Model Answer

Semester	:	**V (New)**	**Term**		:	1st	**Academic Year**	:	**2021-2022**
Course No.	:	**ENTO – 354**	**Title**		:	**Pests of Crops and Stored Grain and their Management**			
Credits	:	2 (1+1)							
Day & Date	:	**21.11.2021**	**Time**		:	1.00 Hr	**Total Marks**	:	40

Note: 1) Solve ANY FOUR questions from SECTION -A.
2) Solve ANY SIX 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 .

Section "A"
(Write the answers in 4-5 sentences only. Each question carries 4 marks)

Q.1. Enlist the Bollworm complex of Cotton and write nature of damage of Pink boll worm.

Ans: BOLL WORM COMPLEX OF COTTON (02 marks)

1) Spotted boll worm *Eariasvitella,Eariasinsulana*
2) American cotton boll worm *Helicoverpaarmigera*
3) Pink boll worm *Pictinophoragossypiella*

Pink boll worm: *Pictinophoragossypiella* (02 marks)

Egg laying on bolls, but it is also found on buds and flowers also. Larvae never attack shoot and leaves but bore into buds and flowers and causes sheding. Flowers which remains on plant does not open. These unopened flower is known as "domkali" or fakadi. Then larva enter into the boll and feed on inner content and by moving from one locule to another by making a hole to the septum**.** As the larvae feed on seed, oil percentage of seed, quality of lint and quantity of yield is adversely affected.

Infestation of Pink bollworm on bolls is difficult to locate unless they drop down because as the boll mature the entry hole caused by minute larvae get closed by callus formation. Numbers of larvae found infesting in same boll. larvae pupate in the infested boll and hibernate in seed.

Q.2 Write the nature of damage and management practices of Brown plant hopper **and** Yellow stem borer of rice..

Ans: Brown plant hopper

Scientific name :*Nilaparvatalugens*.

Nature of damage : (02 mark)

The nymphs and adults of brown planthopper confine themselves to basal parts of plants and suck the cell sap. The toxic saliva produces the "hopper burn" symptoms resulting into drying of leaves

Management : (02 mark)

Grow BPH resistant tolerant varieties.
Avoid dense transplanting.
Draining of water from bunds at 3-4 day intervals.
Broadcast of *Metarrhiziumanisopliae* @ 2.5 kg / ha after withdrawing of water from field
Use of chemical insecticide after attaining ETL.
Spray of Imidacloprid 17.8 SL @ 2.2 ml or Fipronil 5 SC @ 20 ml Thiamethoxam 25 WG @ 2g per 10 lit. water. Do not use the same insecticide repeatedly

AND

Yellow stem borer :

Scientific name : Yellow stem borer *Scirpophaga*(*Tryporyza*) *incertulas*

Nature of damage : (02 mark)

Larva feed inside the stem causing drying of central shoot known as dead heart.
In young plant drying of panicle or white ear. No grain formation.

Removal of stubbles, ploughing , clipping of tips before transplanting, Roots dip seedlings for 12 hours in the solution prepared by mixing Chlorpyriphos 20 EC 500 ml 500 litres of water Release of *T.japonicum*, Chemical control:-Granular application of Phorate 10 G 10 kg per ha or Carbofuran 3 G 16.5 kg per ha in standing water in the field.

Q.3 Describe the nature of damage and management practices of Soybean Stemfly or Sorghum shoot fly.

Soybean Stemfly : *Melangromyza*sojae(01 mark)

Nature of damage and Management : (03 mark)

Female lay eggs in leaf tissues, after hatching maggots enter into the stem through leaf and feed on central tissue of the stem , the seedlings and branches gets wither.If the infected stem is opened by splitting, distinct zigzag reddish tunnel can be seen with maggot or pupae inside it.

Seed treatment, with Thiamethoxam 30% FS 10ml / Kg seeds. Chemical Spray of Ethion 50% 30ml or Indoxycarb 15.8% 6.7ml or Chloantraniliprole 18.5% 3.0 ml any one in 10 lts of water

OR

Sorghum shoot fly:

Scientific Name : *Atherigonasoccata* (01 mark)

Nature of damage and Management : (03 mark)

Maggot attack the young crop i.e. six leaf stage. Feed on main shoot, growing point is destroyed. Dead heart formation and tillers produce . Maggot pupate in main shoot.

Seed treatment, increase seed rate up to 11 Kg./ha., Apply phorate 10 G@ 10 Kg/ ha / Carbofuran 3 G @ 15 Kg/ ha.

Q.4 Explain the nature of damage of *Helicoverpaarmigera* on Pigeon pea and give the management practices for pod borer complex of Pigeon pea

1) **Tur pod borer:** *Helicoverpaarmigera* (02 marks)

It is cosmopolitan and polyphagous pest

Nature of damage: The young larvae feed on the foliage for some time and later on bore into the pod and feed on developing grain. Anterior portion of the body is inserted in pod and posterior body remain hanging outside. This is characteristic habit of *Helicoverpa*. They move from pod to pod and destroy 10 to 15 pods during their larval life. At the time of pupation larvae come out of the pod and pupate in the soil.Pest population is high in Dec. Jan. if weather is cloudy.

