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1964 RESULTS OF BLOOM TIME TREATMENTS FOR THE CONTROL OF EARLY BOTRYTIS ROT OF GRAPES

Progress Report - Not For Publication

"Early Botrytis rot" refers to the early season rot of grapes resulting from bloom-time infection by Botrytis cinerea. Conidia of this fungus infect berries at bloom time through the stigma. The fungus grows into the ovary and shortly after this it becomes dormant in the cells of the young berry and remains inactive in the fruit until the fruit begins to mature. When the sugars in the fruit begin to rise rapidly and the pH drops, the infected berries rot. The rot spreads from the infected grapes to cause rot of adjacent berries and to produce a cluster rot.

Tissue platings of blossom parts and young developing ovaries onto culture plates at full bloom show that a number of fungi, including Botrytis cinerea, are present on them. Surface sterilization to kill fungus spores on the surface of the ovaries and subsequent culturing of them has demonstrated that B. cinerea does infect the ovaries and becomes established inside the young developing fruit. At shatter time, many of the infected berries drop from the cluster but an occasional infected berry remains attached to the cluster. It is the early Botrytis rot that servesas the primary source of spores of Botrytis for later spread during early fall rains in many vineyards.

The object of the control tests is to determine if it is possible and practical to control or materially reduce early bunch rot resulting from blossom infections.

It is well-established that Captan is an effective fungicide for Botrytis cinerea, furthermore, in test plots applied in 1963, Captan gave significantly better control of Botrytis rot than did Dithane. Results of the 1963 control test plots show that time of application is an important factor in obtaining control of the early Botrytis rot. It was decided that in the 1964 tests that only Captan would be used and that applications would be made at about 50% bloom and full bloom. Bob Sisson included Captan 10% dust in the Sonoma County plot. Plots in Napa County were abandoned because of a severe frost.

Results of 1964

Sonoma County plots were on the variety Chenin blanc located on the Kunde Ranch. Treatments were: 1) Control, no spray; 2) spray, Captan 50W at 2 lbs per 100 gal of water + 2 oz. of Rohm & Haas Triton B 1956; 3) Captan 10% dust at 17# per acre; and 4) Captan 10% dust at 29# per acre. All treatments were applied at full bloom and late full bloom.

Table 1 shows the detailed data from the spray plots and Table 2 the data from the Captan dust-treated plots. Table 3 is a summary table of the data in Tables 1 and 2. The results shown in summary Table 3 indicate that Captan applied at full bloom or late full bloom will give reasonable control of early Botrytis rot. The table further shows that the dust was apparently better than the spray and that dust applied at 29# per acre was better than dust applied at the rate of 17#.

The significance of the results, however, is open to question because of the high variability in crop between vines and between rows (replications). The results do indicate though that the tests should be repeated another season.

At the same time sprays were applied, blossom ovaries (young berries) were tissue plated onto culture plates. The samples were taken from the control rows of the spray plots, row numbers 2, 8 and 14. Botrytis cinerea was recovered in culture from 21% of 144 blossoms plated from Row 2, 21% of

168 from row 8 and 25% of 160 from row 14. The percent of blossoms with Botrytis at bloom time was fairly high. It seems likely that many or perhaps most of the infected berries dropped during berry shatter time.

The results of the bloom time treatments for the control of Botrytis rot in Zinfandel grapes on the Leon Kirschenmann vineyard in San Joaquin County are given in detail in Tables 4a and 4b and summarized in Table 5.

Treatments were: 1) Control no spray; Captan 50W at 2# per 100 gal. water + 2 oz. Rohm & Haas Triton B 1956 + 2# wettable sulfur applied, 2) at 50% bloom, 3) at full bloom and 4) a combination spray at 50% and full bloom.

There was less bunch rot in the spray treatments than in the control. The full bloom treatment was better than the spray at 50% bloom. The very low counts in rot and the variability between replication, however, place a question on the significance between treatments.

On June 6, 1964, blossom ovaries were collected at random, eight from each of 20 vines in each of the rows number 2, 14 and 24 of the control plot. Botrytis developed on 71% of 160 blossom ovaries from row 2, 11% from row 14 and 71% from row 24.

