

Current Strategies for Bio-Control in Strawberries and Caneberries

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Overview

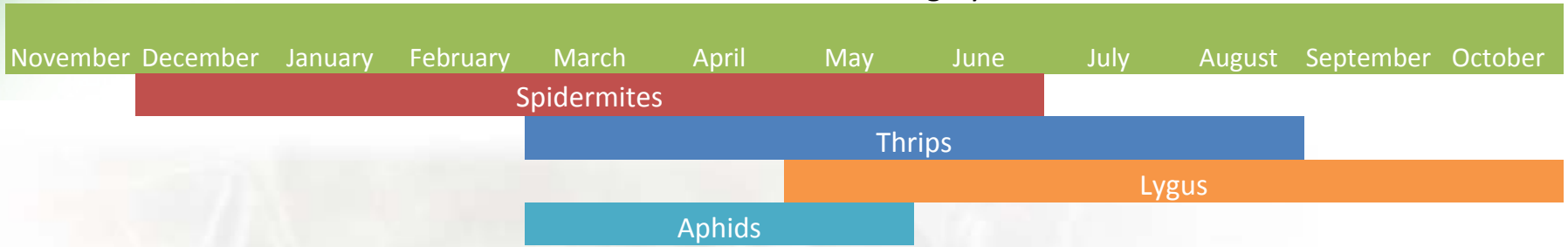
Knowing and Recognizing is the basis for responsible and successful Bio-Control

- Strawberries Pests and Beneficials
- Monitoring
- Chemical Compatibility
- Caneberries Pests and Beneficials
- Technical Advice
- Conclusions

