WATER AND FERTILIZER MANAGEMENT OF CANTALOUPE CROP UNDER DRIP IRRIGATION SYSTEM

By

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B. Sc. ,Agric. Sc. (Soil and Water), Bani-Walid University, Libya, 2008.

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ABSTRACT

Mohammed Ali Moftah: Water and Fertilizer Management of Cantaloupe Crop under Drip Irrigation System. Unpublished M. Sc. Thesis, Department of Agricultural Engineering, Faculty of Agriculture, Ain Shams University, 2015.

The aim of this study was to investigate the deficit conditions on dripped cantaloupe crop yields and quality under old lands conditions of Egypt. Field experiments were carried out under open field conditions on a clayey soil at Shalaqan, Experimental Farm of Faculty of Agriculture, Ain Shams Univ. Qalyubia Governorate, Egypt, during the season of 2014. The deficit conditions consisted of three irrigation water levels (100% ,80% and 60% of ETc) and two N fertigated regime treatments (100% and 50% of the recommended rate). With this respect, a split plot design with three replicates was implemented. Results indicated that the soil moisture content increased near the emission point and then decreased horizontally and vertically. A decrease of salt concentration below the emitter, while incense away horizontally and vertically for all of the studied coefficients. Regarding the cantaloupe response to the deficit conditions, data analysis revealed that highest total yield was obtained under fully irrigated condition of (100% Etc and 100% N). On the other hand, data analysis of deficit conditions indicated significant increment of total yield with increasing irrigation level. On the other hand, the highest IWUE value (10.21 kg/ m^3) was obtained by using 60% of Etc treatment, while , the lowest IWUE value (7.96 kg/ m^3) was obtained by using 100% ETc treatment. Regarding capital costs of irrigating cantaloupe, data indicate that it had been increased from 401.22 to 534.96 to 668.7 LE/fed by increasing irrigation treatments from 60%, 80% and 100% of Etc. Meanwhile, the highest production costs of one ton was 52.33LE/ton at the treatment of 100%Etc and 50%N, while the lowest value of costs was 40.77 LE/ton at 60%ETc and 100%N.

Keywords: Soil Moisture, Salt Distribution, Water Use Efficiency, Nitrogen Use Efficiency Drip irrigation, Cantaloupe.

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1.INTRODUCTION

Cantaloupe is considered one of the most important vegetable crops in Egypt, which has the majority of exported productions to Europe. However, due to its sensitivity to water, irrigation scheduling should be linked with its ability to consume water, therefore, water requirement, must be estimated appropriately in accordance with plant wetted root zone **(Badr, 2007 and Badr & Abou Hussein, 2008).**

Nowadays determining the optimal crop water requirements is considered as one of the most important factors that affecting plant production, especially, with the scarcity of water resources under arid conditions of Libya and Egypt. This may be due to negative interrelation between the amount of water added and the ability of plant. Leaching irrigation water leads to rising field water table, which, leads to the ground water pollution with nutrients, especially, nitrates and yield reduction due to the disturbance in water balance in the root zone. Also, leaching of nutrients will affect plant production. While, over use of water will reduce water use efficiency. Moreover, utilization of extra amounts of fertilizers, will lead to water stress of plants and increase cost of production input, due to the increase in the cost of fertilizers, energy consumption for extra pumping among other factors **.**

Drought is the major environmental constraint to crop productivity. Consequently, it is necessary to study the physiological response of plants to drought stresses in order to develop appropriate strategies in order to carry on food production under adverse environmental conditions **.**

Estimating the exact crop water requirements is the suitable method for avoiding soil pollution by chemicals. and in turn protect soil ecosystem and saves water**.**