Citrus Huanglongbing: History, Current Status and Prospects

California Rare Fruit Growers
Mira Costa College
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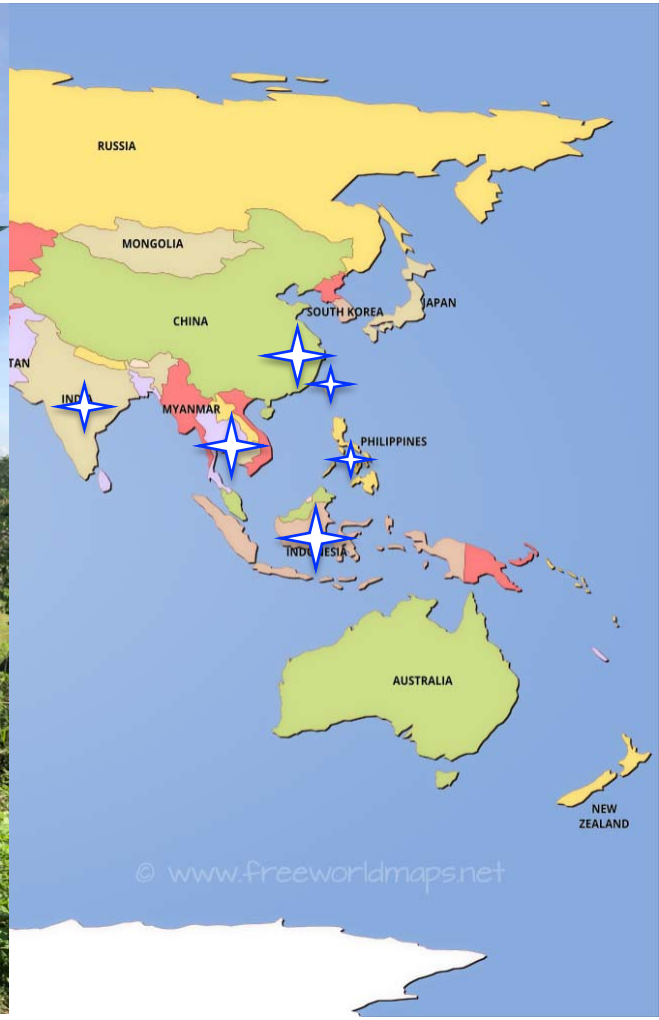
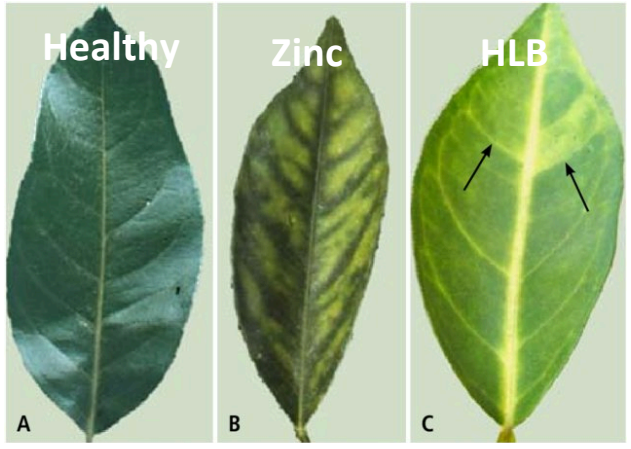
History of HLB - Huang (yellow) Long (dragon) Bing (disease) – *aka* Citrus Greening



1919: China **1921:** The Philippines **1928:** South Africa **1943:** Taiwan **1963:** India

