

Vector Management:

Life Cycle, Acquisition Time, Chemical Suppression

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Psyllid Movement

- **Psyllids move in response to the presence / absence of new flush**
- **Within grove movement**
- **Long distance dispersal between groves, probably stopping at first “attractive” location**

The “Jim Dilley” Psyllid Monitoring System

(patent pending???)







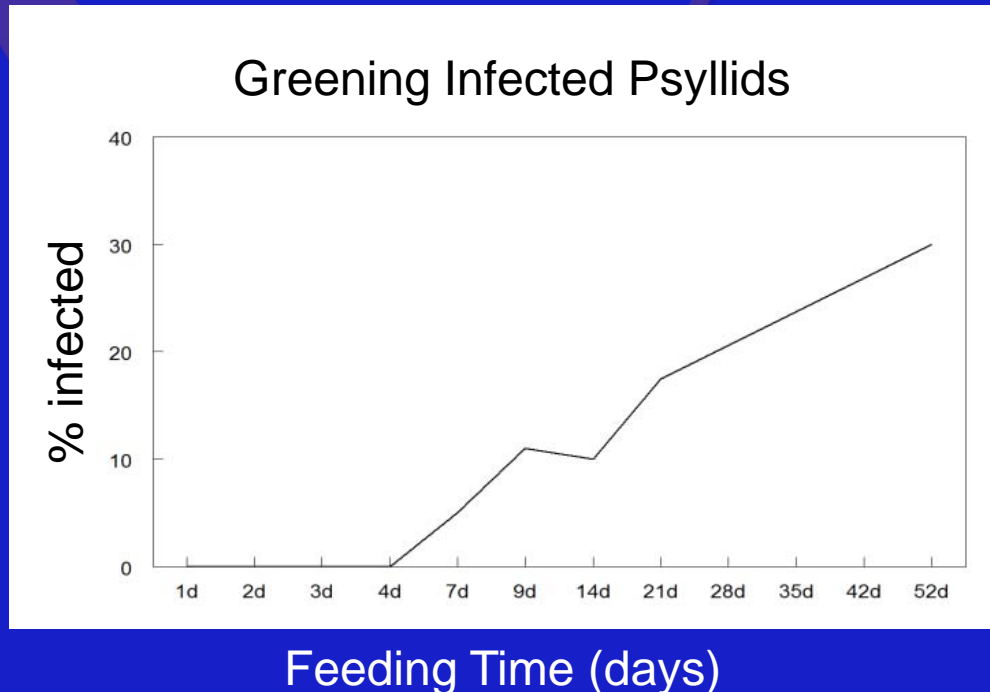


1,300 ft to nearest citrus



Psyllid Transmission

- **Average 20-30% of psyllids expected to be carrying greening pathogen**
- **The longer a psyllid feeds on an infected tree, the greater the risk**



Psyllid Transmission

- **Psyllids can still acquire the pathogen from asymptomatic trees**
- **Failure to remove infected trees will increase the risk for disease spread in your grove and surrounding groves!**

Ongoing Trials 2008

- **Young tree early season psyllid control**



Ongoing Trials 2008

- **How long will soil applications really last using high and low rates?**
 - Uptake by root system vs. leaching
 - Temik applications method and rates
 - Admire Pro application rates

Ongoing Trials 2008

- **Temik Application to young trees**



Ongoing Trials 2008

- **Treatments**

1. Temik 1 oz / tree (1 side only)
2. Temik 1 oz / tree (0.5 oz on two sides of tree)
3. Temik 2 oz / tree (1 side only)
4. Temik 2 oz / tree (1 oz on two sides of tree)
5. Admire Pro 3.5 oz / A (0.025 fl oz / tree)
6. Admire Pro 7 oz / A (0.05 fl oz / tree)

Treatments replicated 5 times at 3 different study sites; counting psyllids on total of 50 trees per treatment at each study sites

