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## **PROTECTION OF TEA FROM STEM AND BRANCH CANKER DISEASE IN THE LOW COUNTRY**

*(Macrophoma theicola)*

*(This Advisory Circular replaces Circular Nos D7 and D8, Serial Nos 3/81 and 6/85)*

### **1. Introduction**

Stem and branch canker caused by the fungus *Macrophoma theicola* Petch is in common occurrence in many low-country districts of Sri Lanka. If neglected, this disease can cause heavy casualties particularly in new clearings.

Lately, there has been an increase in the incidence of stem canker, caused by *Macrophoma theicola*, in the low country. Several factors are attributed to this. 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.
- Large scale planting with very susceptible cultivars (i.e. TRI 2023 and TRI 2026).
- Large scale replanting and new planting, undertaken without due attention 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 sometime 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.

### **3. Control 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.
- 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.
- Do not plant cultivars that are very susceptible to cankers (i.e. TRI 2023, TRI 2026, TRI 2024, KEN 16/3, TRI 3047). Please also refer to Advisory Circular PN 1; Serial No 6/02 for the cultivars that are more tolerant 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 (such as Baycor 3PA) 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 plants of a cultivar less susceptible to canker (Advisory Circular No PN 1; serial No. 6/02).

### **3.2 Chemical methods**

Any appropriate systemic fungicide, i.e. Benomyl (Benlate), Bitertanol (Baycor) sprayed at the rate of 0.05% (5 g/ml in 10 l of water) together with above cultural measures have been found to be effective in reducing the incidence of the stem and branch canker. When using Benomyl, the powder should be first made into a fine paste with a little amount of water and then diluted to the required amount.

In new clearings the fungicides should be applied with a knapsack sprayer, from the time of planting, once in 2-3 months, up to the time of the first prune. The plants should be given a drenching spray. As the plants get bigger, care should be taken to see that the developing branches are also covered by the spray fluid.

The pruned bushes should be sprayed with a fungicide about three times once in 2-3 months, starting soon after the pruning operation. The fungicide should be applied with a knapsack sprayer, to wet the frames and branches thoroughly.

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