Huanglongbing in Belize
Current Situation & Activities

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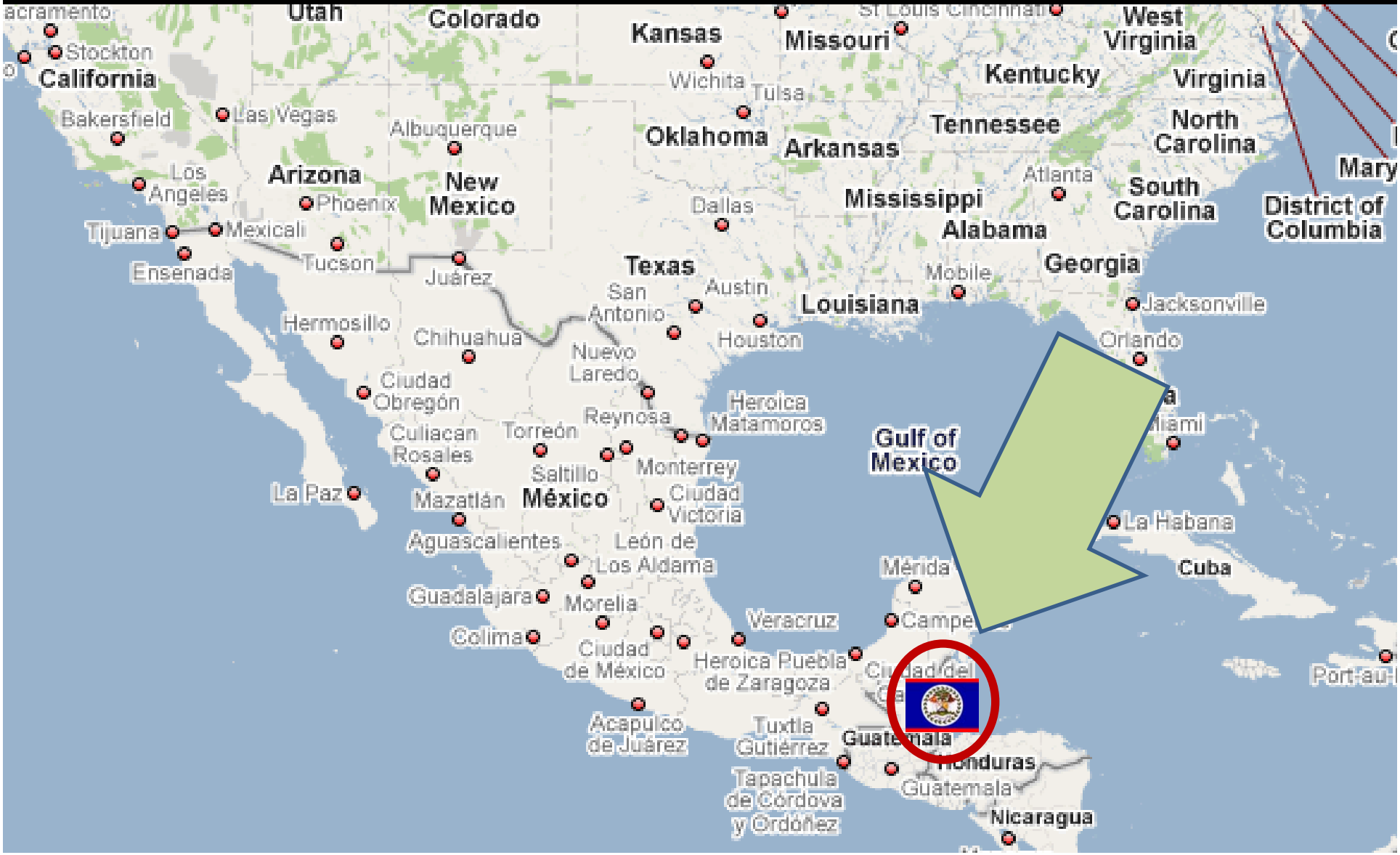
Huanglongbing in Belize – Current Situation & Activities – 16th November 2009

In this 10 minute presentation I shall talk about how HLB was found in Belize, the initial response to the discovery and on-going and future activities

I am Stephen Williams, the Director of the research unit (the Citrus Research & Education Institute) of the Citrus Growers Association. I also must acknowledge Veronica Manzanero Majil of CGA who has been instrumental in the work to survey for and discover greening in Belize and is currently leading the HLB-laboratory and HLB-survey activities in the country.

