



University of Zabol  
Graduate School  
Department of Agronomy

**Thesis Submitted in Partial Fulfillment of the Requirement for the  
degree of Master of Science (M. Sc) in Agronomy**

**Title:**

**Investigation of the Relative yield of several common crops in  
Sistan region to different levels of water salinity**

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**January 2021**

## **Investigation of the Relative yield of several common crops in the Sistan region to different levels of water salinity**

### **Abstract**

This study was conducted to investigate of the Relative yield of several common crops in the Sistan region to different levels of water salinity, as a split-plot in the form of a randomized complete block design with three replications in the crop year 1398 in the educational-research farm of Zabol University Agricultural Research Institute located in Zahak (Baqiyatallah Azam Research Institute) was implemented. Treatments include four levels of irrigation as the main factor including freshwater irrigation (control), irrigation with 75% freshwater + 25% saltwater (one out of every four irrigations was done with saltwater), irrigation with 50% freshwater + 50% saline water (one in between), irrigation with 25% freshwater + 75% saline water (three out of four irrigations with saline water) and four common crops in the region as a sub-factor including barley, garlic, Pineapple, and cumin were considered. The results of the analysis of variance showed that the difference in plant height, economic yield, dry matter yield, harvest index, 1000-seed weight per barley, asparagus and cumin, number and weight of garlic per garlic, number of spikes per barley, number of spikes per Asparagus plant, number of umbrellas per cumin plant, number of seeds per barley cluster, the spike in asparagus and umbrella in cumin, carbohydrate content in barley, allicin in garlic, the mucilage in asparagus and essential oil in cumin, protein content, chlorophyll b, chlorophyll Total carotenoids, nitrogen, phosphorus and potassium between the studied crops were interacted with different water salinity levels and became significant. But the amount of proline and chlorophyll was significantly different only between the studied crops. Based on the results of comparing the average of the interactions, the highest economic yield (169.210 kg/ha) and harvest index (92.71%) of garlic were obtained under irrigation conditions with 50% saline water + 50% freshwater. Also, the highest dry matter yield was observed in garlic plants under irrigation conditions with 75% saline water + 25% freshwater (11198.3 kg/ha). Also, the highest amount of carbohydrates in barley plant under irrigation conditions with freshwater (17.3%), the highest amount of mucilage in asparagus (15.006%) and allicin in garlic plant (5.12%) in irrigation conditions with 50% water Saline + 50% freshwater, and the highest amount of essential oil in cumin was obtained under irrigation conditions with 75% saline + 25% freshwater (1.46%). The highest amount of protein (22.15 mg / g) in irrigation conditions with 75% saline + 25% freshwater, the highest amount of total chlorophyll (11.51 mg / g) in freshwater irrigation conditions in barley, and The highest amount of carotenoids (41.9 mg / g) was obtained in irrigation conditions with 50% saline water + 50% freshwater in cumin plant. Also, the highest amount of nitrogen in asparagus (11.20%), phosphorus in garlic (37.76 mg/kg), and potassium in barley (58.45 mg/kg) under irrigation conditions with 75 Percentage of saline water + 25% of freshwater were obtained. To achieve favorable results in the use of saline water and its combination with freshwater and its effect on the yield ratio of common crops in the Sistan region, garlic cultivation under irrigation conditions with 50% saline water + 50% freshwater for cultivation in the region is proposed It becomes.

**Keywords:** Salty water, Essential oil, Proline, Sodium, Yield, Chlorophyll