

HLB/ACP Science and Technology Committee

Conference Call
September 10, 2010

Questions Raised by CPDPC Regarding Residential Areas

1. Is the treatment of residential areas still valid?
2. What is the effective time from detection to treatment?
3. Is the 400 m radius treatment area still valid?

Situation in Florida – what should we have done? (Mike Irey)

- We should have been controlling the psyllid
 - Biocontrol not effective enough
 - ACP populations were high and widespread
 - HLB was there and being spread unchecked
 - Long latent period (months to years)
 - We had an effective system to move both the ACP and HLB
 - Movement of fruit
 - Movement of trees
- Had we been controlling the ACP, it is likely that the spread of HLB across the state would have been much slower.

1. Is the treatment of residential areas still valid?

- For San Diego County, most of the trap catches occur in the fall, through the winter with a few ACP caught during the late summer.
- Given the flushing patterns of the citrus in this area, and the insecticide treatment regime being used, ACP adult densities can be suppressed for at least one month, but in some areas, the suppression lasts about 5 or 6 months.

Survey Protocol After Asian Citrus Psyllid Found in Southern California (Began August 2008)



0.5 sq. miles 50 traps	50 traps	50 traps
50 traps	100 traps	50 traps
Nursery – 50 traps	Crop land – 20 traps	Crop land – 20 traps

For urban and rural residential areas, 100 traps in core area and 50 traps in buffer area.

Crop land has 2 - 3 traps per acre.

Nursery areas have 5 - 10 traps per acre.

1. Is the treatment of residential areas still valid?

- Joe Morse: persistent where we are getting good uptake ~10-15% of trees are not getting good uptake probably due to poor irrigation and/or root health
- Kris Godfrey: don't have many nymphal finds so we must be doing something right
- Kris Godfrey: if we had done nothing we would have ACP in commercial groves
- Joe Morse surprised we haven't found ACP in Ventura
- Mike Irey: buying time is very important
- Glenn Wright: diligent sprays have kept populations down in AZ (following CA protocol)

1. Is the treatment of residential areas still valid?

- Must realize the difference between eradication and suppression
- Control is how you achieve suppression
- Based on data from the CA-MX border and in AZ
- **YES! Continue the treatment protocol!**

2. What is the effective time from detection to treatment?

- Ideally, the time lag between detection and treatment should be within 1- 2 days of detection
- It shouldn't be anymore than 2 weeks
- Mike Irey: When ACP are detected, treatments should occur as soon as practical and treat as much of the area as practical

3. Is the 400 m radius treatment area still valid?

- Kevin Hoffman: initially USDA suggested 800 m
- Jim Bethke: stay with 400 m - it worked well in San Diego we are making progress, funds are limited
- Beth Grafton-Cardwell: should maintain 400 m
- Magally Williams: suggested in an area where ACP populations are high go to 800 m, and where they are low stay with 400 m
- Kris Godfrey: Determine by number of properties with host plants around the detection site

3. Is the 400 m radius treatment area still valid?

- Kris Godfrey: can't be cut and dry - we need to keep treating as far out as we can and for as long as we can – if a high risk area such as LA is identified, increase the treatment area
- Lukasz Stelinski: the larger an area you can treat, the more time you can buy
- **Mike Irey: more important to note that areawide management is key**

When Do You Walk Away From Treating Residential Areas?

Mike Irey's Comments

- **More important to note that areawide management is key**
- Need to control BEFORE you have disease 2-2.5 years
CONTROL EARLY
- Best option is to control the ACP as low as possible
- Low levels of psyllid translates to low levels of spread

When Do You Walk Away From Treating Residential Areas?

- Lukasz Stelinski: the larger the area you can treat the more time you can buy
- Jim Bethke: look at successes maybe small scale, pressure needs to continue in the LA area, close to commercial area need more resources, shrink that concentric circle
- Until the psyllid is widespread throughout the state, urban treatments should continue to protect commercial citrus
- The committee should re-address that question when the psyllid situation changes

How have we measured psyllid movement?

