

Understanding navel orangeworm 2002-? : A work in progress

Joel Siegel, USDA/ARS





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- Areawide Program Year 4: ARS, UC Berkeley, UC Davis, UCCE, Paramount Farming Company
 - FAS Grant: ARS, Paramount Farming Company, UC Davis
 - Ongoing research Pistachios: ARS, UC Davis, Paramount Farming Company

- **My Research: Emphasize Insecticide Persistence, Application Timing, Application Coverage. Primary tools are egg strips, split nuts, and spray cards. Test plots of 5-10 acres or entire blocks. Population Emphasis.**
- **Brad Higbee's Research: Classic field trials using 20 acre plots replicated 4 times. Focus on Actual damage assessment, Measure population using several types of traps. Application Coverage.**

Coverage

Jack Dibble's Law

2 MPH

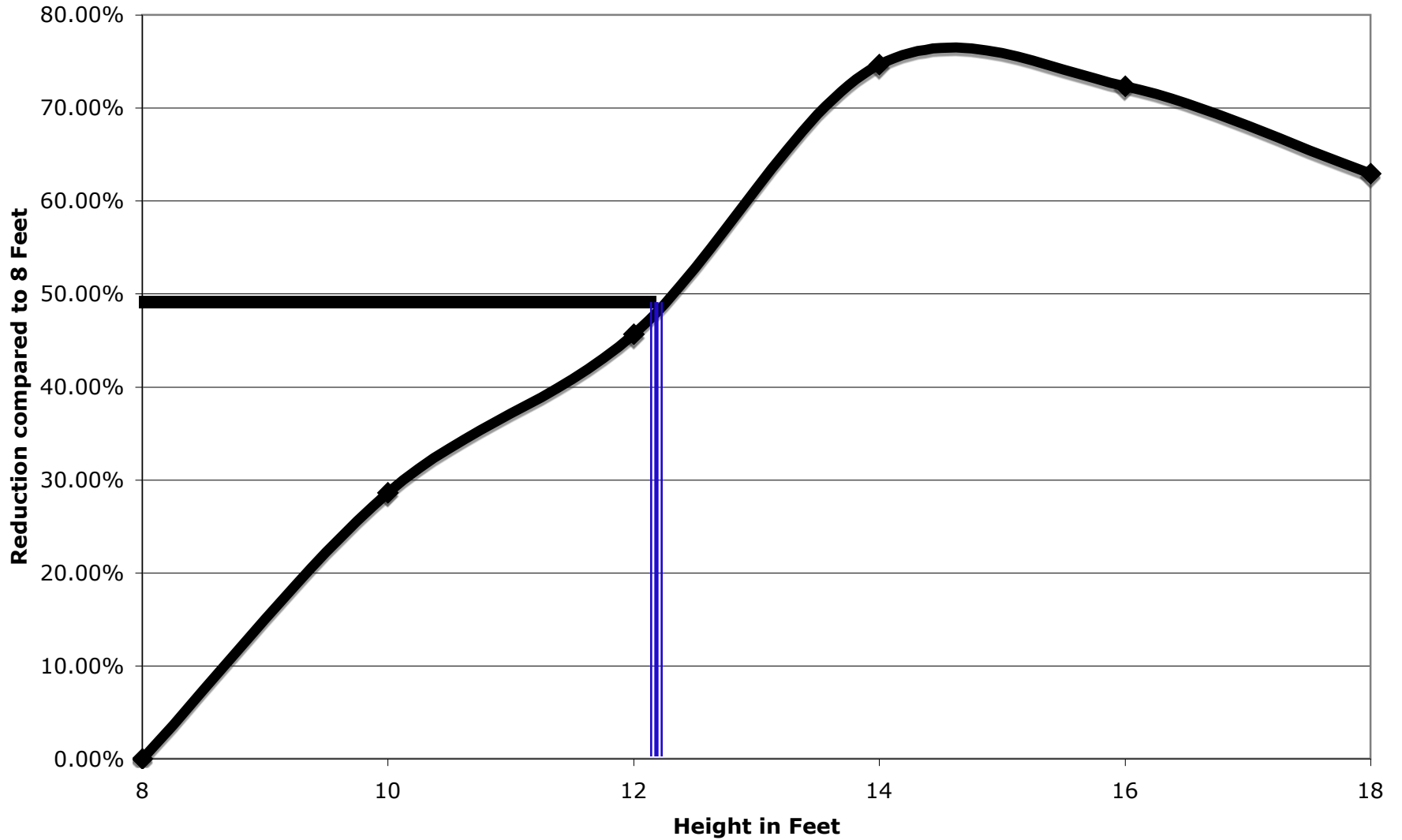
1.8 VS 2.2 MPH

SPEED	FRONT	BACK	TOTAL
1.8 MPH	87,936	81,904	
			169,840
2.2 MPH	63,380	53,220	
			116,600

My Observation

12

Madera Spray Trial 2



- **Gary Weinberger**
- **Bob Beede**
- **Jean Phillimore**
- **James Bettiga: S&J Ranch**
- **Kevin Olson: S&J Ranch**
- **Richard Paslay: Agri-World Coop**
- **Chris Wylie: Agri-World Coop**
- **Chuck Nichols: Nichols Farms**
- **Ali Orandi: Orandi Farms and Management**

**Compare
Worst (2007)
and
Best (2010)**

Nut Vulnerability: Madera

Year	2010	2007
Number of Loads	1,071	1,626
Net Dry Weight	19,570	18,565
<i>Percent Split*</i>	71.7	87.3
Percent Closed	27.8	12.7
Percent Blank	5.2	9.4

