PRESENT ACTIVITIES IN THE LOW-COUNTRY

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The organisation of the Institute's activities in the low-country has not altered since 1951. The staff consists of :—

(1) A scientific officer, (Mr. T. E. Walter), stationed at Pembroke, who is in charge of advisory and experimental work in the low-country.

(2) An assistant, (Mr. F. P. Jayawardene), who has been provided with an allowance in lieu of quarters.

In addition, Messrs. James Finlay & Company have very kindly made the services of Mr. C. Shanmugam available, for the supervision of the experiments on Galbode Estate.

Before discussing the field experiments, some further comment is necessary on the activities of the staff. In the first place, regarding the advisory work, it is evident that full advantage is not being taken of the facilities provided ; it must be pointed out, however, that the onus for making more use of these facilities obviously lies with the low-country planters themselves, in whose interests the service was made available. I would also take this opportunity of again drawing the attention of low-country planters to the fact that all low-country advisory correspondence should be addressed direct to the Scientific Officer, T.R.I., Pembroke, P.O. Bombuwela, nr. Kalutara.

The field experiments are carried out in liaison with the specialist officers, in whose particular province each experiment comes, and who are responsible for their design ; responsibility for their layout and upkeep devolves on the low-country scientific officer. It is necessary to point out here that a field experiment, which requires accurate recording of data by means of dry weights, occupies at least 2 days every week of an assistant's time, and hence the number of field experiments which it is possible to undertake is very severely limited by the assistant staff available. It must also be clearly pointed out that, (perhaps fortunately !) no single estate exists on which all the problems peculiar to the low-country can be investigated; it is obvious, therefore, that these problems have to be tackled, (by means of field experiments), on the estate in which each one is most prominent ; accordingly it has not been possible to centralise our activities with regard to these investigations.

The following is a summary of the experimental work now in hand :—

(1) A preliminary N.P.K. experiment on Vogan Estate.
(2) A pruning cycle experiment (on which is superimposed a Rhizoctonia control experiment) on Ingiriya Estate.
(3) Vegetative Propagation. Clonal trials with materials selected by low country estates are in progress on Vogan Estate, where 2 blocks of land, (4 acres and 6 acres respectively), have been leased for the purpose. Nursery sites are also available for our use.
(4) A Rhizoctonia control experiment on Galbode Estate.
(5) Shot-hole borer experiments on Galbode Estate.
(6) Shade experiments.

In addition to the above field experiments, the Director is extending his soil survey to low-country districts, with particular reference to the organic matter and nitrogen content at various depths.

An attempt has also been made by the writer to survey the progress made with regard to vegetative propagation on low-country estates.

The present position regarding each of the field experiments, together with their aims and objects, will now be discussed.

(1) N.P.K. Experiment (Vogan Estate).—A preliminary N.P.K. experiment of simple design is now in its second cycle. Previous yield levels of the field in question were just over 500 lb. per acre and the field is in general fairly typical of large areas of low-country tea. Two levels of each of the three main nutrient elements were laid down as a basis for the various combinations—namely, 39 and 78 lb. nitrogen, 18 and 36 lb. phosphoric acid and 24 and 48 lb. potash.

Results to date indicate that increased fertiliser applications do not give a corresponding increase in yields where the yield level is low to start with. This indication is amply supported by evidence obtained on other low-country estates. Following on from this trial, a further more complex experiment has been planned and will shortly be started on another estate, where a flattish area of uniform soil under an even stand of bushes provides the essential requirements for the work.

(2) Pruning Cycle Cum Rhizoctonia Control Experiment. Ingiriya Estate.—The object of this experiment is to determine the optimum engih of pruning cycle :—

(*a*) under normal low-country conditions, and

(*b*) when limitations due to diseases such as Rhizoctonia are eliminated by application of suitable control measures.

Apart from the obvious desirability of increasing yields by running as long a cycle as possible, this question is also linked with that of shot-hole borer control.

Cycle lengths of 1½ years, 2 years, 2½ years and 3 years are laid down for the various plots, and control measures thought to be effective against Rhizoctonia are superimposed on half the plots ; these measures consisted in spraying with Bordeaux mixture shortly after the plots were originally pruned, and again recently when disease symptoms began to appear.

