STUDIES ON GRAFTED WATERMELON *(CITRULLUS LANATUS)* PRODUCTIVITY UNDER NORTH SINAI CONDITIONS

BY

MOHAMED REDA WEHEDY

B.Sc. Agric. Sc. (Plant Production), Alexandria University, 2013

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ABSTRACT

Mohamed Reda Wehedy. Studies on Grafted Watermelon *(Citrullus Lanatus)* Productivity under North Sinai Conditions. Unpublished M.Sc. Thesis. Horticulture Dept., Fac. Agric., Ain Shams Univ., 2018.

The influences of grafting treatments (6001 and Star rootstocks in addition to check nongrafted transplants) and some foliar spray treatments (potassium silicate at rates of 4 and 5 ml/L, calcium at rates of 1 and 2 ml/L, urea at rates of 1 and 2%, amino acids at a rate of 1.5 ml/L and check) on growth, yield and fruit quality of watermelon cv. Aswan F1 were investigated. The experiment was conducted in Baloza Research Station, Desert Research Center, at North Sinai Governorate during the two successive growing seasons of 2016 and 2017. The results indicated that plants sprayed with urea at a rate 2% or grafted onto Star rootstock recorded the highest significant values in vegetative growth characteristics (plant length, branch number, fresh and dry weights), yield and its components (fruit weight, size and diameter, flesh thickness and total yield), while the lowest values were observed in check nongrafted plants. Meanwhile, grafting had reducing effect on fruit quality, where the highest values of total soluble solids, total sugars and lycopene were found in the fruits of nongrafted plants. The application of 5 ml/L potassium silicate gave the best significant values of fruit quality parameters compared with check treatment during the two studied seasons.

Kay words: Watermelon, Grafting, Rootstock, Foliar spray, Potassium silicate, Calcium, Urea, Amino acids

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INTRODUCTION

Watermelon (*Citrullus lanatus*) is considered as one of the most important vegetable crops in Egypt which occupies a great position either in the local consumption or export. The total area cultivated with watermelon was about 52,352 ha and the total production was about 1,68 million ton with an average yield of 32.1 ton/ha **(FAOSTAT, 2016)**.

Under the desert conditions, watermelon plants are exposed to many environmental stresses and root disease, therefore there was an urgent necessity to find out effective solutions to overcome these stresses. Grafting may be one of these solutions and it is widely used in horticulture, whereby tissues of plants are joined so as to continue their growth together as a single plant **(Hartmann *et al*., 2002)**.

Vegetable grafting is a very old technique that first appeared in Korea and Japan in 1920 by grafting watermelons onto bottle gourd rootstock **(Lee, 1994)** and then spread in many countries of the world as a technique for the proliferation of vegetable plants such as watermelon **(Kroggel and Kubota, 2017)**, melon (*Cucumis melo* L.) **(Mohammadi *et al*., 2014)**, squash **(Oda, 2002)**, tomato **(Bhatt *et al*., 2015)**, cucumber **(Gao *et al*., 2015)**, eggplant **(Gisbert *et al*., 2011)** and pepper **(Jang *et al*., 2012).** Grafting achieves the following purposes: enhance plant growth, yield and fruit quality, reduce bacterial, fungal and viral infections in shoot and roots, control soil borne diseases, increase nutrient and mineral uptake, increase plant tolerance to stresses **(Singh and Rao, 2014)**.

In addition, there are many materials that can be sprayed on watermelon plants to increase plant growth, yield and fruit quality under desert conditions such as potassium silicate, calcium, urea and amino acids.