***Warm Early**

***Pea Splits Early**

***Poor Insecticide**

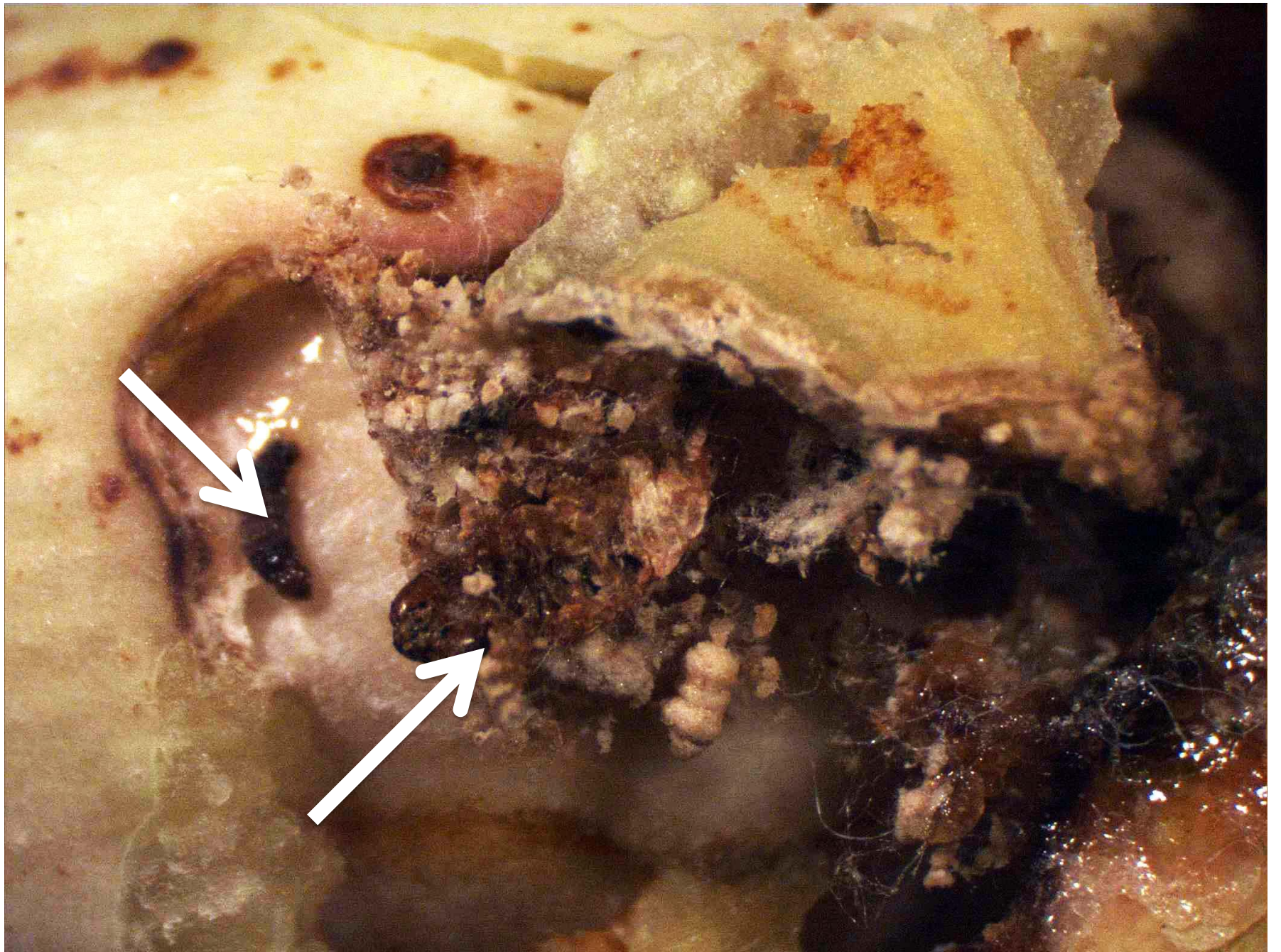
***Timing**

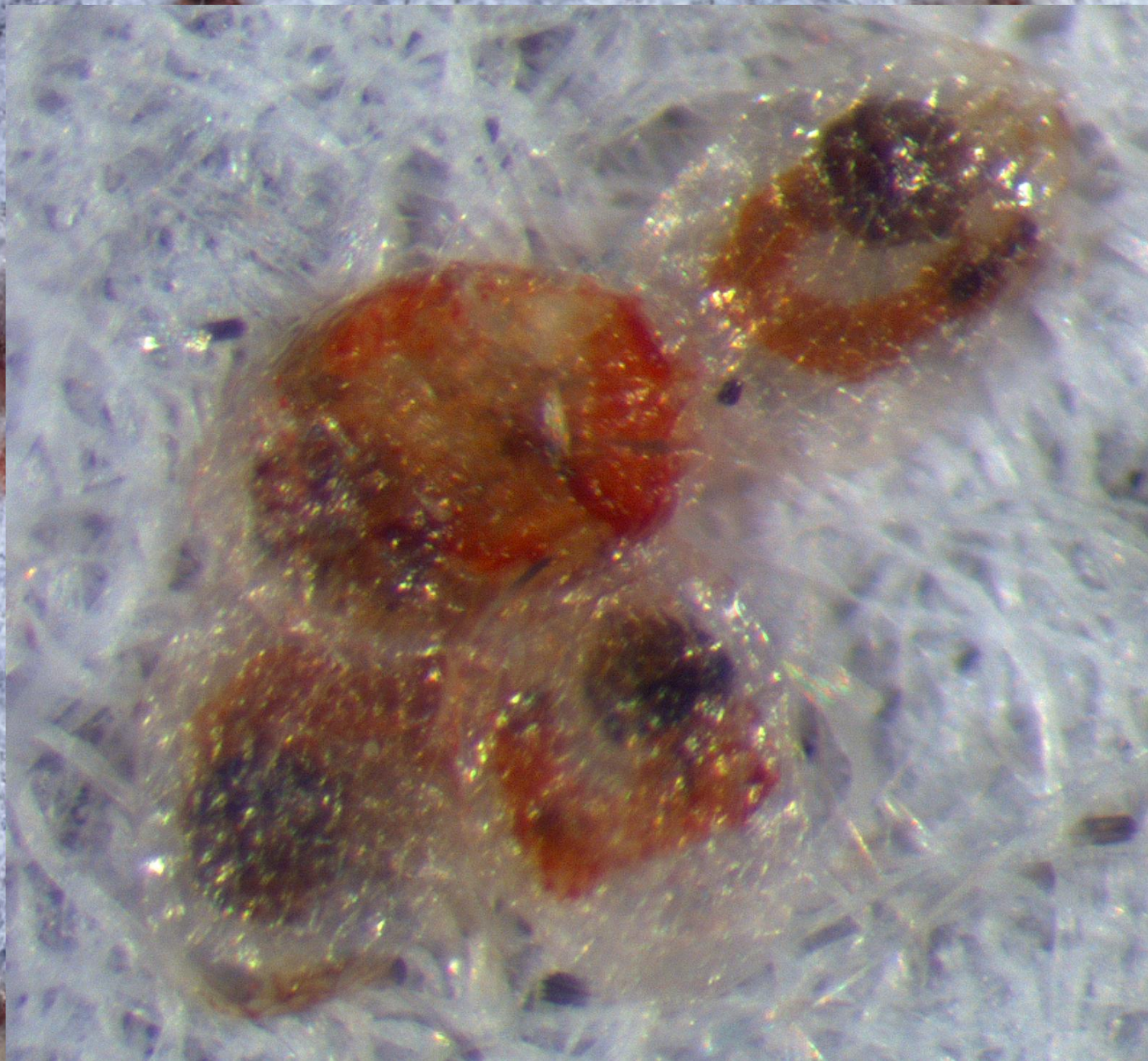


**Over 220
Degree Days F
By End of March**



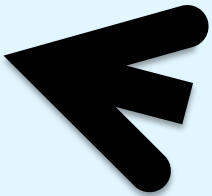
