INTRODUCTION

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Flax *(Linum usitatissimum. L.)* belongs to Family Linaceae which is a traditional source of fiber and oil. It is the most important bast fiber crop in A.R.E. for its fiber and seed production. It plays a great role in developing the national economy by exportation and local fabrication.

Moreover, many industries had been established on its fiber and seed yields.

The flax area in Egypt was about 30,000 faddans[1] in 1992/93. The flax seed production is not enough to cover the local consumption, especially for seed oil, where our country imports about 50 % from annual seed requirements paid in hard currency.

This crop is cultivated on a wide rang of environmental conditions such as soil types and climatic conditions.

Flax genotypes could be classified according to the environmental effects into three types: (1) Fiber type that needs low temperature and equable climate, free from heavy rains and frost. The plants in this weather tends to produce more fine fibers and it is cultivated in Holland, Belgium, France and in other countries with

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[1] ***Annual Statstical Data, Ministry of Agriculture. Cairo (1993). (In Arabic)***

similar climatic conditions. (2) Oil type that needs hot dry weather and cloudless condition. In this weather the plant tends to produce more basal and apical branches. It is cultivated in the United States, Canada, Argentina, India and Ethiopia. (3) Dual purpose type that suits the temperate climatic regions of the world such as Egypt, where flax is grown for both fiber and oil productions.

The present investigation is designed to gain some information about the effect of three different climatic conditions and the genotype X environment interaction on the yield, yield components and quality as well as anatomical manifestations of 12 flax genotypes.

The comparative analysis of these genotypes under different environmental conditions is very important in breeding program, to select the best one for highest fiber and seed production in addition to their quality.

The three locations which had been chosen are Sakha (North Delta), Gemmiza (Middle Delta) and Giza (North Upper Egypt) which include three main growing areas for flax production.

Genotypes were evaluated concerning their performance for fiber and seed yield as well as the technological characters.