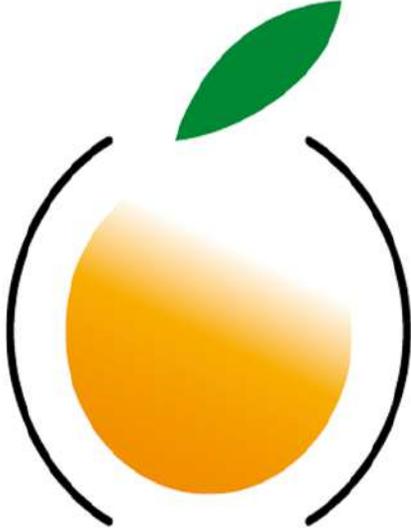




This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 801234

[www.prehlb.eu](http://www.prehlb.eu) @PreHLB

# Challenges for the citrus sector: PRE-HLB, preventing HLB for ensuring citrus survival in Europe

Pre  HLB

**Leandro Peña – PreHLB coordinator**

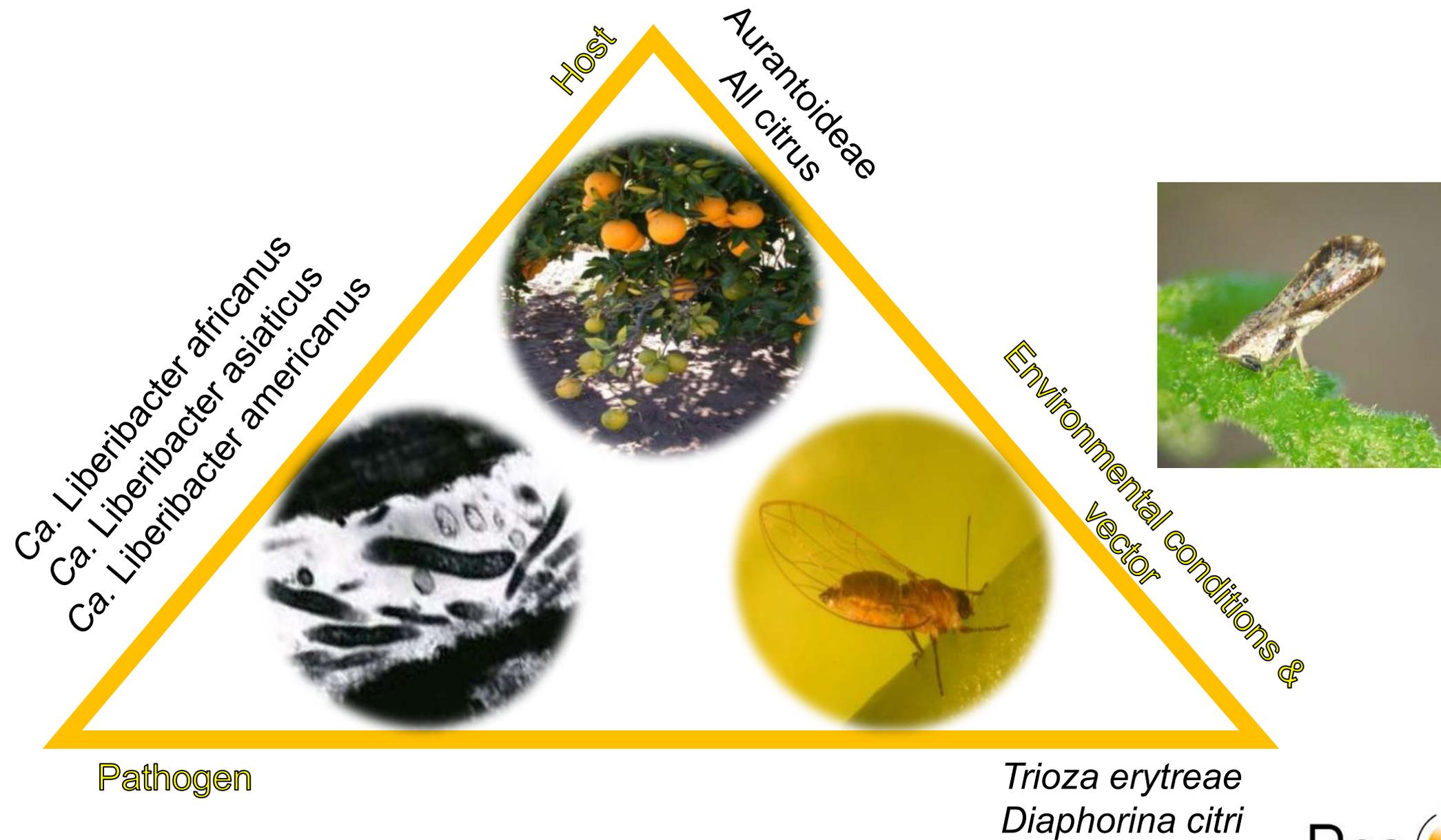
Instituto de Biología Molecular y Celular de Plantas (IBMCP),  
Consejo Superior de Investigaciones Científicas (CSIC)-Universidad  
Politécnica de Valencia (UPV).

46022 Valencia, Spain.

Tel.: +34 963877865

email: [lpenya@ibmcp.upv.es](mailto:lpenya@ibmcp.upv.es)

# Huanglongbing



# Huanglongbing symptoms

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Yellow shoots and branches

The first symptomatic leaves usually appear in the upper third of the tree



- 1) Defoliation
- 2) Dry branches
- 3) Decline



# Huanglongbing symptoms

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Small lopsided fruits that remain green and taste bitter. Vascular necrosis and seed abortion



Peduncular end stained orange

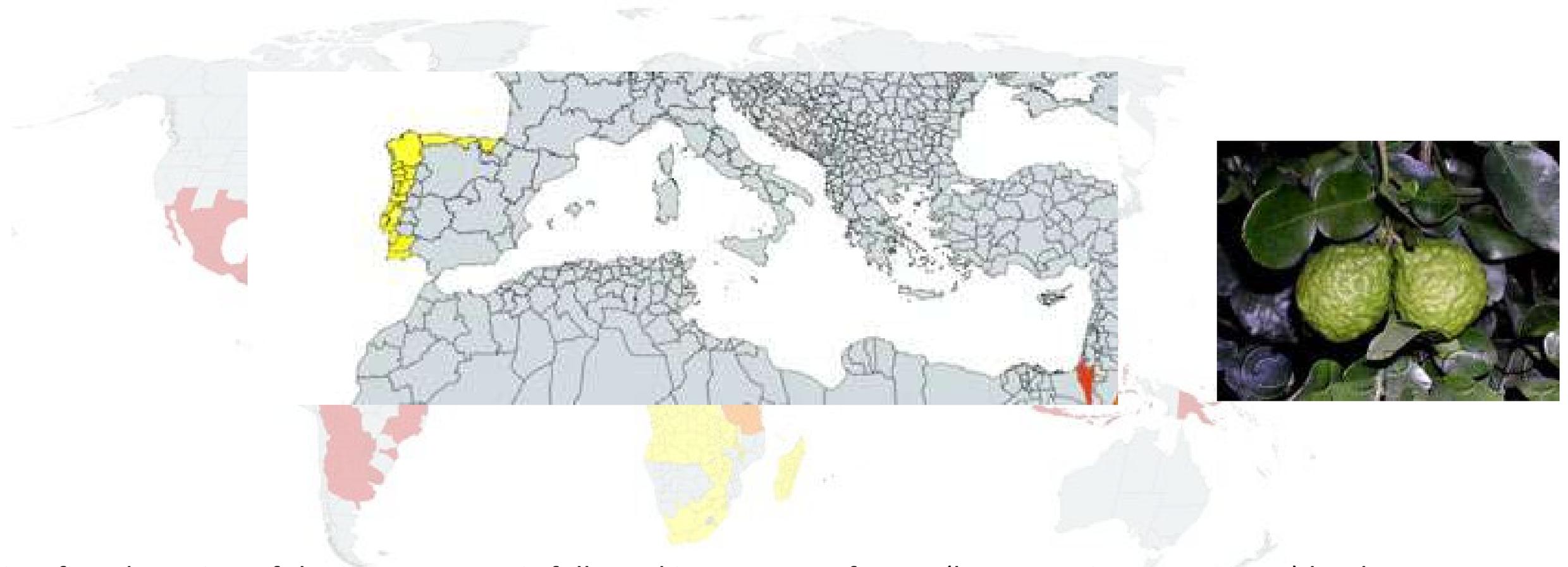
Premature fruit fall



Color inversion

## Huanglongbing: distribution of insect vectors in the Mediterranean until 2023

■ *Diaphorina citri*      ■ *Trioza erytreae*



In almost all countries, first detection of the insect vector is followed in a matter of years (less years in recent times) by the detection of the HLB-associated bacterium/a.

