NEMATODE PROBLEMS IN YOUNG TEA

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Today, the eelworm problem is not so severe or of such grave concern in old seedling tea as it is in new clearings. The decline of old infested tea fields, is in my opinion, due to a general physiological weakening of the old tea, mainly as a result of ageing and other contributory factors such as, soil erosion, poor cultural practices, *etc*, when the balance gets tipped in favour of eelworms. Figure 1 shows a badly-infested seedling field where such decline has occurred.

We should not forget the fact that the tea in such instances has been living with the eelworms over several decades and that the worms were not suddenly introduced into these fields. In a case like that shown in Figure 1 there is little doubt that the balance has been shifted in favour of the eelworms. One heartening fact, however, is that most of the old tea fields that are heavily infested and yielding poorly, are those that are now being included in the replanting scheme. In cases where all fields are simultaneously affected badly there is little sense in drawing up an economic replanting programme ; here it is time one thought of something else other than tea ! Fortunately, such instances are very rare.

The problem that is of immediate concern is the outbreak of infestations in new clearings. When a field is to be replanted, there are three major operations involved: (*a*) Uprooting of the old tea, (*b*) Rehabilitation - during which period, there is a decline in eelworm numbers and (*c*) Replanting with uninfested resistant clonal material.

Reinfestations in new clearings could be minimized, if not prevented altogether, if these three steps are carried out effectively. It is a pity, that in spite of these measures of control being well within our reach, some of us fail to exploit them to the maximum. Figure 2 shows old tea roots dug out from a " rehabilitated " tea field. When an old tea field is to be uprooted, we always recommend the use of winches wherever possible, followed by deep forking and removal of all tea roots up to about the thickness of a pencil (about 0.3 inch). The main idea is to remove as many of the old infested roots as is practicable. If the uprooting had been unsatisfactory, old infested tea roots could be left behind and these would continue to serve as a potential inoculum for the new material coming in. No matter how clean the transplanted material is, it would subsequently get infested.

Figure 3 shows tea being uprooted with a tractor-operated winch.

During rehabilitation, when land is left under Guatemala Grass for periods ranging from 1½ to 2 years, the eelworm population in that area is certainly not fully eradicated, *ie* the eelworms do not get eliminated completely ; all that happens is

