ABSTRACT

With increasing population and limited fresh water resources, seems to be necessary to application non-conventional waters in agriculture, but use these waters need to distinct management in farmyard. In order to compare the effects of saline and fresh water irrigation combined with organic and chemical fertilizers on quantitative and qualitative traits in cumin, once a split-plot experiment based on randomized complete block design with three replications in 1390 and 1391 at the Research Farm of Zabol University and Agricultural Research Institute (Chahnimeh) was conducted. Two major irrigation regimes (irrigation with normal as the control and application of nature saline water with 4/180 $ds.m^{-1}$) and subplot were involving different fertilizer systems: chemical fertilizer 80:40:30 kg per ha, 40 Ton/ha of manure, compound chemical fertilizer with manure rate half the amounts mentioned, and no treatment (control). Combined analysis of variance showed that the use of saline water with EC 4/180 $ds.m^{-1}$ plant height, seed weight, number of umbels per plant, number of seeds per umbel, number of seeds per plant and seed yield decreased significantly; in contrast, the percentage of essential oil was added. Reduction in quality of water irrigation, water reduced in essential oil yield, but this subtraction was not statistically significant. Different fertilizer system's effects on yield components (plant height, seed weight, number of umbels per plant, number of seeds per umbel and seed number per plant) compared with control increased grain yield. Among the different fertilizer treatments application of combined treatment with NPK fertilizer with cattle manure was more effective than using them separately. Fertilizers affected on yield of essential oil were also; so combining NPK fertilizer with manure resulted in the highest percentage and oil yield. Interaction between irrigation regimes and different systems of fertilizer on plant height and grain weight were significant; in irrigation control was observed the integrated system of fertilizer increased grain weight (4/46 gr) and height (23/26 cm) were comparative with control (no fertilizer); But reduction in quality of irrigation water lead to reducing fertilizer effects and manure treatments was superior. The results showed an increase in soluble salts in water irrigation up to 4/180 $ds.m^{-1}$ leads to increased accumulation of sodium and ash content in cumin seed. Salinity with interfering and reducing in activity of ions in the soil, stimulated decrease in absorbing phosphorus, potassium, calcium and magnesium ion and reduce their concentration in plant tissue. Evaluation of organic matter and protein was also found to decrease with an increase in the electrical conductivity of irrigation water. Application system Fertilizers effective in improving quality characterties and the highest concentration of potassium ions, calcium and magnesium and protein content were obtained in mixture treatment. In this study, although the highest percentage of organic matter, phosphorus and most of the reduction in sodium content obtained in NPK fertilizer (80:40:30 kg/ha), but was no

significant difference between this treatment with mixture system of fertilizer. Chemical fertilizer and manure treatments had no significant effect on the ash percentage but excess sodium increases ash content in control plants.

Key words: Cumin *(Cuminum cyminum)*, Yield, Manure, Chemical fertilizer, Electrical conductivity

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