Sustainable Roses: Chilli Thrips Research…part 4

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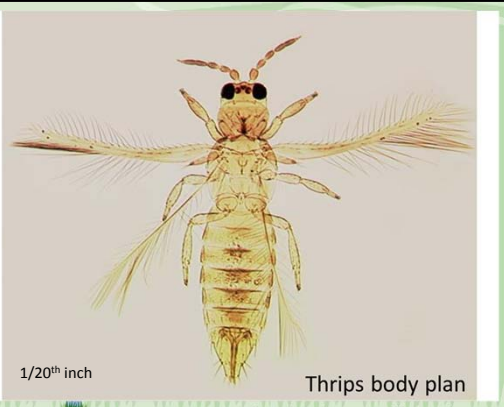
Photo credit: Lance Osborne

Webinar topics, 23 Jan. 2015

- Identification/damage/scouting
- Cultural control
  - Cultivar preferences
  - Relationship with fertilizers
  - Pruning
- Biological control agents
- Insecticides
- Conclusions

Identification



1/20th inch

Thrips body plan

Scirtothrips dorsalis. www.**padil**.gov.au/

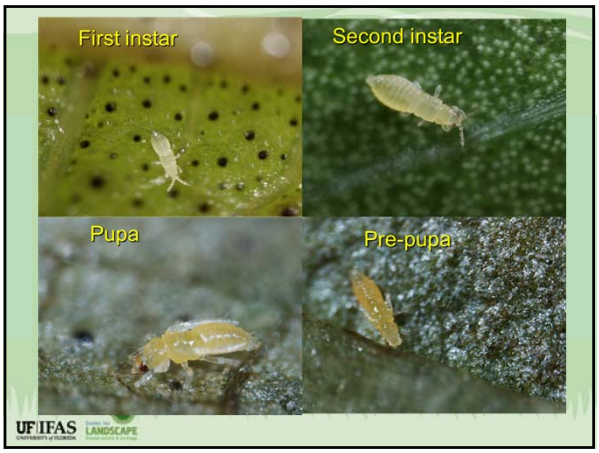
Chilli thrips 101

- Adults pale brown, 1/20th" with dark 'wing line'; significantly smaller than flower thrips
- Larvae pale yellow, no wings
- Mostly found on <u>young foliage;</u> pupal stages *may* occur in soil
- No noticeable 'hairs' at tip of abdomen

Chilli thrips (L) and flower thrips
Photo Lance Osborne

Dorsal and ventral surface of *S. dorsalis adult* females

Image: Bugwood.org


First instar
Second instar
Pupa
Pre-pupa
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Flower thrips (L) have hairs at the end of their body, chilli thrips (R) do not
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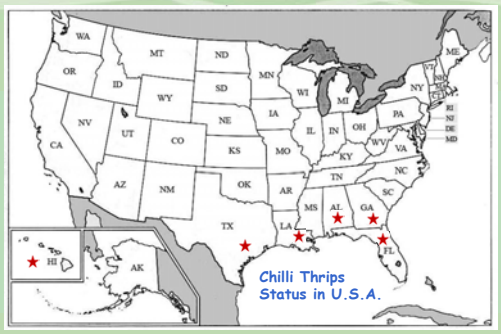
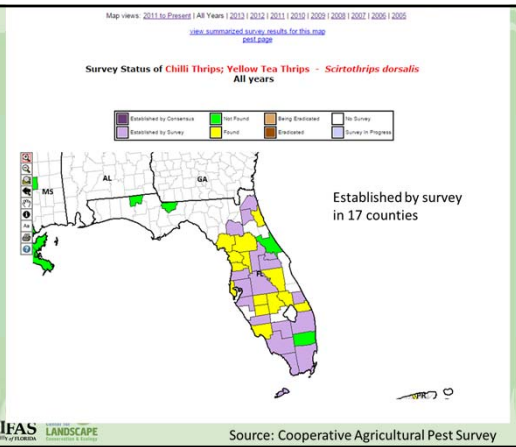
Photo: Lance Osborne

Distribution



Date of U.S.A. It was reported: Hawaii (1987), Florida (2005), Texas (2007), Louisiana (2010), Georgia (2010), and Alabama 2010.