1960's: Southeast Asia **2004:** Brazil **2005:** Florida **2012:** California

HLB Symptoms are Similar to Other Stresses in Citrus



Citrus HLB Symptoms: Tree Decline and Fruit Drop

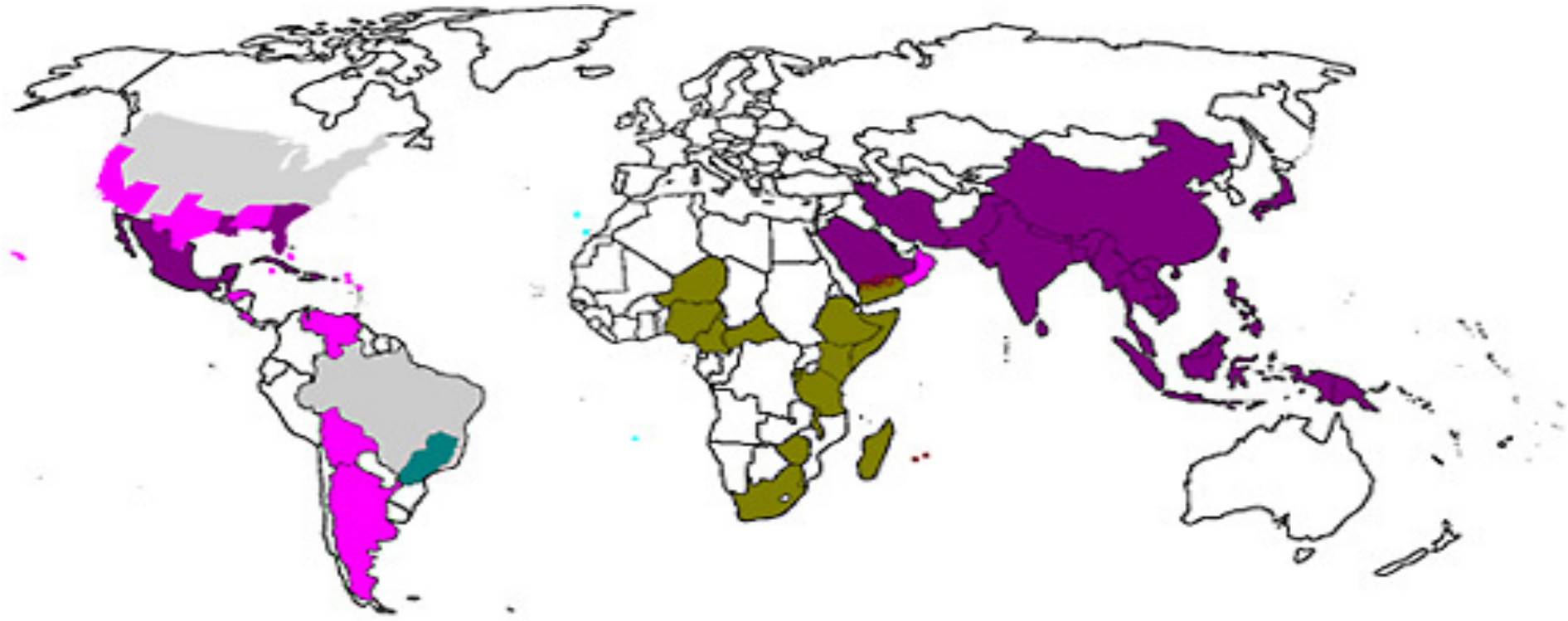




HLB: Multiple Pathogens and Vectors

- Two psyllid insect vectors
  - *Trioza erytreae* in Africa (cool climate, high altitude)
  - *Diaphorina citri* in Asia and America (hot climate, low altitude)
- At least three pathogenic strains
  - African strain: *Candidatus* Liberibacter africanus. Heat sensitive.
  - Asian strain: *Candidatus* Liberibacter asiaticus. Heat tolerant.
  - America strain: *Candidatus* Liberibacter americanus. Broad heat range.

Geographic Distribution of Pathogens and Vectors



Candidatus Liberibacter africanus and *Trioza erytreae*

Candidatus Liberibacter asiaticus and *Diaphorina citri*

Candidatus Liberibacter asiaticus, *Candidatus* Liberibacter americanus, and *Diaphorina citri*

