INTRODUCTION

The cotton leafworm , ***Spodoptera littoralis*** (Boisd.) is still one the main key pests affecting cotton production in Egypt . It is one of the major pests in cotton fields as well as in many other field and vegetable crops in Egypt and in several Mediterranean and Asian countries . The development of resistant populations by this species against a wide variety of highly toxic chemical insecticides used in the fields has lead to further development of new and more toxic insecticides by the chemical industries (***Abou – Bakr et al , 1993***) . The intensive and repeated applications of chemical insecticides are , undoubtedly , one of the main sources of environmental pollution . It is always necessary to look for more safe solutions of the insect pests problem . These control methods may be used alone or in integration with the chemical methods . It this respect , microbial insecticides depending upon the crystalliferous bacteria , ***Bacillus thuringiensis*** (Berliner) comprise one of the main alternatives to chemical – based insecticides . Nowadays , several bioinsecticides have , already , been registered for microbial control of some insect pests in Egypt . But , one of the main disadvantages of microbial insecticides is the susceptibility and high reduction in its potentiality after field application due to the direct detrimental effect of ultraviolet irradiations emmited by the sun . The decrease in residual activity of microbial insecticides due to sunlight was previously reported by ***Morris , 1983*** and its wash off by rainfall was indicated by ***Sundaram et al , 1993*** .

One of the main targets of recommending the bioinsecticides for pest control is the safety of these commercial products and its use as

alternatives of chemical pesticides will , surely , lead to minimizing the environmental pollution problem .

The study presented in this thesis was carried out under laboratory and field conditions aiming to cover the following points :

- Evaluation of three ***B. thuringiensis*** products against different larval instar of ***S. littoralis*** , determining the LC_{50}'s and studying the effect on the survivors .
- Efficacy of Dipel 2X on the infestation rates by ***S. littoralis*** in the field .
- Laboratory and field evaluations of some materials to be mixed with Dipel 2X as UV photoprotectants for increasing the efficacy of ***B. thuringiensis***.
- Estimating the efficacy of a genetic engineering prepared product , namely MVP Π by treatment of ***S. littoralis*** 1^{st} and 3^{rd} larval instars , determining the LC_{50}'s and the effect on the subsequent stages . Also , studying the effect of UV on the potentiality of this material , in laboratory and the field , against ***S. littoralis*** .
- Effect of Dipel 2X treatment to ***S. littoralis*** 2^{nd} & 4^{th} instars at LC_{20} and LC_{50} on the haemolymph of treated larvae .
- Effect of Dipel 2X and MVP Π treatments to ***S. littoralis*** 1^{st} and 3^{rd} instars at LC_{50}'s and LC_{90}'s on the mid - gut cell layers .