Lukasz Stelinski, U FL

- We adopted a protein marking technique
- Psyllids are marked in various locations by spraying with egg, milk, or soy protein solutions
- Psyllids marked in the field are re-captured on traps
- Enzyme-linked Immunosorbant Assay (ELISA) is used to identify previously marked psyllids and determine where they came from and how far they moved



Egg protein

Marking psyllids



Egg protein



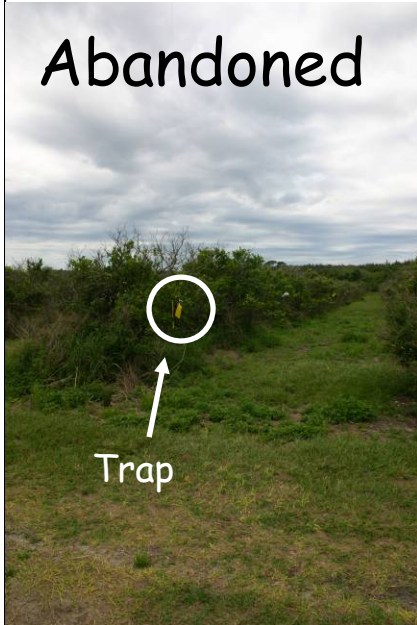
Identifying marked and re-captured psyllids in the lab by ELISA method

Impact of abandoned groves on managed groves

Abandoned Grove
marked with Protein 1

Managed Grove
marked with Protein 2

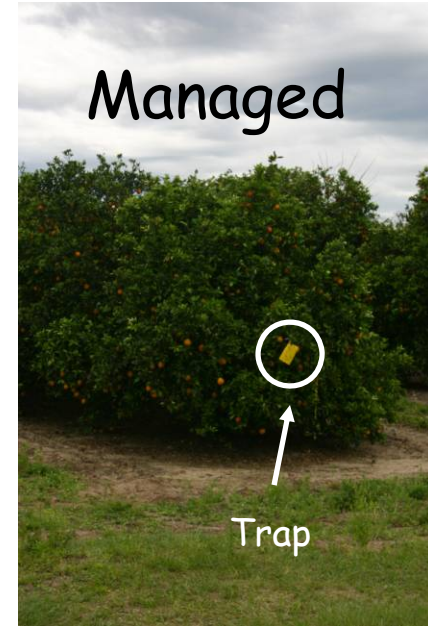
Abandoned



Psyllids recaptured on traps within each grove
are tested by ELISA to determine their origin



Managed



Results suggest that direction of psyllid movement
is from abandoned to nearby managed groves



Block of 200 trees sprayed with protein mark

Traps placed in radial fashion at distances from 0.06 miles to 1.24 miles away from sprayed area

Traps were collected 12 days after spray application and psyllids were tested for the marker protein

General conclusions on psyllid movement in Florida

- Psyllids can move at least 1.24 miles within 11 days
- Longer-distance movement appears correlated with wind direction
- There appears to be seasonal variation in movement, but inconsistent year to year--varying psyllid phenology, differences in flush patterns
- When no (less) flush is present, more movement
- Movement is biased from abandoned into managed groves
- A low percentage of psyllids moving into commercial groves from abandoned sites carry the HLB pathogen

Questions Raised by CPDPC Regarding Commercial Groves

1. If ACP is detected in a commercial grove, how wide of an area would need to be treated (400 m, 800 m, more?)
2. What course of action would be recommended for commercial growers in this event? (i.e. growers adjacent and/or nearby to the detection site)
3. What recommendations for control/management strategies can be made for growers and for activities at the urban/production interface?

1. If ACP is detected in a commercial grove, how wide of an area would need to be treated?

- Mike Irey: Best option is to control the ACP as low as possible
- Mike: Buying time – young plantings will be worth more in a few years
- Initially, this will be determined on a case-by-case basis
- Beth GC: Suggested the formation of a Technical Advisory Committee

Technical Advisory Committee

- Beth Grafton-Cardwell
- Joe Morse
- Jim Bethke
- Joe Barcinas
- Jim Cranney
- CDFA person
- PCA's from the different regions of the state

2. What course of action should growers take?

3. Suggested control/management strategies

Phases of Response to ACP in commercial citrus: Beth Grafton-Cardwell

Phase 1: A few psyllids are found on traps. The combination of two broad spectrum insecticides (foliar and systemic such as the a pyrethroid + imidacloprid) suppresses the psyllid below detectible levels for many months.

