

ZINC FOLIAR SPRAYS: RECOMMENDATIONS—1966

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Experiments conducted by the authors in three districts on a variety of types of tea and under very different climatic conditions have shown promising yield response to zinc foliar application. Details may be found in the respective Annual Reports for 1964 and 1965. For advisory purposes a summary of the Institute's recommendations may be given at this stage, even though experiments are continuing.

A—Zinc Sulphate

Solutions of zinc sulphate with no wetting agent or other additive, have proved to be very successful in practice and are apparently tolerated by tea foliage of varying maturity at concentrations which would damage many other crops.

Rate per acre

Experiments show that in certain circumstances up to 20 lb of zinc sulphate per annum can give a worthwhile yield response. Twenty pounds may be taken as a firm recommendation, replacing the originally suggested 10 to 15 lb. It is left to the discretion of estates to decide if they wish to use a lower rate, but it should be pointed out that one of the earliest findings (Tolhurst 1962) was that low-jat tea could often respond to zinc sprays even though there was little evidence of the characteristic deficiency symptoms.

Frequency of application

If it is not desired to mix all the zinc sulphate with routine copper sprays, or if it is not possible to put out the full annual dose of zinc in this way, separate applications may be made with the following provisos:

There is experimental evidence to suggest that very frequent application is *not* necessary. For convenience, four applications a year may be suggested for the annual programme.

It would be wise to try to avoid the wettest months for these separate sprays, but it is probably safe to assume that once a spray solution has dried on the leaf it becomes quite resistant to removal by rain.

There is no need to try to avoid spraying in strong sunshine.

Concentration of solution

Many experiments have shown that under varying conditions, a concentration of 1 lb of zinc sulphate in 2 gallons of water is safe to use in practice. Even higher concentrations have been used, with no report of damage to the foliage, but estates must take the risk if they decide to exceed the above rate, which applies equally to separate sprays and to mixtures with copper fungicides.

Volume of solution for separate sprays

This is conditioned by the spraying equipment available, as well as by the size of the individual dose of zinc sulphate. For example, application of 5 lb of zinc sulphate by mist-blower would require 10 gallons of water per acre. Using knapsacks, the same volume could of course be used, but better distribution could be expected from 15 or 20 gallons. There appears to be no need to increase the volume of water above these quantities.

Nurseries and young tea

No special techniques appear to be necessary, but more frequent application to rapidly developing foliage might be advisable. Much of the solution will be wasted when small plants are sprayed. Using the above concentration, one pound in two gallons, a sufficient volume of solution should be applied to give a good cover of droplets on the leaves. Do not waste solution by spraying until the droplets coalesce and start to run off the leaf.

Many clones have been sprayed at various stages of growth, with no report of damage. There is always the possibility that a clone may be found which is hypersensitive, and it may be wise to test-spray on a small area of a newly-selected clone.

Zinc deficiency has been reported frequently in nurseries and young clearings, and there is ample reason to consider zinc spraying as a routine operation.

A warning

If zinc sulphate solution is sprayed on to fern or other shading materials, and the solution then drips on to the tea over a period of a few hours, damage may result as the solution may have reached a high concentration by evaporation.

Clonal mother-bushes

Experiments showed that bushes of many clones were susceptible to damage when run up for cuttings. A mixture of zinc sulphate and copper fungicide was used. The suspension which fell on the under surface of the leaves (as may happen in practice, especially where mist blowers are used) tended to collect in the angles formed by veins and mid-rib. Often thick deposits of the blue reaction product were seen. The leaf was scorched over areas coinciding with these deposits, but no further damage to the leaf or adjoining stem was noted.

B—Zinc oxide

Experiment on St Coombs has shown that, at equivalent zinc rates, the oxide is as effective as the sulphate. Further, that mixing either compound with cuprous oxide fungicidal formulations has no effect on efficiency.

It is probable that in the near future a zinc oxide—copper fungicide mixture will be made in Ceylon, possibly to more than one formula. As soon as possible, the Institute will issue another note suggesting spray programmes. It is probable that supplementary zinc sprays may be required, and this point will be dealt with at the same time.

Zinc oxide is, for practical purposes, insoluble and if it were to be used on its own as a substitute for the sulphate would be treated in the same way as the familiar fungicides; *ie* ensuring that the suspension did not settle out in the mixing tank. Having a greater content of the element zinc, it should be used at about one-third of the rate for zinc sulphate. No damage has resulted from very heavy deposits on the foliage and it appears that the volume of water required to distribute zinc oxide need only be enough to ensure even application.

C—Manufacturing Properties

The only reports which have reached us concerning a possible effect of zinc spraying on manufacturing properties have suggested that it might even be favourable. Although this is unconfirmed, we do not anticipate adverse reports, provided that sprays (of either zinc compound) follow closely on plucking.

Reference

TOLHURST, J. A. H. (1962). Zinc deficiency of tea in Ceylon. *Tea Quart.* **33**: 134-137.