Evaluation of Solidset Sprinkler Irrigation Systems in Asadabad Plain of Hamedan Province

H. Zareabyaneh* and S. Zivari Aref
Associate Prof., Water Eng. Dept., Agriculture Faculty, Bu-Ali Sina University, Hamedan.
zareabyaneh@gmail.com
Ms.C. Graduated Student in Irrigation and Drainage, Bu-Ali Sina University, Hamedan.
Sajad.zivari.aref@gmail.com

Abstract

The objective of this study was to evaluate the design and the management of the solidset sprinkler irrigation systems in Asadabad plain of Hamedan province. For this purpose, 10 solid-set sprinkler irrigation systems of Asadabad plain were selected and some performance indicators such as Christiansen’s coefficient of uniformity (CU), distribution uniformity (DU), potential application efficiency of low-quarter (PELQ), actual application efficiency of low-quarter (AELQ), wind drift and evaporation losses (WDEL), deep percolation losses (DP) and adequacy of irrigation (ADirr) were used for evaluation. The mean values of these parameters were obtained as 75.26%, 56.76%, 45.4%, 34.65%, 28.92%, 31%, and 90.46 %, respectively. All of the systems had low PELQ values and also their water distribution uniformity was lower than the values recommended by Merriam and Keller. On the other hand, due to deficit irrigation, in all but seven systems, the AELQ values were equal to PELQ. Unsuitable design and implementation of the systems were recognized as the most important reason of low PELQ. One of these most important factors was unsuitable pressure. Simultaneous use of many sprinklers was also an important reason for low DU. The results of the study showed that, in many cases, operation of the system was very weak. Generally, the results showed that the proper design and implementation of the solid set sprinkler irrigation systems will be useful when the management of those systems were convenient and efficient.

Keywords: Application efficiency of low-quarter, Actual efficiency, Distribution uniformity, Application efficiency.