Environmental Horticulture Program

Options to Manage *Thrips parvispinus*

Cristi L Palmer

IR-4 Environmental Horticulture Program Manager

Thrips parvispinus

What works?

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Pesticides registered in India for thrips in chili peppers

Active Ingredient	IRAC MOA
Acephate	1B
Acetamiprid	4A
Carbofuran	1A
Cyantraniliprole	28
Dimethoate	1B
Emamectin-benzoate	6
Ethion	1B
Fenpropathrin	3A
Fipronil	2B
Imidacloprid	4A
Lambda cyhalothrin	3
Methomyl	1A
Oxydemeton-methyl	1B
Spinosad	5
Spirotetramat	23
Thiacloprid	4A
Thiamethoxam	4A
Tolfenpyrad	21A

Pesticides registered in India for thrips in chili peppers

G: Greenhouse
I: Interiorscape
L: Lathhouse
N: Nursery
S: Shadehouse

Active Ingredient	IRAC MOA	Available in the US for Ornamentals
Acephate	1B	Orthene, etc – G, N
Acetamiprid	4A	TriStar – G, L, N, S
Carbofuran	1A	
Cyantraniliprole	28	Mainspring – G, I
Dimethoate	1B	Dimethoate – N
Emamectin-benzoate	6	Enfold – N (***no thrips on label!***)
Ethion	1B	
Fenpropathrin	3A	Tame – G, I, L, N, S
Fipronil	2B	
Imidacloprid	4A	Marathon, etc – G, I, N
Lambda cyhalothrin	3	Scimitar – G, N, S
Methomyl	1A	
Oxydemeton-methyl	1B	
Spinosad	5	Conserve, Entrust – G, L, N, S
Spirotetramat	23	Kontos – G, I, N
Thiacloprid	4A	
Thiamethoxam	4A	Flagship – G, L, N, S
Tolfenpyrad	21A	Hachi-Hachi – G, L, N, S

Pesticides registered in India for thrips in chili peppers

G: Greenhouse
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Active Ingredient	IRAC MOA	Available in the US for Ornamentals	Available in Canada for Ornamentals
Acephate	1B	Orthene, etc – G, N	Orthene – G, N
Acetamiprid	4A	TriStar – G, L, N, S	TriStar – G, N, L, S
Carbofuran	1A		
Cyantraniliprole	28	Mainspring – G, I	Ference – G, N, turf
Dimethoate	1B	Dimethoate – N	Cygon, Lagon – N
Emamectin-benzoate	6	Enfold – N (***no thrips on label!***)	
Ethion	1B		
Fenpropathrin	3A	Tame – G, I, L, N, S	
Fipronil	2B		
Imidacloprid	4A	Marathon, etc – G, I, N	Intercept – G, N, turf
Lambda cyhalothrin	3	Scimitar – G, N, S	Demand, etc - N, turf
Methomyl	1A		
Oxydemeton-methyl	1B		
Spinosad	5	Conserve, Entrust – G, L, N, S	Success – G, N, turf
Spirotetramat	23	Kontos – G, I, N	Kontos – G, N
Thiacloprid	4A		
Thiamethoxam	4A	Flagship – G, L, N, S	Flagship – N
Tolfenpyrad	21A	Hachi-Hachi – G, L, N, S	

Thrips parvispinus

What works?

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Success Story: Biocontrol in Greenhouse Peppers

Photo: Greenhouse Canada Magazine

- **Short term control achieved with** a combination of thrips predators:
  - Large predator of thrips (*Orius*)
  - Large number of predator mites (*Cucumeris*)
- **Confirms only biocontrol study out of Europe** (Biobest – on peppers and ficus)
  - *Orius*, lacewing (*Chrysoperla carnea*) = first line of defense
  - Most predatory mite species can help suppress population
- **Other factors that may have contributed:**
  - Mixed population with WFT (competition, alternate food)
  - Available pollen from pepper flowers to support *Orius*
  - Happened in Spring/Summer when *Orius* was active (diapauses in low temp./light conditions)

Ontario Sarah Jandricic ANATIS BIOPROTECTION Ron Valentin

Success Story: Biocontrol in Ornamental Pepper

Photo: J. Grindstaff

- Banker Plant System for Hoya in commercial greenhouse
- *Hypoaspis* and *Atheta* + one of four different other biocontrol options released into ornamental pepper banker plants
  - Degenerans (predatory mite)
  - Degenerans + pollen
  - Chrysoperla rufilabris larvae (green lacewing)
  - Chrysoperla rufilabris eggs (green lacewing)
- Thrips counted on 3 leaves of 10 ornamental pepper plants per treatment