Management practices for pod borer complex of pigeon pea (02 marks)

Tur pod borer: *Helicoverpaarmigera*

Tur plume moth: *Exelastisatomosa*

Tur pod fly: *Agromyzaobtusa*

1) Deep ploughing in summer to destroy immature stages of pest (tur pod borer)
2) Inter cropping of tur with cereals like sorghum, maize, bajra .
3) Arrange bird stands in the field @ 20/ha.
4) Shaking of plant before flowering when there is infestation of tur pod borer and after pod formation to destroy pupa and larva of plume moth and pod fly.
5) When infestation reach to the ETL

A) Spraying of NSE 5 % ,HaNPV250 LE/ha & dusting of Methyl Parathion 2 %, 20 kg. at an interval of 15 days.

B) Spraying of dimethoate 30 EC @ 0.03% / quinalphos 0.05% at 50 % flowering and 15 days after first spray.

C) Spraying of Emamectin benzoate 5 WDG @ 3 g / 10 liter of water or Chlorantraniliprole 18.5 SC (Rynaxpyr 20 SC) in 10 liter of water for effective management of pod borer complex of pigeonopea.

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of them .

Ans: **Preventive measures:** (02 marks)

Sun drying,
Removal of insect stages,
Insect free godowns,
Use of insect free storage structures,
Providing dunnage to gunny bag,
Proper stacking,
Dusting or spraying the gunny bag
Admixture of inert dust
Admixture of local plant.

Describe any one : (02 marks)

Sun drying : Most of the stored grain pests cannot multiply in grain with less then 8% moisture (except khapra beetle and pulse beetle). Therefore, an age old practice of sundrying to reduce moisture content.

Removal of Insect stages: it must be ensured that the grain before storage is free from insect infestation. For this grain should be sieved and shifting should be done so as to remove the different stages of insects.

Insect free godowns : All dirt rubbish webbings or refuge material should be removed from the godown. All cracks and crevices and rat hole in the walls, floors or ceiling should be filled with cement. Before storing the new stocks, disinfect the godowns to remove insect infestations. Spraying with recommended insecticides.

Use of insect free storage structures: When the grain is properly dried and ready for storage, it should be stored in gunny bags, free insect pests. As far as possible new bags should be used for storing the grain. In case old bags are to be used, they should be fumigated with Ethylene dibromide for 5 to 7 days.

Providing dunnage to gunny bag: At the time of storage of gunny bags, proper dunnage is necessary to protect grains from moisture damage which usually occurs at the bottom layers of bags. Best dunnage is of wooden battens or with a layer of bamboo mating.

Proper stacking : Gunny bags should not be kept touching to the walls as well as roof, as they absorb moisture particularly in rainy seasons. This will also facilitate aeration as well as inspection and treatment of grains in the godown.

Dusting or spraying the gunny bag : After filling the bags their outside surface be dusted or sprayed with Malathion or DDVP (@0.05% spray).

Admixture of inert dust : Mixing of inert dusts with foodgrains has been adopted in India for centuries. The admixture of wood or coal ash, slaked lime clays, talc or sand with foodgrains is carried out in many areas. However, it is restricted to the storage of small quantity of grains in earthen wares for seed purposes.

Admixture of local plant : Some of the local plants have a repellant effect upon insects. In India powdered dried rhizomes of sweet flag (*Acorouscalamus*) is mixed with paddy or rice @ 1:100 parts of grains. Mixing the “neem” leaves in grains or smearing them with castor oil are some of the indigenous methods.

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b) Define Secondary store grain pest.
c) Beneficial Stage of Blister beetle .
d) Host plants of Adult White grub.
e) Nature of damage of Sugarcane scale insect
f) Act of oviposition of soybean Gidle beetle.

Ans:

a) Gall midge .
b) The insect pest cause damage or feeds broken grain by primary pest
c) Grub
d) Neem, Babool and Ber
e) Nymphs and adult suck the sap from the cane stalks,canes become shriveled.
f) Female beetle makes rings on branches making three holes for laying eggs.

Q.7 Choose the answers option .Each question carry 1 mark

1. *Trichogrammajaponicum* is recommended in Paddy for the control of
   a) **Yellow Stem Borer** b) Brown Pant Hopper
   c) Rice Hispa d) Gall midge
2. *Metarrhiziumanisopliae* is
   a)Acaricide b) **Entomopathoginic Fungi**
   c) Botanical d) Chemical insecticide
3. *Athalialugens*is the pest of
   a) Sesamum b) Linseed
   c) **Mustard** d) None of these
4. Scientific name of Sorghum ear head midge is
   a) *Scirphophagaincertulas* b) *Orseoliaoryzae*
   c) ***Contarinasorghicola*** p d) *Atherigonasoccata*
5. Name the insect pest causes drooping and drying of shoots in cotton.
   a) Jassids b) Whiteflies
   c) **Spotted Boll worm** d) Red Cotton Bug
6. Which Pest is common in Pigeon Pea, Gram &Cotton
   a) ***Helicoverpaarmigera*** b) *Atherigonasoccata*
   c) *Pectinophoragossypiella* d) *Chilopartellus*
7. *Chalosobruchuschinensis* is a storage pest of
   a) Wheat b) Rice
   c) **Gram** d) Maize
8. Rice Tungro virus disease is transmitted by
   a) **Green Leaf Hopper** b) Brown Plant Hopper
   c) White backed plant hopper d) Gundhi bug
9. Site of pupation of Castor Semilooper
   a) **Dried leaves** b) Soil
   c) Shoots d) None of these
10. . Metaldehyde is used for the control of
    a) **Snails and slugs** b) Mites
    c) Rats d) Millipedes
11. Excretion of honey dew like substance and development of black sooty mouldwhich affects photosynthesis in Safflower
    a) Jassid b) Mites
    c) **Aphids** d) None of these

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