How reliable are cylinder infiltrometers in determining the infiltration characteristic of a soil?

Abstract:

A number of methods are discussed for obtaining a reasonable estimate of the infiltration function for irrigation borders. Data from ring infiltrometers are fit to power functions for infiltration rate and cumulative infiltration rate versus time and to a branch function where the infiltration rate is not allowed to go below some value (called the final infiltration rate). A volume balance within the border is used to adjust the data to give a better indication of the "average" infiltration conditions over the border. The results of Bouwer's method, which uses a series of borders as infiltrometers, were compared to the results of ring data for actual field data. Bower's method was also analyzed by developing advance and recession curves with the zero-inertia border-irrigation model with a known infiltration rate. The zero-inertia model was also used to examine the effect of different infiltration functions for specific examples (resulting from different irrigations or different estimation methods) on the application of water by surface irrigation.