AGRO-CLIMATIC ZONING IN EGYPT
TO IMPROVE IRRIGATION WATER MANAGEMENT

Abstract

The objective of this paper was to develop agro-climatic zones in the old cultivated lands of Egypt in the Nile Delta and Valley using climate normals from 1985–2014 to facilitate better irrigation water management under water scarcity conditions. 30-year monthly climate data were collected for 17 agricultural governorates in Egypt and yearly averages and 30-year averages were calculated. BISm model was used to calculate yearly averages of potential evapotranspiration ($PET$) and 30-year average for each governorate. Analysis of variance was done using one factor randomize complete block design, with number of years as replicates. Furthermore, the mean, the range and $R^2$ were calculated to test the strength of the relationship between $PET$ and climate elements. The means of $PET$ for each governorate was separated and ranked in ascending order using least significant difference test ($LSD_{0.05}$). The results identified 7 agro-climatic zones ($LSD_{0.05} = 0.146$). These zones were: (1) Alexandria; (2) Demiatt, Kafr El-Sheikh and Dakhlia; (3) El-Behira, and El-Gharbia; (4) El-Minofia, El-Sharkia, El-Kalubia, Giza and El-Fayom; (5) Beni Sweif, El-Minia, Assuit and Sohag; (6) Qena; and (7) Aswan. Such zoning will increase the ability of the Egyptian policy makers to prepare the appropriate water management and development policies as a result of the availability of proper information on each zone aiming at efficient use of the limited water resources.

Key words: 30-year climate data, efficient water use, governorates, Penman–Monteith equation, potential evapotranspiration