Abstract

Salt Accumulation in soil surface is a common problem in arid regions with low rainfall and high evaporation. Thus, providing a practical method for estimat water requirement is essential for controlling soil salinity. Field experiments in order to determine the optimum amount of leaching water are expensive and time consuming. So an alternative is to use mathematical simulation models. However, before implementing such models, the accuracy of their results should be evaluated according to field experimental. Sistan plain with a dry and semi-arid climate is increasingly faced with the salinity problem.In this research SWAP and HYDRUS-1D were used to simulate moisture and salt transport with in the soil profile in a farm in campus of university of Zabol. Morever these model were use to determine the best leaching in Sistan soils. Field experiments were performed in the form of a fully random block project with four leaching treatments, and in five interactions. The treatments were included 100, 150, 200 and 250 mm water with time intervals 3, 4, 6 and 7 days. With each treatment, soil samples were taken from five depth intervals 0-20, 20-40, 40-60, 60-80 and 80-100 cm and water content and soil chemical properties (EC, pH, TDS, and Na, K, Ca and Mg) were measured. According to the statistical analysis, the best leaching was provided with treatments with greater amount of water and higher irrigation frequency. It is suggested that HYDRUS-1D and SWAP are examined for different salinity condition and in presence of plant, in future works.

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Simulation of water and solutes movement in soil using HYDRUS_1D and SWAP models

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