Application Date: January 31, 2008

Solid Plantings of Young Trees

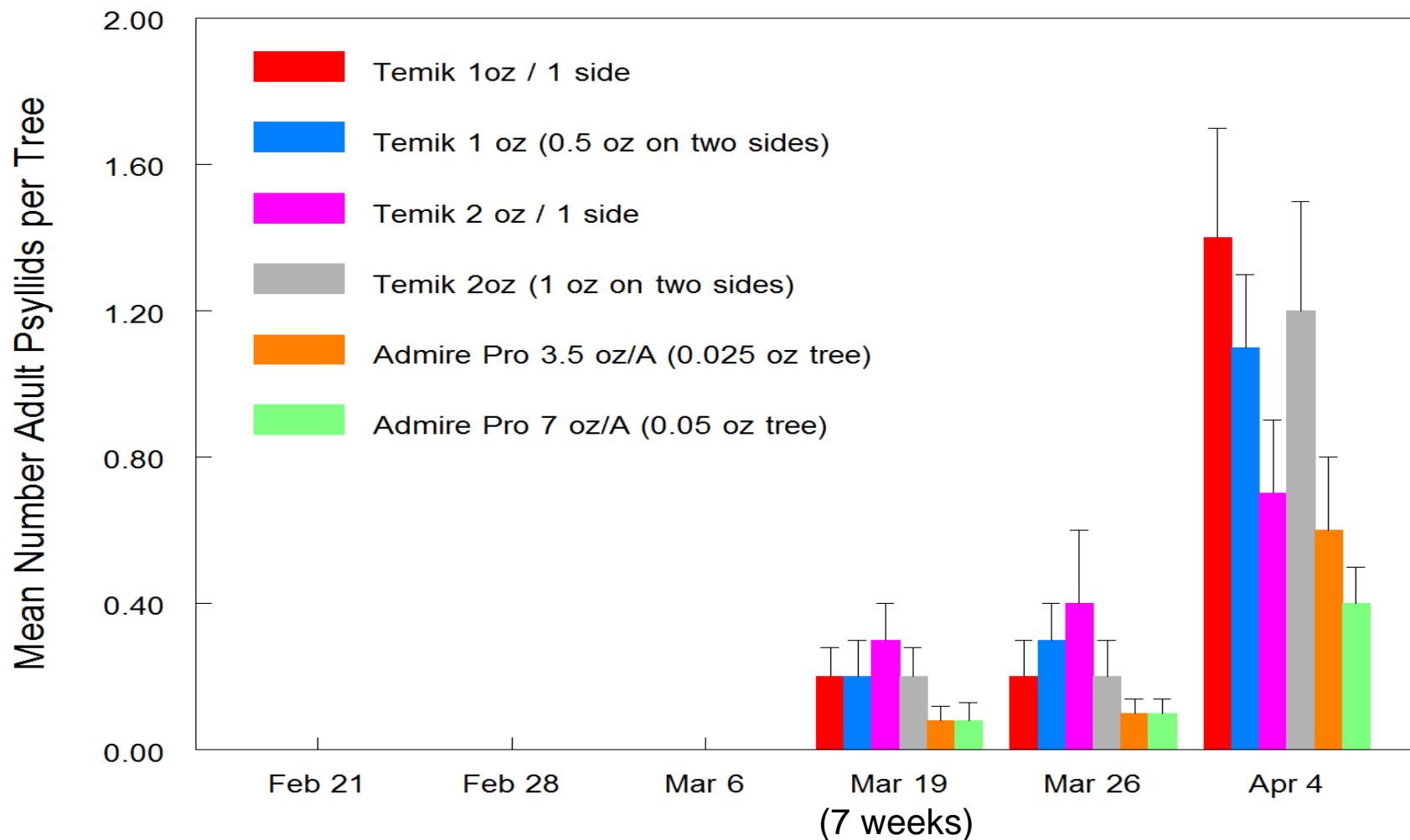
- **Imidacloprid soil-drench applications**

Tree height	Rate product / A	Apps. Per season	oz / tree	Trees / oz
<i>Imidacloprid 2F</i>				
2ft – 4ft	8 fl oz	4	0.057 fl oz	17.5 trees
4 ft – 6ft	16 fl oz	2	0.114 fl oz	8.77 trees
<i>Imidacloprid 4.6 F (Admire Pro)</i>				
2 ft – 4ft	3.5 fl oz	4	0.025 fl oz	40 trees
4ft – 6ft	7 fl oz	2	0.05 fl oz	20 trees

