



INSECT PESTS ASSOCIATED WITH PIGEONPEA VARIETY UPAS 120 IN WESTERN UTTAR PRADESH, INDIA

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Abstract

Insect pests associated with pigeonpea in Western Uttar Pradesh were studied during *Kharif*, 2012 and 2013 at Crop Research Center, SVPUA & T, Meerut, Uttar Pradesh (India), in a randomized block design with three replications. The results of two consecutive years revealed that the seventeen insect species encountered on pigeonpea in this region, which belongs to five orders *viz.* lepidoptera (pod borer, legume pod borer, leaf folder, lablab pod borer and blue butterfly), hemiptera (jassid, white fly, aphid, cow bug, tur pod sucking bug, pod bug and green bug), coleoptera (blister beetle, gray weevil and bruchid), diptera (pod fly) and orthoptera (grasshopper).

Key words : Pigeonpea, insect pests, randomized block design, *Helicoverpa armigera*.

Introduction

Pigeonpea (*Cajanus cajan*) is an important pulse or grain legume crop in semi-arid, tropical and subtropical areas of the world. India has the largest area under pigeonpea in the world followed by Myanmar, China and Nepal. India contributes 75 per cent to the global production, it occupies an area of 3.88 million ha with an average production and productivity of 3.29 million tonnes and 849 kg/ha, respectively. In Uttar Pradesh, it occupies an area of 0.30 million ha with an average production of 0.27 million tonnes and contributes 7.76% of total production (Anonymous, 2014). Pigeonpea is a perennial shrub but most often cultivated as an annual crop. Thus, it's throughout year presence makes it prone to several abiotic and biotic stresses. Among biotic stresses, insect pests are the major limiting factors resulting in heavy loss to pigeonpea growers. More than 250 species of insect belonging to 8 orders and 61 families have been reported to attack pigeonpea crop from the germination of crop till its harvest (Lal and Katti, 1997). However, detailed studies on insect pest complex were undertaken.

Materials and Methods

A field experiments were conducted for two consecutive seasons (*Kharif*, 2012 and 2013) at Crop

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Research Center, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut (U.P.), India in a randomized block design with three replications having plot size of 5 × 5 m². Pigeonpea variety UPAS 120 was sown during the mid of June by adopting recommended agricultural practices. Observations on insect pests associated with pigeonpea were recorded right from germination of crop till the harvest at weekly interval from 5 randomly selected plants in each plot during *Kharif*, 2012 and 2013. The damage caused by various insect pests was also recorded to assess the economic status of insect pests.

Results and Discussion

Seventeen insect species encountered on pigeonpea in this region which belongs to five orders *viz.* lepidoptera (five species), hemiptera (seven species), coleoptera (three species), diptera (one species) and orthoptera (one species). The insect abundance, which occurred consistently, ubiquitously and causing appreciable damage, were categorized on the basis of crop stages.

Lepidoptera

Pod borer, *Helicoverpa armigera* (Hubner) was recorded as major insect pest of pigeonpea crop in this region. The larvae of this insect fed for a short time on the tender leaflets by scrapping green tissues and then

shift to flower buds and tender shoot. Slowly, it enters and feeds on the seed inside the pods. The half portion of larvae remained inside pod while feeding on the developing seeds. The appearance of pest was started in the beginning of October and remained active throughout the crop season. The peak incidence of this insect was noticed in the month of November.

Legume (cowpea) pod borer, *Maruca vitrata* (Geyer) was a potentially important pest causing severe damage to the crop in this region. Larvae fed on the tender leaves, flower buds and developing seeds. Webbing of tender leaves and flower buds together seen on plants indicate the possibility of *Maruca* damage. The damage of this pest was observed from the mid of September to November end.

Leaf folder, *Grapholita (Cydia) critica* (Meyr.) was another important pest of pigeonpea. The larvae bind the leaves together and feeds on the chlorophyll while remaining inside the web. Infestation started at the seedling stage and persisted to the reproductive stage when the larvae fed on flower buds and young pods. This pest was recorded from September beginning to middle of November.

The larvae of lablab pod borer, *Adisura atkinsoni* (Moore) fed on flower buds and green pods and noticed as major insect pest from October beginning to the November end.

The blue butterfly, *Lampides boeticus* (L.) was recorded as important pest of pigeonpea crop in this region. Larvae of this insect fed on flower buds, flower and foliage of plants thus causing considerable damage. Its occurrence was recorded in the month of November - December.

Hemiptera

Jassid, *Empoasca kerri* (Pruthi) is a potentially important pest causing severe damage to the crop in this region. Both nymphs as well as adults sucked the sap from lower surface of leaves. The pest appeared in September beginning and remained active till November end as a major pest. The population attained its peaks in mid of October.

