

DEVELOPMENTS IN BLISTER BLIGHT CONTROL

III. DUSTING TRIALS IN 1955, USING 4% COPPER BLENDED DUSTS

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Of the three dusting trials carried out by the writers during 1955 one was on St. Coombs estate and two on Mattakelle estate. That on St. Coombs was designed to use 4% blended copper dusts manufactured with locally produced fillers. The use of locally produced copper dusts is standard practice in Java and Sumatra, and has contributed substantially to the maintenance of relatively low crop protection costs in those countries and all the three locally produced fillers are available in sufficient quantity to make local production of blended copper dusts an economic possibility. Two commercially available 4% copper dusts and one specially prepared 3% dust were also included in the trial.

St. Coombs No. 2 field experiment

- OBJECTS:—
1. To compare the efficiency of a 4% blended dust and a 4% coated dust in the control of blister blight. Although this constituted a departure from stated policy the information was required for the setting up of standards in subsequent trials.
 2. To assess the efficiency of three new 4% coated dusts, based on copper oxychloride blended with locally produced fillers (arbitrarily numbered 1, 2 and 3), by comparison with two commercially available 4% copper dusts, one a blended dust, and the other a coated dust.
 3. To ascertain whether a reduction in copper content, and a consequent saving, can be achieved without loss of control, by the dilution of a 6% coated dust with its own weight of filler.

LAYOUT:—St. Coombs No. 2 field, pruned in June 1954, was the area chosen for this experiment, being divided into 5 blocks (A to E), each subdivided into six plots of approximately 1/5 acre. The regular shape of the field enabled almost all the plots to be laid out as rectangles of 20 × 30 bushes, thus enabling the random number sampling technique to be employed (Webster and Park, 1956). Guard rows of two bushes in width were retained between all the plots.

Three irregularly shaped plots were left untreated, whilst the six treatments were randomised within the five blocks.

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TREATMENTS

1. Blended dust, filler No. 1 (4% copper) 5 lbs/acre every 6 days.
2. Blended dust, filler No. 2 (4% copper) 5 lbs/acre every 6 days.
3. Blended dust, filler No. 3 (4% copper) 5 lbs/acre every 6 days.
4. 'Blidust' 6% copper (F.P.C. Ltd.), diluted 50/50 with filler, 5 lbs./acre every 6 days.
5. 'Blidust' 4% copper (F.P.C. Ltd.), 5 lbs./acre every 6 days.
6. 'Cuprosana' 4% copper (Universal Crop Protection, Ltd.) 5 lbs/acre every 6 days.

Dusting was carried out in 6 day rounds on the day following estate plucking, commencing on 11th May and continuing until 20th September. Dusting of the experimental plots was carried out using the 'Orient' hand dusting machine, whilst the balance of the field was protected with 'Cuprosana' dust applied by means of the 'Kestrel' hand duster which was undergoing test.

Results:—1. **TAINT TESTS:**—Leaf from all plots receiving the new formulations was taint tested throughout the course of the experiment, with negative results.

2. Results of treatments were assessed by the method previously described (Webster and Park, 1956), the choice of bushes being made by the random number method, ten bushes per plot being plucked. Assessments were made on the day before, or the day of plucking, in every other plucking round, and expressed as total blisters on 100 third leaves, and percentage of shoots with infected third leaves. The mean results for the six treatments during the season are shown in figure 1. For an explanation of the significance of the diagrams reference should be made to paper II of this series (Park, Webster and Jennings, 1956).

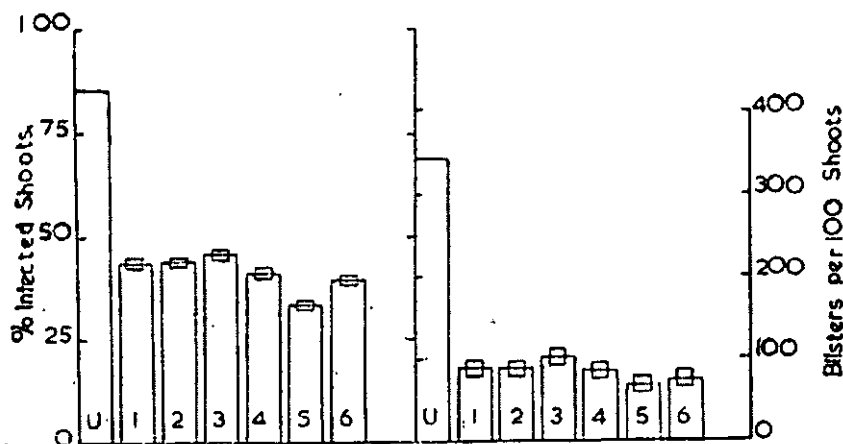


Fig. 1. Block diagrams representing the comparative degree of control gained with treatment 1 — 6. U = Untreated. The small blocks represent the standard errors at 5% level.

