

Pesticides- Compatible with a Biocontrol Program?

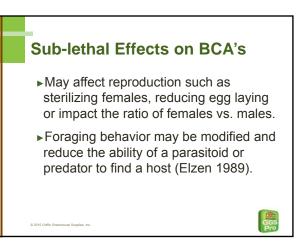
Integrated Pest Management approach implies a variety of tactics that interact with each other.

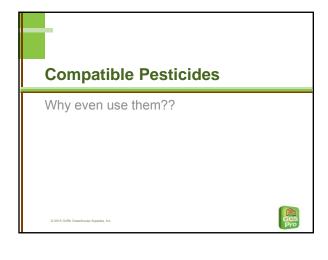
- Cultural controls- nutrition, bloom date manipulation, optimizing growing environment, sanitation
- Scouting/monitoring- essential!
- BCA's- "Compatible" Pesticides

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Sub-lethal Effects on BCA's
 Residual activity
 Residues may have repellent activity thus influencing the ability of parasitoids or predators to locate a food source.
 Residues on a potential host may make them unacceptable to a parasitoid or predator.

"Compatible" PesticidesJust how compatible are they?**Toxicity Legend**111111112212212222222222222222222222222222222222222223333344455</td

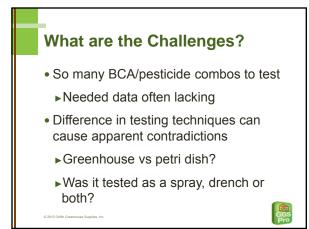






Why BCA Compatible Pesticides? Comp Where • Incoming plant material has an unacceptably high level of pests. • Biocol • University • Compatible Pesticides? • Sometimes there are so many overlapping pests that it is difficult to control all with only BCA's. • Biocol • University • Pesticides? • An unanticipated pest arrives. • Grow • Stuff happens! • Stuff happens!





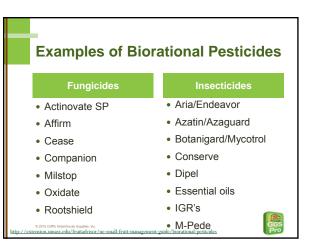


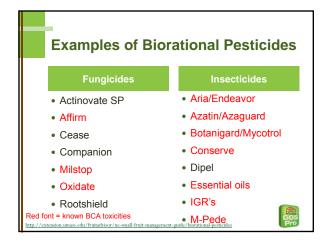
Choosing Compatible Pesticides

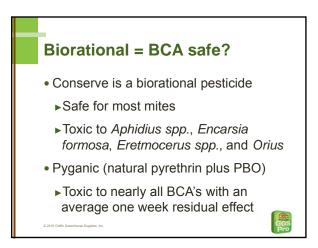
- Identify compatible pesticides when the crops are being planned. (This is planning to succeed, not planning to fail!)
- Consider all BCA's that might be used in the course of production.
- Need ability to react quickly to save the BCA program.
- Determine acute toxicity to BCA's & length of residual.
 - Don't forget fungicides and PGR's.

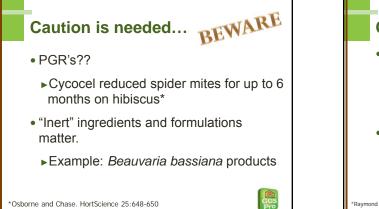


What is a Biorational Pesticide? EPA definition for Biorational Pesticide "Fundamentally different modes of action" and "Lower risks of adverse effects" When compared to conventional pesticides (i.e. neurotoxin). Exs- IGR's, insecticidal soaps, horticultural oils, microbial insecticides.













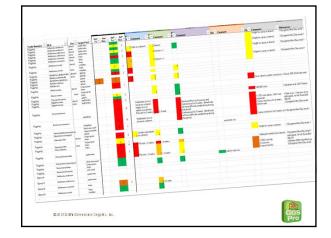
· · , · · · ·	
Products other than those mentioned	
may be safe and effective.	

Short Residual- "Clean Up" Pesticides							
Pesticide	Pests Controlled	Comments					
Botanigard ES, WP	Aphids, thrips, whiteflies	Toxic to some BCA's. 1 week or less residual					
Horticultural oils	Mites, scale, mites, mealybugs, whiteflies	Toxic to many BCA's. 1 week or less residual					
Insecticidal soaps	Aphids, mealybugs, mites, many others	Toxic to many BCA's. 1 week or less residual					
Floramite	Mites	Toxic to some BCA's. 1 week or less residual					
Pyganic	Flying insects, beetles, caterpillars, many others	Toxic to many BCA's. 1 week or less residual					

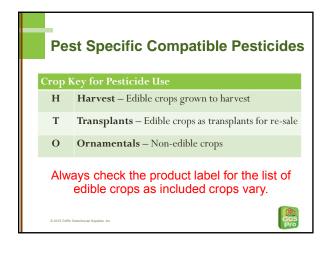
About the Pesticide/BCA **Compatibility Tables**

- Multiple sources used when available.
- Typically went with the most pessimistic.
- Table is revised as more data is found.
- Time on table refers to persistence.
- Immature life stages noted if different from adult.

