Insect Pests of Corn in the Libyan Jamahirija and Infestations Associated with its Seedling Stage

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ABSTRACT

Periodical field surveys of corn insect pests were conducted on plants grown at twelve different sowing dates. The study indicated that this crop is attacked by eleven species of insects. Five species are new records; and only *Delia flavibasis* stein and *Sesamia cretica* Led. were able to build damaging populations during the seedling stage.

Severe infestations with *D. flavibasis* appeared early in the season during cool weather conditions and in plants having an extended height of 27.1 cm on the average. But plants with an average of 57.1 cm extended height were the most susceptible stage for infestation with *S. cretica.*

D. flavibasis seriously damaged corn seedlings grown through April and the first half of May. While *S. cretica* severely infested corn planted during June and July. The middle of May could be suggested for planting corn in Tripoli area to avoid high infestation rates with both pests.

INTRODUCTION

In recent years a great deal of interest has arisen in the Socialist People's Libyan Arab Jamahiriya to use corn (maise) as a feed grain for farm animals. Statistical estimates for 1972/1973 indicate that corn acreage has increased by 56.3% since 1960/1961 (2,4). This increase in production made insect pests of corn to become of greater economic importance.

Corn is subject to attack by several species of insect pests. The complete list of local corn insects is not available. But according to a publication prepared by the Libyan Ministry of Agriculture on the control measures of major pests, the pink borer, Egyptian cotton leafworm, green armyworm, corn leaf aphid and red spider mite are listed as the pests of corn in the Socialist People's Libyan Arab Jamahiriya (3).

Although chemical control measures are used to control corn insects, farmers still complain from the damage and from the failure of control programs. Field studies were carried out to survey all major corn pests, recognize their economic importance, and determine the relationship between infestation and the different growing stages of corn. This information will be needed to design suitable control measures.

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MATERIALS AND METHODS

Field experiments were conducted in the Experimental Farm of the Faculty of Agriculture, University of Alfateh, Tripoli, Socialist People's Libyan Arab Jamahiriya during the seasons of 1975 and 1976. Recommended cultural practices were followed in all the experimental area, and treatments in each test were replicated four times in a simple randomized block design. Each plot was 5 × 5 m in size. The corn variety 'American Early' was planted in rows about 70 cm apart. The plants were thinned when they reached a normal height of 20 cm to leave one plant per hill.

Different planting dates were tested in this experiment, and corn was sown every two weeks in four plots from the first of April to the first of September. Plots were examined every week to collect samples of the pests. Also, random plants from rows No. 2, 3, 6 and 7 were measured, then pulled and carefully dissected at weekly intervals. Rows No. 1 and 8 were guard rows, and the plants in the middle two rows in each plot were left to mature. No pesticides were applied in all the experimental area.

The transformation of hibernating pink borer larvae into pupae and the emergence of moths were also studied under field conditions. Infested stalks remaining from the 1974 crop were collected and stored in screen cages. The stalks were examined by dissection every five days to count the number of formed pupae and later the emerging moths were collected and counted.

RESULTS AND DISCUSSION

The following are the insect pests which were collected from corn plants during its growing season. Thanks are due to the specialists of the British Museum (Natural History) for identifying all the mentioned species:

1. *Frankliniella*? *tenuicornis* (Uzel.) (Thysanoptera, Thripidae).
2. *Brachycaudus holichrysi* group (Hemiptera, Aphididae).
3. *Brachycaudus* (*Thuleaphis*)? *amygdalinus* (Hemiptera, Aphididae).
4. *Rhopalosiphum maidis* (Fitch) (Hemiptera, Aphididae).
5. *Delia flavibasis* Stein (Diptera, Anthomyiidae).
6. *Sesamia cretica* Lederer (Lepidoptera Noctuidae).
7. *Mythimna unipuncta* Haw. (Lepidoptera, Noctuidae).
8. *Spodoptera littoralis* F. (Lepidoplera, Noctuidae).
9. *Carpophilus mutilatus* Er. (Coleoptera, Nitidulidae).
10. *Urophorus humeralis* (F.) (Coloeoptera, Nitidulidae).
11. *Sitophilus oryza* (L.) (Coleoptera, Curculionidae).

