

# INSECT PESTS OF FRUITS



# CITRUS PSYLLA



# *Taxonomy*

- *T.N:*        *Diaphorina citri*
- *Family:*    Psyllidae
- *Order:*     Homoptera



# Identification

- The insect is **brown** with its **pointed head**
- The nymphs are **flat, louse like** and **orange yellow**, congregates in large numbers on the young leaves and the buds



# *Life Cycle*

- The adults lay **500 almond-shaped, orange and stalked eggs** on tender leaves and shoots of citrus trees
- The eggs are laid either **singly or in groups** which **hatch in one week** in the summer
- There are **5 nymphal stages** and the development is completed in **2 weeks**
- Full grown nymphs migrate to the lower surface of the leaves and convert into adults
- There are **8-9 overlapping generations** in a year

# Life Cycle



# Damage

- With the help of their sharp, piercing mouthparts, they **suck the cell-sap**
- The vitality of the plants deteriorates and their **young leaves and twigs stop growing** further
- The leaf-buds, flower-buds and the leaves may **wilt and die**
- Moreover, the **nymphs secrete drops of a sweet thick fluid** on which a **black fungus** develops, adversely affecting photosynthesis
- This insect is also responsible for spreading the **greening virus**
- If the pest is not checked in time, the **entire orchard may be lost within one or two years** of continuous damage









# Citrus Greening



# Control



- Ladybird beetles and green lace wings are important natural enemies of citrus psylla
- Spray trees with imidacloprid SL 40ml/100 l of water or endosulfan EC 200ml/100 L of water





# **CITRUS CATTERPILLAR / LEMON BUTTERFLY**



# *Taxonomy*

- *T.N:*        *Papilio demoleus*
- *Family:*    Papilionidea
- *Order:*     Lepidoptera



# *Identification*

- **Eggs** are small, rounded and pale in colour
- The **caterpillar** is yellowish green with few oblique brownish strips
- It has a horn like structure on the dorsal side of the body
- The caterpillar also have two reddish sacs posterior to head
- The **adult** is a large beautiful butterfly with green colored wings having black spots







# *Life Cycle*

- The female lays nearly 100-150 eggs, singly or in groups
- Larva lives for 1-2 weeks
- Larva spins a cocoon around its body and pupates
- Pupal duration is one week
- Adult life is less than one week

# Damage

- Larva feeds on **young/ tender leaves** and terminal shoots
- Their habit is to **eat from edge up to midrib**
- Larger caterpillar can feed on **mature leaves**



# Control

- Hand picking of larvae
- *Trichogramma spp.* are effective egg parasitoids
- Spray of 3% neem extract is also effective
- Spray trees with endosulfan 35 EC / methamidophos 60SL (200ml/100 L of water)

# CITRUS LEAFMINER



# *Taxonomy*

- *T.N:*        *Phyllocnistis citrella*
- *Family:*    Gracillariidae
- *Order:*     Lepidoptera



# Identification

- Eggs are **minute** and **transparent**
- Larva is **legless**, **pale yellow** in colour
- Adults is a **tiny moth** and **silvery white** in colour
- Fore and hind wings have **fringe of hairs**

