International Journal of Life Sciences
International Peer Reviewed Open Access Journal

Special Issue | A20 | April 2023
ISSN:2320-7817(p) 2320-964X(0)

Original Article Open Access

Seasonal Crop Pests of Red Gram (Pigeon Pea) in Akola Region.

Potekar Ashwini and Ade PP

Department of Zoology, Shri Shivaji College of Arts, Commerce and Science, Akola, (MS) India 444003

Manuscript details:

Available online on http://www.ijlsci.in
ISSN: 2320-964X (Online)
ISSN: 2320-7817 (Print)

Cite this article as:
Potekar Ashwini and Ade PP (2023) Seasonal Crop Pests of Red Gram (Pigeon Pea) in Akola Region. *Int. J. of. Life Sciences*, Special Issue – A 20 : 46-50

Article published in Special Issue on "*National conference on Advances in Biodiversity Conservation and Sustainable development: Educational & Scientific Research Perspective NCABCSD-2023*" organised by Department of Life Sciences, Shri Shivaji Science College, Amravati (MS) India - 444 603 Dated March 3 - 4, 2023.

ABSTRACT

The Pigeon pea also called as red gram (*Cajanus cajan*: family: Fabaceae) is a perennial legume. The centre of origin is the eastern part of peninsular India, including the state of Orissa where the closest wild relatives occur in tropical deciduous woodland. Today, pigeon pea is widely cultivated in all tropical and semitropical regions of both the Old and the New Worlds. The large number of pests and diseases which attack pigeon pea in India (and elsewhere) is perhaps the main constraint to increased production. Pigeon pea was found to be associated with termites (*O. badius*), crickets (*G. lucens*), and variegated grasshoppers (*Z. variegatus*) at the seedling stages, but the insects were considered minor pests. Field insect pest infestation on pigeon pea was more critical at the reproductive stage where damage was mainly caused by pod-sucking bugs (*Clavigralla* spp.), pod borers (*Helicoverpa*), pod flies (*Melanogromyza* spp.), and blister beetles (*Mylabris* spp.). The infestation and damage by Gram Pod borer (*Helicoverp*a) in this study area recorded as approximately 40% crop damage, followed by30% damage by Spotted pod borers, about 20% by Pod Fly and less damage about 10% by Blister Beetles.

Keywords: Pigeon pea, *Cajanus cajan*, Pests

INTRODUCTION

Pigeon pea are both a food croft (dried peas flour or green vegetable peas) and a forage or cover crop in combination with cereals pigeon pea make a well balanced human diet in India split pigeon pea (toordal) also called Kandhipappu in telgu, Togaribele in kannada and tuvaramparuppu in Tamilnadu. One of the most popular pulses being an important source of protein in a mostly vegetarian diet.

Pests of National Significance

- Gram Pod borer: *Helicoverpa armigera* Hubner (Lepidoptera: Noctuidae)
- Podfly: *Melanagromyza obtusa* Malloch (Diptera: Agromyzidae)
- Leaf webber: *Grapholita critica* Meyr (Lepidoptera: Tortricidae)
- Spotted pod borer: *Maruca vitrata* Fabricius (Lepidoptera: Pyralidae)
- Plume moth: *Exelastis atomosa* Walsingham (Lepidoptera: Pterophoridae)
- Pulse beetle: *Callosobruchus chinensis* Linn., *C. maculatus* Fab. (Coleoptera: Bruchidae)

MATERIAL & METHODS

Survey and collection of pests on crop of pigeon pea fields:

The study area for the collection and survey of crop pests of pigeon pea was done from September to February 2017-18. The fields visited at Pimpalkhuta, Redwa, Barshitakali, Aalanda and Pinjar in Taluka Barshitakali, district Akola. The samples of different developmental stages of insect pests were collected and preserved in 70% alcohol.

OBSERVATION & RESULTS

1. GRAM POD BORER:

Biology: It is a polyphagous pest, infesting gram, lablab, safflower, chillies, groundnut, tobacco, cotton etc.

Egg: Spherical, yellowish eggs are laid singly on tender parts and buds of plants. The egg period lasts for 2-4days.