F. tenuicornis, D. flavibasis, Munipuncta, C. mutilatus, and *U. humeralis* are considered new records for the Libyan Jamahirija since they are not included in the Libyan literature or in the catalog of the Libyan insects published by Damiano (5). The insect pests which were able to build damaging populations on corn seedlings were the maize shoot fly *Delia flavibasis*, and the pink borer *Sesamia cretica*. The other listed insects were uneconomic pests under the conditions of these experiments.

D. flavibasis attacked corn plants during the seedling stage only. It presented a serious threat to early sown corn particularly under cool weather conditions. The larvae mine in the leaves without destroying the shoots. This is in partial agreement with the findings of Deeming (6) who reported that the closely related species *D. arambourgi* (Séguy), which attack millet and sorghum at Samaru, Nigeria, does not destroy the shoots of these hosts and that the larvae sometimes mine in the leaves.

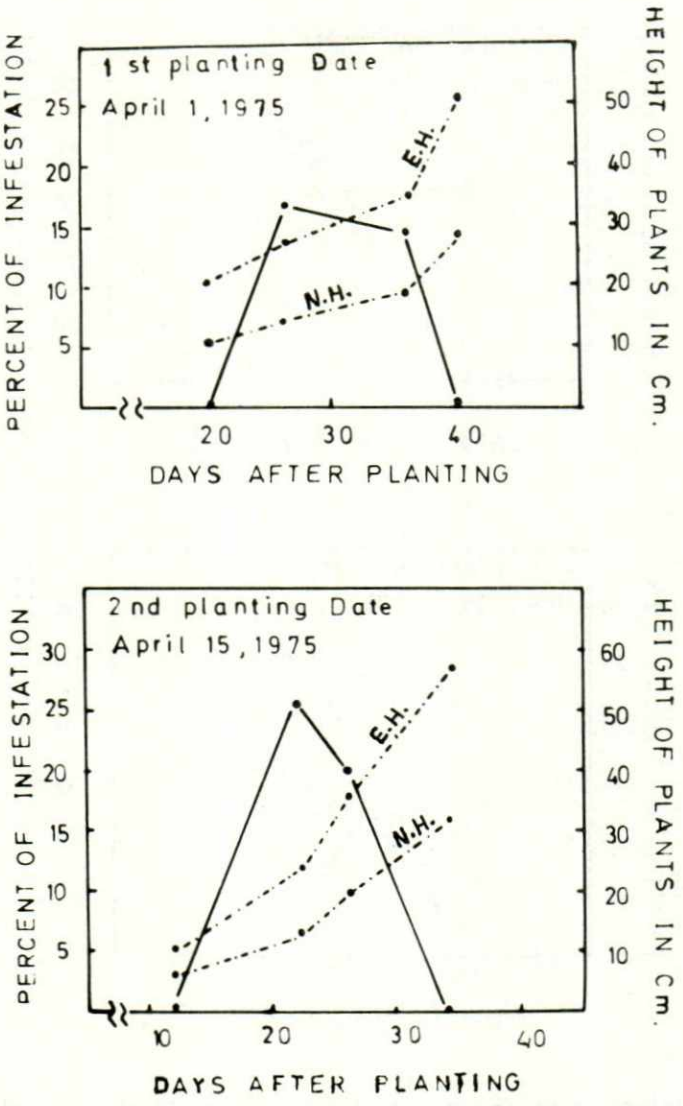

Fig. 1. Relation between the degree of infestation with *Delia flavibasis* and plant heights in the first and second planting dates; April 1, and April 15, 1975: E. H., Extended height; N. H. Normal height.

Corn seedlings of the first four planting dates which emerged from seeds planted on April 1, April 15, May 1, and May 15 showed variable degrees of damage. But seedlings of later planting dates had escaped infestation. The earliest infestation of 0.1% had appeared on April 20, 1975 on the seedlings of the first sowing date.

Plants are usually susceptible to infestation about 10 days after planting time, and infestation reached its maximum after 20 days from planting date. At this age infestation peaks were 16.9%, 25.5%, 16.4% and 10.8% in the first four sowing dates respectively (Fig. 1 and 2).

