

## Pest Complex of Redgram and Their Management

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### SUMMARY

The pigeon pea (*Cajanus cajan*), which produces high-quality vegetable protein, animal feed, and firewood, is a significant crop in semi-arid tropical and subtropical farming systems. Insect pests that harm blossoms, pods, and seeds are the principal biotic factor reducing pigeon pea production. In this study, the biology and ecology of the most significant insect pests of pigeon pea are described. Recent studies on the complex interactions between the main pigeon pea pests and their natural enemies are also discussed. These interactions have an impact on the prospective management methods and the pest status of particular species. Prior to recently, the majority of pigeon pea pest management research focused on breeding resistant cultivars and utilising herbicides to eradicate them. Future studies must concentrate on pest management techniques that are compatible with the needs and constraints of the environment.

### INTRODUCTION

A significant grain legume of the Indian subcontinent, Southeast Asia, and East Africa is the pigeon pea (*Cajanus cajan* (L.) Millsp.). Aside from being high in critical amino acids like lysine, threonine, cystine, and arginine, arhar seeds are also high in iron and iodine. Six states— Maharashtra, MP, Karnataka, UP, Gujarat, and Jharkhand—produce more than 80% of all tur. Among the various constraints limiting red gram, tur, or arhar. Economically it is the second most important pulse crop after chickpea in India accounting for about 20 percent of total pulse production. India annually produces about 2.0-2.5 million tones, which remained stagnant in the past 10 years. The second-most significant pulse crop in the nation, after gram, is arhar. It is mostly consumed as "dal," a split Pigeon pea production, insect pests are the major ones. The important insect's pests' causes' economic loss by attacking the crop at vegetative and reproductive stage are Pod borer (*Helicoverpa armigera*), Legume pod borer (*Maruca testulalis*), Pod fly (*Melanagromyza* spp.).

### Production Scenario

	Redgram			
	World		India	
Area	India	49.8 lakh ha	Maharashtra	12.98 lakh ha
	Malawai	8.1 lakh ha	Karnataka	11.02 lakh ha
	Myanmar	6.5 lakh ha	Uttar pradesh	3.47 lakh ha
Production	India	43.2 lakh t/ha	Maharashtra	1035 t/ha
	Malawai	4.51 lakh t/ha	Uttar pradesh	998 t/ha
	Myanmar	3.07 lakh t/ha	Karnataka	759 t/ha
Productivity			Maharashtra	1343 t/ha
			Karnataka	1036 t/ha
			Uttar pradesh	342 t/ha

### Source-D. of Eco And Sta. (2020-2021) \* in FAOSTAT\*W

Major redgram producing countries in the world are presented in the above table India ranks first in redgram production globally with 43.4 lakh tonnes cultivated under 49.8lakh hectares with 871 kg/ hectares . In India redgram takes second place in total pulse production after bengal gram . State wise redgram shows that , Maharashtra and Karnataka are the major producing states in area of 12.98 and 11.02 lakh hectare, respectively. Uttar Pradesh , Maharashtra and Telangana were found superior in terms of productivity of redgram.

**Pests of Redgram:**

Redgram is susceptible to various pests, which can cause significant damage to the crop and reduce yields. Some of the common pests that affect redgram include-

1. Gram pod borer: *Helicoverpa armigera* (Noctuidae: Lepidoptera)
2. Plume moth: *Exelastis atomosa* (Pterophoridae: Lepidoptera)
3. Spotted pod borer: *Maruca testulalis* (Pyraustidae: Lepidoptera)
4. Spiny pod borer: *Etiella zinckenella* (Phycitidae: Lepidoptera)
5. Pod fly: *Melanagromyza obtuse* (Agromyzidae: Diptera)
6. Green stink bug : *Nezara viridula* (pentatomidae:Hemiptera)
7. Eriyophid mite: *Aceria cajani* (Acarina : Eriophyidae)

**1. Gram pod borer *Helicoverpa armigera* ( Noctuidae Lepidoptera):** is one of the major polyphagous pests distributed throughout the country. The eggs hatch in less than 3 days at optimum temperature of 27-28 degree C. On hatching, the larvae feed for a short time on the tender leaflets by scrapping green tissue and then shift to flower buds and tender shoots.. Slowly it enters and feeds on the seeds inside the pods. The half portion of larvae remains inside pod while feeding on the developing seeds. They can cut hole on one to another locule and feed 20-25 pods in its lifetime.

