FUMIGATING NURSERIES

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All tea and green-manure nurseries of estates above 3,500 feet elevation should be routinely fumigated before planting, as a protection against Meadow Nematode. Nurseries below this elevation can probably benefit from fumigation.

Although such insects as cockchafer grubs can injure tea plants in the nursery, soil fumigation is primarily directed against nematodes. Of these, the Meadow Nematode, *Pratylenchus coffeae*, is the most important. In up-country, and in a very few high mid-country areas, a tea nursery infested with this pest can serve as a distribution centre to contaminate an entire estate. Green manure plants are never as heavily infested as tea, but shade trees such as *Albizzia moluccana* and *Acacia decurrens* can support small numbers of this nematode (Visser, 1959) and it would therefore be wise to fumigate nurseries that are to contain such plants.

Soil tests are not always reliable in determining whether or not Meadow Nematodes are present in nursery soil. Since the efficiency of the method used to extract nematodes from soil is not greater than 30%, Meadow Nematodes can be present that are not detected. During the time that plants are in the nursery, numbers that were originally very small may increase to considerable proportions. Therefore, proposed and existing nursery sites of up-country and high mid-country estates should be fumigated **each time** before they are planted, and soil for basketing should be fumigated regardless of its origin.

The root-knot nematode, *Meloidogyne javanica*, commonly found producing galls on the roots of *Tephrosia vogelii* and Dadaps (*Erythrina lithosperma*) thrives at all elevations, and can occasionally be a problem in tea and green-manure nurseries. With tea, the damage is limited to the time when the plants are in the nursery, since this nematode apparently will not survive on plants older than one year. With shade trees such as *Albizzia sumatrana*, the infestation may continue in the field (Visser 1959). Spiral, pin, and other plant parasitic nematodes found around the roots of tea at all elevations have not yet been shown to be harmful, but it would be well to assume that they might do harm to young plants.

Therefore, if plants in nurseries below 3500 feet are doing poorly, and if such factors as too high a soil pH, poor soil texture or drainage, or improper shading are not involved, it would be a good idea to fumigate a part of the nursery before the next planting, to see if growth is improved.

A simpler method of fumigation

The method previously recommended for fumigation nurseries required an injector gun. A simpler method of applying fumigant uses only a jar with two holes in the cap. The holes should be about one-eighth of an inch and placed at opposite sides of the cap, one to allow escape of the fumigant and the other to admit air.

Before fumigation, the entire nursery, including paths, is carefully cultivated and all weeds, old tea plants, etc. are removed. If a large amount of root debris is present, two weeks should be allowed so that the roots will have rotted and the nematodes will move into the soil. Trenches 6–8 inches deep and one foot apart are then made across the nursery. The fumigant is dribbled into the trench by a man walking at normal speed, and the trench is immediately covered with soil and firmed down by a second man. With Shell D-D mixture, approximately one pint

is used for 200 feet of row, giving a dosage of 25 gallons per acre. A trial (calibration) run can be made with a pint of water. After fumigation, the area is well-thatched and left for 3 days. After this time it can be thoroughly cultivated to allow escape of the fumigant from the soil. If the weather is warm and sunny, planting can be done after three weeks. Under cool and rainy conditions, an additional period of two weeks is recommended. Nematox can be used in a similar manner after being diluted with four parts kerosene. Nemagon is principally suited for sandy soils of low moisture content which are subjected to high temperatures—conditions not prevailing on up-country estates. However, it might be found suitable for use on low-country estates.

Fumigation should not be carried out when the soil is obviously wet, but when it is in a condition which would be suitable for planting.

Basket soil can be fumigated in the same manner if it is spread in a layer one foot deep over ground that has previously been fumigated.

Other considerations in the fumigation of nurseries have been noted by Visser (1959a).

Guarding against re-infection

Once they are fumigated, nurseries should be kept free of plant parasitic nematodes. This can be done by digging drains around them, to prevent nematodes washing in from tea or shade trees on higher ground. Soil from these drains should not be thrown on to the nursery, but should be put back on the slope from which it eroded. Care should be taken to prevent introduction of soil on the tools or feet of labourers.

Despite all precautions, however, nematodes will probably be reintroduced if, mature tea and shade trees on the estate are infested, and fumigation before each planting of the nursery is therefore necessary.

This emphasises the basic philosophy in nematode control, the object of which is not to eliminate nematodes—a virtually impossible task—but to reduce their numbers to a level at which they cannot do harm.

References

VISSER, T. (1959a). Practical aspects of the eelworm problem in tea. *Tea Quart.* **30**: 143–149.

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