

Stink Bug Management Update

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Why did Populations and Damage Increase?

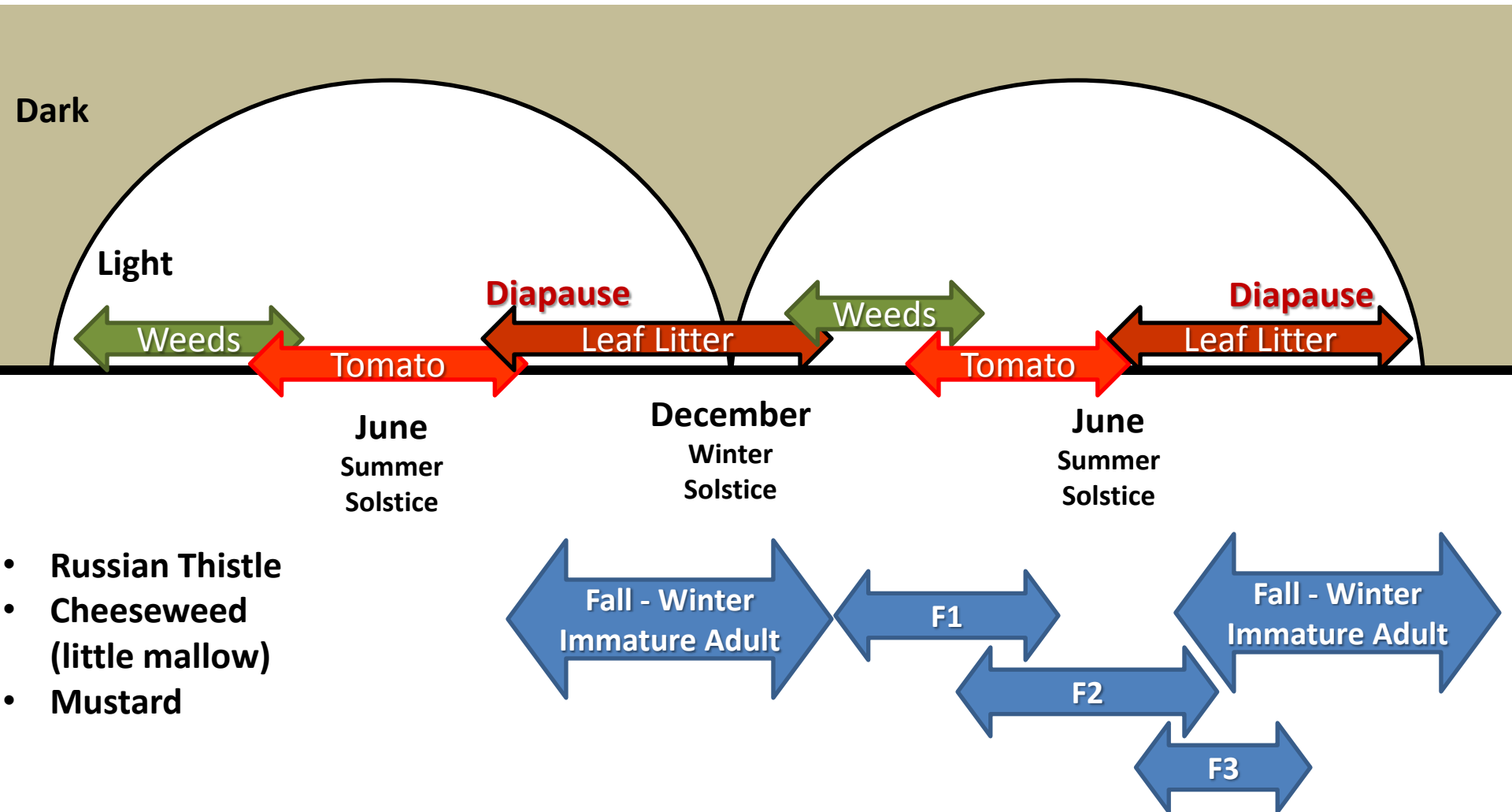
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- Increase in permanent crops which may serve as overwintering sites?

Conspere Stink Bug Schematic Life Cycle



- Russian Thistle
- Cheesweed (little mallow)
- Mustard

Why did Populations and Damage Increase?

- Changes in insecticides used?
- Increase in permanent crops which may serve as overwintering sites?
- Different species?



[Consperse stink bug: *Euschistus conspersus*](#)

