Comparative assessment of soil moisture depletion pattern of forest species *Alstonia macrophyla* compared to bare soil

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The present research was carried out in a long term experimental plot established in the Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, in May 2001. Soil moisture extraction by *Alstonia* plantlets compared to bare soil and the root development pattern of *Alstonia* were studied during May-October 2001. Dielectric capacitance method using Diviner 2000 was used to assess the moisture depletion pattern of the soils.

The soil in the experimental site was clay; bulk density of the soil varied from 1.36 to 1.53 g/ $cm^3$with maximum values at 40-60 cm depth. The silt content of the soil had a considerable increment (from average of about 15% to 30%) beyond 70 cm depth. A distinct hard laterite layer was observed at 50 - 60 cm depth.

Results revealed that Dielectric capacitance method using Diviner 2000 as a reliable and easy method to assess in situ soil moisture monitoring in field experimental plots.

Throughout the period of research, soil moisture levels in the *Alstoniia* plots were comparatively low. During this period 9.55mm of additional moisture was extracted by *Alstonia* plantlets from 60 cm depth profile compare to bare soil. The highest moisture extraction was observed at the depth of 10 – 20 cm and 20- 30 cm depth. Furthermore, high moisture recharge was observed in *Alstonia* plots after the rains. *Alstonia* root system may have promoted the moisture penetration to the soil profile after the rain.

Observation made at the vertical and lateral distribution of roots after 6 months of establishment indicated that the depth and lateral distribution of the root zone of *Alstonia* as 57 cm and 46 cm respectively. It was also noted that more than 85% of roots are concentrated in the top 30 cm depth level and maximum root density lies at 20-30 cm depth layer.

Authors wish to acknowledge the research grant offered by the IAEA.

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