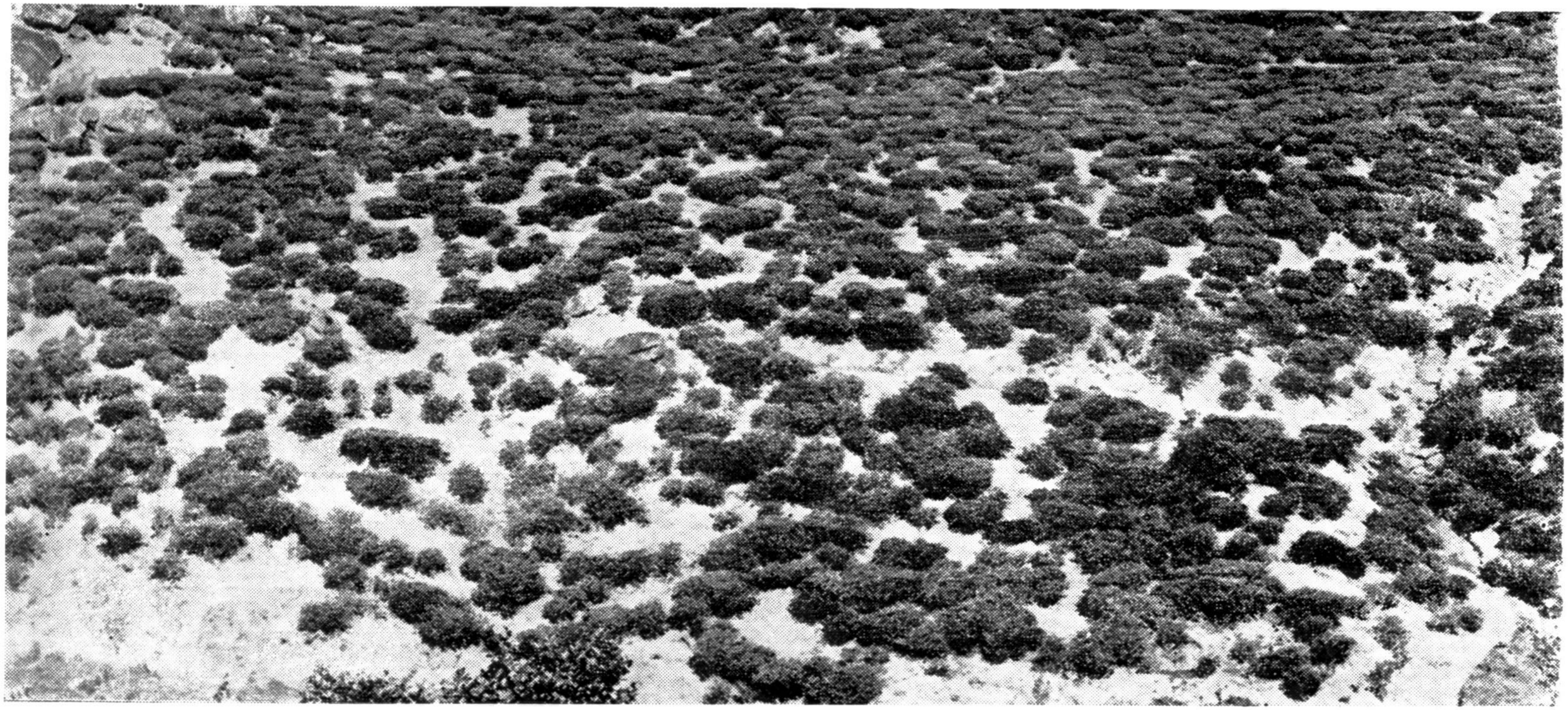

FIGURE 1 — *A poor seedling tea field where the bushes have declined because of various factors*

FIGURE 2 — *A mass of tea roots dug out from a field that was supposed to be "rehabilitated"*

