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DROUGHT MITIGATION IN TEA PLANTATIONS*(This circular cancels the circular No. PA 2 serial No. 2/01 issued in January 2001)*

Drought is a serious environmental hazard. Its damage to cultivated crops has become frequent in the recent past and tea is no exception. Most of the tea growing regions in Sri Lanka receive rains from both north-east and south-west monsoons. However, tea plantations are adversely affected by moisture stress conditions due to uneven distribution of rainfall within the year. The main dry period in most of the tea growing regions extends from early January to about late March. However, those areas which receive mainly the north-east monsoon rains, viz. Uva and some parts of the Low and Mid country, have the main dry period generally extending from late June to about early September.

During these dry months, considerable damage can be caused to both young and mature tea, with extensive casualties being observed in young clonal tea during their first and the second year after planting. In order to minimize such damage and ensure early recovery, the following precautionary measures need to be adopted prior to, and following, a drought. The drought effects differ with the growth stage of tea that is whether it is young tea (before first pruning) or mature tea (after first pruning). Hence drought mitigation measures also should vary according to the stage of growth of the tea.

1. New clearings - tea before the first proper prune**1.1 Measures to be adopted before and during drought****1.1.1 Mulching**

The inter-rows of new clearings should be thatched with Guatemala or Mana grass well before the monsoon tails off. For this purpose, about 37.5 metric tons per hectare (15 tons per acre) fresh material would be required. This could be obtained from a single lopping from one hectare of well-tended grass clearing. Partially decomposed waste materials such as sawdust, paddy husk and refuse tea can be used (at the rate of 15 - 20 tons/ ha) for mulching. They can be applied as a layer 1" - 2" thick, leaving about 6" - 8" from the base of the tea plants. If paddy husk or saw dust are used, they should be mixed or sprayed with urea at the rate of 2 - 3 kg per 100 kg of material. Mulching should be repeated 2 - 3 times a year depending on the rate of decomposition of the material used.

1.1.2 Weed control

New clearings should be kept free of weeds during drought. Hence, weeding program should be completed before the onset of the drought. If weeds are present during the drought, they can be slashed down to minimize competition for soil moisture. As plants are under moisture stress, spraying of any herbicide during drought is not recommended.

1.1.3 Spraying of Sulphate of potash (SOP) or Muriate of potash (MOP) and Kaolin

In order to reduce transpiration by the leaves, 2% SOP or 2% MOP can be sprayed (at the rate of 2 kg/ ha in 100 L of water during 1st year, 4 kg/ ha 200 L of water during 2nd year and 8 kg/ ha in 400 L of water during 3rd year) using a knapsack sprayer. Spraying should commence at least a month prior to the onset of drought and continue at 2 - 4 week intervals depending on the severity of drought. Urea can also be mixed (2 kg/ ha) with SOP or MOP to enhance K

absorption. In plucking fields, spraying should be done immediately after harvesting of flush to ensure proper deposition of spray droplets on mature foliage. Drenching of foliage should be avoided since the drip would cause leaf scorch.

Spraying of Kaolin (5 - 10 kg of Kaolin in 100 L of water) on to the leaves of young tea plants reduces heat and water loss by transpiration. Spraying should be done soon after drought sets in.

1.1.4 Irrigation

If water is available, irrigate first year plants at 4 - 7 day intervals with 400 - 500 ml/ plant/ application. The volume should be doubled for the second year plants irrigating them at 7 - 10 day intervals.

1.1.5 Skiffing

If the drought is prolonged and the plants remained wilted in the morning hours, young tea in their second to fourth year from planting can be partially defoliated by giving a light skiff to remove the top most 2" - 3" of foliage.

1.1.6 Fertilizer application

Fertilizer applications should be avoided during dry weather.

1.1.7 Green manure crops

SALT hedge rows and other green manure crops inter-planted with tea should be lopped. Cover-crops should be cut back to ground level before the onset of a drought.

1.1.8 Pest Control

Mites, tea tortrix, nettle grubs are the common dry weather pests. Outbreaks of dry weather pests can cause considerable damage to tea plants (Please refer TRI Advisory Circulars on pest control for their management).

