

Research paper

Field Evaluation of Center Pivot Sprinkler Irrigation Systems, Atbara Food Security Scheme

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ABSTRACT

This study aimed to evaluate the performance of three center pivot sprinkler irrigation systems; A, B and C in the high terrace soil of a farm near Atbara, River Nile State. Catch-can tests were carried out to determine the performance of irrigation applied with the center pivot sprinkler irrigation systems under field conditions. The coefficient of uniformity (CU), distribution uniformity (DU), and application efficiency (AE), as performance parameters, were determined. The Center Pivot irrigation Model (CPM) was used to determine the average application depth (AgD) as well as the performance parameters CU, DU and AE. Field evaluation results indicated that for the three systems, A, B and C the CUs were 77.7, 84.1 and 92.5%, respectively, the DUs were 49.1, 71.6, and 87.1%, respectively, and the AEs were 79.7, 92.1 and 92.9%, respectively. Generally, among the three systems, both B and C showed higher performance than A. Hence, the test of performance for a center pivot sprinkler irrigation system should be carried out each season.

Keywords: *Application efficiency, coefficient of uniformity, distribution uniformity, soil moisture content*