POPULATION STUDIES ON THE COTTON LEAFWORM, SPODOPTERA LITTORALIS (BOISD.)

By

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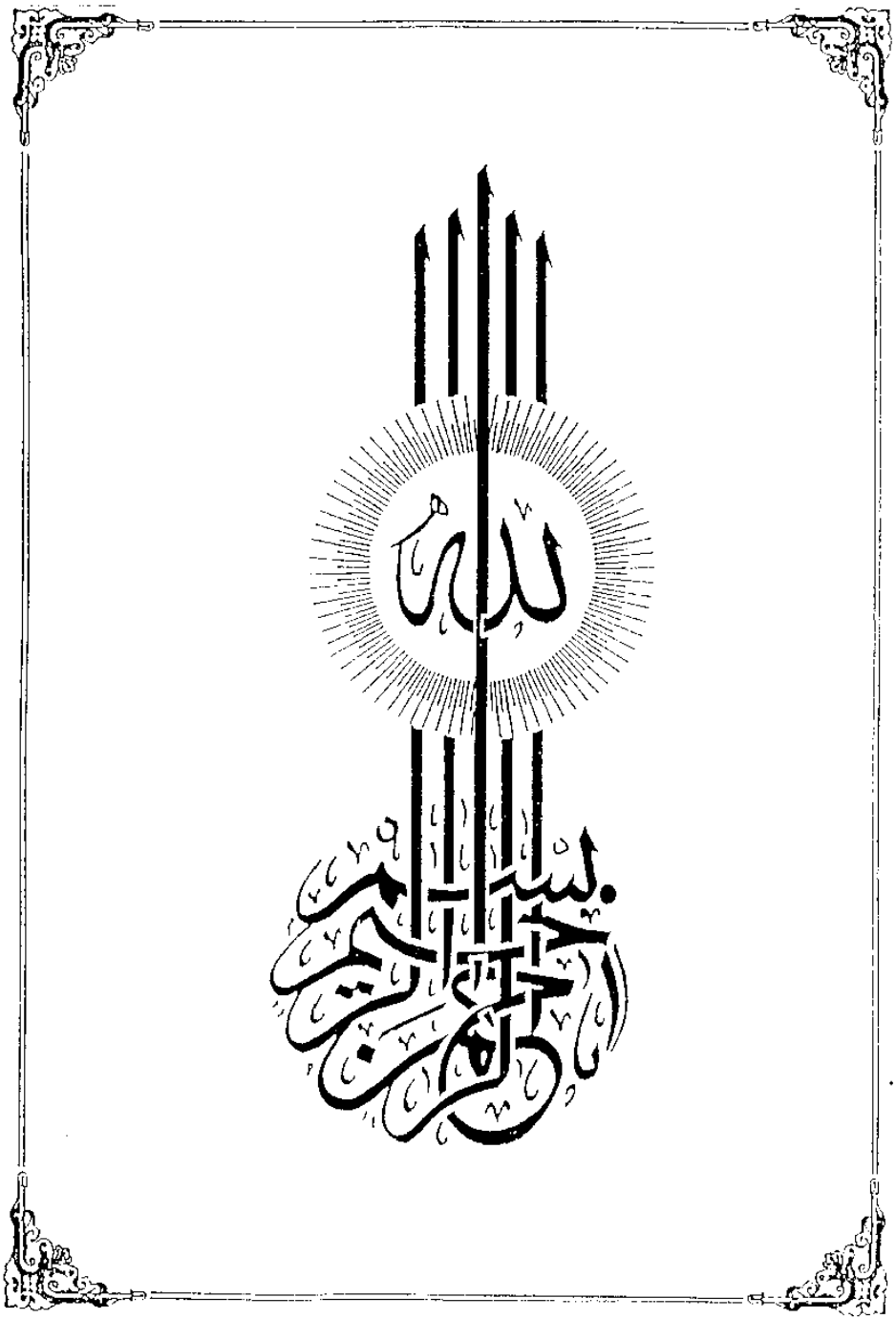

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Biostatistics	3	(Good)
Insecticides	4	Very Good
Toxicology	4	Excellent
Insect Ecology	4	Very Good
Special courses	3	Very Good
Research	5	Excellent
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PART V

I N T R O D U C T I O N

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Cotton, in A.R.E., is the most important crop, from the stand point of exportation- yet, the cotton yield in this country is annually threatened with infestations by a number of insect pest, on top of which is the Egyptian cotton leafworm, Spodoptera littoralis(Boisd.) = Prodenia litura Fab.

