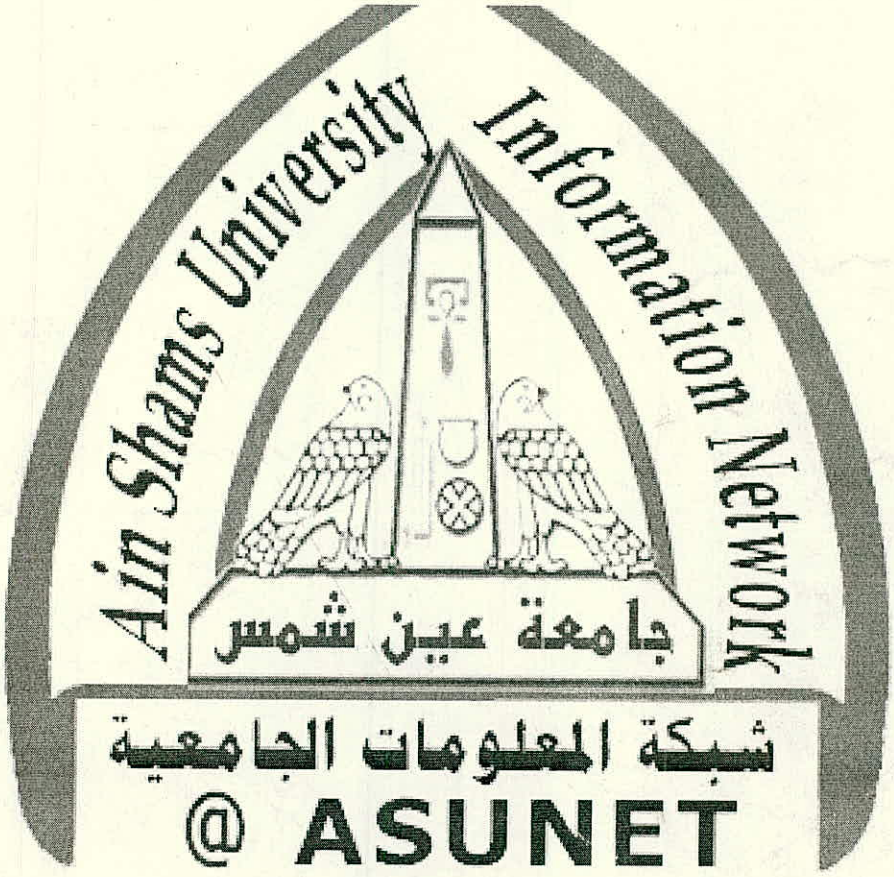
شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

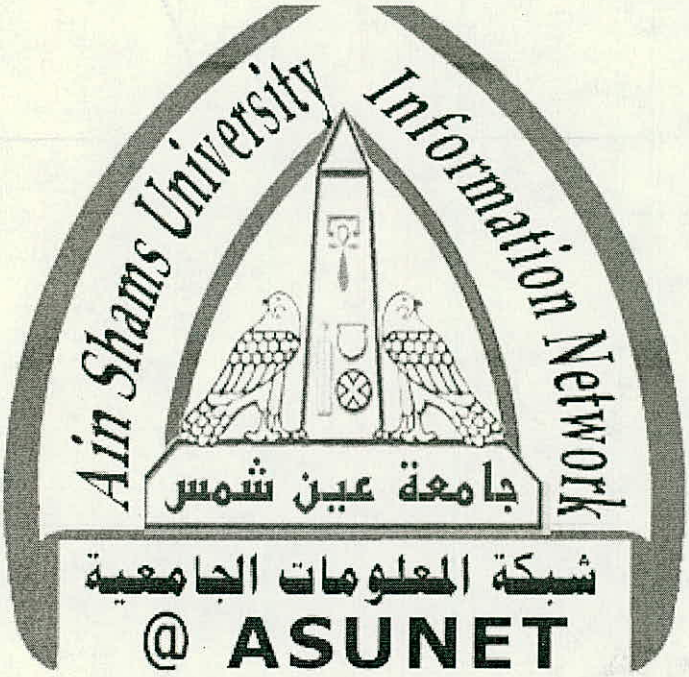
نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

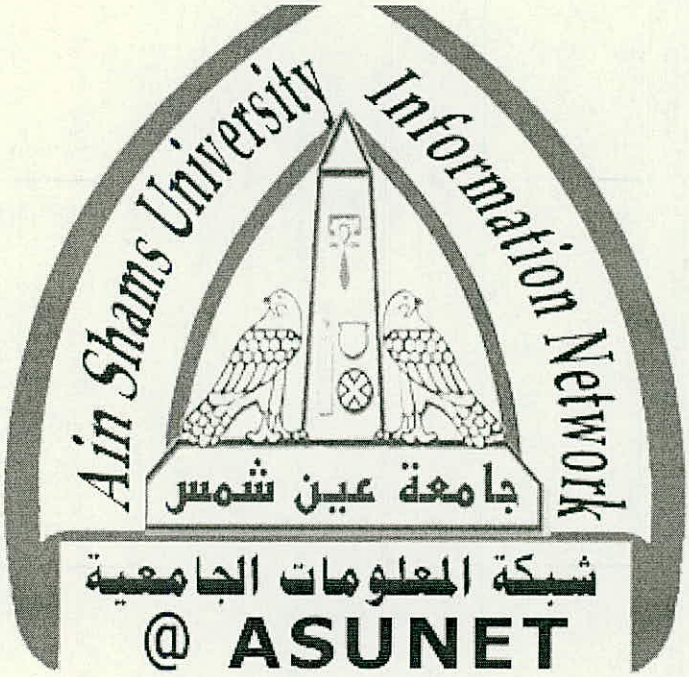
تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %