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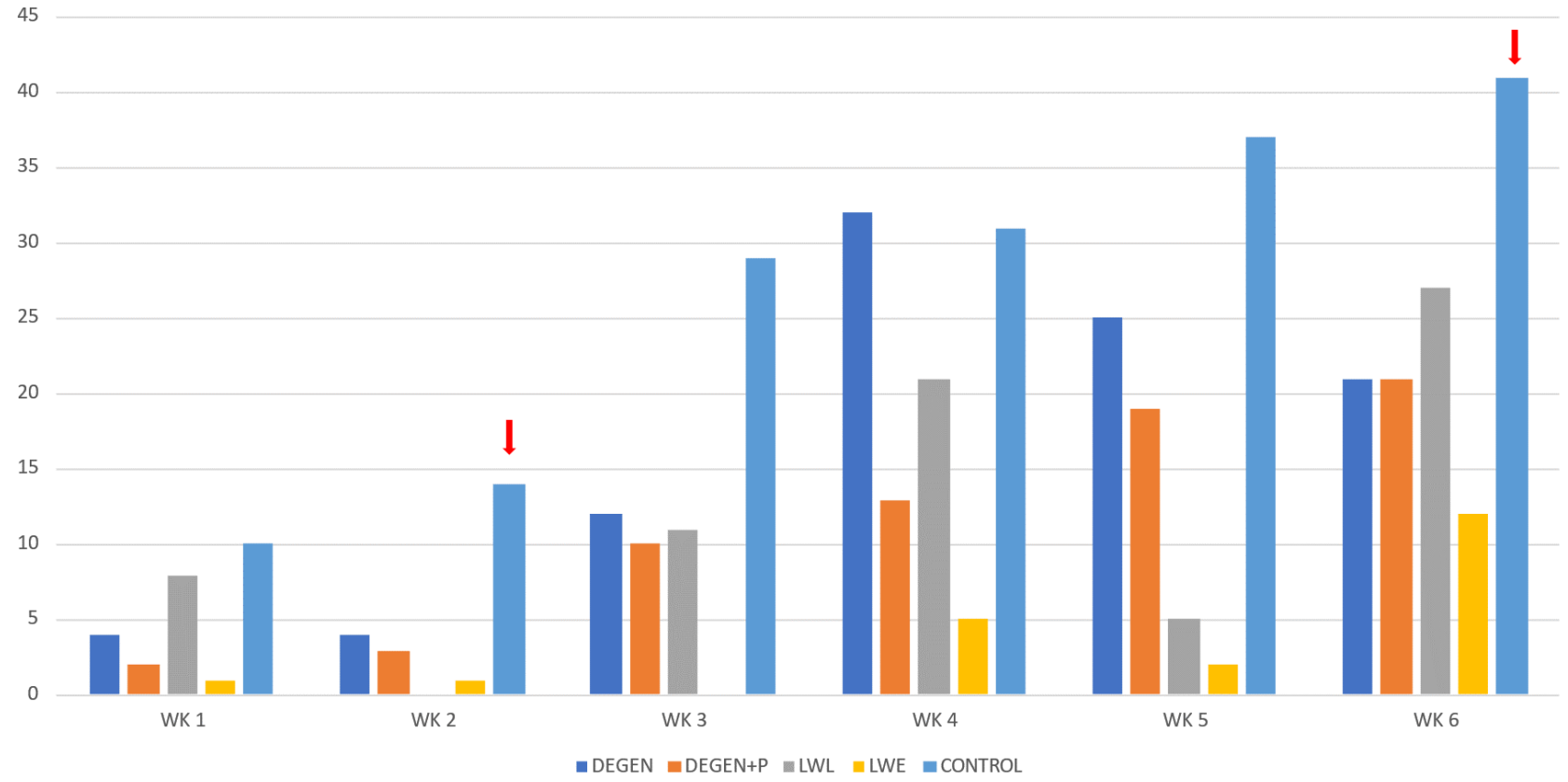
Lance Osborne
Veronica Cervantes
PLANTPRODUCTS

Success Story: Biocontrol in Ornamental Pepper

Photo: J. Grindstaff

Outcomes: Reduction of *T. parvispinus* with predators released on ornamental pepper banker plants



