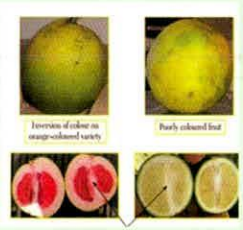
15th Seeds of GOLD Farm Clinic

CITRUS PESTS AND DISEASE MANAGEMENT

7th /SEPT/2019 AT MUZARDI KAMENYAMIGO MASAKA



Control of Citrus greening

- Is a highly destructive disease
- It seriously affects citrus production in the Indian subcontinent, Asia, The Arabian Peninsula and Africa.
- Trees affected by greening at an early age do not come into production
- It is a graft transmissible disease.
- Reduction of the inoculums by removal of the affected trees
- Planting in the environmental zones unfavorable for the spread of the vectors
- Propagating trees from greening free zones.

Tristeza (Citrus Tristeza Virus-CTV)



Tristeza is an economically important viral disease of citrus. The virus is a member of the clostero virus. Trees grafted with sour orange have been killed by the CTV induced decline. The decline of trees on sour orange was called Tristeza which means sadness. It is also transmitted by aphids.

Symptoms

- Seedling yellows. Severe chlorosis and dwarfing
- Decline scions become dwarfed, chlorotic and often they die. The decline results from the viral effects on the phloem of the rootstock just below the bud union.
- The decline lasts over a period of several years or rapidly.
- Trees that decline slowly generally have a bulge above the union, and honeycombing is present
- When trees decline rapidly, honeycombing does not occur, but a brown line may be observed at the bud union after the bud is removed
- Trees are stunted and may have a bushy appearance

Control.

In CTV free-areas CTV introduction and spread should be prevented by quarantine, use of clean stock and certification.

Photo of Valencia grafted on a sour orange root stalk Affected by citrus tristeza

Citrus Psyllid (Trioza erytreae)

CITRUS PESTS



The Psyllid is a vector of the citrus greening. Adult is aprox 2mm long. Damaged leaf as seen on the right

Symptoms

- Leafs are pitted, the pits open onto the lower Leaf surface
- Eggs are yellow and laid on lower leaf surface

Control: Spray during flush growth with Dimethoate.

Citrus black fly, Aleurocanthus woglumi



Symptoms: Shiny black scale like insects on underside of leaves, approximately 1mm Leaf surfacemay have spots of sticky transparent honey dew or sooty mould.

Citrus aphids(Toxoptera spp), vector of the CTV disease

Control; New stock can be defoliated and dipped into a solution of dimethoate as a preventive measure before planting.



Symptoms:

-Clusters of black and brown aphids on flush growth.

-Classical case of natural bio control of aphids by the ladybird insect seen

Control

-Spray with dimethoate during flush growth

-Contact insecticide may be used in heavy infestation



The citrus aphid

Citrus root mealy bug (Planococcus citr)

They appear as a white fluffy mass on leaves and fruits. Leaves may wilt and turn yellow



Control

- The soil under the tree should be dusted with appropriate insecticide, especially round the collar.
- The Insecticide should be worked into the top layers of the soil.
- Mulch and irrigation should also be provided round the affected tree
- On foliage, dimethoate can be used

Soft green scale, *Coccus spp*

These appear as rows of flat green, oval, immobile scales especially along the main leaf veins.



Control

Natural enemies can address the issue of scales however in extreme cases dimethoate can be used.

Cottony cushion scales, *(Icerya purchasi)*



Control: Natural enemies or use of chemical control if severe.

Citrus thrips *(Scirtothrips aurantii)*



Symptoms

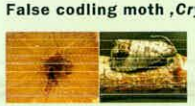
Thrips cause a ring of scaly , brownish tissue round the stem end of the fruit and irregular areas of scarred tissue On other parts of the fruit.

Thrip damage on fruit and young shoots above

Control

- Spray fruits towards the end of the flowering period
- When three quarters of the petals have fallen
- The spray should be repeated after 10 day

False codling moth ,*Cryptophlebia leucotreta*



Also known as the late ball worm of cotton. The eggs are laid outside the fruit but the larvae Penetrate into the fruit after hatching. The larvae are approximately 15mm and pink.

