

**B-89 Identification of basic design parameters of a drip irrigation system for coconut (*Cocos nucifera* L.) in gravelly soils**

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The gravity flow drip irrigation system could be implemented successfully in coconut plantations with precise knowledge on the soil water movement and activity of coconut roots. The effective root zone of coconut for moisture absorption, the optimum wetting pattern of soils with respect to flow rates of drippers and number of drippers per palm and suitable position for placement of drippers in the effective root zone of coconut grown in drought prone gravelly soils were investigated. Root distribution studies with respect to water absorption showed that 75-80% of coconut roots was localized at the depth range of 20 to 100 cm, about 5% roots beyond 100 cm depth and 15%-20% roots occurred in top soil layer (0-20 cm). Moisture stored at the 20-120 cm depth range was found to be highly extractable by coconut palm. Roots localized at a distance from 50 to 100 cm away from the bole of coconut palm were more responsible for water absorption and the highest moisture extraction was observed at 100 cm away from the palm. Irrigation of coconut through drippers at the rate of 30 l/h for 2 h wetted a large volume of soils in the effective root zone. Evidently the placement of 4 drippers (flow rate of 30 l/h for 2 h) at 100 cm distance away around the bole can fully wet the soils in the effective root zone of coconut grown in gravelly soils.