

**EFFECT OF IRRIGATION, POTASSIUM AND MULCH  
ON VEGETATIVE GROWTH, BULBS YIELD AND ITS  
COMPONENTS, PHYSIOLOGICAL TRAITS,  
CHEMICAL CONSTITUENTS AND STORABILITY OF  
GARLIC  
(*ALLIUM SATIVUM* L.)**

**By**

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M.Sc. Agric. Sci. (Horticulture, Olericulture), Fac. Agric., Fayoum Univ., 2015

***THESIS***

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## ABSTRACT

The scope of current study was to investigate irrigation levels; 60, 80 and 100 %ET<sub>C</sub>, potassium rates; 24, 48, 72 and 96 kg K<sub>2</sub>O fed<sup>-1</sup> and mulch types; rice straw and bare soil (control) on growth, productivity, physiological traits, chemical composition and storability of garlic under Beni Suef conditions. Two identical sets of experiments and each set consisted of a series of two experiments as field and storage trial. Filed experiment was imposed during the winter seasons of 2016/2017 and 2017/2018 and storage trial was conducted during the summer seasons of 2017 and 2018. The experimental layout of field experiment was split-split plots system based on Randomized Complete Blocks Design with three replications where irrigation levels, potassium rates and mulch types were randomly distributed in the main, sub and sub-sub plots, orderly. The experimental layout of storage trial, under room conditions, was Randomized Complete Blocks Design with four replications. The results of field trials exhibited that, irrigation levels 80 and/or 100 % ET<sub>C</sub> were satisfactory on morphological characters, total bulbs yield fed<sup>-1</sup> and some of its components, physiological traits and some of leaf chemical constituents. Fertilizing growing garlic plants with 48 followed by 72 and 96 kg K<sub>2</sub>O fed<sup>-1</sup> accompanied increased gradually on growth traits, total bulbs yield fed<sup>-1</sup> and mostly of its components, physiological traits and leaf chemical constituents. Rice straw mulch resulted in, significantly, higher growth phenomena, total bulbs yield fed<sup>-1</sup>, physiological traits and some leaf chemical constituents than

bare soil. Some of 1<sup>st</sup> interaction between any two studied factors and 2<sup>nd</sup> interaction among three studied factors on growth, productivity, physiological traits and leaf chemical constituents were, intrinsically, the maximum values. The results of storage experiment revealed that, the pre-harvest treatment of interaction among irrigation amount 80 % ET<sub>C</sub> × potassium rate 96 kg K<sub>2</sub>O fed<sup>-1</sup> × rice straw mulch led to, significantly, the minimum loss weight of bulbs after two, four and six months, cloves total soluble solids, total carbohydrate's and clove weight at the termination of storage trial.

**Keywords:** Garlic (*Allium sativum* L.), Irrigation, Potassium, Soil mulching.