

CITRUS BIOSECURITY THREAT: Huanglongbing (HLB) or Asian Greening: Fact Sheet



Symptoms

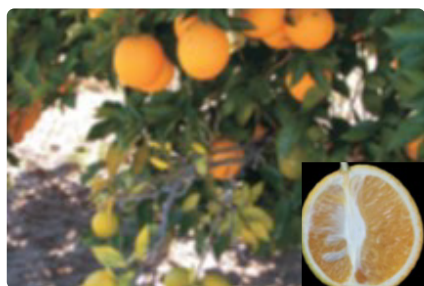
The first symptom of HLB on a tree is usually a branch or twig with yellow leaves. The most characteristic leaf symptom is asymmetrical blotchy mottling. The veins are often prominent and yellow. Abundant leaf drop is common.

Chronically infected trees show sparse yellow foliage, extensive twig dieback, stunted growth, corky veins and root decline.

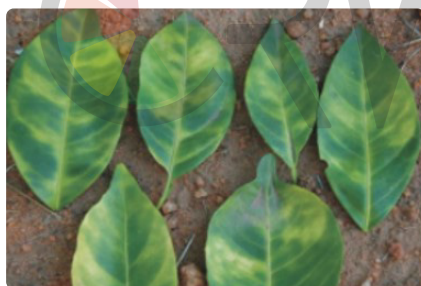
Fruit are poorly coloured (greening) and show colour inversion when maturing: the peduncular (twig) end of the fruit turns orange, while the stylar end is still green.

Some fruit on infected trees are reduced in size, lopsided (inside the columella is curved), low in soluble solids, high in acids, and can have a sour, bitter or salty taste.

Unseasonal and heavy flowering on diseased branches and out-of-phase flushing can also be seen.



Small, lopsided fruit



Small leaves, yellow veins,
asymmetrical mottle

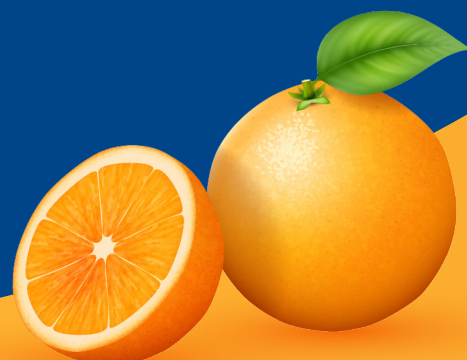
The tree can remain symptomless for months or years after the initial infection. Symptom development is slow and infected trees decline gradually in vigour and yield, and remain stunted or eventually die. The disease develops irregularly so that individual trees may show a mixture of normal and diseased sectors.

The disease

- HLB, associated with the bacterium '*Candidatus Liberibacter asiaticus*' (CLas), is the most destructive citrus disease worldwide.
- Tree growth, health and fruit production are severely impacted.
- Infected trees die, and symptomatic fruit are unsuitable for fresh fruit or juice markets.
- There is no cure once trees become infected. Infected trees need to be eradicated.



Sparse yellow foliage and stunted growth



Possible confusion with

Leaves may show symptoms resembling those of zinc, copper or manganese deficiencies. However, the asymmetrical blotchy mottle, typical of HLB, is in contrast with symptoms of nutrient deficiencies, which are symmetrical. Symptoms of mineral deficiency, such as yellowing, are distributed uniformly throughout the canopy, but HLB symptoms may be more scattered. HLB may also be confused with other diseases, such as citrus stubborn disease, phytoplasma infections, dieback, citrus tristeza virus, Phytophthora root rot and citrus blight.

Host range

Mainly plants in the family Rutaceae, including:

- All *Citrus* spp.
- Orange jasmine (*Murraya paniculata*)
- Curry leaf (*Berberis koenigii*)

Current distribution

- Asia
- Papua New Guinea
- America (North, Central and South)
- Ethiopia
- Kenya
- Mauritius
- Réunion

Method of spread

• Insect vectors

Asian citrus psyllid (ACP) (*Diaphorina citri*) and African citrus triozid (ACT) (*Trioza erytreae*). They feed from the phloem sap of infected hosts. Once acquired, the bacteria can persist in the vector for up to 3 months, and transmit the HLB bacteria when feeding



ACP adults are heat tolerant and not restricted to climatic regions.

Not present in SA



ACT adults are heat sensitive and restricted to cooler elevations.

Present in SA

• Infected plant material

Citrus propagation material (trees, cuttings, grafts, budwood) and propagation material of other hosts

• NOT fruit or seed transmitted

Preventative actions

- Quarantine procedures for importation of citrus propagation material and other hosts
- Plant certified disease-free citrus trees
- Awareness and surveillance to ensure early detection and rapid implementation of control measures
- Prevent incursion and spread of ACP, including effective control of ACT
- Do not bring illegal plant material into South Africa and onto your farm!

For more information on this disease, or if you find anything unusual, contact Wayne Kirkman from CRI's Biosecurity Division: waynek@cri.co.za, 084 458 0349

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