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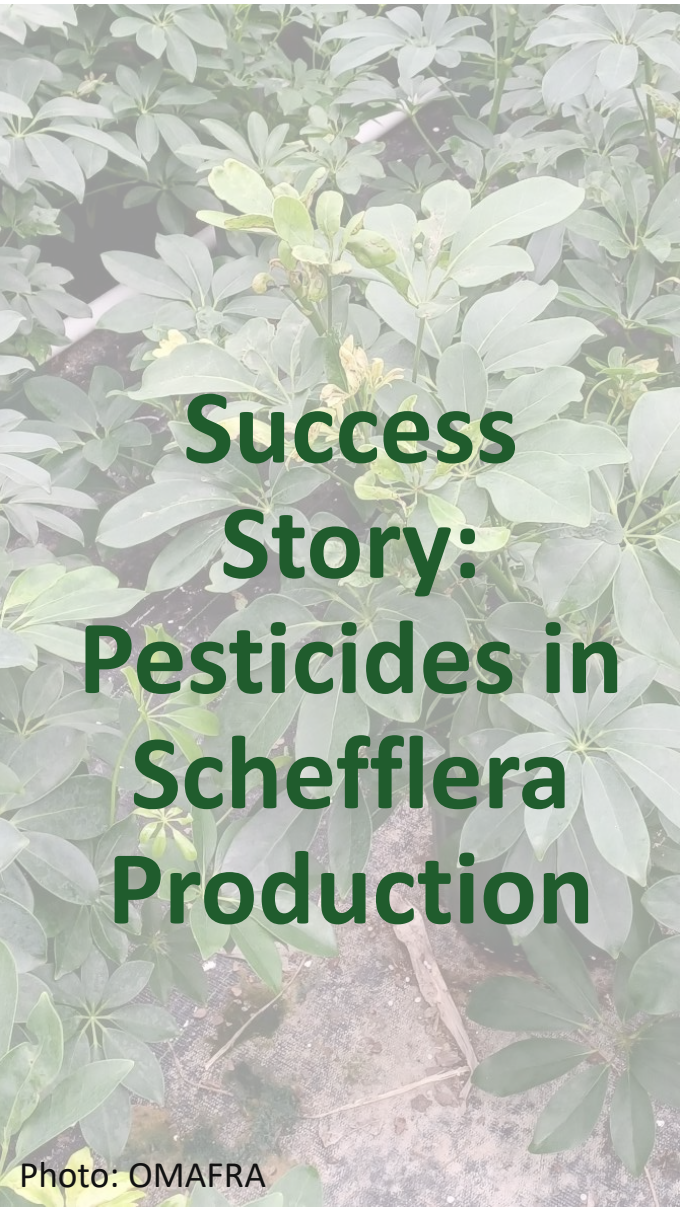
PLANTPRODUCTS



Success Story: Pesticides in Schefflera Production

Photo: OMAFRA

- *T. parvispinus* outbreak in **long term schefflera crop**
- Grower had previously applied landscape oil, but still had **high pressure**
- Allowed a test for various **pesticides + mechanical control** (cutting back of all growing points)
  - Flonicamid (Aria, Beleaf) + spinosad (Success)
  - Chlorfenapyr (Pylon)
- Measured efficacy of treatments with **card counts + plant taps**
  - Before and every week for 3 weeks after application

