EFFECT OF SOME MICRONUTRIENTS FERTILIZATION ON NUTRIENT UPTAKE AND YIELD OF STRAWBERRY *(Fragaria x ananassa Duch)* GROWN ON CERTAIN EGYPTION SOILS

BY

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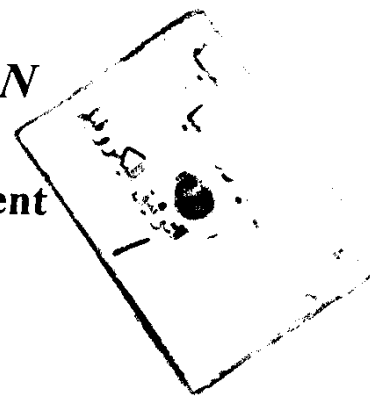

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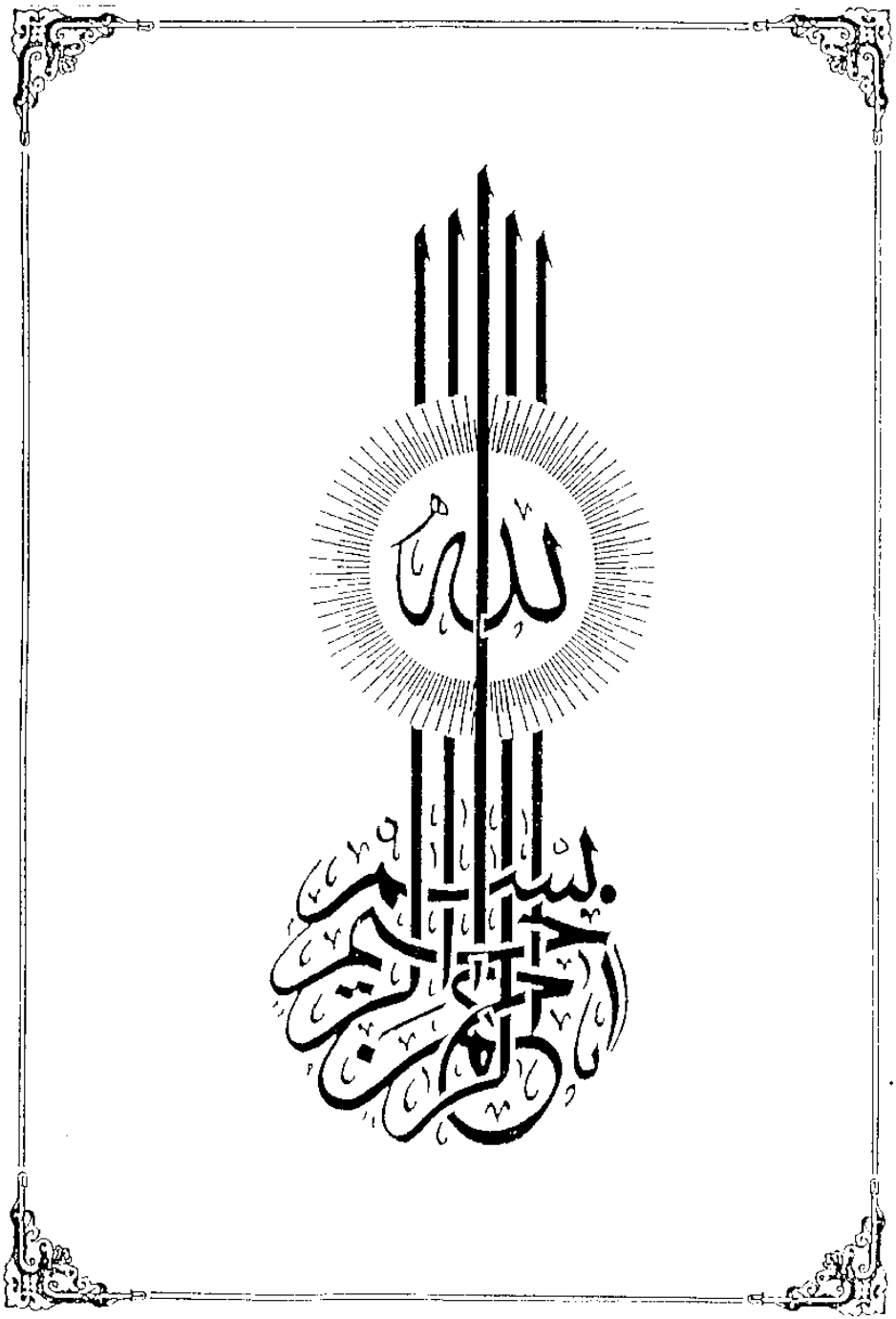

