### Prevention
- Winter-irrigate in mid-December to freeze and kill underground pupae.
- Deep plough 10–50 cm in summer (mid-June to July) or at the end of September.
- Use armyworm adhesive tape on trunks 50-100 cm above ground in February before temperature reaches 0-5°C to prevent larvae crawling up.

### Monitoring
- Newly hatched small larvae of *Apocheima* moth start to attack walnuts when buds sprout, before flowering.
- When larvae become 1 cm long they start feeding from leaf edges. Later appear about 1 cm diameter holes.
- When larvae are 3 to 4 cm long, they eat entire leaves and leaf rips remain.
- They feed all soft and fresh leaves and they will go to the next trees by spinning silk in mid-March.
- Timing of action is immediately when first-instar larva (0.1-1 cm) or second-instar larva (1-2 cm) take 80-85% in all of larvae found.
- Threshold of action is at 2-3 young larvae (2-3 instar, 1 to 2.5 cm) in each 50 cm branch of a tree.
- To attract adult males and assess adult fly use solution of weight ratio: brown sugar 1: vinegar 4: water 16 (Whole solution adds detergent 0.3-0.5g) in a bottle hang into branches or put onto ground.
- During ploughing, if 2 pupae/m2 are found beside trunk (when temperature reaches 5°C) in the soil depth in 10-15cm, consider action.
- You may consult agri-extension experts like Pr. Adil Sattar (contact 2015.03.18)

### Direct Control
- From end of February until end of March, use black light lamp traps to kill adult male moths because of its photo taxis (Females moths do not fly); 1trap/2 square hectare walnut orchard.
- Use insect virus AcINPV (content 6.45x10^7 ~ 7.5x10^7 PIB/ square hectare). Use 45~75ml/ square hectare against young larva (2-3 instar, 1 to 2.5 cm long) in March to end of April.
- When using a pesticide or botanical, always wear protective clothing and follow the instructions on the product label.

### Restrictions
- WHO toxicity class III (slightly hazardous); biological multistate pesticide that is a stomach poison for insects, thus must be eaten by the insect pre-harvest interval (PHI) 1 day, restricted re-entry interval (REI) 1 day, min retreatment 7 day, max 2 sprays per season.

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**Apocheima cinerarius**

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