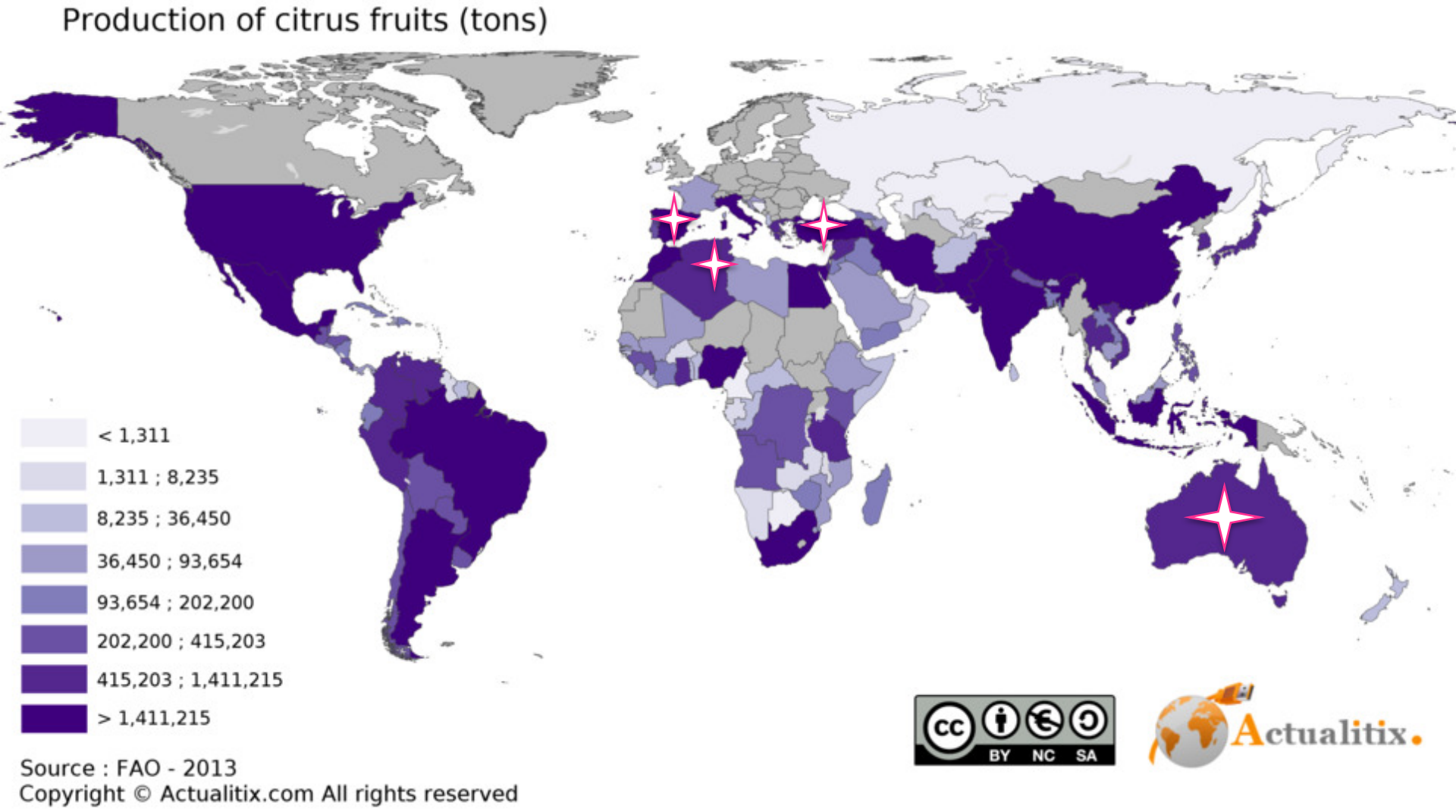
Candidatus Liberibacter africanus, *Candidatus* Liberibacter asiaticus, *Diaphorina citri*, and *Trioza erytreae*