1.2 Measures to be adopted following a drought

1.2.1 Fertilizer application

Young tea fertilizers should be applied only after the plants have fully recovered from moisture stress and once the new leaves of defoliated plants are fully opened.

1.2.2 Bringing into bearing and plucking

Bringing into bearing should be done selectively and only after the plants have fully recovered from moisture stress and the severely affected plants have fully refoliated. Second to fourth year plants in plucking should be harvested only after they have fully recovered from moisture stress and resumed flushing. Light plucking (Mother-leaf plucking) should be resorted to during the first few months.

Bushes which are severely affected by drought (defoliated) should be rested until they form a healthy canopy.

1.2.3 Resupplying

It is necessary to give priority for resupplying the vacancies before undertaking any normal replanting programme scheduled for the year. If drought casualties are found in isolated patches,

it is important to identify reasons. If soil is found to be unsuitable *i.e.* very shallow or gravelly, resupplying can be done in trenches (30 cm wide and 45 cm deep) which had been filled with compost and allowed to settle for sometime.

2. Mature Tea

2.1 Measures to be adopted before and during drought

2.1.1 Plucking

It is recommended that light plucking (Mother-leaf plucking) be practiced during the drought.

2.1.2 Spraying of Sulphate of Potash (SOP) or Muriate of Potash (MOP)

In order to mitigate drought damage in mature tea by reducing water losses through transpiration, particularly in drought prone areas, foliar application of SOP or MOP prior to anticipated drought, is recommended. A 2% solution of SOP or 2% solution of MOP (8 kg in 400 L of water/ ha) to be applied using a knapsack sprayer at fortnight intervals, commencing at least one month prior to the onset of drought and continue at 2 - 4 week intervals depending on the severity of drought. 2% Urea (8 kg/ ha) can also be mixed with SOP or MOP to enhance K absorption. Spraying should be done immediately after harvesting to ensure proper deposition on mature foliage. Drenching of foliage should be avoided since the drip would cause leaf scorch.

2.1.3 Skiffing

If bushes show symptoms of wilting in the morning, they can be partially defoliated by giving a light skiff to remove the topmost 2" - 3" of foliage (below the *kolunthu mudichchu*).

2.1.4 Pruning

As a rule, pruning should not be carried out just prior to or during a drought. Dry weather pruning can result in extensive bush debilitation.

2.1.5 Forking

This operation should be avoided during or just prior to the onset of a drought as it would accelerate loss of soil moisture.

2.1.6 Weeding

Fields should be kept free of weeds during a drought. Hence, the weeding programme should be completed before the onset of drought. If weeds are present during drought, they can be slashed down to minimize competition with the tea for soil moisture. Spraying of herbicides during dry weather is not recommended.

2.1.7 Green manure crops and grasses

All SALT hedge rows and rehabilitation grasses planted in vacant patches in mature tea lands should be lopped prior to a drought.

2.1.8 Pest control

Mites, tea tortrix, nettle grubs are the common dry weather pests. Outbreaks of dry weather pests can cause considerable damage to tea bushes (Please refer to TRI Advisory Circulars on pest control series for their management).

2.2 Measures to be adopted following a drought

2.2.1 Fertilizer application

Mature tea bushes affected by drought should be fertilized only after they have fully recovered from moisture stress, *i.e.* when bushes commence flushing. It is also imperative that the fertilizer application for defoliated bushes is delayed until they have fully refoliated and the first set of new leaves are fully expanded.

2.2.2 Plucking

In any given field the tea bushes are subjected to varying degrees of drought damage. Light plucking (Mother-leaf plucking) should be adopted until such time that flushing resumes its normal periodicity.

2.2.3 Pruning

Pruning of drought affected fields should be delayed until the bushes have fully recovered and produced sufficient foliage. It is also best to rest drought affected fields until adequate root reserves have been accumulated.

2.2.4 Resupplying vacancies

Having infilled the new clearing areas, the best of the remaining nursery plants should be used to supply vacancies in mature tea fields. Vacancies in seedling tea should be planted with an appropriate soil reconditioning grass and infilled after a lapse of two years.

3. Other considerations

All grass clearings must be lopped prior to a drought to prevent fire hazards. However, shade trees should not be lopped during dry weather.

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