Francisco Gutierrez of the Belize Agricultural Health Authority (BAHA) and Fermin Blanco of OIRSA are also key players in Belize's fight against this devastating disease

Where is Belize?



45,000 Citrus Acres

Citrus Products of Belize Limited

6.5 – 7m cxs / yr

Belize Citrus Growers Association

The Belize Citrus Industry – is composed of 45,000 acres of citrus, 80% of which is Valencia Orange and 20% of which is Marsh Reed Grapefruit. The citrus industry is the number one agricultural foreign exchange earner for the country of Belize.

The majority of the fruit (98%) is processed by the Citrus Products of Belize Ltd. into concentrate for export. The company, on average, processes between 6.5 and 7 million cxs of citrus each year.

The majority of citrus growers in Belize are members of the Citrus Growers Association (CGA) which provides loan services for growers, cost price chemicals, fertilizer and fuel, laboratory diagnostics for graft transmissible and other diseases, citrus nursery certification programme, Mexican fruit fly control and extension services. Further information on the Belize Citrus Growers Association and its work can be found at www.belizecitrus.org

Next, information will be presented on the process towards discovering HLB in Belize and the initial responses that were implemented.

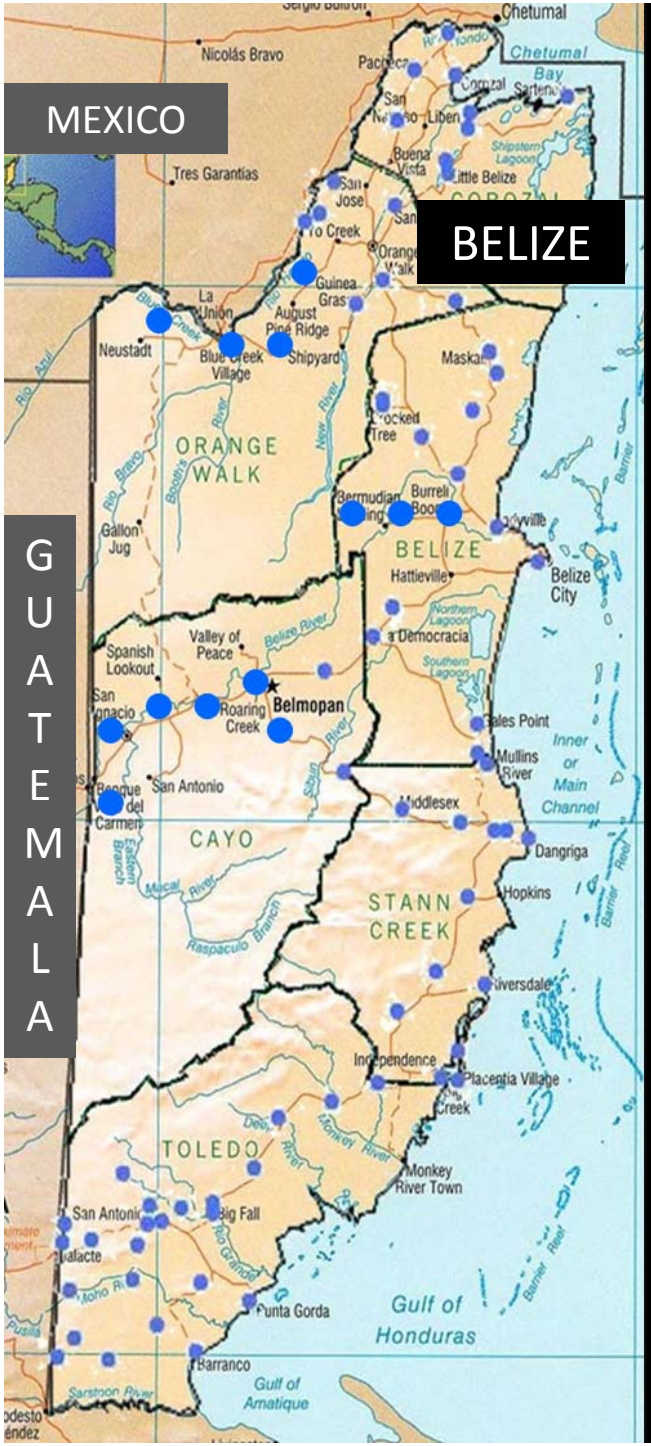
This will be followed by a discussion on the on-going and future activities.