Caterpillars of this insect attack all parts of the cotton plant, except the roots, causing damage, that ranges between slight and complete ruin to the yield. This variation in the extent of damage depends on the insect's population density prevailing at the time of infestation in the different localities and seasons. Different methods of control, mainly cultural, mechanical and chemical are applied against the infestation depending on its severity. Thus, in a season of heavy infestation, the cost of control may be quite expensive.

In Egypt, changes in the seasonal environmental conditions are not drastic, the prevailence of the insect's hosts is plentiful, and the activity of biotic factors is mostly stable. The question of speculating the level of the insect's infestation may thus appear an easy job, which, in fact, is a from it. Tentative forecasting proved to be, in most cases, inaccurate. The level of infestation throughout the season, the time of peak occurrence, the extent of infestation threat, are all subjects to great variations from season to season and from one region to another.

During the last sixty years and through the study of the biology, bionomics, and life history of the cotton leafworm in Egypt, the number of its annual generations on cotton plants is now well known. Among those who conducted such studies are, Janisch(1930); Bishara(1934) & (1936); Willcocks and Bahgat(1937); Wiesmann(1952); Hosny and Khattab(1960); Moussa et al.(1960); Abul- Nasr et al.(1966); Iss-hak and Hosny (1967); Abul-Nasr and Naguib(1968); and Nasr et al.(1976). A few of these works dealt with the level of infestation in each generations.

Inspite of the fact that the cotton leafworm is a polyphagous insect, as it attacks several field crops as well as vegetable and ornamental plants, yet its principal hosts in this country are Egyption clover (berseem) in the winter and cotton in the summer. These two crops overlap in the fields during a critical period in the spring (March-June).

The present work aims at studying the following points:

(I) The population fluctuations of the insect's soil stages(larvae and pupae) in clover fields.

(II) Effect of irrigation before and after the 10th. of May on the population fluctuations of the soil stages in these fields (to evaluate the 10th of May law).

(III) The vertical and horizontal distributions of the eggmasses on cotton plants.

(IV) The daily movement of larvae and the hourly distribution of the adults in the cotton fields, and

(V) The economic threshold of damage and the economic injury level of the pest in cotton fields.

The fields experiments were carried out, over three successive years(1975,1976 and 1977), at the Experimental station of Ain Shams University in Shalakan, Kaliobyia Province(15 Km. north of Cairo). In 1978, an additional field trial was carried out at Sids Agricultural Station, Ministry of Agriculture, Beni- Suef Province (150 Km. South of Cairo).

REVIEW OF LITERATURE

REVIEW OF LITERATURE

The literature pertaining to the points investigated in the present work, on the cotton leafworm, Spodoptera littoralis(Boisd), is so voluminous. It would be more practical and convenient to classify it under the following headings:

A. Population-fluctuations of the soil stages (larva and pupae) of the cotton leafworm in clover fields:

1- Fluctuations in larval populations:

Bishara(1934) observed that the attacks of the cotton leafworm, Spodoptera littoralis(Boisd)= (Prodenia litura Fab.) in the Egyption clover fields occurred, first, during the early stages of this host's growth(September-October) then again towards the end of its growing season (May-June). Few numbers of larvae could found between early January and till April.

Willcocks and Bahgat(1937) found that four or five broods of P. litura may take place in the clover fields. Two or three of these broods occur in the autumn (September-December) and the rest in the spring (March-June).

Nasr(1961) observed very low populations of larvae, in clover fields, from December to May. This observation coincided with the records obtained from moth catches in a light traps during the same period.

Abul-Nasr and Naguib(1968) indicated that the rate of the cotton leafworm's infestation in clover fields varied from one region to another as well as from year to year in the same region. They also compared three methods of counting the larvae of S. littoralis from clover fields (net catch, vegetation count and soil samples). In the first, most of the capture consisted of the first three instars, the vegetation counts contained most of the instars, and the soil samples mostly consisted of grown and full grown larvae.

The same authors, in the same paper, estimated larval population in two regions(Giza and Sakha) during the 1958/1959 and 1959/1960 seasons. In the first season, there was very light population in the spring and autumn in Giza, whereas in Sakha , three overlapping generations were conspicuous during the autumn and one in the spring. In 1959/1960 , two noticeable generations were recorded during the autumn and two in the spring at Giza.

Abul-Nasr et al(1971) assessed the larval populations in clover fields. They found that the soil-sieving method was more reliable than net sweeping or row -clearing.

Nevertheless, the latter method was more efficient in the assessement of pupal populations than soil-sieving.

Naguib(1971) found that, during autumn, a positive significant relationship exists between the peak number