

From Forest Nursery Notes, Winter 2013

**171. Pest control guide: pest control materials for managing insect and mite pests of greenhouse-grown crops.** Cloyd, R. A. Greenhouse Management 32(1):3-8. 2012.

## 2012 Greenhouse Manager 32(1):3-8

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# Pest Control Guide

Pest control materials for managing insect and mite pests of greenhouse-grown crops

**G**reenhouse pest management involves using a multitude of strategies in order to minimize the prospect of dealing with arthropod pest (insect and mite) populations. The use of pest control materials (insecticides and miticides) is one component of a pest management program that also includes pest identification and monitoring along with cultural, physical, and biological control. Proper stewardship of pest control materials includes resistance management by rotating products with different modes

of action. A system has been developed by the Insecticide Resistance Action Committee (IRAC) to facilitate the implementation of appropriate rotation programs. Pest control materials have been assigned a designated number (sometimes number and letter combinations) based on their mode of action. For more information consult the IRAC website ([www.irac.online.org](http://www.irac.online.org)). The information presented in this chart is not a substitute for the label. It is important to read and understand all information presented on the label before



Use this guide to find controls labeled for aphids.

fore using any pest control material. Be sure to check county and state regulations to determine if there are any local restrictions associated with the use of specific pest control materials listed in this chart. **GM**

Insect or Mite Pest	Pest Control Material Common Name	Pest Control Material Trade Name(s)	Restricted Entry Interval (REI)	Mode of Action
<b>APHIDS</b>	Abamectin	Avid	12 hours	GABA <sup>1</sup> Chloride Channel Activator
	Acephate	Orthene/Precise	24/12 hours	Acetylcholine Esterase Inhibitor
	Acetamiprid	TriStar	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Azadirachtin	Azatin/Ornazin/Molt-X/ Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	<i>Beauveria bassiana</i>	BotaniGard/Naturalis	4 hours	
	Bifenazate + Abamectin	Sirocco	12 hours	Mitochondria Electron Transport Inhibitor + GABA Chloride Channel Activator
	Bifenthrin	Attain/Talstar	12 hours	Prolong Opening of Sodium Channels
	Chlorpyrifos	DuraGuard	24 hours	Acetylcholine Esterase Inhibitor
	Clarified hydrophobic extract of neem oil	Triact	4 hours	Suffocation or Membrane Disruptor
	Cyfluthrin	Decathlon	12 hours	Prolong Opening of Sodium Channels
	Dinotefuran	Safari	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Fenoxycarb	Preclude	12 hours	Juvenile Hormone Mimic
	Fonicamid	Aria	12 hours	Selective Feeding Blocker/Blocks Action of Potassium Channels
	Fluvalinate	Mavrik	12 hours	Prolong Opening of Sodium Channels
	Imidacloprid	Marathon/Benefit/ Mantra	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Kinoprene	Enstar II/AQ	4 hours	Juvenile Hormone Mimic

