granules of carbofuran and keep in plastic container.

- Cover fruits with polythene/ paper bags to minimize fruit fly infestation.
- Conserve predators such as Pennsylvania leather wing beetle (*Chauliognathus pensylvanicus*); larvae of which feed on pumpkin beetle larva.
- Conserve parasitoids such as *Celatoria setosa* (grub).
- Use well decomposed FYM @ 8-10 tones per acre or wormi-compost @ 5 tons per acre treated with *Trichoderma* sp. and *Pseudomonas* sp. @ 2 kg per acre as seed / nursery treatment and soil application for controlling soil borne disease such as root rot, wilting.
- Apply neem cake @ 100 kg per acre for reducing nematode population.

**Important activities for pest free Snake gourd production for export**

**Monitoring**

**Evaluation**

**Inspection**

**IPM**

**Action**

**Identification**

**CIB&RC recommended pesticide against cucurbit pests**

<table>
<thead>
<tr>
<th>Pest/Pesticide</th>
<th>Dosage</th>
<th>Dilution (Litre)</th>
<th>Waiting period</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>a.i. (gm)</td>
<td>Formulation (gm/litre)</td>
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<tr>
<td>Red Pumpkin beetle</td>
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<tr>
<td>Dichloves 76%EC</td>
<td>500</td>
<td>627</td>
<td>500-1000</td>
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<tr>
<td>Trichlorfon 5%GR</td>
<td>500</td>
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<td>-</td>
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<tr>
<td>Tricholfon 50%EC</td>
<td>500</td>
<td>627</td>
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</tbody>
</table>

**Biodiversity in natural enemies**: Parasitoids

**Biodiversity in natural enemies**: Predators

**For more details please contact**: Plant Protection Adviser

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Snake gourd (*Trichosanthes anguiana*) occupies an important place among vegetables in India. The plants are commonly grown in South India for their snake-like greyish white spongy fruits. Fruit fly, semi looper, leaf eating caterpillars, pumpkin beetles & leaf miner are major economic pest of this crop. Melon fruit fly (*Bactrocera cucurbitae*) and semi looper (*Diaphania indica*) are the pest of quarantine importance for EU countries.

**I. Identification Pest of Snake Gourd**

1. **Fruit fly (*Bactrocera cucurbitae*)**
   Egg laying puncture marks on fruit surface, oozing of fruits juice. Softening & water soaked lesion on fruits. At later stage fruit get rotten.
   A female lays eggs under the skin of host fruit. After hatching legless & head less rice shaped maggot feeds on fruit pulp. Full grown larvae come out from fruit for pupation in the soil. Adult with hyaline wings with costal band broad and prominent, anal stripes well developed and hind cross veins thickly margined with brown and grey spots at the apex & face with two black spot.

2. **Pumpkin beetles (*Aulacophora foveicollis*, *A. cincta*, *A. intermedia*)**
   Both grubs and beetles damage. Grubs remain below the soil surface feeding on roots, underground stems of creepers and on fruits lying in contact with the soil. The adults feed on those parts of the plant which are above the ground.

Freshly hatched grubs are dirty white; full grown are creamy yellow, 22 mm long. Adult: *A. foveicollis*: red, 6.8 mm long. *A. cincta*: grey with black having glistening yellow-red border and *A. intermedia*: blue in color.

3. **Snake gourd semi looper (*Diaphania indica*)**
   Larvae webs leaves and feed. Ovaries and young developing fruits are also eaten. Affected flowers bears no fruits and infested fruits become unfit for consumption. Adult has transparent white wings with broad and dark brown marginal patches and orange coloured anal tuft of hairs in the female. Larva elongate bright green with a pair of thin white longitudinal lines on the dorsal side. Pupation take s place in a cocoon in the flowers.

**II. Pest Surveillance**

Weekly monitoring through pest scouting with the help of monitoring device like pheromone traps, colored sticky traps should be practiced. For field scouting 300 fruits in 100 plants/ acre in a cross diagonal pattern through zig zag manner is required to be observed for counting of each and every type of insects. Pest monitoring for fruit flies using traps should be done regularly from fruiting stage onwards. If 95% plants are found free from insect pests then the field will be considered fit for export.

**III. Integrated Pest Management Strategies**

The following Good Agricultural Practices should be adopted for the management of various pests of snake gourd:

- Destruction of debris, crop residues, weeds & other alternate hosts
- Deep summer ploughing
- Frequent raking of soil beneath the crop to expose and kill the eggs, grubs & pupa.
- Hand collection and destruction of infested leaves and fruits.
- Adoption of proper crop rotation and avoid growing of cucurbit crops in sequence.
- Use of resistant and tolerant varieties recommended by the State Agricultural Universities of the region. Early maturing varieties are less affected by fruit flies than later ones.
- Slight raking of soil during fruiting time and after the harvest to expose pupae from the soil.
- Use cue-lure traps to attract *B. cucurbitae* males.
- Use poison bait against fruit fly-mix 500 gm jaggery, 20 ml malathion and keeping plastic containers (100ml/container) @ 5 nos/Acre for monitoring and 20/acre for mass killing of fruit fly.
- Use fish meal trap @ 10-15 nos/acre against fruit fly.
- Use 10 banana pulp traps/acre against fruit fly-mix 20gm banana pulp, 3 drops of palm oil and 10....