The experiment has been in progress for 2 years and obviously at this stage no conclusive results can be recorded ; my latest observations, however, are as follows :—

(1) Die-back of the young shoots, accompanied by considerable leaf-fall, was evident on all the unpruned plots in May of this year, when heavy and continuous rain was experienced throughout the month.

(2) Yields have not as yet been affected by the die-back. The yields of all the unpruned plots are almost identical.

(3) The control measures referred to (spraying with Bordeaux mixture) have not had any effect on the disease symptoms described.

The inference from this is either that the disease is not in fact Rhizoctonia, or if it is, that Bordeaux mixture is not effective in controlling it. The first supposition is supported by the fact that Rhizoctonia has not been found in any of the isolations attempted by the Mycologist. On the other hand, careful examination of the infected material has so far shown the presence of the following :—

(*a*) White thread blight
(*b*) Red rust (*Cephaleuros parasiticus* Karst).
(*c*) Horse hair blight. (*Marasmius equicrinis*).

Further experiments are, therefore, indicated to show which, if any, of these is in fact the causal organism, and the Mycologist is pursuing this question by means of small scale infection trials on nursery plants.

(3) Vegetative Propagation (Vogan Estate).—Planting up of the 4 acre block has now been virtually completed and this year 4,500 plants were put out representing 30 of the best clones in our collection.

It was laid down originally that this 4 acre block should be used purely as a multiplication plot, from which cuttings of the most promising clones would be taken for further trials. No yield records are, therefore, available from this area, but a comparative assessment has recently been made of about 150 of the 200 old clones represented—based on their general vigour of growth and branching characteristics. In these observations the term 'outstanding' was applied to 27 of the clones, while about 14 others were considered to be 'very good', and certainly worthy of further trial ; about 66 of the clones showed only moderate or poor growth, which fact merely serves to emphasise the need for careful selection of mother bushes followed by small scale trials before large scale planting is attempted.

A feature of this area is the enormous variation in growth between the various clones. This is not surprising in view of the great difference in the degree of selectivity which had been applied previously on the estates from which they came. Thus 72 of the clones are from an original field selection of apparently outstanding mother bushes—of which about 5 turned out to be comparable to others listed as 'outstanding' and about 10 'very good'. On the other hand 17 of the clones (from 3 estates) represent the final product of a process of selection, which has been in progress on these estates since as long ago as 1938, involving trials with some 1,500 clones. Obviously, therefore, there is some first-class material in the collection and, though yield figures in respect of individual clones are not available as far as is known, one estate reports that a yield of 2300 lb. per acre has been obtained in the 3rd year of plucking from an area containing 3 of the clones referred to as 'outstanding'. This figure is based on the yield from 615 bushes, and is calculated for a stand of 5,000 bushes per acre.

It will be readily seen from this that no 'final' stage has been reached with these clonal trials, and further trials with the best available material, (which has now been selected), are necessary before their use on a large scale can be recommended ; it should also be pointed out that the present clones were supplied to us on condition that they would not be made available for general distribution, without the prior consent of the estates concerned.

In view of the importance of V.P. work to low-country estates in their future replanting programmes, there is an obvious case for a considerable expansion of our activities in this direction. For this purpose a further clonal trial area—preferably in a district where the soil and climatic conditons are somewhat more favourable for V.P. work—is essential. It should also be borne in mind that experience has shown that clones do not necessarily reproduce the form shown in their own evironment when grown in a locality with a different climate. The latest developments in nursery irrigation technique also need to be tested under low-country conditions, for which purpose an area with a good supply of running water will be essential.

Nursery work is of course, proceeding, and at the moment there are some 18,500 cuttings in the nurseries from 36 clones. Small scale trials with a new type of nursery shading, using a 'pandal' of open weave coir matting, have been highly successful ; at the moment it appears that 1/4 inch mesh weave is the most satsifactory for low-country conditions, (at least in the early stages), but further trials with other meshes are necessary before this particular gauge can be finally recommended.