Phase 2: The psyllids are found in multiple sites both urban and commercial citrus and coordinated, areawide application of the two insecticides is needed. ACP are not found for many months.

Phase 3: The psyllids are found in < 9 months and the continuous areawide management program starts. Minimum of 3 ACP treatments per year focusing on flushes and overwintering populations.

**ACP
Management**

Lessons learned from Florida, Texas and CA backyard situations

- Nymphs are more important than adults in the transmission of the HLB disease
- Treating during flush is critical to get nymphal populations + adults
- Nymphs are difficult to kill because they are tucked into new foliage – systemic insecticides are critical
- Imidacloprid uptake is best after petal fall (June-September), need uptake information on Platinum

Lessons learned from Florida, Texas and CA backyard situations

- **Some insecticides work better against nymphs and some against adults – combinations are most effective**
- **The pyrethroid + neonicotinoid combination is the best**
- **Treating the population as it goes into overwintering in late fall and as it begins to attack new spring flush is critical**
- **Resistance to pyrethroids and neonicotinoids is developing in ACP and leafminer in Florida – rotate insecticides**

Commercial citrus orchard treatments for psyllid

Foliar insecticides

*Pyrethroids: fenpropathrin (Danitol), cyfluthrin (Baythroid), zeta cypermethrin (Mustang)

OPs: chlorpyrifos (Lorsban Advanced),
dimethoate, Imidan, Supracide

Carbamates: carbaryl (Sevin), formetanate (Carzol)

spinetoram (Delegate)

diflubenzuron (Micromite)

abamectin (Agri-Mek)

Systemic insecticides

*Neonicotinoids: imidacloprid (Admire), thiamethoxam (Platinum)

spirotetramat (Movento)

Ineffective Insecticides

Entrust, Success, Assail, Envidor, Nexter, Sulfur, Esteem, Applaud

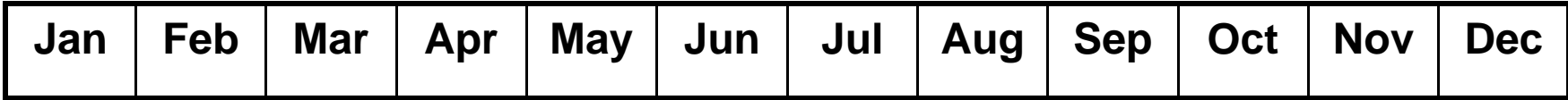
Organic insecticides (too short of a residual to be useful)

pyrethrins: pyganic

oils

Azadirachtin, neem oil

Slide by Beth Grafton-Cardwell



Citrus Red Mite

Oils, Miticides



San Joaquin Valley

Citrus Thrips + Katydid



Thrips: Delegate, Agri-Mek, Veratran, Success
 Katydid: Lorsban, pyrethroid, Micromite, Altacor

Citrus peelminer (susceptible varieties)



Micromite+ Delegate or Lorsban, Agri-Mek

Citrus leafminer

Nonbearing only
 Admire, Intrepid



California red scale

Esteem, Movento or OP

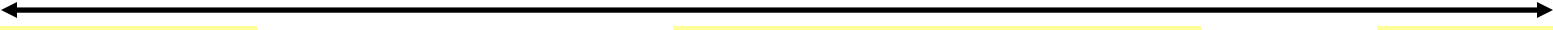


Citricola scale

Lorsban, Assail, Applaud, Admire, Sevin, Supracide



Asian citrus psyllid



Pyrethroid

Systemic Imidacloprid or Platinum

Pyrethroid

Notes: All treatments in red are ACP effective and when applied for other pests would assist with ACP control.

Share Point

- All presentations have been posted on Share Point
- My meeting notes will be posted on Share Point as well
- I will post relevant articles that you can download