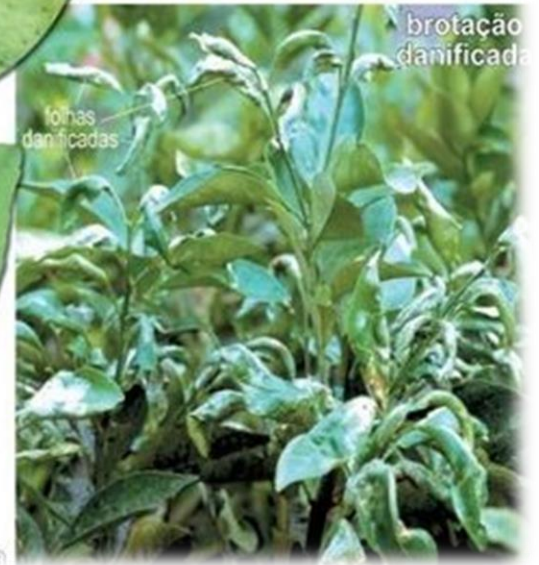
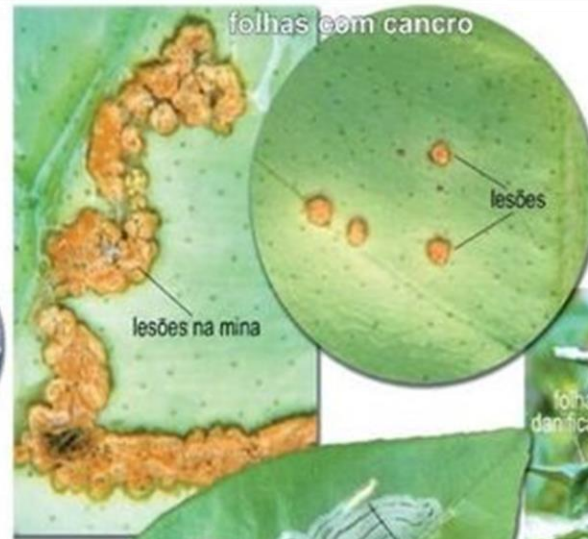
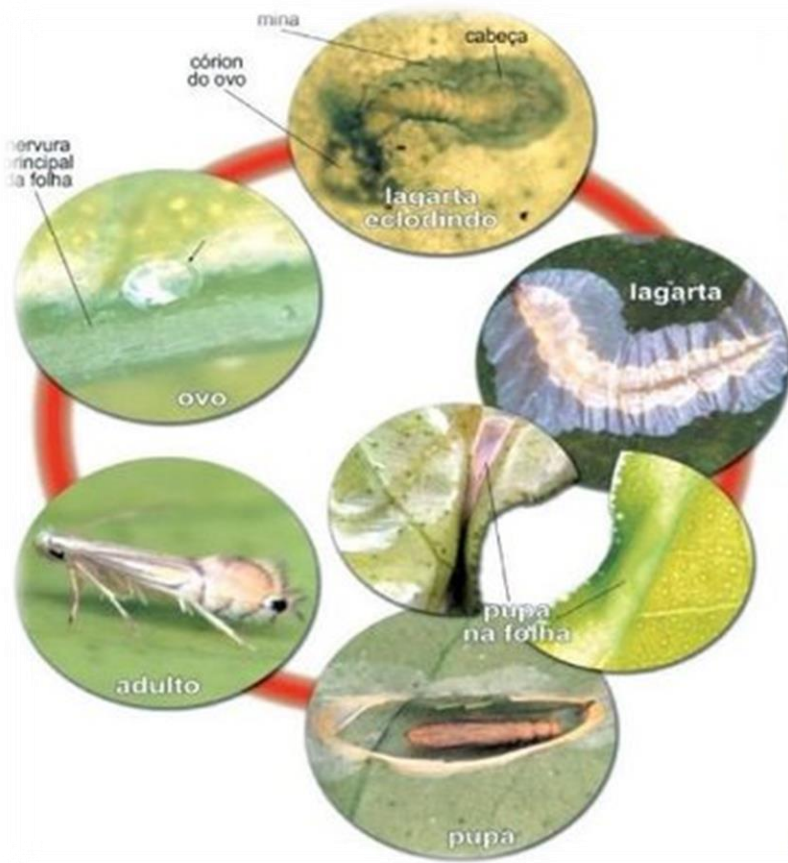




# *Life Cycle*

- The female lays eggs **singly** on leaves
- Larva lives for **2-4 weeks**
- Mature larva settle down in galleries **near the leaf margins**
- Later on, larva **spins a cocoon** and **pupates**
- Pupal duration is **1-2 weeks**
- Adult life is **2-3 weeks**

# Life Cycle



# Damage

- This pest is **active through the year**
- Larvae **mine into young / tender leaves** and form **zigzag galleries** between upper and lower leaf layers
- Infestation of this insect results in infection of **citrus canker**



