment No. Name	Plot	1	2
11 L0	111	9.13	311.44
4.4 MPH	213	10.44	315.18
45" BOOM HEIGHT	315	9.43	324.88
	411	11.60	319.34
	511	12.04	303.09
	Mean =	10.53	314.79
12 L0	112	11.71	301.37
4.4 MPH	207	12.26	324.39
60" BOOM HEIGHT	308	12.88	289.30
	406	10.61	316.75
	512	14.89	327.82
	Mean =	12.47	311.93
13 L0	113	9.33	319.34
6.5 MPH	209	13.13	326.85
30' BOOM HEIGHT	310	11.82	321.89
	414	12.04	323.89
	513	11.66	343.91
	Mean =	11.60	327.18
14 L0	114	10.88	339.93
6.5 MPH	215	12.04	325.38
45" BOOM HEIGHT	316	12.72	346.08
	403	9.77	323.39
	514	9.02	325.38
	Mean =	10.89	332.03
15 L0	115	10.03	319.34
6.5 MPH	208	12.23	330.70
60" BOOM HEIGHT	304	11.08	334.46
	401	10.74	329.75
	515	11.84	351.98
	Mean =	11.18	333.25
16 L0	116	6.52	349.48
9.5 MPH	201	6.83	349.48
30' BOOM HEIGHT	306	6.44	341.72
	408	6.22	344.78
	516	7.35	347.79
	Mean =	6.67	346.65
17 L0	117	7.64	320.87
9.5 MPH	202	9.24	330.70
45" BOOM HEIGHT	307	9.06	318.83
	412	7.51	321.38
	517	10.72	339.49
	Mean =	8.83	326.25
18 L0	118	4.10	311.44
9.5 MPH	216	8.40	321.38
60" BOOM HEIGHT	301	7.56	320.36
	409	5.52	320.36
	518	4.05	344.35
	Mean =	5.93	323.58