Both nymphs and adults of whitefly, *Bemisia tabaci* (Gennadius) sucked the sap from undersurface of leaves and excreted honeydew. This species was recorded from the beginning of July and remained active throughout the crop season as minor pests.

Aphid, *Aphis craccivora* (Koch) was another pest of pigeonpea. Both nymphs and adults sucked the sap from tender shoots and leaves, thus devitalized the plant

and was recorded in the month of July and sustained there for a period of four weeks.

Both the nymphs and adults of cow bugs, *Oxyrachis tarandus* (F.), tur pod sucking bug, *Clavigralla gibbosa* (Spinola), pod bug, *Riptortus* spp. and green bug, *Nezara viridula* (L.) sucked the sap from leaves, growing tips, and sometime pod also. The seed become shrivelled and lose viability. These bugs were found active from September end to October end.

Coleoptera

Blister beetle, *Mylabris pustulata* (Thunberg) fed on the flower, flower buds and foliage of the plants thus causing considerable damage to the crop. This pest was recorded from mid of September to November beginning.

Infestation caused by ash/grey weevil, *Myloccerus undecimpustulatus* (Faust) was noticed during August to October as minor pests. Adults of this insect chew the leaflets, generally at the margins causing a ragged effect. Larvae lived in the soil, where they fed mainly on roots.

The grubs of Bruchids, *Callosobruchus maculatus* (F.) fed on the inner content of seed. The pests was observed in the month of November and remained continued till the harvest of the crop.

Diptera

Pod fly, *Melanagromyza obtusa* (Malloch) was also a potentially important pest causing severe damage to the crop. The maggot bore into the pod and fed on developing seed. Usually one seed is sufficient for development of one maggot. The maggot pupates inside the pod after making a small hole on the pod covering it with a thin membranous structure. The damage of this pest was observed from October beginning to the mid December.

Orthoptera

Surface Grasshopper, *Chrotogonus trachypterus* (Blance) was found feeding on the leaves and making irregular shape on the margins of leaves. The infestation was recorded in the month of July and remained active throughout the crop season as minor pest.

It is evident from the present studies that seventeen insect species were found associated with pigeonpea crop in western Uttar Pradesh. These findings are in accordance with the findings of Khokhar and Singh (1983), who reported 38 species of insects-pests. Among them *Mylobris pustulata*, *Helicoveppa armigera*, *Clavigrella gibbosa*, *Nezara viridula*, *Meruca testulalis* were noticed in the month of September and October, when the crop was at flowering and pod stages. The results of Rao *et al.* (2002) also support the present

findings. They recorded 35 insects associated with pigeonpea. The dominant groups of insect pests associated during vegetative and flowering stages were *Helicoverpa armigera*, *Etiella zinckenella*, *Euchrysopterus cnejus*, *Odontotermes distans*, *Maruca testulalis* and *Gryllusbi maculatus*. Similar results were also reported earlier by Rangaiah and Sehgal (1984). Madang *et al.* (2012) reported the infestation in pigeonpea at seedling stage by grasshopper. Whiteflies were observed on the plants at the vegetative stage. Recently, nearly 200 species of insects have been enlisted to attack the pigeonpea crop, among these, 34 as serious pests including podbug, *Calvigralla gibbosa*, *C. scutellarius*, various species of leaf webbers, especially *Cydia critica*, *Maruca vitrata* and glaucid beetle (Lal *et al.*, 1983).

References

- Anonymous (2014). *Agricultural statistics at a glance*. Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, New Delhi.
- Khokhar, K. S. and Z. Singh (1983). Insect pests associated with pigeon pea at Hissar. *Int. Pigeon Pea Newsl.*, **2** : 43-44.
- Lal, S. S. and G. Katti (1997). Pod fly, *Melanagromyza obtusa* Malloch- A key pest of pigeonpea. Indian Institute of Pulse Research, Kanpur, 267 pp.
- Lal, S. S., C. P. Vadava and C. A. R. Dias (1983). Major pest problems of pigeon pea in Uttar Pradesh, India. *Int. Pigeon pea Newsl.*, pp. 30-31.
- Madang, A. D., C. E. Bonaventure and E. A. Jerry (2012). Field insect pests and crop damage assessment of pigeonpea, *Cajanus cajan* [L.] grown under ratoon and in mixture with maize. *Chilean J. Agric. Res.*, **72**(1).
- Rangaiah, P. V. and V. K. Sehgal (1984). Insects of T2, pigeon pea and losses caused by them at Pant Nagar, Northern India. *Int. Chickpea Newsl.*, pp. 40-43.
- Rao, R. G. V., K. B. Saxena, P. Yang Shiyang and T. Weiguang (2002). Insect pest problems of pigeon pea in Gangni and Hainan province of China. *Int. Chickpea and Pigeon pea, Newsl.*, p. 48.