P

Dr. PANJABRAO DESHMUKH KRISHI VIDYAPEETH, AKOLA
SEMESTER END THEORY EXAMINATION
B.Sc. Horticulture

Semester	**: V (Old)**	**Term**	**: I Academic year : 2021-22**
Course No	**: H/ENTO-232**	**Title**	**: Insect Pest Management of Vegetable, Ornamental and Spice Crops.**
Credits	**: 3 (2+1)**		
Day and Date	**:**	**Time**	**: 09.00 – 11.00 Total Marks : 80**

Note : 1. Solve ANY EIGHT questions from SECTION-A
2. Solve ANY TWELVE questions from SECTION-B
3. All questions from SECTION-C are compulsory
4. Send the PDF file of answer sheet to the email id of respective course teacher

	MODEL ANSWER PAPER SECTION "A".	
Q.1	Write in brief about nature of damage and management practices in field for potato cutworm. **Ans :** **Nature of Damage:** The caterpillars hide during the day in cracks and crevices in soil or in debris around the plants and feed on tender leaves during night by cutting seedlings near ground level. The destruction is much more than actual feeding. **Management practices:** 1) Heaps of green grasses may be kept at suitable interval in infested field during evening and collected next day early in the morning along with caterpillars and destroy. 2) Clean cultivation and mechanical destruction of caterpillars. 3) 5% carbaryl poison bait @ 25-60 kg/ha controls the pest effec tively (1 kg carbaryl 50 wp + 10 kg wheat bran + 1 kg jaggery and sufficient water).	**2 mark** **2 mark**
Q.2	Write the scientific name, site of oviposition and nature of damage for mustard sawfly. **Ans : Mustard Sawfly :** S.N. *Athalia lugens proxima* **Nature of damage:** Larvae feed on leaves from margin inward, mostly during morning and evening. They cut small holes into the leaves and skeletonized the plant. Frequently large number of larvae can be found on each leaf. **Management practices:** 1) Hand picking of larvae and their destruction help in reducing the intensity of infestation. 2) Spray with 0.5 % malation or 0.1 % carbaryl or 0.02 % diazinon control the pest effectively.	**1 mark** **1 mark** **2 mark**
Q.3	Write the management practices for melon fruit fly and red pumpkin beetle **Ans : 1) Melon fruit fly :** **Management practices:** 1) Clean cultivation, removal and destruction of fallen and infested fruits daily to minimise the intensity. 2) Deep ploughing to expose hibernating stages. 3) Application of spray bait containing 20 ml malathion + 200g jaggery + 20 lit. of water. 4) Spraying with 0.05% malathion or 0.2% carbaryl at flowering reduce the intensity of infestation . **2) Red pumpkin beetle:** **Management practices:** 1) Buring of old creepers, ploughing and harrowing after harvest of crop. 2) Collection and destruction of beetles in early stage. 3) Spray 0.05 % malathion or dusting with 5 % malathion dust @ 10 kg/ha.	**2 mark** **2 mark**

Q.4	Write the scientific name, nature of damage and management practices for diamond back moth. **Ans : S.N.** Diamond back moth : *Plutella xylostella* **Nature of damage:** Young larve feed on epidermis of leaves while full grown larve bore inside the heads. Round transperant patches apper on leaves due to feeding. In case of sever infestation then plant may be completely skelotonised. **Management Practices:** 1. Spraying with 0.05% malathion or quinalphos or fenitrothion control the pest effectively. 2. Spraying with Bt (*Bacillus thuriengiensis*) @ 1 to 1.5 kg / ha. 3. Spraying with 4% NSKE. It is necessary to add wetting spredding agent viz ; teepol / sandovit @ 1 ml / lit. 4. Trap cropping with mustard crop attracts 80-90% moths for colonization. 5. Tomato when intercropped with cabbage reduces egg laying by DBM.	1 mark 1 mark 2 mark
Q.5	Write in brief about integrated management practices for tomato fruit borer. **Ans :** 1. Ploughing the field after harvest of the crop would expose the pupae which would be destroyed by birds. 2. In early stage of attack, handpicking of caterpillars & their destruction help in reducing the intensity of infestation. 3. Installation of sex pheromone trap, *Helilure*. 4. Apply *Helicoverpa armigera* nuclear polyhydrosis virus (HaNPV) @ 250 to 500 LE/ha. 5. Spraying the crop with any contact or stomach insecticide e.g. quinalphos, profenophos,fenitrothion.	4 mark
Q.6	Give the mark of identification and nature of damage for epilachna beetle and cowpea pulse beetle. **Ans : Epilachna beetle: Identification:** Beetle : Spherical, pale brown & mottled with black spots. *E. dodecastigma* has 6 spots on each elytra, while *E. vigintioctopunctata* has 14 spots on each elytra. They are strong flier. **Nature of damage :** Both grub & beetle eat the chlorophyll of leaf in between the veins & cause characteristic skeletonised patches on leaves. **Cowpea pulse beetle: Identification:** Adults beetles : Oval dark brown, 3 – 4 mm in length, 2 ivory coloured spots in the middle of dorsal side of the body. Grubs : White , cylindrical, fleshy with brownish mouth-parts , always found inside the grains. **Nature of damage:** It is a major pests of pulses in storage. However, field infestation is also common. The young grubs burrow into the pods & feed on developing seed / grain. The holes seen on the pulses are the exist holes from where the adults have emerged. Such grains are unsuitable for sowing.	2 mark 2 mark
Q.7	Write in brief about nature of damage of rose thrips and carnation red spider mite. **Ans : Rose thrips:** **Nature of Damage:**Nymphs and adults with rasping mouth parts scrape the tissue from leaf surface as well as petals and suck the cell sap oozing out from wound. The attacked leaves show brown patches, get distorted, finally wither and drop down. Presence of brown patches on petals affects the beauty of flowers. **Carnation red spider mite:** **Nature of Damage:** Mite feed on underside of the leaves, suck the cell sap, and as a	2 mark 2 mark

