objectives

ENTO-243

Pest of Horticultural Crops and their Management

1. ----------is a monophagous pest on mango is **Stone weevil** and **Mango hopper**
2. ---------- feeds on mango inflorescence during flowering season -**Mango hopper**
3. Mango fruit become marble sized due to attack of ---------- **Mango Stone/Nut weevil**

OR

4. 'T' shaped marking on marble sized mango fruits **Mango Stone/Nut weevil**
5. The insect pest of mango which has quarantine importance is **mango stone weevil**
6. ---------- is the scientific name of mango mealy bug -***Drosicha mangifera***
7. Citrus can be covered with perforated polythene bag to control the incidence of ------- **Fruit sucking moth**
8. Larvae feed their own exuviae after each molting in the case of ------ **Citrus butterfly.**
9. The pest of citrus where the early instars larva resembles bird droppings is **Citrus butterfly**.
10. The greening virus in citrus is transmitted by **Citrus psylla (*Diaphorina citri*)**
11. Scientific name of citrus leaf mite is---------- ***Eutetranechus orientalis***
12. Scientific name of citrus leaf roller is---------- ***Psorostichya zizyphi***
13. Male annihilation technique is used to control …… **Fruit fly**
14. The chemical used in male annihilation technique/fruit fly trap is **Methyl eugenol**
15. Breeding weed host of fruit sucking moth- ***Tinospora cordifolia*** **(Gulvel)**
16. Site of oviposition for mealy bug is **In soil**
17. Severe infestation results in mango fruit drop and liquid oozes out upon pressing ***Bactrocera dorsalis***
18. ------- causes irritation during harvest and is a nuisance in mango orchards. **Red tree ant.**
19. Citrus butterfly belongs to family **Papilionidae**
20. Glistering zigzag tunnels on citrus leaves. – **Citrus leaf miner, *Phyllocnistis citrella***
21. Citrus leaf miner belongs to family **Gracillariidae**
22. Presence of blisters and scales / rusty corky growth on guava fruits is a typical symptom of ---------- **Tea mosquito bug**
23. Rotting and dropping of guava fruits are due to ……. ***Bactrocera diversus***
24. Scientific name of guava fruit borer is a…… ***Virachola isocrates***
25. Covering of guava fruit with polythene bag is especially for management of ***Virachola isocrates***

26. Infested pomegranate fruits ultimately fall off and give an offensive smell ***Virachola Isocrates.***
27. Scientific name of pomegranate aphids is ---------- ***Aphis punicae***
28. Anar butterfly belongs to family a. ***Lycaenidae***
29. Scientific name of chickoo moth is ---------- ***Nephopteryx eugraphella***
30. Chickoo moth also feeds on ---------- **Cured tobacco**
31. Scientific name of sapota bud worm is ---------- ***Anarsia ephippias***
32. Prominent horn is present in which sex of adult rhinoceros beetle. **Male**.
33. ---------- Fungus used to control rhinoceros beetle - ***Metarhizium anisopliae.***
34. Central spindle appears cut or toppled in coconut is a symptom of ---------- **Rhinoceros beetle** (***Oryctes rhinoceros***).

OR

Series of holes in fronds of coconut. – **Rhinoceros beetle, *Oryctes rhinoceros***

OR

Geometrical cutting of coconut fronds – Rhinoceros beetle.

35. Conspicuous long snout with tuft of hairs in males is seen in **Red palm weevil.**
36. Gummosis (oozing of brown liquid) and crown toppling in coconut is due to **Red palm weevil.**
37. ------ is an aggregation pheromone used for control of red palm weevil. **Ferrolure**.
38. ----------is the scientific name of coconut black headed caterpillar. ***Opisinia arenosella***.
39. Alternate host of *Oryctes rhinoceros* is … (**Pineapple, Sugarcane and Arecanut)**.
40. Dried up patches on leaflets of the lower leaves of coconut is symptom of **Black headed caterpillar.**
41. Root feeding technique is followed to control following pest **Black headed caterpillar**.
42. Scientific name of slug caterpillar is ***Parasa lepida.***
43. Brown color patches, longitudinal fissures and splits on outer surface of the coconut husk is due to **Eriophyid mite**.
44. Scientific name of eriophyid mite is ***Aceria guerreronis***.
45. *Opisina arenosella* belongs to …….. family. **Cryptophasidae.**
46. …….. is a predator of Rhinoceros beetle. ***Platymeris laevicollis***.
47. Female of rhinoceros beetle lays eggs in **manure pits or decaying vegetable matter** to a depth of **5-15 cm.**
48. ……stage of rhinoceros beetle does the damage to coconut fronds. (**Adult**).
49. Holes on the trunk with brownish ooze are a symptom caused by **Red palm weevil.**

