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EFFECT OF SOME AGRO-CLIMATIC FACTORS ON THE GROWTH OF RUBBER (*HEVEA BRASILIENSIS*) IN A HUMID AND A DRY SUB-HUMID LOCATION

In a perennial crop like rubber (*Hevea brasiliensis*), the influence of climate on growth and productivity is cumulative due to the long duration of the crop. There is shortage of land for further extension of rubber cultivation in the southern parts of India where the crop has conventionally been grown. Due to the increasing demand for rubber, the cultivation is being stretched to the dry sub-humid and subtropical regions, which are marginal areas with climatic constraints (Sethuraj *et al.*, 1989). The major constraints in expanding rubber cultivation to the dry sub-humid regions are prolonged drought coupled with high temperature, low relative humidity and dry wind (Mohankrishna *et al.*, 1991). Under dry conditions, even with irrigation, rubber plantation exhibits growth inhibition leading to longer immaturity period (Omont, 1982; Saengruksowong *et al.*, 1983; Vijayakumar *et al.*, 1988; Sethuraj *et al.*, 1989). The objective of this paper is to compare the effect of dry sub-humid and humid tropical climates on growth of rubber and to identify suitable clones for the former.

Nine clones were planted at Central Experimental Station of Rubber Research Institute of India (RRII) at Chethackal (9.22°N, 76.50°E, 50 m msl) Kerala state (humid climate) and at the RRII Regional Research Station Dapchari (20.04°N, 72.04°E, 48 m msl) Maharashtra state (dry sub-humid climate) during 1982 in a randomized block design with 25 plants per plot in two replications. During subsequent years plants in a few plots suffered casualties due to unfavourable climatic conditions in dry sub-humid location whereas no casualties were noticed in plants grown in humid climate. During the first six years partial life saving irrigation were provided during summer months (December to May) in the dry sub-humid location (Chandrashekar *et al.*, 1994) and no irrigation was provided in the humid location.

Girth was recorded in both the locations at quarterly intervals and the biomass computed following the equation of Shorrocks *et al.* (1965) to work out seasonal relative growth rates (RGR). The meteorological data such as rainfall, relative humidity (RH), maximum temperature (Tmax), minimum temperature (Tmin), evaporation (Ev) and sunshine hours (SH) were collected from both the locations. In both the locations, four different seasons were identified based on the above climatic parameters (Table 1). Regression equations and correlations between seasonal RGR and all the relevant weather parameters were worked out for each location.

Monthly variation (mean of four years from 1987 to 1990) in rainfall, relative humidity, maximum and minimum temperatures, evaporation and sunshine hours for both the locations are presented in Fig. 1.