	result the leaves turn pale yellow and dust coating and fine webs. In severe infestation plants become stunted and the flowers also invaded. Plant growth, crop quality, yield and vase life of carnation flowers decreased with increasing mite population.	
Q.8	Write the scientific name, order and management practices for the chrysanthemum aphid. **Ans : Chrysanthemum aphid:** **S.N. :** *Microsiophoniella sanbarni,* **Order :** Hemiptera **Management practices:** 1. Application of sticky traps useful to minimize aphids infestation. 2. Excess use of nitrogenous fertilizers should be avoided. 3. Aphids can be controlled by spraying 0.02 % methyl demeton or 0.05 % malathion or 0.03 % dimethoate.	1 mark 1 mark 2 mark
Q.9	Describe the management practices for turmeric rhizome fly and curry leaf butterfly. **Ans: 1) Turmeric rhizome fly: Management Practices:** 1) Use of healthy planting material. 2) Destroy residues of previous crops. 3) Cover the exposed rihizomes with soil by earthing up operation in the month of July to Sept. 4) spraying with 0.05% Quinalphos 25 EC as soon as the infestation is noticed. 5) destruction of stray plants in off season. 6) Deep ploughing after harvesting. **2) Curry leaf butterfly: Management Practices:** 1. Hand picking & destruction of early instars of caterpillar as well as the pupae. 2. As soon as the incidence is notified, spray Monocrotophos – 0.04% or Dimethoate – 0.03% or 3. Egg parasitoid – *Trichogramma chilonis.* 4. Removal and destruction of alternate host – Bawchi. 5. Spray – *Bacillus thuringiensis* @ 0.05%.	2 mark 2 mark
Q.10	Write short notes on. **(Any one) -** **Ans : Termites :** (*Odontotermes obesus*): These are social insects living in a colony having different castes.A) Reproductivle caste: 1) Queen 2) King, B) Sterile caste : 1) Workers 2) Soldiers **Nature of Damage:** Termites are polyphagous and workers of termites feed on the roots and stem parts of the plants this resulting in drying of plants. Other castes do not cause any direct damage to the crop. **Management practices: 1)** Locate termitoria and destroy queen by digging out termitoria and fumigation with fumigants like CS2 or methyl bromide or CS2 + chloroform mixture @ 250 ml/mounds. 2) Termite damage in standing crop can be minimized by application of 5 liters of Lindane 20 EC/ha into irrigation water. **Rat control:** a) Preventive : Rat proffing, cleaning and sanitation. b) Mechanical : Traps, sound repellants, rat hunting etc. c)Cultural method :It includes deep ploughing, reconstruction of bunds, flooding etc. d) Most physible and effective, it includes rat poisons. i) Single dose poison : Zinc phosphide (acute poison) Bait composition for acute poison. For 100 gm, Zinc phosphide 2 gms + Food material 50 gms. + sweet oil 2 gm + Jaggery 6 gm. ii)Multiple dose/Chronic poison : Warfarin, bromedioloe – poison 5 gm + flour 450 gm + Jaggery 15 gm + sweet oil 10 ml. e) Fumigants : HCN, EDB are mostly use fumigants 3 gm tab/burrow 2-3 times prebaiting is needed.	4 mark 4 mark