– Based on 140 trees per acre

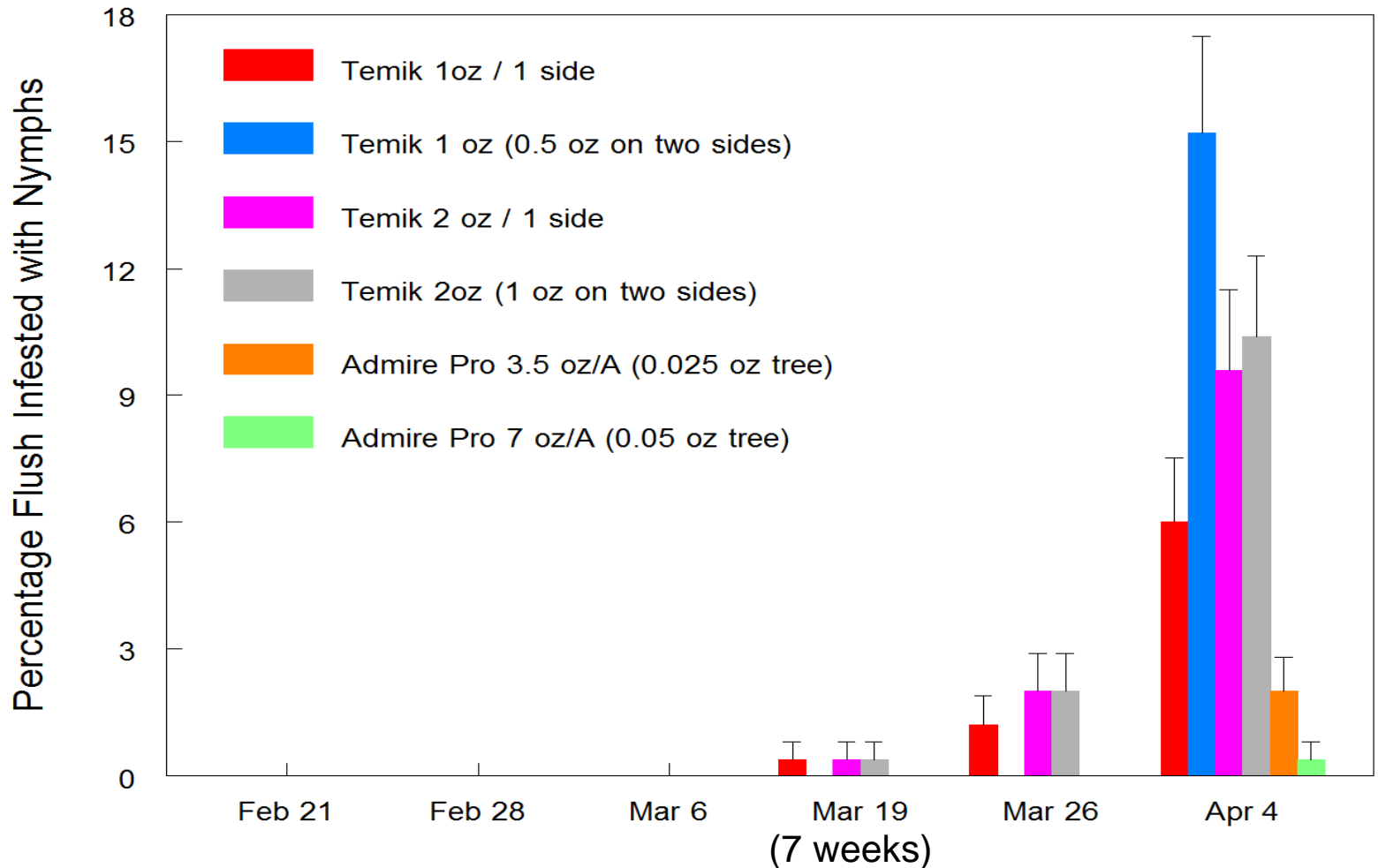
Psyllid Adults (site 1: Hamlin)

Young Tree Trial 2008-3



Psyllid Nymphs (site 1: Hamlin)

Young Tree Trial 2008-3



Results to Date

- **Site 1:**

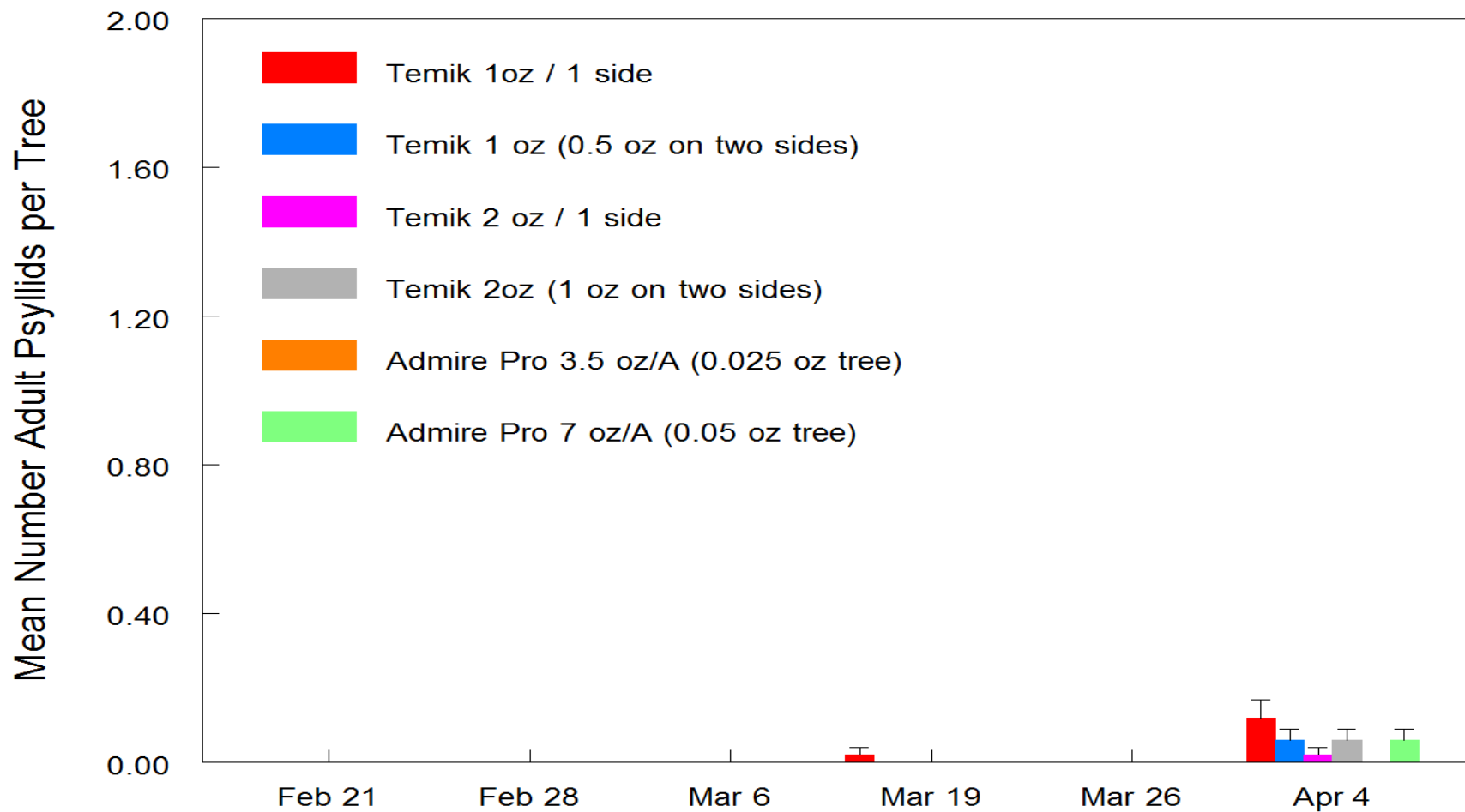
- Low numbers of adult psyllids began to appear in plots 7-8 weeks after treatment
- **Adults are coming in from surrounding groves**
- Very few nymphs present until week 9
- results from data collected in week 9 suggest a need to retreat now