Control; Orchard sanitation

Surveillance and pest freedom status. Not yet applicable due to high costs but can be considered.

Blue mold

It occurs in citrus producing regions of the world, but is less prevalent than the green mold. All types of citrus are susceptible to blue mold



Penicillium decays

Symptoms

- Diseased tissue becomes soft, watery and slightly discolored and easily punctured
- The lesions enlarge more slowly than those of the green mold.
- A white powdery growth of mycelium develops on the lesion surface and soon blue mass forms leaving only a narrow white fringe of mycelium surrounding the lesion.
- Pronounced halo water soaked faded tissue surrounds the lesion between the fringe of the mycelium and the sound tissue. The blue spores covering the fruit may become brownish with age.
- The casual organism is the penicillium italic.

Control

- Careful picking and handling of the fruit minimizes injuries to the rind and risk of blue mold
- Disinfectants such as alcohol should be used to prevent inoculums buildup
- Spore population is kept low in packing area when infected fruit is removed promptly.
- Keep fruit damping area away from the packing area, at least 100 metres away.
- Apply Benomyl 3 weeks before harvest to suppress to inoculum count.
- Thiabendazole and carbendazim can be applied as post harvest treatment also to suppress the inoculums. The two are used alternatively to overcome development of resistance.
- Immediate cooling after packing significantly delays development of the mold especially if combined with fungicide application.

Green mold

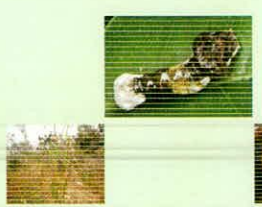


It is the most common and serious post harvest disease of citrus. Millions of spore are produced on the surface of the infected fruit.

Symptoms

- Initial symptoms are similar to those of green mold and sour rot
- A white powdery growth of mycelium develops on the rind surface and after it reaches a diameter of 2cm a green spore is produced.
- The entire fruit will then be encompassed with olive green spores which are easily dispersed if the fruit is handled , shaken or exposed to wind.
- If the relative humidity is low, the whole fruit shrinks to a wrinkled dry matter.
- If the humidity is high other molds and bacteria become involved and the fruit collapses as a decomposing mass

ORANGE DOG(Carterpillars)



Extreme case of dead Scales and mealy bugs can appear like melannose

Citrus canker(Xanthomonas Axanopodis)

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Some of the most common citrus fruit diseases include the following; Phytophthora foot rot, Gummosis

Symptoms

• Gummosis causes the most serious soil borne root diseases of citrus. It has world-wide indistribution and causes production losses in irrigated areas, high rainfall areas and poorly drained areas.

• They cause damping off, root rot, gummosis, brown rots in groves

Lesions occur on trunks near ground level. Scrapping the tree back reveals brown discoloration. The tree back may dry and peel off..

Foot rot or gummosis can also occur on a wound or bark crack around the base of the trunk or at the bud union. Lesions may spread around the circumference of the trunk slowly girdling the tree. Phytophthora root rot symptoms progress much more rapidly in the presence of the citrus root weevil. Diaprepes abbreviatus.



• The most widespread and important phytophthora species include:

• The P. nicotianae, P.parasitica and P. citrophora.

• P. nicotianae is the most common in the sub-tropical areas and causes foot rot, gummosis and root rot but does not attack the tree above the ground.

• P. citrophora causes gummosis and root rot in the Mediterranean, subtropical and tropical climates and also attacks aerial parts of the trees causing foliage blights

Alternaria brown spot

Brown spot is a serious disease of citrus especially in humid areas. It causes defoliation, fruit drop and fruit blemishes on susceptible cultivars.(Mineola, Dancy and its hybrids, Nova, grape fruit).Even in semi-arid areas blemishes on the peel can reduce the marketability of the fruits.

Alternaria on leaves



Alternaria Symptoms



• Alternaria on young leaves it appear as tiny brown to black spots which become surrounded by a hole.

