

1:00 to 1:25 pm Eastern

IMPORTANCE OF A PROACTIVE APPROACH WITH A BIOLOGICAL CONTROL STRATEGY

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Why is it important to be proactive with BCA strategies?

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Pro-active approach to maximize efficacy of BCAs:

- Life cycle of the target pest problems?
- Where does BCA affect the target pest?
- Eggs, larva, pupa and adults
- Threshold ornamentals vs. vegetable production
- Starting 'clean'
- Role of cutting production / propagation
- Residues (on plant material and greenhouse)
- Inspection young plants upon arrival
- Communication (the good and the bad)
- BCAs is a systems approach
- An example on Thrips control.....



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Thrips



Biological control is preventing problems, not fixing them!

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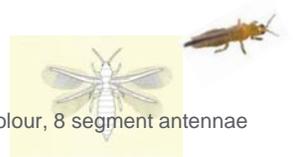
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Thrips damage:



Some back ground info on Thrips →

- Small insects 2-3 mm
- *Frankliniella occidentalis* → brown-black colour, 8 segment antennae
- Other common thrips species:
 - *Thrips tabaci* → brown-black colour, 7 segment antennae
 - *Echinothrips americanus* → black with white stripe, white larvae, all stages on plant
 - *Scirtothrips dorsalis* → approx. 1/3 of the size of WFT
- Where on the plant?
- Life cycle
- Damage done by larvae and adults
 - Flowers
 - Leaves
 - Virus transmission (TSWV/ INSV)



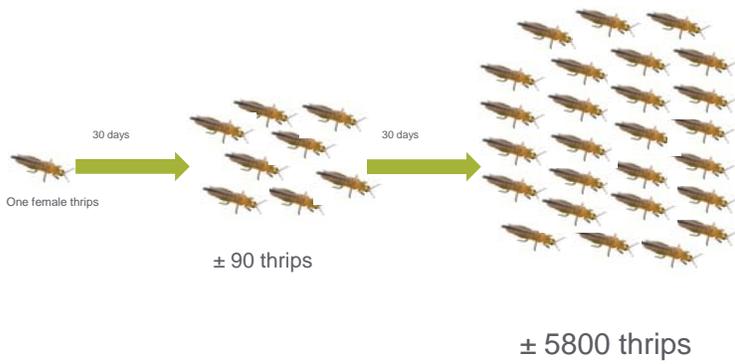
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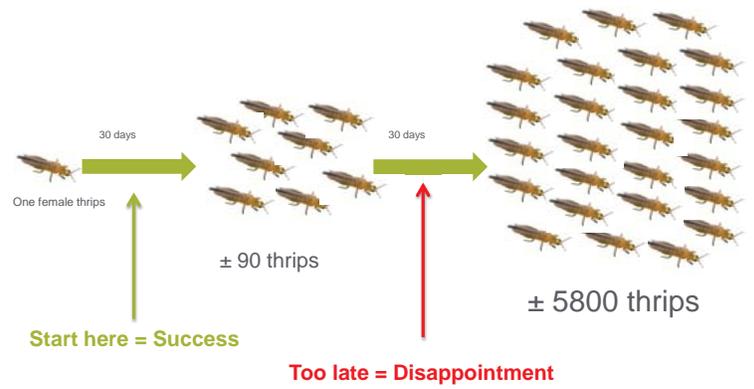
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Development of thrips in 60 days (at 68°F)



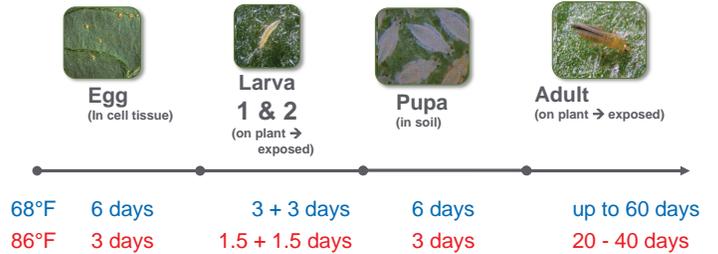
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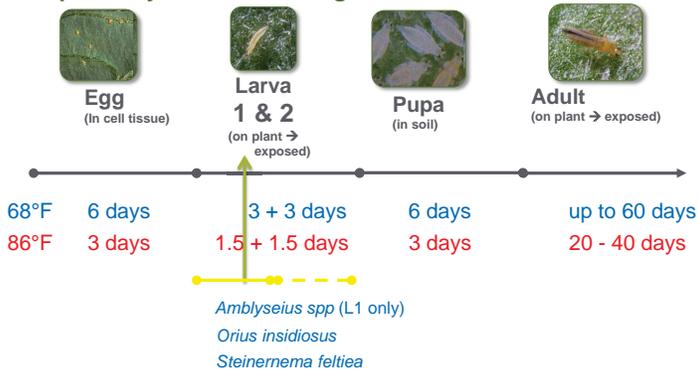
Thrips life cycle and BCA target!