# August 2023, Findings of *Diaphorina citri* in Cyprus:



Main cultivation of Citrus fruit production: 1, 2, 3  
Small scale Citrus fruit production areas: 4, 5, 6, 7

Findings: ★  
No Findings: ★





# Distribution of *Trioza erytreae*, the African psyllid vector of HLB

IBERIAN PENINSULA: CURRENTLY PRESENT IN THE ENTIRE CANTABRIAN COAST, FROM GALICIA TO THE BASQUE COUNTRY, AND ALONG THE ENTIRE COASTLINE OF PORTUGAL, FROM OPORTO TO ALGARVE

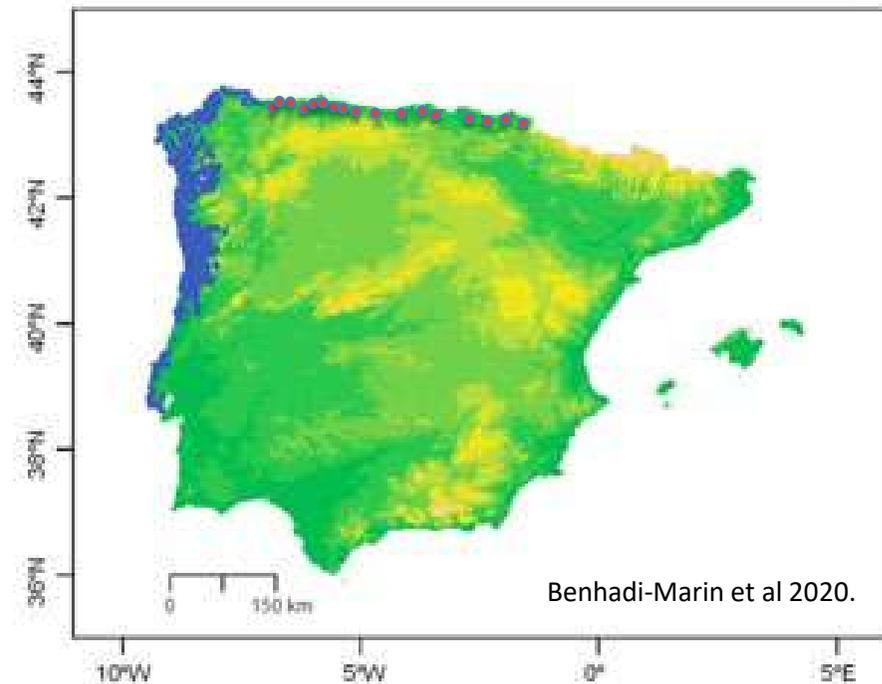


Fuente : CABI: <https://www.cabi.org/isc/datasheet/54914>

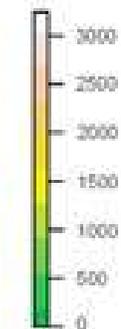
First Detection in PT -1994 (Madeira)

In SP (Canary Islands) – 2002

Iberian Peninsula (Pontevedra & Oporto) (2015)



● Presence 2020-21



October 2021: it was detected in Ajelzur (Algarve)

## Importance of HLB

**Table 5:** Percentiles of the uncertainty distributions of the proportion of yield loss [%] caused by species with effect on yield of citrus fruits

Species with effect on yield of citrus fruits			Percentiles of the proportion of yield loss [%]												
Class	Species	EPPO code/host	1%	5%	10%	17%	25%	33%	50%	67%	75%	83%	90%	95%	99%
BACTERIA	<i>Candidatus Liberibacter</i> spp. (citrus greening)	LIBEXX/citrus	17.7%	29.8%	37.7%	45.0%	52.0%	57.8%	67.8%	76.7%	81.1%	85.7%	89.8%	93.5%	97.6%
INSECTS	<i>Thaumatotibia leucotreta</i>	ARGPLE/citrus	7.4%	11.5%	14.1%	16.7%	19.3%	21.7%	26.2%	31.0%	33.8%	37.4%	41.2%	45.8%	54.3%
BACTERIA	<i>Xanthomonas citri</i>	XANTCI/high impact citrus	1.8%	3.1%	4.2%	5.5%	7.0%	8.5%	12.2%	17.4%	21.3%	27.2%	35.2%	47.6%	83.6%
BACTERIA	<i>Xylella fastidiosa</i>	XYLEFA/citrus	0.1%	0.7%	1.5%	2.8%	4.5%	6.4%	10.9%	16.2%	19.4%	23.1%	26.7%	30.2%	34.4%
INSECTS	<i>Bactrocera dorsalis</i>	DACUDO/citrus	0.6%	1.6%	2.5%	3.5%	4.7%	5.9%	8.6%	11.9%	14.2%	17.2%	20.9%	25.7%	36.4%
INSECTS	<i>Anoplophora chinensis</i>	ANOLCN/citrus	2.5%	3.5%	4.3%	5.0%	5.8%	6.6%	8.3%	10.3%	11.7%	13.6%	16.0%	19.3%	27.4%
INSECTS	<i>Bactrocera zonata</i>	DACUZO/citrus	0.4%	1.2%	2.0%	2.9%	4.0%	5.0%	7.3%	9.9%	11.7%	13.9%	16.5%	19.8%	26.5%
FUNGI	<i>Anastrepha ludens</i>	ANSTLU/citrus, peaches	0.9%	1.5%	1.9%	2.4%	3.0%	3.6%	4.9%	6.8%	8.1%	10.0%	12.5%	16.3%	26.7%
BACTERIA	<i>Xanthomonas citri</i>	XANTCI/medium impact citrus	0.2%	0.7%	1.2%	1.8%	2.6%	3.3%	4.9%	6.8%	8.1%	9.8%	11.8%	14.3%	19.5%
FUNGI	<i>Phyllosticta citricarpa</i>	GUIGCI/citrus	0.1%	0.2%	0.4%	0.7%	1.0%	1.3%	2.1%	3.1%	3.9%	4.9%	6.2%	7.8%	11.7%

EFSA (2019) Scientific report on the methodology applied by EFSA to provide a quantitative assessment of pest-related criteria required to rank candidate priority pests

## Potential distribution of HLB in EU

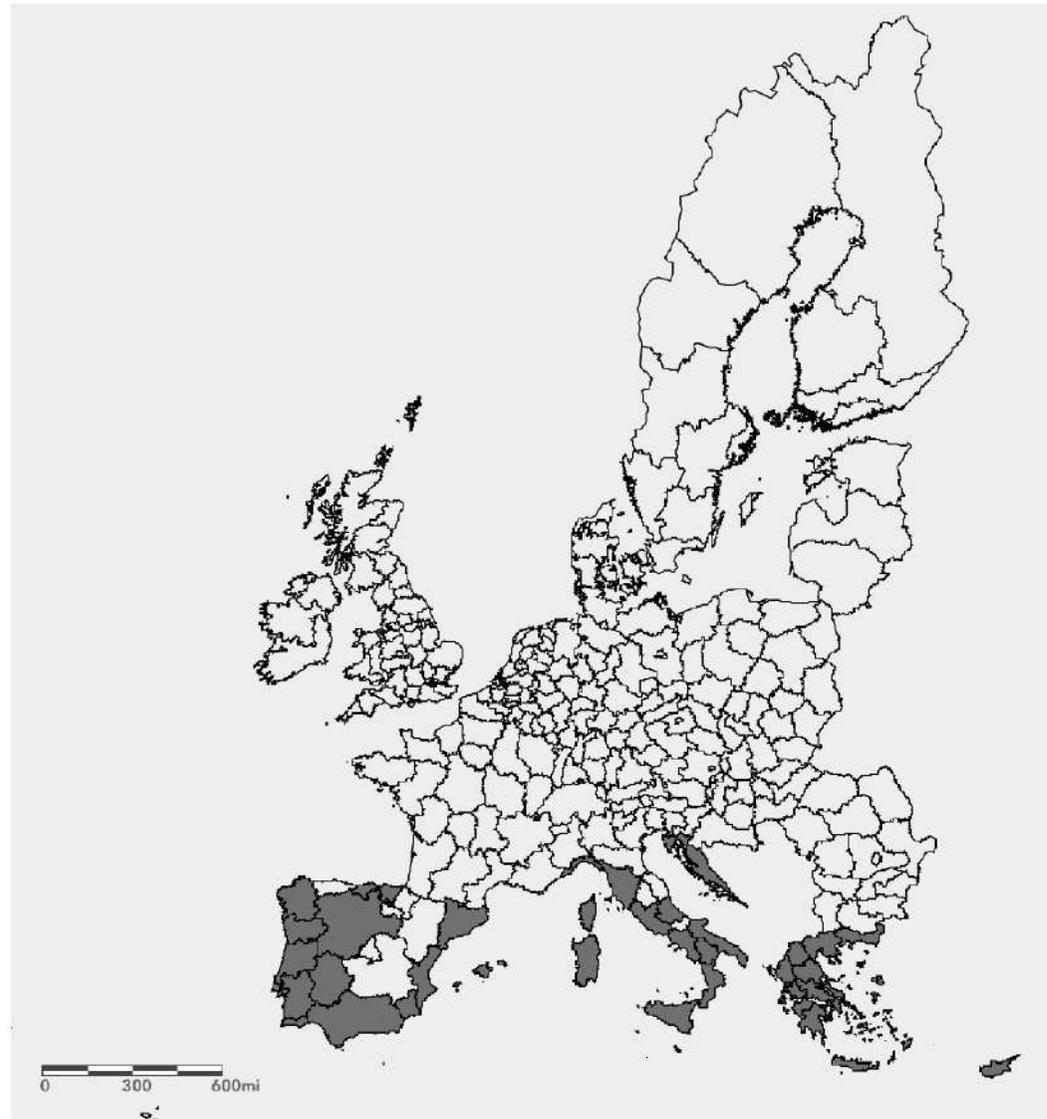


Figure 7 The potential distribution of the pest in the EU NUTS2 regions based on the scenarios established for assessing the impacts of the pest by the EFSA Working Group on EU Priority Pests (EFSA, 2019). This link provides an online interactive version of the map that can be used to explore the data further: <https://arcg.is/1lv5vr>

EFSA (2019) *Candidatus Liberibacter* Pest Report to support ranking of EU candidate priority pests. Baker R, Gilioli G, Behring C, Candiani D, Gogin A, Kaluski T, Kinkar M, Mosbach-Schulz O, Neri FM, Preti S, Rosace MC, Siligato R, Stancanelli G and Tramontini S. Doi: 10.5281/zenodo.2788904

# Importance of HLB



JRC TECHNICAL REPORTS

The Impact Indicator for Priority Pests (I2P2): a tool for ranking pests according to Regulation (EU) No 2016/2031

Sánchez, Berta  
Barreiro-Hurle, Jesús  
Soto Embodas, Iria  
Rodríguez-Cerezo, Emilio

2019



## **Economic** impact indicators:

- Production losses and value
- Trade
- Price and market
- Others

## **Social** impact indicators:

- Employment
- Food security and food safety
- Landscape or cultural heritage

## **Environmental** impact indicators:

- Biodiversity and ecosystem
- Parks and natural areas
- Other undesired impacts of control measures

JRC (2019) Sánchez, B; Barreiro-Hurle, J; Soto Embodas, I; Rodríguez-Cerezo, E, 29793 2019, ISBN 978-92-76-08785-4, doi:10.2760/585182, JRC116973.