Larva: Caterpillars are of varying colour, initially brown and later turn greenish with darker broken lines along the side of the body. Body covered with radiating hairs. When full grown, they measure 3.7 to 5 cm in length. The larval period lasts for 18-25 days. The full grown caterpillar pupates in the soil.

Pupa: Pupation takes place inside the soil in an earthen cell. Pupal stage lasts 7-15 days.

Adult: Moth is stout, medium sized with brownish/greyish forewings with a dark cross band near outer margin and dark spots near costal margins, with a wing expanse of 3.7 cm.

Damage symptoms:

- Defoliation in early stages
- Larva's head alone thrust inside the pods and the rest of the body hanging out.
- Pods with round holes

Favorable conditions:

Warm weather conditions followed by light rains and dry spells are favorable for multiplication.

Natural enemies of gram pod borer:

Parasitoids: *Trichogramma* spp., *Tetrastichus* spp., *Chelonus* spp., *Telenomus* spp., *Bracon* spp., *Ichneumon* spp., *Carcelia* spp., *Campoleti s*sp etc.

Predators: Lacewing, ladybird beetle, spider, red ant, dragonfly, robber fly, reduviid bug, praying mantis, black drongo, common mynah, big-eyed bug (*Geocoris*sp), earwig, ground beetle, pentatomid bug *(Eocanthecona furcellata*) etc.

2. POD FLY:

It is widely distributed in India and causes major economic losses in northern parts of India causing significant losses especially in long duration varieties. This pest alone accounts for 70-80% of the total pod damage by pod borer complex. The infected seeds do not germinate.

Biology:

Egg: The adult female oviposits in the tender pods. Eggs measure about 0.97 mm in length and 0.15 mm in breadth.

Larva: The freshly enclosed maggots are transparent, Mature larvae are white and up to about 3.5 mm long.

Pupa: Pupal cases are orange-brown, about 3 mm long, with a pair of closely spaced anterior spiracles projecting forward, and a pair of prominently projecting posterior spiracles on tubercles that are joined basally.

Adult: Both sexes are 2-3 mm long, and may appear black to the naked eye, but the thorax and abdomen have a distinct, green metallic sheen if examined under magnification. The head has a prominent ocular triangle, also metallic green that extends to the lunule (recessed crescent above the antennae). The wings are clear. The female has an unusually long, black ovipositor sheath.

Damage symptoms:

- Dark brown encrustation on the pod wall
- Dry pods showing pin head size hole
- Seeds shriveled, striped and partially eaten

Natural enemies of pod fly:

Parasitoids: *Euderuslividus*, *Eurytoma* spp., *Senegalella* spp., *Ormyrus orientalis* etc.

Predator: Spiders, reduviid bug, robber fly, dragonfly, etc.

*For management refer to page number 17

3. PLUME MOTH:

The pest is active throughout the year depending on the availability of the host plants. Apart from redgram, it is also recorded in horse gram and lablab.

Biology:

Egg: The female lays green oval eggs singly on buds and pods. Each female can lay 60 green coloured eggs on the tender developing pods. The egg period is 48-96 hours.

SPOTTED POD BORER

LARVA ADULT GRAM POD

BORER LEAF WEBBER

ADULT POD FLY

BLISTER BEETLE

PLUME MOTH

Helicoverpaarmijera Last Instar

Helicoverpaarmijera larvae

The Adult Female Oviposits In The Tender Pods

Pod Borer Larva Spotted

Pod Borer Larva

Pupae & Larva of Gram Pod Borer

Photo plate 1:

Larva: The larvae are green in colour with spine like hairs all over the body and are spindle shaped. The larva feeds on the developing parts/tender seeds.

Pupa: The pupa which appear like a larva, is often found attached to the pod surface or on the pedicel.

Adult: The plume moths usually appear at flowering time of the crop or sometimes in pre-flowering stage. The adults have brown, plume like wings. One generation can be completed in about 4 weeks.

PIGEON PEA/ RED GRAM INSECT PASTES (PHOTO PLATE I AND II):

In the study area in Barshitakli Taluka, Akola district many fields of crop pigeon pea were visited. In the above photo plates, I & II, the insect pests were recorded and collected.

