

**MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE**  
**SEMESTER END THEORY EXAMINATION**

**B. Sc.(Hons.) Agriculture**

<b>Semester</b> : IV (New)	<b>Term</b> : II	<b>Academic Year</b> : 2018-2019
<b>Course No.</b> : ENTO 243	<b>Title</b> : Pest of Horticultural Crops and their Management	
<b>Credits</b> : 2 (1+1)		
<b>Day &amp; Date</b> :	<b>Time</b> :	<b>Total Marks</b> : 40

**MODEL ANSWERS**

**SECTION "A"**

**Q.1** Enlist any four important insect pests of citrus along with scientific name and describe nature of damage and management of any two insect pests.

**Ans.** Enlist any four pests (1 mark)

Sr. No.	Common Name	Scientific Name
1	Lemon butterfly	<i>Papilio demoleus</i>
2	Citrus psylla	<i>Diaphorina citri</i>
3	Leaf miner	<i>Phyllocnistis citrella</i>
4	Whitefly Blackfly	<i>Dialeurodes citri</i> <i>Aleurocanthus woglumi</i>
5	Fruit sucking moth	<i>Eudocima fullonica</i> , <i>Eudocima maternal</i> , <i>Achoea janata</i>
6	Aphid	<i>Toxoptera aurantii</i>
7	Citrus red scale	<i>Aonidiella aurantii</i>
8	Mealy bugs	<i>Ferrisicoccus cameronensis</i>

Nature of damage and management (1.5 marks each)

**Q.2** Explain nature of damage and management practices for mango stone weevil and hoppers.

**Ans.** Mango stone weevil (2 marks)

*Nature of damage* : Grubs bore through the pulp, enter into the stone and pass entire life inside the stone.

*Management practices* : Ploughing of orchard after harvest. Collection and destruction of infested and fallen fruits. Destroy all left over seeds in the orchard and also in the processing industries.

**Mango hoppers** (2 marks)

*Nature of damage* : The nymphs and adults suck the sap from the tender leaves, inflorescence causing withering and shedding of flowers. The hoppers also secrete honeydew which encourages the development of fungi.

*Management practices* : Avoid dense planting. Keep orchards clean by regular ploughing and removal of weeds. Avoid excess use of nitrogenous fertilizers. Smoking of orchards by burning of crop residues/cow dung cake during evening hours. Application of bio-agents, *Metarhizium anisopliae* or *Beauveria bassiana*. Spraying of recommended insecticides.

**Q.3 Give host plants, nature of damage and management practices of the following.**

**Ans. a) *Deudorix isocrates* (2 marks)**

*Host plants* : Pomegranate, guava, orange, ber, mulberry, plum, peach, pear and palm and some other wild fruits.

*Nature of damage* : Caterpillars bore the fruits, feed on pulp and seeds.

*Management practices* : Clean cultivation. Remove and destroy affected fruits. Remove weeds of compositae family. Bagging of fruits if number of fruit trees is limited. Release of *Trichogramma chilonis*. Spraying with recommended insecticides.

**b) *Cosmopolites sordidus* (2 marks)**

*Host plants* : Banana

*Nature of damage* : Grubs bores into stem or sucker. As a result, the affected stem gets riddled with holes while the roots are weakened. Bacterial and fungal infections lead to rotting.

*Management practices* : Field should be cleaned by removing the dried leaves and plant debris. Use healthy, uninfected sucker or rhizomes for planting time. Crop rotation with non host crops. Keep pheromone (cosmolure) trap @ 5 traps / ha. Application of biocontrol agents, *Beauveria bassiana* and *Metarhizium anisopliae*. Regular monitoring of weevil by keeping banana traps. Application of carbofuran 3 G @ 40 g / plant. Cut the banana plant after harvest at the ground level and treat it with chlorpyrifos (2.5 ml/lit) at the cut surface.

**Q.4 Give the site of oviposition and site of pupation of the following pests.**

**Ans. a) Udadya beetle (1 mark)**

*Site of oviposition* : In crevices of vines and under bark.

*Site of pupation* : In soil.

**b) Chiku moth (1 mark)**

*Site of oviposition* : On leaves and buds of young shoot.

*Site of pupation* : In leaf webs.

**c) Codling moth (1 mark)**

*Site of oviposition* : On young fruits, leaves and twings.

*Site of pupation* : In cracks and crevices on bark or in soil.

**d) Serpentine leaf miner (1 mark)**

*Site of oviposition* : In leaf.

*Site of pupation* : In soil

**Q.5 Write scientific name, host plants and management practices of rhinoceros beetle and spindle bug.**

**Ans. Rhinoceros beetle (2 marks)**

*Scientific name* : *Oryctes rhinoceros*

*Host plants* : Coconut and other palms.

*Management practices* : Treating manure pits with insecticides. Extracting beetles with iron hooks. Filling bored holes as well as leaf axils with insecticide dust + sand (1:1). Removal and destruction of decaying organic matter lying near about orchards.

**Spindle bug (2 marks)**

*Scientific name* : *Carvalhoia arecae*

*Host plants* : Arecanut

*Management practices* : Digging and forking of the soil before and after the monsoon will help in eliminating the various developmental stages of the beetle

**Q.6 Describe shoot and fruit borers on orka and brinjal.**

**Ans.** Scientific name, nature of damage and management

**Okra shoot and fruit borer (2 marks)**

*Scientific name* : *Earias vitella*

*Nature of damage* : Caterpillars bore into the tender shoots, flower buds and fruits.

*Management* : Removal and destruction of infested shoots, fruits and shed material. Spraying of Azadirachtin or *Bacillus thuringiensis*. Spraying with recommended insecticides.