Stink Bug Species Reported in CA



Say's stink bug complex: *Chlorochroa sayi* and *Chlorochroa uhleri*



Redshouldered stink bug: *Thyanta pallidovirens*



Conspere stink bug: *Euschistus conspersus*



Southern green stink bug: *Nezara viridula*

Stink Bugs Recently Reported in California

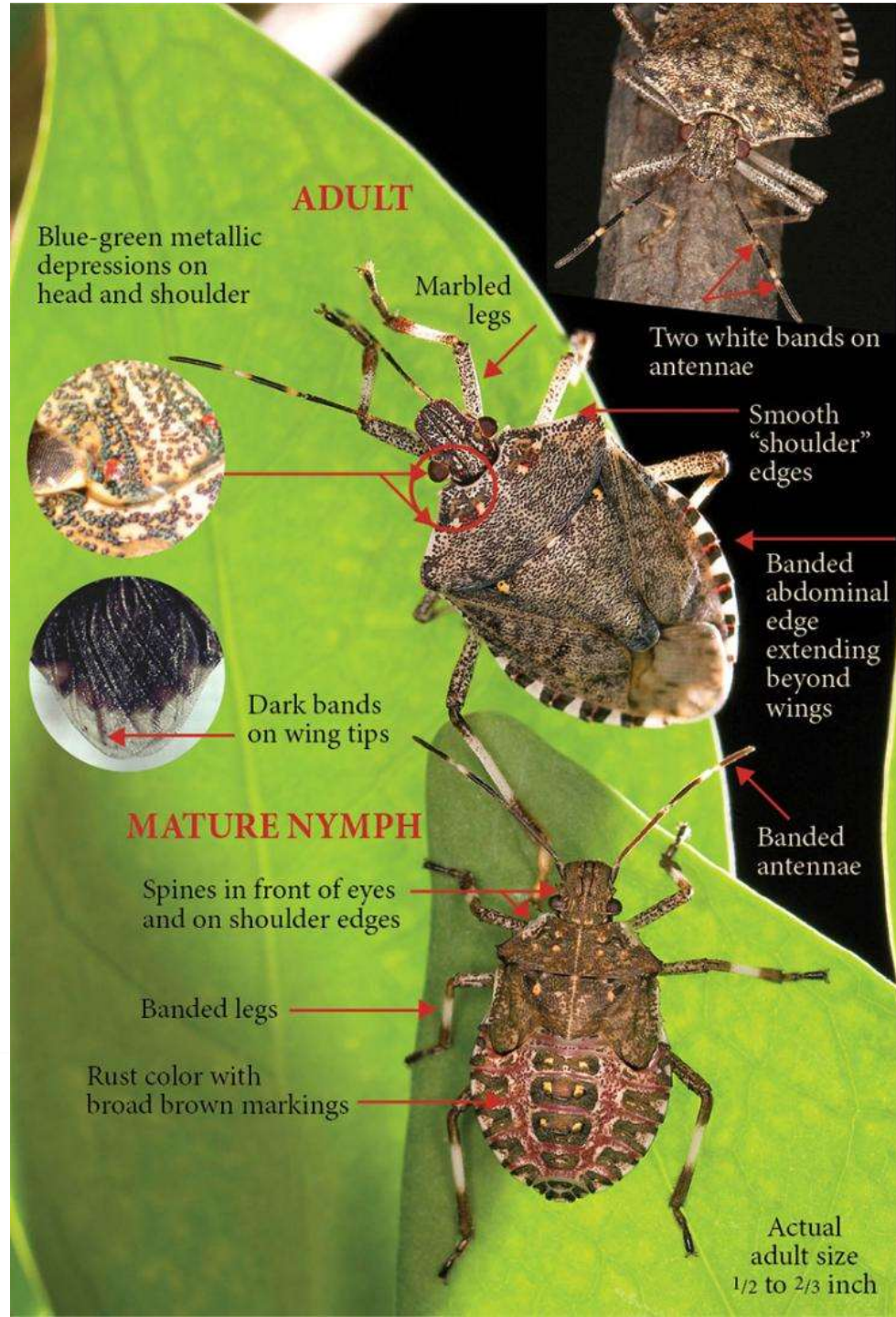


Euschistus servus
Brown stink bug

Halyomorpha halys
Brown marmorated



Brown marmorated stink bug (BMSB), *Halyomorpha halys*



Brown vs. Consperse



All Identified Stink Bugs Associated with Fresno Co. Tomatoes from 2013-2014 were Consperse



Photos by E. Hannon 2014

Why did Populations and Damage Increase?

- Changes in insecticides used?
- Increase in permanent crops which may serve as overwintering sites?
- Different species?
- **Recent weather conditions?**

Monthly $DD_{>54^\circ}$ Accumulation

	30 yr	2014	2013	2012	2007
Jan	18.69	105.74	30.23	63.98	32.41
Feb	77.43	115.93	61.66	83.25	76.44
Mar	168.3	226.56	230.12	144.3	258.74
Apr	248.14	333.14	337.5	259.62	283.64
May	427.48	544.03	462.62	473.45	491.52
June	590	642.8	654.1	584.95	593.55
July	803.9	839.4	824.4	785.4	744.4
Aug	767.4	786.9	732.93	838.4	747.98
Sept	595.5	664.1	560.27	692.56	468.44
Oct	352.57	440.78	309.75	385.24	281.99
Nov	112.99	149.28	154.88	153.93	146.45
Dec	14.24	55.07	48.83	41.12	19.96

Why did Populations and Damage Increase?