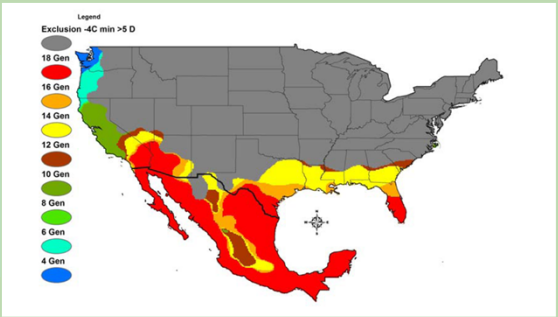
(Silagyi & Dixon 2006, Ludwig & Bogran 2007, Diffie & Srinivasa 2010, Edwards et al. 2010, Dale 2010)



Source: Cooperative Agricultural Pest Survey

How are chilli thrips distributed?

Projected range



Generational potential outside of the predicted cold temperature exclusion boundary for *S. dorsalis* in the U.S. and Mexico. (Source: USDAAPHIS- PPQ-CPHST 2005).

Damage Symptoms

Chilli thrips are foliar feeders

Fresh damage to KO rose

Chilli thrips damage (L) versus insecticide treated (R)

Symptoms on KO rose…

Defoliation in municipal rose garden, Winter Park Florida (Photo Lance Osborne)

Damage to Indian Hawthorn

Schefflera arboricola

The bottom row of plants is *Plumbago auriculata* many of which were completely defoliated by chilli thrips and removed shortly thereafter.

Stephen H. Brown, Lee County Extension

Damage to Hydrangea 'Mme Emile Mouillere' in NY

Photo courtesy of Dan Gilrein

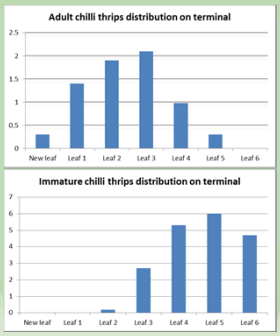
Chilli thrips is a pest of fruits and vegetables

Damage to sweet pepper

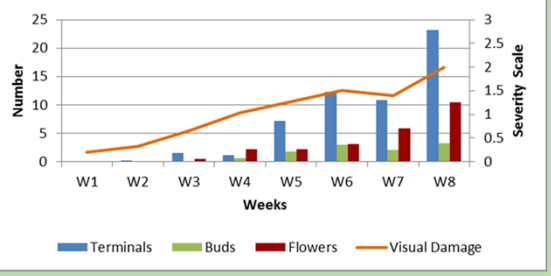
Photo: Luis Aristizabal

Scouting

Location of chilli thrips on new growth (from top to bottom)

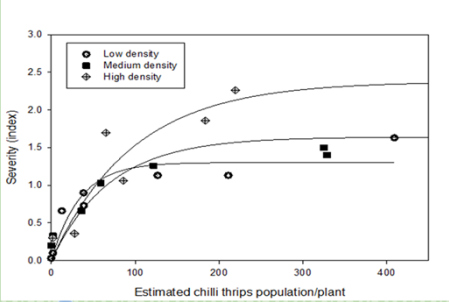


Number of chilli thrips on terminals, buds, flowers, and visual damage



Source: Aristizabal (unpublished)

Correlation of visual damage (Severity index) and chilli thrips population on KO rose (containers)



Scouting with a beat tray

Examining life stages

Cultural Controls

Cultivar selection

Table 2. Mean values of the damage severity index (DSI) caused by chilli thrips in 11 cultivars of old garden (OGR) and modern (MR) roses in central Florida from Sept. 2008 to Dec. 2009.

