



University of Zabol
Graduate School
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The Thesis Submitted for the Degree of M.Sc
(In the field of Horticultural Sciences)

Title

Evaluation of Drought Stress, Potassium and manure fertilizer on Yield, Yield
Components and Physiological Indicators of *Chenopodium quinoa*.

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2021

Abstract:

Increasing organic matter and increasing the supply of nutrients and increasing sufficient organic matter to the soil in sufficient quantities play an important role in the quantitative and qualitative production of agricultural products. Organic fertilizers reduce the adverse effects of chemical fertilizers and increase fertilizer use efficiency by producing humus. To investigate the effect of manure, chemical and potassium fertilizers under drought stress conditions on yield, yield components and physiological characteristics of quinoa, an experiment was conducted in the form of double split plots in a randomized complete block design with three replications in Zabol University Agricultural Research Institute in Zahak. Agriculture was carried out in 1399-1398. Main factor with three levels: complete irrigation (control), cessation of irrigation at flowering stage and cessation of irrigation at seed filling stage and sub-factor including organic fertilizer (cattle) with three levels (control, 10 and 20 tons per hectare) and The sub-factor was potassium fertilizer with three levels (control, 100 and 200 kg / ha). The results showed a significant difference between the effects of drought stress, manure, potassium and their interaction on most of the studied traits. The highest grain yield, biological yield and harvest index were obtained with simultaneous application of animal manure, potassium in the complete irrigation stage. The highest amount of grain protein and leaf carbohydrates was obtained under drought stress conditions. The application of manure also significantly increased the amount of grain protein and leaf carbohydrates. Drought stress during flowering and quinoa seed filling increased proline, soluble carbohydrates, photosynthetic pigments, oxidative enzymes and also increased oil content. Finally, the results showed that the highest grain yield was obtained when using 10 tons per hectare of manure and 200 kg per hectare of potassium fertilizer at full irrigation.

Keywords: Proline, Protein, Carbohydrate, Grain Yield