



BioWorks®
How You Grow Matters™



Mode of Action Chart & Pest Activity

BioWorks® Technical Bulletin

Mode of Action	IRAC*	Pest Control Materials	Type	Pest Activity (based on label)								
				WF	APHIDS	THRIPS	MB	SM	FG	SF	LM	CAT
Acetylcholine Esterase Inhibitors	1B	Acephate (Orthene)	C, S, T	X	X	X	X					
	1B	Chlorpyrifos (DuraGuard)	C		X	X	X		X	X	X	X
	1A	Methiocarb (Mesurol)	C		X	X						
Sodium Channel Blockers	3	Bifenthrin (Talstar/Attain)	C	X	X	X	X	X	X			X
	3	Cyfluthrin (Decathlon)	C	X	X	X	X		X			X
	3	Fenpropathrin (Tame)	C	X	X	X	X	X			X	X
	3	Fluvalinate (Mavrik)	C	X	X	X		X				X
	3	Lambda-cyhalothrin (Scimitar)	C	X	X	X	X	X			X	X
Nicotinic Acetylcholine Receptor Disruptors	4A	Acetamiprid (TriStar)	C, S, T	X	X	X	X		X		X	X
	4A	Dinotefuran (Safari)	C, S, T	X	X	X	X		X		X	
	4A	Imidacloprid (Marathon)	C, S, T	X	X	X	X		X		X	
	4A	Thiamethoxam (Flagship)	C, S, T	X	X		X		X			
Nicotinic Acetylcholine Receptor Agonist & GABA Chloride Channel Activator	5	Spinosad (Conserve)	C, T, ST			X		X			X	X
GABA Chloride Channel Activator	6	Abamectin (Avid)	C, T	X	X	X		X			X	
Juvenile Hormone Mimics	7B	Fenoxycarb (Preclude)	C	X	X	X	X	X			X	X
	7A	Kinoprene (Enstar II)	C	X	X	X	X		X			
	7C	Pyriproxyfen (Distance)	C, T	X	X		X		X	X	X	
Chitin Synthesis Inhibitors	16	Buprofezin (Talus)	C	X			X					
	17	Cyromazine (Citation)	C						X	X	X	
	15	Diflubenzuron (Adept)	C	X					X	X	X	X
	10B	Etoxazole (TetraSan)	C, T					X				
	15	Novaluron (Pedestal)	C	X		X					X	X
Growth and Embryogenesis Inhibitors	10A	Clofentezine (Ovation)	C					X				
	10A	Hexythiazox (Hexygon)	C					X				

(Continued on next page.)

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Mode of Action	IRAC*	Pest Control Materials	Type	Pest Activity (based on label)								
				WF	APHIDS	THRIPS	MB	SM	FG	SF	LM	CAT
Selective Feeding Blockers	9C	Flonicamid (Aria)	C, S, T	X	X	X	X					
	9B	Pymetrozine (Endeavor)	C, S, T	X	X							
Disruptors of Insect Midgut Membranes	11A1	<i>Bacillus thuringiensis</i> var. <i>israelensis</i> (Gnatrol)	ST						X			
	11B2	<i>Bacillus thuringiensis</i> var. <i>kurstaki</i> (Dipel)	ST									X
Oxidative Phosphorylation Uncoupler	13	Chlorfenapyr (Pylon)	C, T			X		X	X			X
Oxidative Phosphorylation Inhibitor	12B	Fenbutatin-oxide (ProMite)	C					X				
Ecdysone Antagonist	18B	Azadirachtin (Azatin/Ornazin)	C	X	X	X	X		X	X	X	X
Mitochondria Electron Transport Inhibitors	20B	Acequinocyl (Shuttle)	C					X				
	21	Fenpyroximate (Akari)	C				X	X				
	21	Pyridaben (Sanmite)	C	X				X				
Desiccation or Membrane Disruptors		Neem oil (Triact)	C	X	X		X	X				
		Paraffinic oil (Ultra-Fine Oil)	C	X	X	X	X	X	X		X	
		Petroleum oil**	C	X	X	X	X	X	X		X	
		Potassium salts of fatty acids***	C	X	X	X	X	X				
GABA-Gated Antagonist	25	Bifenazate (Floramite)	C					X				
Lipid Biosynthesis Inhibitor	23	Spiromesifen (Judo)	C, T	X				X				
	23	Spirotetramat (Kontos)	C, S, T	X	X		X	X				
Unclassified by IRAC		<i>Beauveria bassiana</i> (BotaniGard/Naturalis)	C	X	X	X	X					X
		Pyridalyl (Overture)	C, T, ST			X						X
Pest Activity Codes:		Type Codes:										
WF=WHITEFLIES		C=Contact										
MB=MEALYBUGS		S=Systemic										
SM=SPIDER MITES		T=Translaminar										
FG=FUNGUS GNATS		ST=Ingested										
SF=SHOREFLIES		*Insecticide Resistance Action Committee (IRAC) designation, which appears on product labels.										
LM=LEAFMINERS		**Products=PureSpray Green, Ultra-Pure Oil, SuffOil-X										
CAT=CATERPILLARS		***Products=Insecticidal Soap and M-Pede										

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