- Changes in insecticides used? **Possible**
- Increase in permanent crops which may serve as overwintering sites? **Possible**
- Different species? **Probably not**
- Recent weather conditions? **Possible**

CTRI Funded Project

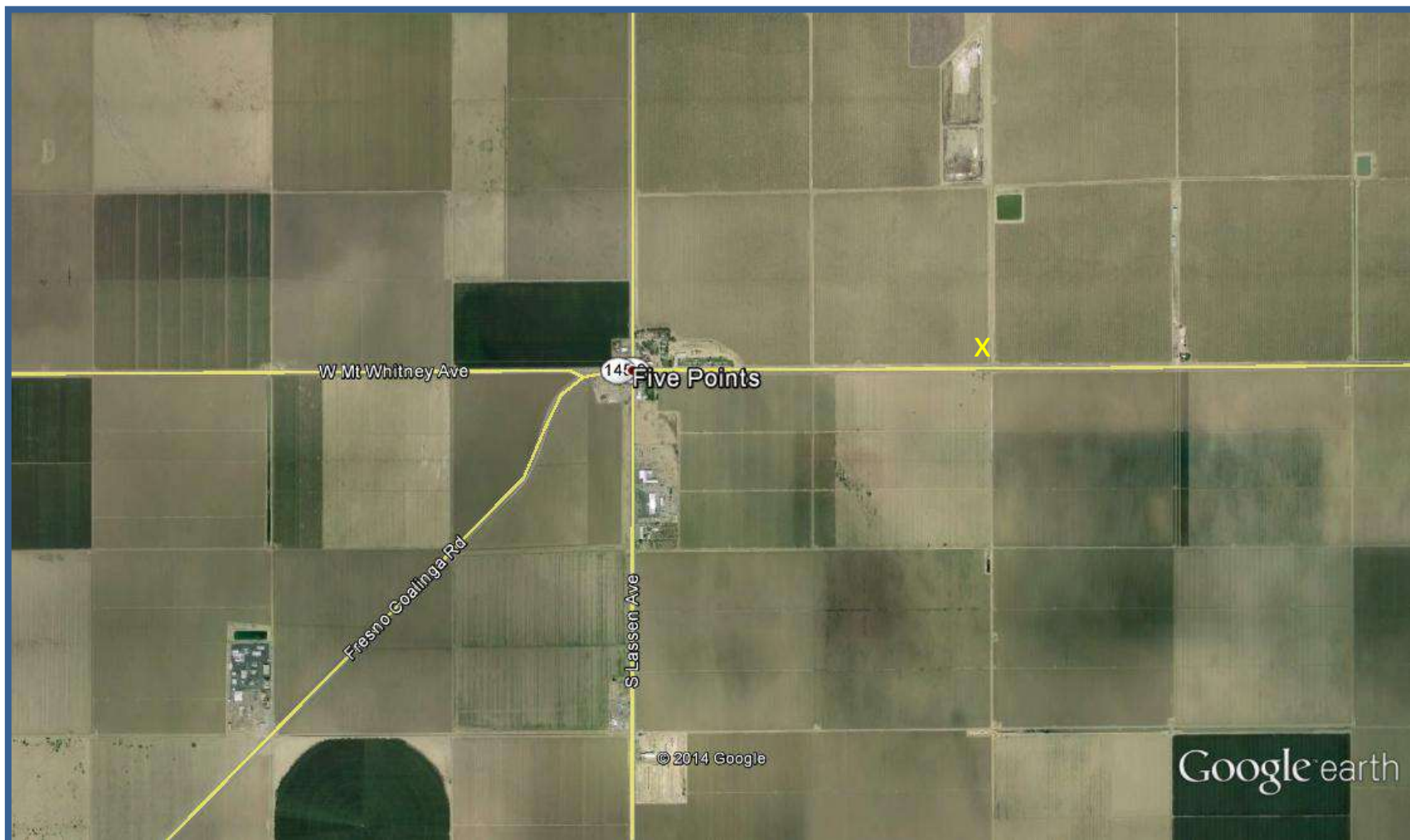
Objectives:

- Overwintering site identification and evaluate seasonal population development
- Pheromone trap evaluation
- Insecticide comparisons and program evaluation

