EFFECT OF SOIL pH AND BASE STATUS ON THE GROWTH OF YOUNG NATURAL RUBBER PLANTS

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In India, natural rubber (*Hevea brasiliensis*) is cultivated in around 8,27,000 hectares of arable land. Major share of the NR growing regions experiences tropical humid climate and the soils are mainly Ultisols with low base saturation, high exchangeable Al and acidic pH. Studies were conducted to monitor the growth of NR seedlings in soils having three different pH *viz*. 4.4, 5.5 and 7.4 with wide variations in base status in the laboratory condition and in the open-air condition in polythene bags. In the laboratory study, the length and biomass of shoot and root were monitored and in the polythene bags, growth of the plants in terms of shoot diameter, root length, shoot and root biomass at periodic interval (45, 90 and 240 days) were monitored. Growth up to 30 days in the laboratory condition was not affected by soil conditions. In the second experiment, growth measurements on the 45th day indicated no difference between plants grown in soils with three distinctly different pH. However, at 90 days and 240 days significantly lower growth was recorded by plants grown in extremely acidic pH (4.4). Highest growth was recorded by plants grown at pH 7.4. The shoot and root biomass also recorded similar trend. Growth of plants was reduced at extremely acidic pH which may be due to the combined effect of extreme acidity and high Al^{3+} and H^{+} ions and low availability of nutrients warranting soil acidity and specific nutrient management for maintaining soil productivity and good growth of rubber plants.

Key words: Extremely acidic soil, *Hevea brasiliensis*, Natural rubber, Rubber growing soil, Soil pH

INTRODUCTION

Natural rubber (*Hevea brasiliensis*) is a forest tree species of the tropical rain forests in Central and South America. In world over, the natural rubber (NR) producing regions lies between 15^{o} North and South (Thomas and Panikkar, 2000). In the review, Verhege (2010) reported that *Hevea* cultivation is presently between 25^{o} North in Yunnan high lands (China) and 21^{o} South in Brazil. At present, the total NR area in India covers 8.27 lakhs hectares (Rubber Board, 2017) including the traditional as well as the non-traditional rubber growing areas with varying agro-climatic and soil conditions. Major share of the area (more than 85%) is in the traditional region and the the soil is mainly Ultisols (Joseph, 2016). In Kerala, rubber cultivation is extended to Wyanad (high elevation, >700 m) and low temperature areas and the productivity is less compared to the major rubber growing districts.

Soil pH plays major role in nutrient availability and plant adaptations to make a

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