

## Estimating earthen tertiary water channel seepage losses as a function of soil texture

### ABSTRACT

Estimation of seepage losses is important in the management of an irrigation scheme because such losses significantly affect the efficiency of water usage. An attempt was made to determine seepage losses as a function of soil texture. Losses were measured three times, with the inflow-outflow method, for each of the 30 channels made of sandy loam, clay, clay loam, silt clay, and silt loam (six channels for each soil texture), and the soil-specific losses were determined. The soil-specific values were validated in terms of computing outflows. The maximum seepage of 294 mm day<sup>-1</sup> was found for sandy loam, followed by 200, 185, 144, and 96 mm day<sup>-1</sup> for silt loam, silty clay, clay loam, and clay material channels, respectively. Two empirical equations requiring soil type constants were also evaluated—namely, the Moritz formula and the Molesworth and Yennidunia formula. Investigation using these two equations for seepage estimation showed either underestimation or overestimation for the soil textures investigated. Therefore, these equations should be used after calibration, in accordance with channel conditions.

**Keyword:** Molesworth; Moritz formula; Seepage losses; Soil-specific seepage losses; Tertiary channels; Yennidunia formula