### American Cotton Bollworm (kai thulaippan *Helicoverpa armigera*)

**Prevention**
- Deep summer ploughing
- Resistant variety (AKT)
- Early sowing
- Remove all the collateral and alternate hosts
- 1 kg of fenugreek powder in 1 litre of water soaked overnight. The next morning, take out the filterate and add 40 litres of water, then spray.
- Synchronized sowing with short duration varieties.
- Avoid continuous cropping and rattooning.
- Grow the less-preferred crops like green gram, black gram, soybean, castor, sorghum, etc along the border.
- Remove and destroy crop residues immediately after harvest.
- Optimal use and split application of N fertilizers.
- Avoiding extended crop growth by continuous irrigation.
- Sow trap crop of marigold plants

**Monitoring**
- Pheromone traps 4 to 8 per acre.
- Light traps 2 per acre.
- 1 larval/ plant or 5% damage to fruiting bodies.

**Direct Control**
- Bird perches 8 to 10 / acre.
- Release *Trichogramma chilonis* 2 to 3 cards per acre.
- Spray 5% neem seed kernel extract at flowering stage.
- Spray 3 times with HaNPV (*Helicoverpa armigera* Nuclear Polyhedrosis Virus) at 3 trillion POB / ha in evening hours at 7th and 12th week after sowing. Mixing 10% jaggery (adjuvant) is advisable.
- Hand pick & destroy various insect stages, affected plant parts and rosetted flowers.
- Spray entomopathogenic fungi such as *Metarhizium anisopliae*, *Beauveria bassiana*.
- Release of *Chrysoperla carnea* @ 1,00,000/ha at 6th, 13th and 14th week after sowing.

**Direct Control**

- **Use of personal protective equipment (PPEs)** such as gloves, mask, goggles and keeping antidotes are mandatory by the spray applicators
- Spinosad 48 SC 50 - 75 or
- Chloryphosphos 20 EC 500 – 700 during fruiting stages
- Neem products ( 1500 ppm ) 2.5 litre 40 – 60 day
- Quinalphos 20 A F 500 - 700 during fruiting stages or
- Profenofos 50 EC 1000 - 1250 during fruiting stages

**Restrictions**
- WHO class III (slightly hazardous)
- WHO class II (moderately hazardous)
- WHO class II (moderately hazardous)
- WHO class II (moderately hazardous)
- WHO class III (moderately hazardous)
- WHO class III (moderately hazardous)
- Botanical pesticide; unlikely to present acute hazard in normal use

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**India**

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**AUTHOR(S):** Mr. Vijay Thokre, Mr. Nilesh Patkar, Dr. Malarvanan, Mr Rajkumar

**EDITED BY:** Plantwise

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