

MOISTURE MOVEMENT STUDIES IN DRIP IRRIGATION

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SUMMARY

The study of moisture movement as a function of elapsed time was undertaken to determine the boundaries of the irrigated soil volume from a single point source of dripper with three quantities of irrigation water ($Q_1 = 33\%$, $Q_2 = 66\%$ and $Q_3 = 100\%$ of daily E_0) and four discharge rates ($D_1=1$, $D_2=2$, $D_3=3$ and $D_4=4$ lit/hr.) in laterite soil at CPCRI, Kasaragod. The horizontal and vertical soil moisture distribution was monitored by gravimetric method and also by excavating trenches after specified time.

Both the horizontal and vertical movement of soil moisture were related to the quantity and discharge rate. However, vertical advancement was faster than horizontal and the differences widened with lapse of time. With Q_3 (and discharge D_2), the wetted front advanced to 120 cm vertically and 65 cm laterally after 5 days of irrigation. The values of vertical and lateral movement of moisture with Q_2 and Q_1 were 100 and 60 cm and 88 and 50 cm respectively. In each case, the vertical component of the wetted zone was larger than horizontal component.

The volume of wetted soil was found to be directly related to the quantity of water applied. The maximum volume of wetted soil (23.8m^3) was found to be with irrigation equal to $100\% E_0(Q_1)$. The discharge rate of 4 lit/hr. wetted larger volume of soil than other rates.

The surface and sub-surface (30cm) application of water had a distinct effect on volume of wetted soil. Placing dripper on the surface could wet 8.4 per cent of the volume of the basin whereas sub-surface application wetted 14.6 per cent which was about 73% higher than the surface application. Different shapes of the wetted zones were traced with surface and sub-surface dripping points. Surface placed dripper formed conical shape wetted zone while it was top like with sub-surface dripping.