Ontario

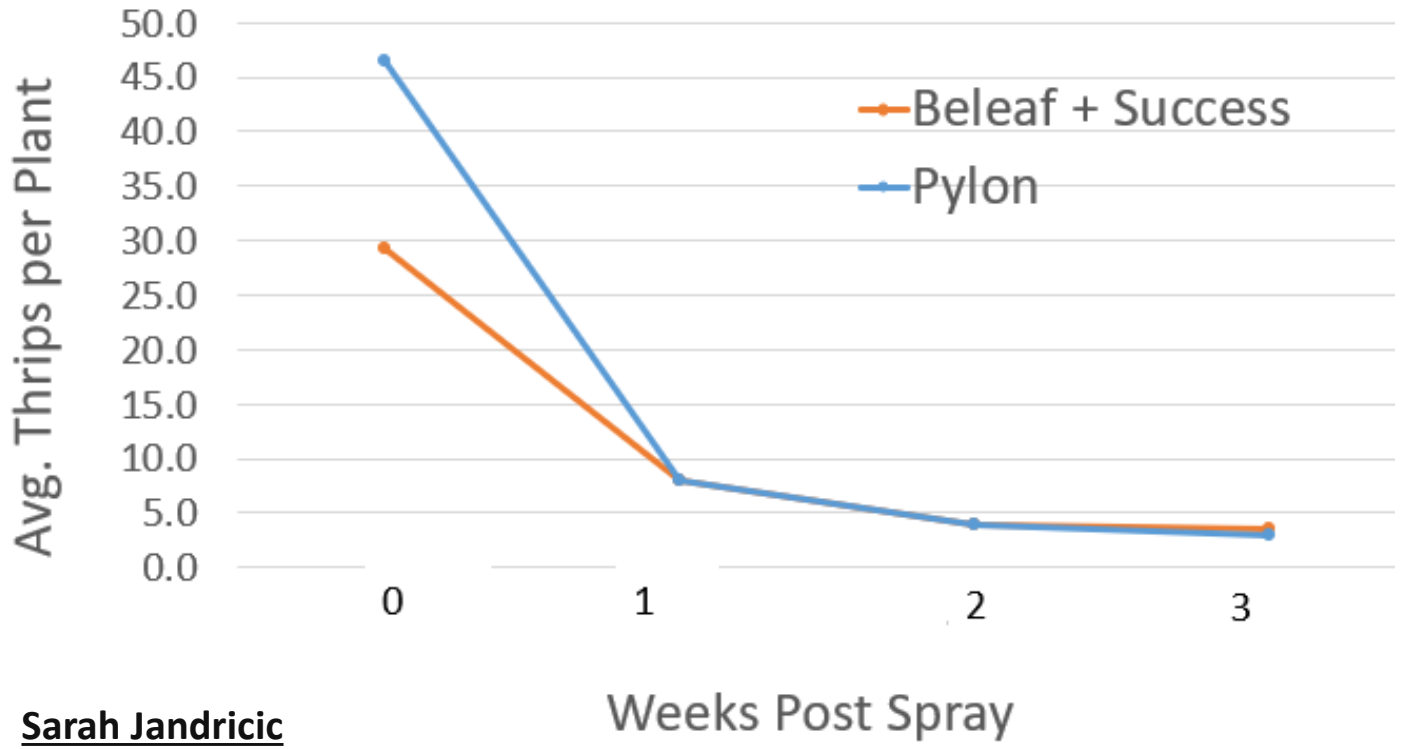
Sarah Jandricic

Success Story: Pesticides in Schefflera Production

Photo: OMAFRA

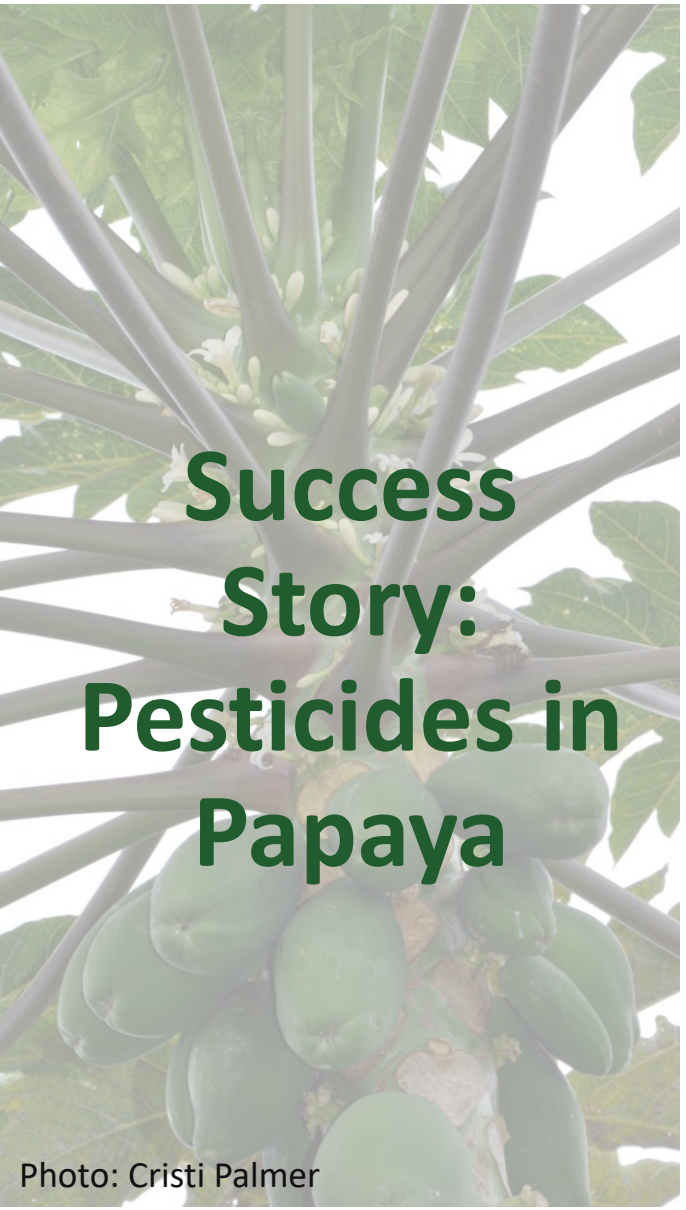
Outcomes:

- Both sprays (2 appl. ea., 7 days apart) brought thrips down to almost zero
- Larvae totally controlled
- 1-5 adult thrips left per plant
  - May need to add drench application or 3rd spray to completely eradicate
  - Able to sell plants that had been cut back
- **Caveat: NOT a long-term trial and no nontreated controls**



