Asian Citrus Psyllid (ACP) & Huanglongbing (HLB)

Sandra Zwaal
ACP/HLB Grower Liaison
The Asian Citrus Psyllid (ACP) pest transmits the bacteria that causes Huanglongbing (HLB) disease.

No cure for HLB! HLB kills citrus trees.

California is a fresh fruit state.
Topics

1. Asian citrus psyllid (ACP) pest
2. Huanglongbing (HLB) disease
3. Spread of ACP/HLB
4. Best Practices
Pest

Asian Citrus Psyllid
(ACP)
ACP Lifestages

The lifecycle takes about 4 weeks to complete

Egg, 5 wingless nymph stages, and a winged adult.

(insects molt to grow bigger)
ACP – the Pest

A small insect, about the size of an aphid
Egg Stage
Juvenile/Nymph Stage

Nymphs feed on young, tender leaves and stems.

Nymphs produce waxy tubules that direct honeydew away from their bodies.
When feeding, the adult leans forward on its elbows and tips its rear end up in a very characteristic 45° angle.
ACP Signs

Injests a salivary toxin when feeding, causing tips of new leaves to breakoff. Twisted, notched leaves can be a sign that ACP has been there.
Host Plants

All citrus and related plants in the Rutaceae family

- *Citrus* (limes, lemons, oranges, grapefruit, mandarins...)
- *Fortunella* (kumquats)
- *Citropsis* (cherry orange)
- *Murraya paniculata* (orange jasmine)
- *Bergera koenigii* (Indian curry leaf)
- *Severinia buxifolia* (Chinese box orange)
- *Triphasia trifolia* (limeberry)
- *Clausena indica* (wampeii)
- *Microcitrus papuana* (desert-lime)
- Others....
Disease

Huanglongbing (HLB)
HLB Signs - Tree

CLas blocks phloem/nutrient flow.

Tree stops bearing fruit & dies in as little as 5 years.

Huanglongbing means ‘yellow shoot disease’ in Chinese.

_Candidatus Liberibacter asiaticus_
HLB Signs - Leaves

Slight to completely yellow

Thick veins

HLB

Zinc
HLB Signs - Fruit

- HLB prevents fruit from developing properly.
- Lower half is green (why it is called Citrus Greening).
- Small fruit, crooked midrib, aborted seeds.
- Bad/bitter tasting fruit
How HLB Is Spread

ACP
- Transmits CLas bacteria during feeding & carries it in its body for life.
- ACP flies from tree to tree.

Artificially moved via transportation

Grafting
- Use certified budwood
How HLB Is Found

• CDFA Surveys/Sampling
  – Risk-Based Surveys
  – Commodity Surveys
  – Delimitation Surveys

• Lab Testing
  – Plant & ACP Samples are tested
  – Confirmed via PCR testing

⚠️ Pest Hotline: 1-800-491-1899
HLB Regulatory Actions

1. HLB Positive Tree Removal
2. Survey Properties (250-meters)
3. HLB Quarantine (5-mile)
4. Mandatory ACP Treatments (250-meters)
5. Public Meeting (residential citrus)

Public Meeting (residential citrus) → Mandatory ACP Treatments (250-meters) → HLB Quarantine (5-mile) → Survey Properties (250-meters) → HLB Positive Tree Removal → Public Meeting (residential citrus)

Disease Prevention Program
## HLB Quarantine Impact to Citrus Growers

<table>
<thead>
<tr>
<th>Origin</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLB Quarantine Area</td>
<td>Within the Same Contiguous HLB Quarantine Area OR Outside of HLB Quarantine Area OR Different HLB Quarantine Area</td>
</tr>
<tr>
<td></td>
<td>Field Cleaned by Machine OR Grate Cleaned* OR Spray &amp; Harvest AND Transport Completely Tarped or in a Fully Enclosed Vehicle AND Complete HLB Pest Risk Mitigation Form</td>
</tr>
<tr>
<td></td>
<td>Wet Wash OR Field Cleaned by Machine/Grate Cleaned* and Spray &amp; Harvest AND Transport Completely Tarped or in a Fully Enclosed Vehicle AND Complete HLB Pest Risk Mitigation Form</td>
</tr>
</tbody>
</table>

*Grate cleaned citrus must be pre-approved by CDFA per #2 on page 3 of this document.

