

**A SURVEY OF DROUGHT DAMAGE TO TEA
IN THE RATNAPURA REGION IN 1992**

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INTRODUCTION

Drought is one of the most serious environmental hazards of global societies and it's damage to cultivated crops has become a frequent phenomenon and tea is no exception. It has been observed that in certain years drought is more intense resulting in considerable damage to tea plantations. The damage results in not only loss of yield during the dry period but also debilitation of plants, stress related diseases and severe defoliation and even death of plants.

The growth of tea as in the case of most plants is largely determined by the availability of water. The quantity of water utilized by tea plants depend on the stage of growth and the size of the leaf canopy. The availability of water to the tea plant depends on several factors.

An acre of tea with a good cover on a fine day removes approximately a quantity of water equivalent to 3 - 4 inches of rain. The

removal of water by tea has to be replenished in the soil in time or else it could result in a condition of water stress. Drought conditions result when there are long dry periods leading to prolonged water stress conditions.

Drought in the Low-country

The Ratnapura tea region consists of four Administrative districts, viz. Kegalle, Ratnapura, Kalutara and Colombo. While over 15,000 ha of state owned tea estates are seen in the Ratnapura region approximately an equal amount is distributed among private properties and small holdings. Each Administrative district has several tea regions the boundaries of which are basically demarcated taking agro-ecological differences into consideration. The distribution of tea among state owned estates in the Ratnapura region are given in Table 1.

Nearly 75% of the tea hectarage in the Ratnapura region is found in the Ratnapura Administrative district followed by Kegalle district (16%), Kalutara district (less than 10%) while the Colombo district has only a small percentage.

Soils and Climate

The soil type found in the tea growing areas of the Ratnapura region belong to the great soil group Red Yellow Podsol with Immature Brown Loam soil in certain areas/groups. The soil type in the Kalutara district and certain parts of the Ratnapura district towards the tea growing areas of Horana are associated with lateritic layers.

TABLE 1 - Distribution of tea area in Ratnapura region

Administrative district	Tea district	No. of estates	Tea area (ha)
Ratnapura	1. Ratnapura	12	1,834.49
	2. Balangoda	10	2,687.40
	3. Kahawatte	13	3,870.65
	4. Bambarabotuwa	03	1,228.50
	5. Rakwana	06	1,644.87
	Total		44
Kegalle	1. Kegalle	12	986.66
	2. Yatiyantota	06	525.46
	3. Deraniyagala	06	999.83
	Total	24	2,511.95
Kalutara	1. Horana	12	1,138.62
	2. Kalutara	03	383.76
	Total	15	1,522.38
Colombo	1. Avissawella	03	100.94
	Grand total	86	15,401.18

The land becomes steeper towards the higher elevations of the Rakwana and Balangoda tea districts in Ratnapura as well as in the Deraniyagala area in the Kegalle district.

Soil depth is a highly variable factor even within the boundaries of an estate and could influence localised water stress conditions.

Elevational factor

Though the entire tea area in the Ratnapura region is generally described as low grown, a considerable area especially in Balangoda and Rakwana falls in the mid elevational category and even certain fields of few estates are in the high elevation.

Rainfall

The tea growing areas of the Ratnapura region receive a minimum annual rainfall of 2300 mm as in Rakwana while the Bambarabotuwa area receives the highest of over 4200mm. While Rakwana and Balangoda subdistricts receive less rainfall compared to the others they receive more rain during the North-East monsoon but the rest of the subdistricts receive the bulk of its rain from the South-West monsoon.

Drought damage to tea

During the first three months of 1992 all subdistricts in Ratnapura received only 25% or less of the usual rains obtained in the area (Table 2). The subdistricts of Rakwana, Kalutara and Kegalle were the worst affected which received rainfall as low as 8, 4 and 15%

respectively compared with the 10 year average. Towards the end of the first six months the situation improved and by the end of the year all subregions, except Rakwana received the usual quantity of rainfall.

It is noteworthy that the subdistricts of Kalutara, Rakwana, Kahawatte and Kegalle had continuous periods of dry days for 60 days or more during the first three months of the year.

The ambient temperature had been maintained above average in 10 out of 12 months during 1992 (Table 3). This was most remarkable during the critical period, January, February, March and even in April with the ambient temperatures showing an ascending trend from January to March.

Effects of drought on tea

The heaviest damage to tea was observed in the subregions/districts of Rakwana, Kahawatte, Kalutara and Kegalle. The damage in the Balangoda and Bambarabotuwa regions was comparatively low. The highest incidence of casualties was seen in fields with young tea up to the first prune. In the Rakwana, Kahawatte and Kegalle regions casualty rates of over 90% were not uncommon. It must be clearly emphasized that in young fields up to two years of age, the first to suffer were those planted on poor soils. However, towards the end of the prolonged drought period plants on soils considered good, had also suffered considerable losses. Fields in the third and fourth year from pruning which were receiving regular doses of fertilizer and giving high yields were more vulnerable to drought damage

TABLE 3 - Monthly maximum temperature - St. Joachim Estate
(10 year average and of 1992)

Month	10 year Average	1992	Difference
January	32.42	33.00	+ 0.58
February	33.73	35.70	+ 1.97
March	34.40	37.20	+ 2.80
April	33.54	34.30	+ 0.76
May	32.72	32.90	+ 0.18
June	30.75	31.30	+ 0.55
July	30.53	30.70	+ 0.17
August	30.99	31.40	+ 0.41
September	31.41	31.20	- 0.21
October	30.86	30.40	- 0.46
November	31.18	31.50	+ 0.32
December	31.71	32.00	+ 0.29

than those fields which showed an average performance. Fields which were in the first and second year from pruning withstood the drought better than third year fields. Fields that were more than 15 years of age with debilitated bushes that had been pruned poorly suffered earlier than the healthy bushes.

Young tea under well managed shade was observed to better withstand the drought than those under dense *Albizia* shade planted at a closer spacing than recommended or where there was no shade. Tea under good shade showed comparatively less scorching effect on leaf and defoliation.

In the Ratnapura region clone TRI 2025 better withstood the drought irrespective of other related conditions.

Casualties in mature tea was minimal in the Balangoda and Bambarabotuwa subdistricts. Symptoms of water stress were observed in fields with soils having high graveliness or in soils having poor depth.

Severe casualties of mature tea were seen in the subdistricts of Rakwana, Ratnapura, Kegalle and Kalutara. A prominent feature associated with these high incidences is the poor physical characteristics of the soil.

In the Kalutara and Kegalle districts severely eroded soils were frequently associated with a high gravel content which is more kabooky in nature while in Ratnapura the soils are more quartzey gravel with certain parts containing kabooky gravel. All these subdistricts have suffered casualties in

subdistricts have suffered casualties in fields which have low depth of soil and specially in those with underlying slab rock.

Among the popular clones planted, apart from TRI 2025 clones, S 106 and KP 204 showed a greater degree of drought tolerance. However, even susceptible clones like TRI 2023 and TRI 2026 survived wherever there were deep soils with good structure undergoing temporary damages in the form of loss of leaf and death of tertiary branches.