Available online at
http://currentagriculturetrends.vitalbiotech.org/

ISSN (E): 2583 – 1933

Curr. Agri.Tren.:e- Newsletter, (2023) *2*(10), 27-29

Current Agriculture Trends: e-Newsletter

Article ID: 239

Exploring the Insect Pests of Pigeon Pea

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Open Access

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Article History
Received: 5.10.2023
Revised: 12.10.2023
Accepted: 15.10.2023

INTRODUCTION

Pigeon pea, scientifically designated as *Cajanus cajan*, represents a versatile leguminous crop primarily cultivated for its seeds abundant in protein content and its capacity to fix atmospheric nitrogen into the soil. This tropical and subtropical species is especially well-suited for rainfed agriculture in semi-arid regions, distinguished by its deep taproot, heat tolerance, and rapid growth characteristics (Mallikarjuna et al., 2011). Globally, pigeon pea ranks as the sixth most produced grain legume, following phaseolus beans, peas, chickpeas, broad beans, and lentils (Mula and Saxena, 2010). Pigeon pea is recognized for its composition, containing approximately 20-22% protein, 1.2% fat, 65% carbohydrates, and 3.8% ash (FAO 1982). In the Asian context, responsible for nearly 90% of worldwide production, pigeon pea holds the position of the third most crucial pulse crop. India, Myanmar, and Nepal stand as the principal producers, and within India, its demand is noteworthy due to its potential to provide high-quality protein in vegetarian diets (Bhattacharjee et al., 2013). Nonetheless, the cultivation of pigeon pea faces a significant impediment in the form of insect pests that target its flowers, pods, and seeds. These pests can be categorized into three primary groups: Lepidoptera, which feed on flowers and pods; Hemiptera, which engage in pod-sucking; and Diptera and Hymenoptera, which feed on seeds. While insects can affect various parts of the pigeon pea plant, the most severe damage occurs when these pests target its reproductive structures, such as buds, flowers, and pods. The cultivation of pigeon pea, despite its promising attributes, is confronted with substantial challenges, primarily emanating from the presence of diverse insect pests. Consequently, this article aims to provide a comprehensive overview of the various types of insects that inhabit pigeon pea crops.

1. Pod Borer (*Helicoverpa armigera*): It is an important polyphagous pest on pulses including pigeon pes. Caterpillar first feeds on foliage, later bores into pods and feeds on seeds. Larva is seen feeding with the head alone thrust inside the parts and the rest of the body hanging out. Boreholes on pods, absence of seeds on pods and defoliation in early stages are the symptoms of attack. A single larva may destroy 30-40 pods before it reaches maturity. Particularly H. armigera causes pod damage of 20-57 per cent in both early and late maturing varieties, ensuring the losses in seed yield up to 28 per cent.

2. Spotted pod borer (*Maruca vitrata*): It is a sporadic pest of pigeonpea and commonly damages the short duration crop. Varieties with determinate growth and spreading types are more susceptible. The larvae cause extensive damage to floral buds and flowers. The characterestic symptom is webbing together of flowers, pods, and leaves with frass often on pods and shoot tips. This is a serious pest in early maturing varieties. They damage flowers causing discoloration and shedding.

3. Red gram pod fly (*Melanogromyza obtusa*): Maggots cause damage by boring into the soft seeds and feed on grains. The damaged seeds are unfit for consumption as well as for germination. The adult female fly thrusts its minute eggs in to the shells of a tender pods piercing through the ovipositor. Each locule may contain to the maximum 4-5 eggs but normally single egg is found in each locule. A female may lay 60-80 eggs. This pest alone accounts for 70-80% of the total pod damage by podborer complex.

4. Pod borer (*Etiella zinckenella*): The caterpillars injure the buds, flowers and pods. The young larva bores its way into the floral parts at once. Once the larva is inside the flowers or pods, it damages them from all angles and eats them one after the other, making rough and irregular incision. In pods the larva devours many seeds. the larva leaves one pod and enter another if the food is exhausted. The pods are seen with several entry holes. However, the entrance holes in the green pod heal and leave little evidence that the pod is infested.