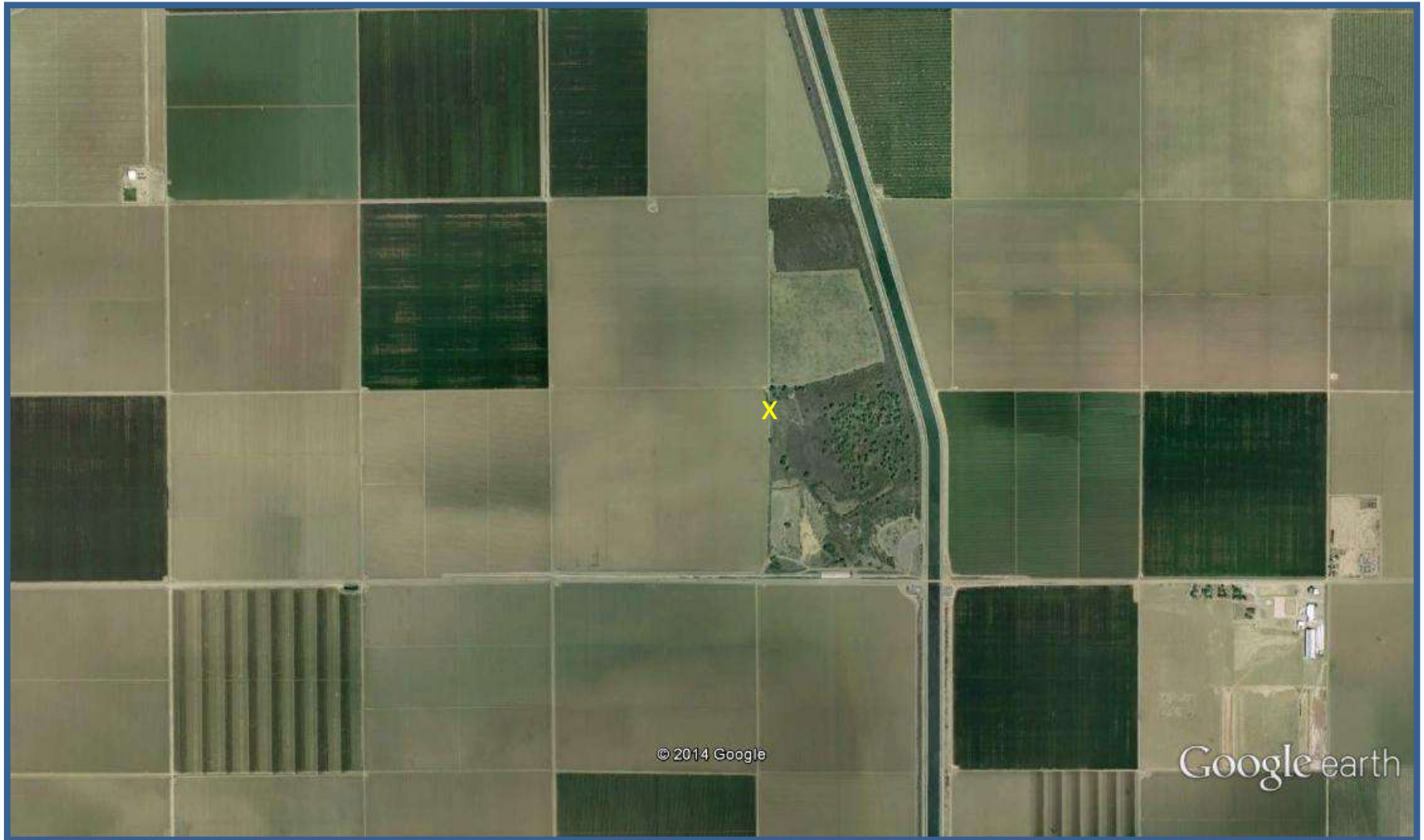
Firebaugh-Area



Five Points-Area



Huron-Area

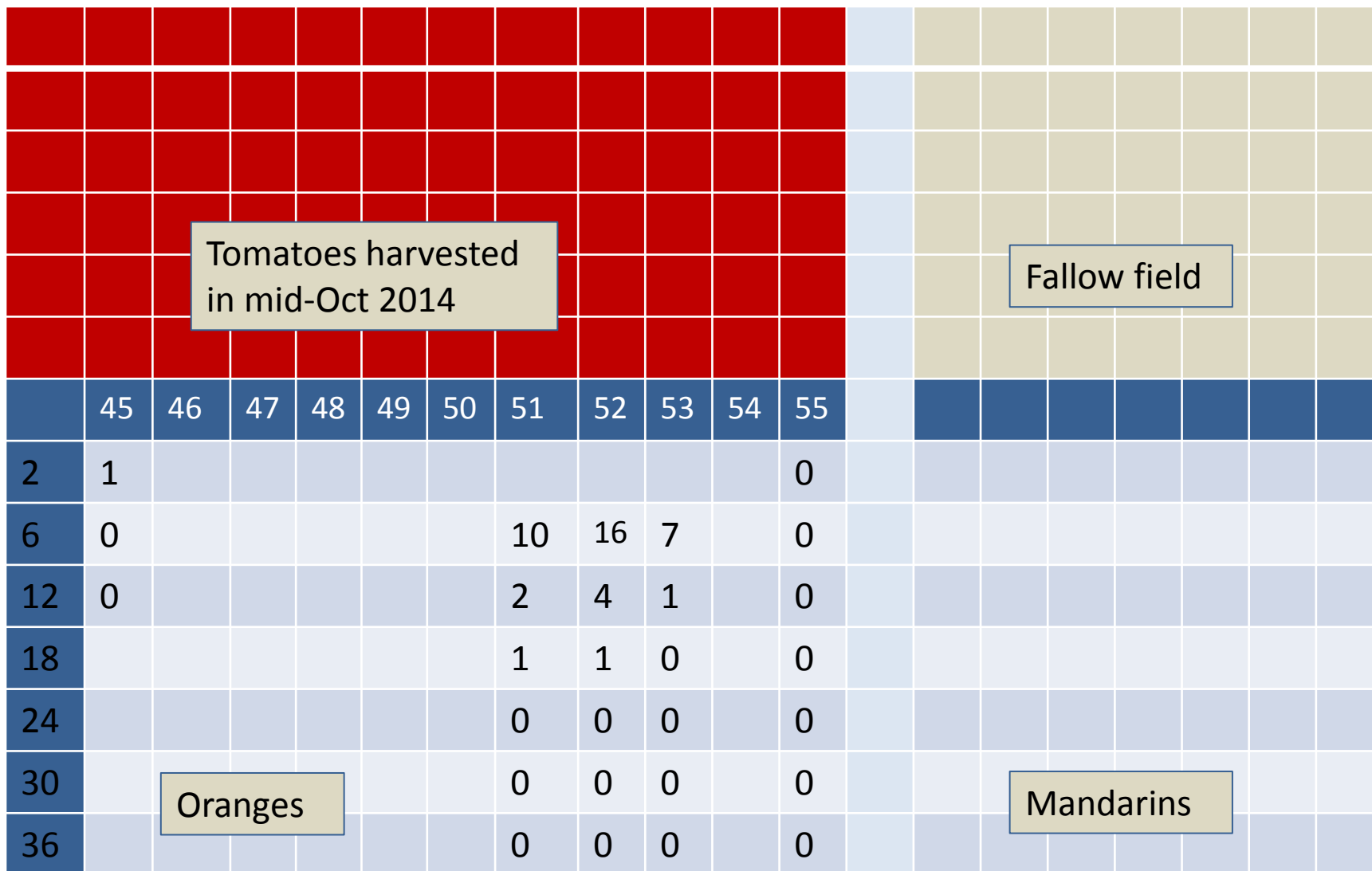


