



## TR-13

### A Hydrodynamic Study of Flow in Irrigation Furrows

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- [Full Text](#)

Equations of motion describing flow in irrigation furrows are derived and presented in characteristic form. Predicted flow profiles obtained from approximate numerical solutions of the equations of motion did not compare well with measured flow profiles. An estimate of furrow hydraulic roughness was obtained from field data. A procedure for determining infiltration rates from measurements of surface flow volume and irrigation stream advance is proposed for the case for which the cumulative infiltration is described by the KostiaikovLewis equation. Numerical solutions of the steady-state form of the flow equations were used to prepare design curves providing estimates of cutback flow rates for preventing tailwater losses. Sample problems illustrate how these reduced rates of application can be utilized to design furrow irrigation distribution systems to obtain improved irrigation efficiencies and subsurface water distribution patterns.

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