

**THE EFFECT OF NITROGEN SOURCE AND POPULATION DENSITY ON CORN  
 PRODUCTION  
 B- YIELD AND ITS COMPONENTS**

BY

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**ABSTRACT**

*This* investigation was carried out during 1999 and 2000 seasons, at the Agricultural Experiment and Research Station, Faculty of Agriculture, Cairo University at Giza, Egypt to study, the effect of N fertilization treatments (mineral as urea (46.5% N) with farmyard manure (FYM) as cattle manure) and plant population density (20000, 25000 and 30000 plant/fed.) on yield and its components of maize Single cross 10.

The results showed that, the most studied yield components increased by raising the quantity of N from urea. However, the differences between 120 kg N/fed. as urea alone and 90 kg N/fed. as urea + 30 kg N/fed. as cattle manure were insignificant in most cases. However, increasing plant population density from 20000 to 30000 plant/fed. significantly increased grain yield. Meanwhile, the interaction between N fertilization combinations and plant population density had a significant effect on all studied characters. Optimum grain yield/fed. as well as harvest index was obtained by planting 30000 plant/fed. with 120 kg N/fed. as urea, followed by 60-90 kg N as urea combined with 30-60 kg N as organic source (cattle manure).

**INTRODUCTION**

Maize (*Zea mays* L.) is a major cereal crop in Egypt and all over the world. In Egypt, the total cultivated area of maize reached 1.927 million feddan in 2005 season with an average grain yield of 25.3 ardab/feddan (Statistical and Agricultural Economic Research Institute, Ministry of Agriculture of Egypt, 2005).

Several forms of mineral fertilizers as well as organic nitrogen manure, especially farmyard manure (FYM) and chicken manure are commonly used in Egypt.

Organic matter of the soil is considered to be the magic remedy for all types of soil. The applications of organic manures enrich the soil with nutrient element and humus which is the final product of decomposition of organic matter. Humus has a very vital role in improving soil physical and

chemical properties. It increase the water holding capacity of the soil as a result of its colloidal status, and also humus increase the cation exchange capacity of the soil which is a remedy of one weakness of light textured soil. Awad-Allah and Nabila Bassiouny (1993) reported that one cubic meter of FYM contains about 64, 2.4, 3.2 and 9.6 Kg OM, N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, respectively. Most of the nutrient elements in FYM are not in the available form and it takes long time for decomposition and mineralization. Therefore, FYM has a good residual effect on the succeeding crops following the manured crop. In this connection, Fan *et al.*, 2005 reported that balanced fertilization and long term addition of organic material to soil should be encourage to maximize the use of stored soil arrest grain yield decline and ensure sustainable productivity.