

DISTRIBUTION OF EXCHANGEABLE AND TOTAL MANGANESE IN RUBBER GROWING REGIONS OF INDIA

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Profiles were exposed in the conventional rubber growing areas in Kanyakumari, Kottayam, Trichur and Calicut and in the non-conventional region in Dapchhari, Maharashtra. Soil samples were collected horizon-wise from these profiles and analysed for mechanical composition, organic carbon, pH, total iron, total manganese and exchangeable manganese. Correlations were worked out between the two forms of manganese and physico-chemical properties of the soil. It was observed that the total as well as the available manganese are high in Dapchhari compared to other regions studied. The total manganese was found to be significantly correlated with the exchangeable manganese, fine sand, silt and total iron. The high content of manganese (1373 ppm) in the soil of Dapchhari may not cause any adverse effect on growth of rubber, as rubber is found to be growing satisfactorily in soils having similar manganese status in other rubber growing countries.

Key words.—Traditional and non-traditional rubber growing regions, Total manganese, Exchangeable manganese, Soil mechanical composition, Correlations, India.

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INTRODUCTION

Manganese is one of the essential plant nutrients required in traces and its deficiency leads to chlorosis and, in extreme cases, drying of growing points. The essentiality of this element was established as early as 1922 (Mc Hargue, 1922). Manganese is closely connected with the synthesis of chlorophyll and its deficiency symptom, namely appearance of chlorotic mottling leaving the veins and midrib green, is also shown by iron deficient plants. In *Hevea*, manganese and magnesium are inter-related, high manganese content inducing magnesium deficiency (Bolle Jones, 1957). In young unbranched rubber, deficiency symptoms appear on the lower and middle stories. In acute cases

upper stories are also found affected. In branched trees, deficiency symptoms are seen in shade leaves on low branches (Shorrocks, 1964).

Manganese is found to have an important role in the quality of raw rubber, as well as rubber products. A high amount of manganese in manufactured rubber promotes oxidation and hence the tolerance limit is fixed as 10 ppm in sheet rubber (Anon, 1957). Rubber trees growing in soils containing high manganese may absorb large quantity of this element and thus deteriorate the quality of latex.

In soil, manganese occurs as water soluble, exchangeable and higher oxides of manganese