THE DESTRUCTION OF ANT-HILLS

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"WHAT shall I do to rid my garden of ant-hills ?"—is a question often asked. This has been a problem to many an agriculturist and nurseryman, because of the durability of the mounds these termites build. This problem is more serious on neglected properties than on well-cultivated lands.

"Ant-hills" are earth mounds made of the excavations of termites, often erroneously but more descriptively called "white ants" or "wood ants," probably because of their gregarious habits and comparable size. Termites live in colonies, are not pleasant insects and account for much destruction. Many people refer to them as if there was only one species or as if their habits were practically the same. Actually termites are classified into different groups with various species within each group. To enter into a catalogue of details characterising the different groups and species is unnecessary for the purpose of this article.

The kind of termite under consideration infests the ground and belongs to the group commonly known as mound-building termites. These build their mounds from below, to various heights above the surface of the ground with earth, bound together by salivary secretions. A colony of termites is generally ruled by a single royal family, with various castes principally soldiers and workers, working in close co-operation. The queen is of enormous size; she lays the eggs for the whole colony and produces a vast number of nymphs or young ones, many of which subsequently take to flight and establish fresh colonies elsewhere.

A mound consists of an irregular honeycomb of chambers connected by tunnels. Some of these chambers are filled with coral-like "nests" of decomposed organic material in which the eggs are deposited.

Some mounds are completely enclosed but others are exposed and exhibit the honeycomb nature of the mound. Looking inside, one can see the termites, like grains of rice, moving slowly to and fro, much more slowly than ordinary ants.

A preliminary survey of such termitaria was carried out in and around the estate at Bandiripuwa with a view to study their effect on a coconut field. The investigations revealed the following observations :—

(1) The majority of "ant-hills" were either very near to, if not at the base of a coconut palm or were situated in close proximity to the roots.

(2) The roots enveloped by a termitarium are in an environment and under conditions different from the rest of the root system. These roots are tightly surrounded by a relatively harder and more compact mass of soil. Roots which project into the chambers have only a short life owing to unfavourable conditions. The penetration of young roots into the hard mass especially during the height of drought more usually results in damage to the growing points.

(3) The structure of the older coconut root is such that it can stand a fairly high longitudinal pull, *i.e.*, a strain along its length, but it is not able to sustain much lateral pressure, as it readily splits. This will explain why fractured roots are found in a mound which has shrunk during a drought, thus causing the death of a part of the root system of the palm.

(4) The free ends of a fair number of the several hundreds of the older roots in a coconut palm are either dead or dried up, as these are short-lived, branching taking place at a point further away which is living. The dead roots so produced are attacked and broken down by the termites.

(5) It is interesting to note that the red outer covering (sclerenchymatous tissue) and the hard central core (conducting system) of the root usually remain intact but the soft white tissue is either completely devoured or removed.

The root system of a coconut palm.

"..... The earth sets like concrete and holds the major roots in a vice-like grip....."

Methods of Control

There are various views regarding the best method of control of underground termites. It is generally felt that digging up the queen and destroying her, exterminates the rest of the colony, but this really would only be a temporary measure since the rest of the colony can adopt a new queen or queens elsewhere, if not at the same place. The destruction of the whole colony is therefore essential in effecting complete and permanent eradication. For this purpose different field methods which included the use of insecticides, fumigants, " gassing " and dynamiting have been tried. A few were successful, some were only partially effective, and the remainder were totally ineffective. Those recommended, therefore, cover either the relatively less poisonous and more economical ones as against the not easily available and poisonous compounds like Paris Green which contain Arsenic and are dangerous to both plant and animal life.

The use of petrol in termite control is fairly well-known. Its action is to clog the breathing channels and to suffocate the termites to death. It effectively kills all the termites within a short time but as it vapourises quickly it does not remain in the soil for long.

Naphthalene is a substance from which " moth balls " are made and these may be purchased in most shops. It is not quite satisfactory when used alone but when dissolved in a mixture of petrol and kerosene it has been found a cheap and effective insecticide for the control of white ants, because the odour of naphthalene remains in the soil long after the application.

In 1915 A.B. Druckett of the Bureau of Entomology first demonstrated the use of Paradichlorobenzene, sold under various trade names—Paradi, Paracide, Crystal glass, Dichlorocide, etc., as a commercial insecticide. This has also been found to be very effective against termites and gives a high degree of permanence. It is, however, not so easily available as naphthalene and is more costly.

" Cymag," a commercial insecticide and fumigant, was not found to be effective in the control of " white-ants " and its use is therefore not recommended. Chlorination by the use of a bleaching powder and the addition of water was only partially effective because of the insufficient amount of gas evolved.

Gammexane D 025, and various other solutions and emulsions did not give any satisfactory and noteworthy results.

Methods of Application

The application of the above substances is quite simple. A mound can be treated as it is or after breaking it down to ground level. In the former case the quantity of substance required would be about double if not more. Levelling the mound, prior to treatment, is therefore advocated. In either case holes about the size of a crowbar are made in the mounds at a distance about 6 inches apart together with a row of holes, just outside it, at approximately the same distance. The number of holes required depends on the size of the mound and the holes should be deep enough to reach the bottom of the mound. A fair number of termites are carried away during the process of levelling the mound. These should be destroyed by burning a few dried fronds over them.

1 oz. of petrol or 1/3 oz. of Paracide or 1 oz. of Naphthalene in solution, is next put into each of the holes, after which the mouths are plugged with balls of clay prepared from broken mounds.

The solution of Naphthalene is made up in the following proportion :—

Naphthalene	15	balls
Petrol	½	bot.
Kerosene	1	bot.

All these substances can be used at any time during the year, but the best time for breaking down the mounds is during the wet season when the work would be easier.

Another method of control without the use of chemicals is possible with the onset of heavy rains. In this method the mound is levelled and scooped out to about 6" below ground level and a number of holes bored in it by means of a crowbar. Two or three channels each a few feet long are next cut to radiate into it. The water thus drained in will enter the galleries and flood them, and so asphyxiate the termites to death.