بعض الوثائق الأصلية تالفة



بالرسالة صفحات

لم ترد بالأصـــل

SIMULTANEOUS EFFECT OF CERTAIN ENVIRONMENTAL FACTORS ON DENSITY OF SOME COTTON PESTS

By

HATEM MAHMOD SABRY SAYED

B.Sc. Agric., Fac. Agric, Ain Shams University, 1966
M. Sc. Environmental Studies and Researches Institute
Ain Shams University, 1990

A thesis submitted in partial fulfillment of
the requirements for the degree of

DOCTOR OF PHILOSOPHY
in

Agricultural Environmental Sciences

Department of Agricultural Environmental Sciences
Environmental Studies and Researches Institute,
Ain Shams University

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ABSTRACT

The present field and laboratory studies were conducted at Shalakan, Qalyubyia governorate to achieve certain biological and ecological aspects for the cotton leafworm, pink and spiny bollworms as principal and prior steps based on heat units (DD°) for each stage of the target insect-pests when forecasting programs are considered.

The obtained results revealed that the time needed for completion of embryogenesis decreased as the temperature increased for the three tested insect pests. The estimated threshold of development values for the egg stage were 11.85°C for cotton leafworm, 12.2°C for the pink bollworm and 11.4°C for the spiny bollworm. The thermal units required for egg development were 61.48 day-degrees for the cotton leafworm, 82.17 dd's for the pink bollworm and 106.1 dd's for the spiny bollworm.

The same trend was achieved for the larval duration. The lower threshold of development for this stage was 7.77°C, 12.6°C and 9.7°C for CLW, PBW and SBW, respectively. The calculated thermal units (dd's) required for completing the larval stage of each of the three tested insect pests were 360.38, 171.37 and 143.76 for CLW, PBW and SBW, respectively.

The duration of pupal stage was 17.66, 19.4 and 26.5 days at 20°C. These averages were 13.2 and 8.4 days at 35°C for cotton leafworm and pink bollworm. It was 11.3 days at 30°C for the spiny bollworm. The developmental threshold values for the pupal stage were 11.92°C, 9.03°C and 12.5°C for the considered three cotton pests, respectively. The total thermal units needed for the pupal development were 179.94 dd's for CLW, while for the PBW it was 213.2 dd's and 199.0 dd's for the SBW.

The longest life span of male moths was estimated 20°C while the shortest was estimated at both 30, 35°C. Accumulated thermal units were 129.85, 102.2 and 256.1 dd's for ***S. littoralis***, ***P. gossypiella*** and ***E. insulana***, respectively.

The life span of CLW female moths decreased with rising temperature from 20°C to 35°C. For PBW, it was 22.2 and 6.1 days. The longevity of SBW female at 20 and 30°C was 49.4 to 21.1 days. The developmental threshold values were 11.3, 14.3 and 12.5 dd's for CLW, PBW and SBW, respectively. The total thermal units were 97.17, 126.2 and 369.25 dd's.

The expected duration of moth generations was 73.02, 75.9 and 94.56 days at 20°C for CLW, PBW and SBW, respectively. While these durations were 29.10, 26.45 and 42.66 days at 35°C and 30°C for the three tested insect pest. The total required heat units, however were 725.75, 609.14 and 776.00 dd's.

The recorded results of the field studies revealed that moths of *S. littoralis* had 7 peaks of activity, only 3 peaks were estimated from May to September. Deviations between the actual and expected generations along with their corresponding peaks were estimated based on the threshold of development (t_o) 10.06°C and daily mean of temperature the corresponding accumulated thermal units were estimated.

The first appearance of overwintering *P. gossypiella* moths occurred in the field as early as February and March but with scarce numbers forming two broods during the period from April to December. Generally, deviations between the actual and expected generations along with their corresponding peaks were estimated based on the threshold of development (t_o) 11.97°C.

The obtained results for *E. insulana* revealed the presence of 5 overlapping generations/year. Deviations between the actual and expected generations were estimated based on the threshold of development (t_o) 11.80°C.

During 1996, 1997 and 1998, *S. littoralis* completed 7 overlapping generations. The population cycles of the CLW needed 4012.50, 3608.01 and 4309.50 degree-days, respectively. Based on the number of observed *P. gossypiella* peaks in 1996; number of expected generations was found to be 6.48. For 1997 it was 5.77 generations and 7.13 generation in 1998. The accumulated heat units required for completing one generation was 478 DD°C. *E. insulana,* however, completed four overlapping generations during cotton growing season. The population cycles of the spiny bollworm needed 3429.87, 3063.12 and 3134.39 degree-days for 1996, 1997 and 1998, respectively.

Keywords: *Spodoptera littoralis, Pectinophora gossypiella, Earias insulana,* thermal units, zero of development, degree-days, seasonal abundance