

ON THE USE OF COPPER OXYCHLORIDE IN CONTROLLING LEAF-FALL AND FRUIT-ROT OF ORANGES

Outbreaks of the leaf-fall and fruit-rot diseases of oranges caused by *Phytophthora palmivora* Butl. usually occur in the Nelliampathy hills (Kerala State, India) during the south west monsoon. In the Government owned citrus plantations in this region, the disease is effectively kept under control by the routine application of 1 percent Bordeaux mixture. But lime of the desired quality required for the preparation of Bordeaux mixture is often not easily available in the locality. An attempt was therefore made during 1961 to determine whether some of the proprietary fungicides containing copper oxychloride could be used satisfactorily in the place of Bordeaux mixture.

One hundred trees each were sprayed with four proprietary formulations of copper oxychloride (See Table 1) containing 45-50 percent metallic copper at a concentration of 100g of the product in 30 litres of water and with 1 percent Bordeaux mixture. Each tree received seven litres of the spray fluid applied with a high volume power sprayer. Hundred trees were kept as unsprayed control.

The trial was conducted during the south west monsoon period in 1961. A total of three sprays were given, the first during the first week of June, the second during the third week of July and the final during the second week of September.

Severe outbreaks of the disease in the locality occurred during the second week of July and the last week of August following spells of heavy rain fall. A total of 625mm and 875mm rain fell during the ten days preceding the first and second outbreaks respectively.

Results are presented in Table 1. It will be observed that all the trees which received Bordeaux mixture remained healthy, while 20 to 29 percent of the trees which received the proprietary products and 80 percent of the trees which received no fungicide took infection. Further, the coverage was also low in the case of the proprietary fungicides as compared to Bordeaux mixture. While Bordeaux mixture gave 81.2 and 62 percent coverage on the upper and lower leaf surfaces, respectively the proprietary products gave only 40 to 50 percent coverage on the upper leaf surface and 20.8 to 30.6 percent coverage on the lower leaf surface.

Table 1
Fungicidal coverage of orange leaves and percentage of disease
infected orange trees under different fungicidal treatments

Fungicidal treatment	Coverage percentage (area)		Percentage of plants affected
	Upper leaf surface	Lower leaf surface	
Bordeaux mixture 1 percent	81.2	62.0	0
Fytolan (Copper oxychloride)	50.7	30.6	20
Coppersan (-do-)	40.1	20.8	29
Cupravit (-do-)	45.0	25.7	25
Blue copper 50 (-do-)	45.7	25.5	25
Control-No spray			80

The incidence of the disease observed in some of the trees receiving the proprietary products may be attributed to the low coverage **and also** to the inability of the products to withstand the leaching action of rain as effectively as Bordeaux mixture. It is therefore evident that the proprietary copper fungicides under test cannot be a better substitute to Bordeaux mixture for the control of the leaf-fall and fruit-rot diseases of oranges.

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