

Preventing HLB epidemics  
for ensuring citrus survival  
in Europe



PreHLB

## **PRE-HLB: PREVENTING HLB EPIDEMICS FOR ENSURING CITRUS SURVIVAL IN EUROPE**



PRE-HLB is a project funded by the Horizon2020 Programme of the European Commission. PRE-HLB goal is to develop and implement a holistic contingency plan to protect the citrus sector in the EU from HLB disease drivers and to co-create new solutions to manage the disease through a multidisciplinary approach and in collaboration with experienced partners from America and Asia.

The EU citriculture is threatened by the emerging disease **Huanglongbing** (HLB, also known as Greening), currently considered **the most devastating citrus disease due to its rapid dispersal, severity and fast progression of symptoms**, huge losses in fruit production and quality, cost and difficulty of preventing new infections, lack of resistant commercial citrus

varieties and economically feasible treatments for infected trees, and absence of durable control mechanisms.

**HLB is generating multimillion economic losses** to most citrus industries worldwide. Now is the time to start research in the EU because the vector *T. erytreae* has been detected in the Azores and the Canary Islands, and since 2014, this HLB vector has been also found in Galicia (Spain) and the Portuguese north and central coast.

**Establish short-term preventive actions**

to monitor vector spread and risk of HLB invasion in the EU, to establish efficient control measures and to set up an HLB information and communication network to discuss PRE-HLB results with phytosanitary authorities to facilitate the development and implementation of a new EU health policy.

**Setting up medium-term mitigation actions**

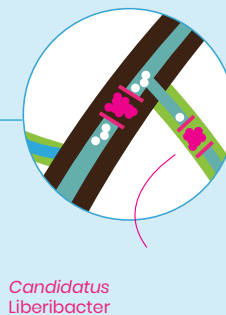
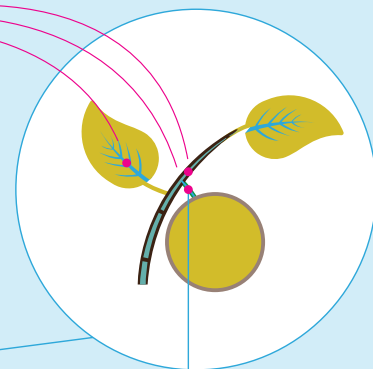
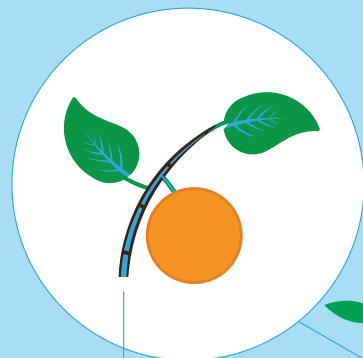
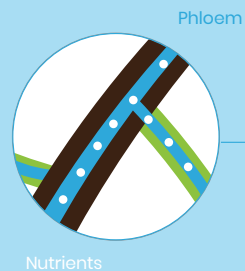
to reduce the spread of psyllid/HLB via rapid interventions, through analysis of the insect interactions to understand the biology of the vector/disease, development of vector/bacteria detection and integrated pest management strategies, and data—and model—based risk assessment tools adjusted to the EU and associates.

**Implementing long-term avoidance actions**

by biotechnological approaches, including exploitation of resistance to HLB-causing bacteria or to insect vectors, generation of genetic resistance to them, and development of new biocontrol agents.

## The problem

Healthy orange tree.  
The phloem of plants transports vital nutrients such as sugar and amino acids from the leaves.



*Candidatus Liberibacter*

## THE ACTION PLAN

The first measures proposed in the PRE-HLB project are **informative**, to raise awareness of the existence of HLB and its aggressiveness, as well as **to train citrus growers in the identification of symptoms**. At the same time, attempts will be made to prevent the arrival of the bacteria by identifying and inspecting the critical entry

points, and the presence and dispersion of vectors will be monitored. In a second stage, *Trioza erytreae* dispersion models will be established in different areas of the EU to predict its movement, as well as farm management models to fight against HLB. New insect control tools and early diagnosis techniques will be developed.

## Basic solutions



Crop protection agents help to stem the spread of the psyllids.



The psyllid's natural enemies *Tamarixia* spp. parasitize psyllid nymphs. Entomopathogenic fungi may help to control psyllids in citrus orchards.



Anti-bacterial solutions may be able to selectively combat the bacteria in the long term. This may also make it possible to cure infected plants.

## GOOD PRACTICES AND LEGISLATION

PRE-HLB is focused on notifying and spreading the word of useful information for farmers about the HLB disease, its vectors and best practices of control. The project is completely aligned with the EIP-AGRI initiative and is focused on creating practice abstracts to publish the main results in the thematic networks and working groups about fruit trees:

- **Creation of technical data sheets for farmers** on the detection of the insect vectors *T. erytreae* and *D. citri* and symptoms of the disease (technical leaflets, visual files, talks, stickers, etc.).
- **Free distribution of information** among the main farmers' associations in Europe.

- **Elaboration of training material for each specific target groups** (farmers, nurseries, agronomists, local governments...) in collaboration with Fundecitrus.
- **Discussion with farmers and regional governments to deploy the new EU HLB health policy** to accomplish the legal requirements and best practices in sanitary controls for plant material at risk.
- **Implementation of accurate and rapid psyllid detection and bacteria diagnostic** assays already available to be adopted in EU countries for surveillance programs.

## PARTNERS





## WHO IS INVOLVED?

PRE-HLB is formed by a multi-disciplinary consortium led by the Institute of Molecular and Cellular Plant Biology – Institute of Plant Molecular and Cellular Biology (CSIC-UPV, Spain). It is a well-balanced group made up by various research centers, universities, consultancy firms and private companies from 6 different European countries (Spain, Portugal, Italy, United Kingdom, France and the Netherlands) and 3 countries of the world (Brasil, China and Israel).





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