# **Control**

- **Collection and burning** of mined leaves
- Spray of 2% **neem extract** is also affective
- **Bifenthrin** 10 EC 40ml/100 L of water
- **Imidacloprid** 200 SL 40ml / 100 L of water



# MANGO HOPPERS



# *Taxonomy*

- *T.N:*        *Amritodus atkinsoni*
- *Family:*    Cicadellidae
- *Order:*     Homoptera





# Identification

- Adult are **grayish**
- There are **three dark brown spots** on the head,
- **A median band** and **two black spots** on the pronotum



# Life Cycle

- The pest is active during the **hot months** of **May-June** and the **cold months** of **October-January**
- The adults emerge in **February** from underneath the bark of trees and other places of shelter
- When the inflorescence appears, they **start laying eggs** in them in the **2<sup>nd</sup> or 3<sup>rd</sup> week of February** and continue to do so for some weeks
- Female deposits **200 eggs, singly**, that hatch and the newly emerged **nymphs** are first seen at **end of February** or in **early March**
- The life cycle is completed in **2 weeks**

# Life Cycle

- The adults are mostly seen **congregated** on the lower portions of the branches and trunks
- There is a **second cycle** of brood-rearing, starting with the **monsoon**
- **Eggs and nymphs** of this of this generation are found during **July-August** in the **sub-mountain districts** of the Punjab
- **Adults** of this generation emerge in **September** and they hibernate during the winter



# Damage

- The **nymphs** are particularly **harmful**, as they are voracious feeders
- They cause the **inflorescence** to **wither** and **turn brown** by sucking cell sap
- Even if the flowers are fertilized, the subsequent **development** and **fruit -setting** may **cease**
- The nymphs also **secrete** drops of a **sweet thick fluid** on which a **black fungus** develops, adversely **affecting photosynthesis**



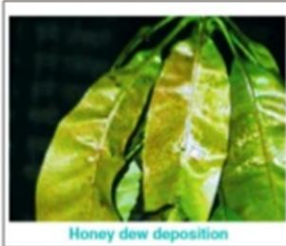


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**Damage symptoms due to Mango Hopper**



**Sooty Mould formation on mango leaves due to Mango Hopper infestation : - A secondary symptom.**



Honey dew deposition



# Control

- Dense plantings should be avoided
- Waterlogged conditions should be avoided
- Natural enemy (parasitoid) of mango hopper is *Epipyrops spp* should be encouraged
- Spray trees with Deltamethrin EC 400ml/100 L water or Imidacloprid SL 50ml/100 L of water



# MANGO MEALYBUG



# *Taxonomy*

- *T.N:*            *Drosicha mangiferae*
- *Family:*        Margarodidae
- *Order:*          Homoptera



# Identification

- Eggs are pinkish
- The wingless females are oval and flattened, with their body covered with white mealy powder
- They males have one pair of black wings and other is crimson red



# *Life Cycle*

- The pest is **active** from **December to May** and spends **rest of the year** in the **egg stage**
- The eggs are generally **deposited** in **April- May** in the **soil up to 15 cm**, within **silken purses** and the **dead body** of the **female** often found **sticking** to them
- They **hatch** in the **end of December** or in **January**
- Thus the **nymphs appear before** the **fresh growth** of the mango trees

# *Life Cycle*

- Eventually, they **congregate on the panicles** where they feed on the cell sap and pass through three stages

