

## CROP COEFFICIENTS FOR IMMATURE RUBBER

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Crop coefficients were worked out for immature rubber using lysimetrically measured crop evapotranspiration and reference evapotranspiration estimated using weather based empirical methods (pan evaporation, modified Penman, Hargreaves and radiation methods). The mean evapotranspiration measured was 2.60, 4.24 and 4.98 mm per day during the first, second and third year respectively. The Kc values increased from the first year to third year of planting for all the four methods studied. A regression analysis indicated that modified Penman method and Hargreaves method are suitable for estimating evapotranspiration of rubber during the summer season.

Key words: Crop coefficient, Evapotranspiration, *Hevea brasiliensis*, Lysimeter.

### INTRODUCTION

In India, *Hevea brasiliensis*, the most important commercial source of natural rubber (NR) is traditionally grown in Kerala, parts of Tamil Nadu and Karnataka under rainfed conditions. It is also cultivated in non-traditional areas like the north eastern states, Maharashtra, Orissa and West Bengal. Since the former experiences soil moisture stress for a period of four to five months starting from December to April, and the climatic conditions of the latter are less congenial for the growth of rubber trees, the effect of irrigation on the growth and yield of rubber has to be examined (Vijayakumar *et al.*, 1988).

Estimation of water requirement of a crop is essential for planning and operating irrigation systems. It is also useful to understand the water use by a given crop. Water requirement of a crop is directly related to its evapotranspiration and varies with the weather conditions and stage of growth.

A widely accepted approach for esti-

imating evapotranspiration of a crop (ETc) is to apply an experimentally derived crop coefficient to a reference crop evapotranspiration (ETo) calculated from weather based empirical methods (Doorenbos and Pruitt, 1977). Crop coefficient (Kc) is the ratio of actual evapotranspiration (ETc) of the crop under non-stressed conditions to reference crop evapotranspiration (ETo). It represents crop specific water use.

Evapotranspiration and crop coefficient of two year old rubber plants have been reported earlier (Jessy *et al.*, 1992). The present study was taken up to develop crop coefficients for the first three years of plant growth using ETc measured lysimetrically and ETo estimated using weather based empirical methods.

### MATERIALS AND METHODS

#### Measurement of ETc

The ETc was measured using a non-weighing lysimeter (diameter 3.5 m and depth 1.5 m). The lysimeter was installed

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