Firstly, the discovery of HLB in Belize!

The Citrus Research & Education Institute (CREI) of the CGA has, since 2004, being conducting 6-monthly surveys for exotic diseases, that is, diseases present in the regions but not known to be present in Belize. These diseases have been HLB, citrus canker, leprosis virus and citrus variegated chlorosis (CVC). Belize is the only country in Central America that does not have citrus leprosis virus – a fact attributed to an effective citrus nursery certification programme being operated, by CREI, in the country.

The blue dots on the map (Exotic Disease Surveys Every 6 Months) represent the sites where, in January 2009 (as in previous years), psyllid samples were collected from citrus trees with leaves with HLB suspect symptoms. These psyllid samples were sent to the laboratory of Richard Lee and K. Manjunath at Riverside, University of California, for screening for the presence of HLB. In May 2009, 9 of the samples were returned positive, from the January sampling, for the bacteria Candidatus Liberabacter asiaticus. The HLB-positive samples were obtained from sites in the centre, far north, east and south of Belize. We are, of course, extremely grateful to Drs. Lee and Manjunath for providing these diagnostic services and their continued dedicated support for our work to control the spread of citrus diseases in Belize.

Following the discovery of HLB in Belize, OIRSA (the International Regional Organization for Agricultural Health) declared a regional emergency and released funding to CGA and BAHA for the implementation of a delimiting tree-survey for the presence of HLB – this survey was conducted from May to June 2009.



Exotic Disease Surveys

Every 6 Months

HLB

CANKER

LEPROSIS

CVC

On discovering that HLB was present in Belize a major concern was the potential for continued spread of the disease through the distribution of HLB-contaminated citrus nursery plants. None of the citrus nurseries in Belize were (or are currently) covered with psyllid proof structures and so all nurseries were considered to have potentially being exposed to HLB disease.

May/June is the most active time in Belize for the planting of citrus and so, with this in mind, the newly formed “Citrus Greening Task Force” worked with the Ministry of Agriculture to pass emergency legislation to prohibit the movement of citrus plant material (except fruit) in the county. This ban remained in place until the survey to determine the distribution of the disease around the country was completed. Thereafter (in October 2009) the legislation was modified to permit movement of plants but only with a BAHA-plant-movement-permit. Such permits are only being issued for plant movement that will present minimal risk of spreading the disease around the industry. The legislation also provided nursery owners with a deadline, until February 2009, to ensure all citrus plants produced in Belize are done so under BAHA approved screened structures.

An HLB diagnostic laboratory (real-time PCR) has been established at the Citrus Research & Education Institute (CREI) and a delimiting survey conducted through out the country by CREI and BAHA staff.

Over 1,000 samples of suspect citrus leaves were collected from around the country and delivered to the CREI laboratory for testing. Around 200 of those were diagnosed positive for HLB. The HLB-testing for many of these samples was also conducted in the laboratory of Mike Irey at Southern Gardens Citrus in Florida. We are, of course, very grateful for the generous support provided by Mike Irey and others in our efforts to control HLB.

The map (Citrus Greening Delimiting Survey) reveals the results of the survey: HLB was found to be present in backyard trees (red crosses) in all Districts, in some nurseries (red diamonds) and in some groves (red squares). The majority of the incidences of the disease were found to occur in the Stann Creek District. The yellow symbols represent sites where samples were taken but were found in laboratory tests to be “HLB-not determined”.

While the survey was being conducted a public and grower awareness campaign was also implemented. Posters, depicting symptoms of the disease, were distributed and workshops were held to inform people about the presence of the disease in Belize, its possible implications and what they should do. Radio and TV appearances by members of CREI staff, to discuss HLB, also occurred.