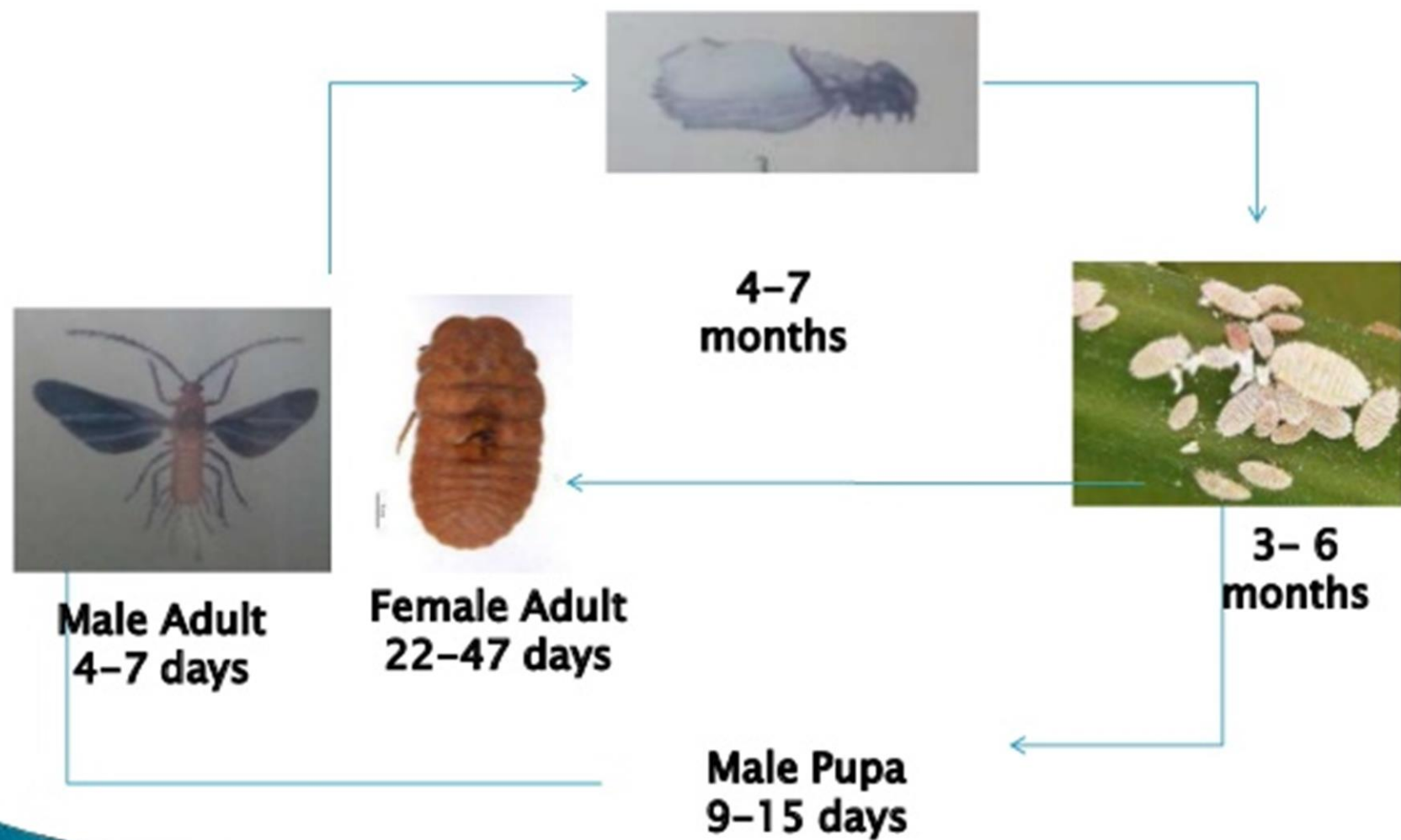
The duration of:

- **First stage** runs from the **middle of December- early February**
- **Second** from **February - middle of march**
- **Third** from **March– April**
- The female mature after **5 weeks** and **lay eggs for 6 weeks** during **April-May**





# Life Cycle



# Damage

- Only the **nymphs** and **wingless females** are **destructive** and they **suck juice**, causing the tender shoot and flowers to **dry up**
- The **young fruits** also **become juiceless** and **drop off**
- The pest is responsible for causing **considerable loss** to the mango growers and when there is a serious attack, the **tree retain no fruit** at all