Ontario

Sarah Jandricic



Success Story: Pesticides in Papaya

Photo: Cristi Palmer

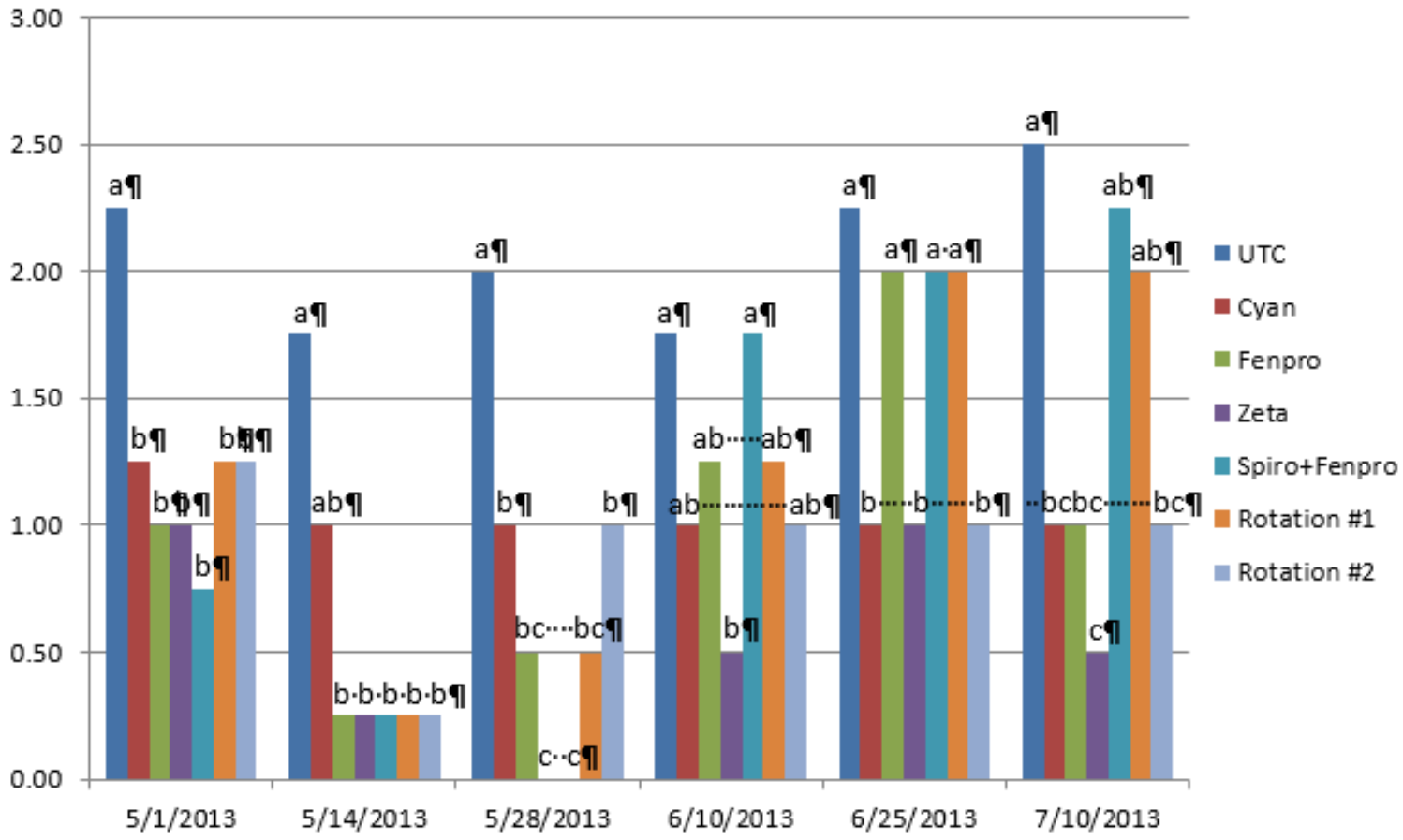
- Papaya experiment in established field
- Thrips treatments selected for maximum rate and applications per year
  - Cyazypyr (cyantraniliprole)
  - Danitol (fenpropathrin)
  - Mustang (z-cypermethrin)
  - Tank Mix: Movento (spirotetramat) + Danitol
  - Rotation 1: Mustang / Cyazypyr / Malathion / Delegate (spinetoram)
  - Rotation 2: Danitol / Delegate / Malathion
- Thrips injury assessed on tagged young leaves, tagged flowers, and fruit

Julie Coughlin, Mike Kawate, James Kam, Julie Coughlin, Jari Sugano & Steve Fukuda. 2013

