

# SOIL SAMPLING FOR pH AND EELWORM TESTS

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The limited facilities of the Tea Research Institute only permit us to do two types of advisory soil analysis, viz: the pH test, or estimate of acidity, and the population count of parasitic eelworm species. As the demand for this service is high and as the request for instructions on taking samples comes in quite frequently a joint memorandum from the Chemistry and Nematology departments may be of value, as the requirements of each are the same.

**Soil Variation.**—At first sight the taking of a sample might seem to be one of the simplest of operations, and this could be true if it were not for the inherent variability of the soil. Soil is a most complex biological system and over a small area some of the factors can change enormously.

In a recent very detailed survey of several small plots on St. Coombs the pH showed a range from 3.7 to 5.6 over three hundred yards. This, by interpretation of the mathematical device known as the "pH scale", means that the soil at pH 3.7 was nearly one hundred times as acid as that at 5.6. Small variations were found over distances of a few yards, and this on an apparently uniform slope of tea.

Our analyses can only refer to the actual soil which we receive and we can not guarantee that our findings will hold good for the neighbouring soil. Our determinations are as accurate as modern equipment can make them, but they are only as true as the method of sampling will allow them to be.

**Sampling a Field.**—If a general picture of pH and eelworm is required it is best to consider the field as several units according to the lie of the land. A forty-acre field running up hill and down dale is not an entity. From each unit, which should not be larger than 3 to 5 acres, about twenty equal samples should be cut, mixed together, and a sub-sample sent for analysis.

If a poor area is to be examined then the number of samples from within the area need not be so great. It is not always appreciated that the good area immediately adjacent must be sampled as well for comparison.

**Sampling New Clearings.**—The same principles apply, except that it is better to send more separate samples for analysis, with their positions in the field marked. In this way a trend to alkalinity or high eelworm could be spotted which might be masked if several samples were bulked together. These two sources of trouble often occur in small pockets, later spreading in the case of eelworm, and if the Tea Research Institute does not get samples from such areas it can not be held responsible in later years for a knoll which persists in being a conspicuous bare patch.

**Sampling for a Nursery Site.**—This requires the most detailed sampling of all, as the soil is often added to by importation of compost, jungle soil, and even wood ash. Consequently the variation from one bed or basket to the next may be very great.

It can not be stressed too strongly that all the components of a proposed nursery site should be sent for analysis BEFORE planting. Too frequently do we get young plants in the last stages of their struggles with eelworm, or too high pH, and it gives no pleasure to us or consolation to the planter to know that nothing can be done.

In a nursery bed the question of depth of sampling is extremely important, as the beds are often built in layers of different composition, and this will be considered next.

**Technique of Sampling.**—It is usually worth while to sample the 0-6" layer and the 6-12" layer separately. It has been known for a top soil to be derived from limestone fragments washed down from a hill top, while the sub-soil was of a normal acidity, being derived from the rock actually underneath it.

In nursery beds sampling these two layers may be said to be essential.

An alavangoe will penetrate to 12", if the soil is that deep, without much difficulty. This is important as the tendency with a mamottie is to scrape a lot of soil from a shallow depth to save effort. Some samples have been sent which looked suspiciously like the nearest loose earth from a bank or out of a drain.

The ideal place for sampling is around feeding roots of the plant, as parasitic eelworms will only be found in and around acceptable food. Sampling too close to the stem may result in samples which though negative for parasitic eelworms, have in fact come from areas of high infestation.

**Packing and Posting.**—It may seem unnecessarily particular to give instructions on this point, but in some ways it is the most vital of all, and from our observations, it is obvious that some times there is little appreciation of what can happen in the post.

The first essential is that the soil should reach us. Screws of newspaper, and sadly dilapidated tins, with or without a makeshift lid, invariably arrive almost empty.

The soil should also be moist, by which we mean as moist as it was in the field when sampled. The pH may alter if the soil is allowed to dry, even for a few days in transit, but even more serious is that an eelworm count is not possible after a soil has dried out.

To meet these requirements there is one almost ideal and universal container. The cigarette tin, providing it is in reasonable condition with a good lid, gives us sufficient soil, keeps it moist and travels very well. Some adhesive paper or string round the tin and good brown paper are perfectly adequate and there is no need to have boxes made unless many tins are to be sent.

One final point, which can cause extra work or even confusion at our end, is the labelling. Two tins marked A and B may seem perfectly distinct when they leave the estate, but at the Tea Research Institute they may be in company with twenty or more similar tins with a fair sprinkling of A's and B's. A fairly detailed label inside and outside the tin speeds our work and makes confusion less likely when they are being moved between the two departments.

We make no apology for this detailed note, because we feel planters would prefer to know that they are able to get the greatest information by adoption of a methodical sampling system. Further, although the majority of samples do arrive well packed and labelled, too high a proportion are quite useless. The more detail we receive with the actual sample the more likely we are to be able to give useful advice in return.

Soil sampling is one of those things which is not as simple as it seems, and is also an example of one which, if it is to be done at all, is worth doing properly.