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PROTECTION OF YOUNG TEA FROM NEMATODES

(This Advisory Circular supersedes the Advisory Circular PM 4 Serial No. 02/10 issued in December 2010 and related previous Advisory Circulars and links with Advisory Circular PU 4)

1. Introduction

Tea Nematodes are microscopic organisms, which inhabit the tea root system and the soil around. Besides parasitizing and weakening the host root system, they interfere with the smooth uptake of water and nutrients, leading to severe nutrient imbalance and physiological stress in the plant.

The economically important nematode pests of tea are

- a. *Pratylenchus loosi* Loof - "root-lesion nematode" or "meadow eelworm"
- b. *Radopholus similis* (Cobb) Thorne - "burrowing nematode"
- c. *Meloidogyne brevicauda* Loof - "root-knot nematode"

2. Symptoms of Damage

The typical symptoms of nematodes are slow decline in growth with the leaves turning a pale-yellow colour, premature flowering and fruiting and stunted growth of the plant. Similar symptoms could also be observed due to other stress factors such as drought, water deficit, water logging and ill-drained conditions and nutrient imbalances etc.

3. Integrated Management of Nematodes in Young Tea

Plant parasitic nematodes affecting tea could be disseminated through planting materials, soil, water and agricultural implement etc. In the presence of a susceptible root system of a good host, the residual nematode populations may get developed. Hence, nematodes once introduced to fields, they cannot be eradicated.

Further, all tea growing areas are declared as nematode active and / or prone areas due to evidences on presence of either of above three species. Therefore, every attempt should be taken for integrated management of nematodes by adhering to the following measures in young tea.

- a. The area should be planted to rehabilitation grasses; Mana or Guatemala for a minimum period of 2 years. Mana is recommended to all tea growing areas. In areas where the tea has been found to be infested with the burrowing nematode, *Radopholus similis*, Guatemala grass is not recommended as it is a good host. The CO3 (Hybrid Napier grass-*Pennisetum purpureum* X *P. americanum*) grass is recommended for lands with no nematode history and for a minimum of 12 months of rehabilitation as the biomass production is comparatively high (Please refer to Advisory Circular PM 12).
- b. Use of nematode free and healthy planting materials of recommended cultivars to the region for field planting (please refer to Advisory Circulars PN 1 on Suitability of Tea Clones for the Different Regions and PN 2 on Good Nursery Management Practices).
- c. Adopt all Good Agricultural Practices (GAPs) recommended by TRI to ascertain a healthy and vigorous plant growth.
- d. Prophylactic chemical treatments to bring down any residual plant parasitic nematode populations ensuring to avoid invasion to tea roots of the newly introduced tea plants as described under section 4.

4. Prophylactic Measures at Planting

Nematode control through chemical treatments is not economical due to the hidden nature of nematode damage in tea fields. Therefore, chemical application is restricted to the time of planting in the Integrated Management of Nematodes. As a protective measure to minimize any residual populations of parasitic nematodes, it is mandatory to incorporate a nematicide into soil in the planting hole at planting.

The recommended nematicides at correct dosages should be used as described in the Advisory Circular PU 4.

Alternatively, 100 g of ground or powdered neem oil cake (neem poonac) could be mixed with soils in the planting hole.

5. Nematode Management in Infested Young Tea

When premature flowering and fruiting and / or any symptoms of debilitation have been observed, the affected areas must be checked for the presence of nematodes. Proper sampling should be done as per the method described in Advisory Circular PM 5 for nematode estimation at TRI. If the cause for such symptoms has been confirmed as nematodes, the following measures should be carried out over a period of 1 - 2 years.

- a. An 'Infestation-specific nematode management recommendation' by TRI considering the field and crop conditions.
- b. When nematode affected patches or blocks with heavy infestations have been identified, *in situ* block infilling; uproot affected tea in patches; remove all possible roots and rehabilitate the area with a suitable grass species.
- c. Under a very light nematode infestation with a nematode tolerant tea cultivar, planting of nematode suppressive plant species such as Mana (*Cymbopogon confertiflorus*), Wild Sun Flower (*Tithonia diversiflora*), Wild Chrysanthemum / Mari Kolundu (*Artemisa vulgaris*) and Marigold (*Tagetes* sp.) against *Pratylenchus loosi* and *Radopholus similis* and Vetiver (*Vetivaria zizanioides*) against *Pratylenchus loosi*.
- d. Incorporation of soil organic amendments such as compost and well-decomposed reclaimable tea (at the rate of 2 kg per plant) or neem oil cake (at the rate of 500g per plant in two splits) depending on availability.
- e. All Good Agricultural Practices (GAPs) recommended by TRI to minimize impacts from other possible factors leading to stress conditions i.e. soil pH, ill - drained and dry soil conditions, graveliness, poor and imbalanced manuring *etc.*

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