

**Water Uptake Pattern by Cotton Roots  
from a Drip Irrigated Field**

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Cotton (cultivar DPL-62) was planted on beds with drip tubing placed 8" below the surface. Water was applied equally to all plots for germination and early seedling growth after which water variables were imposed to approximate 0.6, 0.95 and 1.2 of the estimated evapotranspiration (ET).

Soil samples were taken in July, August and September to determine the total chloride concentration in the soil water. A mathematical analysis was developed to calculate the water extraction pattern by the roots based upon the soil chloride analyses. A similar technique has been previously used for determining root uptake of water under other irrigation regimes.

The first year's data indicate that the approach is indeed feasible for drip irrigation conditions and that the calculated water uptake pattern (Figure 1) is consistent with that obtained from root count studies. From the data for the low water treatment, it was observed that the rate of water uptake by the roots decreases the further the roots are located from the drip line. This is somewhat surprising, since it might be expected that, under the conditions of a limited rooting volume with a high root density, water uptake would be high throughout the entire root zone.

Relative Rate of Water Uptake

