

# INVERTEBRATE PESTS

Two decorative diagonal lines, one orange and one green, cross the bottom left of the slide. The orange line is composed of a series of small, overlapping circles, and the green line is composed of a series of small, overlapping squares.

# Plant Pests – Main groups of pests

## Insects

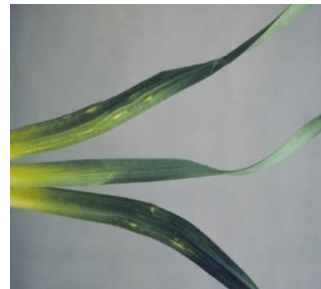
- Sap suckers
- Chewers and tunnellers



## Mites



## Nematodes





# Insect pests – sap suckers



Photos:  
Top: woolly aphid on apple,  
mealybugs  
Bottom: whitefly scales, scale  
insects



# Different types of sap-sucker



Aphids



Whiteflies – adults and scales



Scale insects



Thrips



Mealy bugs



Psyllids



# Insect pests – sap suckers

- Unsightly
- Reduce vigour
- Cause discolouration
- Cause distorted growth
- Produce honeydew
- Sooty mould growth
- Transmit viruses

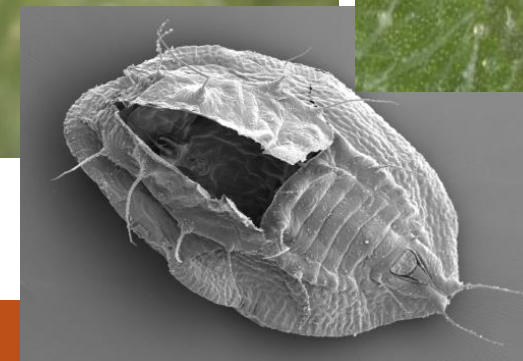


Photos: Top row: left: bay sucker damage, right: tomato spotted wilt virus (thrips-transmitted). Middle row: left cherry blackfly damage, right: sooty mould on hebe. Bottom row: left: thrips damage to flower, right: woolly aphid.

# Key species - Tobacco whitefly (*Bemisia tabaci*)

- Can feed on over 800 different plant species.
- As well as causing plant damage from its feeding, honeydew and associated sooty mould, it can transmit over 100 different plant viruses, including some very damaging ones not present in the UK, such as tomato yellow leaf curl virus.
- It is commonly transported in the horticultural trade, e.g. cases on poinsettia cuttings.
- Adult tobacco whiteflies hold their wings in a tent-like fashion, & slightly apart to reveal the yellow body. In comparison, the indigenous and common glasshouse whitefly holds its wings flatter and closer together so you can't see the body.

Photos: *B. tabaci* pupa and adult. Smaller adult photo on animation is glasshouse whitefly.





# Insect pests – chewers and tunnellers

Photos:

Top left: Solomon's seal sawfly

Top right: leaf mine caused by the cherry leaf miner (moth)

Bottom left: longhorn beetle larvae in a stem

Bottom right: Spodoptera caterpillars (moth)





# Insect pests – chewers and tunnellers

## Butterfly and moth caterpillars

- Some will chew leaves and stems, some tunnel into fruit or vegetables, some act as leaf miners.



### Photos:

Top left: Spodoptera caterpillar tunnelling into a flower head

Top right: Mullein moth caterpillar feeding on flower

Bottom left: Tunnels in tomato fruit caused by *Tuta absoluta* (South American tomato moth)

Bottom right: Leaf mines caused by caterpillars of the horse chestnut leaf-mining moth





# Insect pests – chewers and tunnellers

## Sawfly larvae

- Related to bees, wasps & ants, larvae look like caterpillars, adults like small flies or wasps.

Photos:

Top left: Solomon's seal sawfly

Top right: Rose leaf-rolling sawfly

Bottom left: scar caused by apple sawfly

Bottom right: Geun sawfly larva

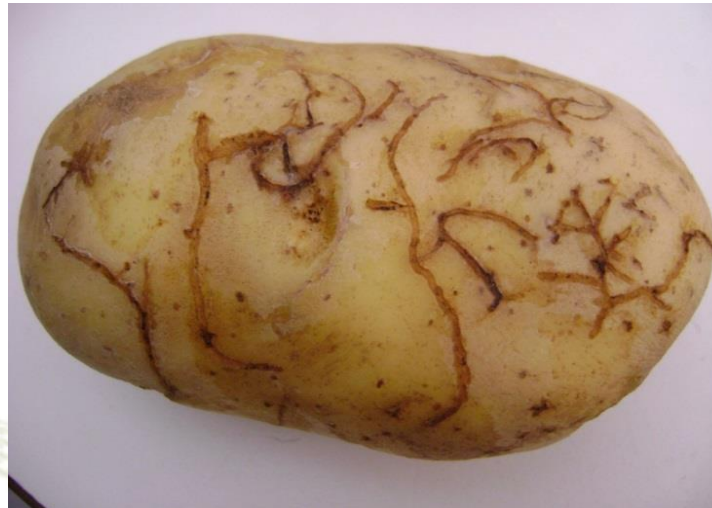




# Insect pests – chewers and tunnellers

## Beetles and their larvae

- Over 400,000 species worldwide, make up 40% of all insect species. More than 40 species are quarantine organisms in the EU.
- Symptoms include chewing damage, tunnelling and boring, according to species. Mainly caused by larvae, but adults sometimes also cause damage.



Photos:

Top left: Colorado beetle larva & adult; top right: Asian longhorn beetle larvae, pupa, adult

Bottom left: *Epitrix* (potato flea beetle) tuber damage; bottom right: *Viburnum* beetle larvae



# Insect pests – tunnellers

## Fly larvae

- Have sucking rather than chewing mouthparts, but will tunnel into plant tissues.
- Includes leaf miners & fruit flies (latter really suck in juices but still burrow into the fruit)



Photos:

Top – Leaf miner adult, celery leaf miner damage

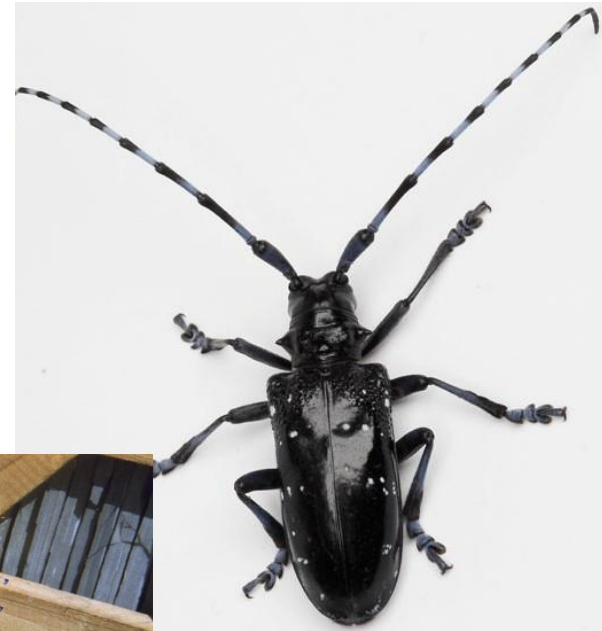
Bottom – Mango damaged by fruit fly, fruit fly larva



# Key species - Asian and citrus longhorn beetles (*Anoplophora* spp.)

- Neither are present in the UK.
- Larvae cause substantial damage to broadleaved trees by burrowing in trunk and branches.
- Citrus longhorn tends to arrive in young plants (often Acer), Asian longhorn in timber products (e.g. pallets)
- Outbreak of Asian longhorn in Kent in 2012, Paddock Wood area. Eradicated but over 2000 trees felled.

Photos: adult emergence hole, larval damage on timber crate, tunnel in stem, adult citrus longhorn, citrus longhorn larva in stem.





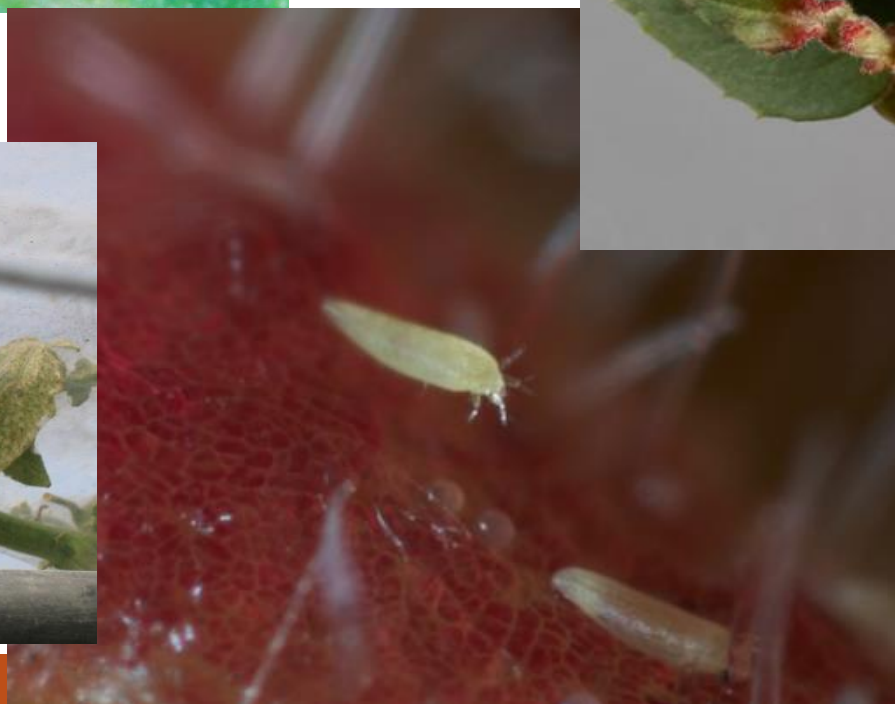
## Key species - *Liriomyza* species (leaf-mining flies)