## SCIENTIFIC OPINION

ADOPTED: 26 November 2020

doi: 10.2903/j.efsa.2021.6357

### **Pest categorisation of *Diaphorina citri***

EFSA Panel on Plant Health (PLH),  
Claude Bragard, Katharina Dehnen-Schmutz, Francesco Di Serio, Paolo Gonthier,  
Marie-Agnès Jacques, Josep Anton Jaques Miret, Annemarie Fejer Justesen,  
Christer Sven Magnusson, Panagiotis Milonas, Juan A Navas-Cortes, Stephen Parnell,  
Roel Potting, Philippe Lucien Reignault, Hans-Hermann Thulke, Wopke Van der Werf,  
Antonio Vicent Civera, Jonathan Yuen, Lucia Zappalà, Virag Kertesz, Franz Streissl and  
Alan MacLeod

The European Commission requested EFSA to provide categorizations of pests of harmful organisms included in the annexes to the Directive 2000/29 / CE, in cases where no recent pest risk assessment or classification is available.

For all this, EFSA adopted a Scientific Opinion on pest categorization on November 26, 2020 that has been published on January 6, 2021 specifically on *Diaphorina citri*.

*D. citri* has moderate dispersal potential by itself but can spread longer distances by hitchhiking on recycled fruit and fruit boxes. Wind-assisted dispersal can be important. The movement of plants may be another way of propagation; it should be noted that as of May 2020, **there have been 21 records of interception of *D. citri* in the Europhyt database. The 21 interceptions were made on *Murraya spp.***

Based on the literature mentioned in the report, **a pest risk analysis conducted by ANSES (2019) highlights that southern Portugal, eastern Spain, Corsica, southern Italy, Greece, Croatia, Cyprus and Malta show favourable conditions for the establishment of *D. citri*.**

## COMMISSION DELEGATED REGULATION (EU) 2019/1702

of 1 August 2019

supplementing Regulation (EU) 2016/2031 of the European Parliament and of the Council by establishing the list of priority pests

### List of priority pests

*Agrilus anxius* Gory  
*Agrilus planipennis* Fairmaire  
*Anastrepha ludens* (Loew)  
*Anoplophora chinensis* (Thomson)  
*Anoplophora glabripennis* (Motschulsky)  
*Anthonomus eugeni* Cano  
*Aromia bungii* (Faldermann)  
*Bactericera cockerelli* (Sulc.)  
*Bactrocera dorsalis* (Hendel)  
*Bactrocera zonata* (Saunders)  
*Bursaphelenchus xylophilus* (Steiner et Bühner) Nickle *et al.*  
*Candidatus Liberibacter* spp., causal agent of Huanglongbing disease of citrus/citrus greening  
*Conotrachelus nenuphar* (Herbst)  
*Dendrolimus sibiricus* Tschetverikov  
*Phyllosticta citricarpa* (McAlpine) Van der Aa  
*Popillia japonica* Newman  
*Rhagoletis pomonella* Walsh  
*Spodoptera frugiperda* (Smith)  
*Thaumatotibia leucotreta* (Meyrick)  
*Xylella fastidiosa* (Wells *et al.*)

*Candidatus Liberibacter* spp., causal agent of Huanglongbing disease of citrus/citrus greening

- Annual surveillance mandatory, but surveillance programs were not defined
- Outbreak response, but demarcation and control measures were not defined

L 317/4

EN

Official Journal of the European Union

23.11.2016

REGULATION (EU) 2016/2031 OF THE EUROPEAN PARLIAMENT OF THE COUNCIL  
of 26 October 2016

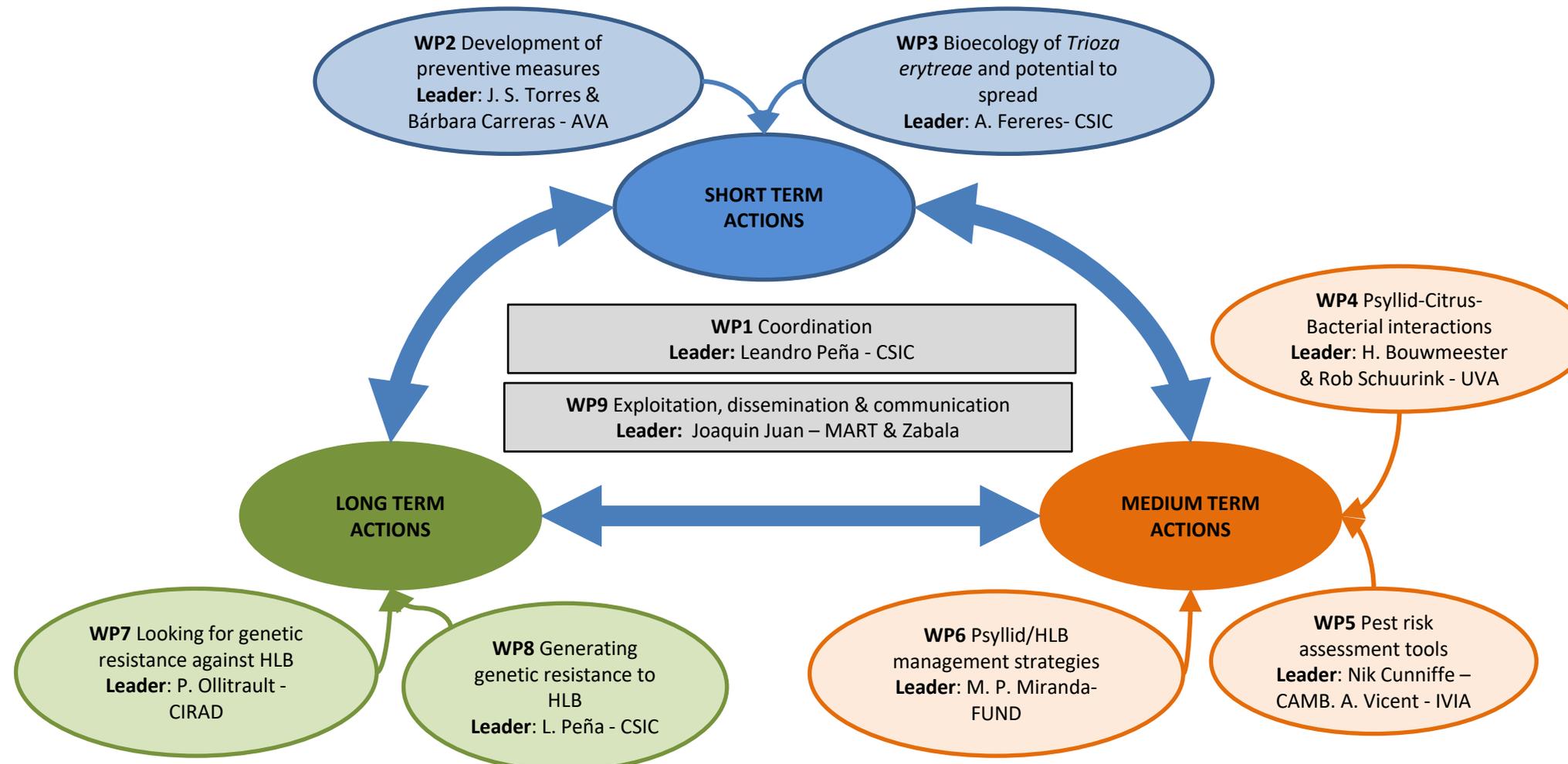
on protective measures against pests of plants, amending Regulations (EU) No 228/2013, (EU) No 652/2014 and (EU) No 1143/2014 of the European Parliament and of the Council and repealing Council Directives 69/464/EEC, 74/647/EEC, 93/85/EEC, 98/57/EC, 2000/29/EC, 2006/91/EC and 2007/33/EC

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 801234

[www.prehlab.eu](http://www.prehlab.eu) @PreHLB



The overall objective of the PreHLB project is to develop and implement a comprehensive contingency plan to protect EU citrus farming from the causative agents of HLB and create new solutions to manage the disease through a multidisciplinary approach and in collaboration with experienced partners from America and Asia.