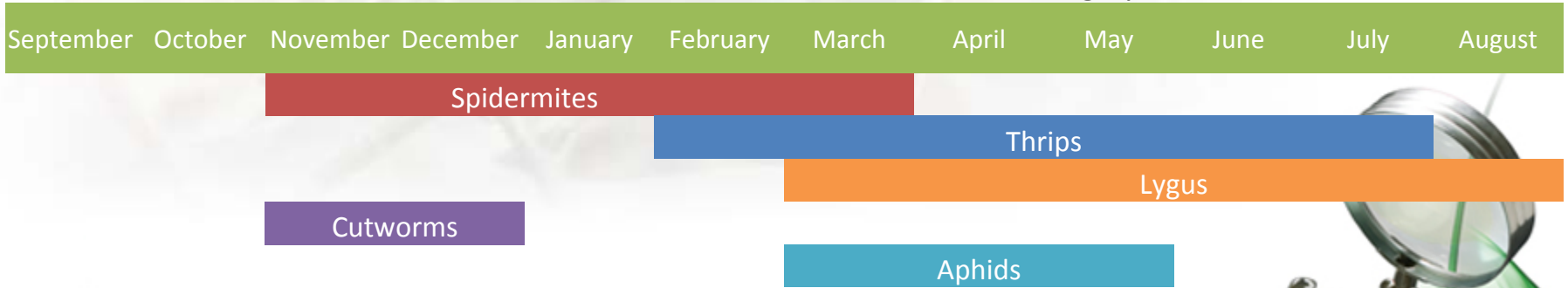


Pest Pressure

Northern California Planting Cycle

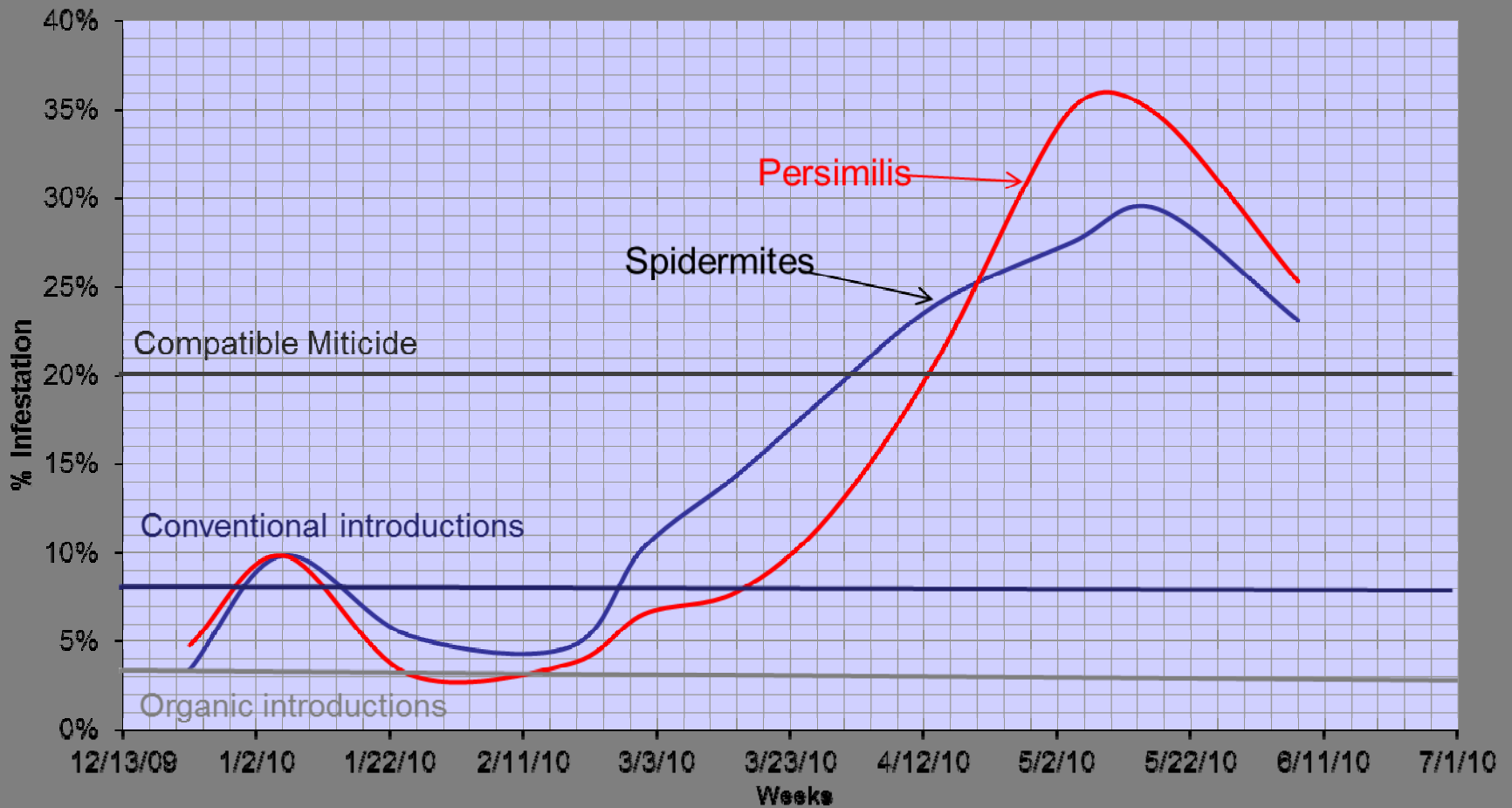


Central and Southern California Planting Cycle



Monitoring

Organic Ranch Watsonville



Northern California Strategy



- Spidermites
 - Apply *P. persimilis* when threshold is reached
 - Conventional 30K-50K/A
 - Organic 100,K-150K/A



Aphids

Apply *Aphidius colemani* 1500/A
with 2 apps



Thrips and Lygus

Use soft chemistries
and vacuums until *P.
persimilis*
establishment



Southern California Strategy

- Bio-Control Fall plantings
- Less Organic acres
- *P. persimilis* after broad spectrum sprays
- Spidermites
 - Apply *P. persimilis* when threshold is reached
 - Conventional 25K-40K/A
 - 2 apps



