

Huanglongbing (HLB) is currently an exotic disease that is not in Australia*. Be alert; HLB is the most devastating citrus disease in the world. More than one *Liberibacter* species has been reported to cause HLB, but in Asia, North and South America, the main responsible pathogen-vector relationship is '*Candidatus Liberibacter asiaticus*' and the Asian citrus psyllid, which is currently exotic to Australia*.

The earlier an exotic plant pest incursion is discovered, the greater the chance of eradication. Email photos and questions to biosecurity@dpi.nsw.gov.au

Exotic plant pest hotline 1800 084 881.

Description

Leaves: yellowing, which can be asymmetric 'blotchy mottle' crossing leaf veins (yellow and green pattern differs on each side of the midrib; Figure 1). Symmetrical nutrient deficiency symptoms can develop (yellow and green pattern the same on each side of midrib), particularly from zinc deficiency (Figure 2), as the canopy is starved of nutrients. As the disease progresses, there is complete yellowing of leaves, which might be small, upright and have thickened, corky midribs and veins.

Fruit: small, hard, lop-sided, and bitter tasting. When cut, the fruit from seeded cultivars often has dark, aborted seeds. The skin might remain partially green (Figure 3). Including HLB-infected (bitter tasting) fruit in juice production can taint juice flavour.

Trees: poor root growth, progressive canopy yellowing, leaf and fruit drop, branch dieback and eventually death (Figure 4).

Disease cycle

The bacteria associated with HLB are transmitted to healthy citrus trees via infected plant materials, grafting tools or insect vectors. The bacteria survive in the salivary glands of psyllids (Figure 5), which are currently exotic to Australia*. The bacteria move through the nutrient passages (phloem). Root growth is affected before above-ground symptoms appear, which can take months to years (Figure 6). Infected psyllids continue to spread disease throughout the orchard. Infected trees gradually die.



Figure 1. Huanglongbing causes asymmetric 'blotchy mottle' on leaves.



Figure 2. Zinc deficiency symptoms in a Huanglongbing-affected citrus tree.



Figure 3. Huanglongbing causes partially green fruit.



Figure 4. Huanglongbing disease progression symptoms. Image: Rolsausen (2021).

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Damage

HLB is currently the most devastating disease of citrus in the world. It greatly reduces fruit production and quality. All citrus varieties are susceptible to HLB, and currently there is no cure.

Monitoring

Early detection and reporting of both exotic psyllid insect vectors and HLB disease symptoms are essential to maintaining Australia's HLB-free status. HLB and exotic psyllids are currently ranked as the most important biosecurity threat to the Australian citrus industry. Preventing the disease and its vectors from coming into Australia is a priority.

Management and control

Keep HLB out. Long distance spread of HLB occurs through the movement of infected citrus plants or plant parts (e.g. grafts) and HLB-infected insects. Adopt biosecurity actions to prevent entry, establishment and spread of pests and disease. Practice 'Come clean, go clean' and ensure all staff and visitors are instructed to adhere to orchard hygiene requirements. Source propagation material of a known high health status from [Auscitrus](https://www.auscitrus.com.au/) (<https://www.auscitrus.com.au/>). Purchase nursery trees from reputable suppliers. Keep records of visitors.

Biological: natural enemies of psyllids include lady beetles, lacewings, hoverflies, minute pirate bugs and spiders.

Cultural: use disease-free propagation material and sterilise equipment after use. Re-plant with structurally sound insect-proof netting to eliminate insect vector access to trees. HLB-tolerant rootstocks are being evaluated.

Chemical: if exotic psyllids enter Australia, follow the directions of the [APVMA emergency pest control permit](https://www.apvma.gov.au/registrations-and-permits/applying-permits/before-you-apply/types-permits/minor-use-and-emergency-permits) (<https://www.apvma.gov.au/registrations-and-permits/applying-permits/before-you-apply/types-permits/minor-use-and-emergency-permits>). Psyllid populations can be reduced by using insecticides. Repellents such as mineral oils and kaolin clay can be used as deterrents.

More information

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Figure 5. The Asian citrus psyllid is an insect vector of Huanglongbing, currently exotic to Australia*. Image: David Hall, USDA Agricultural Research Service, Bugwood.org.

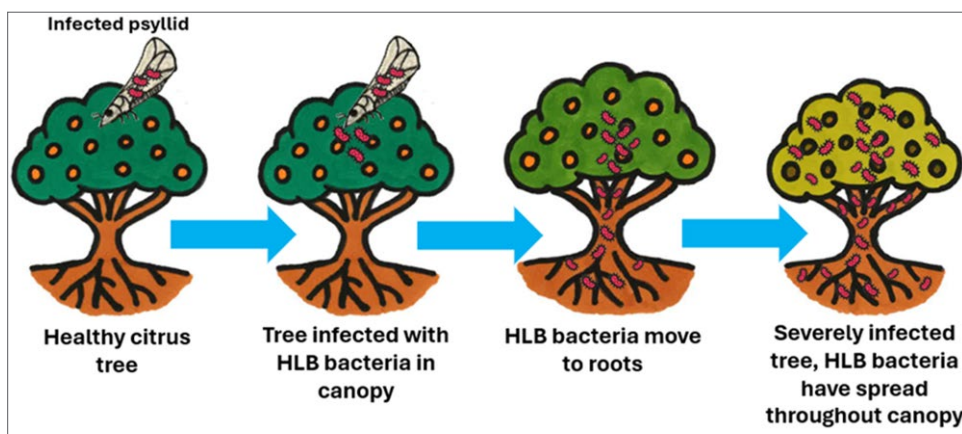


Figure 6. Huanglongbing infection and transmission path. Adapted from Alquezar et al. (2021).

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