Scientific institutions: CSIC, ARO, IPB, CREA, CIR, CNR, IVIA, EMB, CAMB, UDUR, UVA, ALG, UNICT, UHUN

Private companies: MARTINAVARRO, KOPPERT, VAL

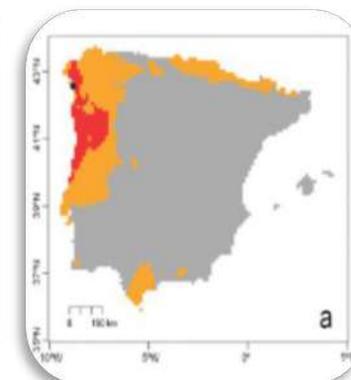
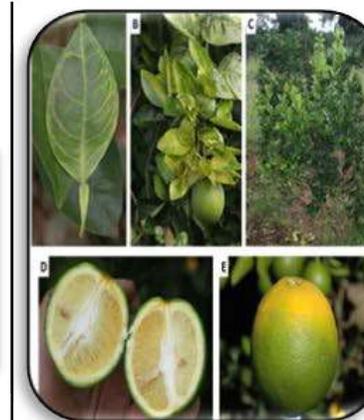
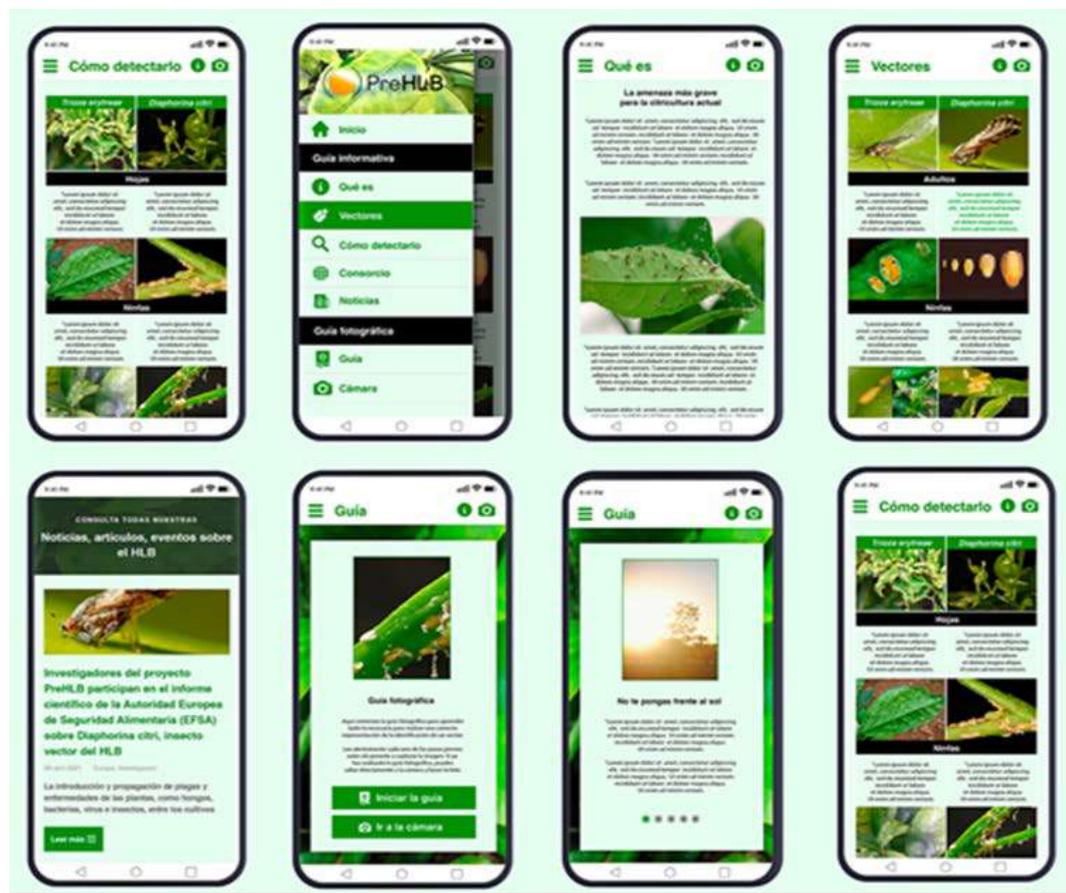
Grower associations: AVA, FRUSOAL, FUND

Phytosanitary authorities: AGROAMBIENT, EPPO, USDA



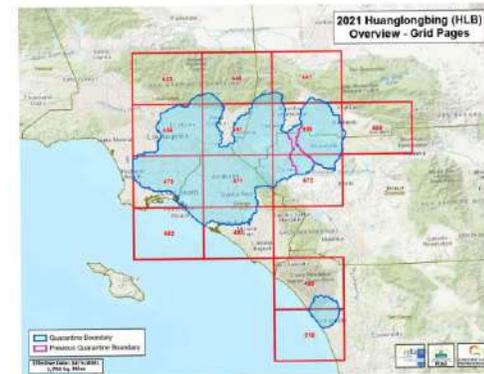
## Huanglongbing: SHORT-TERM MEASURES

- Disclose the threat HLB represent for EU citriculture. Establish a communication network on HLB.
- Train farmers in identifying HLB symptoms/psyllid vectors.
- Monitor the spread of African psyllid and prevent the entry of Asian psyllid.
- Increase our knowledge about vector biology.
- Propose an updated contingency plan for the EU.



## Huanglongbing: MEDIUM-TERM MEASURES

- Development of sustainable and environmentally friendly management strategies: biological and cultural control of the vector. Antimicrobial and insecticidal peptides. Sensitive methods for detecting infection by the bacteria in infected, still asymptomatic plants and in infected insects.
- Develop pest risk assessment tools.
- Establish large-scale prospecting zones and regional management. Citrus Health Management Areas (CHMAs).

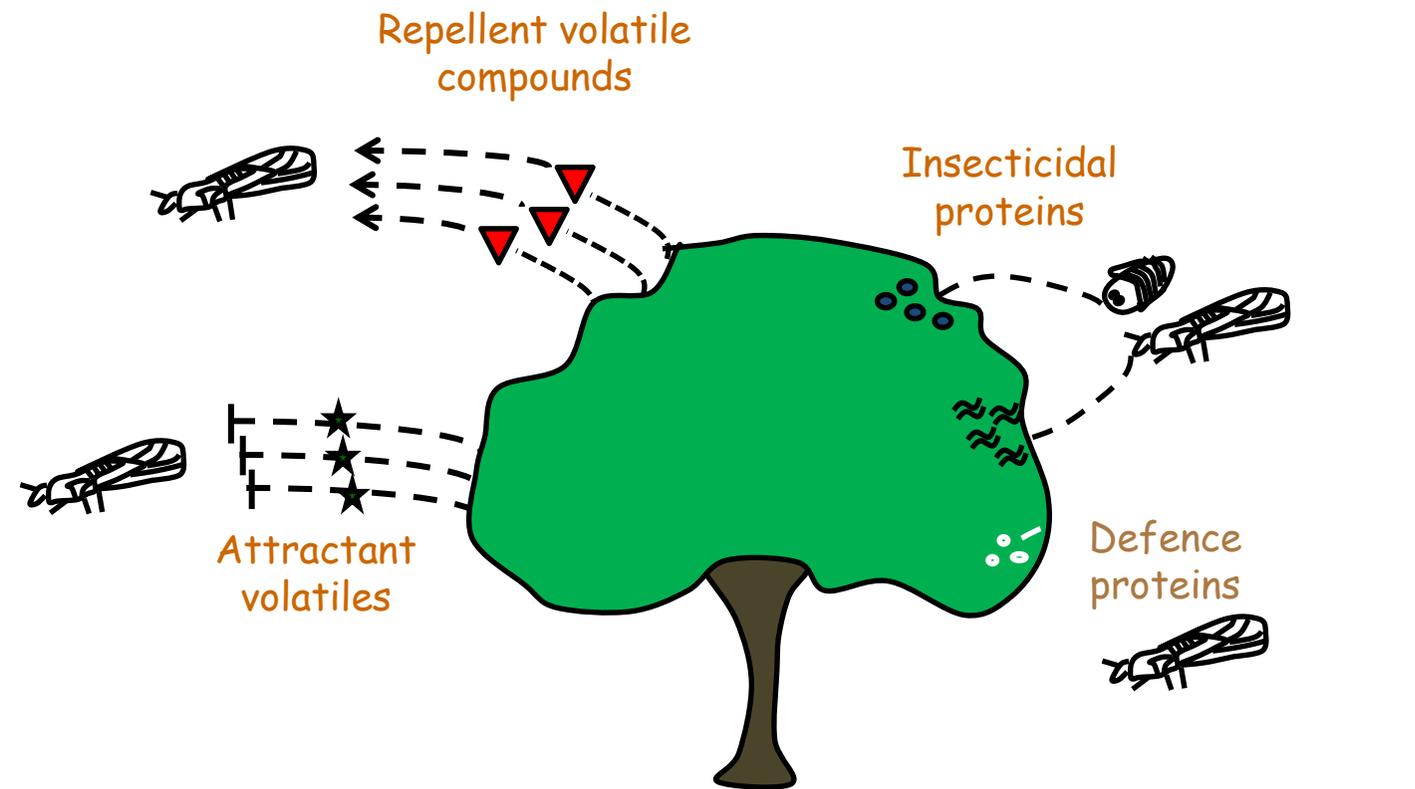


## Huanglongbing: LONG-TERM MEASURES

- Generation of genetic resistance to organisms associated with HLB, through breeding and/or through biotechnological strategies.
- Development of new biocontrol agents.



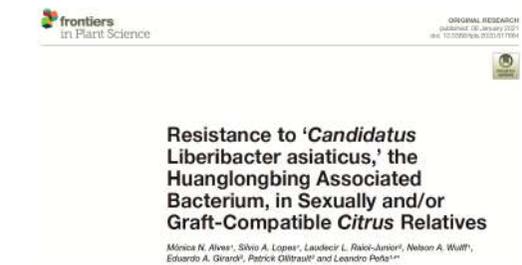
## Resistance in Microcitrus & Eremocitrus



Proposal for a

### REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on plants obtained by certain new genomic techniques and their food and feed, and amending Regulation (EU) 2017/625



## Regulation 2016/2031

Due to their higher impact, priority pests have compulsory measures in order to reduce the risk of introduction and spread in the EU territory.