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Insect or Mite Pest	Pest Control Material Common Name	Pest Control Material Trade Name(s)	Restricted Entry Interval (REI)	Mode of Action
	Methiocarb	Mesurool	24 hours	Acetylcholine Esterase Inhibitor
	<i>Paecilomyces fumosoroseus</i>	PF9-97/NoFly	4 hours	
	Petroleum oil	Ultra-Pure Oil/SuffOil-X	4 hours	Suffocation or Membrane Disruptor
	Potassium salts of fatty acids	M-Pede	12 hours	Desiccation or Membrane Disruptor
	Pymetrozine	Endeavor	12 hours	Selective Feeding Blocker
	Pyrethrins	Pyreth-It/Pyrethrum	12 hours	Prolong Opening of Sodium Channels
	Spirotetramat	Kontos	24 hours	Lipid Biosynthesis Inhibitor
	Thiamethoxam	Flagship	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Tolfenpyrad	Hachi-Hachi	12 hours	Mitochondria Electron Transport Inhibitor
<b>BROAD MITE</b>	Abamectin	Avid	12 hours	GABA Chloride Channel Activator
	Bifenazate + Abamectin	Sirocco	12 hours	Mitochondria Electron Transport Inhibitor + GABA Chloride Channel Activator
	Chlorfenapyr	Pylon	12 hours	Oxidative Phosphorylation Uncoupler
	Fenpyroximate	Akari	12 hours	Mitochondria Electron Transport Inhibitor
	Pyridaben	Sanmite	12 hours	Mitochondria Electron Transport Inhibitor
	Spiromesifen	Judo	12 hours	Lipid Biosynthesis Inhibitor
<b>CATERPILLARS</b>	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	<i>Bacillus thuringiensis</i> spp. <i>kurstaki</i>	Dipel	4 hours	Midgut Membrane Disruptor
	Bifenthrin	Attainr/Talstar	12 hours	Prolong Opening of Sodium Channels
	Chlorpyrifos	DuraGuard	24 hours	Acetylcholine Esterase Inhibitor
	Cyfluthrin	Decathlon	12 hours	Prolong Opening of Sodium Channels
	Fenoxycarb	Preclude	12 hours	Juvenile Hormone Mimic
	Fenpropathrin	Tame	24 hours	Prolong Opening of Sodium Channels
	Fluralinate	Mavrik	12 hours	Prolong Opening of Sodium Channels
	Potassium salts of fatty acids	M-Pede	12 hours	Desiccation or Membrane Disruptor
	Novaluron	Pedestal	12 hours	Chitin Synthesis Inhibitor
	Spinosad	Conserve	4 hours	Nicotinic Acetylcholine Receptor Agonist and GABA Chloride Channel Activator
	Tolfenpyrad	Hachi-Hachi	12 hours	Mitochondria Electron Transport Inhibitor
<b>CYCLAMEN MITE</b>	Abamectin	Avid	12 hours	GABA Chloride Channel Activator
	Bifenazate + Abamectin	Sirocco	12 hours	Mitochondria Electron Transport Inhibitor + GABA Chloride Channel Activator
	Chlorfenapyr	Pylon	12 hours	Oxidative Phosphorylation Uncoupler
	Fenpyroximate	Akari	12 hours	Mitochondria Electron Transport Inhibitor
	Spiromesifen	Judo	12 hours	Lipid Biosynthesis Inhibitor
<b>FUNGUS GNAT LARVAE</b>	Acetamiprid	TriStar	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	<i>Bacillus thuringiensis</i> spp. <i>israelensis</i>	Gnatrol	4 hours	Midgut Membrane Disruptor
	Chlorfenapyr	Pylon	12 hours	Oxidative Phosphorylation Uncoupler
	Chlorpyrifos	DuraGuard	24 hours	Acetylcholine Esterase Inhibitor
	Cyromazine	Citation	12 hours	Chitin Synthesis Inhibitor
	Diffubenzuron	Adept	12 hours	Chitin Synthesis Inhibitor
	Dinotefuran	Safari	12 hours	Nicotinic Acetylcholine Receptor Disruptor



