

San Joaquin Valley Agricultural
Research and Extension Center

Cooperative 1970 and 1971 Chemical
Control and Application
Evaluation Trials on Grapes

J. E. Dibble

APPLICATION COVERAGE TRIALS

Grapes 12' Rows
August 7, 1970

Equipment ^{1/}	Row No.	Color Code	GPA	MPH	PSI	GPM/Side	Nozzling
1 Bean 200 (300 PSI)	2	Y	30	3	300	1.2 gpm	X X X 2.5/1 3/1 2.5/1 X
2 Bean 200 (300 PSI)	5	W	30	4.5	360	1.7 gpm	X X 2.5/1 3/1 3/1 2.5/1 X
3 Bean 200 (100 PSI)	8	R	30	4.5	100	1.2 gpm	X X 4/1 4/2 4/2 4/1 X
4 Bean 200 (200 PSI)	11	B	200	3	200	7.5 gpm	X X 8/2 5/3 5/3 8/2 X
5 Turbonist (Spiral)	14	O	30	3	100	1.2 gpm	X 2 5 3 3 3 X (#24 cores)
6 Turbonist (Spiral)	17	G	30	4.5	100	1.7 gpm	X 4 5 5 4 4 X (#24 cores)
7 Kinkelder (Royal)	20	P	30	3	1.5	1.2 gpm	Setting No. 129
8 Kinkelder (Royal)	23	YW	30	4.5	1.5	1.7 gpm	Setting No. 194
9 Windmill (350 PSI)	26	RW	30	3	21	1.2 gpm	Setting No. 129
10 Windmill (350 PSI)	29	BW	30	4.5	21	1.7 gpm	Setting No. 194
11 Span Spray (Vine boom)	32	OW	30	3		1.2 gpm	
12 Spray Spray (Vine boom)	35	GW	60	3		2.4 gpm	
13 OTV Boom	39	RW	200	3	200	7.5 gpm	Adjustable "T" jets
14 RSM (Junior fan)	41	BY	30	3	100	1.2 gpm	1.25 1.75 1.50
15 RSM (Junior fan)	44	YO	30	4.5	100	1.7 gpm	1.75 2.25 2.00
16 Victair	-	-	30	3	90	1.2 gpm	X · X · 4 · X · 4 · X · 4 · X · 4 · X
17 Victair	-	-	30	4.5	90	1.7 gpm	4 · X · 4 · 4 · X · 4 · X · 4 · X · 4

