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INFLUENCE OF PLANT DENSITY ON GROWTH AND CANOPY ARCHITECTURE IN *HEVEA BRASILIENSIS*

Canopy architecture, the expression of the equilibrium between endogenous growth process and exogenous constraints (Edelin, 1984), determines leaf display and therefore, influences light interception and subsequent carbon assimilation. Architectural analysis is essentially a dynamic approach to study plant development.

A trial was undertaken with *Hevea brasiliensis* at three different planting densities and to assess the overall development of the plant in the juvenile phase, plant canopy architecture was studied.

Polybag plants of two clones (RRII 105 and RRII 118) of *H. brasiliensis* were field planted in the year 1988 at the Taranagar farm of the Regional Research Station of RRII at Agartala, India, situated at 23.53° N 91.15° E and at an elevation of 16.6 m MSL. Square planting was followed to obtain a population of 420, 660 and 840 plants per hectare (referred hereafter as D1, D2 and D3 densities, respectively). The data were analysed using the analysis of variance technique for a randominsed block design.

Girth and bark thickness at 150 cm from bud union, tree height, crotch height, crown width and light intensity were measured. Number of branches, branch length and circumference and angle of insertion of the branches were also recorded. Circumference was measured 6 cm above the branch union. Branching angle was recorded using a protractor devise (Norman and Campbell, 1989). A blunt hypodermic needle (21 g x 38 mm) with plastic guide was used for measuring bark thickness. All the branch characteristics were measured only on the first order branches, as they are dominant in terms of size, and their disposition determines the arrangement of branches of higher orders and ultimately results in the overall structure of the crown (Nelson, *et al.*, 1981).

Tree girth at 150 cm ranged from 33.80 to 39.59cm in RRII 105 and 33.95 to 43.72 cm in RRII 118. A significant difference in girth between the densities as well as clones (Table 1) was noted. In both the clones, girth increased with the higher plant density. The difference in the girth between the clones is mainly due to the inherited growth characters of these clones and RRII 118 is a remarkably vigorous clone. Recently Varghese *et al.* (1994) have shown that RRII 118 has a higher juvenile growth compared to RRII 105.

Generally girth tends to increase when the density is less (Sethuraj, 1985). However, in the north eastern part of the country where this trial was conducted, a similar trend was not apparent in the initial growth stages. The trial was carried out in virgin forest clearing highly infested with lalang (*Imperata cylindrica*) especially during the initial years. Lalang is a fast spreading weed which has drastic effect on growth of rubber in the early stages (Soedarsan, 1976). Therefore, it is likely that the initial growth of rubber has been affected by this weed irrespective of the plant density. After four years, when the canopy started closing