T.R.I. ADVISORY CIRCULAR No.DM 5

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PROTECTION OF TEA FROM STEM AND BRANCH CANKER DISEASE

(This Advisory Circular supersedes the Advisory Circular DM 5 Serial No 20/03 issued in September 2003 and related previous Advisory Circulars and links with Advisory Circular PU 2)

1. Introduction

Stem and branch canker caused by fungi of family Botryosphaeriaceae, *Lasiodiplodia theobromae*, *Botryosphaeria mamane* & *Botryosphaeria dothidea* (generally known as *Macrophoma theicola* Petch representing one of the anamorphic genus) is in common occurrence in mid and low country tea lands.

The increase in the incidence of stem canker in the low country is attributed to several factors. The most important of them are:

- The prolonged periods of dry weather, experienced in the recent past. Severe attacks of *Macrophoma* are normally associated with dry weather conditions.
- Planting of cultivars specially TRI 2023, TRI 2026 and TRI 4042 in tea lands with inferior soil conditions such as gravelly and rockey.
- Planting undertaken without due attention given to soil conditions, soil rehabilitation, establishment of shade and the use and availability of thatching materials. The association of one or more of these factors result in the establishment of unthrifty plants in the field. When followed by dry weather, these plants become very vulnerable to attacks by *Macrophoma*.

2. Symptoms and Diagnosis

The disease first appears as slightly sunken, dark patches on the red wood of branches of about pencil thickness. These patches are usually oval, running longitudinally along the stem for a few centimeters. The fungus kills the bark over these patches, which then turn black and soft and later separate from the wood. The fungus is usually arrested after it kills small areas of the bark. Callus develops around the edges of the dead patches or cankers.

In mild attacks the cankers are completely callused over within a few months. But in severe cases callus formation is usually incomplete and the fungus may renew its activity after some months and kill the cankered branches completely. In cankers, which have not healed over completely, fruiting bodies (pycnidia) may be found in the dead bark tissues, which release spores that could start fresh infections. In some cases, the bark is blackened and killed uniformly down to the base of the branch and the disease then continues on to the main stem. The branch dies when the fungus completely encircles a branch and if this happens at the base of the main stem the entire plant will be killed. In the affected shoots, the leaves become yellow, wither and ultimately fall off. This type of attack is common in young tea, which had not been cutback. The fungus *Macrophoma theicola* also attacks the older stems of mature bushes and cause typical cankers. It usually attacks the upper surface of horizontal branches, killing the bark and discoloring the wood. After some time, the dead bark peels off from the wood and wood-rot sets in. As this takes place in the interior of the bush, the disease is not noticed until pruning and by that time the canker may have reached an advanced state. Latent infections can be in the field without visible canker on stems.

3. Management of Stem and Branch Cankers

It has been found that the disease cannot be controlled by the planting of resistant cultivars or by the exclusive use of fungicides. An integrated system of control has been found to be most suitable. These will have to be invariably combined with measures to conserve soil moisture during dry weather periods. No tea cultivar has been found to be completely resistant to the disease under conditions of severe moisture stress.

3.1 Cultural Methods

It is important that the incidence of the disease should be kept to a minimum, up to the time of the first prune. Infection of the main stem and primary branches should be prevented if the plant is to survive and be productive in the coming years. To achieve this;

In New Clearings

- Avoid planting in areas where the soil is poor (gravelly and rocky soil).
- It is important to follow all the soil conservation measures during replanting as recommended.
- A good stand of shade should be established prior to planting tea.
- Do not undertake to replant an area larger than that can be handled.
- Before planting a new clearing, ensure that sufficient thatching material is available to completely thatch the entire area during the dry periods.
- Please refer to Advisory Circular PN 1 for selection of cultivars that are resistant to stem and branch canker disease.

In Mature Tea

- As in the case of young tea, a good stand of shade will reduce the incidence of the disease.
- The disease is usually noticed at the time of pruning. This therefore is the best time to get rid of the cankered branches.
- The cankered branches should be removed just below the canker, followed by a wound dressing (refer Advisory Circular PU 2) of cut ends. At pruning time, attempts should be made to remove as much cankered branches as possible. In instances where the entire bush is affected those should be uprooted and burnt. The vacancies thus created must be supplied with cultivars resistant to canker (refer Advisory Circular PN 1).

3.2 Chemical Methods

Any appropriate systemic fungicide together with above cultural measures have been found to be effective in reducing the incidence of the stem and branch canker. In new clearings the fungicides should be applied with a knapsack sprayer, from the time of planting, once in 2-3 months. The plants should be given a drenching spray.

The pruned bushes should be sprayed with a fungicide about 2-3 times starting soon after the pruning operation (2-3 weeks interval). The fungicide should be applied with a knapsack sprayer, to wet the frames and branches thoroughly.

Spraying of systemic fungicides should be avoided in plucking fields as they leave residues in made tea.

Mother bushes should also be treated similarly before taking cuttings for nursery. As a precaution, cuttings should be dipped in 0.05% systemic fungicide solution before inserting into nursery bags as a prophylactic treatment to protect nursery plants from latent infections.

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