

Abstract

The purpose of study was to evaluate 8 classical sprinkler irrigation systems in Khash city. To do this, water and soil properties of each system were studied in terms of quality, soil permeability, salinity and alkalinity. Then pressures and discharge of sprinklers were measured in November 2018. Evaluation indices then include Christianity uniformity coefficient (CU), distribution uniformity (DU), low quadratic real use efficiency (AELQ), low quadratic potential efficiency (PELQ), evaporation and wind loss (WDEL), deep penetration losses (DP), Irrigation adequacy (ADir) and application efficiency (Ea) were calculated by analyzing the measured field data. Average Christianity uniformity coefficient of 76.1%, distribution uniformity of 65.2%, actual quadrant use efficiency of 43.3%, low quadrant potential efficiency of 44.9%, evaporation and wind losses of 22.1%, penetration losses of 21.8%. Irrigation adequacy percentage was 79.2% and application efficiency was 56.06%. Irrigation was completed in systems 3, 6 and 8 and in other systems due to the unintended dehydration, the true efficiency values and the potential efficiency of the low quadrant application were equal. Systems 2, 6, 3 and 8 had lower uniformity and uniformity coefficients than the Merriam and Chlorine recommended values. Inadequate design of systems, simultaneous use of more than one sprinkler, poor user management, and use of nonstandard equipment were the main reasons for the low uniformity of water distribution and water use efficiency in these systems. Studies also showed that in most of the designs studied the performance of the systems was low. Therefore, it is necessary to remove the obsolete equipment and pipes and sprinklers for troubleshooting. Re-check pumping station to supply needed pressure and educate farmers on the proper use of the systems.

Keywords: Application Efficiency, Evaporation and Wind, Irrigation Adequacy, Khash, Potential Efficiency.



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