/ All PTO Sprayers

COMPARISON OF APPLICATION EQUIPMENT
AS TO DYE COVERAGE ON TARGET CARDS IN GRAPES

Equipment	GPA	MPH	% Coverage															
			1'	I 1'	2'	I	3'	I	4'	I	5'	I	6'	I	7'	I	8'	I
Windmill	30	3	90	L	100	G	100	H	100	G	95	L	100	L	100	G	100	L
Windmill	30	3	50	L	100	H	100	H	100	H	65	L	95	L	100	L	100	L
Windmill	30	4.5	0	L	100	L	100	H	70	L	60	L	95	L	100	L	100	L
Windmill	30	4.5	50	L	100	G	100	H	20	L	85	L	100	L	100	L	100	L
Span Sprayer	30	3	60	L	90	L	100	G	60	L	100	H	100	H	100	H	100	H
Span Sprayer	30	3	60	L	55	L	30	L	85	L	100	G	100	G	100	G	100	H
Span Sprayer	60	3	100	L	100	L	100	L	100	L	35	L	100	L	80	L	85	L
Span Sprayer	60	3	80	L	65	L	90	L	75	L	80	L	100	G	100	G	---	-
OTV	200	3	95	G	85	L	80	L	100	G	100	H	100	G	70	L	---	-
OTV	200	3	70	G	85	L	75	L	100	L	100	G	100	L	50	L	---	-
RSM	30	3	55	L	100	G	100	G	0	L	55	L	100	G	100	H	100	H
RSM	30	3	100	L	100	H	100	H	10	L	100	L	100	G	100	G	100	G
RSM	30	4.5	85	L	100	H	100	H	15	L	80	L	100	L	100	G	95	L
RSM	30	4.5	100	G	100	G	85	L	40	L	95	L	10	L	100	G	---	-
Kinkelder	30	3	100	G	100	H	100	H	70	L	85	G	100	G	100	H	100	H
Kinkelder	30	3	95	L-H	100	G	100	L	50	L	60	G	100	G	100	H	100	H
Kinkelder	30	4.5	90	G	100	H	75	L	55	G	60	G	100	G	100	H	100	H
Kinkelder	30	4.5	95	G	85	G	100	L	25	L	55	G	100	G	100	H	100	H
Turbomist	30	3	50	L	100	G	100	G	55	G	65	G	100	H	100	H	100	H
Turbomist	30	3	80	G	100	G	100	G	20	L	30	G	100	G	100	H	100	H
Turbomist	30	4.5	10	G	100	G	100	G	55	G	80	G	100	H	100	H	100	G
Turbomist	30	4.5	45	G	100	G	100	G	50	G	45	G	100	H	100	H	100	G
Bean 200 ^{2/}	30	3	100	L	100	G	50	L	70	L	95	L	100	H	100	G	100	G
Bean 200 ^{2/}	30	3	85	L	100	L	100	G	80	L	50	L	100	G	100	H	100	H
Bean 200 ^{3/}	30	4.5	40	L	100	L	100	L	100	H	100	G	100	H	100	H	100	H
Bean 200 ^{3/}	30	4.5	25	L	100	L	10	L	60	L	95	L	100	H	100	H	100	H
Bean 200 ^{4/}	200	3	5	L	100	L	100	L	30	L	70	L	100	G	100	G	---	-
Bean 200 ^{4/}	200	3	70	L	100	L	100	J	100	L	100	L	100	H	100	G	100	G
Bean 200 ^{5/}	30	4.5	25	L	90	L	60	L	25	L	95	G	100	H	100	G	100	H
Bean 200 ^{5/}	30	4.5	10	L	75	G	65	G	25	G	100	H	100	G	100	H	100	H
Victair	30	3	60	L	100	G	100	G	60	G	70	G	100	H	100	H	100	H
Victair	30	3	75	G	100	G	100	G	30	L	35	G	100	G	100	H	100	H
Victair	30	4.5	35	G	100	G	100	G	50	G	75	G	100	H	100	H	100	C
Victair	30	4.5	50	G	100	G	100	G	65	G	55	G	100	H	100	H	100	G

usual intensity (Light = L, General = G, Heavy = H)

COMPARISON OF APPLICATION EQUIPMENT
USING FLUORESCENT DYE
(KIIFS)

Equipment	GPA	MPH	Row No.	Fluorometer Ave. Readings ^{1/}					
				Inside Leaves			Outside Leaves		
				Upper	Lower	Ave.	Upper	Lower	Ave.
Bean 200	30	3	2	19.7	29.4	24.6	17.8	38.2	28.0
Bean 200	30	4.5 ^{2/}	5	20.2	28.7	24.5	24.1	40.3	32.2
Bean 200	30	4.5 ^{3/}	8	18.8	29.1	23.9	32.1	37.9	35.0
Bean 200	200	3 ^{4/}	11	11.5*	18.9*	15.2*	19.8*	27.9*	23.9*
Turbomist	30	3 ^{3/}	14	21.2	34.0	27.6	24.1	41.6	34.4
Turbomist	30	4.5 ^{3/}	17	22.4**	36.9**	29.7**	25.1	45.5	35.3
Kinkelder	30	3	20	23.5	32.6	28.1	24.2	36.8	30.5
Kinkelder	30	4.5	23	14.0	22.0	18.0	21.0	29.5	25.0
Windmill	30	3	26	16.0	27.3	21.7	21.1	38.9	30.0
Windmill	30	4.5	29	18.2	22.4	20.3	25.9	37.5	31.7
Span Spray	30	3	32	24.8	40.5	32.7	24.5	54.5	39.5
Span Spray	60	3	35	14.2*	18.5*	16.4*	24.3*	34.0*	29.2*
OTV	200	3	39	13.9*	14.8*	14.4*	15.4*	23.1*	19.3*
RSM	30	3 ^{3/}	41	18.2	29.6	23.9	27.7	45.1	36.4
RSM	11	4.5 ^{3/}	44	22.3	33.2	27.8	29.8**	42.7**	36.3**
Victair	30	3		20.6	33.9	27.2	25.0	42.9	33.9
Victair		4.5		23.2	35.7	30.0	24.1	44.4	34.2