### Priority pests:

- **Surveys and eradication** are prioritized for **EU co-financing**.
- **National Contingency Plans** must be approved (unless their establishment is not possible).
- **Action Plans** (concrete measures for the eradication of the pest) must be carried out when its presence is officially confirmed.
- **Simulation exercises** on the application of contingency plans must be carried out in all Member States and for all priority pests (unless the Member State has already adopted eradication measures for a priority pest).
- **Annual surveys** should be carried out with a sufficient number of visual examinations, sampling and analysis.

# Contingency Plan for HLB and its vectors

First adopted in Spain in November 2015

- Survey program (detection survey):
  - Nurseries and garden centres
  - Orchards
  - Gardens (public & private)
  - Fairs, etc
  
- Eradication program:
  - Delimiting surveys
  - Establishment of Demarcated Areas
  - Eradication measures



The collage displays several official documents from the Spanish Ministry of Agriculture, Food, and Environment. The documents include:

- PROGRAMA NACIONAL PARA LA APLICACIÓN DE LA NORMATIVA FITOSANITARIA** (National Program for the Application of Phytosanitary Regulations)
- PLAN DE ERADICACIÓN DE *Trioxys erythrocephala*** (Eradication Plan for *Trioxys erythrocephala*)
- PLAN DE CONTINGENCIA DE *Candidatus Liberibacter spp.* bacteria asociada a la enfermedad del huanglongbing o greening de los cítricos** (Contingency Plan for *Candidatus Liberibacter spp.* bacteria associated with the disease huanglongbing or greening of citrus)

Additional text visible in the collage includes 'DIRECCIÓN GENERAL DE SANIDAD DE LA PRODUCCIÓN AGRARIA' and 'SUBDIRECCIÓN GENERAL DE SANIDAD E HIGIENE VEGETAL Y FORESTAL'.

# Valencian Contingency Plan for HLB and its vectors

First adapted to Valencian situation in 2016

- Survey program (detection survey):
  - Nurseries and garden centres
  - Orchards
  - Gardens (public & private)
  - Fairs, etc
  
- Eradication program:
  - Delimiting surveys
  - Establishment of Demarcated Areas
  - Eradication measures



**PLAN DE CONTINGENCIA  
de la  
COMUNITAT VALENCIANA**

*'Candidatus Liberibacter spp.'*  
bacterias asociadas a la enfermedad del  
huanglongbing o greening de los  
cítricos y sus insectos vectores.

# Royal Decree 115/2023 (before RD23/2016)

## Legal enforcement

Royal Decree 115/2023 establishes the national control and eradication program for *Trioza erytreae* and the national prevention program for *Diaphorina citri* and *Candidatus Liberibacter* spp.

- Obligations of the agents involved
- Surveys and controls
- Official confirmation and immediate actions:
  - If the presence of the vectors is confirmed (T.e. and/or D.c.)
  - If the presence of HLB is confirmed
  - If the presence of HLB and any of the vectors is confirmed
- Plant material and plant products movement restrictions in and from demarcated areas
- Compensation, public utility and sanctions

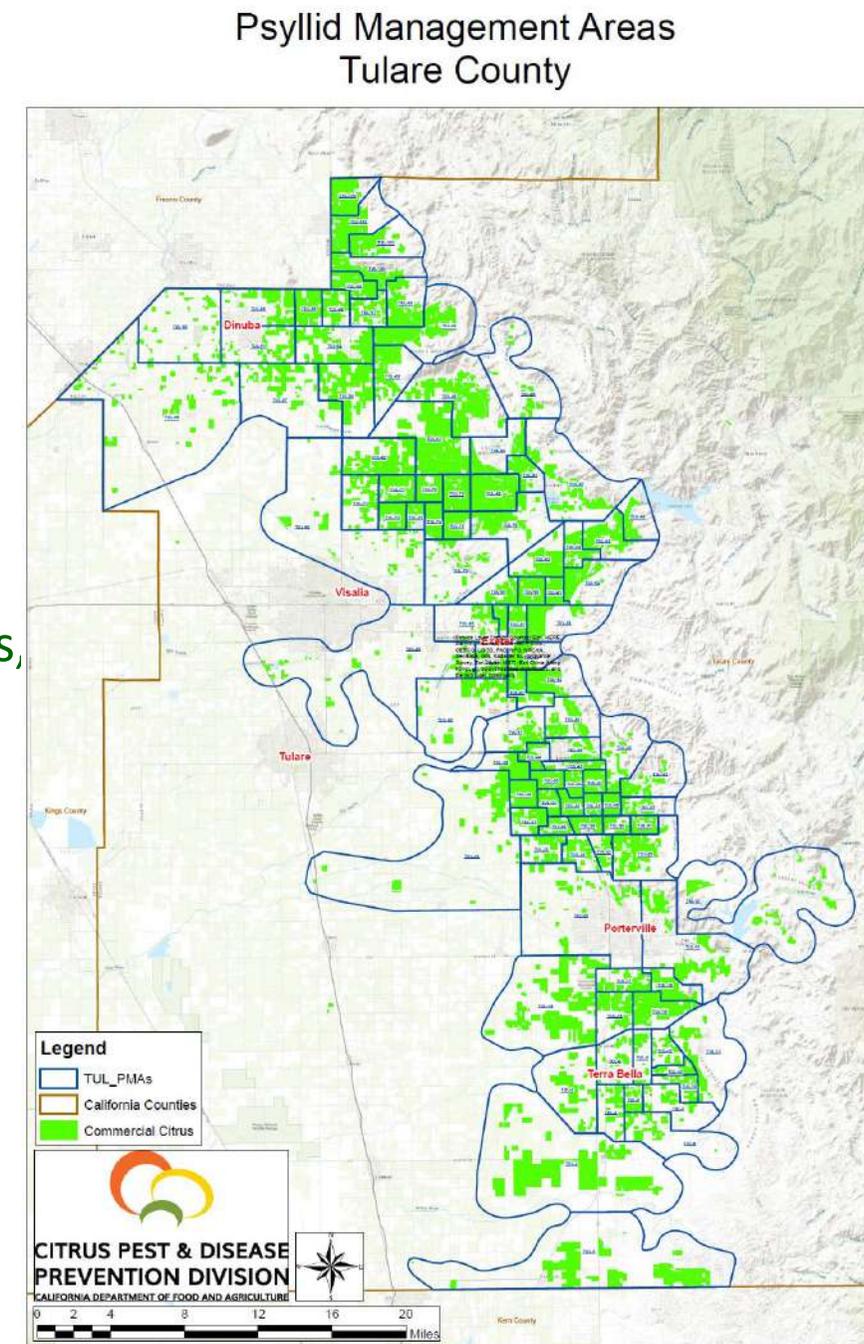
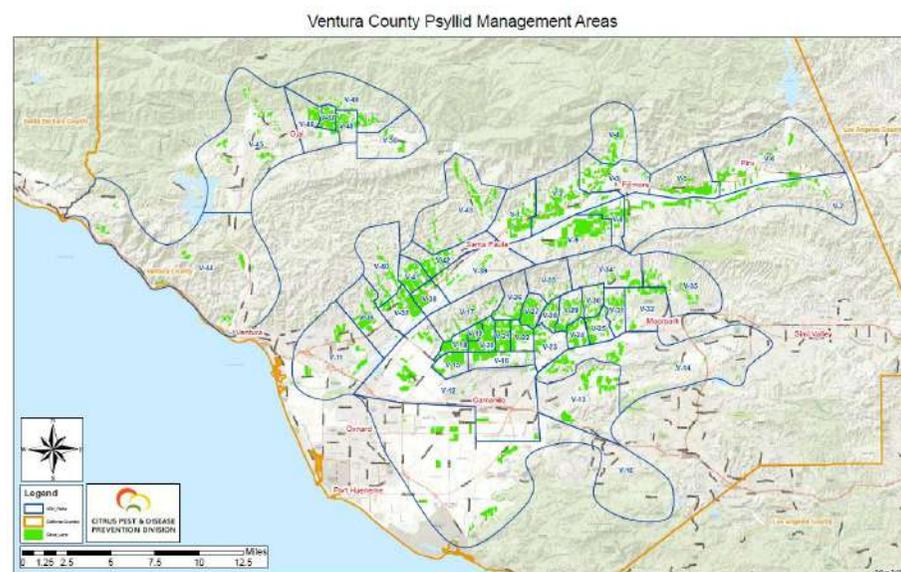
# Contingency Plan for HLB and its vectors

## Main changes proposed through PreHLB:

- Establishment of Citrus Health Management Areas (CHMAs) for vector management.
- Delimiting a minimum area of 1,5 Km around a suspect case. Isolation of suspect plant material and access restrictions to the suspect orchard/premise.
- Sub-division of the management area (region) into smaller zones (counties). Designate a “grower liaison” responsible for each small zone: workgroups, constant communication with growers, stakeholders and authorities.
- Measures to limit the movement of the vector with bulk fruits from the orchard.
- Compulsory removal of abandoned citrus orchards, mainly in demarcated areas.
- Addition of mass rearing and releases of *Tamarixia radiata* in case of detection of *Diaphorina citri* (residential areas).
- Compulsory host plant material production under physical protection.