Emergency Legislation

Restrict Movement of Citrus Plants

Belize Agricultural Health Authority

BELIZE:

STATUTORY INSTRUMENT
NO. 122 OF 2009
122

REGULATIONS made by Belize Agricultural Health Authority with the approval of the Minister responsible for Agriculture in exercise of the powers conferred upon it by sections 35 and 86 of the Belize Agricultural Health Authority Act, Chapter 211 of the Substantive Laws of Belize Revised Edition 2000-2003; and all other powers thereunto it enabling.

CONSIDERING the importance of the citrus industry to Belize;

GIVEN the fact that it has been confirmed that the bacteria (Candidatus *Liberibacter asiaticus*) that causes the devastating citrus disease known as citrus greening or huanglongbing is now present in Belize;

RECOGNIZING the fact that significant spread of this disease occurs due to the movement of plant material that is either infected with the bacterium or carrying the infected psyllid *Diaphorina citri*;

IT IS RESOLVED that immediate measures need to be implemented to restrict the movement of planting material (citrus and other hosts of the disease or vector) (except fruits) until officers of the Belize Agricultural Health Authority advise the

Short title. 1. These Regulations may be cited as the

BELIZE AGRICULTURAL HEALTH AUTHORITY (NOTIFIABLE PLANT PEST) (CITRUS GREENING) REGULATIONS, 2009.

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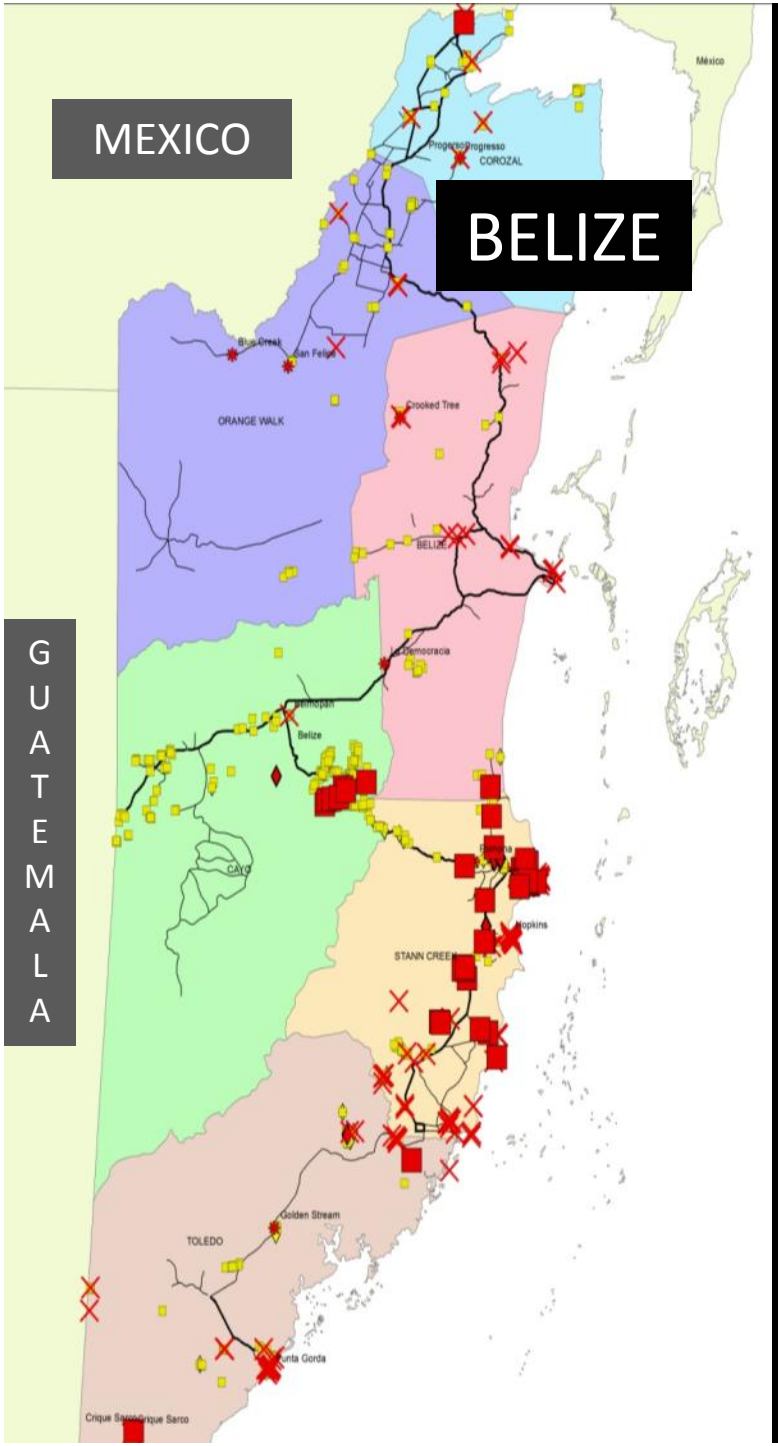
HLB-Diagnostic Capacity Established