1. **Gram Pod borer:** *Helicoverpa armigera* Hubner (Lepidoptera: Noctuidae): At the survey all the developmental stages of pod borer were collected. The damage through this insect pest is only by the larval stage. In photo plate I & II the eggs, larva, pupa and adult were collected in December month,when the infestation of this pest was maximum.

2. **Pod Fly:** *Melanagromyza obtusa* Malloch (Diptera: Agromyzidae):

The study work was done by collecting spotted larva, pupa and adult. The infestation of Pod Fly in the study area was recorded. Due to the climatic changes the infestation of this pest was found to be 20%.

DISCUSSION

Pigeon-pea is one of the major legume crops grown in India but has been relatively neglected in terms of research and development. The peas are a rich source of protein and the crop is nitrogen-fixing and drought tolerant. It is an ideal crop for the Tropical areas of India and there is great potential for it to be more widely grown. The large number of pests and diseases which attack pigeon pea in India (and elsewhere) is perhaps the main constraint to increased production. The most important pest worldwide is the pod borer, *Helicoverpa armigera*, but the flowers and pods are attractive to a wide range of insect pests. Kooner and Cheema (2006) in a humid region of Kenya. In addition to unquantified damaged flowers and pods destroyed by insect pests, this clearly implies that field insects are a big threat to crop production and could enhance yield if adequately controlled. Marin et al. (2004) reported that water stress appears to be the critical limiting factor for germination and seedling establishment in pigeon pea. The drop in rainfall and temperature in November and December were essential for pigeon pea since they coincided with pod maturation and drying this same thing was recorded in the study area, as the crops in the area are monsoon dependent. In addition to unquantified damaged flowers and pods destroyed by insect pests, this clearly implies that field insects are a big threat to crop production and could enhance yield if adequately controlled.

CONCLUSIONS

Pigeon pea was found to be associated with termites (*O. badius*), crickets (G. lucens), and variegated grasshoppers (*Z. variegatus)* at the seedling stages, but the insects were considered minor pests. Field insect pest infestation on pigeon pea was more critical at the reproductive stage where damage was mainly caused by pod-sucking bugs (*Clavigralla* spp.), pod borers (*Helicoverpa*), pod flies (*Melanogromyza* spp.), and blister beetles (*Mylabris* spp.). The infestation and damage by Gram Pod borer (*Helicoverpa*)in this study area recorded as approximately 40% crop damage, followed by30% damage by Spotted pod borers, about 20% by Pod Fly and less damage about 10% by Blister Beetles. The IPM programmes run by Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India should be implemented for management and control of pests.

Conflicts of interest: The authors stated that no conflicts of interest.

REFERENCES

Agrawal NS and Pandey ND (1961) Bionomics of Melanagro myzaphaseoli Coq. (Dip: Agromyzidae). *Indian Journal of Entomology*, **23**(4): 293–298.

Carney JA and Rosomoff RN (2009) In the Shadow of Slavery. Africa's Botanical legacy in the Atlantic World. Berkeley: University of California Press.

ICRISAT Newsletter. (2003) Crop improvement and management. International Crops Research for the Semi-Arid Tropics (ICRISAT) Newsletter October 2003. INFLIBNET

Kooner BS and Cheema HK (2006) Evaluation of pigeon pea genotypes for resistance to pod borer complex. *Indian Journal of Crop Science,***1**:194 – 196.

Minja EM, Shanower TG, Songa JM, Ong'aro JM, Kawonga WT, Mviha PJ, *et al*.,(1999). Studies of pigeon pea insect pests and their management in Kenya, Malawi, Tanzania and Uganda. *African Crop Science Journal,***7**:59-69. Night.

P.D.K.V. Library, Akola , Maharashtra.

Ramamurthy VV, Singh VS, Gupta GP & Paul A. V. N. (Eds.). (2005). Gleanings in Entomology. pp.317. Division of Entomology, Indian Agricultural Research Institute, New Delhi 110012.

2023 | Published by IJLSCI