- Mitigation costs to move citrus
- Short list of pesticides
- County approvals to move fruit
- Can only move citrus to a packinghouse or approved location
<table>
<thead>
<tr>
<th>Region</th>
<th># of Sites</th>
<th># of Trees</th>
<th># of ACP Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles Co.</td>
<td>659</td>
<td>804</td>
<td>150</td>
</tr>
<tr>
<td>Orange Co.</td>
<td>1,886</td>
<td>2,861</td>
<td>290</td>
</tr>
<tr>
<td>Riverside Co.</td>
<td>88</td>
<td>118</td>
<td>28</td>
</tr>
<tr>
<td>San Bernardino Co.</td>
<td>89</td>
<td>160</td>
<td>34</td>
</tr>
<tr>
<td><strong>San Diego Co.</strong></td>
<td><strong>7</strong></td>
<td><strong>9</strong></td>
<td><strong>7</strong></td>
</tr>
<tr>
<td>Fallbrook</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Pauma Vly</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Vista</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Oceanside</td>
<td>4</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>2,729</strong></td>
<td><strong>3,952</strong></td>
<td><strong>509</strong></td>
</tr>
</tbody>
</table>
Best Practices

• Manage your citrus – https://ucanr.edu/ACP
  – Learn to recognize ACP and HLB
  – Regularly inspect your citrus trees
  – Follow ACP area wide treatment protocols!
  – Control Ants!

• Know where the HLB quarantines are
  – https://gis2.cdfa.ca.gov/Plant/CitrusQuarantines/

• Remove uncared/unloved citrus trees
Best Practices

• Keep citrus local
  – Buy citrus plants from reputable nurseries
  – Don’t move citrus trees out of an HLB quarantine

• Properly remove citrus green waste
  – Dry out for 2 weeks before disposing OR
  – Double bag OR
  – Chip and shred
IPM Area-Wide Treatment Strategy

- IPM strategy for effectively suppressing or eradicating single pest populations in a geographical area or zone.

- Greater pest suppression achieved as area-wide vs. individual orchard treatment. *(sum is greater than its parts)*

- Coordinated treatments
  - ACP treatments applied to all citrus at the same time
  - 2-3 week treatment windows
  - Treat when most effective (3x a year)

<table>
<thead>
<tr>
<th>San Diego Co. Commercial Citrus (25+)</th>
<th>ACP Treatment Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td><em>early Jan</em></td>
</tr>
<tr>
<td>Summer</td>
<td><em>mid May</em></td>
</tr>
<tr>
<td>Fall</td>
<td><em>late Aug/early Sep</em></td>
</tr>
</tbody>
</table>

Psyllid Management Area (PMA) zones for San Diego Co.
**Combined ACP Control Strategies**

**Biocontrol Releases (Tamarixia)**
Parasitic wasp specific to ACP. Lays egg inside ACP nymph. Emerges from an ACP nymph & leaves an exit hole.

**Trap Crops**
Plant alyssum, buckwheat or other trap crops to attract other beneficial insects.

**Control Ants!**
Ants protect ACP by feeding on honeydew and kill biocontrol agents.

**Barriers**
Use of living windbreaks, mesh fencing, citrus under protective structures (CUPS).
ACP/HLB Resources & Info


Residential Citrus Website – www.cacitrustthreat.org

CDFA website - www.cdfa.ca.gov/citrus

University of California - https://ucanr.edu/ACP
Thank You!

ACP/HLB Grower Liaison
San Diego, Ventura, Riverside & San Bernardino Co.

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