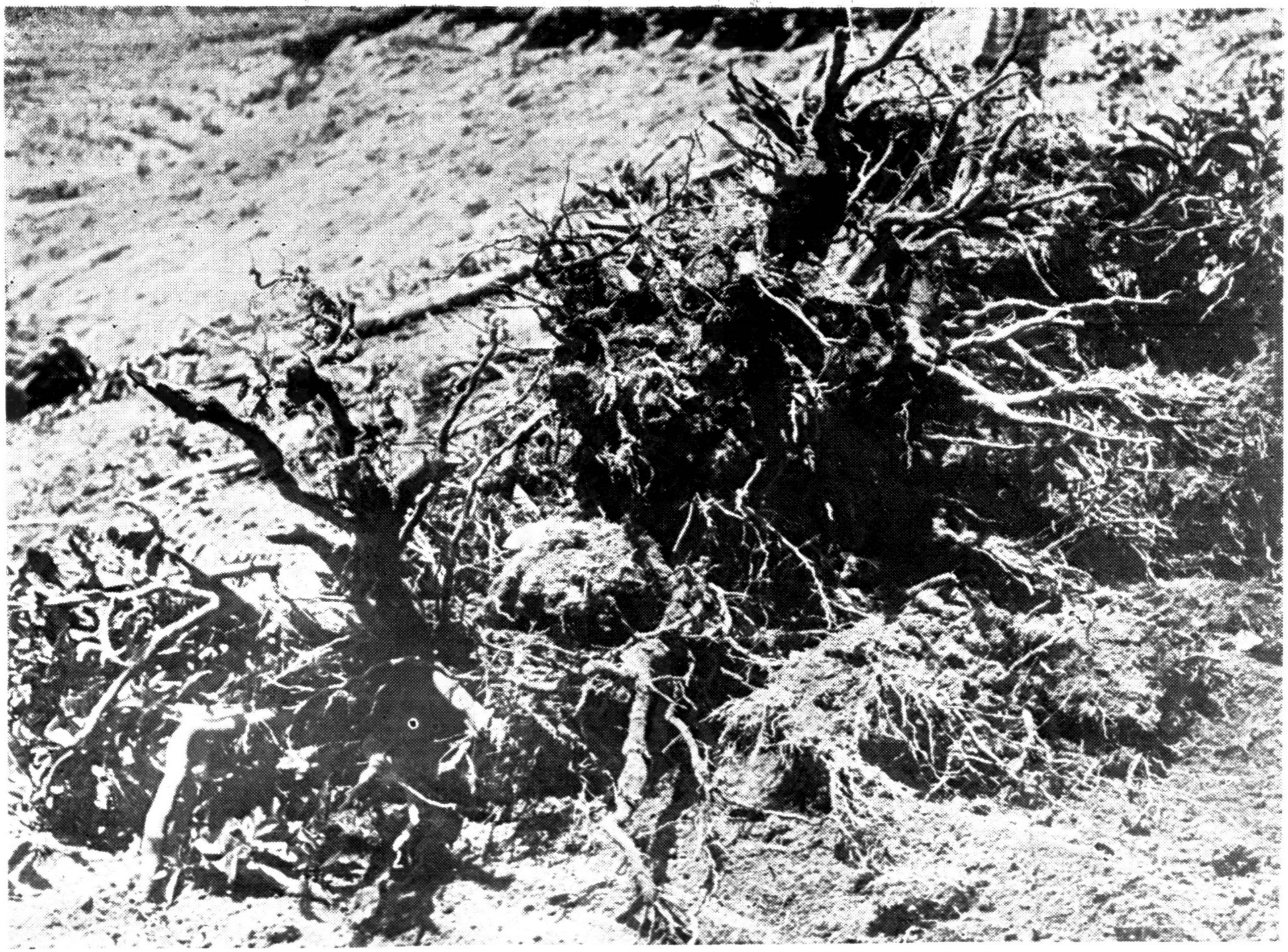

FIGURE 3 — *Tea uprooted by a tractor - operated winch*

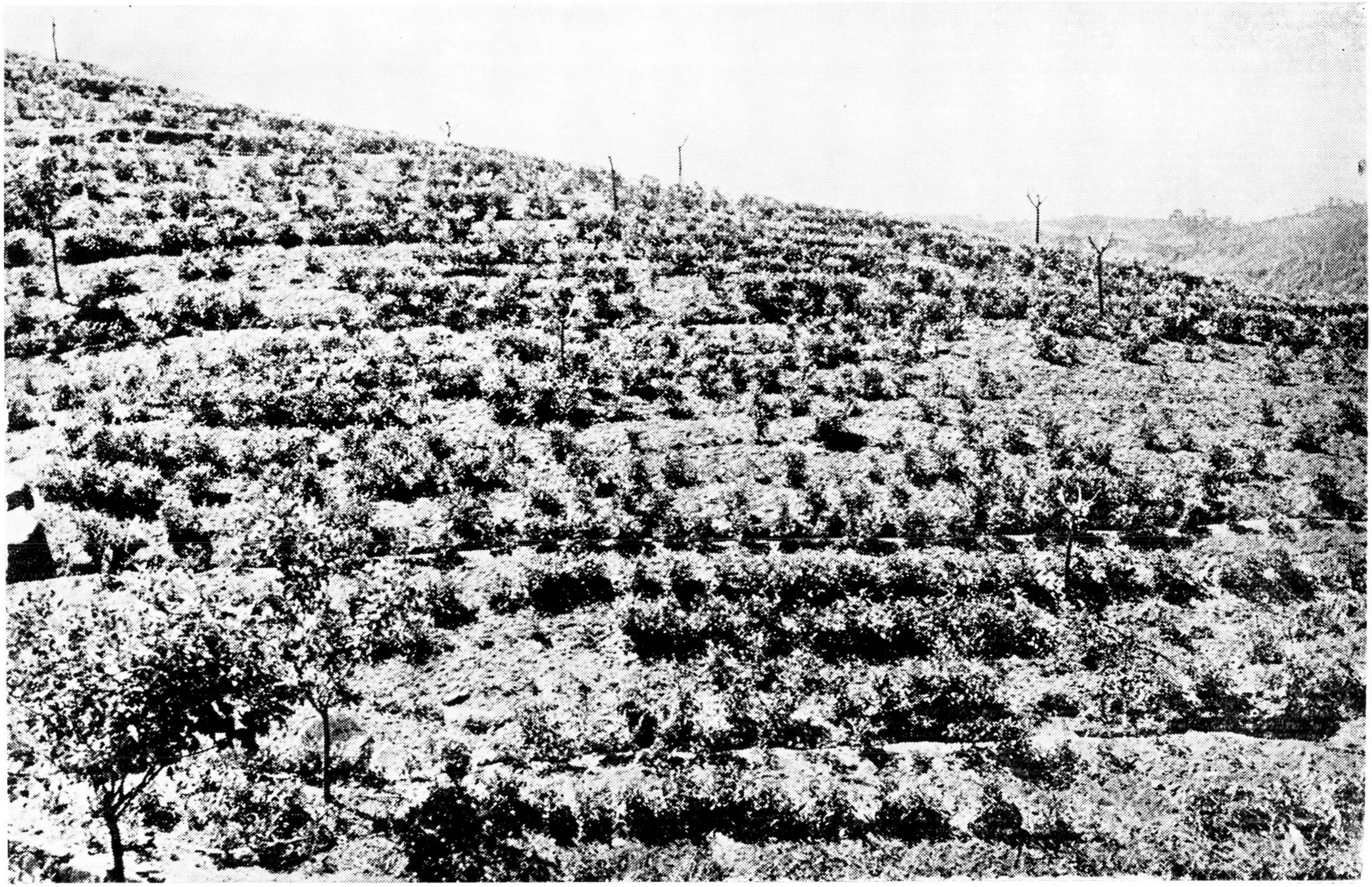

FIGURE 4 — *A new clearing with eelworm-infested tea*

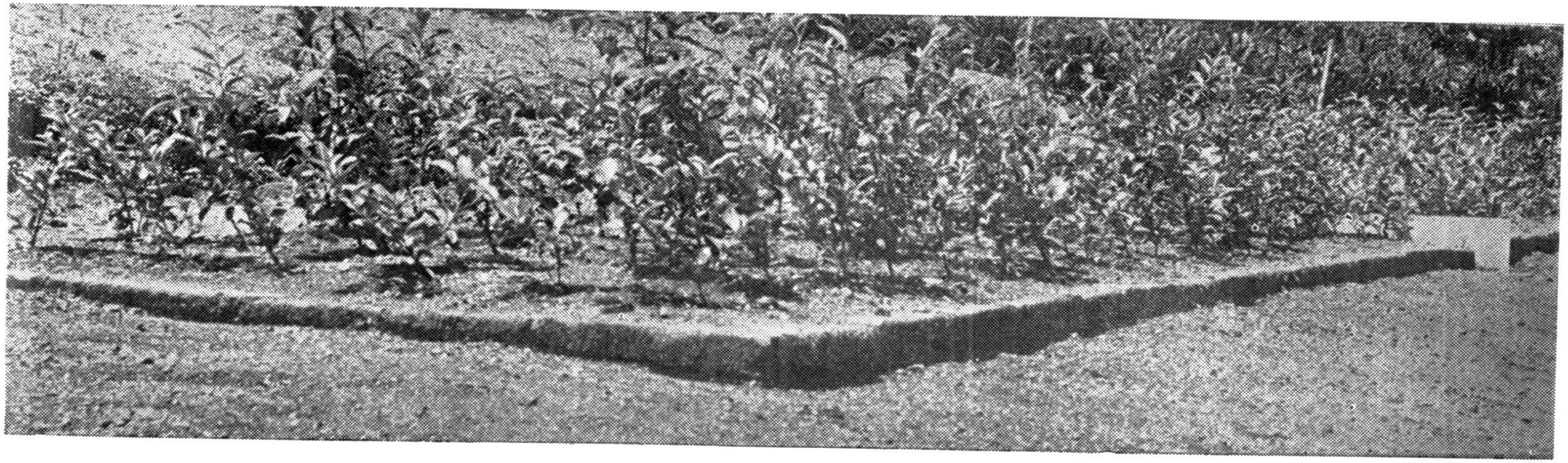

FIGURE 5 — *Cemented beds used for testing clones for eelworm tolerance*

that the population level declines to such low levels, that our soil extraction techniques fail to detect any eelworms. It is, therefore, incorrect to say that the area is free from eelworms.

TABLE 1—*Field population* vs *numbers recovered*

Field population	Number of eelworms recovered from 100g samples
80×10^6	0
80×10^6	1
477×10^6	10
$1{,}188 \times 10^6$	25
$2{,}376 \times 10^6$	50
$4{,}752 \times 10^6$	100
$9{,}504 \times 10^6$	200

Table 1 shows the field population and the corresponding numbers of eelworms that could be recovered by current extraction techniques. As seen from the table, if the population drops below 80 million eelworms per acre, our extraction technique would fail to detect a single eelworm. It is only when the population is higher than this figure, that our technique could detect the presence of eelworms. This means that when we fail to detect any, the population could be anywhere from zero to 80 million per acre. When a susceptible clone is planted on rehabilitated land, the population builds up very rapidly. With susceptible clones, low eelworm populations have been known to build up to very high levels of infestation, in relatively short