Results to Date

- **Sites 2 & 3:**
 - No psyllid nymphs found to date
 - **Grove is isolated with no nearby source of psyllids**
 - There are mature blocks of trees present but they are all on the same psyllid program
 - **Good example of the benefit of having an entire area on the same psyllid management program**

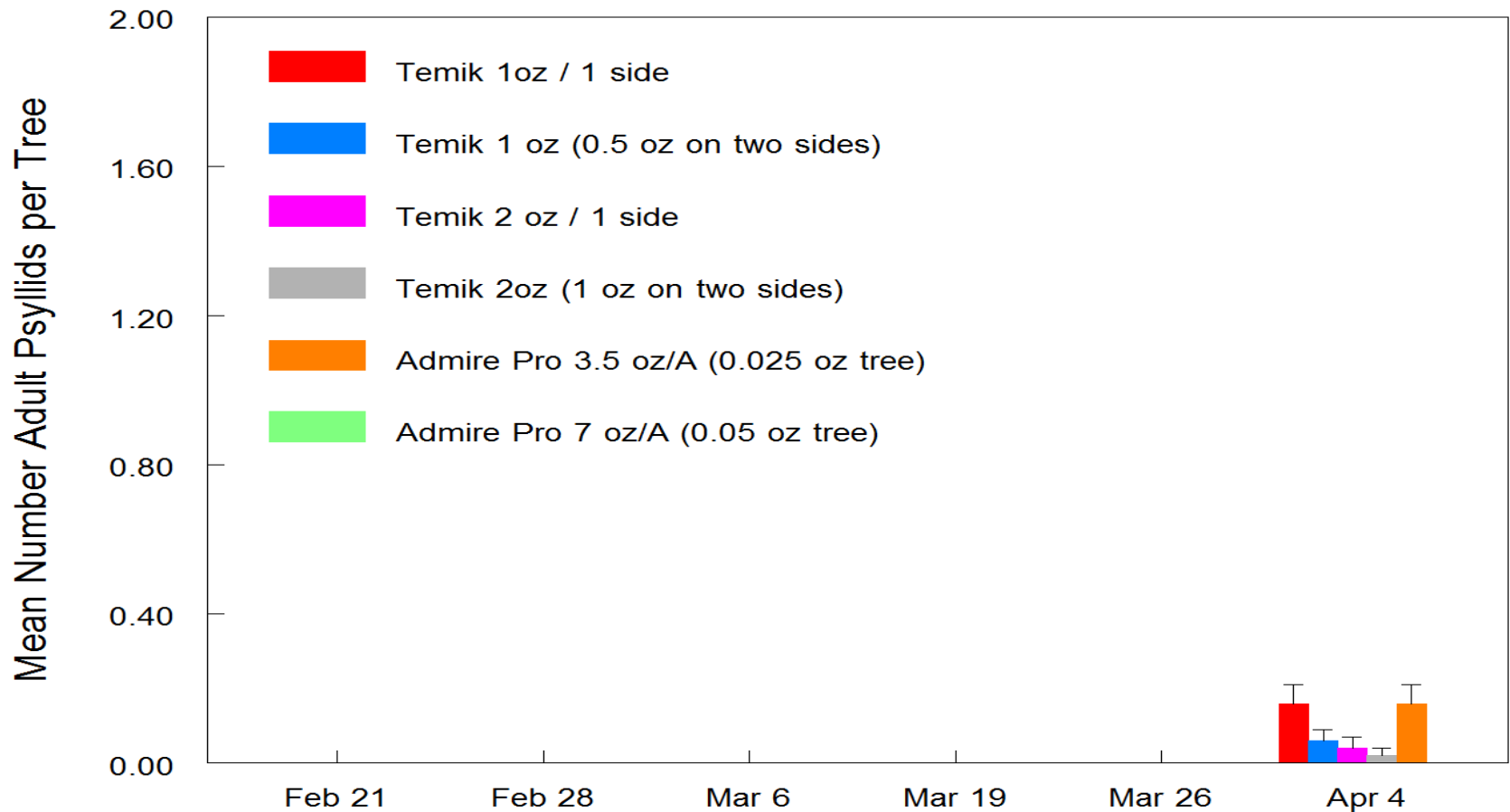
Psyllid Adults (site 2: Grapefruit)