Stink Bug Detected in Leaf Litter

Fall 14



Overwintering site identified

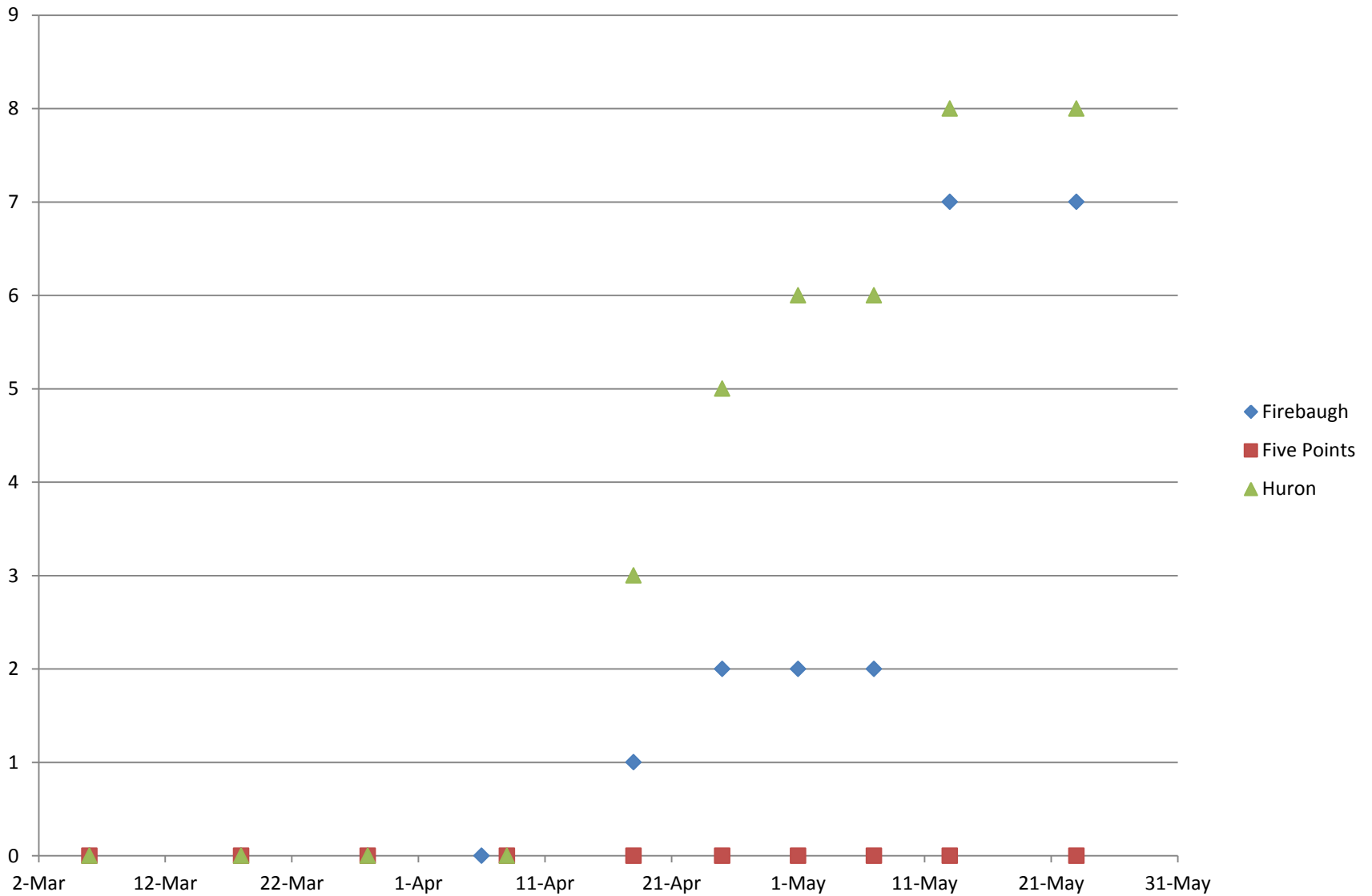