Q.11	SECTION "B"	
a.	**Ans.** Family: Termitidae Order: Isoptera	2 mark

b.	**Ans.** Authors: A.S. Atwal and G.S. Dhaliwal	2 mark
c.	**Ans.** Site of oviposition: Singly in small incisions in the leaf with ovipositor Order: Diptera	2 mark
d.	**Ans.** Site of oviposition: In moist soil Site of pupation: In soil	2 mark
e.	**Ans.** Extended form: Neem Seed Kernal Extract Concentration generally used: 5 per cent	2 mark
f.	**Ans.** Scientific name: *Hyadaphis coriander*i Order: Hemiptera	2 mark
g.	**Ans.** Scientific name: *Bemisia tabaci* Site of pupation: On leaves	2 mark
h.	**Ans.** Scientific name: *Longitarsus nigripennis* Damaging stages: Grub and adults	2 mark
i.	**Ans.** Damaging stages: Larva Order: Hymenoptera	2 mark
j.	**Ans.** Site of pupation: Swampy areas Host plant: Yam crop	2 mark
k.	**Ans.** Extended form: *Spodoptera litura* Nuclear Polyhedrosis Virus Pest name against which it use: *Spodoptera litura*	2 mark
l.	**Ans.** Site of Oviposition: Just under the skin (epidermis) of the fruits Order: Diptera	2 mark
m.	**Ans.** Scientific name: *Papilio demoleus* Damaging stages: Caterpillar	2 mark
n.	**Ans.** Site of pupation: In stem Order: Coleoptera	2 mark

Q.12	SECTION "C"	
1	Scientific name of cabbage aphid is **Ans.** d) *Brevicorne brassicae*	1 mark
2	Site of pupation for fruit fly, *Bactrocera cucurbitae* is **Ans.** d) In soil	1 mark
3	Mustard when intercropped with cabbage crop reduce damage of **Ans.** b) Diamond back moth	1 mark
4	The pest having both beneficial and harmful stages in its life cycle is **Ans.** c) Blister beetles	1 mark
5	Use of egg parasitoid, *Trichogramma chilonis* is recommended for management of **Ans.** a) Bean pod borer	1 mark
6	The major pest of capsicum in protected environment of polyhouse is **Ans.** a) Mites	1 mark
7	Which one of the following is serious pest of onion and garlic? **Ans.** a) Thrips	1 mark
8	*Epilachna vigintioctopunctata* is a serious pest of **Ans.** b) Brinjal	1 mark
9	Yellow sticky traps are recommended for the management of **Ans.** a) White flies	1 mark
10	Scientific name of turmeric rhizome fly is **Ans.** c) *Mimegralla coeruleifrons*	1 mark
11	HaNPV is recommended for the management of	1 mark

	Ans. b) *Helicoverpa armigera*	1 mark
12	Use of resistant varieties in the IPM is an example of Ans. c) Cultural control	1 mark
13	The damaging caste of termites, *Termes spp.* is Ans. b) Workers	1 mark
14	Selection of healthy rhizome for planting is recommended for the management of Ans. a) Turmeric rhizome fly	1 mark
15	Which pest of potato attacks the tuber both in field and storage ? Ans. b) Potato tuber moth	1 mark
16	Tortoise beetles are pests of Ans. d) Sweet potato	1 mark
17	Irregular holes on cucurbit leaves is damage symptom of Ans. c) Red pumpkin beetle	1 mark
18	Upwardly curling chilli leaves with rat tail like leaf tip is due to attack of Ans. a) Thrips	1 mark
19	Scientific name of jasmine budworm is Ans. a) *Hendecasis duplifascialis*	1 mark
20	Cinnamon butterfly *Chilasia clytia* belongs to family Ans. c) Papilionidae	1 mark
21	Scientific name of okra shoot and fruit borer is Ans. a) *Earias vittella*	1 mark
22	Monophagous pest of sweet potato crop is Ans. c) Sweet potato weevil	1 mark
23	Pest acts as a vector for transmitting yellow vein mosaic virus disease in okra is Ans. b) *Bemisia tabaci*	1 mark
24	The major pest of Cardamom crop is Ans. a) Cardamom thrips	1 mark

Signature of the course teacher
Name : P.W. Nemade
Designation : Assistant Professor
College : COH, Dr. PDKV, Akola
Mobile. No. : 9850208111

Signature of Head of the Department
Name : Dr. D.B. Undirwade
Deaprtment : Agril. Entomology
Mobile No. : 9850819992
Office seal :