Success Story: Pesticides in Papaya

Photo: Cristi Palmer

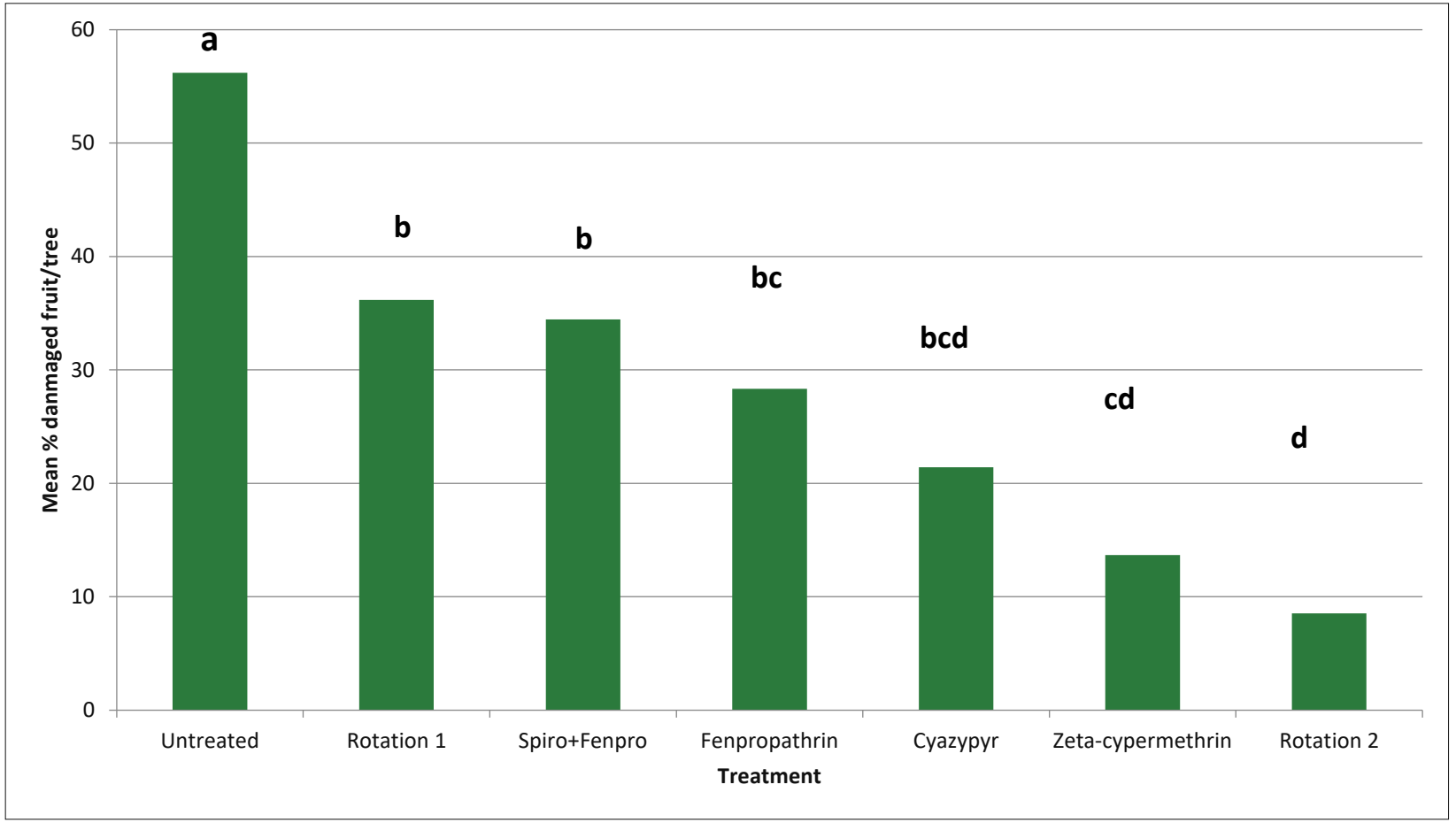
Outcomes: Visual thrips injury in papaya canopy



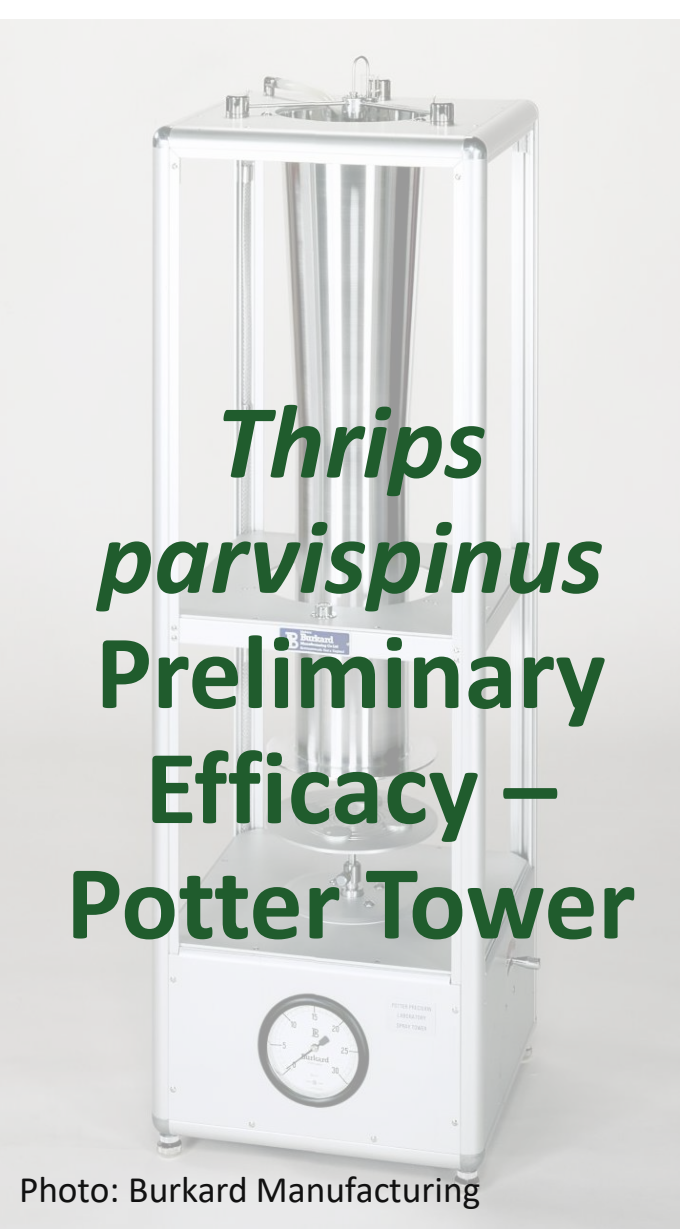
Julie Coughlin, Mike Kawate, James Kam, Julie Coughlin, Jari Sugano & Steve Fukuda. 2013