Koppert Scouting Software



Side Effects of Miticides on Predators

Brand	Persimilis	Californicus	Feltiella
Agrimek	4 (2)	4 (2)	4
Acramite	2	1	1
Dicofol / Kelthane	4 (2)	4 (2)	
Kanemite	2	1	
Oberon	3 (4)	1	4 (2)
Savey	1	1	1
Vendex	1	1	
Zeal	4 (6)		



Side Effects of Insecticides on Predators

Brand	Persimilis	Californicus	Feltiella
Brigade/Danitol	4 (8-12)	4 (8-12)	4 (8-12)
Mustang	4 (8-12)	4 ?	4 (8-12)
Success/Entrust	2 (1)	1	
Delegate/Radiant	2 (1)	1	
Malathion	2 (1-2)	?	
Bt	1	1	1
Actara	3 (2)	2 (?)	



- Pests
- Diseases
- Pest control
- Pollination
- Products
- Side effects**
- Search

Natural progression

Home

Koppert receives honourable mention in "Best Participant Award 2008"



Koppert received an honourable mention in connection with the Best Participant Award 2008 at the Horti Fair. This prize is awarded to the exhibitor that makes the best use of the Horti Fair as a complete communication platform.

[Read more](#)

Even more effect when Trianum is used properly

An increasing number of growers in the Netherlands and other countries are discovering the strength of Trianum (*Trichoderma harzianum*). However, Trianum is not always used to maximum effect, even though occasionally dramatic improvements in the results can be achieved in a relatively simple manner. For this reason, we give you 9 tips for the best use of Trianum in trickle irrigation systems.



[Read more](#)

More certainty with Koppert's pheromones



Not many growers are aware of it, and for this reason it is worthwhile drawing your attention to the following: Koppert supplies a large number of pheromones to greenhouse



Koppert

Providing state of the art biological control and natural pollination for professional growers around the world.



Swirski-Mite



Trianum



Home > Side effects

Beneficials	Pesticides
Amblyseius californicus	Active ingredients
	Tradenames

- Moden...ob
- Modine
- esfenvalerate
- ethiofencarb
- etridiazole
- enarimol
- enazaquin
- enbutatin oxide
- enoxycarb
- enpropathrin
- enpyroximate
- enthion
- ipronil
- lucycloxuron
- lufenoxuron
- lusilazole
- luvalinate
- osetyl-aluminium
- uralaxyl
- teptenophos

Side effects

How to use this menu:

Beneficials - search side effects via beneficials

On opening this page and/or after clicking "beneficials" in top of the left menu a list is shown with all beneficials on which we have side effect information

Clicking one organism will put this item in the input field and gives a list of all pesticides that have side effects on this item

Clicking a pesticide will give (or expand) a table with side effects info on the chosen combination(s)



Pesticides - search active ingredients or tradenames of pesticides

Choose "active ingredients" or "tradenames" in the pop-up menu under "pesticides" in the left menu

Lists of corresponding items will be shown by typing the first character(s) of the searched items in the input field.

Clicking one item in this list will put it in the input field and gives a list of all beneficials that have side effects from it.

Clicking a beneficial will give (or expand) the side effects table with the chosen combination (s).

The table can be expanded to a **maximum of 7 active ingredients** and **7 beneficials**. Items can be removed from the table by clicking the red minus  above the item. Clicking the green plus  above a table item will give a list of all possible related combinations in the left menu.

A simplified version of this side effects menu (without javascript) you can find in our PDA website: www.koppert.mobi/en/side_effects/

Search by active ingredient

abamectin

Amblyseius cucumeris

Amblyseius degenerans

Amblyseius swirskii

Aphelinus abdominalis

Aphidius colemani

Aphidius ervi

Aphidoletes aphidimyza

Bombus spp.