**Brinjal shoot and fruit borer (2 marks)**

*Scientific name* : *Leucinodes orbonalis*

*Nature of damage* : The caterpillars bore into the growing shoots, midribs and petioles of large leaves, fruits and feed on internal tissues.

*Management* : Continuous cropping of brinjal and potato should be avoided. Removal and destruction of affected shoots and fruits along with larvae. Install pheromone traps. Spray Azadirachtin or recommended synthetic insecticides.

**Q.7 Enlist any four important insect pests of cruciferous vegetables along with scientific name and describe nature of damage and management of any two insect pests.**

**Ans.** Enlist any four pests (1 marks)

Sr. No.	Common name	Scientific name
1	Aphid	<i>Brevicoryne brassicae</i>
2	Diamondback moth	<i>Plutella xylostella</i>
3	Cabbage head borer	<i>Hellula undalis</i>
4	Tobacco leaf eating caterpillar	<i>Spodoptera litura</i>
5	Mustard sawfly	<i>Athalia proxima (lugens)</i>
6	Painted bug	<i>Bagrada cruciferarum</i>
7	Cabbage butterfly	<i>Pieris brassicae</i>

Nature of damage and management (1.5 marks each)

**Q.8 Explain nature of damage and management strategies of the following.**

**Ans.** a) *Phthorimaea operculella* (2 marks)

*Nature of damage* : In early stage of the crop growth the pest is injurious to plant as leaf miner. It also bores into petiole and terminal shoots. The main danger is to tubers both in the field and under storage.

*Management strategies* : **In field** : Timely earthing up. Spray with recommended insecticides. Heaps of harvested potatoes, should not be kept exposed in the field. Release of egg larval parasitoid *Copidosoma koehleri*.

**In storage** : The potatoes should be stored in well ventilated cool and dry places. Covering of tubers with 1" layer of dry sand. Fumigate the tubers. Walls of godown should be sprayed insecticides. Treatment of seed potato tubers with 5% malathion dust. If cold storage facilities are available, the produce can be safely stored for a longer period. Release of egg-larval parasitoid, *C. koehleri*. Application of Bt powder.

**b) *Tuta absoluta* (2 marks)**

**Nature of damage :** Larvae mine in the mesophyll of leaves and make irregular, papery mines. The larvae also mine apical buds and stems. In cases of heavy infestation, both green and red fruits are attacked

**Management strategies :** Collect and destroy affected plant parts. Install pheromone traps. Spray recommended insecticides.

**Q.9 Write scientific name, host plants and management practices of turmeric rhizome fly and onion thrips.**

**Ans. Turmeric rhizome fly (2 marks)**

**Scientific name :** *Mimegralla coeruleifrons*

**Host plants :** Turmeric and ginger

**Management :** Destruction of stray plants in off season, selection of healthy rhizomes for planting. Removal and destruction of rotten rhizomes. Spraying with recommended insecticides.

**Onion thrips (2 marks)**

**Scientific name :** *Thrips tabaci*

**Host plants :** Polyphagous

**Management :** Spraying of recommended insecticides.

**Q.10 Write short notes (Any two). (2 marks each)**

**a) Chilli mites**

**Scientific name :** *Polyphaogotarsonemus latus*

**Nature of damage :** Both nymphs and adults suck the sap from young foliage and growing tips.

**Management :** Resistant or tolerant varieties : Pusa jawla, Phule jyoti. Chilli crop bordered by two rows of maize at every 0.5 acre area (31.2 x 60 sqm). Management of nutrients and water will also helps in reducing the mite population. Conserve the predators. If the incidence of mites is low, spray neem seed powder extract 4% at 10 days interval Soil application of Phorate 10 G @ 10 Kg/ha. Spray recommended acaricides.

**b) Snails and slug**

Snails and slugs belong to invertebrate phylum Mollusca (class- Gastropoda). These are amphibious capable of living on land and waters. Snails differ from slugs in having a spirally coiled shell over their body. The snails live in humid condition. They are nocturnal and damages to vegetables, ornamental and plantation plants etc.

**Common species of snails :** Common garden snail- *Helix* sp. Green house snail – *Opeas gracilis*. Giant African snail- *Achatina fulica* **Slug- *Limax* Sp.**

**Control measures :** Hand picking. Use of Metaldyde.

**c) Cultural control of plant parasitic nematodes**

Cultural nematode control methods are agronomical practices employed in order to minimize nematode problem in the crops.

Selection of healthy seed material- Adjusting the time of planting –Fallowing - Deep summer ploughing -Crop rotation –Manuring –Flooding -Trap cropping -Antagonistic crops - Removal and destruction of infected plants -Use of resistant varieties

## SECTION "B"

**Q.11 Fill in the blanks.**

- 1) a) Banana aphid acts as a vector of bunchy top virus.
- 2) b) *Carpomyia vesuviana* is a pest of ber.
- 3) c) Silvery white scorchy patches with curly tips and scab formation on infested berries of grape is due to infestation of thrips.
- 4) d) The site of oviposition of tea mosquito bug is in tissues of tender shoots, buds, mid ribs and petioles of leaves.

**Q.12 Do as directed.**

- 1) a) *Cylas formicarius* is a pest of rose. (State True or False).  
Ans. False
- 2) b) Give the site of pupation of red pumpkin beetle.  
Ans. In soil
- 3) c) Which plant parasitic nematode is responsible for galls on roots?  
Ans. Root knot nematode
- 4) d) Which crop is infested by Pollu beetle?  
Ans. Black pepper