

MITICIDE GUIDE *Longwood Gardens®* Rev. 8/2010
NOTE: Always check product labels for crop/location specific information

NOTE: Always check product labels for crop/location specific information

Brand Names	Use Sites ¹	REI	Active Ingredient	IRAC Group	Chemical Class	Mode of Action	Target Species on Label	Target Stage	Impact on Beneficials ²	Comments
AKARI	GH, S/L, IN	12 hours	fenpyroximate	21	pyrazole	Mitochondrial electron transport inhibitor, inhibits oxidative phosphorylation	SPIDER MITES MITES: Broad, Cyclamen, Eriophyid (Rust, Gall, & Bud)	nymphs, adults	Toxic to parasitoids, predatory mites, and lacewings (moderate). No toxicity to lady beetles and predatory bugs. Parasitoids, predatory bugs, & predatory mites sensitive for 1-3 weeks after application.	Do not rotate with SANMITE. Short residual.
AVID	GH, S/L, L, X	12 hours	abamectin	6	macrocyclic lactone	Blocks GABA at neuromuscular junction	SPIDER MITES: European red, Two-spotted, Carmine, Southern Red, Spruce MITES: Broad, Cyclamen, Eriophyid (Rust, & Bud)	nymphs, adults	Toxic to parasitoids, lacewings, predatory bugs, predatory mites (adults), and bees. Low toxicity to lady beetles.	Has translaminar systemic action. Very good spider and rust mite control, fair/good broad mite control. Not for use in Citrus nurseries.
CONSERVE	GH, N, L, T, X, V, F	4 hours	spinosad	5	naturalyte	Disrupts binding of acetylcholine at nerve receptors	SPIDER MITES	adults	Toxic to parasitoids, lacewings, predatory mites, & bees. No toxicity to lacewing larva.	Not Recommended - Research indicates variable results where inert ingredients in formulation were more effective for mite control than A.I.. Labelled rates for mite control as much as three times higher than for other pests
DECATHLON	GH, N, L, IN	12 hours	cyfluthrin	3	pyrethroid	Sodium and potassium channel disrupter (nerve)	SPIDER MITES: Clover	adults primarily	Long Persistence: Toxic to parasitoids, lacewings, predatory bugs, predatory mites, & bees. Not toxic to nematodes.	Not recommended - Use may often lead to mite flareback due to resistance and/or natural enemy elimination.
DELTAGARD	T, L, IN	12 hours	deltamethrin	3	pyrethroid	Sodium and potassium channel disrupter (nerve)	SPIDER MITES: Clover MITES: Bermudagrass	adults primarily	Long Persistence: Toxic to parasitoids, lacewings, predatory bugs, predatory mites, & bees. Not toxic to nematodes.	Not recommended - Use may often lead to mite flareback due to resistance and/or natural enemy elimination.
DEMAND	T, L, IN	12 hours	Lambda-cyhalothrin	3	pyrethroid	Sodium and potassium channel disrupter (nerve)	SPIDER MITES: Two-spotted & Spruce; MITES: Clover	adults primarily	High impact on Bees. Low toxicity to Birds. High impact on both Predatory mites and other natural predators including: lady bugs, lacewings, and wasps. Broad spectrum.	Not for use on plants being grown for sale or other commercial purposes, or for commercial seed production, or for research.
DURSBAN, DURAGUARD (Lorsban)	GH, N, T, X (Commercial site uses only)	24 hours	chlorpyrifos	1b	organo-phosphate	inhibits the nerve enzyme acetylcholinesterase	SPIDER MITES: Clover, Red	nymphs and adults	Long Persistence: Toxic to parasitoids, lacewings, predatory bugs, predatory mites, & bees. Moderately harmful to ladybeetles.	Restricted Use Pesticide. Recent label restrictions due to FQPA scrutiny have eliminated use in/around residential areas. Commercial site uses only.
ECOTROL	F, V, L, T, GH, N, X, H, S/L, IN	0	Rosemary Oil, Peppermint Oil, Wintergreen Oil, Butyl Lactate, Vanillin, Lecithin	None listed	oil	Wet contact sufficant	SPIDER MITES MITES	eggs, nymphs, and adults	May be toxic to bees.	Spraying this product can occur up to the time of harvest on all intended crops. OMRI Certified
FLORAMITE	GH, S/L, N, L, IN, X	4 hours	bifenazate	25	carboxamide	Neuronal Inhibitor/ GABA blocker	SPIDER MITES: Two-spotted, Pacific, Strawberry, European red, Citrus red, Clover, Southern red, Bamboo, & Spruce.	eggs and adults	No toxicity to beneficials known.	Excellent selective miticide for population reduction. NOT EFFECTIVE against rust, broad, or false spider mites.May need addition of adjuvant on plants with waxy foliage. Some buffering problems in high pH water.
FORBID / JUDO	L, GH, N, IN	12 Hours	Spiromesifen	23	Tetronic acid derivatives	Inhibitors of lipid synthesis	SPIDER MITES: Two Spotted, Southern Red, Maple, Spruce, Honey Locust, and Boxwood MITES: Euonymus, Tumid, Lewis, Rust, Broad, Cyclamen, ans False Spider Mite.	eggs, nymphs, and adults	Feltiella acarisuga-extremely harmful to larva, Phytoseiulus persimilis- moderately harmful to adult.	Provides knockdown and residual control. Also a good whitefly control product. Some beneficial toxicity will be experienced with its use. Not for use on plants being grown for sale or other commercial purposes, or for commercial seed production, or for research.
HEXYGON	GH, S/L, N, IN, X, L	12 hours	hexythiazox	10a	carbazate	Mite growth regulator - MOA Not exactly known.	SPIDER MITES: Arborvitae, Honeylocust, Pacific, Spruce, Strawberry, Willamette, European red, & Two-spotted MITES: Southern red .	eggs and nymphs	Toxic to bees. No toxicity to other beneficials known	Excellent mite IGR with selectivity. Restrictions allow only one application per crop cycle. Do not rotate with OVATION. Combinations with some sufactants may induce phytotoxicity. Should be used in conjunction with good scouting practicies.
HORTICULTURAL OILS (PETROLEUM: e.g. Purespray Green, PARAFFINIC/ MINERAL: e.g. Dormant Oil)	GH, IN, L, V, X, N, F	4 hours	Petroleum, Paraffinic, or Mineral Oil	None listed	oil	Wet contact sufficant, some repellency	SPIDER MITES MITES	eggs, nymphs, and adults	Toxic to predatory mites & bees, but persistence is short. No toxicity to lacewing, ladybeetle, predatory bug, & nematode.	For best results mix with an adjuvant such as Eco Adjuvant. Provides residual protection. Maintain agitation in all spray systems. Good ovicidal action. Don't tank mix with sulfur. Cannot be used on plants with glaucous foliage or in high relative humidities. Some OMRI Certified