Young Tree Trial 2008-4



Psyllid Adults (site 3: Valencias)

Young Tree Trial 2008-5



Solid Plantings of Young Trees

	<u>Tree Size</u>				
Month	Reset	2' – 4'	2'-4'	4'-6'	4'-6'
Jan	Imidacloprid	aldicarb	imidacloprid	aldicarb	
Feb					imidacloprid
Mar		imidacloprid	imidacloprid		
Apr	Imidacloprid			imidacloprid	
May		imidacloprid	imidacloprid		Imidacloprid
Jun	Imidacloprid				
Jul		imidacloprid			
Aug	Imidacloprid		Imidacloprid	Imidacloprid	
Sep		imidacloprid			
Oct					
Nov					
Dec					

Solid Plantings of Young Trees

	<u>Tree Size</u>				
Month	Reset	2' – 4'	2'-4'	4'-6'	4'-6'
Jan	Imidacloprid	aldicarb	imidacloprid	aldicarb	
Feb					imidacloprid
Mar	Foliar	imidacloprid	imidacloprid	Foliar	
Apr	Imidacloprid			imidacloprid	Foliar
May		imidacloprid	imidacloprid		imidacloprid
Jun	Imidacloprid			Foliar	
Jul		imidacloprid	Foliar	Foliar	Foliar
Aug	Imidacloprid		Imidacloprid	imidacloprid	Foliar
Sep		imidacloprid			Foliar
Oct	Foliar		Foliar	Foliar	Foliar
Nov		Foliar			
Dec	Foliar		Foliar	Foliar	Foliar

Solid Plantings of Young Trees

	<u>Tree Size</u>				
Month	Reset	2' – 4'	2'-4'	4'-6'	4'-6'
Jan	Imidacloprid	aldicarb	imidacloprid	aldicarb	
Feb					imidacloprid
Mar	Foliar	imidacloprid	imidacloprid	Foliar	
Apr	Imidacloprid			imidacloprid	Foliar
May		imidacloprid	imidacloprid		imidacloprid
Jun	Imidacloprid			Foliar	
Jul		imidacloprid	Foliar	Foliar	Foliar
Aug	Imidacloprid		Imidacloprid	imidacloprid	Foliar
Sep		imidacloprid			Foliar
Oct	Foliar		Foliar	Foliar	Foliar
Nov		Foliar			
Dec	Foliar		Foliar	Foliar	Foliar

Psyllid Control in Organic Citrus

- **Very few options available for psyllid control in organic citrus production**
- **How effective are those options?**
- **Can we control psyllids adequately in organic citrus?**

Psyllid Control in Organic Citrus

- **Ecotrol EC – Rosemary oil, Peppermint oil**
- **Pyganic – 5% pyrethrins**

Ecotrol EC Laboratory Bioassay

Results

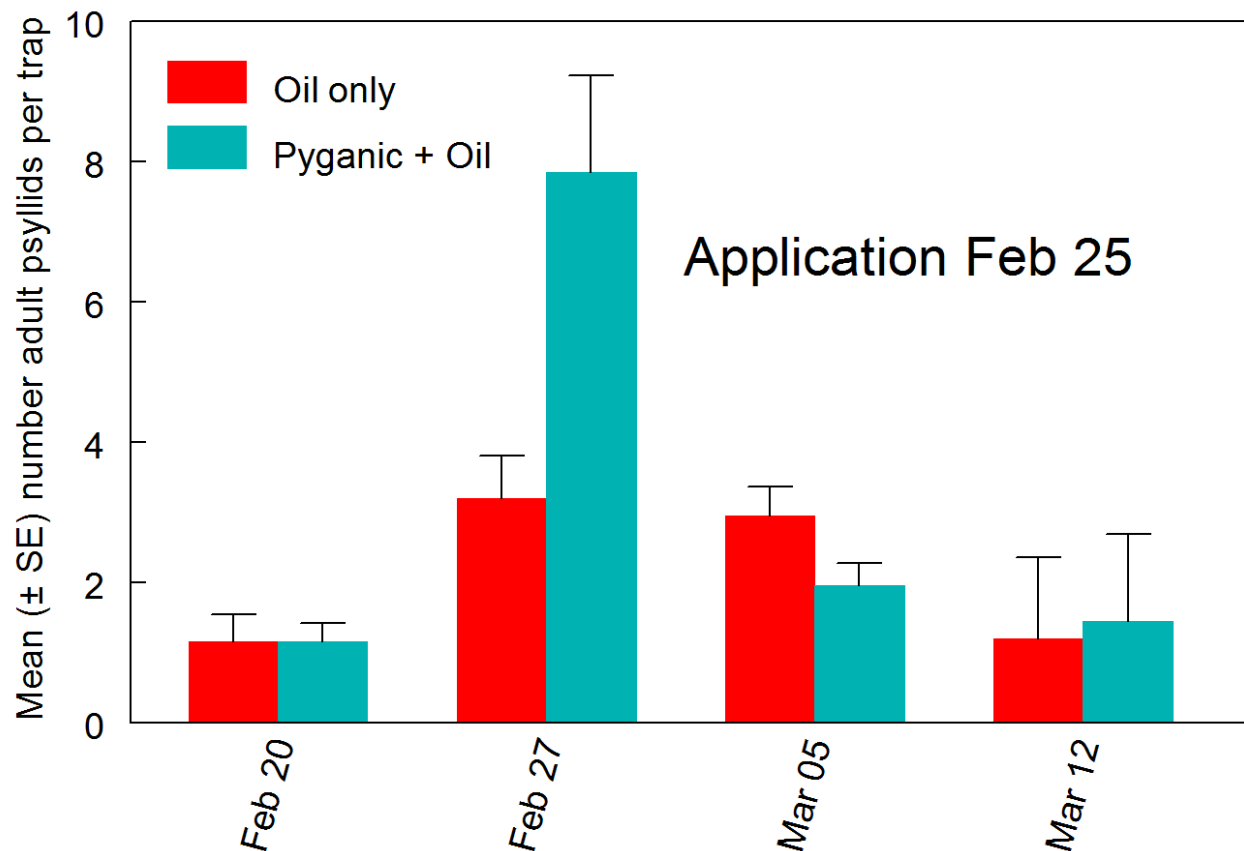
Mortality (%)¹ of Asian citrus psyllids (*Diaphorina citri*) exposed to wet and dry treated leaves over 72 hours.

