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Effects of ambient temperature and evaporation on yield of tea in Sri Lanka

Knowledge on the impact of the temperature and evaporation on tea yield is important for the future planning aimed at enhancing the productivity of plantations in Sri Lanka. The present analysis was carried out using monthly mean temperature and evaporation data over a period of 30 years (from 1968 to 1997) recorded in four agro –meteorological

stations in tea growing regions and monthly yield data from four estates located close to those agro-met stations. Months with a rainfall of less than 100 mm were excluded from analysis to minimize the rainfall effect on yield.

Multiple regression analysis showed that there is a significant correlation between temperature and tea yield ($p<0.001$). The yield response for temperature is of curvilinear type, which could be extrapolated to the zero yield at a minimum temperature (base temperature) of 10.5 ^{o}C (+0.5). the peak tea yield was found to be received at a temperature of 22 (+0.5) ^{o}C.

It was also found that there is a significant correlation between monthly mean yield and monthly mean evaporation for low country and up country ($p<0.001$). The variation of tea yield against monthly mean evaporation in the upcountry is of curvilinear type which shows that the yield increases with increasing evaporation up to 85 mm/ month. The while it reduces with further increase in evaporation. However, in the low country, the yield of tea linearly decreases with increase in evaporation above 80 mm/ month. The results show that the tea production in Sri Lanka can be adversely affected whn the monthly evaporation exceeds 80 mm.

This analysis shows that the increasing trend of temperature and evaporation with global warming would be beneficial for tea cultivation in the upcountry while it could give an adverse effect for tea cultivation in the low country.