## Main changes proposed through PreHLB:

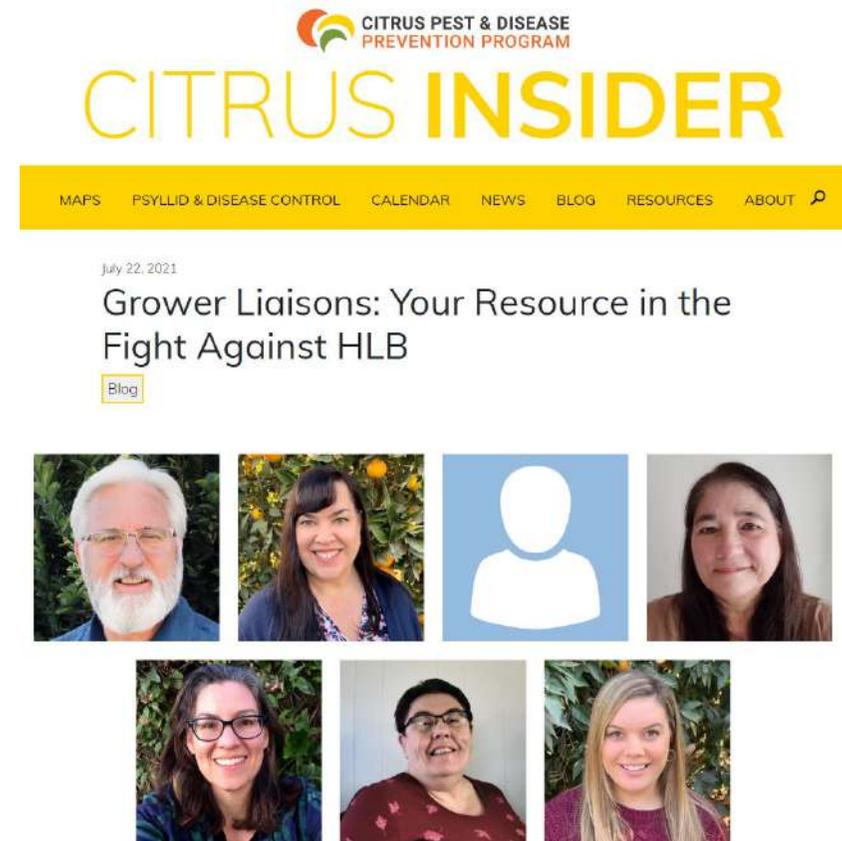
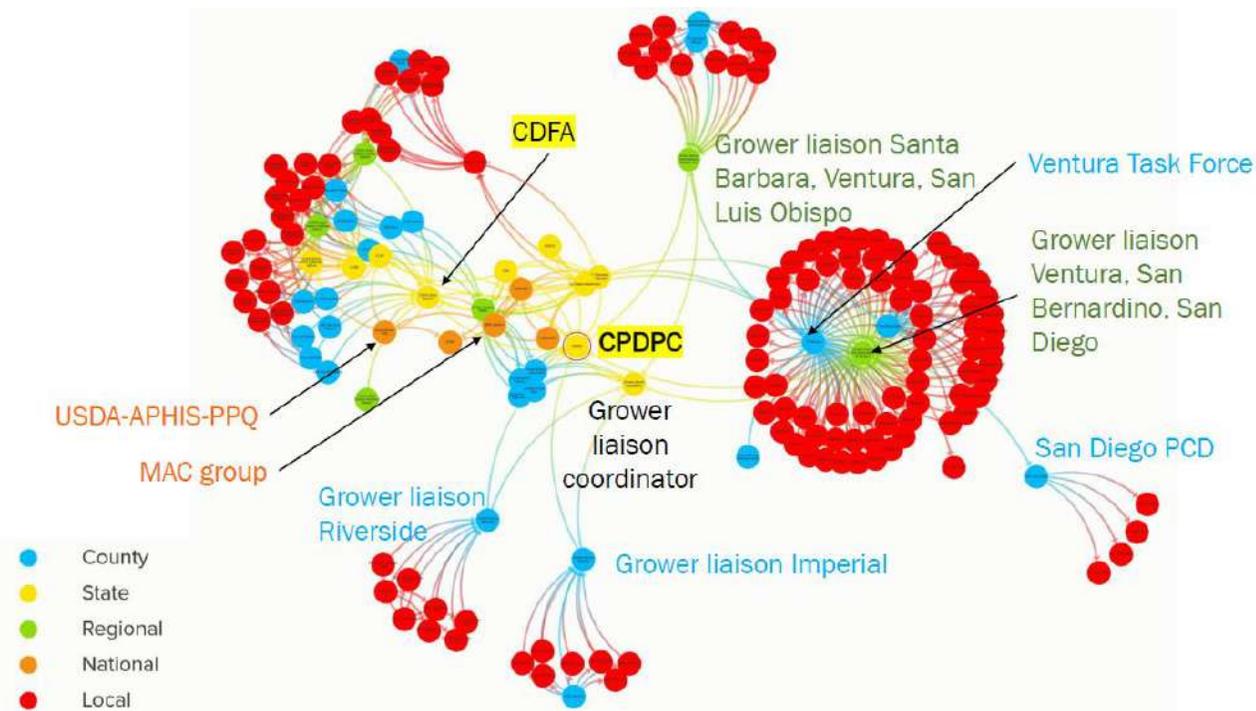
- Establishment of Citrus Health Management Areas (CHMAs), for vector management
  - Crucial especially in areas of small groves/farms
  - Coordinate compulsory treatments (Psyllids Quarantine Enforcement)
  - Cooperatives/municipalities/irrigation communities could lead every CHMAs, under guidance of the competent authorities



# Contingency Plan for HLB and its vectors

Main changes proposed through PreHLB:

- Sub-division of the management area (region) into smaller zones (counties). Designate a “grower liaison” responsible for each small zone: workgroups, constant communication with growers, stakeholders, local and regional authorities.



# Contingency Plan for HLB and its vectors

## Main changes proposed through PreHLB:

- Measures to limit the movement of the vector with bulk fruits from the orchard.

Citrus shipped, regardless of their origin or destination, must be covered or shipped in an enclosed container or vehicle

When fruits are shipped out of a demarcated area, insecticide treatment prior to movement

Ban of movement of fruits with leaves and peduncles out of a demarcated area



# Contingency Plan for HLB and its vectors

Main changes proposed through PreHLB:

- Compulsory removal of abandoned citrus orchards, mainly in demarcated areas.



# Contingency Plan for HLB and its vectors

Main changes proposed through pre-HLB:

Include mass rearing and releases of *Tamarixia radiata* in case of detection of *Diaphorina citri*

- *T. dryi* is already included in the Contingency plan, but *T. radiata* in case of ACP outbreak was left
- Biological control is useful in urban and peri urban areas, where isolated citrus plants could be difficult to find



# Contingency Plan for HLB and its vectors

Main changes proposed through PreHLB:

- Compulsory host plant material production under physical protection (nurseries biosecurity)



# Dissemination activities to increase awareness

Publications, factsheets, webinars, conferences, technical seminars, field guides, posters, videos etc.

**2º WEBINAR EL HLB. TÉCNICAS DE GESTIÓN PREVENTIVAS**  
 PROYECTO PRE-HLB  
 Presente: ANTONIO CUBIÑANA MARTÍNEZ, DIRECTOR GENERAL DE AGRICULTURA, GANADERÍA Y PESCA. Modera: VICENTE DALMAU, JEFE DE SERVICIO DE SANIDAD VEGETAL.  
 MARTES 15 DE JUNIO DE 2021  
 17:00h: 17:20-17:40h: GENERALIDADES DE LA ENFERMEDAD Y RIESGOS EN LA CITRICULTURA DEL MEDITERRANEO. LEANDRO PEÑA (EMICP-CSIC)  
 17:40-18:00h: GESTIÓN DEL VECORIO *Trioxa erythrae* Y MEDIDAS DE PREVENCIÓN CONTRA LA ENFERMEDAD EN PORTUGAL. AMILCAR DUARTE (UNIVERSIDADE DO ALGARVE)  
 18:00-18:30h: GESTIÓN SANITARIA DE ÁREAS CITRÍCOLAS – CHINA (CITRUS HEALTH MANAGEMENT AREAS). RENATO BEZZOZZI (BASSANOZI) (HUNDECHERUS)  
 18:30-19:00h: VECTORES POTENCIALES. SITUACIÓN ACTUAL EN ESPAÑA Y PORTUGAL. MEDIDAS DE LUCHA. ALBERTO FERRERES (CSIC)  
 19:00-19:30h: PREGUNTAS A LOS PONENTES.  
 MIÉRCOLES 16 DE JUNIO DE 2021  
 17:00-17:30h: TÉCNICAS DE DETECCIÓN. KITS ESPECÍFICOS. ANA CRESPO SEMPERE (WALGENETICS)  
 17:30-18:00h: REPERCUSIÓN DE LAS IMPORTACIONES REGALES. IMPORTACIÓN DE LA CESTIFICACIÓN. LUIS NAVARRO (ASESOR CSIC)  
 18:00-18:30h: GESTIÓN SANITARIA DE ÁREAS CITRÍCOLAS EN CALIFORNIA. SARA GARCÍA FIGUEROA (UNIV. DE CALIFORNIA-DAVIS)  
 18:30-19:00h: PREGUNTAS A LOS PONENTES Y CLOSURA



**PSILA AFRICANA (*Trioxa erythrae*) (Del Guercio)**  
 Descripción: Insecto hemíptero de la familia Triozidae. Los adultos son alargados y son de color verdoso al emerger y al poco oscurecen. Las alas son transparentes (foto 1). Se sitúan en los brotes muy tiernos, donde se agrupan y realizan la puesta (foto 2). Las hembras son amarillentas, cilíndricas, apiladas. Se pueden distinguir en grupos o solitarias. Una hembra puede producir entre 2 y 200 huevos. Las orugas, muy planas, ovaladas, se alimentan rascando la savia de la hoja. Para por cinco semanas más tarde. La larva de último estadio (foto 3) se mueve, variando de verde amarillento a gris oscuro; aproximando los segmentos del futuro adulto. Posee un característico reborde formado por filices oscuras filariformes. Emboscadas, sobre la que se desarrolló el hongo neovulva o fumagina. Los machos son más pequeños que las hembras, tiene el abdomen redondeado mientras que las hembras lo tienen alargado. Los adultos, al alimentarse, levantan ligeramente el abdomen, formando un ángulo de 25 grados. En la actualidad, sólo está presente en las Islas Canarias.  
 Síntomas y daños: La característica más destacada, es la deformación de brotes y hojas nuevas, con aparición de múltiples abollamientos, por el cual, que se corresponden con coque y chupa, por el cual, donde se sitúan las larvas (foto 4).  
 Los daños los ocasionan los insectos, al aspirar savia por el estilete fuertemente, en ataques intensos pueden provocar la detención del crecimiento del brote. El daño más reportado se produce al...

