

## Orange - Huanglongbing (HLB) / Citrus Greening

Causal agent: *Candidatus Liberibacter* spp. (primarily *Candidatus Liberibacter asiaticus* - CLas).

Vector: Asian citrus psyllid (*Diaphorina citri*).

### Overview

Huanglongbing (HLB), also known as citrus greening, is a systemic bacterial disease of citrus.

It is one of the most serious diseases affecting oranges and other citrus. There is no cure.

Infected trees decline and eventually die. Management focuses on prevention, vector control, removal of infected trees, and use of clean nursery stock.

### Key Facts

- Hosts: All commercial citrus (sweet orange is highly susceptible).
- Transmission: Feeding by Asian citrus psyllid (ACP) and via grafting of infected budwood.
- Latency: Long incubation period; trees may be infected months to years before symptoms are visible.

### Symptoms

Leaves:

- Blotchy, asymmetrical yellow mottling (not uniform between leaf halves).
- Interveinal chlorosis; vein yellowing or corking in some cases.
- Yellow shoots; overall canopy thinning and twig dieback.

Fruit:

- Small, lopsided fruit with curved central axis; color inversion (stays green at the styler end).
- Poor juice quality and bitter taste; misshapen, premature fruit drop; aborted seeds.

Tree:

- Stunted growth, canopy decline, reduced yield and fruit size; eventual tree death.

### Diagnostics (confirmation)

- Laboratory testing (qPCR) of petiole/midrib tissue is standard for CLas detection.
- Field symptom recognition is helpful but not definitive.

### Epidemiology and Favorable Conditions

- ACP adults and nymphs acquire and transmit CLas while feeding on young flush.
- Rapid spread occurs where psyllid populations are uncontrolled and infected sources exist.
- Warm climates with frequent flushing support psyllid reproduction and spread.

### Integrated Management (no single tool is sufficient)

#### 1) Exclusion and Clean Planting Material

- Plant only certified HLB-free nursery trees.
- Avoid movement of uncertified budwood or plants from quarantine areas.

## 2) Vector (ACP) Management - Integrated Pest Management (IPM)

- Monitor psyllids with yellow sticky cards and flush inspections.
- Use area-wide, coordinated insecticide programs with rotation of modes of action.
- Protect new flush; time applications to periods of psyllid activity.
- Encourage biological control (e.g., *Tamarixia radiata*) and conserve natural enemies.
- Cultural aids: reflective mulches, kaolin particle films, windbreaks, and hedging to reduce psyllid colonization.
- Remove unmanaged or abandoned citrus that serve as reservoirs.

## 3) Roguing / Tree Removal

- Promptly remove (rogue) laboratory-confirmed infected trees to reduce inoculum.
- Remove volunteer citrus and alternate hosts that support ACP near orchards.

## 4) Nutrition and Canopy Care (mitigation, not a cure)

- Enhanced nutrition and irrigation scheduling can temporarily improve productivity of infected trees but does not eradicate the bacterium.

## 5) Antibiotics and Trunk Injection (jurisdiction dependent)

- Oxytetracycline (OTC) trunk injection is permitted in some regions to suppress CLas and improve tree health. It is not a cure; follow local regulations and label directions. Consider fit within an overall IPM plan.

## 6) Resistant or Tolerant Planting Material (emerging)

- Use of tolerant rootstocks, scions, or interstocks is under evaluation. Adoption should follow regional trial evidence.

## 7) Surveillance, Quarantine, and Coordination

- Follow national and regional HLB action plans and quarantine rules.
- Participate in coordinated, area-wide programs for trapping, testing, and response.

## Actionable Field Checklist

- Before planting: source certified HLB-free trees.
- Weekly: scout for psyllids and new flush; deploy traps; record counts.
- At flush: apply targeted ACP controls and rotate chemistries.
- Monthly: sample symptomatic leaves for testing where available.
- Immediately: remove confirmed infected trees; manage abandoned citrus nearby.

- Ongoing: maintain nutrition and water; keep strict sanitation; review program efficacy each season.

#### References and Downloadable Resources

- 1) USDA APHIS: Citrus Greening and Asian Citrus Psyllid (overview and current status)

<https://www.aphis.usda.gov/print/pdf/node/2077>

- 2) UF IFAS (2024): Integrating antibiotics into a broader management plan for HLB

[https://crec.ifas.ufl.edu/media/crecifasufledu/extension/extension-publications/2024/2024\\_May\\_antibiotics.pdf](https://crec.ifas.ufl.edu/media/crecifasufledu/extension/extension-publications/2024/2024_May_antibiotics.pdf)

- 3) UF IFAS (2024): Use of interstocks for HLB management (presentation)

[https://citrusagents.ifas.ufl.edu/media/crecifasufledu/citrus-agents/growers-institutes/2024/Dutt\\_hlb.pdf](https://citrusagents.ifas.ufl.edu/media/crecifasufledu/citrus-agents/growers-institutes/2024/Dutt_hlb.pdf)

- 4) UC ANR IPM: Huanglongbing in Citrus - management guidance

<https://ipm.ucanr.edu/agriculture/citrus/huanglongbing/>

- 5) FAO (management guidance and surveillance frameworks)

<https://openknowledge.fao.org/server/api/core/bitstreams/1615a184-f2af-41b7-98ca-7a5d72cb2ad2/content>

<https://openknowledge.fao.org/server/api/core/bitstreams/e98e9435-9d51-4266-9130-4c7faf1d3a6a/content>

- 6) UF IFAS (2025): Proposed Integrated HLB Management Tools (IPM overview)

<https://crec.ifas.ufl.edu/media/crecifasufledu/citrus-research/docs/expo2025/Batuman.pdf>

- 7) UC IPM (home and landscape): Asian citrus psyllid and HLB symptoms

<https://ipm.ucanr.edu/home-and-landscape/asian-citrus-psyllid-and-huanglongbing-disease/>

#### Notes

- Always verify pesticide registrations, labels, and legal use in your country or region before application.
- Antibiotic and trunk injection approvals vary by jurisdiction and may change.