• Lesions expand and appear as circular or irregular blight areas.

• It may produce a die back on twigs.

• On more mature fruits the symptoms vary from small dark specks to large black lesions.

Control of Alternaria

• Much of the spread of Alternaria citri on citrus is attributed to the dispersal by the infected plantlets.

• If the foliage remains dry the disease never develops.

• Fields should be located in areas with good air circulation. Low lying and foggy areas should be avoided.

• Increasing the spacing between trees and pruning helps to minimize the brown spot problem

• Use Fungicides to control.



Melanose Melanose (Diaporthe citri) fungal

• This disease is present in most of the citrus growing areas but is important only in areas where fruit is produced for the fresh market

• Grape fruit and lemon tend to be more affected than others plants.

• Infection is only severe If there are large amount of dead wood in the tree canopy, to provide a substrate for production of inoculums

Symptoms

• Symptoms appear as small brown discrete sunken spots

• The pustules on leaves are first surrounded by a yellow halo but later the chlorotic areas regreen and the corky pustules are the only symptoms

• Melanose can be distinguished from rust mite injury by the raised pustules it produces in contrast with the smooth blemish caused by the rust mite.

Control

• Topping trees that have large amounts of dead wood in the canopy can remove some inoculums and reduce the disease

• Copper based fungicides give the best control

• Fungicide application should continue until when the fruits are two third their final size.

• The disease has been observed on all citrus varieties and lime is the least susceptible



Phaeoramularia angolensis (Cercospora fruit and leaf spot







Symptoms

• On leaves the fungus produces circular mostly solitary spots that are about 10mm in diameter with light brown or grayish centers

• Each center is surrounded by prominent yellow halo.

• During the rains leaf spots of young shoot coalesce and culminate into generalized chlorosis.

• On fruit the spots are circular to irregular, discrete or coalescent and surrounded by yellow halos.

• On young fruits the symptoms start as nipple like swellings without halos. Spots on mature fruits are flat, and often dark brown to black sunken margins





Citrus scab Citrus scab (Elsinoe fawcettii) fungal disease

Control

• Application of copper based fungicides e.g. Copper hydroxide has proved effective.

• Application of Fungicide should be made every fortnightly until the fruits are resistant.

Is cosmopolitan in humid areas and important where citrus is grown for the fresh market.



Raised pastules of citrus scab



Raised tissue on the area affected by citrus scab on sweet orange



Flat tissue on the area affected by scab

Symptoms

• Initially scab pustules which consist of a mixture of fungal and host tissue are slightly raised and pink to light brown.

• As the pustules develop, they become warty and cracked and turn yellowish brown and eventually dark gray.

• On some varieties the warty growths are produced on fruits and leaves

• The age of the tissue at the time of infection also affects the elevation and the size of the lesions. Those formed from young tissue tend to be raised and those from old tissue are flatter.

Control

• Harvesting the fruit before new flush comes as these are severely affected

• Copper fungicides are commonly used for control citrus scab, spray just before new season growth flush and flowering

• Phyto-sanitary measures are strongly recommended in nurseries

Sooty Mold

• Sooty mold is a black removable fungal growth Capnodium citri, that appears on the surface of leaves, fruits and stems after trees become infested with honey-dew excreting insects.

• Sooty mold deposits are heavier on the upper surface than on the lower.

• Although Sooty molds does not penetrate the tissue its deposits may delay fruit coloring and are difficult to remove in the packing house in cultivars with a rough rind.

Sooty mold excreting insects include aphids, whiteflies, soft scales and mealy bugs, should be controlled.

Citrus greening,(Rickettsia like bacterium



Leaves are yellower near veins, vectors are phsyllids

Symptoms

• Early symptoms are appearance of a yellow shoot on a tree, and moves progressively on a tree until it affects the whole tree.

• Chronically affected trees are sparsely foliated and show extensive twig die back.

• The trees are small ,lopsided and poorly colored

• The fruits contains aborted seed, the juice is low in soluble sugars, high in acids and abnormally bitter. Fruits are lopsided with curved collumela.