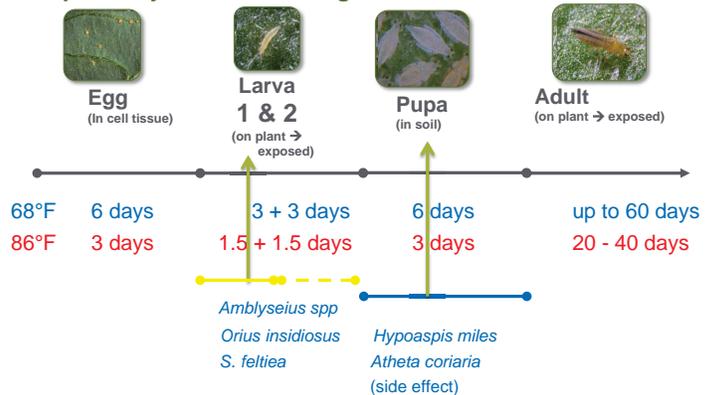
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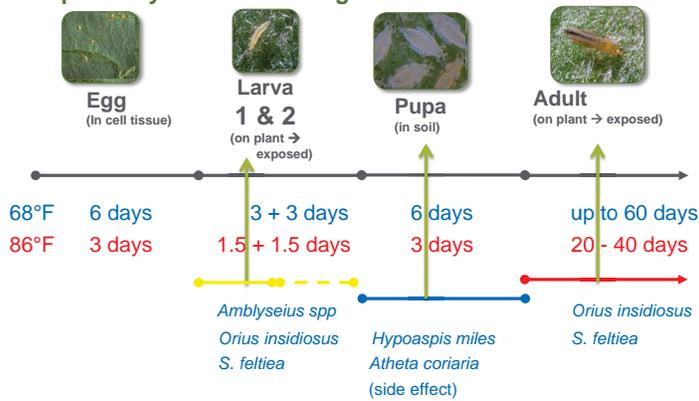
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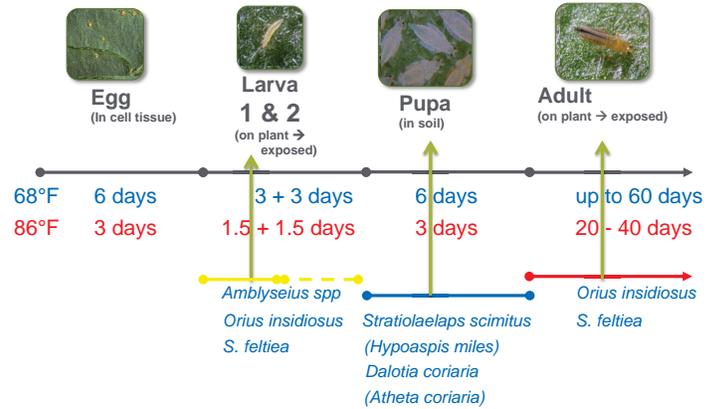
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Thrips life cycle and BCA target!

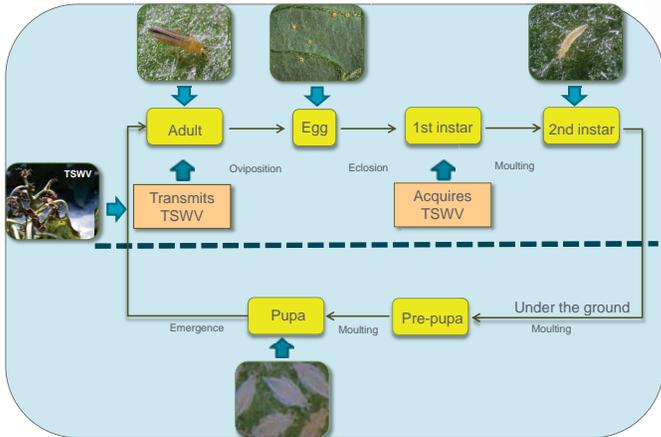


Thrips life cycle and BCA target!



