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Breeding for Improving Yield and Quality in Sweet Potato (*Ipomoea batatas* (L.) Lam.)

By

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DISSERTATION

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بسم الله الرحمن الرحيم

وأنزل الله عليك الكتاب والحكمة وعلمك ما لم تكن تعلم وكان فضل الله عليك عظيما

" صدق الله العظيم "

((سورة النساء من آية ١١٣))

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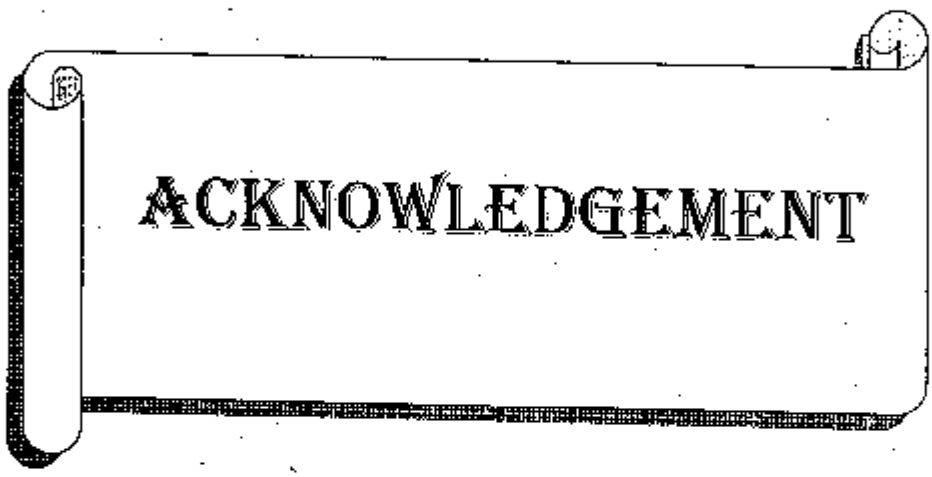
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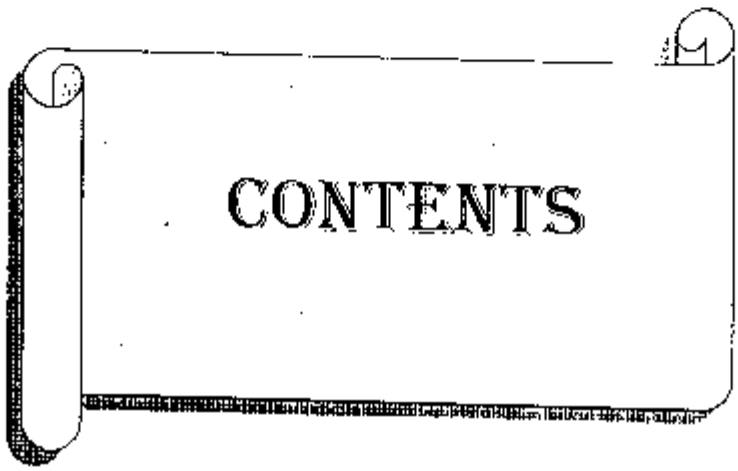

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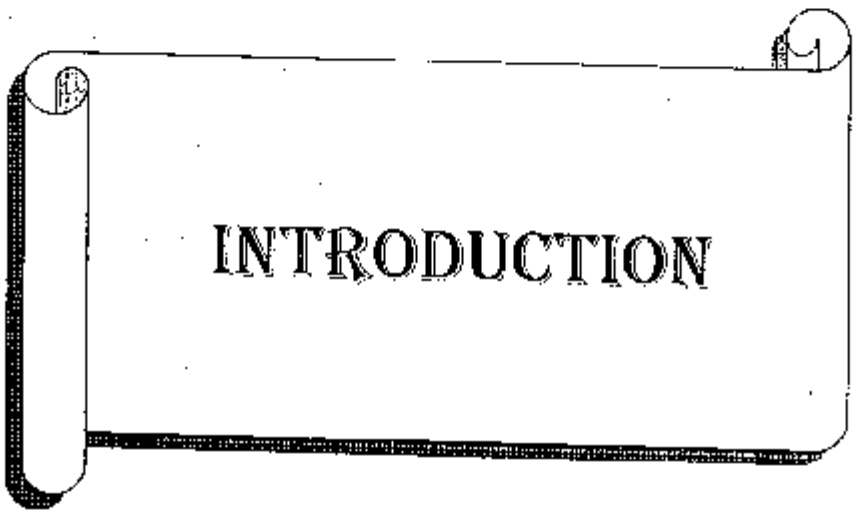

INTRODUCTION

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The sweet potato [*Ipomoea batatas* (L.) Lam] is an asexually propagated vegetable crop that is grown mainly in tropical and subtropical regions. Sweet potato is a member of the convolvulaceae family and the only known natural hexaploid morning glory (6n=90), **Jones (1965a)**.

Sweet potato is considered to be one of the important energy-vegetable crops, characterized by a high nutritional value. It is grown usually for their edible tubers, and considered an important source of food in many countries. It is also used for canning, dehydration, flour manufacture, and as a source of starch, glucose, syrup and alcohol (**Jones, 1965a**).

In Egypt, sweet potato is grown during the summer season, where its acreage reached about 14400 feddan in 1998, yielding about 155000 tons with an average of 10.6 tons/feddan (**FAO, 1998**)*.

In the last years, production of the local commercial cultivars in Egypt has been deteriorated due to either deterioration of these cultivars; using old traditional cultural practices or susceptibility of these cultivars to some diseases and insects. Therefore, improvement of sweet potato production becomes greatly needed. This improvement could be achieved throughout different methods such as introducing high yielding capacity genotypes and/or hybridization among the promising genotypes followed by selection for highly potential characterization.

An earlier work of **Shalaby *et al.* (1994)** indicated the possibility of inducing flowering and seed setting in some introduced genotypes of sweet

*FAO production Year Book Vol. 52, 1998.

potato under Assiut conditions (Upper Egypt) giving evidence to overcome either self-or cross-incompatibility in such genotypes. Accordingly, selfing and/or crossing among these genotypes can be done and in turn high-yielding new genotypes can be selected.

Therefore, the main objective of the present investigation was to produce new sweet potato genotypes with high-yielding capacity and good storage-roots quality. This could be achieved by: 1) clonal selection in a population raised from natural-pollination between two introduced genotypes, 2) production of new genotype from one-generation selfing (S_1) of an introduced genotype, and 3) getting use of hybrid-vigour expression in producing F_1 hybrid in sweet potato.