**2. Plume moth: *Exelastis atomosa* (Pterophoridae: Lepidoptera):** The pigeonpea plume includes three species viz. *Marasmarcha liophanes* (Meyrick), *Exelastis atomosa* (Walshingham) and *Sphenarches anisodactylus* (Walker). All these insects are small and delicate and widely distributed in India. Apart from redgram, it is also recorded in horse gram and lab lab. The average pod and grain damage was 8.95 and 4.02 per cent respectively. The tiny larva bores into unopened buds, flowers and tender parts. 5-20% pods are damaged.

**3. Spotted pod borer: *Maruca testulalis* (Pyraustidae: Lepidoptera):** It is a sporadic pest of pigeonpea and commonly damages the short duration crop. Varieties with determinate growth and spreading types are more susceptible. This is a serious pest in early maturing varieties. The larvae cause extensive damage to floral buds and flowers. The characteristic symptom is webbing together of flowers, pods, and leaves with frass often on pods and shoot tips. The larva feeds on seeds. The assessment of damage in pigeon pea pods has shown that 5-20% pods may get affected depending upon the locality, month and variety.

**4. Spiny pod borer *Etiella zinckenella* (Phycitidae: Lepidoptera):** It is a serious pest of lentils and green peas in North India. Host range: Redgram, horsegram, cowpea and greengram, lentil and green peas. The larva feeds inside green pods and then on pod surface, webbing together 2-4 pods.

**6. Pod fly *Melanagromyza obtuse* (Agromyzidae: Diptera):** It is widely distributed in India and causes major economic losses in northern parts 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. There are no obvious external symptoms of podfly attack till the fully grown larvae chew holes in the pod walls leaving a "window" through which the flies emerge after pupation in the pod. Maggots cause damage by boring into the soft seeds and feed on grains. The damage seeds are unfit for consumption as well as for germination. The extent of damage may be even up to 60-70% during severe infestation.

**7. Green stink bug *Nezara viridula* (pentatomidae:Hemiptera):** The green stink bug has piercing-sucking mouthparts consisting of a long beak-like structure called the rostrum. All plant parts are affected, however, growing shoots and developing pods are preferred. Attached shoots usually wither, or in extreme cases, may die. The damage from the punctures are dark brownish or black spots. Pod growth is retarded, leading to withering and dropping from the plant.

**Integrated Pest Management in Pigeon pea****A. Cultural methods**

1. Summer deep ploughing is effective in destroying the eggs, larvae and pupae of various pests
2. Pest population of pulses can also be suppressed to some extent by resorting clean cultivation.
3. Early sowing crop escapes the first two broods of stem fly.

4. Increase the seed rate to compensate the damage due to stem fly.
5. Soil raking through weeding may reduce the soil grubs.
6. Apply 50 kg potash/ha to the crop raised with closer spacing (20x10 cm) to reduce the stem fly and pod borer incidence
7. Remove the weeds in and around the field.
8. Collect and destroy egg masses and pupae.
9. Dry the seeds adequately to reduce the moisture level to 8% for the grain purpose.
10. Resistant strains of gram like G-130 & C 214 are less susceptible to *H. armigera*.

### B. Mechanical methods

1. Set up light trap to monitor, attract and kill the pod borer moths.
2. Set up pheromone traps @ 12 nos. /ha to reduce gram pod borer incidence.

### C. Bio control methods

1. Release of egg parasite *Trichogramma* spp. And egg larval parasite *Chelonus blackburnii* for the control of *H. armigera*.
2. Conserve natural enemies like *Microbracon* sp., *Cotesia* sp., *Bracon hebetor* and *Apanteles* sp., parasitizes the caterpillar pests.
3. Apply NPV @ 500 LE/ha to control *H. armigera*

### Chemical control

- Azadirachtin 0.03 % WSP 2500-5000 g/ha
- *Bacillus thuringiensis* serovar kurstaki (3a,3b,3c) 5% WP1000-1250 g/ha
- Dimethoate 30% EC 1237 ml/ha
- Emamectin benzoate 5% SG 220 g/ha
- Indoxacarb 15.8% SC 333 ml/ha
- Chlorantraniliprole 18.5 SC 150ml/ha
- Spinosad 45%SC 125-162 ml/ha
- NSKE 5% twice followed by triazophos 0.05%
- Neem oil 2%
- Phosalone 0.07%

(Spray fluid 625 ml/ha) Note : Insecticide / Ha NPV spray

### CONCLUSION

In conclusion, Redgram pests are a major concern for Redgram growers, but they can be effectively managed through integrated pest management strategies. Crop rotation, cultural practices, biological control, and chemical control can all be used to reduce pest populations and minimize damage to Redgram crops. However, the implementation of these strategies requires careful monitoring of pest populations and a thorough understanding of the biology and behavior of the pests involved. With proper management, wheat growers can protect their crops and ensure a stable food supply for the future.

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