50. …… damage is more pronounced in the coastal region. (**Black headed caterpillar**).
51. Bore holes, tunnels in the pseudostem, wilting of banana plant is due to ***Odoiporus longicollis***.
52. *Cosmopolites sordidus* belongs to family **Curculionidae**
53. Scientific name of Banana aphid is ***Pentalonia nigronervosa***.
54. Bunchy top disease of banana is transmitted by ***Pentalonia nigronervosa***.
55. Tea mosquito bug belongs to family a. **Miridae.**
56. **……..** weevils can be trapped by placing chopped pseudostems. **Rhizome weevil**.
57. Host plant of Tea mosquito bug is **Guava, Sweet potato, Tea.**
58. Brown patch on guava fruit. **Guava tea mosquito bug or Kajji bug (*Helopeltis antonii*)**
59. Corky scab formation in banana is due to **Thrips.**
60. Weakening and death of the smaller plants; galls on the roots; white woolly patches on apple trunk is a typical symptom of **Apple wooly aphid**.
61. Predator used for controlling cotton cushion scale ***Rodalia cardinalis***.
62. Scientific name of stem girdler is ***Sthenias grisator***.
63. Silvery white patches on leaves with black excreta, yellowing and withering in grapevine are due to attack of **Thrips.**
64. Scientific name of ber fruit borer is ***Meridarches scyrodes.***
65. Skeletonization of brinjal leaves is caused by **Hadda beetle**.
66. Attacked brinjal fruits with boreholes plugged with excreta are indication of presence of **Shoot and fruit borer.**
67. Continuous planting of brinjal and ratooning is favorable for multiplication of **Shoot and fruit borer**.
68. Little leaf of brinjal is transmitted by **Leaf hopper.**
69. Give the name of an introduced pest in tomato **Serpentine leafminer.**
70. Tomato leaf curl is transmitted by **Whitefly.**
71. First instar larvae of …… mine epidermal surface of leaves producing typical white patches on cabbage. **Diamond back moth**.
72. What is the ETL for diamond back moth **2 larvae / plants**.
73. Name the two larval parasitoids of diamond back moth ***Cotesia plutella and Diadegma semiclausum.***
74. ….. adult has a fringe of long hairs on hind wing. **Diamond back moth**
75. Mustard crop can be used as trap crop in cabbage field to attract **Diamond back moth.**

76. *Plutella xylostella* belongs to the family **Plutellidae.**
77. …. tunnels into foliage stem and tubers which lead to loss of leaf tissue, death of growing points and weakening or breaking of stems **Potato tuber moth.**
78. Which pest of potato infest crop at both field and storage. **Potato tuber moth.**
79. Dusting of sulphur is recommended against **Mite**
80. Cabbage butterfly is **Oligophagous pest.**
81. … is of vector papaya mosaic virus disease. (**Aphid, *Aphis gossypii***)
82. Name the chronic poison used as rodenticide. **Hydroxy coumarins (Warfarin, Fumarin, Tomarin)**
83. Give two examples of acaricides. - **Sulphur 80 WP & Dicofol 18.5 EC.**
84. Name the entomophagous fungi used against sucking pests **Metarhizium anisopliae.**
85. The examples of quarantine pests are **Mango stone weevil, San jose scale & Japanese beetle**.
86. Pink colour encrustation on apple fruits is due to **San jose scale**.
87. Galls on roots are indication damage by **apple wooly aphid**.
88. Irregular holes on the cucurbit leaves – **Red pumpkin beetle.**
89. In Rose, leaves with silvery yellow patches and black spots of excreta is due to attack of **Thrips, *Rhipiphorothrips cruentatus***
90. Study of nematode is called **Nematology.**
91. Study of animal parasitic nematode is called **Helminthology**.
92. How many life stages are present in nematode life cycle 6(six).
93. Rhizome rot of Banana is caused by which nematode ***Radopholus similis.***
94. Grape Vine fan leaf virus cause due to ***xiphinema index.***
95. The three regions of nematode spicules are **Capitulum, Corpus and lamina**.
96. Father of nematology is **N A Cobb.**
97. Nematode malt **4 times.**
98. Give the exact site of oviposition of following insect-pests.
    1. Banana root stock weevil - **In decaying leaf sheath or rhizome**
    2. Black headed caterpillar - **On tip of older leaves**
    3. Rhinoceros beetle - **In decaying organic matter or in manure pits**
    4. Potato tuber moth - **Near the eye of exposed tubers or sometimes on underside of leaves**
    5. Black headed caterpillar. - **On tip of older leaves**
    6. Red pumpkin - **in the soil**
    7. Potato cutworm - **in soil or under surface of leaves.**
    8. Flea beetle - **in the bark or soil**