Treatment	Type	Time post treatment		
		24h	48h	72h
Distilled de-ionized water	wet	3 ± 5 c	3 ± 5 c	5 ± 5 b
Distilled de-ionized water	dry	1 ± 3 c	3 ± 5 c	8 ± 6 b
435 oil	wet	28 ± 25 a	40 ± 27 a	43 ± 24 a
435 oil	dry	12 ± 14 b	22 ± 20 b	34 ± 25 a
EcoTrol EC	wet	1 ± 3 c	4 ± 5 c	7 ± 7 b
EcoTrol EC	dry	0 ± 0 c	1 ± 3 c	3 ± 7 b
		F = 11.4 P = 0.0000	F = 11.1 P = 0.0000	F = 9.9 P = 0.0000

¹Mean percentage of psyllids dead. Means within a column followed by the same letter are not significantly different using LSD ($P \leq 0.05$). Data were subjected to arcsin $\sqrt{(\text{percent})}$ transformations for statistical analysis. Untransformed means are presented for comparison.

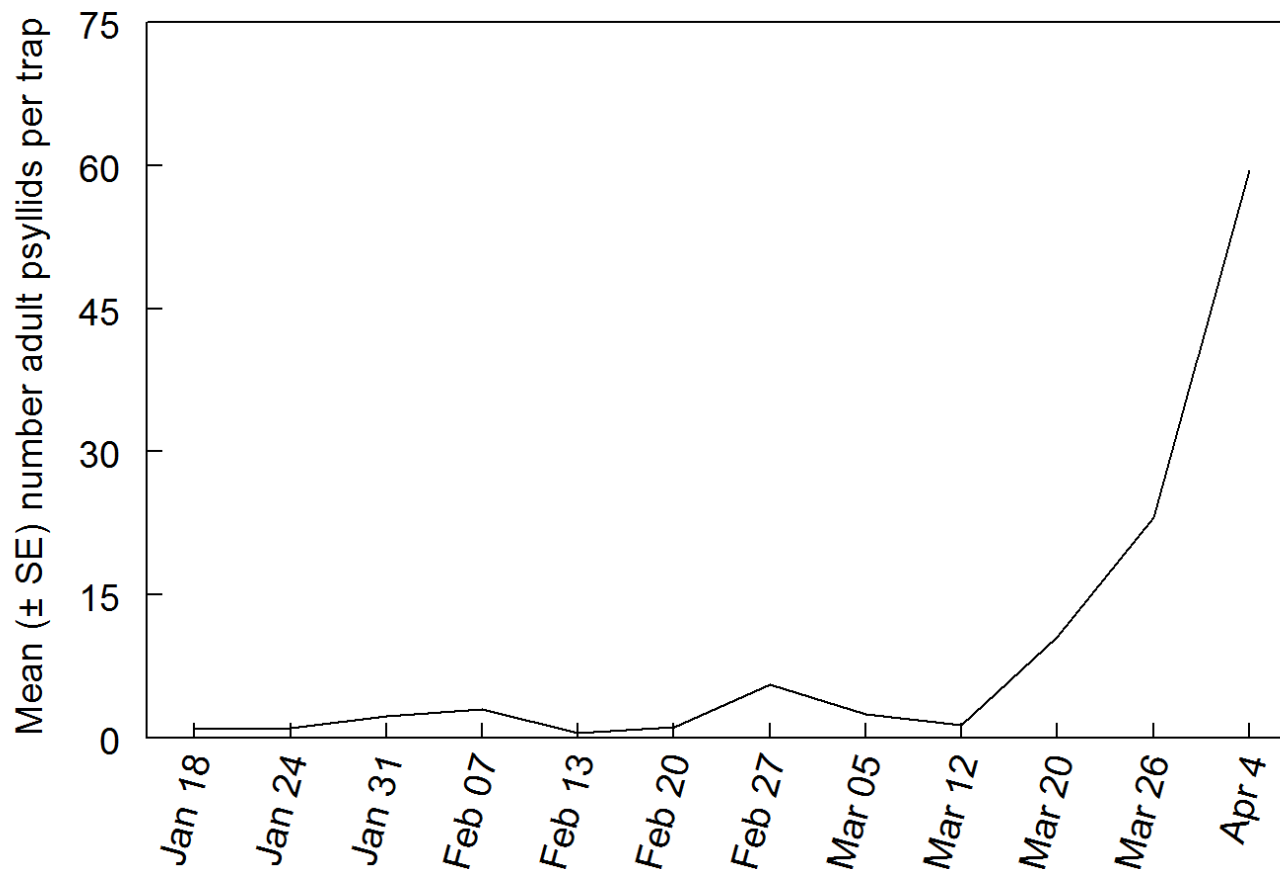
Psyllid Control in Organic Citrus

Organic Psyllid Trial (Test 2008-1)