periods. If the decline during rehabilitation had been very drastic, and if uninfested vigorous plants of susceptible clones are planted out in the field, these plants could get themselves established satisfactorily well in advance, before the eelworms could damage them seriously. Such instances are of course very rare, and it is a big risk to take. Even after a satisfactory rehabilitation period, it is therefore advisable to use approved resistant clones when replanting areas that have had a history of eelworm infestation.

To obtain uninfested clonal material for replanting, one should ensure the maintenance of strict nursery hygiene. It is not only the potting soil that ought to be fumigated, but also the nursery site, at least once every year. Deep drains should be cut right round the nursery, and if possible cemented and kept clean right throughout the year. Though costly in comparison to DD, it is preferable to use methyl bromide in nurseries. At the current recommended rate of 2 lb per 100 sq ft, this would cost a little more than ½ cent a bag. Before being put out on the field, the nursery plants should always be tested for the presence of eelworms, by selecting plants at random from a particular batch. If found infested, the entire batch of plants should be destroyed.

If a new clearing is infested and if it is poor in several places, it is best to uproot the entire area, remove all possible roots by deep forking, fumigate and replant. Figure 4 shows an eelworm-infested new clearing. There is absolutely no point in continuing to nurse such an area by resupplying. If, on the other hand, the infestation is only at one point in the clearing, or at points widely apart, then such patches could be uprooted, treated and replanted. The rest of the block should be under constant watch for any further outbreaks.

Although we are at present experimenting with different chemicals, it is yet premature for us to recommend any method of ' curing ' such infested plants. Our slogan continues to be ' prevention is better than cure '.

As for the selection of resistant material, this is done at the TRI by subjecting clones to very rigorous tests. Heavily infested soils from different estates are mixed together and used to fill cemented beds such as the one shown in Figure 5. The test clones are then planted into this bed and at the end of one year, eelworm infestation and the growth rates of the plants are measured. It is presumed that a clone that could survive this drastic testing, should do well in most infested areas. There are of course certain limitations to this kind of testing : (*a*) the time of test is only one year, and (*b*) the testing is done with respect to St Coombs climatic conditions only.

A better method would, therefore, be to test further, the clones already selected at St Coombs, in different clonal testing sites situated in different districts, an then select those that do well at these stations for the respective districts.