9. Stem girdler **- under the bark**

10. Mango hoppers **- into flower buds and the inflorescence stalk.**

11. Brinjal shoot and fruit borer – **on leaves, flower buds and on young fruits**.

12. Anar butterfly – **on flower buds, calyx of developing fruits**.

13. Fruit flies – **On flowers, tender fruits**.

14. Citrus blackfly – **spiral pattern on the underside of leaves**.

15. Fruit sucking moth – **On weed (Vasanvel and Gulvel)**.

99. Give the site of pupation of the following pests.

1. Lemon butterfly **- On plant**

2. Brinjal shoot and fruit borer – **On plant**

3. Sweet potato weevil **- In the larval burrows in vines**

4. Chiku moth **- Inside fold of webbed leaves**

5. Fruit fly **- In soil**

6. Mango stone weevil **- Inside the stone/nut**

7. Fruit sucking moth **- In soil**

8. Red pumpkin **- in the soil**

9. Grapevine flea beetle is **in Soil.**

10. Ash weevil **- in Soil.**

11. Anar butterfly – **Inside the fruit or on fruit stalk**

100. Give damaging stages of following

1. Fig jassids – **Nymph and adult**

2. Fruit sucking moth **- Adult**

3. Tea mosquito bug **- Nymph and adult**

4. Whitefly **- Nymph and adult**

5. Rhizome fly **- Maggot**

6. Banana root stock weevil – **Grub**

7. Lemon butterfly – **Larva**

8. Cucurbit fruit fly – **Maggot**

101. Give the name of vector of following diseases.

1. Katte disease of cardamom – **Aphid, Pentalonia nigronervosa**

2. Chilli leaf curl **- Whitefly**

3. Banana bunchy top **- Banana Aphid*, Pentalonia nigronervosa***

4. Citrus greening – **Citrus psylla, *Diaphorina citri***

5. Okra yellow vein mosaic – **Whitefly, *Bemisia tabaci***

6. Tomato spotted wilt virus – **Thrips, *Frankliniella occidentalis***

7. Citrus tristeza virus – **Aphid, *Toxoptera aurantii***

8. Papaya mosaic - **Aphid,** ***Aphis gossypii***

9. Papaya leaf curl - **Whitefly,** ***Bemisia tabaci***

10. Little leaf of brinjal – **Leaf hopper,** ***Cestius phycitis***

51. Which is the major pest of chilli?
a) Fruit fly Bactrocera dorsalis
b) Thrips Scirtothrips dorsalis
c) Lemon butterfly Papillio demoleus
d) Semilooper Trichoplusia ni

52. Churda murda or bokadya in chilli is caused by ----------
a) Fruit borer
b) Mealybug
c) Thrips
d) Aphid

53. Phthorimaea operculella is a pest of ----------.
a) Potato
b) Turmeric
c) Ginger
d) Maize

54. Pupation of potato tuber moth takes place ----------.
a) On leaves
b) In tuber
c) In stem
d) In soil

55. The caterpillars of ---------- 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 seedl¬ings near ground level.
a) Potato tuber moth Phthorimaea operculella
b) White grub Holotrichia serrata
c) Cutworm Agrotis ipsilon
d) Diamondback moth Plutella xylostella

56. Which of the following is not a monophagous pest?
a) Sweet potato weevil
b) Mango stone weevil
c) Fig jassid
d) Lemon butterfly

57. Which is a lepidopterous leaf miner damaging tomato recently ?
a. Bemisia tabaci
b. Liriomyza trifoli
c. Tuta obsulata
d. Helicoverpa armigera

58. Liriomyza trifoli belongs to _____ order.
a. Diptera
b. Lepidoptera
c. Hemiptera
d. Hymenoptera

59. Which of the following is tomato fruit borer ?
a. Aphis gossypii
b. Helicoverpa armigera
c. Tuta obsulata
d. Bactrocera dorsalis

60. The vector of leaf curl in tomato is _____.
a. Aphid
b. Jassid
c. Leaf miner
d. Whitefly

61. Serpentine mines on leaves of tomato are symptoms of _____ damage.
a. Amrasca biguttula biguttula
b. Bemisia tabaci
c. Liriomyza trifoli
d. Tuta obsulata

62. The site of oviposition of leaf miner Liriomyza trifoli is _____
a. In soil
b. In leaves
c. In fruit
d. In stem

63. The scientific name of brinjal shoot and fruit borer is _____.
a. Earias vitella
b. Helicoverpa armigera
c. Leucinodes orbonalis
d. Hellula undalis

64. Which of the following pest of brinjal bores in stem initially and lateron in fruits ?
a. Phthorimaea operculella
b. Agrotis ipsilon
c. Liriomyza trifoli
d. Leucinodes orbonalis

65. Holes plugged with excreta on fruits of brinjal are due to _____.
a. Leucinodes orbonalis
b. Epilachna viginctopunctata
c. Helicoverpa armigera
d. Plutella xylostella

66. Leaf curl, mosaic and veinal necrosis in brinjal is transmitted by _____.
a. Epilacna beetle
b. Jassid
c. Aphid
d. Mite

67. The characteristic skeletonised patches on leaves of brinjal is symptom of _____ infestation.
a. Shoot and fruit borer
b. Whitefly
c. Thrips
d. Epilacna beetle

