A MODEL FOR USING IRON NANOPARTICALES AS A NUTRITIVE SUPPORT FOR SOME FRUIT TREES TRANSPLANTS

By

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B. Sc. Agric. Sc. (Plant Production), Ain Shams University, 2012

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نموذج لإستخدام جزيئات الحديد النانومترية للدعم الغذائى لبعض شتلات أشجار الفاكهة

رسالة مقدمة من

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ABSTRACT

Mohamed Khaled Abou El-Nasr Abbas: A Model for Using Iron Nanoparticles as a Nutritive Support for Some Fruit Trees Transplants. Unpublished M.Sc Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2015.

This study was performed in the lath house of the Experimental Farm, Faculty of Agriculture, Ain Shams University, Shoubra El-Kheima, Egypt in the two successive seasons of 2013 and 2014 to determine the effect of foliar spray with magnetite nanoparticles (MNPs) as nutrient supplement on some growth parameters and chemical components of orange saplings (*Citrus sinensis L)* Valencia cultivar., grape saplings (*vitis vinifera L*) Flame seedless cultivar., and pear saplings (*Pyrus serotina L.* X *Pyrus communis L.*) Le-Conte cultivar.

The major parameters of vegetative growth, leaf content of N % and Fe (ppm), leaf pigments content, leaf content of total carbohydrates % and total amino acids.

The protocol used in the preparation of nanoscale iron particles after the characterization and identification of nanoparticles, we concluded that iron is present in the form of Magnetite nanoparticles (Fe_3O_4).

Results showed that application of MNPs gave the highest significant values of plant height, leaf area per sapling and fresh & dry weight of sapling in both seasons. Additionally, plant chemicals showed a tremendous increase for the values of leaf pigments content compared with foliar spray with iron chelated and control treatment. Also MNPs was the most effective treatment in increasing the tested chlorophyll-a and chlorophyll-b, total chlorophyll and carotenoids content in both studied seasons. Application of MNPs gave the maximum increase for leaf nitrogen and iron content in both seasons. Also increased leaf total carbohydrates and amino acids content of saplings comparing with other treatments in the two studied seasons.

Application of MNPs at 125 ppm and 250 ppm gave the best effect on parameter of orange, grape and pear saplings.

MNPs proved to have unique physicochemical properties and superparamagnetism that boosted over all plant metabolism that affected by biomass and bio-chemical properties.

Key words:

Magnetite nanoparticles, MNPs, nutrient, supplement, sapling, pear, orange, grape.

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