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Performance Analysis of Collective Set-Move Lateral Sprinkler Irrigation Systems used in Central Anatolia

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Abstract: Performance assessment (PA) of irrigation and drainage systems has been an important area of research and debate in recent years. The present study was carried out to determine some performance parameters of sprinkler irrigation systems. Thirty-eight subunits (lateral) were monitored and assessed in the Konya Basin of Turkey. Sprinkler nozzle-pressure, flow rate, and their variations, and the amount of irrigation water were determined. Application and distribution uniformity, irrigation adequacy, and characteristics of system design and application were analyzed. Christensen Uniformity coefficient (CUC) and distribution uniformity (DU) values were between 41% and 88%, and between 18% and 81%, respectively. Variation in pressure and flow rates, and the use of different sprinkler parts in the same system were the main causes of the observed heterogeneity. It was concluded that by reducing lateral spacing the water distribution pattern, such as CUC and DU, could improve significantly and thus improve irrigation adequacy.

Key Words: Sprinkler system, Christensen uniformity coefficient, Distribution uniformity, Irrigation adequacy, Central Turkey

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