Control Success Stories: Pesticides in Papaya

Outcomes: Reduction in damaged papaya fruit



Julie Coughlin, Mike Kawate, James Kam, Julie Coughlin, Jari Sugano & Steve Fukuda. 2013



Thrips parvispinus Preliminary Efficacy – Potter Tower

Photo: Burkard Manufacturing

Methods

- Applications
  - Direct sprays to bean leaf discs with 1st instars, 2nd instars or adults – “curative”
  - Indirect sprays to bean plants, leaf discs collected then 1st instars, 2nd instars or adults introduced – “preventive”
- Assessments
  - Mortality assessed 24 and 48 hours later (adults assessed only at 48 hours)

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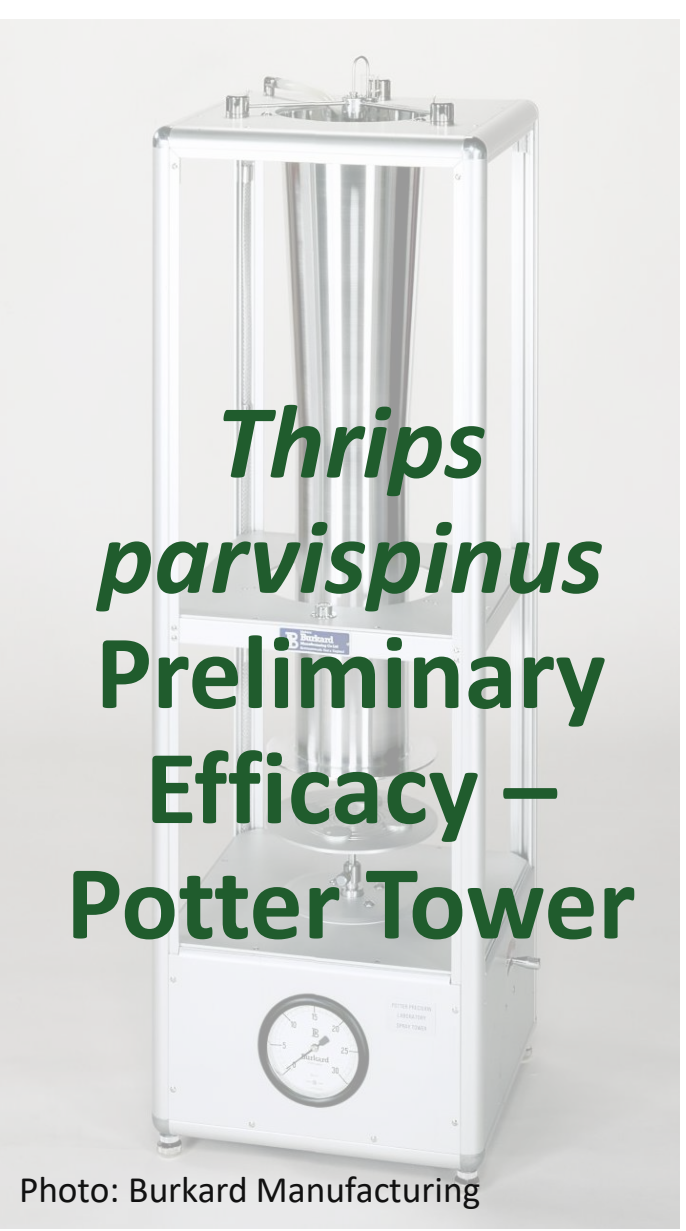

Thrips parvispinus Preliminary Efficacy – Potter Tower

Photo: Burkard Manufacturing

Preliminary Outcomes (experiments still ongoing for Aria, Fulcrum, Kontos, Overture, Pedestal, Piston, Pradia, Rycar, Sarisa, and TriStar)

Treatment	L1 Direct	L1 Indirect	L1 Feeding	L2 Direct	L2 Indirect	L2 Feeding	Adult Direct	Adult Indirect	Adult Feeding
Xxpire	X	X	X	X	X		X	X	X
Conserve SC	X	X	X	X	X	X	X	X	X
Timectin	X	X	X	X		X			X
Piston		X			X	X		X	
Kontos		X	X			X			
Pedestal		X							
Sarisa			X			X			X
Acephate			X						X
Hatchi-Hatchi SC			X	X	X				
Mainspring GNL			X			X			
Overture								X	X

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Product efficacy across thrips species from IR-4 sponsored experiments

