

**VALIDITY AND APPLICATION
OF
SURGE IRRIGATION**

BY

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ABSTRACT

This study focused on adoptability and performance of surge irrigation. Main objectives of this research were to study the advance rate and subsurface water distribution under surge and continuous irrigations by applying measured volume of water in furrows.

The experiments were conducted in sandy loam soil. Different cycle times and cycle ratios were used for surge irrigation. Discharge was also varied in different experiments. Variable on-time and constant on-time surging were applied. Water front advances were noted during surge and continuous irrigations. Soil samples were taken upto 60 cm depth and at an interval of 38 m along the furrow both before and after irrigation. The results of the field trials indicates that a significant amount of water can be saved by adopting surge irrigation as compared to continuous irrigation (60 to 20 percent). In addition water reached faster in the former case which resulted higher distribution uniformity.

Applicability of a kinematic-wave was also verified using the field data. Results of the model were compared with the observed ones. Comparison of the results show that the predicted and observed water front advance curves matches closely when water was applied by surging for most surge treatments. But during surging off-time the movement of the advance curves for the surge treatments slowed down, resulting in deviation from the predicted

curves. Similarly the advance curves predicted by the model and for continuous overlap in the beginning and deviate toward the field end.

In addition to the results, the model predicts that water reached at the field end in equal number of surges as it was observed in the field. So the model holds good for practical application.

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