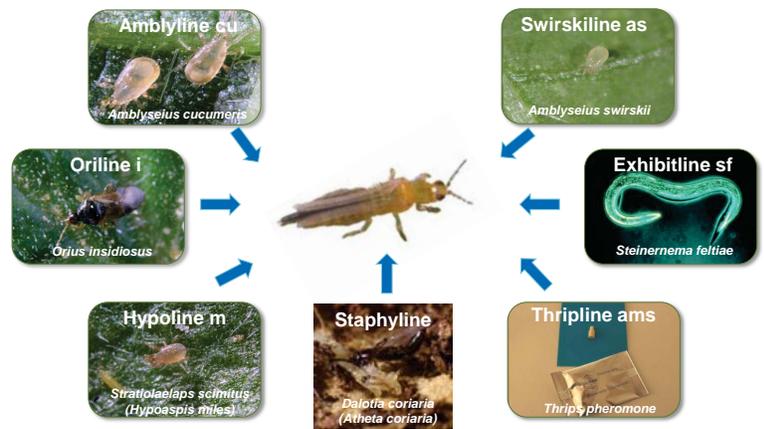
- Fecundity in vegetative stage vs when pollen is available
- Fecundity in different crops

What about Thrips and vectoring virus?



After Kawai, 1989 for *Thrips palmi*

Bioline portfolio against thrips



Amblyline cu – *Amblyseius cucumeris*



- Predatory mite *Amblyseius cucumeris*
- Eats L1 larvae of thrips
- Can be used in wide range of crops
- Active from 12-15°C
- No diapause → active at low light levels
- Strong side effect on tarsonemid mites
- Can establish and sustain in some crops where pollen is available (peppers)
- Available as breeding system (sachets, Bugline) and loose material



Breeding sachets

- What's in a sachet
 - Bran
 - Prey mites
 - Food for the prey mites
 - Predatory mites
 - Culture



Amblyline - mini



Swirskiline as – *Amblyseius swirskii*



Swirskiline as

Amblyseius swirskii

- Predatory mite *Amblyseius swirskii*
- Eats L1 larvae of thrips, whitefly eggs and pollen
- Can be used in wide range of crops
- Active from 18-20°C, but prefers warmer
- Sensitive for low light levels and low temperatures (< 18°C)
- Strong side effect on tarsonemid mites
- Available as breeding system (sachets, Bugline) and loose material
- Best benefit: activity at higher temperatures and crops where both thrips and whitefly are present



Oriline i – *Orius insidiosus*



Oriline i

Orius insidiosus



- Predatory bug *Orius insidiosus*
- Eats larvae and adults of thrips
- Can kill up to 80 adult thrips per day
- Can feed and establish on pollen
- To enhance establishment, can be fed with Bugfood (*Ephestia* eggs)
- Curative treatment in hotspots (nymphs)
- Active from 12-15°C
- Diapause sensitive → less active at low light levels
- Also feeds on other small pest, e.g. TSSM, moth eggs
- Available in a carrier
- Best benefit: in crops with pollen
- Also used with banker plants (purple flash pepper)

Oriline i – *Orius insidiosus*



Orius insidiosus

Exhibitline sf – *Steinernema feltiae*



Exhibitline sf

Steinernema feltiae



- Insect pathogenic nematodes *Steinernema feltiae*
- Penetrates thrips and releases bacteria
- Active from 14-28°C
 - Temperatures above 30 °C are harmful
- *Steinernema spp.* also used for sciarids, vine-weevil, cutworms, etc
- Available as sealed trays
- Often used as dip application or overhead in propagation
- Contact is critical for best results



Pro-active approach to maximize efficacy of BCAs - take home messages:

- Make a plan that fits your operation/crop
- Start as early as possible, even before the crop has started → Planning
- Pro- active approach → insurance = success rate
- Understand life cycle of both pest and BCA
- Systems approach → don't let your efforts on one pest be torpedoed by another
- Communicate → with young plant material suppliers
- Communicate → with specialists and other growers who have made the switch before you
- Communicate with producer/supplier of BCAs
- Consider banker plants as part of your strategy



Biological control is preventing problems, not fixing them!

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BioControl in the Greenhouse



**Coming Up Next:
1:30 to 1:55 Eastern**

**Grower Experience with
Banker Plants for Aphid
Control**

Rich Densel

Time	Topic
2:00 to 2:25	Pesticides- Are They Ever Compatible with a Biocontrol Program?
2:30 to 2:55	The Fundamentals of Biocontrol of Fungal and Bacterial Diseases