



Graduate Management
School of Agriculture
Agriculture Group

Thesis for obtaining a master's degree in the field Agrotechnology

Title:

**Evaluation of the effects of zeolite and humic acid foliar application
on yield, yield components and physiological characteristics of garlic
(*Allium sativum*)**

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Abstract:

The use of various organic acids to increase crops and horticulture, both quantitatively and qualitatively, has become widespread. Also, the use of biofertilizers to reduce the use of chemical fertilizers and improve crop yields is an important issue to move towards sustainable agriculture, which will be doubly important in low water stress. For this purpose, the present study was conducted to investigate the effect of zeolite and humic acid fertilizer on yield, yield components and physiological characteristics of garlic. The present study was carried out as a factorial experiment in the form of a randomized complete block design with three replications in the crop year 2020 in a farm located in the village of Kool in the central part of Zabol city. Experimental treatments will include humic acid at three levels (0, 3 and 6 g/l) and zeolite at three levels (0, 2 and 4 t/ha). Quantitative characteristics of garlic included stem height, number of leaves, number of cloves per garlic, garlic length, garlic width, garlic yield and physiological characteristics including measuring allicin content. The results of qualitative traits of garlic showed that the levels of magnesium, calcium, potassium and allsin were significantly affected by humic acid and zeolite levels and their interaction ($p \leq 0.05$). The highest amount of alsin (6.13 mg) was observed in the treatment containing 6 g/l humic acid with 4 tons per hectare of zeolite fertilizer. Quantitative traits also showed that the highest height (51.13 cm), number of plants (36.00), number of leaves (18.20), garlic (13.53), length of garlic (40.8 Mm), garlic width (50.16 mm) and yield (9153.3 kg / ha) in the treatment containing 6 g/l humic acid with 4 tons per hectare of zeolite fertilizer, according to the results of increasing levels. The combined concentration of humic acid and zeolite fertilizers increased the yield of quantitative traits in garlic. It can be stated that the increase in garlic yield with the application of humic acid and zeolite fertilizers is due to the increase in nutrient uptake from the soil and the efficiency of nutrients in the plant in the studied treatments.

Keywords: Allicin, Physiological properties, Garlic, Biofertilizer