- 4 quarantine-listed species in EU (39 species indigenous to UK but these have limited host ranges and do not damage commercial crops).
- Quarantine species have potential to cause substantial damage to a range of glasshouse crops (both edible and ornamental).
- Adults are small flies with a yellow spot on their back; they leave puncture marks on foliage when laying eggs. Larvae burrow in leaves and cause the major damage.





# Mites





# Mites

- Suck sap
- Reduce vigour, yield loss
- Cause yellowing
- Cause distorted growth
- Some mites (e.g. tarsonemid) are found commonly within the growing points. Others feed more widely.
- Gall mites can cause very characteristic distortion of their host plant (e.g. the fuchsia and sycamore pictures).



# Nematodes

## Photos:

Top left: angular leaf spot caused by leaf and bud nematode on strawberry

Top right: Cysts on roots of potato plants caused by the potato cyst nematode

Bottom left: Internal rotting of a daffodil bulb caused by *Ditylenchus*

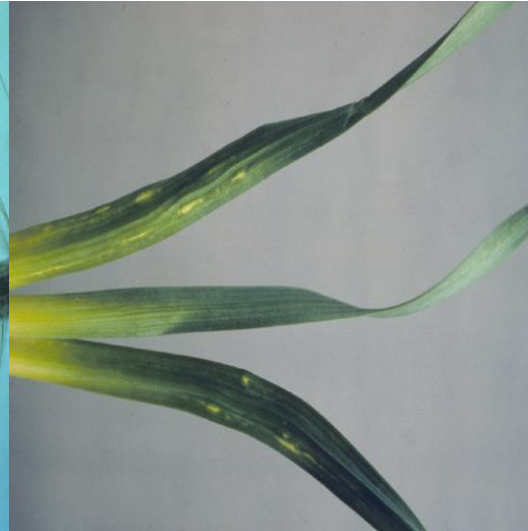
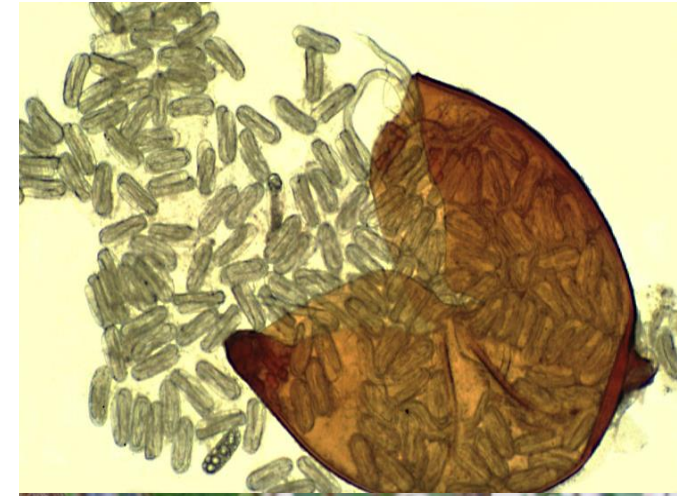
Bottom right: *Pratylenchus* sp – a free-living nematode viewed under a microscope





# Nematodes

- Plant parasitic nematodes are microscopic and worm-like
- Can affect roots or aerial parts of plants
- They can cause stunting, distortion, leaf spots
- May transmit viruses



Photos, top right to bottom left:  
Potato cyst nematode cyst and eggs  
viewed under a microscope, leaf and  
bud nematode on buddleia,  
*Ditylenchus* (stem nematode) on  
daffodil, same, nematodes attracted  
to plant roots.



## Key species - *Ditylenchus dipsaci* (stem & bulb nematode)

- *Ditylenchus dipsaci* infesting onion
- Progression of symptoms from left (healthy) to right (severe infestation)

