

INSECT PESTS AND REPLANTING OF TEA

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The importance of insect damage in new planting is especially significant because at the stage of early vegetative growth, when the plant is in the process of establishing itself, a set-back, as may be caused by insect injury, may lead to a permanent stunting of the plant, which in turn may have serious consequences on subsequent yield. On the other hand, optimum cultural conditions generally make actively growing plants withstand insect attack without being seriously set-back thereby, and the provision of such conditions is an important, indirect method of economically controlling insect injury.

Insect pests that may be met with in replanting are numerous and varied, but only a few are of any importance. The earliest pests one comes across are those present in the soil. These are white grubs, cut worms and termites.

The root-eating white grub is the larval stage of a cockchafer beetle, the commonest ones on tea estates being species of *Anomala*. The adult beetles feed on *Albizzia* and other trees, but lay their eggs amongst grasses. On hatching out these grubs feed on the roots of the grasses but do not generally cause any noticeable symptoms. When the grass is replaced by tea or other plant the grubs migrate from the dying grass roots to the roots of these plants and by their feeding quickly bring about their death.

Control can be effected in two ways:—

(a) Culturally, by a thorough cultivation or forking of the soil done prior to planting so that all grubs are removed or exposed. All undecomposed vegetable matter in the soil is also removed at the same time and the ground left fallow for 4-6 weeks.

(b) Chemically, by an application of a soil insecticide made just prior to planting, so as to destroy all grubs present on the original grass roots. The most effective insecticides which can be used for this purpose are chlordane and aldrin.

Cutworms are caterpillars which hide in the soil during the day coming out at night to feed on young seedlings or tender plants which they cut off at ground level. As the plant gets older and harder they are not able to cause any damage and are, therefore, pests only in the early seedling or nursery stage. They can be controlled by the application of soil insecticides as recommended for white grub.

Termites frequently found in new clearings are of the scavenging type having often been attracted by the roots or stumps of dead trees. Their importance lies in the fact that they destroy the material or thatch laid down to cover the soil and in some cases the seed when it is planted *in situ*, or any dead tissue on the plant. They are not normally primary pests and do not attack healthy, living plants. Digging up or destroying evident termite mounds and removal of dead wood normally eliminates such termites: so does the application of soil insecticides. The resting of the area under a fresh crop like Guatemala grass, as already advocated by Mr. Webster and Mr. Loos for eliminating soil borne diseases, can also serve indirectly to eliminate the termites in the locality.

A common pest of new plantations is the red borer, a stem-boring caterpillar which lives and feeds inside the stem, tunneling through it and causing eventually the wilting and death of the plant or the branch affected. The frass of the caterpillar is often extruded through a hole in the stem and may be evident long before

wilting occurs. Control is effected by regular, periodic examination of the plants for the removal and destruction of the borer.

Another very important pest factor in tea cultivation, though not an appreciable factor in new clearings, is that of mites, the most important of which are the yellow and scarlet mites. They have appeared in the past from time to time without being very serious, but recently they appear to have persisted for very long periods in certain areas, causing very serious defoliation and loss of crop. The reason for this is still not clear, but it is likely that it is due to a combination of various factors. Heavy infestation of shade trees, especially *Grevillea* and *Albizzia*, by scarlet mite, has further complicated the position with regard to the control of this mite. Sulphur as a spray or dust is still the most effective acaricide but it has a great disadvantage in its strong tainting properties, which necessitate the discarding of crop for a period of 3-4 weeks after application. Other acaricides which cause less tainting are, therefore, being tried out and of these chlorobenzilate appears to be promising for use against scarlet mite.

The shot-hole borer (*Xyleborus fornicatus* Eich.) is the most important pest factor which one has to deal with in tea cultivation. This insect has been said to cause die-back of branches, poor development of frame, increase in susceptibility to wood rot; great reduction in yield and by some observers even death of the bush especially after pruning. Other factors can also bring about very similar effects, but wherever these effects are most severe, shot-hole borer incidence is also very high. In such cases the shot-hole borer has been considered to be the key which locks the door to the normal recovery of the bush or improvement in the yield of the crop. In new clearings its effect is perhaps not so conspicuous, but it may occur after the second year in quite appreciable numbers. When it does it brings about a set-back in the initial development of the bush which may have serious consequences on subsequent yields.

Work done in the past on this pest, which has been largely confined to the Uva district, has shewn that a lengthening of the pruning cycle to 3 or more years, coupled with adequate manuring, has greatly minimised the amount of damage caused. In most districts in which these cultural methods are practicable, and where they have in fact been given effect to, the set-back to development or yield on account of the pest is negligible. In other areas such cultural measures have not been practicable or effective.

A parallel line of investigation is the physiological one, namely that of plant resistance or immunity of the plant to attack by the pest. Some difference in susceptibility in various clones has been noticed and this line of investigation will also receive attention.

Attention has also been paid to the biological control aspect, namely, the search for parasites or predators of the pest, but nothing promising has yet been found.

In the past year or so, we have begun to explore the possibility of using insecticides to control this pest and this may turn out to be a practicable line of action in new clearings and perhaps even in areas with short pruning cycles. Most modern insecticides have been tested against the shot-hole borer and many, including D.D.T., benzene hexachloride, aldrin, dieldrin, have been found to be effective in killing shot-hole borer on direct application to infested branches. Routine, repeated applications, throughout the cycle, however, as is at present necessary to give appreciable control, are neither easy to effect nor appear likely to be economically feasible. Much work has, therefore, still to be done before definite recommendations on insecticidal control can be made. Further, it has to be remembered that insecticides are a two-edged sword and however effective they may be in killing the pest in question, they have also to be carefully investigated from the point of view of upsetting the biological balance by the simultaneous destruction of beneficial parasites, which may release some other pest factor hitherto under proper control.

My appointment, as Entomologist, to the Institute, is closely connected with the urgent need for intensive work towards solving the problem of shot-hole borer, which will be my major task, with the mite problem forming a not unimportant second.