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ABSTRACT

A field experiment was carried out during two succesive seasons to study the effect of some micronutrients fertilization (Fe, Mn and Zn) on nutrient uptake and yield of strawberry (Fragaria x ananassa Duch) grown on sandy soil. Iron was sprayed at rates 10 and 20 ppm Fe as Fe-EDDHA alone and in combination with both Mn and Zn treatments. Manganese was sprayed at rates 10 and 20 ppm Mn as Mn-EDTA while Zn was sprayed at rates 5 and 10 ppm Zn as Zn-EDTA. The different micronutrients were sprayed three times at Jan., March and May each season. Some vegetative growth parameters were determined such as plant height, number and area of leaves, early and total yield as well as weight and firmness of fruits. Also, the dry weight and nutrient content in shoots and roots were determined. Moreover, the availability of nutrients before and after foliar application were determined in the soil samples. Obtained data indicated that foliar application with 10ppm Fe + 20ppm Mn + 10ppm Zn resulted in the highest weight of both shoots and roots, high uptake of nutrients by strawberry. However, application 20ppm Fe + 20ppm Mn + 10 ppm Zn resulted in decrease most of the previous growth parameters.

Key words: Fe-EDDHA, Mn-EDTA, Zn-EDTA (foliar application), sandy soil, strawberry (Fragaria x ananassa Duch).

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Also, I am indebted to my parents and all my family for their contenious encouragement and helpful.

DEDICATION

I would like to dedicate this work to my brother Dr. Osman AbdEl-Azeem Osman Previously Prof. of Soil Sci., Faculty of Agriculture, Ain-Shams University.

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INTRODUCTION

Strawberry (*Fragaria x ananassa Duch.*) is considered as one of the most important non traditional horticultural crops for local consumption and exportation in Arab Republic of Egypt. It is very popular vegetable whose fruits either eating fresh or processed. These fruits have juicy refreshing flavour and available to consumers during the period from January to July continuously.

Although the acreage devoted to strawberry plantation increased year by year, its productivity is still low, when compared with other countries. In Egypt, strawberry is grown as fresh or frigo planting system and a production have substantially increased in the last few years. The total cultivated area devoted to strawberry was 4026 feddans, mainly in Sharkia, Kaliubia, Ismaielia and El-Behera governorates, produced 32208 tons as total yield, with an average of 8.00 tons per feddan, according to 1993 and 1994 statistics.

Several strawberry cultivars, with different quantitative and qualitative characteristics, introduced to Egypt, few years ago, but had varied degrees. Therefore more attention was paid to secure high yield and good quality, this could be achieved

through the use of high yielding cultivars with optimum application of different macro- and micronutrients.

Strawberry is a very sensitive plant to unnutritional balance. This might be due to its shallow root system and high productivity in relation to plant size, beside it is a perennial crop with a long life cycle. These plants grown mostly in light soil textures which are very poor in macro- and micronutrients. So that, we added to strawberry plants different amounts and sources of the macro- and micronutrients. Where they need macronutrients in high doses, but they need micro-elements in low ones.

The present study was carried out to investigate the effect of amount, source and their interactions of some micronutrients (Fe, Mn and Zn) as foliar application as well as soil application of N, P and K on nutrient content, vegetative growth, yield and fruit quality characteristics of strawberry plants *cv. Douglas*.

2- REVIEW OF LITERATURE

2.1. Effect of some micronutrients fertilizers on strawberry:

2.1.1. Iron fertilization :

Webb and Hallas (1966) reported that strawberries grown in sand soil with pure inorganic nutrients and supply with iron as ferric citrate. It was used at five different levels in the nutrient solutions: Fe½ (0.56), Fe1(1.12), Fe2(2.24), Fe4(4.48) and Fe8(8.96 ppm). The other trace elements in the solution were Zn (0.77), Cu(0.26), B(0.33), Mn(0.61), Mo(0.017 ppm). Their results shown that restriction of the iron supply can cause marked reduction in growth and crop yield of strawberry where all plants on the Fe½(0.56ppm) treatment showed obvious symptoms of iron deficiency, as did most of those on the Fe1(1.12ppm) treatment while the Fe2(2.24ppm) or higher iron level did not show any symptoms. They add that the transition from symptoms to no-symptoms will be sharply difined and reduction of iron supply can drop the yield from about 540g to about 300g/plant. This means that a drop of over 40% before any visual indication appears while application of Fe (2.24, 4.48 and 8.96ppm) resulted in no visible symptoms. Also, they added that the relations of yield and Lamina weight to iron supply