

DEVELOPMENTS IN BLISTER BLIGHT CONTROL

II. SPRAYING TRIALS IN 1955, USING 50% COPPER FUNGICIDES

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During the monsoon season of 1955 three spraying trials were carried out by the joint Fisons Pest Control Ltd. and Tea Research Institute team. Of these, two were carried out on St. Coombs estate, one being an attempt to introduce a small scale technique of assessing the efficiency of fungicides, and the other a field trial which is reported on below.

St. Coombs No. 6 field experiment

- OBJECTS:—
1. To compare the efficiency of commercially available copper oxide and copper oxychloride fungicides. Although contrary to stated policy it was considered desirable that this information should be available for reference in the setting of standards for future experiments.
 2. To assess the efficiency of a new formulation of copper oxychloride, with an improved adhesive, at half the normal dosage rate of copper.
 3. To assess the efficiency of an experimental organic copper fungicide.

LAYOUT:—St. Coombs No. 6 field, pruned in December 1954, was chosen for this experiment, being accordingly divided into 16 approximately half acre plots, grouped into four blocks, A, B, C, D. The plots were numbered within the blocks according to the treatment to be applied, these treatments being randomised within the blocks. Each treatment was thus replicated four times.

Guard rows of two bushes in width were retained between all plots. The balance of the field was protected by the fungicide in general use on the estate, with the exception of two areas which were left untreated.

TREATMENTS

1. 'Perenox' (I.C.I. Ltd.) copper oxide fungicide (50% copper) at 6 ozs. per 12 gal. water per acre.
2. 'Blitox' (F.P.C. Ltd.) copper oxychloride fungicide (50% copper) at 6 ozs. per 12 gal. water per acre.

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3. 'Wet Blitox' experimental fungicide at the equivalent of one half the copper rate of the two above.
4. CAA experimental organic copper fungicide (50% copper) at 6 ozs. per 12 gal. water per acre.

Treatments were applied on an 8 day round, on the day following estate plucking, commencing on 13th May and continuing until 18th September, a total of 17 rounds. The apparatus used for application was the Birchmeier 'Senior' hand-operated knapsack.

Results:— 1. **TAINT TESTS:—**Routine taint tests were conducted on separately manufactured leaf collected from those plots receiving the two new fungicides. In no case was any taint apparent in the made tea throughout the course of the experiment.

2. The results of treatments were assessed by the method described in paper I of this series (Webster & Park, 1956), the choice of bush being made by the "stick-throwing" method, 25 bushes per plot being chosen. Assessments were made on the day before, or the day of plucking and expressed as (i) total number of blisters per 100 third leaves, and (ii) percentage of shoots infected on the third leaf. The means of the results over the whole monsoon season for the four treatments are shown diagrammatically in figure .1. Small blocks are incorporated in the diagrams superimposed on the tops of the principal columns of seasonal mean results of treatments. These blocks represent the standard error calculated during statistical analysis of the results. Thus, a statistically significant difference in favour of a treatment is shown when the upper limit of its small block falls below the lower limit of the small block of any other treatment under comparison; e.g. treatment 2 is significantly better than treatment 4, but not significantly better than treatment 1.

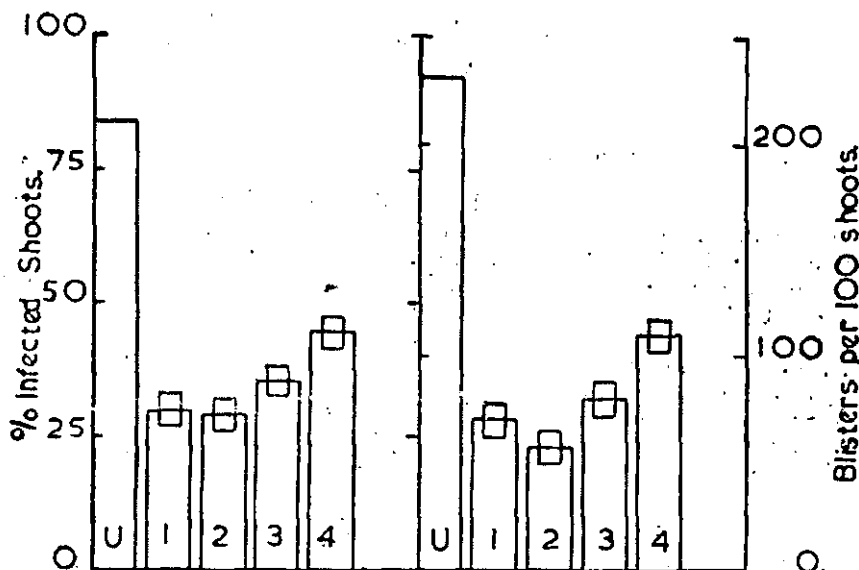


Fig. 1. Block diagrams representing the comparative degrees of control gained with treatments 1—4. U = untreated. The small blocks represent the standard errors at 5% level.

Analysis of results:—Statistical analysis of the results has yielded the following information:—

1. That there was no significant difference in the degree of control of blister blight afforded by copper oxide and copper oxychloride.

2. The experimental fungicide, Wet Blitox, applied at a rate equivalent to 3 ozs. per acre of a 50% copper fungicide, gave control almost as effective as that of the two standard products, despite the 50 per cent. reduction in copper content.

3. The 50% organic copper fungicide (C.A.A.) gave control of blister blight which was significantly less than that of the other three products in the experiment.

Discussion and conclusions:—The much vexed question of the relative merits of copper oxide and copper oxychloride fungicides has, under the conditions of the experiment, been answered to the effect that both are equally efficient.

Much has been said regarding the relative visibility of these two fungicides on treated leaves, but careful observation throughout the season has shown that low volume deposits of neither is easily visible on wet leaf. Although a copper oxide formulation may be more easily visible when freshly sprayed on to dry leaves, a copper oxychloride formulation is more easily visible as a dried-off deposit. From the point of view of supervision, therefore, much would appear to depend, from the visibility aspect, on the time of observation relative to treatment.

A moderately satisfactory level of control was obtained with treatment 3, when used at a rate equivalent to half the normal copper application per acre. This shows a considerable advance, which possibly results from the use of a more efficient adhesive agent. The short life of the plucking shoot of tea would, however, appear to suggest that improved fungicide adhesion is only a doubtful advantage for tea, and possibly other factors are operating in the efficiency of the formulation. Further, other experiments to be reported in later papers in this series have shown satisfactory control to be obtainable with even greater reduction of copper content, thus further investigation of the actual reasons for the improvement under discussion may prove to be of academic interest only.

The organic copper fungicide used in this experiment did not give control up to the standard of commercially available fungicides, and further work on it is not contemplated.

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Reference

- Webster, B. N. and Park, P. O. (1956)—Developments in blister blight control.
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