Insect or Mite Pest	Pest Control Material Common Name	Pest Control Material Trade Name(s)	Restricted Entry Interval (REI)	Mode of Action
	Imidacloprid	Marathon/Benefit/Mantra	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Kinoprene	Enstar II/AQ	4 hours	Juvenile Hormone Mimic
	Pyriproxyfen	Distance	12 hours	Juvenile Hormone Mimic
	<i>Steinernema feltiae</i>	Nemasys, NemaShield, Scanmask, and Entonem		
	Thiamethoxam	Flagship	12 hours	Nicotinic Acetylcholine Receptor Disruptor
<b>FUNGUS GNAT ADULTS</b>	Bifenthrin	Attain/Talstar	12 hours	Prolong Opening of Sodium Channels
	Cyfluthrin	Decathlon	12 hours	Prolong Opening of Sodium Channels
	Fenpropathrin	Tame	24 hours	Prolong Opening of Sodium Channels
	Fluvalinate	Mavrik	12 hours	Prolong Opening of Sodium Channels
	Potassium salts of fatty acids	M-Pede	12 hours	Desiccation or Membrane Disruptor
<b>LEAFHOPPERS</b>	Acetamiprid	TriStar	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	Bifenthrin	Attain/Talstar	12 hours	Prolong Opening of Sodium Channels
	Buprofezin	Talus	12 hours	Chitin Synthesis Inhibitor
	Chlorpyrifos	DuraGuard	24 hours	Acetylcholine Esterase Inhibitor
	Cyfluthrin	Decathlon	12 hours	Prolong Opening of Sodium Channels
	Dinotefuran	Safari	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Fluvalinate	Mavrik	12 hours	Prolong Opening of Sodium Channels
	Imidacloprid	Marathon/Benefit/Mantra	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Potassium salts of fatty acids	M-Pede	12 hours	Desiccation or Membrane Disruptor
	Spirotetramat	Kontos	24 hours	Lipid Biosynthesis Inhibitor
	Tolfenpyrad	Hachi-Hachi	12 hours	Mitochondria Electron Transport Inhibitor
<b>LEAFMINERS</b>	Abamectin	Avid	12 hours	GABA Chloride Channel Activator
	Acephate	Orthene	24 hours	Acetylcholine Esterase Inhibitor
	Acetamiprid	TriStar	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	Cyromazine	Citation	12 hours	Chitin Synthesis Inhibitor
	Dinotefuran	Safari	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Imidacloprid	Marathon/Benefit/Mantra	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Fenoxycarb	Preclude	12 hours	Juvenile Hormone Mimic
	Novaluron	Pedestal	12 hours	Chitin Synthesis Inhibitor
	Spinosad	Conserve	4 hours	Nicotinic Acetylcholine Receptor Agonist and GABA Chloride Channel Activator
	Thiamethoxam	Flagship	12 hours	Nicotinic Acetylcholine Receptor Disruptor
<b>MEALYBUGS</b>	Acephate	Orthene/Precise	24/12 hours	Acetylcholine Esterase Inhibitor
	Acetamiprid	TriStar	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	<i>Beauveria bassiana</i>	BotaniGard/Naturalis	4 hours	
	Bifenthrin	Attain/Talstar	12 hours	Prolong Opening of Sodium Channels
	Buprofezin	Talus	12 hours	Chitin Synthesis Inhibitor
	Chlorpyrifos	DuraGuard	24 hours	Acetylcholine Esterase Inhibitor

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Insect or Mite Pest	Pest Control Material Common Name	Pest Control Material Trade Name(s)	Restricted Entry Interval (REI)	Mode of Action
	Cyfluthrin	Decathlon	12 hours	Prolong Opening of Sodium Channels
	Dinotefuran	Safari	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Fenoxycarb	Preclude	12 hours	Juvenile Hormone Mimic
	Fenpropathrin	Tame	24 hours	Prolong Opening of Sodium Channels
	Fonicamid	Aria	12 hours	Selective Feeding Blocker/Blocks Action of Potassium Channels
	Imidacloprid	Marathon/Benefit/Mantra	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Kinoprene	Enstar II/AQ	4 hours	Juvenile Hormone Mimic
	Petroleum oil	Ultra-Pure Oil/SuffOil-X	4 hours	Suffocation or Membrane Disruptor
	Potassium salts of fatty acids	M-Pede	12 hours	Desiccation or Membrane Disruptor
	Spirotetramat	Kontos	24 hours	Lipid Biosynthesis Inhibitor
	Thiamethoxam	Flagship	12 hours	Nicotinic Acetylcholine Receptor Disruptor
<b>PLANT BUGS</b>	Acetamiprid	TriStar	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Bifenthrin	Attain/Talstar	12 hours	Prolong Opening of Sodium Channels
	Fluvalinate	Mavrik	12 hours	Prolong Opening of Sodium Channels
<b>SCALES (HARD AND SOFT)*</b>	Acephate	Orthene/Precise	24/12 hours	Acetylcholine Esterase Inhibitor
	Acetamiprid	TriStar	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	Bifenthrin	Attain/Talstar	12 hours	Prolong Opening of Sodium Channels
	Buprofezin	Talus	12 hours	Chitin Synthesis Inhibitor
	Clarified hydrophobic extract of neem oil	Triact	4 hours	Suffocation or Membrane Disruptor
	Cyfluthrin	Decathlon	12 hours	Prolong Opening of Sodium Channels
	Dinotefuran	Safari	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Fenoxycarb	Preclude	12 hours	Juvenile Hormone Mimic
	Imidacloprid	Marathon/Benefit/Mantra	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Kinoprene	Enstar II/AQ	4 hours	Juvenile Hormone Mimic
	Petroleum oil	Ultra-Pure Oil/SuffOil-X	4 hours	Suffocation or Membrane Disruptor
	Potassium salts of fatty acids	M-Pede	12 hours	Desiccation or Membrane Disruptor
	Thiamethoxam	Flagship	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Tolfenpyrad	Hachi-Hachi	12 hours	Mitochondria Electron Transport Inhibitor
<b>SHORE FLY</b>	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	Chlorpyrifos	DuraGuard	24 hours	Acetylcholine Esterase Inhibitor
	Cyromazine	Citation	12 hours	Chitin Synthesis Inhibitor
	Diflubenzuron	Adept	12 hours	Chitin Synthesis Inhibitor
	Pyriproxyfen	Distance	12 hours	Juvenile Hormone Mimic
<b>SLUG AND SNAIL</b>	Iron phosphate	Sluggo	0 hours	Inhibits Calcium Metabolism
	Metaldehyde	Deadline	Refer to Label	Central Nervous System Toxin
	Methiocarb	Mesuroil	24 hours	Acetylcholine Esterase Inhibitor
<b>TWOSPOTTED SPIDER MITE</b>	Abamectin	Avid	12 hours	GABA Chloride Channel Activator
	Acequinocyl	Shuttle	12 hours	Mitochondria Electron Transport Inhibitor
	Bifenazate	Floramite	4 hours	Mitochondria Electron Transport Inhibitor