68. Both grub and beetle of _____ eat the chlorophyll of the leaf in between the veins of brinjal.
a. Leaf webber
b. Epilacna beetle
c. White grub
d. Shoot and fruit borer

69. The cocoons of shoot and fruit borer are _____ shaped.
a. Dumbell
b. Boat
c. Oval
d. Sperical

70. Which of the following is a serious pest of okra ?
a. Thrips tabaci
b. Brevicoryne brassicae
c. Earias vitella
d. Bactrocera cucurbitae

71. Deformed fruits of okra having exit holes of the larvae is due to infestation of ___
a. Whitefly
b. Shoot and fruit borer
c. White grub
d. Blister beetle

72. Yellow vein mosaic virus disease of okra is transmitted by _____.
a. Aphid
b. Thrips
c. Jassid
d. Whitefly

73. Velu caricae is a pest of ……..
a) Citrus
b) Fig
c) Rose
d) Chilli

74. Which of the following is major pest of onion?
a) Thrips Thrips tabaci
b) Whitefly Bemisia tabaci
c) Rhizome fly Mimegralla coeruleifrons
d) Jassid Velu caricae

75. Feigning death behavior is observed in ……. larva.
a) Mustard sawfly
b) Citrus leaf miner
c) Diamondback moth
d) Gram pod borer

76. Banana aphid is responsible for transmission of …….. disease in banana.
a) Bunchy top
b) Rhizome rot
c) Yellow vein mosaic
d) Greening

77. The damaging stage of anar butterfly Deudorix isocrates is ……
a) Larva
b) Egg
c) Pupa
d) Adult

78. Larval excreta with webbings and galleries in stem of fruit trees are due to …….
a) a) Citrus psylla

b) Bark eating caterpillar
c) Fruit sucking moth
d) Leaf miner

79. Earias vitella is scientific name of …… pest of okra.
a. Whitefly
b. Shoot and fruit borer
c. White grub
d. Blister beetle

80. The site of pupation of Helicoverpa armigera is ……
a. In stem
b. In soil
c. In fruit
d. On leaves

Answer Key
ENTO 243 (Pest of Horticultural Crops and Their Management)

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	a	21	d	41	d	61	c
2	c	22	b	42	a	62	b
3	d	23	a	43	a	63	c
4	c	24	c	44	d	64	d
5	d	25	b	45	c	65	a
6	c	26	c	46	b	66	c
7	b	27	b	47	d	67	d
8	d	28	a	48	c	68	b
9	a	29	a	49	d	69	b
10	c	30	b	50	b	70	c
11	a	31	a	51	b	71	b
12	d	32	d	52	c	72	d
13	c	33	a	53	a	73	b
14	c	34	c	54	d	74	a
15	b	35	a	55	c	75	a
16	a	36	c	56	d	76	a
17	d	37	a	57	c	77	a
18	b	38	c	58	a	78	b
19	c	39	d	59	b	79	b
20	a	40	c	60	d	80	b

MAJOR PESTS OF CITRUS

Pest	Scientific Name	Host	Oviposition	Pupation	Nature of damage	Management	Typical characters
Shoot psyllid/ Citrus Psylla	***Diaphorina citri* (Psyllidae: Hemiptera)**	Members of rutaceae family.	on the underside of soft young leaves	-	Both nymphs and adults suck cell sap from leaves, which curl up, dry and fall off. Nymph secretes honeydew on which sooty mould grows. Psylla is also known to inject toxin in plant due to which die-back of shoot occurs.	Prune the affected trees and dried shoots. parasitoid *Tamarixia radiate*, and predators - *Coccinella septumpunctata, Chilomenes sexmaculata, Brumus suturalis, Chrysoperla carnea.* Spray NSKE 5 %, neem oil 10 L, dimethoate 30 EC 3.0 L, of monocrotophos 36 SL 1.5 L, methyl demeton 25 EC 2.5 L, quinalphos 25 EC 1.0 L, imidacloprid 200 SL 250 ml in 1500-2000 L of water/ha during new flush.	transmit "Greening melody", a micoplasma disease in citrus
Citrus blackfly/ White fly	***Aleurocanthus woglumi* / *Dialeurodes citri* (Aleyrodidae: Hemiptera)**	Citrus, sweet orange, avacado, grape vine, mango, guava, pear, plum.	On leaves in spiral manner	Pseudo pupa On underside of leaves	Nymphs and adults suck plant sap, causing curling of leaves and premature fall of flower buds and developing fruits. Nymphs excrete honey dew on which black sooty mould develops - "*Kolshi*". Fruits turn black & insipid taste	Avoid Close planting, water logging or stress conditions. Avoid excessive irrigation and application of nitrogen. Use yellow trap at the time of adult emergence, Release *Mallada boninensis* predator, Pupal parasitoids: *Encarsia formosa*, Spraying of *Verticillium lecanii* 2 Kg/ha Spray neem oil 3% or Fish Oil Rosin Soap 30 g/L or quinalphos 25 EC 2.0 L or methyl demeton 25 EC 1 .0 L or ethion 50 EC 2.5 L or triazophos 40 EC 3.0 L in 1500 – 2000 L water per ha.	As only first nymphal instar of the pest is vulnerable to insecticides. The 50% eggs hatching is the most critical period for application of insecticide.
Thrips	***Scirtothrips spp.* (Thripidae, Thysanoptera**	Polyphagous	In leaf tissues		The nymphs and adults suck the sap from fully developed flower and leaf buds, young and grown-up	Spray NSKE 4% or Dimethoate 30 EC @ 2 ml or Thiamethoxam 25 WG @ 0.3 g or Acetamiprid 20 SP @ 0.3 g /L. water at bud burst stage & on berries and the	Two white line parallel to leaf midrib and a whitish silvery ring around the