TABLE 1

BLOOM TIME TREATMENT FOR CONTROL OF BOTRYTIS ROT OF GRAPES

Spray treatment: Captan 50W at 2# per 100 gal.
and Rohm & Haas Triton B 1956 at 2 oz. per 100 gal.
Full Bloom Stage

	Control no spray						Captan 50W Spray					
	Row 2		Row 8		Row 14		Row 5		Row 11		Row 17	
Vines	Clusters		Clusters		Clusters		Clusters		Clusters		Clusters	
No.	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total
1	1	41	0	9	1	7	0	7	0	7	0	11
2	0	16	0	16	0	10	0	20	0	14	1	18
3	2	26	1	39	0	27	0	31	0	11	2	16
4	0	10	0	13	0	26	0	12	1	28	0	8
5	0	31	0	12	0	26	1	38	0	18	0	33
6	0	25	0	32	0	23	0	17	0	32	0	19
7	0	21	0	12	0	24	0	29	0	4	0	14
8	0	6	0	18	0	31	0	20	0	17	0	16
9	0	12	0	10	0	12	1	20	2	34	2	22
10	0	24	1	35	0	16	0	27	0	22	0	13
11	1	16	1	19	1	14	0	28	0	8	0	6
12	0	9	0	26	3	16	0	30	0	11	0	33
13	0	32	0	10	0	3	0	34	3	10	1	17
14	0	37	0	27	0	31	3	39	0	11	0	26
15	2	38	0	20	0	15	0	10	0	11	0	29
16	2	33	0	0	0	11	1	19	0	19	0	23
17	0	29	0	25	2	28	0	26	0	17	0	26
18	0	17	0	15	1	13	0	36	0	13	4	34
19	0	12	0	15	5	35	0	27	0	21	0	43
20	0	16	0	9	5	25	0	30	1	34	0	15
Total	8	451	3	362	18	393	6	500	7	342	10	422
% Botrytis rot	1.77		0.83		4.58		1.20		2.05		2.37	

Chenin Blanc; Kunde Ranch, Sonoma County

Sprayed at about full bloom June 18, 1964

Results: Botrytis rot counts made September 30, 1964

TABLE 2

BLOOM TIME TREATMENT FOR CONTROL OF BOTRYTIS ROT OF GRAPES

	DUST TREATMENT, CAPTAN 10% AT LATE FULL BLOOM STAGE																	
	17 lbs per acre						Control, no dust						29 lbs per acre					
	Row 2		Row 3		Row 4		Row 8		Row 9		Row 10		Row 14		Row 15		Row 16	
	Clusters		Clusters		Clusters		Clusters		Clusters		Clusters		Clusters		Clusters		Clusters	
Vines	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total
1	0	15	0	4	0	2	0	5	0	7	-	-	0	21	0	1	0	6
2	0	7	0	3	0	12	0	3	0	20	0	0	0	2	0	5	0	2
3	0	12	0	20	0	11	0	1	2	23	0	5	-	-	0	5	0	7
4	0	4	0	7	0	14	0	0	0	7	2	10	0	12	0	15	0	8
5	0	5	0	0	0	7	0	7	0	9	0	4	0	22	0	9	0	8
6	0	7	0	10	2	17	0	14	0	6	0	10	0	3	0	19	0	1
7	0	3	0	11	0	15	0	10	0	8	0	4	0	11	0	9	0	4
8	0	7	0	18	0	6	0	1	0	2	1	14	0	2	0	4	0	6
9	0	4	0	15	0	13	3	5	1	5	2	8	0	6	0	13	0	12
10	0	2	0	14	0	10	0	11	0	11	2	16	0	2	0	30	0	9
11	-	-	0	11	0	15	0	0	0	14	3	29	0	12	0	12	0	7
12	-	-	0	22	0	12	3	0	0	3	0	19	0	9	0	2	0	10
13	-	-	0	18	0	6	0	1	0	11	0	15	0	25	0	10	0	11
14	-	-	0	18	0	11	0	4	0	1	0	22	0	15	0	8	0	4
15			1	15	1	19	0	17	0	5	1	22	0	2	0	21	0	7
16					1	10	0	7	1	7	1	42	-	-	2	12	-	-
17							1	18	0	1	0	18	0	15	0	3	0	6
18							0	4	0	10	0	35	0	18	1	8	0	9
19							5	17	-	-	2	27	0	5	0	13	0	3
20							3	30	6	23	1	30	0	15	0	12	0	2
Total	0	66	1	186	4	180	15	155	10	173	15	330	0	197	3	211	0	122
% Rot	0		0.54		2.22		9.68		5.78		4.55		0		1.42		0	