² Data compiled from side-effects data base at www.koppert.com

Longwood Gardens®

NOTE: Always check product labels for crop/location specific information

MITICIDE GUIDE

Brand Names	Use Sites ¹	REI	Active Ingredient	IRAC Group	Chemical Class	Mode of Action	Target Species on Label	Target Stage	Impact on Beneficials ²	Comments
INSECTICIDAL SOAPS (e.g. M-PEDE)	GH, IN, L, V, X, T, H, F	12 hours	potassium salts of fatty acids	None listed	soap	Wet contact dessicant	SPIDER MITES: Pacific & Two-spotted, European red, Willamette, & Spruce MITES: Broad, Citrus Rust, & Russet	eggs, nymphs, and adults	Toxic to parasitoids, lacewings, predatory mites, nematodes, & bees. Moderately toxic to predatory midges. Persistence short.	Cannot be used on plants with glaucous foliage. Phytotoxicity common in applications above 85°F. OMRI Certified
KELTHANE	GH, N, V, T, L, F (Commercial site uses only)	48 hours	dicofol	UN-Unknown MOA	organo-chlorine	Electron transport inhibitor (site II - slightly different than Akari or Sanmite)	SPIDER MITES: Atlantic, Banks grass, Brown, Clover, Carpini, Conifer, Desert, European red, McDaniel, Pacific, Privet, Six-spotted, Schoene, Spruce, Strawberry, Tropical, Willamette, Two-spotted, Yellow, & Yuma MITES: Apple rust, Bermudagrass, Pear rust, Plum nursery, Plum rust, & Tomato russet. Also Broad & Cyclamen mites.	eggs, nymphs, and adults	Long Persistence: Toxic to parasitoids & predatory mites. Moderately toxic to lacewings. Not toxic to ladybeetles & nematodes.	Commercial uses only, not for use in any residential sites. Excellent for Bulb mite control in greenhouse ornamentals (although species not specifically listed on label). Generally not phytotoxic to GH grown plants. Suspected endocrine disruptor. Product not stewarded for ornamentals use in US currently by supplier.
KONTOS	GH, IN, N, V, F	24 hours	spirotetramat	23	Tetronic acid derivatives	Inhibitors of lipid synthesis	Spider mites: container drench only	eggs, nymphs, and adults	Short persistence toxicity noted against predatory mites. Some toxicity to honeybee larvae through pollen and nectar. Toxic to aquatic invertebrates and oysters.	Label dictates applications to ornamentals, fruit and nut trees (NON-BEARING), and vegetable plants in greenhouses, nurseries and interiorscapes. Will not control high mite populations as a drench.
MAGUS	GH, IN, L, X, F	12 hours	fenazaquin	21a	pyrazole	Mitochondrial electron transport inhibitor, inhibits oxidative phosphorylation	MITES	eggs (suppr.), nymphs, adults	Toxicity and 1-3 week persistence noted against predatory mites. Other natural enemy species not affected	For Non-Bearing Fruit Only. Tech sheet reports excellent effects against broad, eriophyid, and spider mites. Whiteflies also listed on label. One application per cropping cycle.
MESUROL	N, GH, I	24 hours	methiocarb	1	carbamate	inhibits the nerve enzyme acetylholinesterase	MITES	eggs, nymphs, and adults	toxic to fish, highly toxic to birds, mammals and bees	Restricted Use Pesticide. Long persistence and high toxicity to beneficials. Pestcide carries "Danger" label and is listed as a P.A.N. "Bad Actor" Chemical.
ORNAMITE	N, X	7 days (48 hours with PPE)	propargite	12c	sulfite ester	Contact miticide; repellent	SPIDER MITES: Two-spotted, Southern red, & Pacific	eggs, nymphs, and adults	Toxic to predatory mites, predatory bugs, nematodes & bees.	Class 1 mammal toxicant. Don't mix with sulfur OR oil. Longest REI of any product authors have observed to date.
Ovation	GH, S/L, N	12 hours	clofentezine	10a	tetrazine	Mite growth regulator - MOA Not exactly known.	SPIDER MITES: Two-spotted, Pacific, European red, McDaniel, & Yellow.	eggs and nymphs	Toxic to bees. No toxicity to other beneficials known.	Mite growth regulator. Do not rotate with HEXYGON. Current formulation may leave some residue.
