

STUDIES IN BLISTER BLIGHT CONTROL

XIV. FURTHER STUDIES ON THE EVALUATION OF SOME COPPER FUNGICIDAL DUSTS IN THE CONTROL OF BLISTER BLIGHT.

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In a recent publication Loos (1) evaluated the efficiency of a number of copper containing fungicidal dusts, applied through the 'Orient' rotary hand duster, in the control of the blister blight disease of tea. Those evaluations indicated that 2 per cent. copper dust formulations, applied at 10 lbs per acre at 5 day intervals, gave indifferent control of the disease. Of the 4 per cent. copper dusts tested Messrs. Universal Crop Protection Ltd.'s 'Cuprosana', applied at 5 lbs per acre at 5 day intervals showed promise of adequate blister blight control under normal monsoonal weather conditions. The degree of protection afforded was, however, inferior to that of spraying with 'Perenox' at 6 ounces per acre at 10 day intervals. Our recommendations, up to the present time, for dusting in the control of blister blight disease of tea have, therefore, been confined to the suggested use of 'Cuprosana' 4 per cent. dust at application rates of 5 lbs per acre at 5 day intervals.

In 1953 we were offered, for test purposes, four proprietary 4 per cent. copper dusts, specially formulated for blister blight control. The results of the tests are described in this article.

The four proprietary copper dust formulations tested were:—

- (1) 'Blidust' manufactured by Messrs. Pest Control Ltd. and supplied through Messrs. Mackwoods Ltd., Colombo.
- (2) 'Perecloud' manufactured by Messrs. Plant Protection Ltd. and supplied through Messrs. Imperial Chemical Industries Ltd., Colombo.
- (3) 'Strawson's Copper Dust' manufactured by Messrs. Strawson Chemical Co. Ltd. and supplied through Messrs. James Finlay & Co. Ltd., Colombo.
- (4) 'C.C.C. Dust'. Origin not disclosed, but supplied through Messrs. Colombo Commercial Company Ltd., Colombo.

The above formulations and 4% "Cuprosana" were applied through the 'Orient' rotary hand duster at 5 lbs per acre at two application intervals of 5 and 10 days. A comparative evaluation of the degree of blister blight protection afforded by the dusts and by wet spraying with 'Perenox', at a concentration of 4 ounces in 10 gallons of water applied at 15 gallons per acre, was made against the incidence of blister on unprotected plots.

Experimental Plots.

I have to record my thanks to the Superintendent of Mattakelle Estate and his Agents, Messrs. Boustead Bros. Ltd., for making available, for experimental purposes, a seven acre block of tea on the Cairness Division of Mattakelle Estate, Talawakelle. The area, which was the site of the 1951 dust evaluation trials, was a field in its first year from pruning. Seven half-acre plots ($300 \times 72\frac{1}{2}$ ft) were fenced leaving 20 feet bands of tea between the plots. These bands, which served as guard bands between treated plots, and the considerable amount of tea above and below the plots were left unprotected throughout the experiment. This, while permitting an undisturbed build up of blister blight around the experimental plots, provided conditions favourable to the assessment of the fungicidal value of the products under test. The test was undoubtedly a severe one, but it should be borne in mind that adequate control, under conditions where blister blight spores are present continually and in considerable numbers, gives promise of a proportionately higher degree of efficiency under conditions less favourable to the disease.

Dusting by means of the 'Orient' rotary hand duster was done across 18 feet bands, either along or across the rectangular plots in accordance with wind direction at the time of dusting. Every effort was made to give the plots as even a cover as possible.

Experimental Results

The experiment commenced on June 10th. 1953, and ceased on September 30th. 1953. The entire experimental block, at the commencement of the trials, was free of blisters following the long drought from May to early June, during which period only 0.48 inches of rain fell over 34 days. Blister evaluations were made inside a band 18 feet wide in the centre of the plots to avoid any possible doubt of mixed dust contamination and, hence, enhanced control. The most severe attack of blister blight was observed during the second week of September when the unprotected plot showed numerous infections on leaves and die-back of plucking shoots following stem infections.

Observations were made on September 15th (Table I) using a scale of ascending numbers 0 - 6 to assess the degree of infections on leaves and as die-back of plucking shoots. Those two figures were then averaged and matched against an arbitrary scale of descriptive terms such as poor, good, fair, etc.

The two scales show therefore:—

- A — Values of blister infections (leaf infections and die-back of plucking shoots).
- B — Arbitrary descriptive scale of the degree of protection afforded by the particular treatment (dust, wet spray or unprotected).

Table I. *Comparative trials with 4 per cent copper fungicidal dusts in the control of blister blight on Mattakelle Estate.*

A. Key to figure assessments:—

- 0 = No infection.
- 1 = Slight infection on leaves.
- 2 = Fairly heavy infection on leaves.
- 3 = Very heavy infection on leaves.
- 4 = Die-back light.
- 5 = Die-back severe.
- 6 = Total loss of plucking shoots.

B. Key to arbitrary scale of protection based on averages of figure assessment :—

- 0 - 1 = Excellent
 1 = Very Good.
 1 - 2 = Good.
 2 = Fairly Good.
 2 - 3 = Very fair.
 3 = Fair
 3 - 4 = Indifferent.
 4 = Poor.
 More than 4 = Very Poor.

Assessment on 15th September, 1953.

Formulation	Treatment	Assessment	Average	Arbitrary Assessment
Blidust	5 lbs. every 5 days	2 - 1	1.5	Good
Cuprosana	5 lbs. every 5 days	2 - 4	3.0	Fair
Strawson's Copper dust	5 lbs. every 5 days	2 - 4	3.0	Fair
C.C.C. Dust	5 lbs. every 5 days	2 - 4	3.0	Fair
Perecloud	5 lbs. every 5 days	2 - 1	1.5	Good
Blidust	5 lbs. every 10 days	2 - 4	3.0	Fair
Cuprosana	5 lbs. every 10 days	3 - 5	4.0	Poor
Strawson's Copper Dust	5 lbs. every 10 days	3 - 5	4.0	Poor
C.C.C. Dust	5 lbs. every 10 days	2 - 5	3.5	Indifferent
Perecloud	5 lbs. every 10 days	2 - 4	3.0	Fair
Perenox	6 ounces per acre as spray at 10 day intervals	0 - 1	0.5	Excellent
Unprotected		3 - 5	4.0	Poor

Discussion

In the arbitrary scale of descriptive terms an attempt has been made to fix what may be considered "adequate" protection. Protection classed below fair should be considered as not worthwhile or uneconomic. All dust formulations used in this experiment may, therefore, be considered to have given adequate protection against blister blight at application rates of 5 lbs. dust per acre at 5 day intervals; while two of the formulations 'Blidust' and "Perecloud" gave control superior to that of the other formulations.

'Blidust' and 'Perecloud' proved to be the most efficient of the dusts tested at application rates of 5 lbs. per acre at 10 day intervals while 'Cuprosana', 'C.C.C. Dust' and 'Strawson's Copper Dust' have to be considered as not worthwhile or uneconomic at that application rate and interval. Spray protection on the other hand may be considered as ideal protection giving almost total control of the disease with applications of 4 ounces in 10 gallons water at 15 gallons per acre every 10 days.

Reference

- (1) Loos, C. A.—Studies in blister blight control. X. Evaluations of some copper containing fungicidal dusts in the control of blister blight disease of tea. "Tea Quarterly", Vol. XXIII. Part 1, March 1952, pp. 6 - 11