B-128: The minimum rainfall requirement to obtain potential yield of tea in Sri Lanka

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Rainfall is one of the most important climatic factors limiting the growth and yield of tea. It has been observed that in certain years, the water stress caused by lack of sufficient rainfall for a significant period of time, leads to considerable losses in the tea plantation. In this paper, we describe a minimum monthly requirement of rainfall that would be necessary to achieve the potential yield from different tea growing regions in Sri Lanka viz. high grown (greater than 1220 m amsl), mid grown (610 m –1220 m amsl) and low grown (less than 610 m amsl).

This study was carried out using monthly rainfall data collected from 7 Agro-meteorological stations; 3 from high grown (TRI Talawakelle, Bandarawela and Seethaelliya), 2 from mid grown (TRI Hantana and Gannoruwa) and 2 from low grown (TRI Ratnapura and TRI Kottawa). The variation of monthly yield (measured in kg made tea/ha) against the monthly rainfall (in respective regions) was observed for a period of 20 years from 1976 to 1995.

It was found that the best linear correlation between those 2 variables was given only when the computation was made using yield vs. rainfall of the same month rather than the yield of month x vs. rainfall of month x-1. Scattergrams of monthly yield figures vs. monthly rainfall and the polynomial curve fittings of the 6^{th} order were used to elucidate the relative behaviour of these 2 parameters.

The analysis revealed that the variation of tea yield against monthly rainfall was of double oscillatory type with first peak falling around 100 mm monthly rainfall in all 3 regions, while the less dominant second peak varies between 225 - 450 mm depending on the regions. The behaviour can be due to the influence of other factors governing the tea yield other than the rainfall viz. temperature, cloudiness, soil erosion under heavy rain, evaporation. The results indicate that the minimum rainfall requirement to achieve the potential

yield in low, mid and high grown tea areas are 110 (±5), 100(±10) and 100 (±5) mm, respectively, The corresponding approximate values of the potential yield were found to be 115, 53, 85 kg/ha, respectively. The average monthly yield for the same regions in 1997 were 142, 84 and 136 kg/ha, which are well above the potential yield at minimum rainfall requirement.

The minimum rainfall requirement found here for different tea growing regions would be of paramount importance in the strategy of maintaining tea productivity during dry weather periods.