

Evaluation of Application Efficiency of Furrow Irrigation Systems in Clay Soils

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Abstract. This poster will present an accurate and simplified methodology for furrow irrigation system design for clay soils in arid locations. Field experiments were conducted for a furrow irrigation system at an experimental site in Egypt with clay soils, cultivated with cotton and irrigated by a three-turn crop rotation. Several parameters were measured including the furrow shape geometry, slope, furrow width, furrow length, infiltration tests, advance time, cut-off time, depletion time, and recession time. A volume balance model was applied to simulate water flow in the furrow system and the results were compared to those obtained from the field measurements. This study shows that a volume balance model can be satisfactorily applied to clay soils and the length of the furrow and its discharge are the main factors affecting application efficiency. Also, this study indicates that in order to obtain high application efficiencies, one must use low discharge rates for small furrows and as the furrow length increases the discharge must also increase, and that furrow length can be increased with higher soil moisture contents.

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