Diaphorina citri only

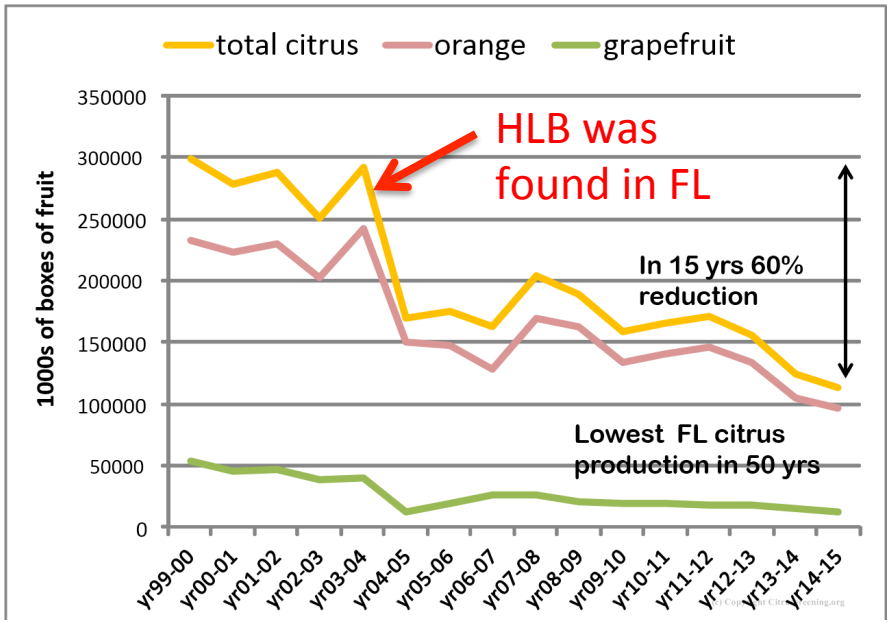
Trioza erytreae only

Citrus Production Worldwide

HLB Free

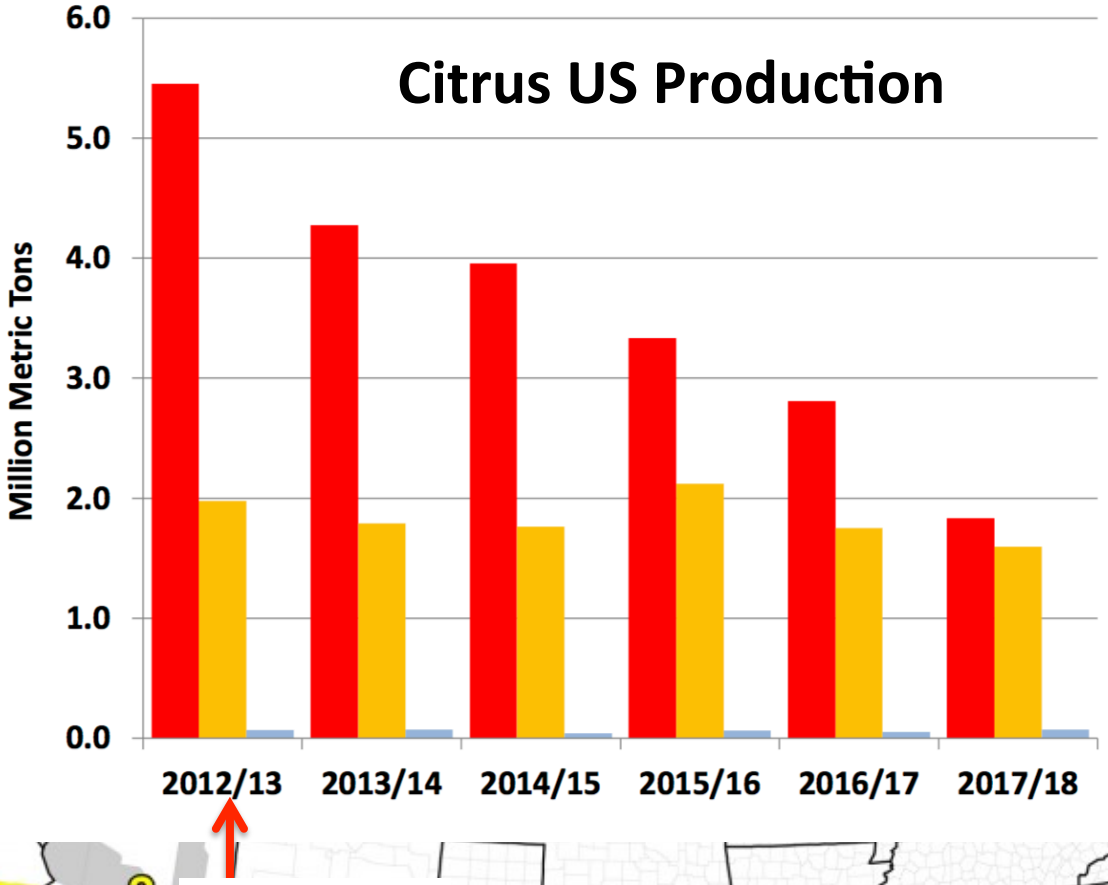


Impact of HLB on Florida Citrus



- 80% of orchards are infected
- Production reduced by 60% in 15 years. On average, 40% decrease in production in affected orchards plus decrease in fruit quality.
- Very rapid disease development from planting to 40% infection in 10 months.
- Per acre management costs increased from $800 to $2000
- 33,000 planted acres abandoned, 43,000 trees removed
- A major concern is that production will drop below critical volume to maintain juice industry and infrastructure

