

Bangladesh Tea Research Institute
Sreemangal, Moulvibazar.

Drought Management
Before drought, onset drought and after drought

Drought is a natural phenomenon which can not be barred but with proper management the adverse effect of drought can be minimized to some extent. The tea estates have been suffering from severe and prolonged drought this year. In the current year, the tea industry in the greater Sylhet region received sufficient rainfall in early April which was very beneficial for tea plantation but its discontinuation has created an adverse situation for immature tea. Due to the prevalence of very high temperature in these days, some of the tea plantation areas are already suffering due to drought. All most all the tea plants have been suffering from the ill effect of drought, but skiffed sections and young teas are the worst sufferer. It may be mentioned that the intensity of drought damage varies on the age of the plants, soil type, plant type, pruning operations, drainage conditions of the sections etc. The sections, which are likely to suffer more under drought condition, teas are grown in light or sandy textured soil and presence of gravel layer below the top layer, tea grown in waterlogged areas with poor drainage system, tea grown in unshaded or insufficient shaded areas. Bushes which were already weak due to pests and diseases, poor drainage condition are susceptible to drought. Unpruned and light skiffed teas suffer more in drought as because of higher transpiration loss due to more foliage than pruned tea. Light leaved Assam type of teas with thin broad leaves tend to be less tolerant to drought.

Therefore, we need to take some strategies to mitigate this situation. The following short and long term measures may be taken for the management of tea under and after droughty conditions-

- **Drought management before onset drought by practicing standard pruning operation :**

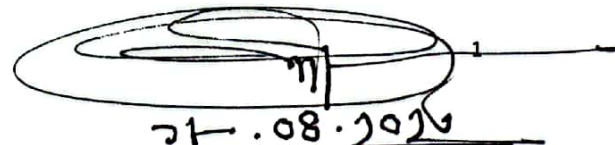
Unpruned and light skiffed teas suffer more in drought conditions than pruned (LP, DSK) teas due to higher transpiration loss from more leaves. So, it is suggested not to keep sections in severely drought prone areas unpruned or light skiffed. Three years pruning cycle comprising LP, DSK and MSK may be followed specially in the drought prone areas. After pruning, pruning litter should be kept in the sections. Beside its organic matter value, it will act as a surface mulch and minimizes loss of water by evaporation loss from the soil. After the pruning, cut ends of the bushes should be pasted with copper fungicide in order to reduce transpiration loss. Sections planned for deep pruning should be rested for 6-8 weeks from mid November. Always avoid pruning young tea into droughty conditions. Pruning must be done with the onset of a rainy season ensuring sufficient soil moisture.

- **Drought management during onset drought by practicing light plucking:**

If the drought is not so severe, light plucking (mother leaf plucking) must be adopted. Stop plucking in case of severe and prolonged droughts. Depending upon the severity, after recovering bushes should be plucked over one or two leaves. In case of much dieback, the bushes need to be plucked over two full leaves of new growth. When drought is over, sections should be visited and all dead branches should be cut to green wood. This may result in some unevenness on the plucking table but no otherway to overcome it.

- **Drought management before onset drought by practicing standard drainage system:**

Plants grown in waterlogged flat areas tend to be shallow rooter and suffer more during drought. Therefore, proper drainage system should be developed with necessary main drain (5 to 7 feet deeper), sub-lateral (3.5 to 4 feet) and lateral drains in the tea section (3 to 3.5 feet) with adequate



৩১.০৪.২০২০

depths encourages the bushes to be deep rooter and allows them to draw water and nutrient from deeper zones of the soil during drought.

Drought Management before onset drought by practicing standard contour Drainage system:

In tilalh land, preparing proper contour drains and silt pits might also be helpful to harvest rain water when rainfall is scanty.

- **Drought management by application balanced fertilizer:**

Generally, healthy and vigorous bushes suffer less in drought and recover quickly than the weaker one. Application of balanced fertilizer is one of the methods to improve health and vigour of the plants.

- **Drought management in worst sufferer tea bushes by using decomposed cowdung and organic matter:**

The soil with more organic matter can hold more water and thus the plants in this soil will suffer less during the dry period. Therefore, organic matter status of the soil should be raised by adding organic manure and cow dung into the soil specially young teas, those are the worst sufferer, already damaged/ wilted/ sun burnt bushes. It is much more beneficial to recover the already damaged bushes by applying 2.0 to 2.5 kg decomposed cowdung and 40 to 50 g TSP by forking the soil at the central point of four bushes or between two rows. This should be practiced only for the already damaged bushes of flat land area or gentle slope area and also flat portion of tillah land area. This should not be practiced in high slope to avoid soil erosion.