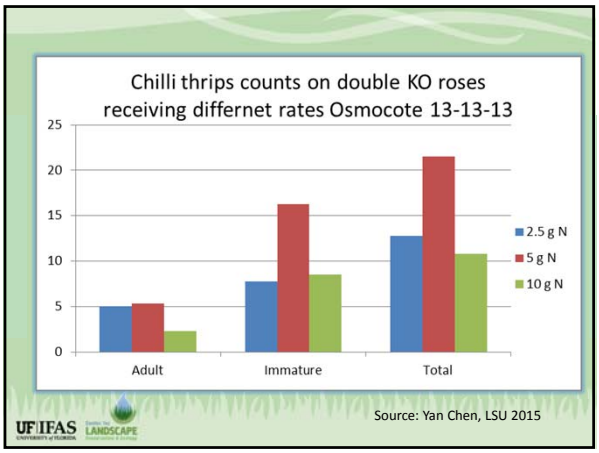
Cultivar[z]	Group	Chilli thrips damage DSI[y]
Mrs. B.R. Cant	OGR	1.01 a[x]
Old Blush	OGR	1.24 ab
"Bailey Red"	OGR	1.30 ab
Belinda's Dream	MR	1.59 bc
BUCbi (Carefree Beauty™)	MR	1.59 bc
Perle d'Or	MR	1.61 bc
RADrazz (Knock Out®)	MR	1.78 cd
WEKcisbako (Home Run®)	MR	1.85 cd
Spice	OGR	2.14 d
Duchesse de Brabant	OGR	2.86 e
Mutabilis	OGR	3.69 f

[z]Trade name in parenthesis.
[y]DSI = $\sum[(\text{frequency}_1 \times \text{rating value}_1) + (\text{frequency}_n \times \text{rating value}_n)] \div$ (total of symptomatic readings) for a total period of 57 weeks.
[x]Mean values followed by the same letters are not significantly different ($P \leq 0.05$) according to Tukey's test.

HortTechnology • April 2013 23(2)

Source: Mangandi, J, Brown, SP, & Peres, N (2013). Evaluation of low-maintenance landscape roses in Central Florida. HortTechnology 23: 252-257

Varieties being tested at MREC (2015), after Orwat



Can pruning manage chilli thrips?

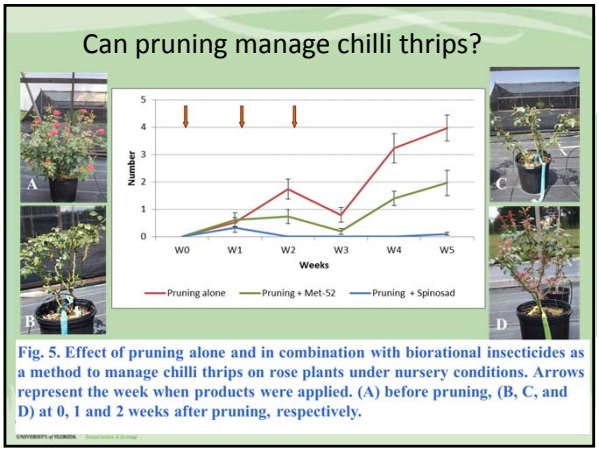


Fig. 5. Effect of pruning alone and in combination with biorational insecticides as a method to manage chilli thrips on rose plants under nursery conditions. Arrows represent the week when products were applied. (A) before pruning, (B, C, and D) at 0, 1 and 2 weeks after pruning, respectively.

Natural Enemies

Key natural enemies

- Pirate bugs (*Orius* spp)
- Predatory mites
  - (*Amblyseius* spp)
- Lacewings
- Predatory thrips
- Ladybirds
- Diseases - fungi

Adult *Amblyseius swirskii* feeding on chilli thrips larvae. Photo Steven Arthurs, University of Florida.

Minute pirate bug, *Orius insidiosus*
Photo: Mahmut Dogramaci

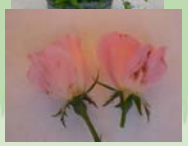
Do Native Natural Enemies Control Thrips on landscape plants?