**Agricultores Y Ganaderos**  
 La citricultura en alerta máxima  
 La detección en Galicia del insecto transmisor del greening obliga a tomar medidas excepcionales

**Jornada de presentación de resultados del proyecto PRE-HLB para la prevención del greening en la citricultura mundial**  
 29 de Septiembre de 2023  
 Finca Sinyent de AVA-ASAJA (Poliinyá de Xúquer)  
 Programa:  
 9:00 - 9:15 am: Registro y recepción de los participantes.  
 9:15 - 9:30 am: Apertura del evento y precepción del doctor. Cristóbal Aguado (AVA-ASAJA).  
 9:30 - 10:00 am: Introducción al Huanglongbing. Características, sistematología y distribución geográfica. Tani Vicent (IVA).  
 10:00 - 10:30 am:  
 1º Proyecto Pre-HLB: Estrategias de control y manejo de la enfermedad. Leandro Peña (CSIC).  
 \* Experiencias de otros países en la lucha contra el Huanglongbing. Julián Ayres (HUNDECHERUS).  
 10:30 - 11:00 am: Pausa café.  
 11:00 - 11:30 am: Actuaciones de la Conselleria de Agricultura. Vicent Dalmáu (Conselleria Agricultura).  
 11:30 - 12:00 pm: Estrategia de lucha contra el HLB. Alberto Ferreres (CSIC).  
 12:00 - 12:30 pm: Presentación de la App de detección temprana del HLB y sus vectores. Iván Estel (CITA).  
 12:30 - 13:00 pm: Debate: Futuros pasos ante la amenaza de la entrada del HLB. Raphael Mordino (CIRAD).  
 13:00 - 13:15 pm: Conclusiones y cierre del evento. Javier Bartolomé (Secretario Autonómico de Agricultura Ganadería y Pesca).  
 Inscripciones:  
 A través del formulario: <https://forms.gle/uSjyA1w7sYro327>

**GENERALITAT VALENCIANA**  
 CONSELLERIA DE PRESIDÈNCIA I AGRICULTURA, PÈSCA, ALIMENTACIÓ I AIGÜES  
 DIRECCIÓ GENERAL DE PRODUCCIÓ AGRÀRIA I RAMADERIA  
 SANITAT VEGETAL  
**Nota informativa *Trioxa erythrae* (psílido africano de los cítricos)**  
 La psila africana (*Trioxa erythrae*) es un insecto chupador del orden Hemiptera, perteneciente a la familia Triozidae.  
 Nombres comunes:  
 Psílido africano de los cítricos, Africano citrus psílido.  
 Distribución geográfica:  
 Es originaria de África. Se encuentra ampliamente distribuido en África y con distribución restringida en Asia y Europa.  
 Distribución en España y zonas próximas:  
 No se ha detectado la presencia de esta plaga en la Comunitat Valenciana. En el año 1994 se detectó en Madeira y en 2002 en Canarias. Recientemente han aparecido focos en el noroeste de la Península Ibérica, en Galicia y Portugal.  
 Hospedantes:  
*Trioxa erythrae* vive exclusivamente sobre plantas de la familia Rutaceae, afectando a los cultivos de cítricos (naranjos, limones, pomelos y mandarinos), y a diversas plantas ornamentales de esta familia.  
 Descripción:  
 Adulto: Sin alas y móvil, con alas transparentes, accidentalmente presentes en color más pálido y posteriormente tornan un color marrón claro. Se asemeja a los mosquitos, mide de 3 a 4 mm de longitud. Se alimentan de las hojas adaptando una posición característica con el abdomen levantado en una posición de 35° respecto a la superficie de alimentación.  
 El periodo medio de vida de las hembras es de un mes.

**MANUAL DE CAMPO para la Prevención del HLB (HUANGLONGBING)**  
 PreHLB

El HLB y el futuro cítrico: situación y perspectivas

Valencia, 2 de marzo de 2016

**RSEAPV REAL SOCIEDAD ECONÓMICA DE AMIGOS DEL PAÍS DE VALENCIA**  
**RSEAPV REAL SOCIEDAD ECONÓMICA DE AMIGOS DEL PAÍS DE VALENCIA**  
**GENERALITAT VALENCIANA**  
 CONSELLERIA DE AGRICULTURA, MEDIU AMBIENT, CAMBIU CLIMÀTIC I DESARROLU RURAL

**Ficha coleccionable: Plagas exóticas**  
 Trioxa erythrae (Del Guercio), Hemiptera: Triozidae  
 Africano citrus psílido, en inglés.  
 Origen: África subsahariana.  
 Estado: Invasor.  
 Presentación: En Europa y en Madeira.  
 Descripción: Los adultos de esta especie miden entre 2 y 4 mm de longitud, son de color oscuro, pueden cambiar de color al alimentarse. Muestran con la abdomen en ángulo de unos 35º con el resto del cuerpo (foto 1). Las hembras miden y pesan más que los machos. Las hembras van de verde amarillento a verde oscuro al alimentarse. Las orugas, muy planas, ovaladas, se alimentan rascando la savia de la hoja. Para por cinco semanas más tarde. La larva de último estadio (foto 2) se mueve, variando de verde amarillento a gris oscuro; aproximando los segmentos del futuro adulto. Posee un característico reborde formado por filices oscuras filariformes. Emboscadas, sobre la que se desarrolló el hongo neovulva o fumagina. Los machos son más pequeños que las hembras, tiene el abdomen redondeado mientras que las hembras lo tienen alargado. Los adultos, al alimentarse, levantan ligeramente el abdomen, formando un ángulo de 25 grados. En la actualidad, sólo está presente en las Islas Canarias.  
 Síntomas y daños: La característica más destacada, es la deformación de brotes y hojas nuevas, con aparición de múltiples abollamientos, por el cual, que se corresponden con coque y chupa, por el cual, donde se sitúan las larvas (foto 4).  
 Los daños los ocasionan los insectos, al aspirar savia por el estilete fuertemente, en ataques intensos pueden provocar la detención del crecimiento del brote. El daño más reportado se produce al...

**ESTRATEGIAS PARA LA PREVENCIÓN Y CONTROL DE HLB EN ESPAÑA Y CALIFORNIA**  
 Martes 6 de octubre de 2020 | 16:30  
**GENERALITAT VALENCIANA**  
**ivia Institut Valencià d'Innovació Agrària**  
**UC DAVIS UNIVERSITY OF CALIFORNIA**

**Stato dell'arte e interventi per la prevenzione dell'introduzione e della diffusione di HLB in Italia**  
 Università degli Studi di Catania  
 Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria Distretto Produttivo Agrumi di Sicilia  
 9 maggio 2022  
 Dipartimento di Agricoltura, Alimentazione e Ambiente - Aula Magna  
 Via S. Sofia 100 - Catania  
 Con il Patrocinio di:  
**REGIONE SICILIANA**  
**MINISTERO DELLO SVILUPPO ECONOMICO E DELLE POLITICHE REGIONALI DELLA PROVINCIA DI CATANIA**  
 Massimo Ardu Costa

**Seminário sobre a distribuição de *Trioxa erythrae* no Algarve e a ameaça do HLB**  
 Programa:  
 A psila-africana-dos-citricos. Riscos associados à praga e necessidade de controlo no Rogil. Amílcar Duarte & Rita Poeira | UALG  
 Os inimigos da cultura dos citrinos "*Trioxa erythrae*" e HLB. Ponto de situação no Algarve. Celestino Soares | DRAP Algarve  
 18/Março/2022  
 Junta de Freguesia do Rogil  
 15h00

# Dissemination activities to increase awareness

Workshop with relevant entities in the phytosanitary field and regional governments to discuss the contingency plans.

PARTICIPATING IN

**PreHLB**

Preventing HLB epidemics for ensuring citrus survival in Europe

**June 2 from 16-18 h (CET)**  
Online: GotoWebinar Platform

Registration:  
<https://tinyurl.com/tc9h4tw6>

AGRICULTURE & INNOVATION

funded by European Commission

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 817526.

**Agenda of the event:**

**Brief presentation of EIP-AGRI and its relation with PRE-HLB.**

**Executive summary of the PRE-HLB project** - Leandro Peña - Project Coordinator

**Operational context in selected regions:**  
**CALIFORNIA** - Georgios Vidalakis - Professor and Extension Specialist in the Department of Microbiology and Plant Pathology, UC Riverside.  
**EUROPE** - Giovanni Baldissera - European and Mediterranean Plant Protection Organization EPPO.  
**PORTUGAL** - Paula Cruz de Carvalho, Ministry of Agriculture of Portugal.

**Brief presentation of the attending authorities:**  
**Spanish Policy in Brussels** - Valentin Almansa, Ministry of Agriculture of Spain.  
**Plant health approach -Threat to Valencian Community** - Vicente Dalmau - Plant Health Service of the Generalitat Valenciana.

**The vision of COPA-COGECA and CropLife Europe:**  
**The vision of COPA-COGECA** - Paula de Vera - Senior Policy Advisor.  
**The vision of CropLife Europe** - Michal Kicinski - Senior Manager Sustainable Agriculture.