					fruits and leaves The leaves become cup shape and leathery.	surrounding vegetation should also be sprayed as the pest thrives on it.	fruit neck are characteristics of thrip infestation.
Pest	**Scientific Name**	**Host**	**Oviposition**	**Pupation**	**Nature of damage**	**Management**	**Typical characters**
Citrus Aphids	***Toxoptera aurantii* (Aphididae: Hemiptera)**	Rutaceae family	Giving birth to young ones		Aphid nymphs and adults suck the sap of leaves, leaves become curled (cup shaped). Secrete a honey like substance attracts sooty- mould impairs photosynthesis. Wilting, flower drop, premature falling of the unripe fruits. Ripening and quality of the fruits is affected.	Natural enemies (coccinelids, chrysopids, and syrphids). Spray imidacloprid 17.8 SL @ 2.5 ml/10 lit. dimethoate 30 EC @ 16.5 ml or malathion 50 EC @ 6 ml (0.03%) in 10 lit of water.	Transmit tristeza virus disease. Aphid reproduce parthenogenetic ally and viviparously
Citrus leaf miner	***Phyllocnistis citrella* (Gracillaridae : Lepidoptera)**	Citrus, Pommelo willow, cinnamon, *Loranthus* spp.	On leaf	In the mines	Larva mines in zig-zag manner forming galleries by feeding on epidermal cells. The leaves turn pale, get distorted and dry up.	Spray NSKE 5% or neem cake extract 5% or neem oil 3 % or imidacloprid 17.8 SL 125 ml per ha, Spray dichlorvos 76 WSC 1.0 L, dimethoate 2 .0 L per ha, Use 5-15 L of water per tree/1500-2000 L of water per ha	Nursery pest. Secondary infection by fungi and bacteria cause 'citrus canker'.
Fruit piercing moths	***Othreis materna*, *O. fullonica*, *Achoea janata* (Noctuidae: Lepidoptera)**	Citrus, mango, grapes and apple	on wild plants and weeds like *Tinospora cordifolia*, *Cocculus pendulus*, *C. hirsutus* ***Gulvel, Wasanvel and Chandvel***	Soil	Adult moth pierces the fruits for sucking the juice and makes characteristic pin-hole damage in fruits. Bacterial and fungal infections at the site of attack. Whole fruit turns yellow, drops from tree and looks like a premature fruit.	Destroy the weed host, Apply smoke to repel adult moth, light traps to attract adults. Cover the fruit with perforated poly bags. Set up Bait with fermented molasses / jaggery (10 g/ L) + malathion 50 EC 1 ml/L or Dispose fallen fruits, Spray with 2.5 kg of carbaryl 50 WP in 1000 L of water per ha at the time of maturity of fruits.	
Fruit fly	***Dacus dorsalis* (Trypetidae,**	Citrus, mango, grapes, pomegranate	just below the fruit epidermis	In soil	Maggots feed on pulp of fruits. As a result a brown patch appears	Harvest the fruits before ripening. Plough around the trees during winter to kill the	