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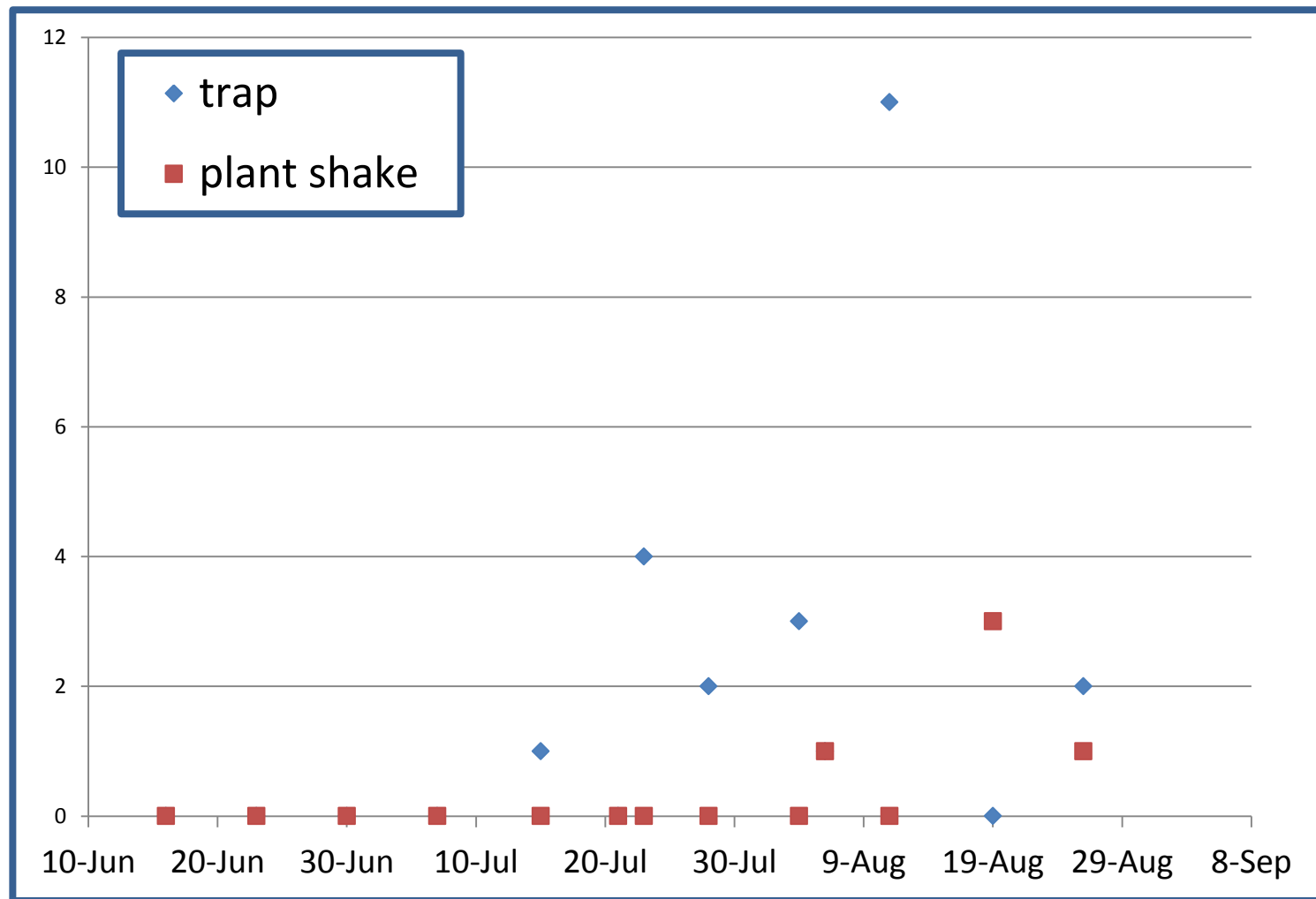