Sea Splits

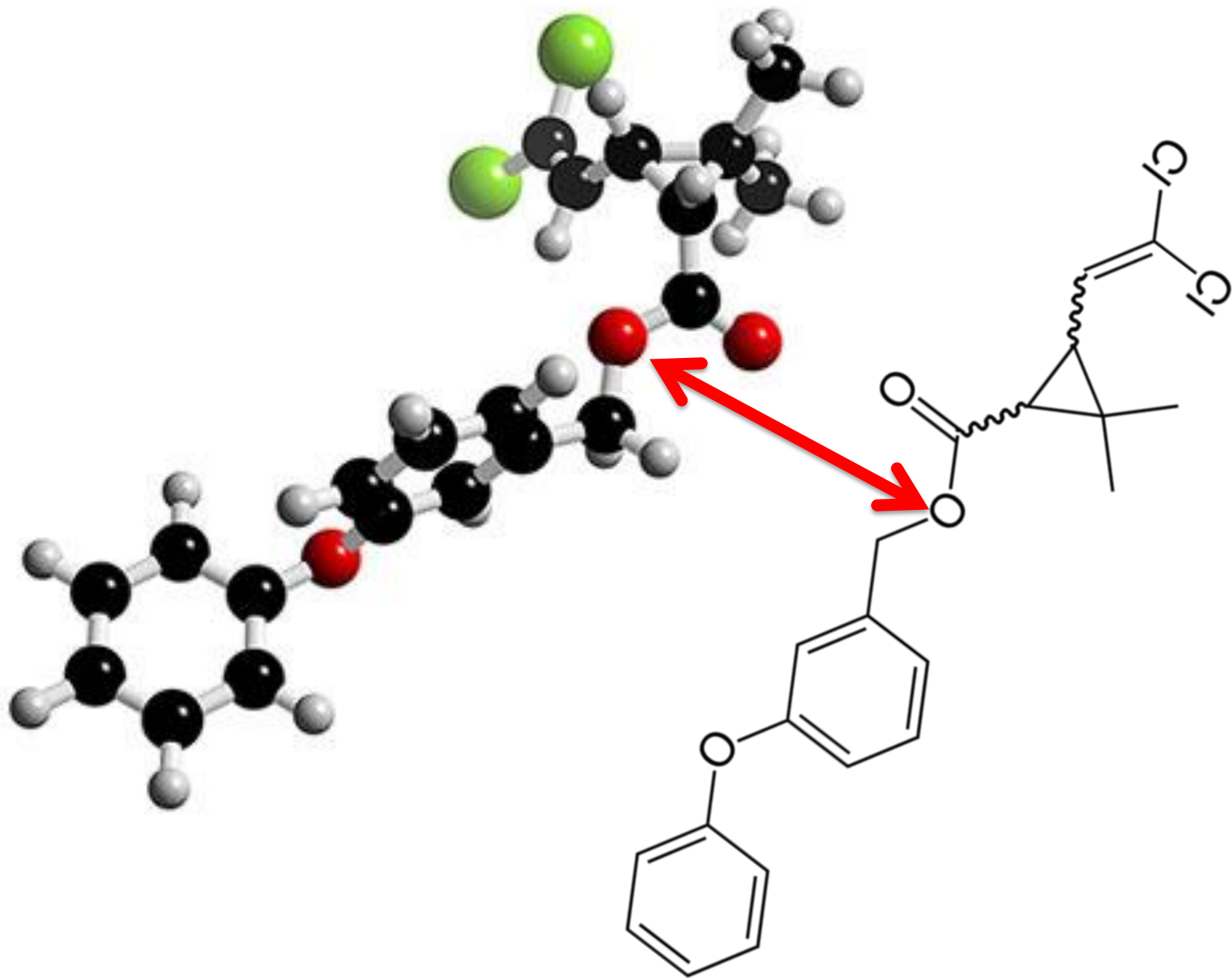




YET

Eggs placed inside mummies: Survival at 3 weeks post exposure

Treatment	Survival	Reduction	N
Control	17.2%	NA	865
Baythroid + Intrepid	0	100%	1,145
Permethrin	0.3%	98.2%	325
Permethrin by Airplane	21.5%	0 	600



In Contrast

Aerial Bifenthrin

Percent Kill	Total Eggs
Brigade 95.50	12,321
Bifenture 98.47	4,000

Insecticide Persistence

- Collect Split Pistachios at Intervals
- Bring to Lab, Add Eggs
- Monitor Adult Emergence

