

SPRAYING GRAPES FOR DISEASE CONTROL IN FLORIDA—1945-1947

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At Whitney, Florida, 4 miles west of Leesburg, is located a small vineyard of about 500 bunch grapes, variety Extra (Florida Beacon), which has served since 1942 as a testing ground for the development of a spraying program for grape disease control and for materials which might possess fungicidal value and at the same time not discolor fruit.

Three fungus diseases make spraying of grapes imperative in Florida, *Guignardia bidwellii* (Ell.) V. & R., which causes black rot, *Melanconium fuligineum* (Scrib. & Vial.) Cav., which causes bitter rot, and *Glomerella cingulata* (Ston.) Spaul. & Schrenk, which causes ripe rot. Loucks (1) worked out a spray program at Whitney for the Florida grape grower and showed that the most important sprays were those applied during blooming and fruit setting. For average years, 8 or 9 sprays are necessary, applied at about 10 days intervals. Loucks recommends 4-4-50 bordeaux except just prior to fruit ripening, when copper acetate is substituted in 2 sprayings. When the fruit is picked, the last spraying can be bordeaux mixture. The reason for the substitution is that bordeaux leaves a deposit on fruit and detracts from its sales value. Loucks states that he found bitter rot and ripe rot more difficult to control than black rot and thought that this was perhaps due to the more frequent rains during the ripening period when the first 2 rots occur, but allowed the possibility that copper acetate was less effective against these diseases than bordeaux.

From 1945 to the present we have followed Loucks' spray program with bordeaux but have tried other materials as well to find a better fungicide, always keeping in mind that no fungicide must discolor the fruit in such a way as to reduce its attractiveness. For 2 years, 1945 and 1946, we used bordeaux (4-4-50) as our standard, and we discovered that while it is a good fungicide it also causes a stunting of the plant, presumably through hardening of the epidemis and in the absence of any fungus can reduce the yield. We have had 2 years, again 1945 and 1946, when grape diseases were practically negligible because we had little or no rain, but in 1947 we had an outbreak of black, bitter, and ripe rots, so our studies are fairly well balanced. We have used the dithane-zinc-lime spray (2 qt.-250 gm.-192 gm. per 100 gal.) for 3 years and we like it. Vines sprayed with this material are glossier in appearance, seem to possess more luxuriant foliage, and bear better than when sprayed with other chemicals (Table 1). Whether or not the presence of the zinc in the spray has a nutritional effect on the plant we do not know.

The fungicides we have tried are listed in table 1; you will note that we eliminate materials as we go along for one reason or another. We dropped Wetable Spergon (2 lb./100 gal.) because it discolored the fruit, likewise Fermate (2 lb. /100 gal.). Copper Compound A (4 lb. /100 gal.) produced burning of the foliage and lowered yields which might possibly have been corrected by the addition of lime but we discontinued it so that other materials might be tried. After 2 years trials we even discontinued bordeaux, and now dithane-zinc-lime is our standard. Carbide & Carbon Chemicals Corporation's 2 ma-

terials, No. 341A (2 1/2 lb. /100 gal.) and No. 169 (4 lb. /100 gal.) are promising but the yellow No. 169 does discolor the fruit. This year, for the first time, we have applied fungicides (listed for 1947 in table 1) throughout the summer, at 2 week intervals, and find that plots sprayed with No. 169 look best, even better than the dithane-zinc-lime which is second. Conceivably, we might use dithane-zinc-lime until after harvest, then switch to No. 169. Post-harvesting spraying has not been recommended, but it is a well known fact that next year's crop is somewhat dependent on how long leaves stay on the vines the previous year.

In summation, we recommend that bunch grapes in Florida be sprayed with dithane-zinc-lime instead of with bordeaux; the dithane spray gives good disease control, high yields, and may be applied on almost ripe or ripe fruit without fear of discoloring the grapes. Carbide & Carbon Chemical Corporation's No. 341 A also shows promise of replacing bordeaux as a spray for grapes in Florida.

LITERATURE CITED

1. LOUCKS, K. W. Spraying experiments for the control of certain grape diseases. Fla. Agr. Exp. Sta. Bul. 294: 1-16. 1936.

TABLE 1—SPRAYING GRAPES (*VITIS LABRUSCA*) FOR DISEASE CONTROL, WHITNEY, FLORIDA; 1945 TO 1947

Fungicide	Total Yield per 100 plants (lb.)	Percent Culls	Total Yields Marketable Fruit(Lb.)	Sale Value at \$0.20 per Lb.	Sale Value Per Acre
1945					
FERMATE	251	11	223	\$ 44.60	\$388
SPERGON	272	13	237	47.40	412
BORDEAUX	277	4	266	53.20	462
COPPER A	212	15	180	36.00	313
ZERLATE	278	10	250	50.00	435
DITHANE	345	4	331	66.20	575
UNSPRAYED	270	10	243	48.60	422
1946					
BORDEAUX	718	11	640	\$128.00	\$1113
ZERLATE	689	23	529	105.80	920
C&C's 341	916	17	751	150.20	1306
DITHANE	893	9	808	161.60	1406
UNSPRAYED	749	16	622	124.40	1082
1947					
ZERLATE	892	24	677	\$135.40	\$1178
C&C's 341A	975	15	778	155.60	1353
C&C's 169	741	25	554	110.80	964
DITHANE	1048	14	944	188.80	1642
UNSPRAYED	480	47	252	50.40	438