Tests provided free to growers



Citrus Greening Delimiting Survey

May 2009

HLB found:

- Backyard trees all Districts ✕
- In some groves ■
- In some nurseries ◆
- In psyllid ✸
- Highest occurrence Stann Creek District

Public

Awareness

Campaign

Launched

In essence, therefore, although we are beginning to get the basics in-place there is still so much more that needs to be done to deal with this threat to citrus production…

Now the presentation will focus on future and on-going activities…

Thanks to support funding provided, through OIRSA and the Mexican authorities, more detailed surveys for HLB are now continuing around the Belize. A new team of six field technicians have been hired to conduct these surveys and to work with growers and householders to remove infected trees – three of the technicians will be focusing in the south of the country and three in the north. This funding is also providing support for securing of Belize's budwood and germplasm collections under psyllid-free conditions.

BAHA has already began to remove infected trees in the north of the country, close to the border with Mexico.

Approaches to control the vector of the disease, the Asian Citrus Psyllid (ACP), are also of great concern for the citrus industry in Belize. The consensus is that there is a need to establish the "Area Wide Control" approach to deal with this problem. Past experiences with the discovery of new pests (such as the brown citrus aphid (1996), the citrus leaf miner (1994) and citrus blackfly) in Belize have shown that there is a good natural control of these pests in the groves by the resident natural predators (parasitic wasps, lady beetles, lace wings, spiders etc.). Citrus growers in Belize are not in the habit of widespread insecticide use and so blanket sprays to control the ACP, as is being used to control ACP in other countries, would disrupt the natural level of biological control that is already operating and almost certainly cause additional pest problems for growers. This, of course, must be avoided.

Tamarixi radiata, a parasitic wasp of ACP, has been found to be present in Belize. One approach being considered is for dry-season area-wide insecticidal control for ACP. The dry season in Belize runs from February to May when citrus trees will be dormant and grove beneficial insect activity will be low and least likely to be affected by insecticide applications. Such insecticide control could be followed by rainy-season targeted release of reared *T. radiata* in areas where ACP populations are found to be remaining high. We are looking for scientists and institutions to partner with us in such a programme. It could be that Belize has something of significance to offer other countries in the region (due to the high insect biodiversity in Belizean citrus groves): A high potential of developing a procedure for the effective augmented biological control of ACP that can be adopted elsewhere.

Nation-wide Surveys for HLB Continue

C.G.A. BELIZE CITRUS GROWERS ASSOCIATION

BAHA BELIZE AGRICULTURAL HEALTH AUTHORITY

OIRSA

SAGARPA

SECRETARÍA DE AGRICULTURA, GANADERÍA, DESARROLLO RURAL, PESCA Y ALIMENTACIÓN

Area Wide Control of ACP

> Biological control:

- Brown Citrus Aphid
- Citrus Leafminer
- Citrus Black Fly
- Scales

> *Tamarixia radiata* in Belize

> Dry season insecticide application

> Targeted release of *T. radiata*

To summarize, what have we discovered, what have we done and what more do we need?

> We have discovered that HLB is in back-yard trees in all Districts of Belize, is present in some nurseries and occurs with the greatest incidences in the south of the country.

> We have restricted plant movement through legislation, established an HLB-diagnostic laboratory and continue to conduct surveys that are monitoring the spread of the disease.

> We continue with intensive public awareness campaigns, training of growers to recognize symptoms of the disease and working with growers to remove infected trees.

But we are the first to admit that this is not enough...

>We need to find additional support to increase Belize's capacity to conduct surveys, to increase its capacity to remove infected trees and to increase its capacity to implement a programme for Area Wide Control for *Diaphorina citri*.