Sterling stink bug live trap

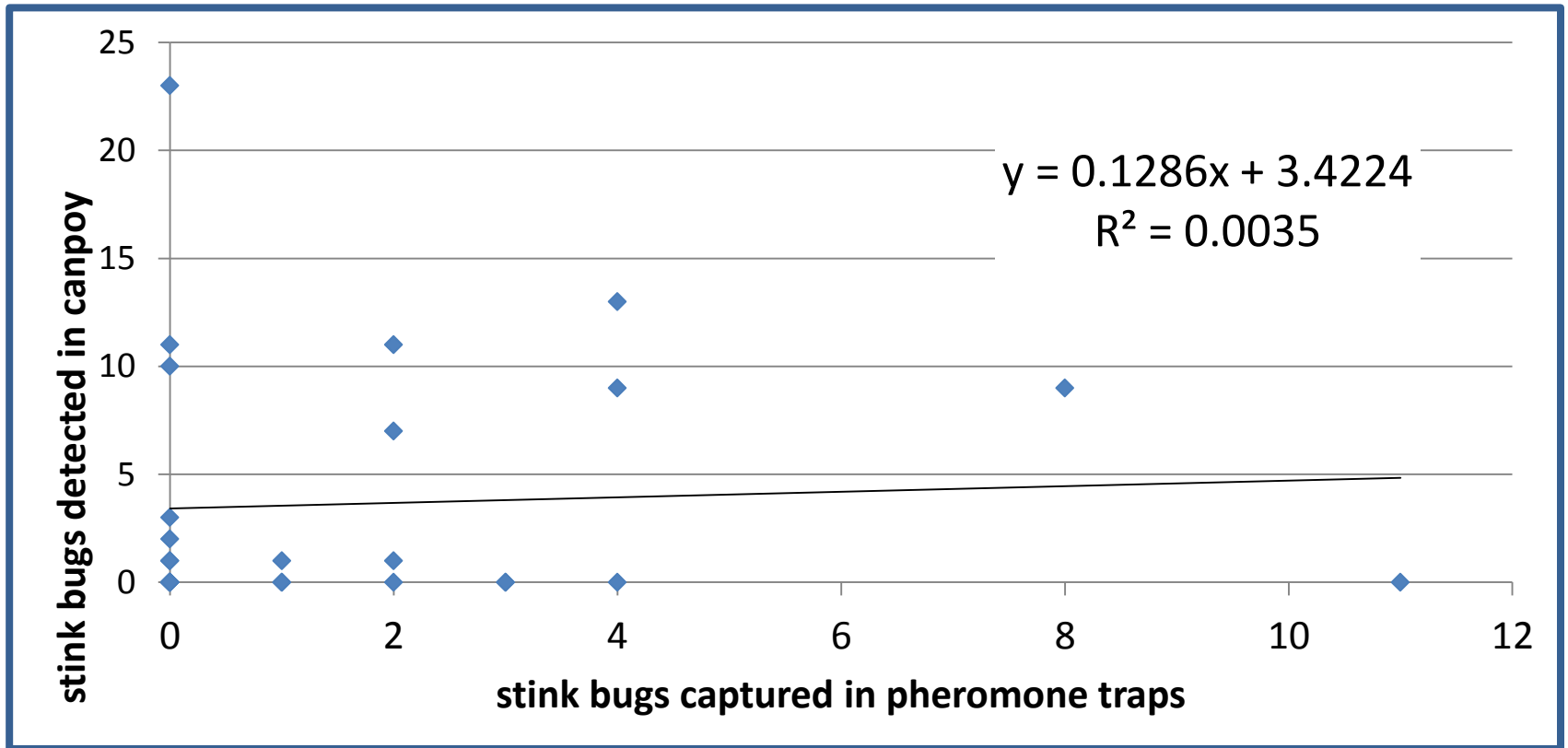
Trapping in High Risk Areas



Trap/Canopy Detection at UC WSREC



Trap/Canopy Stink Bug Detection



Insecticide Trials (Efficacy and Programs)



Not all pesticides mentioned in this presentation are currently registered in tomatoes.

Carefully read all current labels before writing a pesticide recommendation

Insecticides with Activity against Stink Bug

> 80% control (adults and nymphs)	
Beta cyfluthrin	Baythroid
Permethrin	Ambush, Pounce and others
Lambda-cyhalothrin + thiamethoxam	Warrior II + Actara
Bifenthrin	Brigade, Bifenture, Capture, and others
Dimethoate	Dimethoate
Dinotefuron	Venom
> 60% control (adults and nymphs)	
Beta-cyfluthrin + imidacloprid	Leverage
Lambda-cyhalothrin	Warrior II
Thiamethoxam	Actara
Clothianidin	Belay
Methomyl	Lannate
< 50% control of adults and > 80% control of nymphs	
S-cypermethrin	Hero, Mustang Max

From Frank Zalom (UC Davis Entomology)

Insecticides Selected for 2014 Trials

IRAC #*	Trade name	Common name
1A	Lannate	methomyl
1B	Dibrom 8E	naled
1B	dimethoate	dimethoate
2B	Thionex	endosulfan
3A	Danitol	fenpropathrin
3A	Warrior II	lambda-cyhalothrin
3A + 4A	Endigo ZCX	lambda-cyhalothrin + thiamethoxam
3A + 4A	Leverage	cyfluthrin + imidicloprid
4A	Belay	clothianidin
4A	Venom	dinotefuran
21A	Torac	tolfenpyrad

* IRAC# mode of action as assigned by the Insecticide Resistance Action Committee

Efficacy Trial Details

Belay 4 oz + Warrior II 1.92 oz

Danitol 10.67 oz

Dibrom 8E 1.0 pts

Dibrom 8E 1.0 pts **TRAP***

Dimethoate 1 pt

Endigo CX 4.5 fl oz

Endigo ZCX 4.5 fl oz

Lannate SP 1 lb Asana 9.6 fl oz

Leverage 2.7 3.75 oz

Leverage 2.7 3.75 oz **TRAP**

Thionex 1 1/3 qts

Torac 21.0 fl oz

Venom 70 SG 4 oz

Warrior II 1.92 oz

Untreated

H5608 planted 21 May;
harvested 15-17 Sep
- All plots received an
application on 8 and 29
Aug

* Treatments followed
by '**TRAP**' were applied
on 18 Jul after 1st
capture.