TABLE 3

BLOOM TIME TREATMENTS FOR CONTROL OF BOTRYTIS ROT OF GRAPES

Summary of Spray and Dust Treatments with Captan, 1964, Kunde Ranch Sonoma County

Treatment	Row	Vines	Total Clusters	Clusters Botrytis rot	Rot per vine	% Clusters with Botrytis rot
Control no spray	2	20	451	8	0.40	1.77
	8	20	362	3	0.15	0.83
	14	20	393	18	0.90	4.58
Total or mean		60	1206	29	0.49	2.40
Spray Captan 50W at 2#/100	5	20	500	6	0.30	1.20
	11	20	342	7	0.35	2.05
	17	20	422	10	0.50	2.37
Total or mean		60	1264	23	0.39	1.82
Dust, Captan 10% at 17#/a	2	10	66	0	0.00	0.00
	3	15	186	1	0.06	0.54
	4	16	180	4	0.25	2.22
Total or mean		41	432	5	0.10	1.16
Dust, Captan 10% at 29#/a	14	18	197	0	0.00	0.00
	15	20	211	3	0.15	1.42
	16	19	122	0	0.0	0.0
Total or mean		57	530	3	0.05	0.57
Control, no dust	8	20	155	15	0.70	9.68
	9	19	173	10	0.52	5.78
	10	20	330	15	0.75	4.55
Total or mean		59	658	40	0.66	6.08

Chenin Blanc
Spray - Captan 50W at 2#/100 gal + 2 oz Rohm & Haas B 1956 - Sprayed near full bloom on June 18, 1964.
Dusts - Captan 10% - applied late bloom at 17#/a and 29#/a on June 23, 1964

Counts for Botrytis rot made just before harvest September 30, 1964.

TABLE 4a

BLOOM TIME TREATMENT FOR THE CONTROL OF BOTRYTIS ROT OF GRAPE
VARIETY ZINFANDEL, SAN JOAQUIN COUNTY

Treatments - Spray application of Captan 50W at 2#/100 gal. water + 2# W sulfur + 2 oz. Triton B 1956

	Control no spray						50% bloom					
	Row 2		Row 14		Row 24		Row 4		Row 10		Row 20	
Vine No.	Clusters Rot	Total	Clusters Rot	Total	Clusters Rot	Total	Clusters Rot	Total	Clusters Rot	Total	Clusters Rot	Total
1	0	52	2	57	-	-	1	61	0	52	0	27
2	1	49	0	58	-	-	0	53	0	63	0	71
3	4	65	0	52	0	64	0	74	0	82	0	71
4	2	74	1	60	0	58	0	93	0	87	0	54
5	2	64	0	52	0	92	0	75	0	93	0	63
6	1	76	0	56	0	58	0	69	0	51	0	76
7	0	71	0	41	-	-	2	76	0	62	0	69
8	1	69	0	34	1	62	0	59	0	64	1	71
9	1	62	0	42	2	49	0	49	1	69	0	76
10	0	75	2	65	2	70	2	62	0	73	0	51
11	1	62	0	28	0	59	4	51	0	71	0	73
12	2	49	0	62	0	56	0	53	0	49	0	82
13	0	74	1	52	1	48	0	56	0	70	0	55
14	0	53	1	60	0	60	1	42	1	99	0	52
15	0	72	0	58	0	64	0	59	0	86	0	73
16	0	83	0	72	0	64	0	63	0	69	0	80
17	2	72	0	70	0	49	1	70	1	106	0	59
18	0	74	0	65	0	3	4	43	0	66	0	67
19	0	85	0	58	0	79	1	86	0	61	0	51
20	0	34	0	55	0	71	0	64	0	66	0	58
21	0	69	0	49	0	58	0	92	0	25	0	78
22	0	57	0	56	0	73	0	56	0	56	0	51
23	0	80	0	45	0	54	0	59	0	62	0	40
24	0	86	0	40	0	60	1	53	1	61	0	72
25	0	77	0	43	0	50	0	74	0	71	0	69
26	0	77	0	36	0	54	1	46	0	63	0	61
27	1	79	0	15	0	31	0	98	0	67	0	55
28	1	76	0	36	0	54	0	32	0	78	2	64
29	0	82	0	49	0	63	1	94	0	59	0	80
30	0	62	0	63	0	54	0	57	0	63	0	65
Total	19	2060	7	1529	6	1557	19	1919	4	2044	3	1914
Rot/vine	0.63		0.23		0.22		0.63		0.13		0.10	
Rot %	0.93		0.45		0.38		0.99		0.19		0.15	

