

## Rotan manau intercropped with rubber: rate of root growth between three and four years after planting

### ABSTRACT

Efficient fertiliser management depends partly on understanding the active root distribution. In the present study, the active root distribution of 3- and 4-y-old plantation grown rotan manau (*Calamus manan*) was assessed using isotope tracer technique. For the 3-y-old rotan manau, three distances from the plant base (0.5, 1.0 and 1.5 m) at 5 and 30 cm depths were examined. For the 4-y-old plants, two distances, viz-á-viz at a centre between two rattan plants and another in the middle between two rattan plants and two rubber trees were studied. The isotope used was  $^{32}\text{P}$ , applied as a solution with  $\text{KH}_2\text{PO}_4$ . The rotan manau plants had been established under mature rubber plantation. High proportions of feeder roots were found at 0.5 and 1.0 m distances at the surface (5 cm depth) for the 3-y-old plants. Uptake of  $^{32}\text{P}$  was also observed for the application at 1.5 m distance for both depths but the counts were small. Statistical analysis gave a highly significant difference within the distances and within the different depths. For a better synchronisation between fertiliser application and plant uptake, it seems that application at approximately between 0.5 and 1.0 m distance around the plant is most appropriate at this age. At four years after planting, important uptake was obtained only for the two plants located near the application area. Anyhow, to some extent it reflected that roots had already extended for another 1 m compared to the 3-y-old plants.

**Keyword:** *Calamus manan*; Fertiliser management; Radioactive  $^{32}\text{P}$ ; Root activity