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	Bifenazate + Abamectin	Sirocco	12 hours	Mitochondria Electron Transport Inhibitor + GABA Chloride Channel Activator
	Chlorfenapyr	Pylon	12 hours	Oxidative Phosphorylation Uncoupler
	Clarified hydrophobic extract of neem oil	Triact	4 hours	Suffocation or Membrane Disruptor
	Clofentezine	Ovation	12 hours	Growth and Embryogenesis Inhibitor
	Etoxazole	TetraSan	12 hours	Chitin Synthesis Inhibitor
	Fenazaquin	Magus	12 hours	Mitochondria Electron Transport Inhibitor
	Fenbutatin-oxide (Hexakis)	ProMite	48 hours	Oxidative Phosphorylation Inhibitor
	Fenpyroximate	Akari	12 hours	Mitochondria Electron Transport Inhibitor
	Hexythiazox	Hexygon	12 hours	Growth and Embryogenesis Inhibitor
	Petroleum oil	Ultra-Pure Oil/SuffOil-X	4 hours	Suffocation or Membrane Disruptor
	Potassium salts of fatty acids	M-Pede	12 hours	Desiccation or Membrane Disruptor
	Pyridaben	Sanmite	12 hours	Mitochondria Electron Transport Inhibitor
	Spiromesifen	Judo	12 hours	Lipid Biosynthesis Inhibitor
	Spirotetramat	Kontos	24 hours	Lipid Biosynthesis Inhibitor
<b>THRIPS</b>	Abamectin	Avid	12 hours	GABA Chloride Channel Activator
	Acephate	Orthene/Precise	24/12 hours	Acetylcholine Esterase Inhibitor
	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	Beauveria bassiana	Botanigard/Naturalis	4 hours	
	Bifenazate + Abamectin	Sirocco	12 hours	Mitochondria Electron Transport Inhibitor + GABA Chloride Channel Activator
	Bifenthrin	Attain/Talstar	12 hours	Prolong Opening of Sodium Channels
	Chlorfenapyr	Pylon	12 hours	Oxidative Phosphorylation Uncoupler
	Chlorpyrifos	DuraGuard	24 hours	Acetylcholine Esterase Inhibitor
	Cyfluthrin	Decathlon	12 hours	Prolong Opening of Sodium Channels
	Fenoxycarb	Preclude	12 hours	Juvenile Hormone Mimic
	Flonicamid	Aria	12 hours	Selective Feeding Blocker/Blocks Action of Potassium Channels
	Fluvalinate	Mavrik	12 hours	Prolong Opening of Sodium Channels
	Kinoprene	Enstar II/AQ	4 hours	Juvenile Hormone Mimic
	Methiocarb	Mesuroil	24 hours	Acetylcholine Esterase Inhibitor
	Novaluron	Pedestal	12 hours	Chitin Synthesis Inhibitor
	<i>Paeclomyces fumosoroseus</i>	PFR-97/NoFly	4 hours	
	Pyrethrins	Pyreth-It/Pyrethrum	12 hours	Prolong Opening of Sodium Channels
	Pyridalyl	Overture	12 hours	Mode of Action Unknown
	Spinosad	Conserve	4 hours	Nicotinic Acetylcholine Receptor Agonist and GABA Chloride Channel Activator
	Tolfenpyrad	Hachi-Hachi	12 hours	Mitochondria Electron Transport Inhibitor
<b>WHITEFLIES</b>	Abamectin	Avid	12 hours	GABA Chloride Channel Activator
	Acephate	Orthene/Precise	24/12 hours	Acetylcholine Esterase Inhibitor
	Acetamiprid	TriStar	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Azadirachtin	Azatin/Ornazin/Molt-X/Azatrol	4/12/4/4 hours	Ecdysone Antagonist
	<i>Beauveria bassiana</i>	Botanigard/Naturalis	4 hours	
	Bifenthrin	Attain/Talstar	12 hours	Prolong Opening of Sodium Channels

