



**PHYSIOLOGICAL RESPONSES O YOUNG MANGO
TREES GROWN UNDER FAYOUM GOVERNORATE
ENVIRONMENTAL CONDITIONS TO FOLIAR SPRAYING
WITH POTASSIUM SILICATE AND
 α -TOCOPHEROLS.**

By

Reda Hussein Mohammed Hussein

B.Sc. Agric. Sc. (Horticulture) Fayoum University 2015

A Thesis Submitted in Partial Fulfillment

of The Requirements for the Degree of

Master of Science

In

Agricultural Science, Horticulture (Pomology)

Department of Horticulture

Faculty of Agriculture, Fayoum

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ABSTRACT

The investigation was conducted during two successive seasons (2019/2020 and 2020/2021) on two young mango cvs. "Sediek" and "Ewais" to determine the effect of foliar sprayed with different levels of silicone which applied in form of potassium silicate "25% SiO₂+10% k₂O" (0.0%, 0.1% and 0.2%) and α -tocopherol "vitamin E" (0ppm, 200 ppm and 400 ppm) to mitigate the harmful effect of low, high temperature and negative impact of soil salinity on young mango trees. Growth characteristics like tree height, scion and rootstock diameters, number of leaves/shoot, leaf area and shoot length for trees of Sediek and Ewais mango cvs. negatively influenced by abiotic stresses. Meanwhile, foliar application of potassium silicate "P.S." and /or α -tocopherol " α -Toc." alone or in combination significantly improves morphological, physiological characteristics and leaf mineral content. The foliar application of tocopherol alone was more noticeable compared to sprayed with potassium silicate alone particularly at the higher rates and maintained the growth and plant performance under abiotic stresses.

Abiotic stresses, including salinity, cold and extreme temperature caused a harmful effect on relative water content(RWC) and membrane stability index (MSI) for young mango trees under study. On the other hand, foliar application of P.S. and α -Toc. alone or together enhanced significantly these parameters of young mango trees grown under the same conditions.

Negative relationship was detected among free proline content in leaves of young mango trees grown under adverse environmental conditions and foliar application of potassium silicate and α -tocopherol singular or together.

Leaf minerals content like N, P, K, and Ca as well as the K/Na ratio of young mango trees grown under abiotic stress were enhanced significantly with foliar application of potassium silicate and/or α -tocopherol singularly or together compared to control treatment epically at higher levels. On the other hand, leaf Na content showed an adverse trend under the same condition.

Keywords: Abiotic stress, potassium silicate, α -tocopherol, salinity stress, Morphological and physiological characteristics, Sediek and Ewais mango cvs.