	Diptera)	and apple			around the place of oviposition and the infested fruits start rotting, results in fruits drop prematurely	pupae. Fallen fruits should be collected and buried deep in the ground. Use male attracting fly trap baited with 0.1% methyl eugenol and 0.05% malathion @ 25 traps / ha.	
Pest	**Scientific Name**	**Host**	**Oviposition**	**Pupation**	**Nature of damage**	**Management**	**Typical characters**
Bark caterpillar	***Indarbela tetraonis* (Inderbelidae: Lepidoptera)**	Mango, guava, zizyphus, litchi, orange, pomegranate, bauhinia, loquat, mulberry, moringa, rose, guava and eugenia.	under loose bark of the trees	inside the stem	Young trees succumb to the attack. Caterpillars bore into the trunk or junction of branches make zig zag galleries made out of silk and frass. They feed on the bark. Flow of sap is hindered, plant growth arrested and fruit formation is drastically reduced.	Kill the caterpillars by inserting an iron spike into the tunnels. Injecting ethylene glycol and kerosene oil in the ratio of 1:3 into the tunnel, seal the opening with mud. Or piece of cotton in chloroform or petrol or kerosene ordichlorvos into the tunnel.	They hide in tunnel during day time, and feed at night Presence of webbings old trees are preferred
Citrus butterfly	***Papilio demoleus*, (Papilionidae: Lepidoptera)**	Citrus and other Rutaceae plants	On leaves	On twig	The young larvae feeding on the leaf lamina from margin to midrib. Grown up larvae feed on matured leaves and cause severe defoliation.	Hand pick larvae in nurseries and orchards. bird perches, *Trichogramma chilonis* Spray *Bacillus thuringiensis* 1 g /L or neem seed extract 3%. Spray Thiodicarb 75 WP @10 g or Acephate 75 SP @ 7 g or Quinalphos 25 EC @ 20 ml or Fenvalerate 20 EC @ 5 ml in 10 lit of water.	Newly hatched larvae look like a excreta of bird.
MAJOR PEST OF POMEGRANATE							
Anar butterfly / Fruit borer:	***Virachola (Duodorix) isocrates* (Lycaenidae: Lepidoptera)**	Aonla, apple, ber, citrus, guava, litchi, loquat, peach, mulberry, pear, sapota, tamarind.	on calyx of flowers and on tender fruits	inside fruit but occasionally outside on stalk of fruits,	Larvae bore inside the developing fruits and feed on pulp and seeds. Rind exhibit round bore holes. Infested fruits are attacked by bacteria and fungi, fall off and	Mechanical - Bagging of developing fruits with cloth or paper bag. Use light trap @ 1/ ha to monitor the activity of adults, Release *Trichogramma chilonis* at one lakh/acre. Spray NSKE 5% at flower initiation, At the beginning of	

					give an offensive smell.	fruit formation spray with Thiodicarb 75 WP @10 g or Acephate 75 SP @ 7 g in 10 lit of water.	

MAJOR PESTS OF MANGO

Pest	Scientific Name	Host	Oviposition	Pupation	Nature of damage	Management	Typical characters
Mango hoppers	***Idioscopus clypealis, Amritodus atkinsoni* (Cicadellidae : Hemiptera)**	Mango, citrus, mulberry, Sapota	Into the tissues of the young leaves		Both nymphs and adults suck the sap from tender shoots and inflorescence resulting in withering and shedding of flower buds and also wilting and drying of shoots and leaves. The flower stalks and leaves become sticky due to the the honey - dew secreted by the hoppers that attracts growth of black sooty mould on foliage and other parts.	Avoid close planting, Cleaning, Pruning of dense canopy, Avoid excess use of nitrogenous fertilizers. Spray Neem oil 5 ml/lit of water can be mixed with any insecticide. Spray neem seed kernel powder extract 5 per cent. Spray dimethoate 30 EC or malathion 50 EC 1.5 -2.0 L in 1500 – 2000 L of water per ha or acephate 75 SP @ 1 g/L, Thiamethoxam 25 WG @ 0.1 ml or Clothianidin 50 WP @ 0.12 g or imidacloprid 17.8 SL 0.3 ml/tree or lambda cyhalothrin 5 EC 0.5-1.0ml/L of water at 10 - 15 L of water per tree.	The hoppers take shelter in cracks and crevices on the bark during non-flowering season. Clicking sound - movement of jassids amidst leaves.
Stemborer	***Batocera rufomaculata* (Cerambycidae : Coleoptera)**	Mango, rubber, jack-fruit, fig, papaya, apple, eucalyptus and mulberry, morings and silk cotton.	on the bark or cracks and crevices on the tree trunk or branches	inside the larval tunnel in the stem	The grubs feed by tunneling the bark of branches and main stem. Shedding of leaves and drying of terminal shoots takes place in early stage of attack while damage to main stem causes tree death.	Grow varieties viz., Neelam. Remove and destroy dead and affected branches, Remove alternative hosts, Use probe to pull out the grubs from the bore holes. The bore holes be filled with DDVP @ 5 ml or monocrotophos 36 WSC 10 to 20 ml or one celphos tablet (3 g aluminum phosphide) and plug	

