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Effect of Irrigation Techniques on the Efficiency of Dyked and Free End Furrow Irrigation

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Abstract

This study was conducted at the University of Khartoum Top Farm from November 2010 to November 2011. The treatments included four furrow irrigation techniques namely; surge flow, bunds, cut-back and cut-off. The soil was classified as clay soil. The techniques were applied on free end furrows and dyked end furrows. The furrow length was 190 m, the four techniques were randomly distributed in the experimental area and the design followed was the split plot design with three replicates. The results showed that the highest application efficiency of 60.3% was obtained with surge irrigation technique with dyked furrow end ($P \leq 0.05$) followed by surge irrigation with free end furrow (50.1%), bund irrigation techniques with dyked furrow (46.0%), bund with free end furrow (41.4%), cutback irrigation technique with dyked furrow (35.8%), cutback irrigation with free end furrow (44.0%); cut-off irrigation with dyked furrow (29.3%) and cutoff irrigation technique with free end furrow (29.2%). The highest distribution efficiency of 96.3% was also obtained under surge irrigation technique with dyked furrow end. Whereas the lowest distribution efficiency of 73.1% was recorded under cut-off irrigation technique with free end furrow. Surge irrigation technique with dyked furrow end recorded the heist storage efficiency of 87.7% compared with all other techniques with both dyked and free end furrows. While the lowest storage efficiency of 42.5% was obtained under cut-off technique with free end furrows.

Keywords: Bunds, cut-back, cutoff, furrow irrigation, irrigation efficiency, surge irrigation