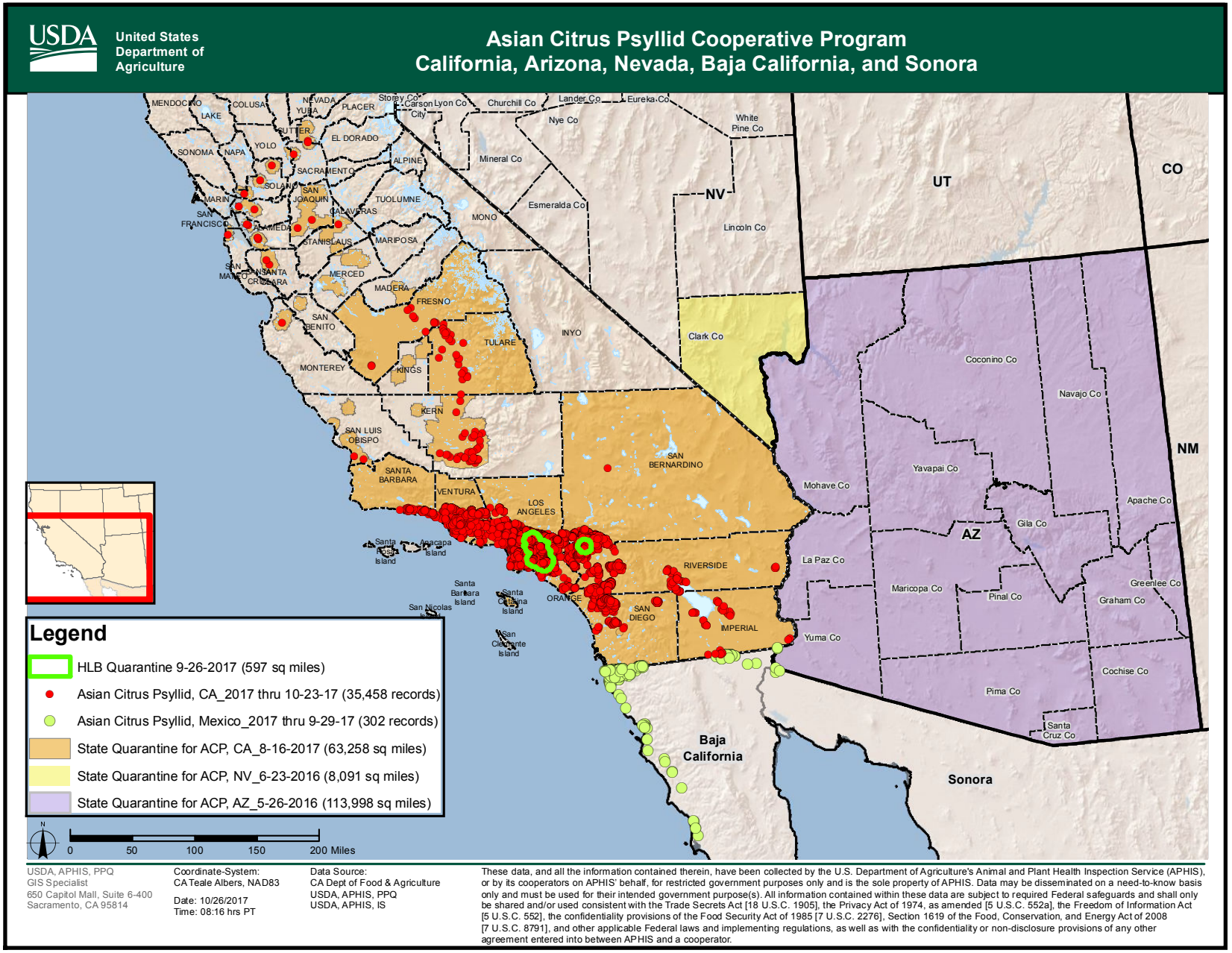
Citrus US Production



HLB was found in CA

USDA World Agricultural Outlook Board
Joint Agricultural Weather Facility

What about California?



Huanglongbing Management

1. Plant HLB-free trees. Use Clean plant propagation in nurseries.

Huanglongbing Management

2. Keep tree healthy
   - Proper nutrient management
   - Manage other diseases (Soil borne diseases)

3. Scouting for Asian Citrus Psyllid with sticky traps

4. Removal of infected trees [Video]

Huanglongbing Management

5. Control Asian Citrus Psyllid
   - Release predators of ACP (*Tamarixia*) [Video]
   - Protect citrus flush [Video]
     - Organic production: *Grandevo; M-Pede; Pyganic; Entrust*; Organic Oils.
     - Conventional production foliar pyrethroid (contact); drench neonicotinoids (systemic)
     - Home owner: Bayer Advanced Fruit, Citrus & Vegetable Insect Control (systemic); Carbaryl or malathion (contact); Dish Soap.

