

Lecture No 5

PESTS OF PULSES - BLACK GRAM, GREEN GRAM, LABLAB AND COWPEA

One of the major constraints for low yield of pulse crop is the extensive damage caused by insect pests. About 250 insects have been recorded feeding on pulse crops. Of these, about one dozen insects including pod borers, stem borers, leaf miners, foliage caterpillars, cutworms, jassids, aphids and whiteflies are most important. Some polyphagous insects also feed on these crops and cause considerable damage.

Major pests				
1.	Bean aphid	<i>Aphis craccivora</i>	Aphididae	Hemiptera
2.	Thrips	<i>Ayyaria chaetophora</i> , <i>Caliothrips indicus</i> , <i>Megalurothrips distalis</i>	Thripidae	Thysanoptera
3.	Whitefly	<i>Bemisia tabaci</i>	Aleyrodidae	Hemiptera
4.	Green leafhopper	<i>Empoasca kerri</i> , <i>E. binotata</i> , <i>E. flavescens</i>	Cicadellidae	Hemiptera
5.	Pod bug	<i>Riptortus pedestris</i> <i>Clavigralla horrens</i> <i>Clavigralla gibbosa</i> <i>Anoplocnemis phasiana</i>	Coreidae	Hemiptera
6.	Lablab bugs / stink bug	<i>Coptosoma cribraria</i>	Coremelanidae	Hemiptera
7.	Leaf webber	<i>Eucosma critica</i>	Eucosmidae	Lepidoptera
8.	Lab-lab leaf miner	<i>Cyphosticha coerulea</i>	Gracillariidae	Lepidoptera
9.	Termites	<i>Odontotermes obesus</i>	Termitidae	Isoptera
Minor pests				
10.	Redgram scale	<i>Ceroplastodes cajani</i>	Coccidae	Hemiptera
11.	Redgram leaf roller	<i>Caloptilia soyella</i>	Gracillariidae	Lepidoptera
12.	Leaf folder	<i>Anticarsia irrotata</i>	Noctuidae	Lepidoptera
13.	Leaf eating caterpillar	<i>Azazia rubricans</i>	Noctuidae	Lepidoptera
14.	Sphingid caterpillar	<i>Acherontia styx</i>	Sphingidae	Lepidoptera
15.	Leaf cutter bee	<i>Megachile anthracena</i>	Megachilidae	Hymenoptera

Major pests

1. Bean aphid: *Aphis craccivora* (Aphididae: Hemiptera)



Distribution and status

Cosmopolitan, India, Africa, Argentina, China, U.S.A., Europe, Australia

Host range

Groundnut, red gram, peas, beans, safflower, lablab, niger

Damage symptoms

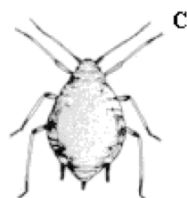
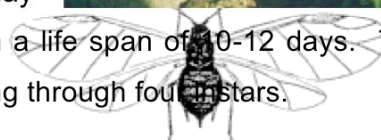
Both nymphs and adults cause the damage by sucking the plant sap. Infested pods become deformed, withered and malformed. Severe infestation may result in complete drying of affected pods. They also act as vector of pea virus.

Bionomics

It is a greenish black coloured aphid. The total life cycle occupies an average of 3-8 days. It reproduces parthenogenetically and viviparously. The female may



produce 8-30 young ones in a life span of 10-12 days. The nymphs transform into adult in 5-8 days after passing through four instars.



Aphids. A-B, Bean aphids. C, Cowpea aphid.

Management

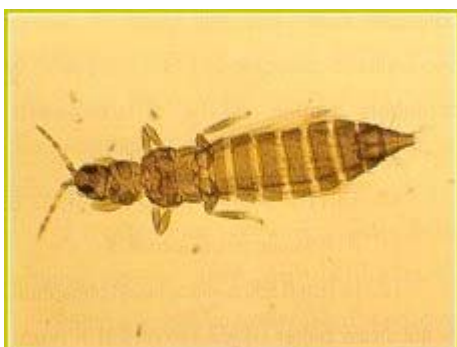
1. Grow resistant cowpea cultivars like P 1473, P 1476, MS 9369, Bendel Lobia 1
2. Use entomopathogenic fungus *Fusarium pallidoroseum* or *Beauveria bassiana* to cause epizootics in aphids in the cowpea field.
3. Spraying of infested crop with 500 methyl demeton 25 EC or dimethoate or 125 ml imidacloprid in 500 L water per ha effectively control aphids. As the strong point of this pest lies in its very quick multiplication, the insecticidal treatment has to be repeated as soon as aphid population is found to have built up again.