- Three plants (plumbago, Indian hawthorn, and KnockOut rose)
- Replicated 4 times at 2 sites (6 plants/rep.)
- Weekly census – 2 years

Landscape pest survey (no insecticides)

Results (2008/9)

- Indian hawthorn, and plumbago had consistently < 1 thrips per sample (aesthetic quality good)
- KO Rose consistently 1-2 thrips per sample (visual quality impacted)



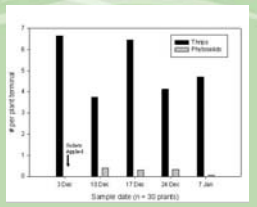
"Natural enemies are insufficient to prevent aesthetic damage from thrips on KnockOut® roses in central Florida landscapes"

Can we release commercially reared natural enemies to control chilli thrips?

Releases of *A. swirskii and O. insidiosus* successfully managed chilli thrips on bell pepper

(Arthurs et al. 2009. Biol. Contr. 49, 91–96; Dogramaci et al. 2011. Biol. Contr. 59: 340-347)

Predator mites did not establish on KnockOuts in landscape tests



Problem: lack of domatia, extra floral nectaries and leaf trichomes?

Insecticides

Insecticides for chilli thrips on ornamentals*

Material	Trade	Use site	IRAC class	Pred. mites	Orius	Lace wing	Ladybe etle
Acephate	Orthene	L,N,G	1B				
Acetamiprid	TriStar	L,N,G	4A				
Dinotefuran	Safari	L,N,G	4A				
Imidacloprid	Maratho n, Merit	L,N,G	4A				
Thiamethoxam	Flagship	L,N,G	4A				
Pyridaly	Overture	G	UN				
Chlorfenapyr	Pylon	G	13				
Spinosad	Conserve	L,N,G	5				
Flonicamid	Aria	L,N,G	9c				
Abamectin	Avid	L,N,G	6				

TOXICITY
Low
Med
High

*Based on data from: Ciomperlik, Ludwig, Osborne, Seal, Arthurs

- Combination insecticide containing spinetoram (group 5) and sulfoxaflor (group 4c)
- Registration for T&O market in 2015
- Provided significant control of chilli thrips for > 9 weeks in our tests with KO roses!


Specimen Label

Dow AgroSciences

XXpire™ WG

INSECTICIDE

with iSOCLAST™ ACTIVE

CAUTION

Biological insecticides and horticultural oils have only provided moderate effectiveness (Aristizabal)

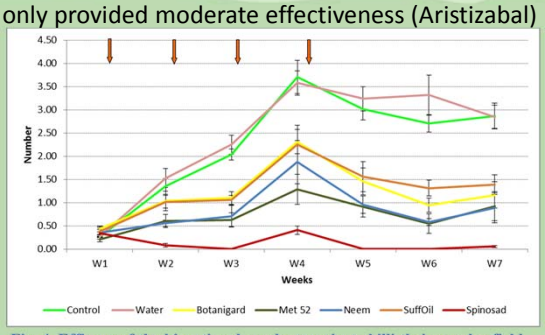


Fig. 4. Efficacy of the biorational product against chilli thrips under field conditions. Data are #insects per leaf during 7 weeks. Arrows indicate treatments applications.

Insecticide strategies: production vs landscape

- Growers surveyed in FL and LA applied insecticides weekly in most cases, i.e. *reflects risk*
- Landscapers should adopt different aesthetic thresholds and practice more selective insecticide use along with cultural controls


Dewar Nurseries Inc, Apopka, FL

Conclusions

- Cultural
  - Limit fertilitity
  - Prune and sanitize
  - Tea varieties may be less susceptible
- Natural enemies
  - Suppress but not totally effective on KO rose
- Insecticides
  - XXpire™ and Conserve™ are effective and preserve natural enemies
  - Pyrethroids not recommended

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Resources

- General information
  http://edis.ifas.ufl.edu/in833
- Damage photos
  http://mrec.ifas.ufl.edu/lso/thripslinks.htm
- Distribution
  http://www.invasivespeciesinfo.gov/animals/chillithrips.shtml

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