INTRODUCTION

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Corn *(Zea mays L.)* is one of the most important grain crops which is used in Egypt as a human food as well as an animal feed. Among cereal grain crops, maize ranks the third world production and is surpassed only by wheat and rice. Efforts being done all over the world to improve maize productivity to fulfill the food requirements for an over expanding population. In Egypt it is quit important to increase maize production to fill the great gap between the local production and the home consumption of cereals. Nitrogen is without doubt the most spectacular of all essential nutrients in its effect on plant growth. A certain level of N must be present in plant cells for optimum utilization of carbohydrates produced during photosynthesis. Under deficiency conditions excessive deposition of carbohydrates takes place in vegetative cells with consequent thickening of the cell wall, limited formation of protoplasm, reduced succulence and growth. The rate of N uptake by field crops is very rapid during the grand period of vegetative growth, approximately 4kg/ha daily in corn for achieving the respective grain yields.

Because of the transitory nature of N in soil, its tendency for loss from the soil, and its potential for becoming a pollutant of air and water, fertilizer N should receive more care in its overall management than any other of the primary and secondary plant nutrients. There are many sources to supply soil with nitrogen, namely organic and mineral N fertilizers and recently microbial inoculation of crop grains and seeds by certain free living N_2-

fixing bacteria had a great importance as a new technology. Existing evidences indicate that maize plants respond well to the nitrogen fertilization. However, increasing cost of chemical fertilizers have reduced their use considerably. Under such a situation it is imperative to use naturally available sources to meet the partial requirement of crops. The methods of microbial inoculation aims at minimizing the amount of applied chemical fertilizers, preventing the pollution which can be occurred by the excessive use of chemical fertilizers and reducing the costs of production. *Azotobacters* and *Azospirillaum* are the most important and well known heterotrophic bacteria which increased the yield of several crops by fixing the atmospheric nitrogen in soil. In general, it is observed that inoculation with these bacteria registered a significant increase in yield at lower levels of nitrogen. Nitrogen requirements of maize are high as the level of N in soil is low, particularly under arid and semiarid conditions where the soil organic matter content is extremely low.

This investigation was carried out to study response of two maize hybrids to bacterial inoculation with *Azotobacters* + *Azospirillaum* and N fertilizer rates of a mineral or/and an organic. Such study can introduce a great device to the farmers through applying the fertilization practices for growing maize in an alluvial soil.