Huanglongbing Management

- CDFA Hotline 1-800-491-1899

- University of California Extension Agents
  - **Sonia Rios**, UC ANR Moreno Valley
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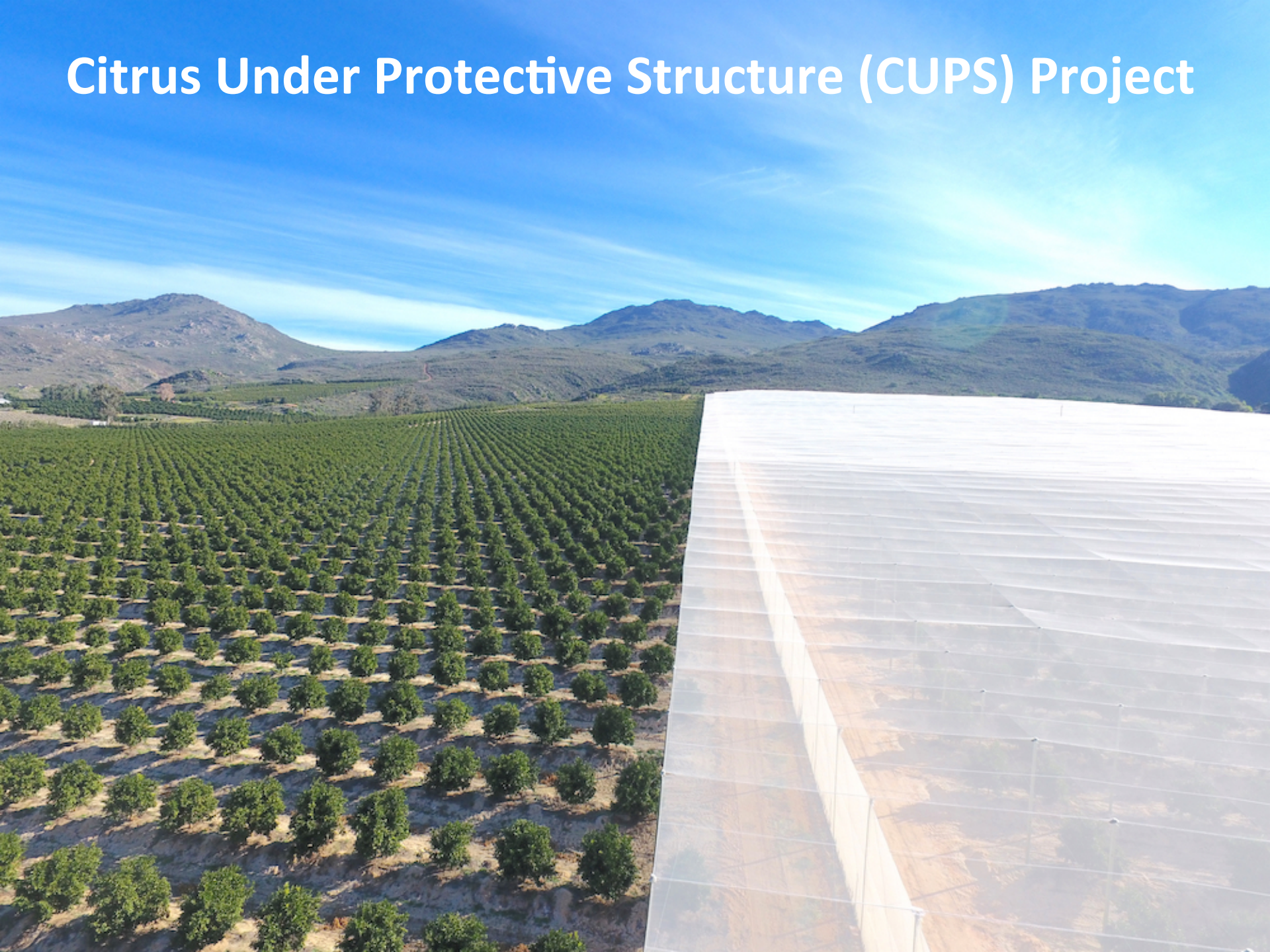
HLB Research Prospects

- Early disease diagnostic. From tree volatiles, to molecular techniques, to K9 teams (Video).
- Culturing CLas
- Breeding resistant/tolerant citrus varieties and rootstocks.
- Discovery on new organic/conventional agrochemicals for control of the ACP and CLas.
- Implementing new cultural practices to manage HLB (wind barriers, individual tree nets, CUPS)

Citrus Under Protective Structure (CUPS) Project



Citrus Under Protective Structure (CUPS) Project

http://californiacitrusthreat.org/

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