It seems that high temperature is a limiting factor for the reproduction of this pest. Infestation had existed during the periods of cool weather when daily temperature ranged from 17°C to 23°C. But no infestation appeared on the fifth or later sowing

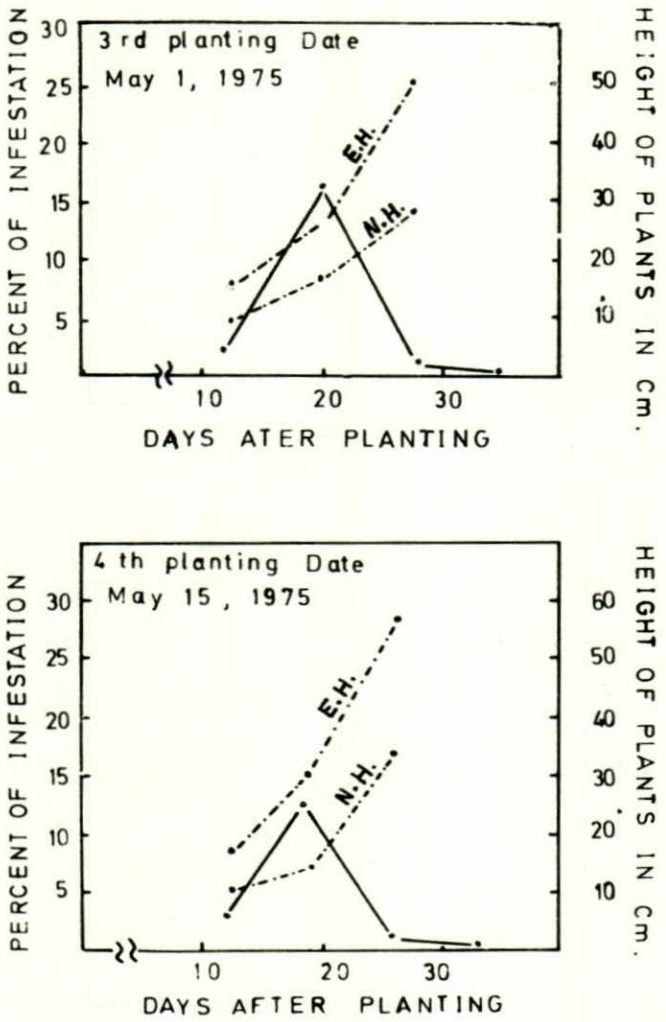

Fig. 2. Relation between the degree of infestation with *Delia flavibasis* and plant heights in the third and fourth planting dates: May 1, and May 15, 1975: E. H., Extended height; N. H. Normal height.

dates when it became warm and the temperature was fluctuating between 18°C and 35°C.

Infestation was also correlated with the height of seedlings. Flies preferred to infest plants with two developed leaves, and the peak of infestation was associated with an average normal height of 14.8 cm and an extended height of 27.1 cm on the average (Figures 1 and 2). Symptoms of infestation appeared on the third to the fifth or sixth leaf only. Plants became unsusceptible to infestation when they passed this growing stage and became more than one month old.

The hibernating larvae of the pink borer, *Sesamia cretica* started its activity during the first week of April, 1975 when a small percentage (6.8%) had transformed to pupae. Pupation continued during all April and the first half of May and a peak was reached

on April 20, 1975. Emergence of moths started during the end of April and continued until the end of May with a peak around the tenth of May. Only 2.2% emerged at the end of April, while 34.1% emerged on May 10, 1975 (Figure. 3).

The first field infestation with *S. cretica* was only detected on May 18, 1975 in 3.5% of the plants sown on April 15, 1975 (second sowing date). The plants at this stage of growth had a normal and extended heights of 30.6 cm and 57.1 cm respectively on the average. Moths preferred this height for oviposition. Ahmed and Kira (1) mentioned that at Bahtim, Egypt, corn plants were attractive for oviposition when their extended heights were 25 to 100 cm with preference towards plants of 45.8 cm extended height on the average. But under Alexandria conditions El-Sherif (7) found that corn plants reached the preferred growth for oviposition when they became 15–30 days old and more than 30 cm extended height. While at Giza oviposition was on plants not less than 20 cm extended height (8).

