- To control leaf folder, spray neem based pesticides like Neegark/Nimbesidin or use Monocrotrophos or Phosphamidon (mix 500 ml in water sufficient for spray in one hectare).
- In case of attack of false smut, use Dithane-M-45 (0.25%) or Copper oxychloride (2 g/ lit)

CHICKPEA

Pulses are suitable crops for crop diversification and are a major source of protein. Gram pod borer, pod fly, sterility mosaic virus, phytophthora blight are biotic stresses in chickpea pea and lower the yield significantly. Fusarium wilt, yellow mosaic virus and pod borers also cause around 15-20% losses in chickpea and other pulses.

Key Pests and Disease

Fusarium wilt (Fusarium oxysporum f sp. ciceris), dry root rot (Rhizoctonia solani), botrytis grey mold (Botrytis cinerea), cutworm (Agrotis ipsilon) and gram caterpillar (Helicoverpa armigera).

IPM Module

- Use tolerant variety like RSG-44.
- Treat seed with Rhizobium culture @ 600 g/ha and also seed treatment with Trichoderma harzianum/ Trichoderma viride @ 4 g plus Vitavax @ 2 g/kg seed for the control of collar rot.
- Adopt seed rate of 80 kg/ ha and increase plant to plant distance of 30 cm instead of 22.5 cm usually recommended.
- Apply pre-emergence spray of Alachlor @ 2 kg/ha for the management of weeds.
- Monitor presence of Helicoverpa through pheromone trap @ 3-4/ha starting from 30 Days After Sowing.
- Install T-shaped perches for birds @ 25-30 /ha, 20-30 cm above crop height for natural control of insects.
- Spray HaNPV @ 250 ml/ha (2 x 10^8 POB/ml) + 0.01% fabric whitener + 0.5% gur, when the small larvae of American ballworm are seen. After next seven days, spray Neem Seed Kernel Extract @ 5% or 1500 ppm as Azadirachtin solvent base.
Repeat the spray of HaNPV @ 250 ml/ha (2 x 10^9 POB/ml) + 0.01% fabric whitener + 0.5% gur after a gap of one week.

If there are 1-2 Helicoverpa in a row of one meter, spray Endosulfan 35 EC @ 750-800 ml/ha.

Near to grain ripening, ensure removal of bird perches.

**PIGEON PEA**

**Key Pests and Diseases**

Tur pod fly (Melanagromyza obtusa), pod borer (Helicoverpa armigera), plume moth (Exelastis atamosa), Euchrysops cnejus, legume pod borer (Maruca vitrata), green stink bug (Nezara viridula), pod sucking bug (Clavigralla gibbosa), phytophthora blight, etc.

**IPM Module**

- Undertake deep summer ploughing to destroy immature stages and pathogen propagules.
- To control pigeon pea wilt, prior to sowing, undertake soil application of Trichoderma harzianum @ 10 g in 1 kg of FYM.
- Grow high yielding varieties with pest/disease tolerance like Asha (ICPL-87119) -wilt and pigeon pea sterility mosaic tolerant for Andhra Pradesh and Karnataka, and Bahar for Varanasi area of UP.
- Sow crop on ridges for suppression of Phytophthora disease at Varanasi (Uttar Pradesh).
- During September, install in the fields pheromone traps @ 10/ha.
- Erect bird perches @ 25/ha for facilitating predation of Helicoverpa larvae.
- Undertake one spray of neem oil (2%).
- Apply Neem Seed Kernel Extract (5%) each in September and October.
- When small larvae are noticed, spray HaNPV @ 500 ml/ha (2 x 10^9 POB/ml) in September and October.