2. Thrips: *Ayyaria chaetophora*, *Caliothrips indicus*, *Megalurothrips distalis* (Thripidae: Thysanoptera)

Damage symptoms

The leaves are mottled with characteristic silvering due to the attack of insect especially under dry spell on lab lab, black gram, green gram, cow pea. Later leaves dry and shed. Damaged plants do not develop pods. It also acts as a vector of many diseases.

Bionomics Tiny yellow fringe winged adults.



Caliothrips indicus

Management

Spray Malathion 50 EC 1.0 L or Carbaryl 50 WP 1.0 kg in 700 L water.

3. Whitefly: *Bemisia tabaci* (Aleyrodidae: Hemiptera)

Distribution and status: Cosmopolitan. It is a vector of yellow mosaic disease..

Host range : Black gram, green gram, red gram, lobia, cotton, tobacco and cassava

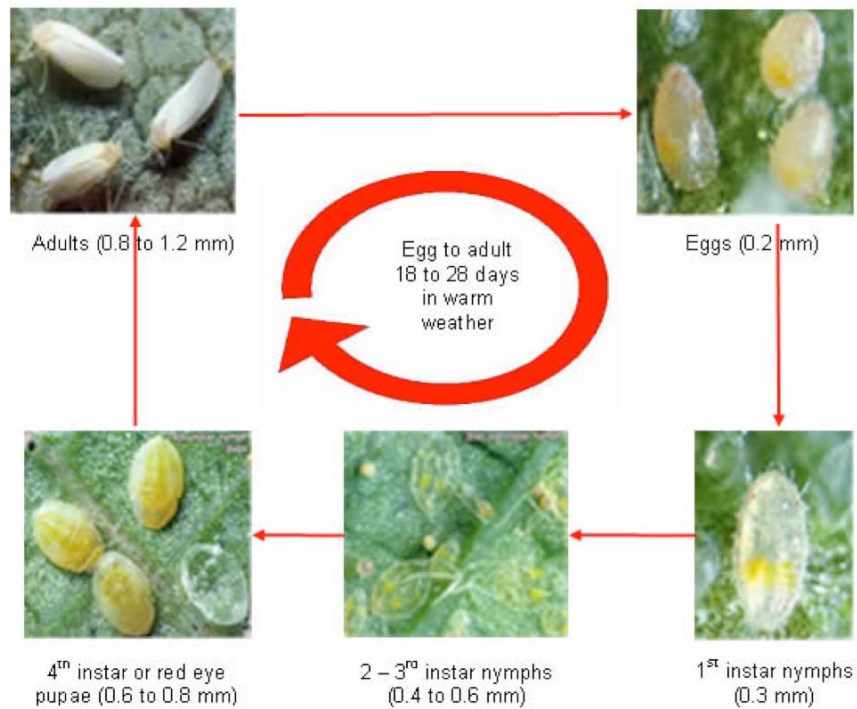


Damage symptoms

The damage is caused by both nymphs and adults, which are found in large numbers. They suck plant sap and lower its vitality. Severe infestation results in premature defoliation, development of sooty mould or honey dew and shedding of flowers and pods.

Bionomics

Adult is a minute insect with yellow coloured body with white waxy bloom. Nymph is greenish yellow, oval in outline along with puparia on the under surface of leaves.



Management

- Grow black gram resistant varieties like ML 337, ML 5, MH 85-61, ML 325
- Spray the infested crop with malathion 50 EC 1.0 L or phosalone 50 EC 750 ml or dimethoate 30 EC 750 ml in 700 - 1000 L water per hectare.

4. Green leafhopper: *Empoasca kerri*, *E. binotata*, *E.flavescens* (Cicadellidae: Hemiptera)

Host plants

Greengram, blackgram, cowpea

Damage symptoms

The nymphs and adults feed on tender leaves and other parts of the plant by sucking the plant sap. In cases of severe attack, leaves become brittle and dry. Characteristics hopper burn i.e cupping of leaves appear. The plant may lose its vigour resulting in poor growth.

