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Insects Pests of Maiz and Their Losses

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Abstract: The insect pests of maize and their losses were studied in KARINA Juglote, Northern Areas. Maize stem borer *Chilo Partellus* was found serious pest with 24.5% plant infestation followed by maize aphid *Rhopalosiphum maidis* with 15% plant infestation at tasseling stage. Shootfly *Atherigona soccata* attack at the early stage with 5% plant infestation. At the same time, Maize Jassid *Zygenia sp* was also recorded with population 5 jassids/3 sweep net. About 1112 Kg ha⁻¹ grain losses has been calculated due to these insect pests.

Key words: *Zea mayze*, , insect pests, percent plant infestation, yield losses

Introduction

Maize (*Zea mayze*) is the third most important cereal crop of Pakistan. It is mostly grown in NWFP and Northern Punjab, In Northern Areas, it is second most cereal crop after wheat. It forms a significant part of local diet. In addition to food, it is an important fodder for livestock and feed for poultry. It has recently become commercially important for food industry e.g. in making of corn oil, cornflakes, and popcorn, Rafhan etc. (Mohammed *et al.*, 1986).

In Pakistan, 944 thousand hectares land is under cultivation of maize with an average yields 1643.2 thousand tone (Anonymous, 2000). Like other parts of the country, maize is also main kharif crop in Northern Area, generally sow thick and remove surplus plants gradually for use as fodder. This is perhaps because fodder is an important to them as grain.

Among the low yield factors of maize, insect pests are important ones. Alam (1981) presented a list of about 20 species of arthropods that attacks maize in Barbados. Parkash *et al.* (1985) recorded the pyralid *chilo partelus*, a noctuid *sesamia inferens* and the anthomyid *Atherigona sp* of maize crop. Rahman (1987) presented a list of 24 arthropods pests of Maize. Karimullah *et al.* (1992) observed that cutworm *Agrotis ipsilon* R. and army worm *Mythimna separata* (wlk) appeared as early and mid season pest while earworm and the corn aphid *Rhopalosiphum maids*. (Fitch) as late season pest of maize crop in Kalam (Swat). Mashwani (1989) reported cutworm, army worm, earworm, grasshopper and aphids as the pests of maize in swat.

These insects cause huge losses in maize crops. According to Khan (1967) the annual losses of maize stem-borer in maize crop run into million of rupees. Atwal (1976) and Saeed (1979) recorded 25 percent plants damage by Maize stem-borer, which according to Khan

(1983) causes loss worth of 149 million rupees.

As this is the first entomological study of maize in this area, so it was urged to record the insect pests of maize and their extent of plant infestation. At the same time it was also tried to measure losses due to these insect pests so as to provide base line information for control action.

Methods and Materials

In this experiment, Azam variety was sown in normal season i-e on 5th July 2001 with plant to plant distance 30 cm and row to row distance 45 cm. After germination the plant population was kept 80 plot⁻¹. Standard but uniform agronomic practices were followed There was two treatments and each was replicated 12 times. The treatment T₁ (check plot) was kept open for insect infestation while in treatment T₂ (Controlled plot), zero infestation was maintained by controlling all insect pests. The insect pests in this treatment were controlled with the following insecticides:

- i. Furadon Granular (For Maize stem-borer control)
- ii. Methyle parathion EC (For sucking insects)

To record the insect pests, the check plots were examined with 10 days interval since 20 days of germination. All the insect species that were found on maize plants were collected and brought to laboratory for identification. Identification was made with the help of available literature. In each observation the number of infested plants in each check plot were recorded for calculating the extent of infestation. The population of Jassid was estimated by three sweep net/plot. At the last, the crop was harvested and the losses due to insect pests were calculated through the following formula:

Losses in yield: Expected yield (yield of treated plot)-
Actual yield (yield of untreated plot).

Results

During this study the following insects were recorded infesting Maize crop.

Maize stem-Borer *Chloe Partellus*. (Swinboe)

(Family Pyralidae, Order: Lepidoptera).

Maize Aphid *Rhopalosiphum maidis*.

(Family Aphididae, Order: Homoptera).

Shootfly *Atherigona sp.*

(Family Jassidae, Order: Diptera).

Maize Jassid *Zyginia sp.*

(Family Jassidae, Order: Hemiptera)

Maize Stem-Borer *Chilo Partellus* (Swinhoe): Maize Stem-borer was found destructive during the present study. Its damage started after two weeks of germination (after 20th July) and gradually increases up to the first week of October (Table 1).