Moths continued to show preference towards the mentioned height in the other sowing dates. For example, on the previously stated date (May 18, 1975) there was no infestation either in the plants of the first sowing date which had a normal and extended heights of 52.1 cm and 86.3 cm on the average or in the plants of the third sowing date which had 16.6 cm and 26.1 cm for both heights respectively. But infestation in the plants of the third sowing date had reached 15.2% on June 10, 1975 when they reached the preferred height.

Corn plants of the fifth sowing date (June I, 1975) was subject to the highest rates of infestation by *S. cretica*. Infestations in the fifth to the seventh sowing dates showed a range of infestation from 20.6 to 26.4% as soon as they reached the preferred stage.

The above information and studies may indicate that the best recommended date for planting corn in Tripoli area can be the middle of May to avoid infestation rates with both insect pests.

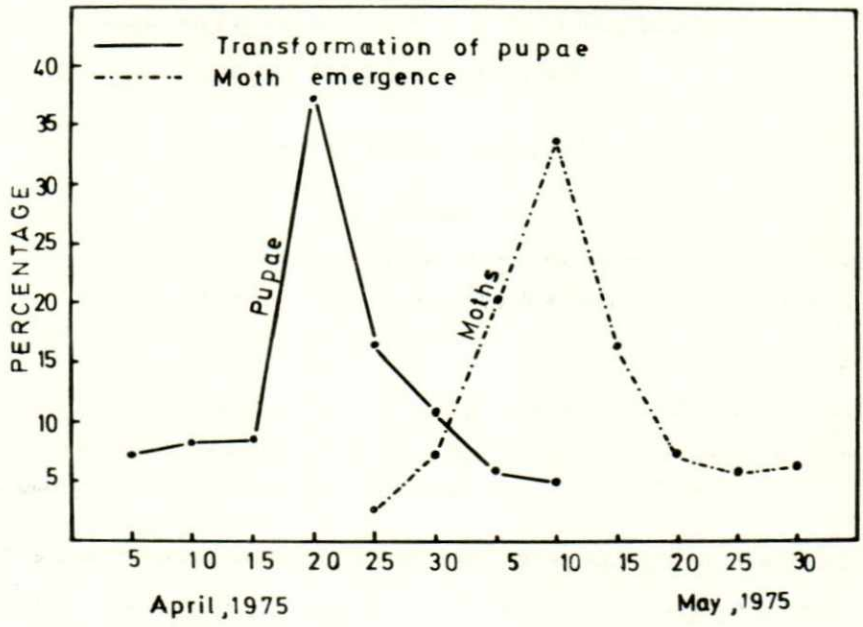

Fig. 3. Transformation of *Sesamia cretica* pupae and moth emergence from hibernating larvae in the season of 1975.

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حشرات الذرة فى الجماهيرية العربية الليبية الشعبية الاشتراكيـــة والاصابات التى تظهـــر عل البـــادرات

مصطفى كمال احمـــــــد

الملخـــــــص

أجرى حصر لآفات الذرة المزروعة فى اثنى عشر ميعادا مختلفا وظهر ان هذا المحصول يصاب بأحـدى عشر آفة حشرية منها خمس أنواع جديدة · ولا يسبب أضرارا اقتصادية للنباتات سوى ديلّيا فلا فيباسيس ، سيزاميا كريتيكا التى تتكاثر بأعداد كبيرة تضر بالبادرات ·

واصابت الحشرة الأولى النباتات وهى فى طور البادرة فقط وخصوصا فى الزراعات المبكرة التى صادفها جويميل للبرودة وكان الطول الممدود للبادرات ١ و ٢٧ سم فى المتوسط · بينما فضلت الحشرة الثانية اصابة البادرات عندما بلغ طولها الممدود ١ و ٥٧ سم فى المتوسط ·

واتلفت ديلّيا فلا فيباسيس بادارات الذرة التى زرعت خلال المدة من شهر ابريل حتى النصف الأول من شهر مايو ١٩٧٥ · بينما اشتدت الاصابة ببرقات سيزاميا كريتيكا فى النباتات المزروعة خلال شهـــرى يونيو ويوليو · وينصح بزراعة الذرة فى منطقة طرابلس خلال منتصف مايو حتى تنجو النباتات من فترات الاصابة الشديدة بكلا النوعين من الحشرات ·