

<http://www.pjbs.org>

PJBS

ISSN 1028-8880

**Pakistan
Journal of Biological Sciences**

ANSI*net*

Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Diagnosis of Important Insect Pests of Soybean in Peshawar

Javed Iqbal¹, Muhammad Shahid², Naveed Akhtar¹, Mirza Hassan¹

¹Barani Agricultural Research Station, Kohat

²Faculty of Crop Protection, NWFP Agriculture, University, Peshawar, Pakistan

Abstract: In the study of insect pests of soybean (*Glycine max* L. Merrill,) in Peshawar, the insects found or feeding on soybean plants were white fly *Bemisia tabaci* (Gen), *Thrips flavus* Schr, jassids *Amrasca biguttula* (Gen), painted bug *Piezodorus* sp., hairy caterpillar *Euproctus* sp., chrysomellids *Systema* sp. and different species of grasshoppers including *Acrida exalta* Walk., *Truxalix nasuta* (Lin.), *Euprepocnemis alacris alacris* (Ser.) and *Attractomorpha acutipennis* (Guer). Also the relative abundance of each of these species on different cultivars of soybean was recorded from August to November. Cultivar GS-50277-266-9-21 attracted significantly large number of all the recorded insects showing its least resistance or maximum susceptibility. Not a single cultivar was found to be resistant to all the insect pests. However, cultivar WILL was relatively more resistant to white flies, cultivar GC-81090-72-7 was relatively more resistant to painted bug and hairy caterpillar and cultivar GC-81083-83 was relatively more resistant to jassids and thrips than the other cultivars.

Key words: Soybean, Insects and pests population, Resistant cultivar

Introduction

Soybean (*Glycine max* L. Merrill,) is believed to be among the oldest plants cultivated by man. Most of the scientists agree that the origin of soybean was in Eastern Asia, possibly in China (Metcalf and Elkins, 1980). It is one of the non-conventional crops which contains 18-22 percent oil containing 85 percent unsaturated fatty acid and is cholesterol free so its is highly desirable in the diet. Soybean has 22-40 percent protein. It is used in the food industry in cookies, biscuits, candy, vegetable milk, cheese, lecithin and many other products including infant milk in which it is an important ingredient (Anonymous, 1991).

In NWFP the total area under this crop during 1996-97 was 5520 hectare. Besides other problems in the successful cultivation of soybean many diseases and insect pests have been reported to attack the crop in different soybean growing parts of this province. In Peshawar hairy caterpillar, stink bug, jassids and white flies have been recorded by Imran (1979).

Ali (1988) found *Aphis* spp., *Attractomorpha* spp., *Spilosoma oblique*, *Monolepta signata*, *Nizara viradula*, *Mylokerus* sp., *Riptorus* sp., *Aphanus sordidus* and *Amrasca biguttula* the most common pest species of soybean in Bangladesh. Usman *et al.* (1984) observed that stem borer, cut worm, hairy caterpillar, field crickets, grass hopper, white flies, white ants and jassids were attacking soybean. Therefore, this project was designed to studies the insect pests and their infestation on different cultivars of soybean.

Materials and Methods

Ten cultivars of soybean were sown during kharif 1991 season at the NWFP Agricultural University, Peshawar for the study of different insects attacking the crop. All the insects found or feeding on soybean plants were collected for identification.

For this purpose sowing was done in rows. Row to row and plant to plant distance was 50 cm and 20 cm respectively. Size of plot for each cultivar was 3 × 4 sq. meter. The experiment was replicated 4 times in randomized complete block design. For the study of population density of each species attacking soybean, density of major insect species was recorded at weekly interval.

For the population density of white flies, jassids and thrips, 4 plants from each plot were randomly selected. On each of these plants 2 leaves each from top, middle and bottom were tagged and the population of insects on the both sides of these 6 leaves was counted and recorded. For the population density of hairy caterpillar, stink bug and chrysomellid beetles,

population per plant on the same 4 plants was counted. The density of grasshoppers was counted and recorded on plants per plot. The data were analyzed statistically. The insect species were identified through the Commonwealth Institute of Biological Control, Rawalpindi.

Ten cultivars for the study of insect pests of soybean were as follows:

- | | |
|-----------------------|-----------------|
| 1. GC-50227-22-6-9-21 | 6. GC-81080-36 |
| 2. GC-B-4007 | 7. AGC-242 |
| 3. GC-81085049NL | 8. GC-81084-37 |
| 4. WILL | 9. GC-81084-41 |
| 5. GC-81090-72-7 | 10. GC-81083-83 |

Results and Discussion

The different insects and their population density as recorded in the present study are given in Table 1. These included white flies (*Bemisia tabaci* (Gen), Thrips (*Thrips flavus* Schr.), jassids (*Amrasca biguttula* (Inshida)), painted bug (*Piezodorus* sp.), hairy caterpillar (*Euproctus* sp.), chrysomellid (*Systema* sp.), hairy caterpillar (*Euproctus* sp.), chrysomellid (*Systema* sp.) and different species of grasshoppers, including *Acrida exalta* Walk, *Truxalix nasuta* L., *Euprepocnemis alacris alacris* (Ser.) and *Attractomorpha acutipennis* (Guer).

Workers of the past like Sagar (1986) also found *Thrips flavus* quildinnii on soybean in Brazil. Imran (1979) found *Bemisia tabaci* (Gen) as a serious pest of soybean in Pakistan. Mundhe (1980) identified 16 insect species in India and the most abundant and injurious species were *Aproaerema modicella* (Deventer), *Heliothus armigera* (Hb.), *Spodoptera litura* ad *Caliothrips indicus* (Bagn). Ramiro *et al.* (1986) found *Euschistus heros* sp., *Nezara viridula* and *Piezodorus quildinnii* the most abundant pest in Brazil.