Bionomics

Elongate, active wedge shaped green insects found on the under surface of leaves. The female inserts its eggs inside the veins of leaves. The incubation period lasts for 4-8 days. There are five nymphal instars occupying 7-10 days.

Management

Spray the infested crop with methyl-o- demeton 750 ml in 700 - 1000 L water per hectare



5. Pod bug: *Riptortus pedestris*, *Clavigralla gibbosa*, *Clavigralla horrens*, *Anoplocnemis phasiana* (Coreidae: Hemiptera)



Riptortus pedestris



Anoplocnemis phasiana

Host range: Redgram and other pulses.

Damage symptoms

The nymphs and adults suck the juice of unripe seeds from the green pods. In case of severe infestation the tender parts get shrivelled and later dries up. The bugs are seen clustered around on the pods.



Bionomics

Riptortus pedestris - The female bug lays an average of 115 eggs singly on pods at their base. The egg period is 3-4 days. The nymphs are brownish black and hemispherical which resembles brown ant. The nymphal stage undergoes 5 instars in 16 days. *Clavigralla gibbosa* - It is bigger than *C. horrens* in size. It lays eggs in groups of 3-15 on pods or leaves. The fecundity is 60-400 eggs per female. The incubation period is 4 days. There are 5 nymphal instars. The nymphal duration varies from 7-31 days. The adult bug lives upto 150 days. *C. horrens* - It is brown, flat, narrow - bodied bug with conspicuous lateral spines on the prothorax and enlarged hind femur.

Management

Spraying the infested crop with endosulfan 35 EC 2.0 L in 700 - 1000 L water per hectare

6. Lablab bugs / stink bug: *Coptosoma cribraria* (Coremelanidae: Hemiptera)

Host range: Bean, lentil etc.

Damage symptoms

Both nymphs and adults cluster on the tender shoots and suck the sap. Heavily infested vines dry and shed away. Moderately infested plants remain weak and stunted in growth.

Bionomics

Oval shaped greenish bugs lay ivory white sculptured eggs in double rows in batches of 35-50 on the tender pods. Incubation period is about 7 days. Total life cycle is completed in about 49 days in South India.



Management

Spray the infested crop with endosulfan 35 EC 2.0 L in 700 L water per hectare.

7. Leaf webber: *Eucosma critica* (Eucosmidae: Lepidoptera)

Distribution and status: Widely distributed in India.

Host range: Red gram and other pulses

Damage symptoms

The damage is caused by the larvae, which bores into the tender shoots of folded leaves and feed from within. Since the terminal leaves get spun together growing tip is damaged. The growth of the main shoot is affected



Bionomics

The small and dark brown moth lays eggs singly or in rows on leaves, petioles (or) stems. The grooves or depressions are preferred for egg laying. Around 80-100 eggs are laid by one female. The incubation period lasts for 3-4 days. Larval period is about 14-21 days and pupal period 4-6 days. Pupation occurs within the folded buds, flowers or pods in a silken cocoon.

Management

Spray the infested crop with endosulfan 35 EC 2.0 L in 700 L water per

hectare.

8. Lab-lab leaf miner: *Cyphosticha coerulea* (Gracillariidae: Lepidoptera)

Distribution and status: Throughout India

Host plants: Blackgram, greengram, cowpea.

Damage symptoms

Tiny larvae bore into the epidermis of the leaf and forms blisters through mining.

Management

Spray the infested crop with endosulfan 35 EC 2.0 L or methyl demeton 750 ml in 700 litre water per ha.

9. Termites: *Odontotermes obesus* (Termitidae: Isoptera)

Host plants – wheat, barley, sugarcane, pea, sorghum, pearl millet, maize, groundnut.

Damage symptoms

Termite damage starts soon after sowing and continues till the growing stage. The leaves of damaged plants droop down which later wither and dry. Such plants are easily uprooted.



Bionomics

7-10 days after aerial flight the female lays the first batch of eggs numbering 100-130. These eggs hatch in 40-42 days. The female termite then swells to become queen and lays upto 30,000 eggs per day. The members of this group are social insects and are composed of workers, soldiers, king and queen.

