

## Integrated Pest Management of Chickpea

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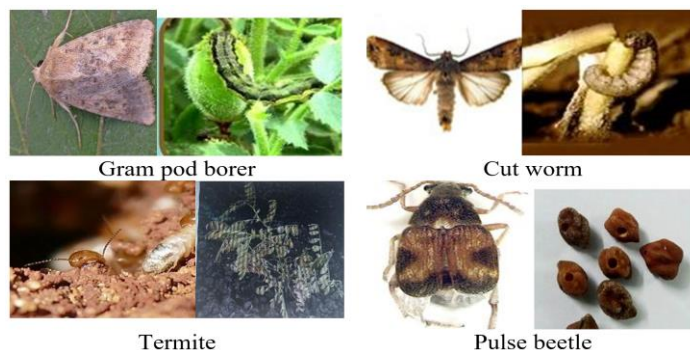
India is the leading producer of chickpeas, accounting for 68% of the global output and is also one of the largest consumers of this legume. The crop is grown in an area 10.91 million ha with annual production 13.75 million tonnes (Anonymous 2024). A number of factors contribute to its low productivity, such as improper selection of crop varieties, poor seed, low plant population, excessive fertilizer use, weed growth and different pests. Among these insect-pests play significant role for lower production and poor grain quality. There is need to follow management for proper and timely control measures of major pests. The detailed information is given below to apply different control measures for management of major insect-pests of the crop.

**Gram Pod Borer (*Helicoverpa armigera*):** It is a polyphagous pest and feeds on all kinds of host plants. It also has cannibalism habit. A moth is stout with dark yellow olive-grey or brown wings crossed by a dark band near the outer margin and a dark spot near coastal margin of forewings and hind wings pale with a dark apical border. The female lays creamy white eggs in groups on tender leaves after hatching the larvae feed on leaves, flowers, flower buds, pods and developing grains. Fully grown larvae feed on the pods by making small circular holes. Half of the larvae body always remains outside the pods. A single larva can damage up to 50-60 pods during its larval period. (Atwal and Dhaliwal 2015)

**Management (Management (Anonymous 2024a and Randhawa et al 2022))**

- Select short duration chickpea varieties for sowing and follow intercropping coriander/linseed with chickpea provides nectar sources for adult parasitoids and improves the natural control.
- The pheromone traps @ 12 per hectare are recommended 30 days of after sowing.
- Erect bird perches @ 10-15/ha at flowering stage and removes before pod maturity.
- Monitor the crop at pod initiation stage to record larval population on per meter row

length basis from a minimum of 10 randomly selected spots per acre. If a total of 16 or more larvae are observed from 10 spots (100 plants), then spray the crop with 800 g *Bacillus thuringiensis* var. *kurstaki* 0.5 WP or 200 ml Helicop 2% AS (HaNPV) or 50 ml Coragen 18.5 SC (chlorantraniliprole) or 80 g Proclaim 5 SG (emamectin benzoate) or 160 ml Rimon (novaluron) in 80-100 litres of water per acre and repeat after two weeks, if necessary. Prefer to use biopesticides as first spray for younger larvae and repeat the spray after a week if necessary.



**Fig. 1. Major insect-pests of chickpea crop**

**Precaution:** Before consuming leaves and green grains, ensure a waiting period of 3 days after the spray of Coragen 18.5 SC (chlorantraniliprole). For pesticidal application always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval.

**Cutworms (*Agrotis ipison*):** The adult moths are brownish with distinct wing markings depending on the species, as seen in the illustrations of the common, brown and black cut worms. The female lays eggs in batches on the ground, or on the plant close to ground level. The larvae are yellowish when hatching with a dark head capsule and later turn into earth-brown to dingy grey colour. The larvae hide under litter or soil during the day at the base of plants, coming out in the dark to feed on plants. The caterpillars cut the tender plants at the base, and branches or stems of growing plants. The caterpillars drag the cut parts into soil for feeding. (Anonymous 2024b).

## Management

- Follow crop rotation and do deep ploughing during summer months.
- Collect and destroy the whole crop ruminates from field after harvesting.
- Use well decomposed organic manure and early sowing in the last week of October.
- Intercropping with wheat or Linseed or Mustard reduces infestation.
- Do not grow potato, tomato or okra crops in nearby chickpea crop and grow marigold on bunds
- The adult insects can be controlled by use of light traps

**Termite (*Odontotermes obesuss*):** It is social insect; live in termitaria, in distinct castes, workers, soldiers, kings. The queen the lays eggs in the soil. The larvae attack the crop especially at seedling stage and also near maturity. The pest can generally be observed feeding on roots or near the root zone of the damaged plants. Due to the bore the plants soon dries. Attack may continue to the standing crop also especially during the period of drought. (Anonymous 2024b)

## Management

- Frequent intercultural operations and irrigation before sowing.
- Field sanitation, timely disposal of previous crop residues and plant debris.
- Use only well rotten/composed farm yard manure.
- Two-three deep hoeing could also help to control this pest.
- Destroy the termite bunds in and around the field and kill the queen and complimentary form.
- Seed treatment with chlorpyriphos @ 4ml/kg of seed.

**Pulse beetle (*Callosobruchus chinensis*):** It is polyphagous pest and feeds on all pulse's grains. The brownish grey beetle with characteristics elevated ivory like spots near the middle of the dorsal side. It is small, short, and active with long conspicuous serrate antenna. Elytra do not cover the abdomen completely, which is called as pygidium. Both grubs and adults cause damage to the grains. They bite holes in the grains to enter inside and feed on kernel, damaging several grains in the process. As the beetles can actively fly, the infestation can start in the fields,

where the female beetles deposit their eggs on the pods.

## Management (Anonymous 2024a)

### Preventive measures

- Dry the grains properly before storage.
- Plug all cracks, crevices and holes in the godowns thoroughly.
- Store new grains in the clean godowns or receptacles/new gunny bags.
- Disinfect empty godowns or receptacles by spraying 0.05% Malathion emulsion (100 ml Malathion 50 EC in 10 litres of water) on the floor, walls and ceiling or fumigate the godowns using 25 tablets of aluminium phosphide/100 m<sup>3</sup> space before storing the grains. Exposure for 7 days.
- Cover the pulses stored in bulk with 7 cm layer of sand or sawdust or dung ash.

### Curative measures

Phostoxin or Delicia or Celphos (aluminium phosphide) one tablet of 3 g/tonne or 25 tablets/100 cum space. Exposure for seven days.

### Caution/limitation

- Before storing, the metal bins should be cleaned and placed in the sun for 2-3 days.
- Grains stored in metal bin also get infested if not treated with any insecticide. Control this infestation by giving fumigation

### References

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