A NOTE ON THE EFFECT OF DIFFERENT COPPER PREPARATIONS ON TEA YIELD

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1. Introduction

It has been found that spraying of potatoes with copper fungicides might depress the yield to some extent because of the phytotoxic effect of copper. With regard to tea, however, it is not known whether or not the application of copper preparations at the recommended rate against blister blight adversely affects the yield of tea.

In the 1957 blister blight trials (reported in this *Tea Quarterly**) no reliable differences were found between yields of plots sprayed with different fungicides or between plots sprayed at the normal and at half the normal rates respectively. It was pointed out that any possible phytotoxic effects on yield could have been masked by the incidence of blister blight. Therefore, a subsequent experiment with several copper formulations was carried out at a period during which little or no blister blight occurred, in order to investigate the influence of copper on tea.

2. Methods and material

The possible phytotoxicity of copper spraying was assessed on the basis of yields of plots sprayed with different proprietary brands at the recommended rate of 6 or 8 oz. per acre; untreated plots served as a control. The randomized experiment was laid out on St. Coombs estate and consisted of 8 treatments (7 fungicides and 1 control) each 6 times replicated (in 6 blocks), the individual plots contained about 200 bushes (1/15th acre). The trial started on 28th January, 1958, and was concluded on 30th April, 1958, during which period the plots were 12 times sprayed and plucked at 9 day intervals.

Rain and sunshine during period of experiment.

Month	No. of days with rain	Rain per day	Sunshine per day
February	6	0.03"	7.3 hrs.
March	15	0.33"	7.0 hrs.
April	17	0.26"	6.0 hrs.

The weather, as can be seen from the above data, was dry and sunny in February, while March and April had a fair amount of rain which was on average not much less than the average daily rainfall in the South West monsoon. However, the amount of sunshine per day was considerably greater than during typical monsoonal weather.

The blister blight incidence was negligible throughout the period; the average percentage of infected shoots (third leaves) on 27th January, 22nd February and 27th March was 8, 4 and 10 per cent respectively on the unprotected plots.

3. Results

The total yields obtained over the period on the plots sprayed with the different formulations are given below.

Yield in relation to spraying with copper fungicides over a period of 12 plucks.

Treatments	Rate per acre per round		Yield** made tea	
	Total	Copper	in lb.	in %
Control: unprotected	0	0.0	130.0	100.0
Fitox: 16% coated copper oxychloride	8 oz.	1.3 oz.	120.8	92.9
Duphar: 26% colloidal copper oxychloride	6 oz.	1.6 oz.	129.2	99.4
Cupravit blue: 35% copper oxychloride	6 oz.	2.1 oz.	133.4	102.5
Cobredon: 45% copper carbonate	6 oz.	2.7 oz.	129.1	99.4
Shell Copper: 50% copper oxychloride	6 oz.	3.0 oz.	120.8	92.9
Copper Sandoz: 50% copper oxyde	6 oz.	3.0 oz.	121.1	93.1
Perenox: 50% copper oxyde	6 oz.	3.0 oz.	128.7	99.0

**yield per 1,200 bushes.

The above figures show that the yields vary only little, irrespective of the type of copper fungicide and the amount of metallic copper applied. None of the differences between the yields of plots sprayed or unsprayed were statistically significant (determined by "analysis of variance"). These results, obtained at a time when blister blight was negligible confirm those which were earlier obtained during the S.W. monsoon*). That is to say, the spraying of fungicides of different formulation and copper content was found to have had no significant depressing effect on yield during both periods. This is not surprising as the amount of copper applied per round on tea is more than ten times less as compared with that applied on a crop like potatoes. Moreover, the rainfall during a monsoonal period is markedly greater that than during a summer in the temperate zone, so that a greater proportion of the copper will be washed off in the former case.

It can be concluded, therefore, *that spraying with copper fungicides at the normal rate will have no appreciable phytotoxic effect on tea.*

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*) VISSER, T., SHANMUGANATHAN, N. AND SABANAYAGAM, J. V.: Blister blight control in 1957 with respect to fungicidal formulation, application rates and yield. Tea Quarterly **29** (1) 1958.