Effect of different shade levels on growth of Cardamom [*Elettaria cardamomum*(Maton)] lines selected for low elevation cultivation

Four lines of cardamom, Eletteria cardamomum (Maton) namely EC1/100, EC1/101, EC1/102 and Ec2/400MT were introduced for growing under rubber (Hevea brasiliensis) at low country wet zone areas. The amount of light reaching cardamom canopy varies with the clone, spacing and age of rubber plantion. Growth response of these cardamom lines to varying light levels under rubber canopy is not known.Therefore, the present study was undertaken to determine the shade required for optimum growth of cardamom lines selected for low elevation cultivation.

The study was conducted at the Export Agriculture Research station, Matale during July-December 1998. Six blocks of different shade levels having Photosynthetically active Radiation (PAR) interception of 50%, 70%,83%,90%,94% and one without shade (PAR of 966.4 µE/ m^2 / s) were established. Potted plants propagated through tissue culture were placed under each block.

Interception of PAR was measured using tube solarimeters during 09.30 -14.30 h (local time) in very clear days. Growth measurements and light dependent characteristics such as chlorophyll content of the leaves, total dry matter production and partitioning were determined.

The number of pseudostems perclump decreased significantly with increasing level of shade. Higher numbers of pseudostems were observed in EC1/101, EC2/400MT and EC1/102 at 70% PAR interception.EC1/100 responded well to a shade level as high as 83%. Highly significant positive correlation was observed between pseudostem height, girth, leaf number and PAR interception up to 83%. Leaf colour changed from yellowish green to dark green with increased light levels. Increased number of leaf scorching patches and rolling leaves were apparent with shading up to 70% PAR interception. Increased chlorsphyll a, b and total chlorophyll were observed with shade from 70% to 90% PAR interception, irrespective of the lines. The highest dry matter accumulation was observed under low shade conditions with a higher proportion of thinner shoots. Shade beyond 90% of PAR interception reduced growth and between 65-85% PAR interception was the optimum level for the highest dry matter accumulation.

Therefore, in conclusion, the light requirement for better vegetative growth of cardamom is between 96.6 – 289.9 µE/ m^2/ s PAR (70% - 90% shading) for EC1/100, EC1/101 and EC1/102 lines while 144.9 – 289.9 µE/ m^2/ s PAR (70% - 85% shading) for EC2/400MT line.