The destruction is caused by its caterpillar, which after hatching feeds on leaves and then bore their way downward into stem. The full grown larva range from 20 to 25 mm in length and are dirty grayish-white in colour, with black head and four brownish longitudinal stripes on the back. It pupates in the lower portion of the stalk. Before pupation an exit hole is formed. The adults are yellowish gray moths, about 25 mm across the wings when spread; they are active only at night.

The Maize stem-borer infestation was recorded at 10 days intervals by counting the total infested plants in each plot (Table 1). The data show that its infestation started in the last week of July with 1.66% infestation, which gradually increases to a maximum of 24.50% in the first week of September. This may be due to emergence of its second generation. Maize stem-borer was also reported to be a serious pest of Maize by Khan (1967), Atwal (1976), Ghuri *et al.* (1978), Mohyuddin and Attique (1978) in Pakistan, India and Ceylon.

Maize Aphid *Rhopalosiphum maidis* (Fitch): This pest was found second in damage to maize crop. Aphids are soft-bodied insects, which suck the cell sap from the leaves and secrete large amount of honeydew. They are usually recognized by their characteristics pear shaped body, a pair of cornicles at the posterior end of abdomen and fairly long antennae.

Its infestation started at the end of August slightly before tasseling stage. Its attack usually occurs on the upper young leaves in the beginning but later the tassels of the crop were attack. Table 1 shows that attack of aphid started in the last week of August with 5% infestation and reaches the maximum of 6.76 infestation in the middle of September and then gradually decreases. This is in favor

Table 1: Percent infested plants of Maize crop by different insect pests recorded on different dates

Date	Infested Plants (%) by			
	Maize Stem Borer	Maize aphid	Shootfly	Maize Jassid
25-07-2001	1.66	0.00	5.1	0.00
05-08-2001	1.87	0.00	8.0	0.00
15-08-2001	3.54	0.00	0.0	5.91
25-08-2001	15.84	5.00	0.0	7.08
05-09-2001	24.37	6.76	0.0	7.67
15-09-2001	24.50	1.87	0.0	5.50
25-09-2001	0.00	1.56	0.0	0.00

Table 2: Grain Yield Losses in Maize due to insect pests (Kg)

Replication	Yield T1 (Untreated)	Yield T2 (Treated)
1	0.4	1.4
2	0.4	5.50
3	3.0	4.00
4	3.0	5.50
5	4.0	5.0
6	3.20	6.0
7	0.40	0.8
8	3.8	6.20
9	5.0	7.00
10	1.0	2.0
11	2.40	5.0
12	3.5	6.0
Yield Kg Plot ⁻¹	2.5a	4.5b
Total yield Kg ha ⁻¹	1388.0a	2500.0b

Means are significantly different at 5% level

Loss in yield : 2500-1388=1112 kg

LSD value = 0.74

T1: Untreated

T2: Treated

of Karimullah and Ahmed (1992) who reported it as late season pest. In early season monsoon rains kept its population under control but at the termination of monsoon its population start raising.

Shootfly *Atherigona soccata* (Ronald): It usually attacks the maize crop at early stage. Due to which the infested plants remain stunted with many tillers. After hatching, its larvae enter the central shoots. Consequently, the central shoot wilts and finally become yellowish which give rise to dead hearts, while lateral leaves remain green.

Its infestation occurs at the early stage i-e after mid of July and reaches maximum infestation level in first week of August (Table 1). During this study 6.67 maximum plant infestation by shootfly was found which is contrary to Kumar and Chander (1987) who reported 26.21% plant infestation in maize crop. This may be due to early termination of summer season in Northern Areas.

Maize Jassid *Zygenia sp*: These tinny insects flew in large number when maize plant is slightly disturbed. It sucks the sap from maize leaves due to which the leaves become copper red in colour. It appeared in maize crop when the crop attain one feet height and remain up to crop maturity. Its average population was 5-7 Jassids/3

sweep net (Table 1). Atwal (1967) and Rehman (1987) also reported it as pest of maize crop in India and Pakistan.

Losses in yield due to insect pests: Data obtained from the study of losses in yield due to insect pests are given in Table 2. Statistical analysis of the data showed that there is significant difference in the yield of treated (2500 kg ha⁻¹) and untreated plots (1388 kg plot⁻¹). The losses recorded by subtracting the actual yield from the expected yield was 1112 kg ha⁻¹, which is worth of 8896 rupees ha⁻¹ (@Rs.8 kg⁻¹). According to available literature no one has worked in Pakistan to calculate its per hectare losses in Maize crop, however Saeed (1979) reported 60 million and Khan (1983) reported approximately million rupees losses annually due to Maize stem-borer.

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