5. Tur pod bug (*Clavigralla gibbosa*): Both nymphs and adult suck the cell sap from leaves, flower buds and unripe seeds of green pods. As a result of this damage, the pods show pale yellow patches and later on grain shrivel up. The grains inside remains small in size and yield may be reduced significantly**.**

6. Pod Sucking Bug (*Riptortus* spp.): Pod sucking bugs are a group of insects that feed directly on pigeon pea pods. They use their piercing-sucking mouthparts to penetrate the pods and feed on the developing seeds. The damage caused by these bugs can result in reduced yields and quality. Farmers often employ chemical pesticides to control pod sucking bug populations.

7. Blister beetles (*Mylabris* spp.): Blister beetles are polyphagous pests and feed on flowering parts of plants belonging to different families. Only the adults of these beetles cause direct damage by feeding voraciously on petals, anthers and pollens, thus affecting the yield considerably. A single beetle can destroy as many as 20-30 flowers/day.

8. Aphids (*Aphis craccivora*): Colonies of aphid are found on the stems, leaves and pods of leguminous crops. The pest is more active during early stage of the crop. Infestation in the early stage causes stunting of the plants as well as reducing the vigour. Nymphs and adults suck the cell sap from underside of leaves, top shoots and stems, as a result of it the plants become discoloured and weak. They also transmit viral diseases in pigeonpea. They also secret honeydew on which sooty mould develop. The aphid more active in *kharif* leguminous crops in the month of July to September.

9. Whitefly (*Bemisia tabaci*): Whitefly nymphs and adults suck sap from leaves and

make the plants very weak showing downward cupping of the leaves giving sickly look and the plant may die eventually due to severe attack of the pest. The insect secretes honey dew on which growth of sooty mould takes place resulting in blackening of leaves, drastically reducing photosynthetic rate and drying of leaves leading to total failure of the crop. Whitefly is a vector of number of viral diseases.

10. Leafhoppers (*Empoasca* spp.): Leafhoppers are common insects in pigeon pea fields. The major symptoms of the jassid (leaf hopper) infestation include downward cupping of the leaves from the edges. These symptoms start appearing when the insect feeds on the leaves. In severe infestation, burn symptoms occur causing drying of the leaves affecting the plant growth and yield negatively. Jassids can be controlled by manipulating the dates of sowing. Intercropping with sorghum, pearl millet and sesame also control its spread.

11. Cutworms (*Agrotis* spp.): Cutworms are nocturnal caterpillars that feed on the young seedlings of pigeon pea. They are known to cut the seedlings at or just below the soil surface. Protecting young plants from cutworms often involves the use of physical barriers and insecticides.

12. Hairy caterpillar (*Amsacta moorei*): The pest is active from mid June to the end of August and passes the rest of the year in pupal stage in the soil. Moths from these pupae appear usually with the first shower of the monsoon. Among the whole group of hairy caterpillars, the red hairy caterpillar is the most injurious to agriculture throughout India. Damage is caused by the caterpillars. The young caterpillars prefer to eat the growing points of the plants. The older ones have no such discrimination and they feed voraciously on all vegetation. Fields after fields are devastated by the moving army of caterpillars. In years of severe outbreaks, fields may have to be re-sown.

CONCLUSION

Insects in pigeon pea crops can pose significant challenges for farmers, affecting both crop yield and quality. Effective pest management strategies are essential to combat these insects, ranging from the use of chemical pesticides to biological controls and integrated pest management practices. Understanding the types of insects that can infest pigeon pea crops is crucial for sustainable cultivation and the preservation of this valuable leguminous crop. As agriculture continues to evolve, research and innovation are ongoing to develop more sustainable and environmentally friendly methods for pest management, reducing the reliance on chemical pesticides while safeguarding pigeon pea crops from these insect pests.

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