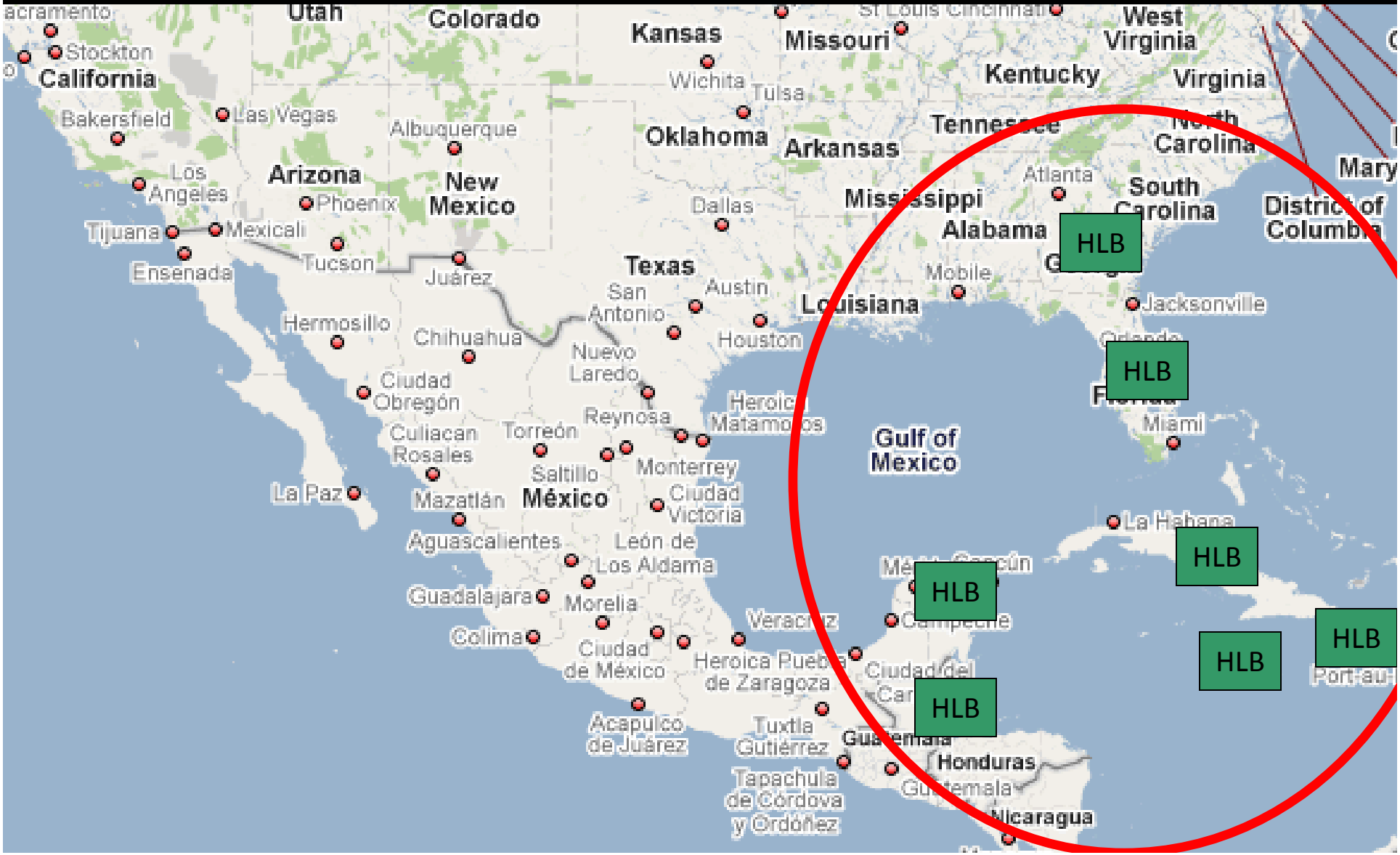
We know that HLB is spreading fast…

If we are to move from the potential devastation of our citrus industries in the region...to ensuring their long term viability

There is an urgent need to implement a regional strategy of actions, collaboration and funding for HLB control...

This is the only way of reducing the risk of the disease becoming *established* throughout Central America, *established* in Mexico and *established* in California and Texas!

Regional Program Required for HLB



For further information on our work contact:

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