						with clay + copper oxychloride paste.	
Fruit fly	***Bactrocera dorsalis* (Tephritidae: Diptera)**	Mango, guava, peach, apricot, cherry, pear, ber, citrus, banana, papaya, passion fruit, coffee, melons, jack fruit, strawberry.	just beneath the skin of the fruit	in the soil	The maggots destroy and convert the pulp into bad smelling, discoloured semi liquid mass unfit for consumption, results in fruit drop and liquid oozes out from the fruit upon pressing.	Plough interspaces to expose and kill the puparia. Infested and fallen fruits should be disposed. Bait-spray of malathion 50 EC @ 2 ml/ L with molasses or jaggery (10 g/L) before ripening. Set up fly trap using methyl eugenol. – Rakshak traps.	
Pest	**Scientific Name**	**Host**	**Oviposition**	**Pupation**	**Nature of damage**	**Management**	**Typical characters**
Mango nut weevil	***Sternochaetus mangiferae* (Curculionidae: Coleoptera)**	Mango	on the marble sized fruits by scooping out the surface tissue	inside the nut	The grub tunnels in a zig-zag manner through the pulp endocarp, seed coat and finally destroys the cotyledons. Tunnel get closed As the fruit develops. The adults inside also feed on the developing seed and hasten the maturity of infested fruit.	Under-sized fruits should be picked and destroyed. General cleanliness, fallen fruits and stones, weevils. Cloth or paper bags for fruits. Spray malathion 50 EC 1ml/L or Quinalphos 3- 4 L in 1500-2000 L water per ha at marble stage of the fruit. During non flowering season spray the base of the trunk. Spray deltamethrin 1.5 - 2.0 L per ha after 6 weeks of fruit set.	
Gaint mealybug	***Drosicha mangifera* Margarodidae Hemiptera**		Inside the soil		Mealy bugs suck the sap from tender leaves and shoots, release a honey dew that attracts sooty mould fungus. Drying of leaves and inflorescence. Infested fruits covered with the white waxy coating, lead to fruit drop, or drying. If flower	Ploughing below the tree to expose eggs. Soil application of 2% methyl parathion dust to kill newly emerged nymphs. Use of greasy band to prevent the climbing of nymphs on trees or polythene sheets. Release Australian ladybird beetle, *Cryptolaemus montrouzieri* @ 10/tree. Spray Monocrotophos 36 SL @ 3 ml or Dimethoate 30 EC @ 1.5 ml/lit. water.	

					blossom is attacked, the fruit sets poorly.		
MAJOR PESTS OF BANANA							
Rhizome weevil:	***Cosmopolites sordidus* (Curculionidae: Coleoptera)**	Banana, cocoa	laid in small burrows scooped out by the beetle on the root stock or within leaf sheaths	Grub pupates within chamber made near the outer surface of the rhizome	Grubs bore into the rhizome causing death of unopened pipe, withering of outer leaves and finally death of the plant. Adult tunnels within stem, feeding on tissues. Bacterial and fungal infections lead to rotting. strong blast of wind, break plants..	Use healthy and pest free suckers. Trap the adult weevils by placing chopped pseudostem Uproot and destroy infested rhizomes. Soil incorporation of carbaryl 5D 10-20 g/plant or carbofuran 3G 20 g/plant or phorate 10 G 10 g/plant around pseudostem.	
Pest	**Scientific Name**	**Host**	**Oviposition**	**Pupation**	**Nature of damage**	**Management**	**Typical characters**
Banana aphid:	***Pentalonia nigronervosa* (Aphididae: Hemiptera)**	Banana, cardamom , *Alocasia* sp, *Colocasia* sp, caladium	Adults reproduce parthenogenetically		Aphids in colonies on leaf axils and pseudostems suck the sap. Aphid produces honeydew that is colonized by sooty mold. The affected leaves become brittle and small.	Employ Coccinellids, Spray monocrotophos 36 SL 1.5 - 2.0 L, methyl demeton 25 EC or dimethoate 30 EC 3.0-4.0 L in 1500-2000 L water/ ha towards the crown and pseudostem base. Inject pseudostem with monorotophos @1 ml in 4 ml of water per tree.	Transmit Bunchy top of banana-Viral disease
Pseudostem borer:	***Odoiporus longicollis*** Dryophthoridae Coleoptera			inside the tunneling	Grub bore into pseudostem making tunnels, Cutting holes on outer surface, blackened mass comes out from the bore hole, Tunneled part decomposes and pseudostem wilts.	Remove dried leaves periodically and keep the field clean Prune the side suckers every month Use healthy and pest free suckers to check the pest incidence Do not dump infested materials into manure pit Uproot infested trees, chop into pieces and burn Use longitudinally split pseudostem	

						trap at 65/ha	
MAJOR PESTS OF GUAVA							
Spiralling whitefly	***Aleurodicus disperses (Aleyrodidae : Hemiptera)***	Banana, Citrus, Guava, papaya, mulberry, tapioca etc.	On the lower surface of leaves	On the lower surface of leaves	As a result of the sap sucking by nymphs and adults leaves show signs of chlorosis, wither, crinkle and curl, are covered with sooty mould and ultimately drop down.	Collection and destruction of infested leaves. Setting of yellow sticky traps @ 25 / ha for adults. Natural enemies *Encarsia* spp. Spray Monocrotophos 36 EC @ 1.5 ml or Dimethoate 30 EC @ 1.5 ml/L. water or Dichlorvas 76 EC @ 2 ml/L water.	Quarantine pest from Central America
Fruit Borers	***Congethes (Dichocrocis) punctiferalis (Crambidae : Lepidoptera)***	Papaya, citrus, cardamom	On tender leaves and fruits	Inside the fruit	Caterpillar bores into young fruits, Feeds on internal contents (pulp and seeds) Dry up and fall off in without ripening	Collect and destroy damaged fruits, Clean cultivation as weed plants serve as alternate hosts Use light trap @ 1/ ha to monitor the activity of adults. Spray malathion 50 EC 0.1%	