**Open discussion forum** - All the above entities and Miguel Minguet from AVA-ASAJA.

## Technical Seminar on Citrus Nursery Plant Production

### JORNADA TÉCNICA

#### LA AMENAZA DEL HUANGLONGBING O GREENING DE LOS CÍTRICOS. ESTRATEGIAS PARA LA PRODUCCIÓN DE PLANTAS DE VIVERO DE CÍTRICOS (PROYECTO PRE-HLB)

**09:25h** PRESENTACIÓN DE LA JORNADA  
SR. GUILLEM ALSINA - EXCMO. ALCALDE DE VINARÒS

Modera: VICENTE DALMAU - JEFE DE SERVICIO DE SANIDAD VEGETAL

**JUEVES 7 DE ABRIL DE 2022**

09:30-10:15h	LA ENFERMEDAD Y SUS VECTORES. RIESGOS EN LA CITRICULTURA DEL MEDITERRÁNEO LEANDRO PEÑA (IBMCP-CSIC)
10:15-10:45h	LA PRODUCCIÓN SEGURA DE PLANTONES CERTIFICADOS ES IMPRESCINDIBLE PARA LA PREVENCIÓN Y CONTROL DEL HLB - LUIS NAVARRO (ASESOR CSIC)
10:45-11:30h	PAUSA CAFÉ
11:30-12:00h	AYUDAS PARA INSTALACIONES DE BIOSEGURIDAD PARA LOS MATERIALES VEGETALES DE REPRODUCCIÓN PACO PIÑERO (SERVICIO DE SANIDAD VEGETAL)
12:00-12:45h	PROGRAMA DE MEJORA SANITARIA DE CÍTRICOS: PRIMERA LINEA DE DEFENSA CONTRA EL HLB MARI CARMEN VIVES (INVESTIGADORA IVIA)
12:45-13:30h	NORMATIVA FITOSANITARIA CARLES ESCRIVÀ (SSV-SECCIÓN CERTIFICACIÓN VEGETAL)
13:30-14:00h	MESA REDONDA

PARTICIPAN

INSCRIPCIÓN AL EVENTO

LUGAR: Vinalab - Calle Galicia nº 12, 12500 Vinaròs (Castellón)

# Dissemination activities to increase awareness

## Simulation exercise, October 2021 (with EPPO advice and participation)



- **Simulation exercise to test the contingency plan (IVIA):** Valencia, 19 and 20 October 2021.

Exercise with sector experts on the hypothetical introduction of HLB in the Iberian peninsula.

# Blog

**Link:** <https://prehlb-blog.eu/>

Linked with the project website, it has been created with the aim to approach the project and its results to farmers in a more comprehensible way to them.



- Information in different languages: Spanish, French, Italian, Portuguese and English.
- Direct and visual content

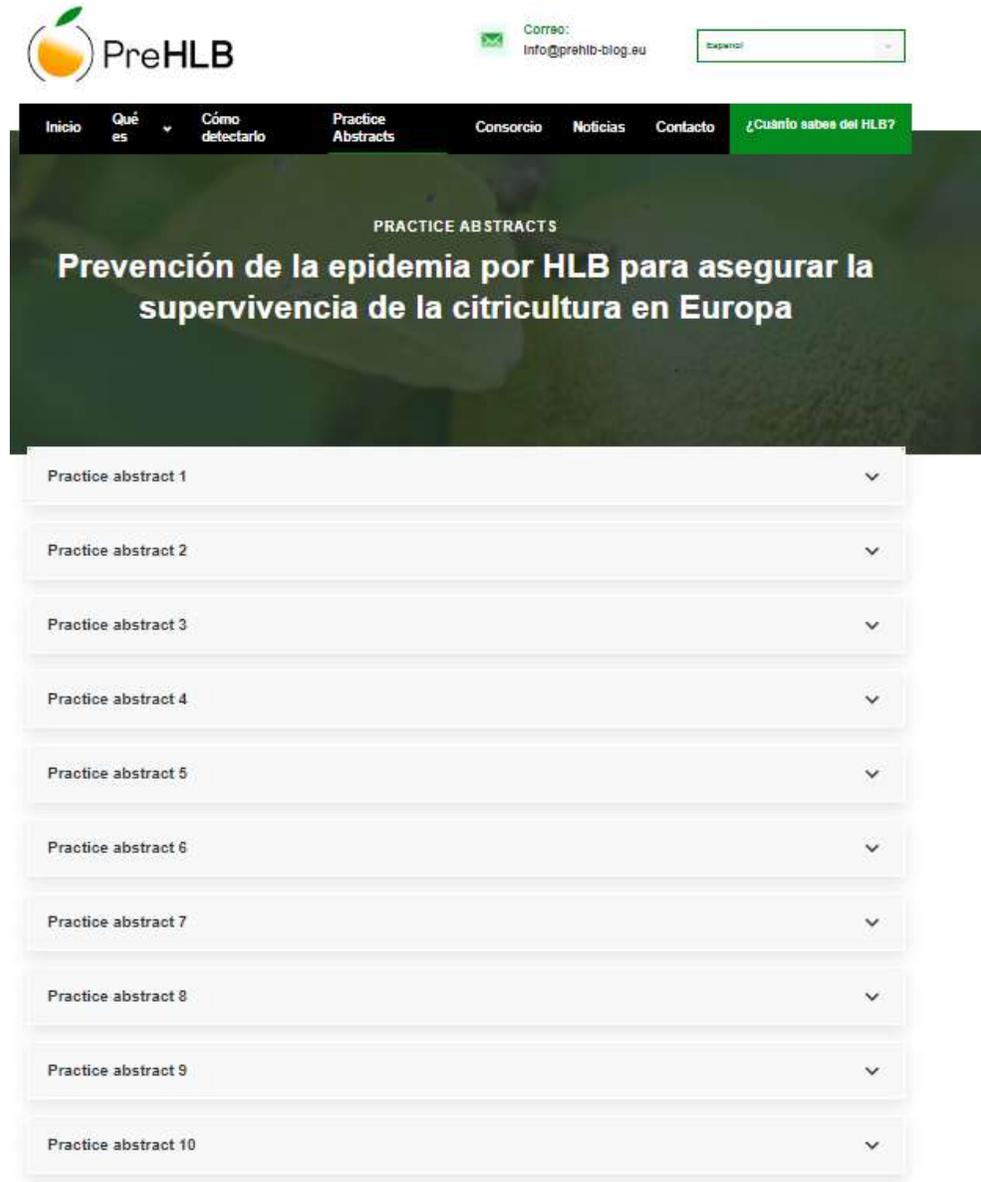


## Blog sections:

- Information about the project.
- Practice Abstracts (PAs) created.
- News.
- FAQ.
- Dynamic "test your knowledge" quiz.

PAs are intended to generate awareness about HLB, to train in HLB prevention/management and to share research results in an educational, understandable way.

To date, **70 PAs** have been published !!!



# Pre-HLB app

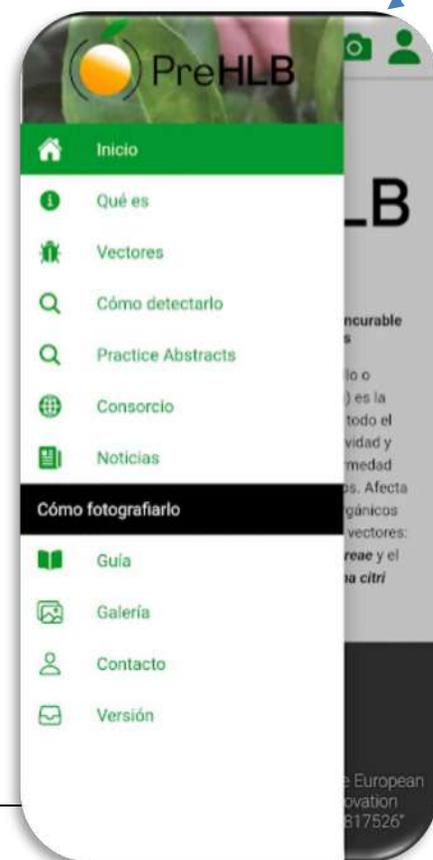


An informative mobile application, which offers:

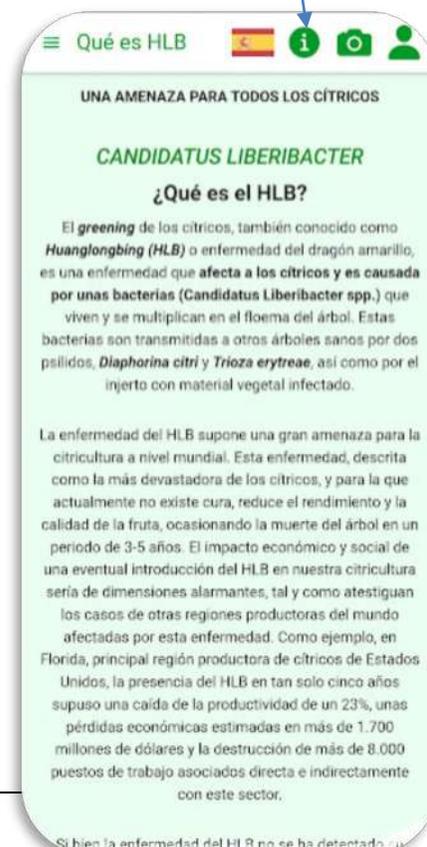
- Digital guide to inform the farmer/stakeholder/public about the disease, transmission, symptoms, vectors and ways of detection.
- Early detection of HLB and vectors from photographs taken by the farmer/stakeholder/public on field/garden/nursery/home.
- Artificial intelligence in constant learning.
- In case of a suspected positive detection, the image is sent for review by a plant health authority.

Available on Android and on IOS.

Home page



Side menu



What is HLB?

Vectors



How to detect it?



THANKS !!!