Chrysoperla carnea

Coccidoxenoides perminutus

Cryptolaemus montrouzieri

Dacnusa sibirica

Diglyphus isaea

Encarsia formosa

Eretmocerus eremicus



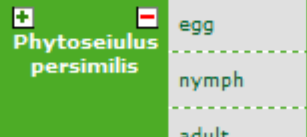
Feltiella acarisuga

Heterorhabdus bacteriophora

Heterorhabdus megidis

Hypoaspis aculeifer

Hypoaspis miles

		+ abamectin		+ bifentazate		+ etoxazole		+ fenbutatin oxide		+ hexythiazox		+ spiromesifen	
		HVS	TMX	HVS	TMX	HVS	HVS	HVS	HVS	HVS	HVS		
 Amblyseius californicus	egg			1				1					
	nymph			1				1		1			
	adult			1				1		1			
	persistence			0				0		0			
 Feltiella acarisuga	larva	4		1						1		4	
	adult									1			
	persistence	?		0						0		2 - 3	
 Phytoseiulus persimilis	egg					4		1		1			
	nymph	4						1		1			
	adult	4		3				1		1		3	
	persistence	2		> 1		4 - 8		0		0		4 - 12	

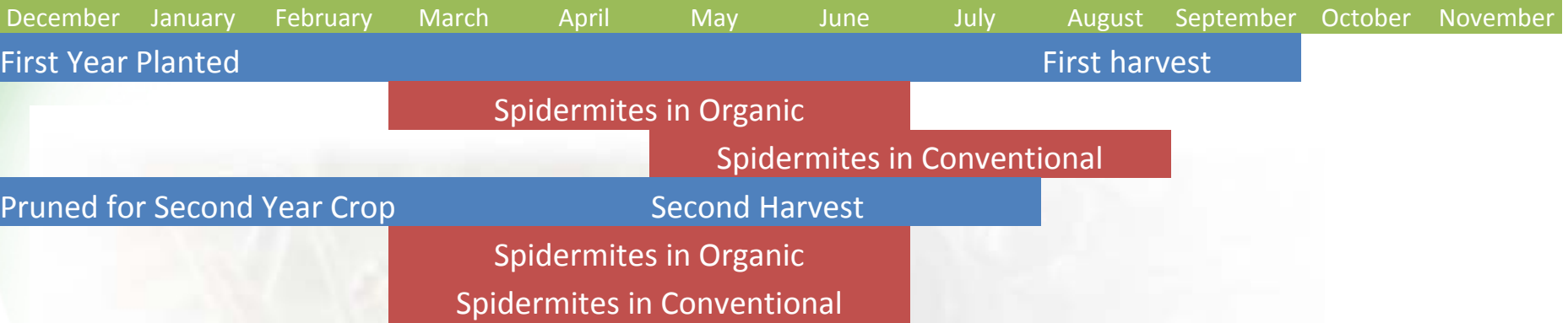
Side Effects Guide

- www.koppert.com
 - Side effects
- www.koppert.mobi
 - From your mobile phone



Raspberry Spidermite Bio-Control

Raspberry Planting Cycle



- Fall Crop
 - Conventional between 25,000-50,000/acre
 - Organic between 40,000-80,000/acre
- Spring Crop
 - Conventional between 25,000-50,000/acre
 - Organic between 20,000-40,000/acre



Almeria, Spain



Macro Tunnels



Macro Tunnels

- Mite behavior is different under tunnels
- Different mite species occur
- Cultural controls
- Timing of cover changes pest incidence
- Varieties



Technical Advice

Advantages

- Proper diagnosis
- Timing and rates of introductions
 - Too early = no establishment
 - Too late = catch up
- Evaluating Establishment
- Compatible Chemistries
- Biology of Insects and Mites



Conclusions

- We estimate 25,000 acres are using Bio-Control
- Technical advice provides many advantages
- Saving 2 miticide applications pays for your persimilis
- Reduce chemical resistance
- Easier to sell and export fruit with less residue
- Product Quality
 - Consistency in Reliability



“Biological control” does not stand still!



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