TABLE 4b

BLOOM TIME TREATMENT FOR THE CONTROL OF BOTRYTIS ROT OF GRAPE
VARIETY ZINFANDEL, SAN JOAQUIN COUNTY

Treatments - Spray application of Captan 50W
at 2#/100 gal. water + 2# W sulfur + 2 oz. Triton B 1956

Vine No.	Full bloom						50% and Full bloom					
	Row 6		Row 12		Row 18		Row 8		Row 16		Row 22	
	Clusters		Clusters		Clusters		Clusters		Clusters		Clusters	
	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total	Rot	Total
1	0	17	0	69	1	45	-	-	0	60	0	52
2	0	29	0	59	0	44	1	19	0	58	0	74
3	0	39	0	79	1	65	0	43	1	52	0	68
4	0	30	0	81	0	84	0	68	0	56	0	53
5	0	40	0	58	0	57	0	54	0	58	0	67
6	0	40	0	41	0	76	1	57	0	35	2	74
7	0	56	0	59	0	42	0	62	0	54	0	62
8	0	44	0	52	0	32	0	60	0	12	0	71
9	0	29	0	62	1	64	0	52	0	65	0	76
10	1	45	0	61	0	56	0	72	0	45	0	57
11	0	51	0	59	0	62	0	66	0	63	0	82
12	2	40	0	25	0	57	0	30	1	58	-	-
13	0	52	0	61	0	81	0	89	0	63	3	67
14	0	22	0	68	0	70	0	72	0	65	0	67
15	0	53	0	63	0	75	0	84	0	56	0	98
16	0	4	0	76	0	96	0	86	0	66	0	87
17	0	37	0	74	0	62	0	81	0	83	0	83
18	0	57	1	76	1	80	1	64	0	69	0	63
19	0	74	0	57	0	101	0	100	0	64	0	78
20	0	78	0	41	0	86	0	64	0	49	0	32
21	1	67	0	64	0	82	0	68	0	71	0	93
22	0	51	0	64	1	86	0	69	0	52	0	86
23	0	55	1	83	0	64	0	47	0	47	0	38
24	0	73	0	62	0	79	0	63	0	46	0	58
25	0	53	0	76	0	89	0	49	0	57	0	78
26	1	77	0	67	0	76	0	68	0	46	0	86
27	0	55	0	51	0	81	0	38	0	50	0	42
28	0	54	0	50	0	78	0	59	0	60	0	52
29	0	87	0	54	0	83	0	69	0	41	0	35
30	0	80	0	72	0	113	0	34	0	55	0	68
Total	5	1489	2	1864	5	2166	3	1787	2	1656	5	1947
Rot/vine	0.17		0.06		0.17		0.10		0.06		0.17	
Rot %	0.33		0.10		0.23		0.17		0.12		0.25	

TABLE 5

SUMMARY - BLOOM TIME TREATMENT FOR THE CONTROL OF BOTRYTIS ROT OF GRAPE

SPRAY TREATMENTS WITH CAPTAN 50W and WETTABLE SULFUR
AT DIFFERENT STAGES OF BLOOM

Treatment	Row	Vines	Total Clusters	Clusters Botrytis rot	Rot per vine	% Clusters with Botrytis rot
Control	2	30	2060	19	0.63	0.93
	14	30	1529	7	0.23	0.45
	24	27	1557	6	0.22	0.38
Total or mean		87	5146	32	0.35	0.62
50% Bloom	4	30	1919	19	0.63	0.99
	10	30	2044	4	0.13	0.19
	20	30	1914	3	0.10	0.15
Total or mean		90	5877	26	0.29	0.44
Full bloom	6	30	1489	5	0.17	0.33
	12	30	1864	2	0.06	0.10
	18	30	2166	5	0.17	0.23
Total or mean		90	5519	12	0.13	0.22
50% and full bloom	8	29	1787	3	0.10	0.17
	16	30	1656	2	0.06	0.12
	22	29	1947	5	0.17	0.25
Total or mean		88	5390	10	0.11	0.18

Variety: Zinfandel

Spray: Captan 50W at 2#/100 gal + 2# wettable sulfur + 2 oz Rohm & Haas Triton B 1956

Application time: 6-5-64 Full bloom

Location: Leon Kirschenmann - Burella Road near Victor - San Joaquin County