Active Ingredients	Products	MOA Class	Impact across Thrips Species Average Rating (Low to High) Number of Trials
Abamectin	**Avid, Timectin, etc**	**IRAC 6**	**3.2 (1 - 5) n19**
Acetamiprid	TriStar	IRAC 4A	3.3 (1 - 5) n9
Beauveria bassiana Strain GHA	BotaniGard	IRAC UNF	2.7 (1 - 5) n12
Bifenthrin	TalStar, etc	IRAC 3A	4.6 (4 - 5) n5
Bifenthrin + Imidacloprid	Allectus	IRAC 3 + IRAC 4A	3.7 (1 - 5) n3
Chlorfenapyr	**Pylon, Piston**	**IRAC 13**	**3.7 (1 - 5) n19**
Clothianadin	Arena (Landscape only)	IRAC 4A	2.5 (1 - 4) n10
Cyantraniliprole	**Mainspring**	**IRAC 28**	**3.8 (2 - 5) n13**
Cyclaniliprole	**Sarisa**	**IRAC 28**	**2.8 (1 - 5) n14**
Cyclaniliprole + Flonicamid	**Pradia**	**IRAC 28 + IRAC 29**	**3.7 (1 - 5) n3**
Dinotefuran	Safari	IRAC 4A	3.1 (1 - 5) n10
Flonicamid	Aria	IRAC 29	2.5 (1 - 5) n12
Imidacloprid + cyfluthrin	Discus, Marathon Ultra	IRAC 4A + IRAC 3A	3.0 (1 - 5) n6
ISM-555, A21377X	*not yet registered*	--	4.7 (3 - 5) n6
Methicarb	Mesural	IRAC 1A	2.9 (1 - 5) n7
Pyridalyl	**Overture**	**IRAC UN**	**3.6 (1 - 5) n20**
Spinetoram + sulfoxaflor	**XXpire**	**IRAC 5 + IRAC 4C**	**3.6 (2 - 5) n7**
Spinosad	**Conserve**	**IRAC 5**	**2.9 (1 - 5) n41**
Thiamethoxam	Flagship	IRAC 4A	2.5 (1 - 5) n28
Tolfenpyrad	**Hachi-Hachi**	**IRAC 21A**	**3.3 (1 - 5) n27**

Thrips species include Western Flower Thrips, Chili Thrips, Gladiolus Thrips, Orchid Thrips, Privet Thrips, Ficus Thrips
Average rating on a scale of 1 – 5 with 1 = 0 to about 70% efficacy and 5 = 90% or greater efficacy; minimum to maximum rating; number of trials.. A rating of 3 or higher is considered commercially acceptable.

**** Preliminary positive Thrips parvispinus efficacy data available for bolded active ingredients***

Products available in the US and Canada for thrips management

**** Preliminary positive efficacy data available for bolded active ingredients***

G: Greenhouse
I: Interiorscape
L: Lathhouse
N: Nursery
S: Shadehouse

Active Ingredient	IRAC MOA	Available in the US for Orn Hort	Available in Canada for Orn Hort
Abamectin	**6**	**Avid, etc – G, N**	**Avid – G, N**
Acephate	**1B**	**Orthene, etc – G, N**	**Orthene – G, N**
Acetamiprid	4A	TriStar – G, L, N, S	TriStar – G, N, L, S
Beauveria bassiana Strain GHA	UNF	BotaniGard – G, I, N, S	BotaniGard – G
Bifenthrin	3A	Talstar – G, I, L, N, S	--
Chlorfenapyr	**13**	**Pylon, Piston, etc – G**	**Pylon - G**
Cyantraniliprole	**28**	**Mainspring – G, I**	**Ference – G, N, turf**
Cyclaniliprole	**28**	**Sarisa**	**Harvanta – G, N**
Cyclaniliprole + Flonicamid	**28 + 29**	**Pradia**	--
Dimethoate	1B	Dimethoate – N	Cygon, Lagon – N
Fenpropathrin	**3A**	**Tame – G, I, L, N, S**	--
Imidacloprid	4A	Marathon, etc – G, I, N	Intercept – G, N, turf
Lambda cyhalothrin	3	Scimitar – G, N, S	Demand, etc - N, turf
Novaluron	**15**	**Pedestal – G, N, S**	**Rimon – G, N (*thrips not on label*)**
Pyridalyl	**UN**	**Overture – G**	--
Spinosad	**5**	**Conserve, Entrust – G, L, N, S**	**Entrust, Success – G, N, turf**
Spinetoram + sulfoxaflor	**5 + 4C**	**Xxpire – G, N**	--
Spirotetramat	**23**	**Kontos – G, I, N**	**Kontos – G, N**
Thiamethoxam	4A	Flagship – G, L, N, S	Flagship – N
Tolfenpyrad	**21A**	**Hachi-Hachi – G, L, N, S**	--

What now?

- More research is needed, particularly longer experiments on ornamental crops and development/proofing of IPM strategies
- Multiple chemical modes of action AND biocontrols are available
- Read product labels carefully and follow all applicable federal, state and provincial laws

Thank you for the support!

Photo by Cristi Palmer

Thank you!

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