- **Drought management by foliar application of potassium fertilizer:**

Under stress condition potassium reduces transpiration loss and increase water use efficiency of the tea plants. It also helps to maintain leaf turgidity. In order to reduce water loss through transpiration by the leaves, 2% MOP (4 kg/ 200 lit water) can be applied as foliar spray, which was found beneficial to alleviate the water stress. When the leaves start losing their freshness and turning pale green or yellowish at the advent of drought, application of 2% MOP at fortnightly intervals may be continued until the drought is over. MOP has burning effects on foliage during sunshine. So, it should be applied early in the morning or in the evening. In plucking fields, spraying should be done immediate after plucking to ensure the deposition of the spray droplets to the maintenance foliage. Urea can also be mixed with MOP but in that case the total concentration (2%) should be adjusted.


In unpruned tea, 4-6 rounds of foliar applications with MOP and $MgSO_4$ (1% each) should be applied from end of November to onset of rain. Fertilizer should not be applied in dry-hard soil. Fertilizer should be applied particularly in moist and wet soil after recovery of the bushes from drought. During fertilizer application soil should be wet at least to a depth of 30 cm and some new growth of leaves.

- **Drought management by using standard mulch material:**

Mulching is beneficial for growth and productivity of young tea as well as mature tea. Mulching is more beneficial for young tea. It reduces soil moisture loss to a great extent. Mulching should be done before onset drought. Water hyacinth can be considered as a very useful mulch material for newly planted tea saplings.

- **Drought management by practicing optimum shade management:**

Shade tree plays an important role in tea production in our climatic condition. It protects tea plants from excessive heat and radiation. Shade trees can reduce wind speed to reduce evaporation loss of water in the soil and plants. In addition, shade trees can also reduce the air temperature (5 to 6°C) in the environment. Shade trees also add a huge amount of organic matter

2

21.08.2026

into the soil through the deposition of litter fall. So, it is advised to raise appropriate shade species like *Albizzia odoratissima*, *Albizzia lebbek* and *Derris robusta* within the tea plantations and ensure their recommended spacing.

- **Drought management by irrigation:**

Irrigation is the only instant remedial measure against the water stress. To save the tea plants, especially the young teas, proper irrigation should be provided. In prevailing drought condition, irrigation at shorter interval with lesser quantity of water is more effective compared to high quantity at longer interval. It should be taken into consideration that irrigated water should reach the root depth for effective.

Many of the developed tea estates have permanent sprinkler irrigation system and it's becoming easy for them to alleviate the situation. For those who don't have sprinkler irrigation system but have good water source, can consider providing irrigation in young tea areas by using pump and hose pipe. Water source should be ensured for irrigation purpose by excavating deep water reservoir for the estates.

- **Drought Management by skiffing tea bushes:**

When tea plants are continuously producing shoots and harvested, it adds an additional stress to the plants. In case of prolonged drought conditions, skiffing (removal of top 2-3 inch layer) can be practiced, so that, the production of shoots is temporarily reduced. This will reduce the annual yield but, in return, the bushes will not die.

- **Drought Management by using anti transpirant:**

If available, anti-transpirant compounds such as kaolin, Kieserite etc. can be applied over the maintenance foliage as foliar spray. Kaolin will cover the tea leaves as a thin layer on the leaves while Kieserite will close the stomata reducing transpiration. In applying Kieserite, care must be taken to keep the solution concentration less than 5%.

- **Drought management by avoiding fertilizer broadcasting during drought**

Avoid fertilizer broadcasting application during drought. As the moisture in the soil sap is inadequate, application of fertilizer can cause the nutrient concentration in the soil sap more concentrated than tolerable to the tea roots.


- **Establishment of shelter belt:**

To create micro-climatic condition in and around the estate species like *Cassia siamea*, *Acacia* sp., *Melia azadirachta* (Neem) etc. may be grown in southern and western border of the sections. These plants will also act as wind breaker and shelter belt.

- **Planting of drought tolerant plant materials:**

In the drought prone areas, hardy clones like BT2, BT4, BT7, BT8, BT11, BT12, BT17, BT19, BT21 and BT23 and biclonal seedlings like BTS1 and BTS5 should be used for replanting and extension planting.

Date: 18/04/2023


(Dr. Md. Ismail Hossain)
Director (In-Charge).
21.08.2026