August 16 Application, Madera County

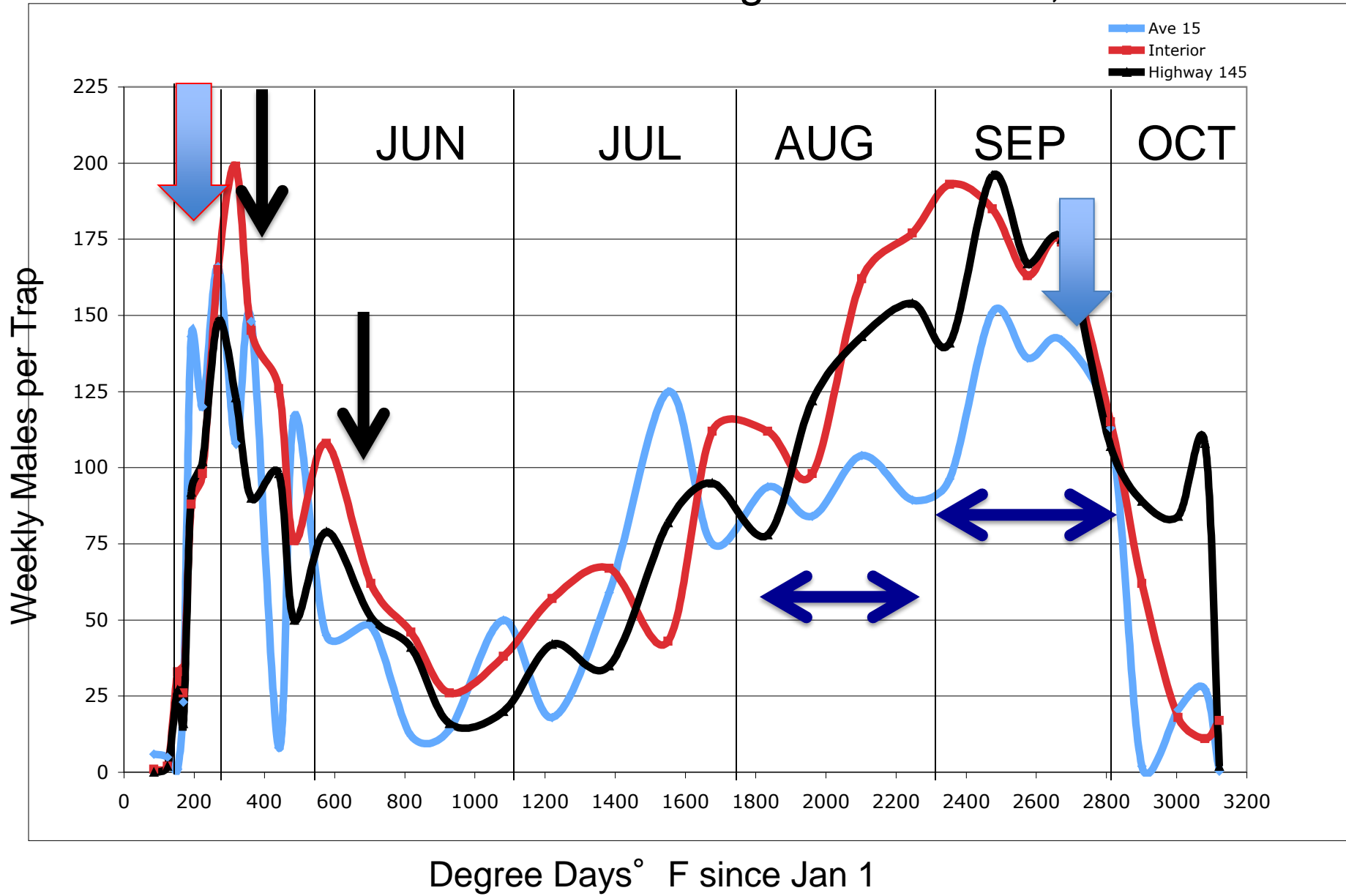
Treatment	Survival	Reduction	Eggs
Day 24			
Control	41.64%		1,400
Brigade 24 oz	18.00%	56.78%	200
Bifenture 24 oz	20.00%	51.97%	200
Intrepid 24 oz	7.00%	83.19%	200
Warrior II 2.5 oz	9.00%	78.39%	200
Lambda-Cy* 5 oz	16.50%	60.38%	200
Intrepid 18 oz +Warrior II 2.5 oz + Sulfur 462 oz	1.50%	96.40%	200
Day 32			
Control	43.64%		2,500
Brigade 24 oz	16.00%	63.34%	300
Bifenture 24 oz	6.33%	85.49%	300
Intrepid 24 oz	2.00%	95.42%	300
Warrior II 2.5 oz	16.50%	62.19%	200
Lambda-Cy* 5 oz	11.00%	74.79%	300
Intrepid 18 oz +Warrior II 2.5 oz + Sulfur 462 oz	3.00%	93.13%	100

Day 39			
Control	34.11%		900
Brigade 24 oz	56.00%	NONE	100
Bifenture 24 oz	13.67%	59.93%	300
Intrepid 24 oz	ND		
Warrior II 2.5 oz	8.00%	76.55%	300
Lambda-Cy* 5 oz	4.00%	88.27%	300
Intrepid 18 oz +Warrior II 2.5 oz + Sulfur 462 oz	1.50%	95.60%	200
Day 53			
Control	23.70%		1,000
Brigade 24 oz	ND		
Bifenture 24 oz	61.50%	NONE	200
Intrepid 24 oz	28.25%	NONE	400
Warrior II 2.5 oz	17.00%	28.27%	200
Lambda-Cy* 5 oz	40.00%	NONE	200
Intrepid 18 oz +Warrior II 2.5 oz + Sulfur 462 oz	6.00%	74.68%	200

Timing

Pistachios 2010: AgriWorld

27,000+





Thank You