# Control

- Destroy the eggs laid under the infested tress.
- For this purpose, all dry leaves and twigs should be burnt in May- June
- The soil should be scraped to a depth of 15 cm to expose the eggs
- Nymphs should he prevented from crawling the trees by applying 8 cm wide sticky bands with greasy material
- Or slippery bands or plastic sheets around the trunks at about one meter above the ground level during the 2<sup>nd</sup> week of December

# **Control**

- **Removal and destruction** of **weed** hosts
- **Coccinellid beetles** are important predators of this pest
- The nymphs congregating below the bands may be killed by spraying them with **Acetamiprid** SP 100ml/100 L of water or **Imidacloprid** SL 50ml/100 L of water

# FRUIT FLY

Oriental fruit flies (Adults)



Female

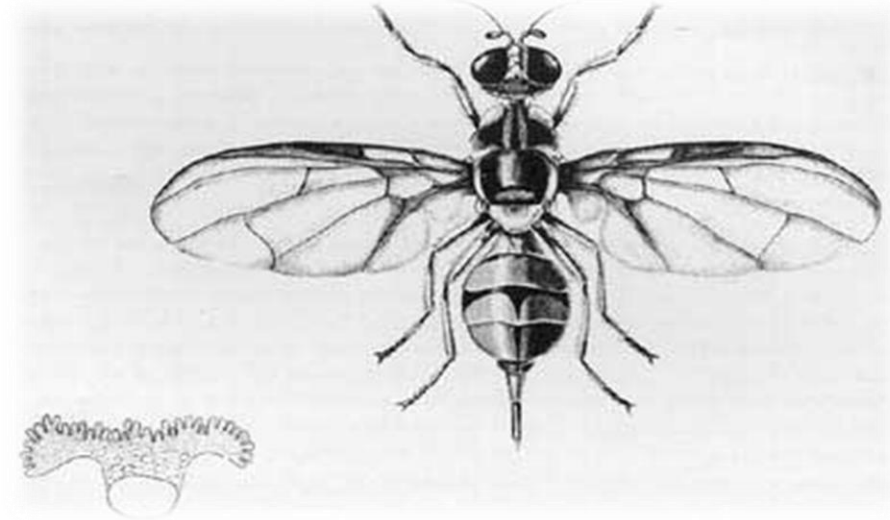


Male



# *Taxonomy*

- *T.N:*        *Bactocera dorsalis*
- *Family:*    Tephritidae
- *Order:*     Diptera



# Identification

- A female lays **50 eggs** on an average
- The **maggots are legless** and **yellowish** in colour
- Fruit flies can be easily distinguished from ordinary flies by their **triangular shaped abdomen** and **spotted wings**



# Life Cycle



**Adult**

7-14 days to  
sexual maturation



**Eggs**

## **Oriental fruit fly Life Cycle**

1-3 months



1-2 days



**Larvae**

10-14 days



**Puparia**

7-12 days



# Life Cycle

- Shining **whitish cigar shaped eggs** are thrust into the **skin of the ripening fruit**, these hatch into footless maggots
- Maggots feed on the **fruit pulp** by burrowing into it
- When **full fed**, they generally **go to the soil**, convert themselves into seed like **pupa** under the soil and emerge as flies after **a week or ten days**
- Life cycle is completed in **5-13 weeks**
- There are **many generations** in a year



# Damage

- Only **maggots** are destructive
- They maggots of these flies **bore** into the **repining fruits** and very often cause appreciable injury, the **fruits** begin to **rot** and **drop**
- All sort of **fruits** and **cucurbits**, especially **melons** and **bitter gourds** suffer from these flies





# Control

- **Damaged fruits** should be rapidly **destroyed** and the flies trapped by poisoned syrups to prevent egg laying
- **Ploughing of soil** and **heavy irrigation** are also helpful
- **Pheromone traps** of **methyl eugenol** are effective for their control
- **Braconid wasps** are effective in controlling these flies
- Spray **Trichlorphon** WP 170 gm/100 L of water or **Dichlorvos** EC 100ml/ 100 L of water