

## SUBSTITUTION OF POTASSIUM WITH SODIUM AS NUTRIENT FOR THE GROWTH OF RUBBER SEEDLINGS

Elsie S. George, K I. Punnoose and M. Karthikakuttyamma  
Rubber Research Institute of India, Kottayam – 686 009, Kerala, India.

Submitted: 22 September 2004 Accepted: 29 December 2006

George, E.S., Punnoose, K I. and Karthikakuttyamma, M. (2006). Substitution of potassium with sodium as nutrient for the growth of rubber seedlings. *Natural Rubber Research*, 19 (1&2): 58-61.

A study was conducted in a rubber nursery to find out the effect of substitution of varying levels of potassium (K) with sodium (Na) on the growth and nutrient uptake of rubber seedlings as well as on soil properties. The experiment was repeated for two years at the same site. The stem diameter of seedlings was not influenced by the substitution of K with Na. Application of 50 and 75 kg K/ha along with 25 and 50 kg Na/ha had a positive effect on the K content in stem and root of rubber seedlings. The application of 75 and 100 kg K alone and combination of 50 kg each of K and Na gave higher K uptake over control. For 75 and 50 kg K/ha application, an increase in soil available K status was noted with 25 and 50 kg Na/ha application while available Na, pH and electrical conductivity (EC) remained unaffected.

Key words: *Hevea brasiliensis*, Potassium, Rubber seedlings, Sodium uptake.

### INTRODUCTION

Potassium (K) is an important plant nutrient essential for enzyme activation and protein synthesis. It also mediates osmoregulation during cell expansion and stomatal movements. Most of the rubber growing soils have low potassium status due to kaolinitic type of clay mineral and leaching losses. The widely used and cheapest K fertilizer is potassium chloride commercially known as muriate of potash. Whether sodium (Na), a closely related cation, can replace K in the physiological processes in the plant is an important question since common salt, the source of Na, is much cheaper than muriate of potash. Khanna and Balaguru (1981a, b) reported that majority of plants show selectivity for K when supplied with both K and Na and the degree of selectivity differs between species. Smith (1969) and Mathew *et al.*, (1984) reported that Na could replace K for coconut trees. George *et al.*, (2000)

reported that substitution of  $K_2O$  by  $Na_2O$  even to the extent of 75 per cent did not reduce the dry matter production and uptake of K in young rubber plants. This experiment was aimed at studying the effect of substitution of varying levels of potassium with sodium on the growth and nutrient uptake of seedlings in a rubber nursery.

### MATERIALS AND METHODS

The trial was conducted at the Central Nursery of Rubber Board, India, at Karikattoor, Pathanamthitta district, Kerala, for two years. The experiment consisted of using different levels of  $K_2O$  and  $Na_2O$  in completely randomized design with thirteen treatments and three replications. The plot size was 12 x 1.2 m and the number of gross and net plants in a plot were 40 and 16 respectively. The initial physical and chemical properties of soil are given in Table 1.

First set of planting was done at a