

CONTROL OF SHOT-HOLE BORER (*XYLEBORUS FORNICATUS* EICHH.): EXPERIMENTS IN PROGRESS

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Introduction

Research on the control of this beetle, by using the post-war insecticide dieldrin, was begun by Austin (1953, 1955, 1956), carried on by Baptist (1956, 1956a), and then by myself from 1957. It is not yet possible to make any recommendation arising from the work.

Small-scale experiments done in the past

In 1957-59, I did about twenty small-scale experiments on fifteen estates in the low country and in the mid-country (Judenko 1958, 1960). In these experiments, the lower woody parts of tea in plucking were sprayed at various heights from the ground up to 24 inches. These experiments showed that, *provided the wood was dry at the time of spraying*, good control was achieved at a minimum dosage of 4 pints of "Dieldrex Extra" in about 100 gals. of water per acre (*i.e.* 2,500 bushes), using Horto Sapphire nozzles 0.55. So we are standardising at 6 pints or, since "Dieldrex Extra" contains 20% of actual dieldrin, 1½ lbs. of actual dieldrin per acre. If, however, the wood of the frames is *wet* at the time of spraying, five or ten times as much dieldrin still gives poorer or more variable results.

Experiments in progress

We had to do small-scale trials, in order to be able to do enough of them to determine the minimum dosage; but small plots have the serious disadvantage that immigration of insects over the short distance to the centre of the plot may be very rapid. That is to say, our results on Shot-hole Borer on small plots are likely to be *less good* than on whole fields; but, at the same time, there is likely to be an effect of size of plot on other insects, like Tea Tortrix and its parasite, *Macrocentrus*. Therefore, we had to begin work on large plots. The objects of the new series of large-scale spraying were:—

(a) to follow the change in infestation after spraying, by counting the actual insects at intervals; we want to know how far the infestation recovers and how far it is new and due to invasion; (b) to follow the new damage done by the beetles, by counting galleries in new wood; (c) to investigate the side-effect of dieldrin spraying on Tea Tortrix about which Mr Cranham will speak; and (d) to investigate the effect of the control on the yield of tea. In order to avoid the risk of contaminating tea in plucking, we are now spraying only freshly-pruned tea. In all experiments, tea was sprayed to a height of 12' above the ground level. The pesticide dieldrin is not a very dangerous one, like arsenic or parathion, but neither is it a relatively harmless one like pyrethrum or copper fungicides. We must not get it into the made tea and neither must we endanger the men who spray. I have explained in the

Tea Quarterly (Judenko 1958, 1960) what precautions have been taken. The only addition to them is that the operators are now provided with Kalutara hats. They must, of course, wash carefully when finished, and any insecticide left over should NOT be poured into drains or streams, because it will kill the fish and contaminate the water for many miles.

I have two series of trials going on at present; first, in the Kandy area and second, in Uva and Balangoda.

Experiments carried out in the Kandy area

In the Kandy area, there are medium-scale trials at Hantane, Kirimetiya and Bandarapola. Here, we used high dosages of dieldrin, for we wanted to find the maximum effect on the yield of tea. After 7-9 months, even in unsprayed control plots, there were few beetles; this is not unexpected, because the big population tends to occur after about 18 months. The sprayed plots did, however, have fewer beetles in them.

The time that has passed has, however, been long enough to allow Tea Tortrix to show itself. There were three times as many Tortrix on the sprayed plots as on the controls at Hantane, but no outbreak of Tortrix developed. Since Mr Cranham has shown in trials by estates that outbreaks developed after 50% of dieldrin sprayings, this perhaps may merely mean that I have been lucky.

Because the time since spraying has been too short for Shot-hole Borer to become conspicuous, it would not be surprising if there were no effects on yields of tea yet. On Hantane, for example, in nearly 9 months after pruning and spraying, the sprayed plots have yielded 2% more than the unsprayed, which is insignificant.

On Bandarapola, in a smaller experiment, after 7 months there were hardly any beetles in the control or the sprayed area, and the difference in the yield was somewhat larger, but still insignificant.

On Kirimetiya after 8 months, there were more Shot-hole Borer in the unsprayed control than at Hantane and Bandarapola; the sprayed area had given 13% more crop, but it is still too early to say if this is a fair figure. We expect differences to show by the middle or the end of 1961, but of course, that is what we are trying to discover—are there differences, and when do they occur?

Experiments begun at Uva and Balangoda

These experiments, begun on three estates in September and October, 1960, were done on larger plots—whole fields—so as to give more realistic results, especially regarding Tea Tortrix. The general design was to take a whole field of 30-40 acres, and divide it into four parts. For 7-8 plucking rounds before pruning, the yields for the four parts were weighed separately. After pruning, two opposite quarters were left as controls and the other two were sprayed with dieldrin. Each dieldrin plot was divided approximately into two halves, one of which was to be sprayed with DDT on the foliage to suppress Tortrix.

The following amounts of "Dieldrex Extra" per acre were used in these three experiments. At Queenstown and Demodera, the tea is old and the bush density

is about 2,500 per acre; about 7 pints in 93 gallons of water were used at Queens-town, and about 6½ pints in 103 gallons of water at Demodera. At Ryc, where the tea is young and the bush density is 3,400 per acre, 6 pints of Dieldrex Extra were used in 71 gallons of water per acre.

It has not been possible to carry out the design in full, because of rain, but the experiments are proceeding. These trials are as yet at much too early a stage to tell us much.

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