Psyllid Control in Organic Citrus

Organic Citrus Grove Psyllid Population 2008



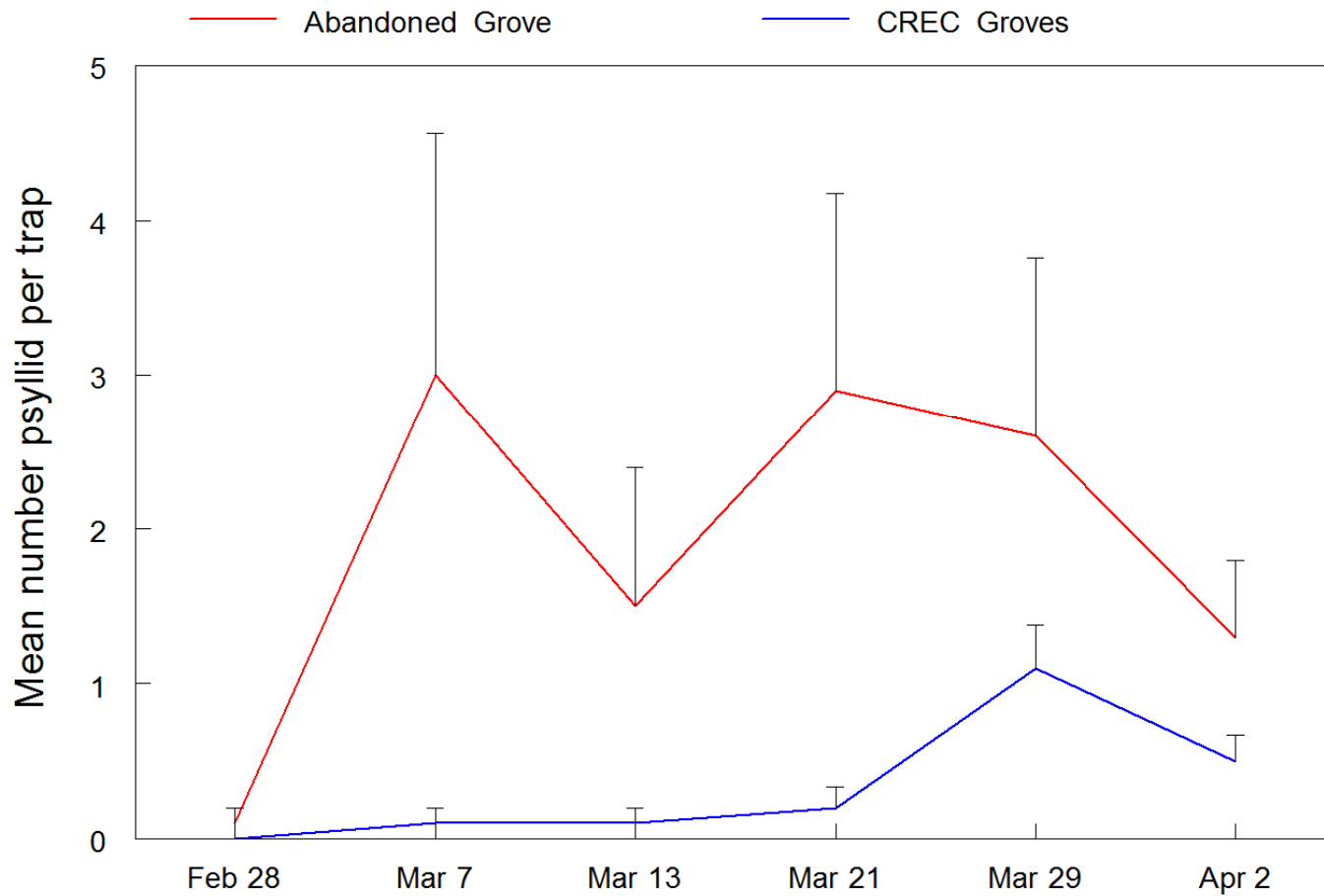
176 Adult Psyllids; 1 trap



Examples of Potential Psyllid Spray Programs

	Example 1	Example 2
Month	CREC groves (Planned)	CREC groves (actual 2008)
Dec/Jan	Temik	Danitol (mid Jan)
Feb	Danitol	
Mar	Bloom	Temik (late Mar)
Apr	Carbaryl 2qts/A	Carbaryl 2qts/A
May	Imidacloprid + oil	Imidacloprid + oil
Jun		
Jul	Chlorpyrifos + oil	Chlorpyrifos + oil
Aug		
Sep		
Oct	Carbaryl 2 qts/A	Carbaryl 2 qts/A
Nov		
Dec		

Psyllid Monitoring 2008 (Lake Alfred)

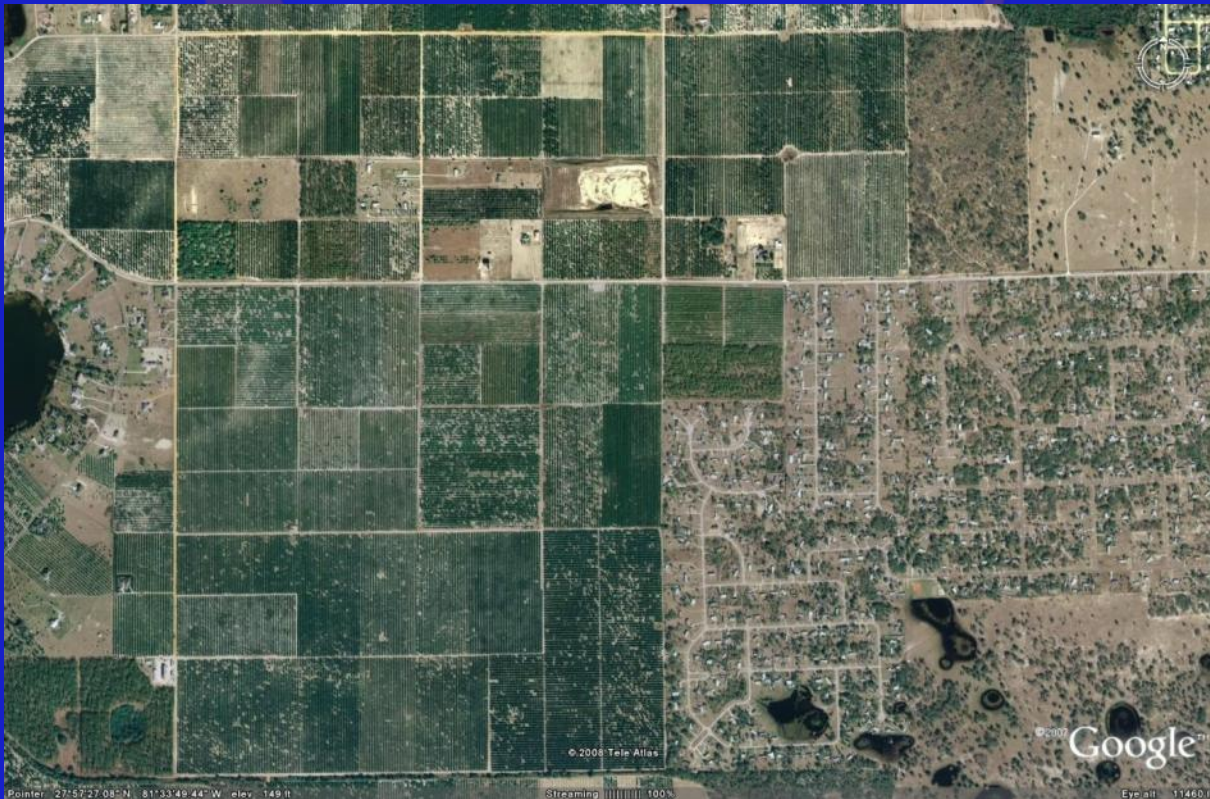


Examples of Potential Psyllid Spray Programs

	Example 1	Example 2
Month	CREC groves	Program with aerial sprays
Dec/Jan	Temik	Temik
Feb	Danitol	Danitol
Mar	Bloom	Bloom
Apr	Carbaryl 2qts/A	Carbaryl (Aerial)
May	Imidacloprid + oil	Imidacloprid + oil
Jun		
Jul	Chlorpyrifos + oil	Danitol (Aerial)
Aug		Chlorpyrifos + oil
Sep		
Oct	Carbaryl 2 qts/A	Dimethoate (Aerial)
Nov		
Dec		

Successful Psyllid Management

- **The success of your psyllid control program is dependent on your neighbors!!!**



Special Thanks!

- **Steve Farr & Jack Dyer, Ben Hill Griffin**
 - Cooperators on young tree psyllid control trial