(4) Rhizoctonia Control Experiment. (Galbode Estate). This experiment was laid down in an area where the symptoms of die-back and leaf-fall, (previously attributed to Rhizoctonia), are prevalent. These disease symptoms are particularly evident towards the end of the second year of the pruning cycle, and limit the length of the cycle which it is feasible to run to 2 years.

The experimental plots are, therefore, designed to run for 3 years, and the following treatments are being given :—

(1) Spraying with Perenox every 3 months.
(2) Spraying with Bordeaux mixture every 3 months.
(3) Thatching of the soil with Guatemala grass, or paddy straw, every 3 months.
(4) Weekly removal of diseased leaves.
(5) Control.
(6) High tipping (10').

This experiment has now run for 2 years, and again no conclusive results can be given ; sufficient evidence is, however, available from yield records and disease incidence to be able to report the following :—

(*a*) There is a close correlation between yields and disease incidence.
(*b*) Disease incidence is considerably less in treatments (3) and (4) (thatching and weekly removal of diseased leaves).
(*c*) Other treatments show no effect.

(5) Shot-Hole Borer Experiments (Galbode Estate).—The experiments now in progress were planned as a result of a series of preliminary observations and experiments made by Mr. Austin during a stay of 6 months on Hapugastenne Estate in 1952, when comparative trials were carried out with a number of insecticides on Galbode Estate. The present experiments are designed to give accurate information as to the degree of control that can be achieved in new clearings by spraying with the most promising insecticide, yet tried, viz: Dieldrex.

These experiments were laid down in a 1949/50 new clearing, and have now been in progress for a year. The treatments given, and the results achieved so far, are as follows :—

(*a*) A loss of crop experiment in which the plots are sprayed with Dieldrex at intervals of 10 days to eliminate shot-hole borer.

The latest examination, (the 8th), carried out just before the plots were pruned in August of this year, revealed the presence of only one affected branch with 2 galleries in the 25 bushes examined in the sprayed plots ; in the control plots (unsprayed) there were 20 affected branches with 61 galleries in 25 bushes.

(*b*) Another experiment in the same clearing is designed to determine the amount of control which can be achieved by spraying with Dieldrex at intervals of 6 weeks, 12 weeks and 18 weeks. Each of these areas is one acre in extent.

A recent examination of 40 bushes in each plot revealed the following :—

(i) Sprayed at 6 weeks interval : incidence of borer nil.
(ii) ,, ,, 12 ,, ,, : 1 branch affected, containing 1 gallery.
(iii) ,, ,, 18 ,, ,, : 60 branches, in 28 bushes affected, containing 121 galleries.

These experiments are continuing and provision has been made for periodical dissections as necessary.

In addition a number of detailed dissections have been made in a 1947/48 new clearing to show the association between shot-hole borer and die-back.

(6) Shade Experiments (Galbode Estate).—The object of these experiments is to investigate the effects of *Albizzia moluccana* as a shade tree in the high rainfall districts of the low-country, where its extremely rapid growth causes apprehension that it may be having an adverse effect on yields. Its effects, under varying rotations, will be compared with Grevillea.

These experiments were started in 1953, and the layout which has now been completed is as follows :—

(1) A 20 acre field of tea in bearing was divided into two halves and the yields of each recorded. A process of gradual elimination of the albizzias was later put in hand over the whole area ; on one half the albizzias were replaced with grevilleas, and on the other half albizzias were replanted. Yield records of the 2 areas are, of course, continuing and, by the time the albizzias are fully grown, a preliminary comparison can be made.

(2) A new clearing of 10 acres was chosen and divided into four approximately equal plots. Gliricidias had been planted in alternate lines on all the plots, and the shade tree layout in the intervening lines was modified as follows :—

(*a*) Grevilleas only.
(*b*) Albizzias + Grevilleas (in the same lines at double normal density).

The albizzias will be cut out after 4 years, (by which time the grevilleas will be sufficiently well grown to ' take over ').

(*c*) Albizzias only on a 6 year rotation.
(*d*) „ „ „ 8 „ „