

## NEMATODE SAMPLES FROM ESTATES

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Although the Institute will continue to request samples from estates for experimental purposes, routine samples for nematode analysis will no longer be accepted. Such samples should instead be forwarded to the Colombo companies mentioned in the following article.

The Meadow Nematode or Eelworm (*Pratylenchus coffeae*) was discovered as a pest of tea by Dr Gadd in 1939. Since that time more than 6,000 soil samples from estates have been examined at the Tea Research Institute for this nematode; with the result that we know it to be rather widely distributed at elevations above 4,000 feet. Only rarely does it present a problem at elevations from 3500-4000 ft. Below 3500 ft, this nematode occurs, but in numbers too small to cause appreciable injury.

The question now arises: "Is the further processing of routine estate soil samples by the Institute likely to be as useful to the tea industry as research directed at control of this pest?" This question arises at this time because of the increased research programme and the need to process more research samples. Judging from the ratio of estate samples over the past nineteen years, one-third more research could be done if the Institute did not process routine estate samples.

Faced with a choice between taking on another T.R.I. staff member with the proceeds of fees, or referring all routine samples to companies in Colombo, the Board of Control of the T.R.I. at its meeting of 4th June chose the latter course.

The Colombo Commercial Company Ltd. (P.O. Box No. 33), Messrs A. Baur & Co. Ltd. (P.O. Box No. 11), and Messrs Harrisons & Grosfield, Ltd. (P.O. Box No. 69) (as agents for Messrs Fisons (Ceylon) Ltd.), have been examining tea soils for nematodes since 1957. These companies are properly staffed and equipped for this work, and a five-day refresher course in plant nematology was recently held at the Institute for their representatives. Upon request, they have generously agreed to accept all estate samples now being sent to the Institute. However, since these companies carry out a large number of analyses in addition to those for nematodes, it is appropriate to consider how this extra work can be prevented from becoming a burden to them.

Judging from our own experience, many of the samples sent to the Institute are not strictly necessary, and many of those that could be useful are not taken so as to yield the most information per sample. The following questions should therefore be carefully considered.

### **Who should be concerned about nematode sampling?**

It is evident that planters are aware of the general distribution of the Meadow Nematode, since we very rarely receive samples from low-country estates. Therefore, it is sufficient to say that no estate of less than 3,000 feet elevation should be concerned with sampling. Of estates between 3,000 and 4,000 feet elevation, there are very few where the Meadow Nematode is numerous enough to cause injury to tea. Even on estates 4,000 feet and above, half of those sampled have shown no Meadow Nematode. In the Dimbula and Dickoya Districts, 74 estates sampled are not known to be infested. Of the 75 infested estates, 17 are very lightly infested,

20 are moderately infested, and only 38 are heavily infested. It is evident, therefore, that not all poor growth on up-country estates can be attributed to the Meadow Nematode and that other factors such as lack of manure, too high pH, underlying slab rock, *Poria* root disease, Phloem Necrosis, mite injury, and even Shot-hole Borer just above 4,000 ft., can cause poor areas in up-country tea fields. Before sending a soil sample for nematode analysis, therefore, some attempt should be made to see if the above factors are causing trouble.

### What parts of an estate should be sampled?

Poor areas in mature tea are the most important to sample. The Director's Editorial in the March 1960 issue of the *Tea Quarterly* requested estates to submit not more than three samples at any one time for analysis, since it was considered unlikely that an estate would suddenly discover more than three patches of poor tea that had not been noticed previously.

Nurseries and soil for basketing should be fumigated routinely before planting (see following note) and, therefore, need not be sampled for nematodes, unless nematode injury is suspected despite fumigation.

Areas in tea to be replanted are reconditioned with Guatemala grass as a matter of course, so that the extent of infestation before reconditioning is not important.

Young tea on reconditioned soil is not likely to show nematode injury unless the basket plants were already infested at the time of planting or if the area was weedy during reconditioning. If basket plants are obtained *only* from a nursery on the estate that is routinely fumigated, and if weeds (many of which can harbour Meadow Nematodes) are not permitted to grow in areas under Guatemala grass, there is no need to sample young plantings. Any nematodes washed down from higher areas of the estate into young plantings are not likely to become a problem until the tea is mature.

Areas in patana or jungle, to be opened up for planting, can justifiably be sampled, since they have been found to harbour small to moderate numbers of Meadow Nematodes.

### How should a sample be taken?

Advice on this subject has been well presented by Tolhurst (1955) and the following is given as a brief review. Sampling should be done when the soil is moist but not wet. A handful of roots and soil is taken from around each of 10 plants, chosen at random throughout the affected area—including the edge of the area. Samples should be taken at a distance of 1-2 feet from the crown of the tea bush, at a depth of from 2-6 inches. The 10 samples are then thoroughly mixed together in a pan, and from this mixture is taken enough soil and roots to fill a cigarette tin or equivalent container.

Only one sample need be taken, regardless of the size of the area involved. This will tell whether or not Meadow Nematode is present. If it is present, resampling of smaller areas can be made, to determine whether or not it is present in sufficient numbers to cause marked injury (usually when 25 or more nematodes are recovered from 100 g. sample). The size of these smaller areas will depend on the size of the initial area, and the following table may be used as a guide:—

2 acres	....	1 sample
4 "	...	2 samples
9 "	...	3 "
16 "	...	4 "
25 "	...	5 "
36 "	...	6 "
49 "	...	7 "

The name of the estate, the field or section from which the sample was taken and any other pertinent information should appear on a label pasted to the container, since labels inside the container may become moist or soiled.

### References

TOLHURST, J. A. H. (1955). Soil samples for pH and eelworm tests. *Tea Quart.* 26: 112-114.

### Note:

Since this article was written, it has been brought to the attention of the writer that the larger roots of tea can survive for several years after the plants have been uprooted and can send up new shoots in areas being reconditioned with Guatemala grass. If present, these shoots and the underlying roots should be removed when weeding. Meadow Nematodes can possibly also be harboured in roots that are still alive but have not yet sent up shoots. Therefore, the number of Meadow Nematodes present before reconditioning commences may be important in determining whether reconditioning should be carried out for one or two years. Areas of mature tea to be replanted should therefore be sampled if the presence of Meadow Nematode is suspected. The possibility of survival of Meadow Nematode on buried roots suggests that when infested areas are being uprooted the removal of large roots should be especially thorough. This can best be done with a tractor-operated winch.