^{1/} Total reading from 36 leaves except *--24 and **--20 leaves.

^{2/} 360 psi

^{3/} 100 psi

^{4/} 200 psi

COMPARISON OF APPLICATION EQUIPMENT
USING FLUORESCENT DYE
(KHFS)

Equipment	GPA	MPH	Row No.	Fluorometer Ave. Readings ^{1/}					
				Inside Leaves			Outside Leaves		
				Up	Low	Ave.	Up	Low	Ave.
Bean 200	30	3	2	26.9	44.9	35.9	29.3	64.1	46.7
Bean 200	30	4.5 ^{2/}	5	25.8	41.3	33.6	43.3	65.9	54.6
Bean 200	30	4.5 ^{3/}	8	35.5	49.2	42.4	46.8	52.9	49.8
Bean 200	200	3 ^{4/}	11						
Turbomist	30	3 ^{3/}	14	32.2	53.2	42.7	44.8	66.8	55.8
Turbomist	30	4.5 ^{3/}	17	26.3	46.6	36.5	40.0	59.4	49.7
Kinkelder	30	3	20	43.1	54.2	45.9	43.4	60.9	52.2
Kinkelder	30	4.5	23	21.9	34.1	28.0	31.7	45.2	38.4
Windmill	30	3	26	34.8	57.0	46.4	38.9	65.9	52.4
Windmill	30	4.5	29	38.6	46.3	42.5	46.1	54.6	50.3
Span Spray	30	3 ¹	32	30.6	54.1	42.3	15.0	55.3	35.2
Span Spray	60	3	35						
OTV	200	3	39						
RSM	30	3 ^{3/}	41	41.4	62.9	52.1	42.1	69.9	56.0
RSM	11	4.5 ^{3/}	44	35.7	55.1	45.4	37.7	55.9	46.8
Check				11.5	18.1	14.8	11.1	15.5	13.3

^{1/} From 12 leaf reading only

^{2/} 360 psi

^{3/} 100 psi

^{4/} 200 psi

Comparison of dye coverage of five concentrate PTO air carrier sprayers
on target cards placed on unobstructed poles.

Equipment ^{1/}	Distance of pole from sprayer and height of target card											
	1'	I ^{2/}	5 Feet	3'	I	6'	I	10 Feet	3'	I	6'	I
ESN	100	L	100	G	100	G	100	L	95	L	100	G
Turbomist	100	H	100	H	100	H	100	H	100	H	100	G
Kinkelder												
Almonds	100	G	100	H	100	H	100	G	100	H	100	H
Plums	100	G	100	H	100	H	94	L	100	G	100	G
Victair	36	L	97	L	100	H	72	L	90	L	100	G
Windmill	100	G	100	H	100	H	100	L	100	G	100	G

^{1/} All sprayers operated at 50 GPA and 2 MPH

^{2/} I = Visual intensity (L = light, G = general, H = heavy)

