شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

بعض الوثائق الاصلية تالفة

بالرسالة صفحات

لم ترد بالاصل

Alexandria University
culty of Agriculture (Saba-Basha)

Latent effects of emamectin benzoate for controlling the cotton leafworm *Spodoptera littoralis*

BY

EMAN KOTB ELSAYED KOTB

A Thesis Submitted on Partial Fulfillment of the Requirements
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(Saba Basha)
Plant protection Department

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CHAPTER 1

INTRODUCTION

INTRODUCTION

As the world's population increases, the need to keep food and fiber crops free from insect infestation and destruction becomes even more urgent. On the other hand, the extensive use of insecticides causes insecticide resistance. The development of insecticide resistance often leads to failures in crop protection and severely increases the economic losses. To counteract resistance problems, compounds belonging to new insecticide classes must be used (Sauphanor *et al.*, 1998).

Long term exposure to modern synthetic insecticides has been associated to low or high extents with tumor, liver damage, immunotoxicity, birth defects and reproductive problems in humans and other animals. In addition, the massive application of pesticides results in adverse effects to beneficial organisms. These side effects of chemical pesticides necessitate the use of target specific compounds with low persistence, development of alternative or additional technologies and increase emphasis on integrated pest management. The availability of several new insecticides with different chemistry and mode of action would allow the implementation of management schemes designed to slow down the selection for resistance to insecticides. Emamectin benzoate is a new avermectin insecticide in development at Merck Resrarch Laboratories targeted for control of lepidopterous pests on various crops (Leibee *et al.*, 1995).

Emamectin benzoate and avermectins modulate specific glutamate-gated anion channels in synapses and muscle cells (Dunbar *et al.*, 1998; Roberts and Hutson, 1999), thereby increasing the influx of chloride ions. This hyperpolarizes the cell, and prevents depolarization of the neuromuscular endplate beyond the threshold level (Davies and Rodger, 2000). Emamectin benzoate thus has neurotoxic properties, and it is more effective in arthropods following ingestion (Roberts and Hutson, 1999). Emamectin benzoate was found to stimulate the female of the American lobster (*Homarus americanus*) to enter an obligator proecdysis and molt prematurely (Waddy *et al.*, 2002). Therefore, emamectin benzoate may affect the molting process in insect-pests and may has latent effects at its sublethel concentrations.

Insecticides application may result in multiple sublethal effects on insect pests, along with direct mortality, since insects exposed to different doses in field and that would cause different effects on pests (Singh and Marwaha, 2000). Sublethel effects are defined as physiological or behavioral effects on individuals that survive exposure to a pesticide (Desneux *et al.*, 2007). Physiological effects may be manifested as reductions in life-span (Stark and Rangus, 1994), developmental rate (Cripe *et al.*, 2003), fertility (Liu and Trumble, 2005), fecundity (Zaliziniak and Nugegoda, 2006), Changes in sex ratio (Couty *et al.*, 2001). Behavioral changes may affect feeding (Stapel *et al.*, 2000), olfactory learning (El Hassani *et al.*, 2005 and Dabrowski, 1969) and oviposition (Fujiwara *et al.*, 2002). Direct or indirect contact of the insect or the host plant with an insecticide may even cause hormoligosis or trophobiosis, (Kerns and Stewart, 2000). Individuals that survive pesticide exposure may still sustain significant damage. Thus, multiple sublethal effects as well as mortality must be considered when examining the total effects of an insecticide.

Therefore, the objectives of this work were to study:

1. The toxicity of emamectim benzoate against the 2nd, 3rd and 4th larval instars of *Spodoptera littoralis* in comparison with two IGR's compounds (lufenuron and flufenoxuron).
2. The ovicidal activity of emamectine benzoate and two IGR compounds.
3. The joint action of emamectin benzoate with lufenuron or/and flufenoxuron on 4th instar larvae of *S. littoralis*.
4. The latent effects of sublethal concentrations of emamectin benzoate against *S. littoralis* larvae in comparison with the two tested IGR compounds.
5. The effect of emamectin benzoate and two IGR compounds on certain enzymes (alanine aminotransferase, aspartate aminotransferase and alkaline phosphatase of the 4th instar larvae of *S. littoralis*.

CHAPTER 2

REVIEW OF LITERATURE