GRANULAR INSECTICIDES

Carbofuran 3 G @ 25 kg/ha

Benfuracarb 3 G @ 33 kg/ha

Chlorantraniliprole 0.4 G @ 10 kg/ha

Fipronil 0.3 G @ 17-25 kg/ha

Cartap hydrochloride 4 G @ 18.75 kg/ha

Phorate 10 G @ 10 kg/ha

Quinalphos 5 G @ 15 kg/ha

Clothianidin 50 WDG @ 250 g/ha

Carbaryl 4 G @ 6.250 kg/ha

Imidacloprid 0.3 G @ 15 kg/ha

SYSTEMIC INSECTICIDES

Thiamethoxam 25 WG 100 g/ ha using water @ 500-600 L/ha

Acetamiprid 20 SP 50 g/ ha using water @ 500-600 L/ha

Imidacloprid 17.8 SL 100 ml / ha using water @ 500-600 L/ha

Dimethoate 500 ml / ha using water @ 500-600 L/ha

Profenofos 50 EC 1.0 L/ ha using water @ 500-600 L/ha

Thiacloprid 21.7 SC 100-125 ml / ha using water @ 500-600 L/ha

Monocrotophos 36 SL 1.0 L/ ha using water @ 500-600 L/ha

Fipronil 5 SC 1.5-2.0 L/ ha using water @ 500-600 L/ha

STOMACH AND CONTACT INSECTICIDES

Quinalphos 25 EC @ 1.0 L/ ha using water @ 500-600 L/ha

Chlorpyriphos 20 EC @ 1.0 L/ ha using water @ 500-600 L/ha

Acephate 75 SP @ 1000 g/ ha using water @ 500-600 L/ha

Thiodicarb 75 WP 1.0 L/ ha using water @ 500-600 L/ha

Indoxacarb 14.5 SC 500 ml / ha using water @ 500-600 L/ha

Indoxacarb 15.8 EC 500 ml/ ha using water @ 500-600 L/ha

Methomyl 40 SP 750-1125 g/ ha using water @ 500-600 L/ha

Profenofos 50 EC 1.5-2.0 L/ ha using water @ 500-600 L/ha

Malathion 50% EC 1.0-1.5 L/ ha using water @ 500-600 L/ha

CONTACT INSECTICIDES

Lambda-cyhalothrin 5 EC @ 250 ml/ ha using water @ 500-600 L/ha
Cypermethrin 10 EC 500-700 ml/ ha using water @ 500-600 L/ha
Deltamethrin 1.8 EC 600 ml/ ha using water @ 500-600 L/ha
Fenvalerate 20 EC 500 ml/ha using water @ 500-600 L/ha
Permethrin 25 EC 500 ml/ha using water @ 500-600 L/ha

STOMACH INSECTICIDES

Chlorantraniliprole 18.5 SC @ 150 ml/ ha using water @ 500-600 L/ha
Flubendiamide 20 WG @ 125 g/ ha using water @ 500-600 L/ha
Flubendiamide 39.35 SC @ 125 ml/ ha using water @ 500-600 L/ha
Spinosad 45 SC @ 150 ml/ ha using water @ 500-600 L/ha
Emamectin benzoate 5 SG @ 220 g/ ha using water @ 500-600 L/ha
Novaluron 10 EC 750 ml ha using water @ 500-600 L/ha

ACARICIDES

Dicofol 18.5 EC 1.0 L in 500-600 L water per ha
Wettable sulphur 40 WP 3.0 kg in 500-600 L water per ha
Chlorfenapyr 10 SC 750-1000 ml in 500-600 L water per ha
Diafenthiuron 50 WP 600 g in 500-600 L water per ha
Lambda cyhalothrin 5 EC 300 ml in 500-600 L water per ha
Ethion 50 EC 1.5-2.0 L in 500-600 L water per ha
Milbemectin 1 EC 325ml in 500-600 L water per ha
Propargite 57 EC 1.5 L in 500-600 L water per ha
Spiromesifen 22.9 SC 400 g in 500-600 L water per ha

INSECTICIDES FOR DUSTING

Chlorpyrifos 1.5 DP @ 15 kg/ha
Cypermethrin 0.25 DP @ 20 kg/ha
Fenvalerate 0.4 DP @ 20 kg/ha
Malathion 5 DP @ 25 kg/ha
Methyl parathion 2 DP @ 25 kg/ha
Phosalone 4 DP @ 25 kg/ha
Quinalphos 1.5 DP @ 25 kg/ha