INTRODUCTION

1. INTRODUCTION

Flax was the chief fiber crop in Egypt before growing cotton. At the present time flax ranks second to cotton in the production of fibers in Egypt. Cultivated varieties of flax belong to *Linum usitatissimum* L. a member of the Linaceae family which is a relatively small family consisting of about nine genera containing about 150 species. Flax crop plays an important role in the national income by its exportation and local fabrication. Nowadays, because of the limited flax cultivated area which is about 34000 feddans annually*, it is necessary to increase flax productivity which could be achieved through the use of high yielding varieties and applying better cultural practices and treatments. Therefore, the Fiber Crops Research Section, Agricultural Research Center, Ministry of Agriculture continues to make efforts to develop new flax varieties which initial from promising strains during the breeding program. These newly developed lines must be more superior than the commercial varieties in yield quantity and quality, in addition to improve flax varieties with the aim to increase the quantity and quality of flax. That is, because increasing the flax acreage, grown as a winter crop in the rotation, will be done at the expense of the area of the other winter crops, mainly wheat which has the priority over other winter crops and clover (Barseem), necessary for livestock. Therefore, it is necessary to increase fiber and seed production per unit area of the local flax cultivars which are grown for a dual purpose, i.e. fiber and seed production to overcome the limited area devoted to this crop.

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* Annual Statistical Data, Ministry of Agriculture, Cairo (1996) (in Arabic).

The Fiber Crops Research Department has recently developed several strains. Of these strains are 282/37, 329/29, 2651/2 and characterized as promising strains.

Phosphorus and nitrogen fertilization regimes are two of the important factors affecting flax productivity and quality, that is, the two elements are very necessary to increase seeds and fibers in flax. Therefore, the present investigation was conducted to study the effects of phosphorus, nitrogen fertilizer rates and their interaction on plant growth, straw and seed yields and quality of the three promising flax genotypes, compared with the known variety, Giza 7. And to trace variations among the four genotypes so as to find out variation regarding their growth attributes. Variation either morphological or physiological could be of value in breeding programs to improve productivity of varieties and selection.

Hence, the main objectives could be stated as follows:

1. To study some growth characters among the four genotypes at 60, 80, 100 and 120 days from sowing.
2. To study the effect of phosphorus and nitrogen fertilizers on growth and productivity of the previous four genotypes.
3. To study the genotypes differential response to some P and N fertilizers rates.