Sprays Applied to Thompson Seedless Grapes - 1970
 L. E. Nielsen - Deposits ($\mu\text{g}/\text{cm}^2$) of Saturn Yellow Pigment on
 leaves (averages). Figures in parentheses are percent of
 leaf disks in the lowest category of deposits 1/

Sprayer, GPA PSI (Row No.)	Outside and Inside Leaves; Upper and Lower Surfaces	Outside Leaves			Inside Leaves		
		Upper Surface	Lower Surface	Both Surfaces	Upper Surface	Lower Surface	Both Surfaces
Hand 30gpa-3mph 300psi (2)	.81 (44.4)	.58 (54.2)	1.17 (35.5)	.88 (44.9)	.82 (29.2)	.65 (58.3)	.74 (43.8)
Hand 30gpa-4.5mph 360psi (5)	.90 (40.7)	.74 (35.5)	1.29 (35.5)	1.02 (35.5)	.89 (25.0)	.65 (66.7)	.77 (45.9)
Hand 30gpa-4.5mph 100psi (8)	.90 (40.35)	1.28 (14.3)	1.42 (7.2)	1.35 (10.8)	.43 (70.9)	.47 (68.8)	.45 (69.9)
Hand 200gpa-3mph 200psi (11)	.85 (31.3)	1.11 (4.2)	1.31 (14.6)	1.21 (9.4)	.50 (50)	.48 (56.3)	.49 (53.2)
Aerobomist 30gpa-3mph 100psi (14)	0.99 (30.8)	.66 (31.3)	1.71 (12.5)	1.18 (21.9)	.80 (41.7)	.79 (37.5)	.80 (39.6)
Aerobomist 30gpa-4.5mph 100psi (17)	1.15 (31.3)	.96 (22.9)	2.08 (14.4)	1.52 (18.7)	.85 (43.8)	.70 (43.8)	.78 (43.8)
Knackelder 30gpa-3mph (20)	.79 (39.1)	.75 (31.3)	1.16 (27.1)	.95 (29.2)	.68 (39.6)	.58 (58.3)	.63 (49.0)
Knackelder 30gpa-4.5mph (23)	.38 (57.4)	.47 (50.0)	.37 (31.3)	.42 (40.7)	.38 (64.0)	.21 (83.4)	.34 (74.0)
Handmill 30gpa-3mph 21psi (26)	.90 (75.3)	.64 (76.1)	1.39 (50.0)	1.02 (63.1)	.32 (85.4)	.44 (84.6)	.38 (87.5)
Handmill 30gpa-4.5mph 21psi (29)	.74 (60.0)	.81 (25.0)	1.52 (41.7)	1.17 (33.4)	.33 (81.3)	.27 (91.7)	.30 (86.5)
Hand spray 30gpa-3mph (32)					.52 (53.2)	.53 (62.5)	.53 (57.9)
Hand spray 60gpa-3mph (35)	1.08 (31.3)	1.48 (4.2)	1.78 (0.0)	1.63 (2.1)	.69 (54.2)	.36 (66.7)	.52 (60.5)
Hand 200gpa-3mph 200psi (39)	.68 (43.8)	.69 (22.9)	1.09 (29.2)	.89 (26.1)	.67 (35.4)	.16 (87.5)	.41 (61.5)
Hand 30gpa-3mph 200psi (41)	.83 (51.4)	1.2 (10.4)	1.86 (10.4)	1.53 (10.4)	.14 (95.6)	.14 (89.1)	.14 (92.4)
Hand 30gpa-4.5mph (44)	.75 (26.0)	.95 (18.8)	.74 (25.0)	.85 (21.9)	.62 (10.4)	.68 (50.0)	.65 (30.2)

Frequencies of leaf disks bearing deposits in steps of $0.4 \mu\text{g}/\text{cm}^2$ (range 0.0-0.4, 0.41-0.8, etc. to 6.69; 17 categories). Saturn yellow pigment was used at 0.5 lb./A.