INTRODUCTION

Rice (*Oraza sativa* L.) is a major cereal crop in Egypt. Rice crop is widely used for both human and animal feeding. The total cultivated area reached 1.468 million faddan in 2005 season with an average grain yield of 4.195 ton/fed(*).

There has been tremendous increase in rice production in Egypt during the last 15 years (1987-2001). This has been due to both the increase in yield per unite area as well as the increase of total cultivated area. Since 1987, an intensive work has been directed to improve the productivity of this crop to keep up with rapid increasing population. Furthermore, there is a strong competition between rice and other summer crops on the limited amount of irrigation water. Therefore, major emphasis was placed on developing varieties with short growth duration, high yield potentiality and resistance to pests (diseases and insects) with less irrigation water requirements **(Badawy *et al.*, 2002).** Nitrogen fertilizer is one of the most limiting factors for rice production. The amount of N required management of the N varies depending on variety, soil condition, cultural practices, crop rotation and other factors **(Yashoda, 1981)** also nitrogen is an essential fertilizer element to the growth and production of rice plants **(Balal, 1981 and Sombol *et al.*, 1981).**

Low land rice is grown on flat land with controlled irrigation flooding, the soil drastically reduced soil O_2 content and decreases

(*) Agricultural Economics of Egypt, Ministry of Agriculture, 2005.

several electrochemical changes with influence rice growth and yield **(De Datta, 1981).**

Zinc deficiency is the most common micro nutrient problem in flooded rice particularly in alkaline soil. Zinc deficiency in flooded soil is not necessarily related to the total zinc content of the soil, which is found to rang from 10- 300 ppm, but rather to complex physico-chemical reactions and biological process .the chemistry of flooded soils is very much different from that of non flooded soils. The flooded soils is more solid phases, variables gaseous phases, and various biological components including both micro flora and high -order plants. Each of these phases play an important role in determining the solubility and availability of zinc to the rice plants **(Mikkelson and Kuo, 1970)** the major chemical electro chemical changes in flooded soils are depletion molecular oxygen, decrease in redox potential of the soil increase in pH of acid soils, decrease in pH of calcareous and sodic soils.

Therefore, the present investigation was aimed to study the effect of different nitrogen fertilization levels and zinc methods of application on the productivity of Egyptian rice varieties Giza 177, Sakha 101 and Sakha 104 under normal soil.