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

1. That the three new blended dusts afforded satisfactory protection from blister blight.

2. That, under the conditions of the experiment, the performance of the coated dust (Blidust 4%) was significantly better than that of the three new blended dusts, but only significantly better than Cuprosana and the Blidust 6% diluted 50/50 when the percentage of infected shoots was chosen as the criterion of assessment. Similarly it is only on this criterion that the standard blended dust, Cuprosana, was significantly superior to the new blended dusts; the differences are not significant on the other assessment method.

3. That Blidust 6% diluted 50/50, *i.e.* to 3% copper content, afforded protection equivalent to that of the standard 4% blended dusts. On the criterion of percentage of infected shoots, it was somewhat superior to the new blended dusts, but not when the number of blisters per 100 shoots is the assessment criterion.

Discussion:—As previously mentioned in paper II of this series (Park, Webster and Jennings, 1956) the initial assessments made during the first month of the monsoon showed an extremely high incidence of blister blight but, as weather conditions began to show a slight improvement, all the treatments used in this experiment showed themselves capable of maintaining an adequate level of control. Blidust 4% maintained throughout a slight superiority over the other treatments, when assessment was made on percentage of infected shoots present, but, when made otherwise (*i.e.* on total blisters per 100 third leaves), Blidust 4%, Cuprosana and Blidust diluted to 3% gave equivalent results.

The three new dusts gave a satisfactory performance with the Orient duster, and very little trouble was experienced with any of the dusts. Blidust 4% showed an occasional tendency to collect in the inlet tube of the Orient duster, under the hopper outlet, but it is believed that this trouble may be corrected by constricting the inlet tube at this point, thus creating a Venturi effect. The Kestrel hand duster performed very satisfactorily, and has been reported on elsewhere.

Conclusions:—It has been satisfactorily demonstrated that blended copper dusts for the control of blister blight, manufactured from locally produced materials, are capable of achieving an adequate degree of control.

Mattakelle No. 7 field experiment

OBJECTS:—1. To compare the efficiency of a coated dust at two intervals of application.

2. To compare the efficiency of dusting with a coated dust, and spraying with a recognised copper oxychloride, at the same intervals of application.

LAYOUT:—Mattakelle No. 7 field, pruned in June 1953, was selected for this experiment and was divided into 1/5 acre plots, grouped in blocks of either 4 or 5 per block. The treatments listed here were part of a larger experiment to be reported later, and were randomly distributed in 4/5 fold replication over the whole field. Guard rows of two bushes were retained between plots. The balance of the field was protected with a commercially available copper oxychloride except for four untreated areas. Statistical analysis of the part experiment is not possible, and thus only the mean assessments of blister level for the period of the experiment are plotted in the block diagrams. In order to fit in with estate plucking rounds, the intervals between applications had occasionally to be modified by ± 1 day but an average frequency of spraying or dusting as shown below was maintained.

TREATMENTS

1. 'Blitox' (F.P.C. Ltd.) copper oxychloride fungicide (50% Cu) sprayed at 6 ozs./15 gallons/acre 8 daily.

2. 'Blidust' (F.P.C.Ltd.) 4% coated dust applied at 5 lbs/acre 6 daily.
3. 'Blidust' (F.P.C. Ltd.) 4% coated dust applied at 5 lbs/acre 8 daily.

Results:—The method of assessment of blister blight control was as described in paper I of this series (Webster and Park, 1956), using the stick throwing method for selection of the bush. The mean results for the last 13 assessments out of the 15 made are given in figure 2.

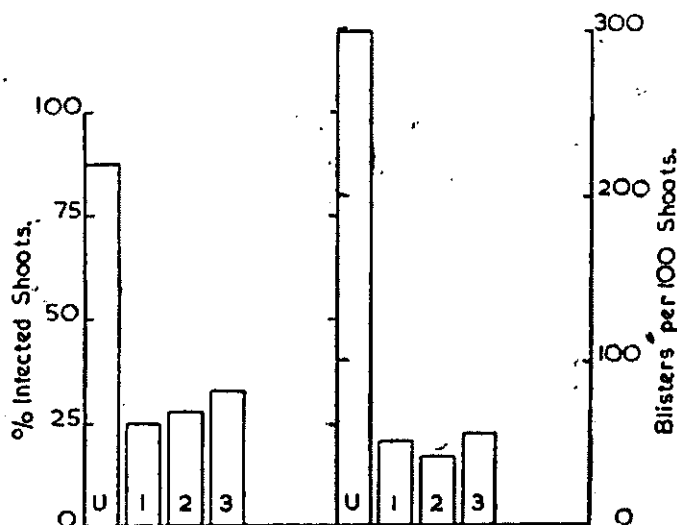


Fig. 2. Block diagrams representing the comparative degree of control gained with treatments 1 — 3. U = Untreated.

Discussion and conclusions:—As mentioned above, statistical analysis is not possible; however it can be seen from the diagrams that 6 and 8 daily applications of a coated dust are almost equally effective. Spraying, and dusting with a coated dust, at the recommended time intervals of 8 and 6 days respectively are equally effective and at equal intervals are almost equally satisfactory.

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