GGS Pro







Pest Specific Compatible Pesticides

Disclaimer-

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Recommendations for BCA compatible pesticides are made based on a compilation of published data but cannot be guaranteed under all circumstances. Growers need to test on a small scale before large scale applications.

Compatible Pesticides- Aprilds								
Pesticide	Aphidius colemani	Aphidius ervi	Aphidioletes aphidimyza	Lacewing C. carnea	н,т,о	OMRI		
Azatin O, Azaguard, Molt-X	S	S	S	S	H,T,O	Yes		
Endeavor	Slightly Toxic* 1 wk	Slightly Toxic* 1 wk	Slightly Toxic 1 wk	S	0	No		
Flagship (drench only)	S	?	S	?	0	No		
Grandevo PTO	S	?	S	?	H,T,O	Yes		
* Mummies safe © 2015 Onthe Owenhouse Supplex, Inc.								

Pesticide	Aphidius colemani	Aphidius ervi	Aphidioletes aphidimyza	Lacewing C. carnea	н,т,о	OMRI
Kontos (drench only)	S	S	S	S	T,O	No
Marathon (drench only)	S	S	S	S	T,O	No
Preferal	S	S	S	S	H,T,O	Yes
Safari (drench only)	S	?	S	?	0	No

Compatible Pesticides- Fungus Gnats								
Pesticide				н,т,о				
Adept	Toxic larvae 2 wks	S	S	0	No			
Azatin O, Azaguard, Molt-X	?	S	S	H,T,O	Yes			
Citation	Toxic larvae 2 wks	S	S	0	No			
Distance	?	S	S	H,T,O	No			
Flagship (drench only)	Toxic 1 wk	Toxic	S	0	No			
Gnatrol	S	S	S	H,T,O	Yes			
Safari (drench only)	Toxic 1 wk	?	S	0	No			
* AKA Stratiolaelaps scim	itus				Pro			

omnatible Pesticides- Anhids

Compatible Pesticides- Spider Mites								
Pesticide					н,т,о			
Floramite	?	S	S	Moderate Toxic 1 week	H,T,O tomato	No		
Hexygon	S	S	S	S	0	No		
Kontos (drench only)	S	S	S	S*	T,O	No		
Ovation	S	S	S	S	0	No		
Preferal	?	S	S	S	P,T,O	Yes		
Shuttle	?	S	S	Slightly Toxic 1 week	H,T,O tomato	No		
· · ·	dicated slight to	oxicity but did no ne.	t specify spray o	r drench		GGS Pro		

Compatible Pesticides- Thrips								
Pesticide	Amblyseius cucumeris	Amblyseius swirskii	Orius	Steinernema feltiae	н,т,о	OMRI		
Aria	S	Slightly Toxic 2 wks	S	S	0	No		
Azatin O, Azaguard, Molt-X	S	Slightly Toxic 1 wks	Nymphs Slightly Toxic 2 wks	S	H,T,O	Yes		
Botanigard, Mycotrol	S	S	Slightly Toxic 2 wks	S	H,T,O	No Yes		
Flagship (drench only)	S	S	Toxic 4 weeks	S	0	No		
Grandevo PTO	?**	?**	S	?	H,T,O	Yes		
** Slightly to:	xic to A. californicus,	unknown for A. cuci	imeris and A. swirskii			GGS Pro		

	Amblyseius cucumeris	Amblyseius swirskii	Orius	Steinernema feltiae	н,т,о	OMRI	
Kontos (drench only)	S	S	Slightly Toxic* 4 weeks	S	T,O	No	
Overture	?***	?***	S	S	0	No	
Pedestal	S	?	S	?	0	No	
Preferal	S	S	S	S	H,T,O	Yes	
Safari (drench only)	S	Toxic 2 wks	?	S	0	No	
(drench only) 3 2 wks 1 3 0 100 *Kontos, 3 sources said safe ** NoFly- currently unavailable ***OFly- currently unavailable ***Ofly- currently unavailable ***Ofly- currently unavailable							

Compatible Pesticides- Whiteflies								
Pesticide	Amblyseius swirskii	Encarsia formosa	Eretmocerus spp	н,т,о	OMRI			
Aria	Slightly Toxic 2 weeks	S	S	О	No			
Azatin O, Azaguard, Molt-X	Slightly Toxic 1 wk	Slightly Toxic 2 wks Larvae Safe	S	H,T,O	Yes			
Botanigard	S	Slightly Toxic 1 wk	S	H,T,O	Mycotrol Yes			
Kontos- drench only	S	S	?	T,O	No			
Pedestal	S	S	S	0	No			
Preferal	?	S	S	H,T,O	Yes			
Safari- drench only	Toxic	Slightly Toxic 4 wks	S	О	No			
Talus	Slightly Toxic 1 wk	Slightly Toxic 1 wk Adults Safe	S	H,T,O Tomato	No			