## Pest Control Guide

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	Bifenazate + Abamectin	Sirocco	12 hours	Mitochondria Electron Transport Inhibitor + GABA Chloride Channel Activator
	Buprofezin	Talus	12 hours	Chitin Synthesis Inhibitor
	Clarified hydrophobic extract of neem oil	Triact	4 hours	Suffocation or Membrane Disruptor
	Cyfluthrin	Decathlon	12 hours	Prolong Opening of Sodium Channels
	Diflubenzuron	Adept	12 hours	Chitin Synthesis Inhibitor
	Dinotefuran	Safari	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Fenazaquin	Magus	12 hours	Mitochondria Electron Transport Inhibitor
	Fenoxycarb	Preclude	12 hours	Juvenile Hormone Mimic
	Fenpropathrin	Tame	24 hours	Prolong Opening of Sodium Channels
	Fonicamid	Aria	12 hours	Selective Feeding Blocker/Blocks Action of Potassium Channels
	Fluvalinate	Mavrik	12 hours	Prolong Opening of Sodium Channels
	Imidacloprid	Marathon/Benefit/Mantra	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Kinoprene	Enstar II/AQ	4 hours	Juvenile Hormone Mimic
	Novaluron	Pedestal	12 hours	Chitin Synthesis Inhibitor
	<i>Paecilomyces fumosoroseus</i>	PFR-97/NoFly	4 hours	
	Petroleum oil	Ultra-Pure Oil/SuffOil-X	4 hours	Suffocation or Membrane Disruptor
	Potassium salts of fatty acids	M-Pede	12 hours	Desiccation or Membrane Disruptor
	Pymetrozine	Endeavor	12 hours	Selective Feeding Blocker
	Pyrethrins	Pyreth-I/Pyrethrum	12 hours	Prolong Opening of Sodium Channels
	Pyridaben	Sanmite	12 hours	Mitochondria Electron Transport Inhibitor
	Pyriproxyfen	Distance	12 hours	Juvenile Hormone Mimic
	Spiromesifen	Judo	12 hours	Lipid Biosynthesis Inhibitor
	Spirotetramat	Kontos	24 hours	Lipid Biosynthesis Inhibitor
	Thiamethoxam	Flagship	12 hours	Nicotinic Acetylcholine Receptor Disruptor
	Tolfenpyrad	Hach-Hachi	12 hours	Mitochondria Electron Transport Inhibitor

\* Refer to label for specific scale species.

† GABA=Gamma-aminobutyric acid

### For more:

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