** Asana was applied
on 15 Aug in addition to
the Lannate applications
on 8 and 29 Aug,

Stink bug efficacy, yield and quality

		Fruit quality (%)				
Treatment	yield (t/a)	reds	greens	sunburn	rot	stink bug
Venom 70 SG 4 oz	39.24	60.83	12.44	10.01	9.99	6.72
Leverage 2.7 3.75 oz trap	40.82	73.46	5.31	4.25	9.52	7.47
Thionex 1 1/3 qts	45.80	74.35	6.54	4.34	5.33	9.41
Leverage 2.7 3.75 oz	40.84	55.88	10.09	9.83	13.86	10.34
Danitol 10.67 oz	37.40	66.04	9.84	4.92	8.49	10.71
Belay 4 oz + Warrior II 1.92 oz	41.80	69.46	5.76	5.36	7.36	12.05
Endigo CX 4.5 fl oz	37.22	59.62	15.77	4.45	7.29	12.87
Torac 21.0 fl oz	41.09	50.05	7.78	13.06	10.66	18.44
Warrior II 1.92 oz	37.00	60.67	8.72	5.73	6.41	18.48
Lannate SP 1 lb Asana 9.6 fl oz	47.52	58.43	14.55	2.46	6.00	18.56
Dibrom 8E 1.0 pts trap1	45.75	46.33	10.55	11.54	10.69	20.89
Endigo ZCX 4.5 fl oz	41.79	57.33	7.84	4.94	8.47	21.44
Dibrom 8E 1.0 pts	37.70	53.13	8.12	2.79	9.26	26.70
Dimethoate 1 pt	40.84	47.82	6.60	11.83	6.62	27.13
Untreated	38.91	52.84	7.02	7.46	7.30	25.38
LSD (P=0.05) ^s	8.440	15.935	7.305	8.425	6.346	12.357
CV (%)	14.33	18.89	56.04	85.95	52.37	52.64

Unless otherwise specified all applications were made on 8 and 29 Aug. Treatments followed by 'trap' were applied on 18 Jul after 1st capture. Asana was applied on 15 Aug in addition to the Lannate applications on 8 and 29 Aug, H5608 planted 21 May and harvested 15-17 Sep

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Pre-Harvest Stink Bug Counts and Damage Evaluation



Stink bug efficacy, field evaluations

Treatment	Stink bug counts (per 4 ft)			Stink bug damage (0-10)		
	21-Aug	28-Aug	5-Sep	21-Aug	28-Aug	5-Sep
Venom 70 SG 4 oz	0.0	2.0	0.8	1.0	3.3	2.0
Leverage 2.7 3.75 oz trap	0.0	0.0	1.0	1.0	0.5	1.0
Thionex 1 1/3 qts	1.3	0.3	0.5	0.8	1.0	1.0
Leverage 2.7 3.75 oz	0.8	3.8	0.8	1.3	2.0	1.0
Danitol 10.67 oz	0.4	3.2	1.6	0.6	4.0	1.0
Belay 4 oz + Warrior II 1.92 oz ^v	1.5	0.5	1.3	1.5	1.5	1.0
Endigo CX 4.5 fl oz	0.5	3.0	3.3	1.0	2.0	2.0
Torac 21.0 fl oz	1.0	1.3	1.8	2.3	2.3	2.3
Warrior II 1.92 oz	0.8	1.3	1.0	1.5	1.5	1.0
Lannate SP 1 lb/Asana 9.6 fl oz	0.5	1.0	2.3	1.3	1.0	2.0
Dibrom 8E 1.0 pts trap	0.3	2.3	2.5	1.5	4.0	2.3
Endigo ZCX 4.5 fl oz	1.3	1.3	0.3	2.8	1.8	0.7
Dibrom 8E 1.0 pts	0.0	0.5	4.3	1.5	1.8	1.7
Dimethoate 1 pt	1.0	3.3	3.0	2.8	3.5	3.7
Untreated	1.3	0.5	4.0	4.5	2.8	3.3
LSD (P=0.05) ^t	NS ^s	3.05	3.23	1.93	2.24	1.39
CV (%)	149.46	133.74	120.69	80.74	71.74	55.45

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Danitol 10 67 oz	0.4	3.2	1.6	0.6	4.0	1.0
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Stink Bug Project 2014 Overview

- Overwintering sites: Located in Fall 2014 singly or in groups up to 16 in leaf litter near late season tomatoes.



Stink Bug Project 2014 Overview

- Pheromone baited traps captured stink bugs before they were detected in the canopy, but quantities in traps did not correspond to canopy densities or damage observed.



Stink Bug Project 2014 Overview

- Thionex, Venom, Leverage, Belay + Warrior II and Endigo reduced damage.
- With the exception of Thionex, the only materials with apparent activity were pyrethroids, neonicotinoids or a combination of the two.

Acknowledgements

- CTRI
- Peter Goodell: UC IPM Kearney Ag Center
- Frank Zalom : UC Davis Entomology
- Les Ehler : Retired UC Davis
- Managers and PCAs of large scale ag operations in Fresno-area
- West Side Research and Extension Center

Questions?

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