The insect pests of soybean recorded in the present study were almost the same as reported by the other workers from Pakistan, India Bangladesh, Brazil etc.

For the relative abundance of different insect pests attacking soybean, ten newly introduced cultivars were studied. Results showed that all the cultivars had attracted greater or lesser number of different insect pests.

In general cultivar GC-50227-22-6-9-21 attracted significantly large number of *Bemisia tabaci* (10.42 per 6 leaves), *Thrips flavus* (5.73 per 6 leaves), *Piezodorus* sp. (2.89 per plant), *Euproctus* sp (5.02 per plant), showing its least resistance of maximum susceptibility (Table 1).

Iqbal *et al.*: Insect pests complex on soybean

Table 1: Population density of insect pest of soybean on different cultivars

Insect pest	Cultivars									
	GC-50227 22-6-9-21	GC-B-4007	GC-81085- 49 NL	WILL	GC-81090- 72-7	GC-81080- 36	AGS-242	GC-81084- 37	GC-81084 41	GC- 81083-83
Whitefly per 6 leaves	10.42A	6.93DEF	7.31CDE	6.57F	7.62BC	6.72EF	7.97B	7.36B-E	7.41BCD	7.67BC
Thrips per 6 leaves	5.73A	3.90B	3.45B	3.63B	4.03B	3.73B	3.39B	3.51B	3.49B	3.29B
Jassids per 6 leaves	4.04AB	3.41CD	3.58BCD	3.40CD	4.29A	3.79ABC	3.34CD	3.33CD	3.43CD	3.19D
Painted bug per plant	2.89A	2.67AB	2.36CDE	2.44B-E	2.22E	2.33CDE	2.26DE	2.56BC	2.66AB	2.49BCD
Hairy Cater- Piller per plant	5.02A	3.60D	4.06B	3.93BC	3.15E	3.41DE	3.65CD	3.62D	3.68CD	3.40DE
Grasshoppers per 4 x 3 sq. meter	3.31A	3.00A	2.96A	3.00A	2.96A	2.69A	2.73 A	2.81A	2.87A	2.86A
Chrysomellid beetle per plant	3.95A	2.81B	2.76B	3.09B	3.38AB	3.09B	3.10B	3.24AB	3.11AB	3.16AB

Means not followed by the same letter are statistically significant at 5% level of probability

Cultivar GC-81090-72-7 attracted significantly large number of *Amrasca biguttula* (4.29 per 6 leaves), showing its least resistance or maximum susceptibility. This cultivar showed relatively more resistance to *piezodorus* sp. and *Euproctus* sp. For other insects, it was intermediate.

Cultivar WILL was relatively more resistant to *Bemisia tabaci* as compared to other cultivars and carried significantly least infestation (6.57 per 6 leaves). For other insect pests it was also intermediate. Cultivar GC-81083-83 carried significantly least infestation and was relatively more resistant. For other insect pests it was also intermediate. From these results it was concluded that cultivar GC-50277-226-9-21 was relatively more susceptible or least resistant to different insect pests attacking soybean. No cultivar of soybean was found to be resistant to all the insects attacking soybean. However, cultivar GC-81090-72-1 was relatively more resistant to *Piezodorus* sp. ad *Euproctus* sp., while cultivars WILL and GC-81083-83 were relatively more resistant to *Bemisia tabaci* and *Amrasca biguttula* respectively.

All the cultivars attracted about same population of grasshoppers and were, therefore, uniform in their resistance or susceptibility. These results can not be strictly compared with the findings of the previous worker because no work has been done on resistance/susceptibility of these cultivars, specially because the cultivars under test in the present study were newly introduced. The cultivars which were relatively more resistant to white flies, thrips and jassids had large number of dense hair on their stems and leaves which made them less attractive for such small insects.

Reference

- Ali, M.I., 1988. A survey of the insect pests of soybean in Northern Bangladesh, their damage and occurrence. *Trop. Pest Manage.*, 34: 328-330.
- Anonymous, 1991. Soybean production. *Crop Production Bulletin* No. 1. PARC., Islamabad Pakistan, pp: 18.
- Imran, M., 1979. Relative abundance of white fly (*Bemisia tabaci*) on different soybean cultivars and its chemical control. M.Sc. Thesis, University of Peshawar, Pakistan.
- Metcalf, D.S. and D.M. Elkins, 1980. *Crop Production: Principles and Practices*. 4th Edn., Macmillan, New York, Pages: 774.
- Mundhe, D.R., 1980. Insect pest complex on soybean (*Glycine max* (L.) Merrill) in Marathwada region. *J. Maharashtra Agric. Univ.*, 5: 259-260.
- Ramiro, Z.A., A.B. Filho and L.A. Machado, 1986. Occurrence of soybean pests and natural enemies in Orlandia, Sao Paulo state, Brazil. *Anais da Sociedade Entomologica do Brasil*, 15: 239-246.
- Sagar, P., 1986. Population abundance of thrips, *Thrips flavus* Schr. on soya crop. *J. Res. Punjab Agric. Univ.*, 23: 458-459.
- Usman, M., M.S. Khan, Z. Quresh and M. Sharif, 1984. Growing soybean in Pakistan. *The Out Reach Programme (Agri) NAU/PNCB Batkhela*, pp: 23-24.