Abstract

In this study, field experiment has been carried out on the grape yard during the summer, Rainy, and winter seasons using different irrigation methods and measuring its impact on moisture retention. Six different irrigation methods such as drip irrigation (DI), drip irrigation with plastic mulching (DIPM), drip irrigation with organic mulching (DIOM), subsurface irrigation with stone column (SISC), subsurface irrigation with mud pot (SIMP), and subsurface irrigation with plastic bottles (SIPB) are used during experimental work. CROPWAT-8.0 model (FAO) is used to find out crop water requirements. Soil moisture is measured using soil moisture sensors fixed in the depth of 30 and 60 cm at the same location. Climatic parameters are obtained from the automatic weather station which is located near the experimental field. Multifactorial statistical analysis has been carried out using recorded soil moisture and climatic data. As per experimental results and analysis, it is observed that drip irrigation with the plastic mulching method is found to be the best method of irrigation for soil moisture retention among all other methods due to its highest soil moisture retention value as 25–30%. Whereas subsurface irrigation with the plastic bottle method is found to be suitable as it retained 15–20% soil moisture and material used in this irrigation method is waste material and the cheapest one.

Key words: drip irrigation, mud pot, organic mulching, plastic mulching, soil moisture retention, subsurface irrigation, surface irrigation