Management

1. Where the pest is of regular occurrence the soil should be mixed with endosulfan 4D or quinolphos 1.5 D or chlorpyrifos 5 D BHC or 10 D @ 35 kg/ha at the time of sowing.
2. If the incidence of pest is noticed in standing crop dilute 2.5 L of endosulphan 35 EC or chlorpyrifos 20EC in 5 L of water and mix it with 50 kg of soil and broadcast even in 1 ha followed by light irrigation.

Minor pests

10. Redgram scale: *Ceroplastodes cajani* (Coccidae: Hemiptera)

Tender branches are covered with scales attended by ants. Adults are round waxy scales.

11. Redgram leaf roller: *Caloptilia soyella* (Gracillaridae: Lepidoptera)

Leaves rolled up apically become white and dries up. Adult moth is very small. Larva is creamy yellow or green with sparse hairs on the body.

12. Leaf folder: *Anticarsia irrotata* (Noctuidae: Lepidoptera)

Larva folds the leaves together. Adult is yellowish brown moth with oblique black lines on the wings. Larva is green coloured.

13. Leaf eating caterpillar: *Azazia rubricans* (Noctuidae: Lepidoptera)

The larva causes severe defoliation. Larva is slender green with ashy white band between each segment. A few narrow lines along the back and bright yellowish brown stripes along the sides may or may not be present. It has looping movement in spite of the presence of all prolegs. Adult moth resembles a dry leaf.

14. SpHINGID caterpillar: *Acherontia styx* (Sphingidae: Lepidoptera)

The larva feeds on leaves and cause severe defoliation. Adult is large, wings grey with waxy markings. Abdomen crimson coloured with black stripes. Larva is a stout green caterpillar with yellowish oblique stripes with curved anal horn.

15. Leaf cutter bee: *Megachile anthracena* (Megachilidae: Hymenoptera)

Red gram leaves showing semi circular or circular cut out. Adults cut small bits of leaves for making larval chambers. Medium sized brown coloured bees.

Questions - pulses

1.	Leaves mottled with characteristic silvering in pulses is due to the attack of	
	a. Thrips	b. Aphids
	c. Leaf hopper	d. Whitefly
2.	Infested pod becomes malformed and withered due to the attack of _____	
	a. Aphids	b. Thrips
	c. Whitefly	d. Pod bug
3.	Premature defoliation, development of sooty mould, shedding of flowers and pods in pulses is due to _____ Whitefly	
4.	<i>Bemisia tabaci</i> belongs to which order	
	a. Diptera	b. Coleoptera

	c. Hemiptera	d. Trichoptera
5.	----- that sucks juice from unripe pods of pulses - Pod bug	
6.	----- lay ivory white sculptured eggs in two rows of 35-50 batches on the tender pods. Stink bug	
7.	Formation of blisters through mining is the symptom of _____ in pulses Leaf miner	
8.	Termite affected plant will come out easily when pulled –Say true or false?	
9.	The queen termite may lay up to----- eggs per day - 30,000	
10.	Adult moth of which insect resembles a dry leaf. - Leaf eating caterpillar	
11.	_____ cut semicircular bits of redgram leaves for making larval chambers. Leaf cutter bee	
12.	----- is the scientific name of leaf cutter bee. - Megachile anthracena	
13.	_____ is the scientific name of pulse pod bug	
	a. <i>Riptortus pedestris</i>	b. <i>Clavigralla horrens</i>
	c. <i>Anoplocnemis phasiana</i>	d. all the above
14.	Alternate host of <i>Aphis craccivora</i> _____	
	a. safflower	b. groundnut
	c. redgram	d. all the above
15.	Alternate host of <i>Bemisia tabaci</i>	
	a. cotton	b. tobacco
	c. Moong	d. all the above
16.	_____is largest in size among the coreid pod bugs in pulses Anoplecnemis phasiana	
17.	_____ can cause epizootics in aphid population in pulses <i>Fusarium pallidoroseum</i> or <i>Beauveria bassiana</i>	
18.	Formation of blisters by minng into the leaf epidermis in lab-lab is due to _____ Leaf miner, Cyphostica coerulea	