1. INTRODUCTION

Spinach (*Spinacia oleracea L*) is one of the most important leafy vegetable crops grown in Egypt. From standpoint of cultivated area, spinach comes in the third rank after cabbage and lettuce. Spinach an annual cool-season plant, is popular as a green, leafy vegetable fresh, canned or frozen. It can be grown both spring and fall seasons giving high yields in a short time. The crop is determined by leaf size, crispness and colour. It is a rich source of chlorophyll which gives it a dark green colour and consumer acceptance. Its high quality due to its unusually high Fe and vitamin A content.

According to the economical statistics of 1995, the cultivated area of spinach reached 6312 faddans produced 46276 tons with an average of 7.33 ton / faddan. Spinach production is concentrated in Alexandria, Behera and Kaliobia provinces.

After the construction of the High Dam most vegetable crops responded to micronutrients application. Therefore, we try to increase leaf yield and quality of spinach by adding Fe, Zn and Mn as foliar application beside N fertilization.

Concerning with the quality of spinach yield, the accumulation of nitrate in leaves plays an important role in human nutrition, especially for babies (*Luhrs, 1973*). Therefore, trials aimed to produce the highest spinach yield with the minimum nitrate content of leaves.

This investigation included two separate experiments the first aimed to study the effect of fertilizing spinach plants with different N-forms and its effect on fresh yield production and its quality especially nitrate accumulation of leaves. The second experiment aimed to found the effect of foliar application with Fe, Mn, and Zn on fresh yield and quality of spinach.

* Cited from the Economic and Statistical Department, Ministry of Agriculture, Egypt.