PYGANIC	V, H, F, GH, S/L, N, L, IN	12 hours	pyrethrum	3	Pyrethrins	Sodium Channel Modulator	SPIDER MITES: Clover Mites	Increase Rate for late stage immature and adults.	Aphidius colemani/Aphidius ervi- moderatley dangerous to adult. Encarsia formosa- extremely dangerous to adult. Toxic to bees.	This pesticide is highly toxic to fish. For terrestrial uses, do not apply to water or to areas where surface water is present. OMNI Certified.
PYLON	GH (Commercial) V, F (Indoor)	12 hours	chlorfenapyr	13	pyrrole	Uncouples oxidative phosphorylation , preventing conversion of ADP to ATP.	SPIDER MITES: Two-spotted MITES: Broad, Rust, Cyclamen, & Citrus bud.	nymphs and adults	Toxic to adult parasitoids. Moderately toxic to predatory bug.	Good spider mite and superior broad mite control product. Use on NON-EDIBLE ornamentals only. Moves from point of application (slight systemic movement).
SANMITE	GH, S/L, N, L	12 hours	pyridaben	21a	pyrazole	Mitochondrial electron transport inhibitor, inhibits oxidative phosphorylation	SPIDER MITES: Two-spotted, Southern red, Tumid & European red MITES: Broad mites.	nymphs and adults	Toxic to bees. Moderately toxic to predatory mites. Not toxic to lacewings.	Carries "WARNING" signal word on label due to eye hazard. Do not rotate with AKARI. Also a great whitefly knockdown agent.
SCIMITAR	T, L,	24 hours	lambda-cyhalothrin	3	pyrethroid	Sodium and potassium channel disrupter (nerve)	SPIDER MITES and "Clover mites" MITES: Broad mites.	adults primarily	Long Persistence: Toxic to parasitoids, lacewings, predatory bugs, predatory mites, & bees. Not toxic to nematodes.	Not recommended. Use may often lead to mite flareback due to resistance and/or natural enemy elimination.
SEVIN	T, L, N, GH, F, V	12 hours	carbaryl	1a	carbamate	inhibits the nerve enzyme acetylcholinesterase	MITES: Eriophyids such as Citrus Rust, Apple Rust, Pear Rust, Fuschia Gall	adults and nymphs	Broad spectrum. High impact on predators, including mites, and birds.	Extremely toxic to aquatic and estuarne invertebrates. Do not apply directly to water or to areas where surface water is present. Do not apply when weather conditions favor drift from treated area. Applying to wet foliage may cause injury as well as applications made during periods of high humidity. The use of adjuvants may increase the potential for injury on some crops.
SHUTTLE	GH, S/L, N, L, IN (commercial)	12 hours	acequinoxyl	20b	Acequinoxyl	Mitochondrial complex III electron transport inhibitors (Coupling site II)	SPIDER MITES: Pacific, Spruce, Strawberry, Willamette, Two-spotted, Citrus Red, European Red, Texas Citrus	adults and nymphs	Compatible with IPM program. Relatively harmless to most predaceous mites and insects.	Do not apply this product through any type of irrigation system.

Rev. 8/2010										
NOTE: Always check product labels for crop/location specific information										
Longwood Gardens										
Brand Names	Use Sites ¹	REI	Active Ingredient	IRAC Group	Chemical Class	Mode of Action	Target Species on Label	Target Stage	Impact on Beneficials ²	Comments
SULFUR	GH, L, N, V, F	24 hours	elemental sulfur	None listed	inorganic	Wet contact sufficant	SPIDER MITES: Brown, Two-spotted, Pacific, Strawberry, Citrus, Red, Six-spotted, European red, Yuma, Timothy MITES: Silver, Almond, Tomato russet, Flat, Citrus rust, Fig rust, Blister, Bud, Olive, Peach silver. Also Broad mites.	eggs, nymphs, and adults	Short persistence, but toxic to beneficials (especially predatory mites) on contact	Do not tank mix with oils. Micronized sulfur formulations often reported more effective. Some OMRI certified.
TALSTAR SELECT	GH, L, IN, N, T	12 hours	bifenthrin	3	pyrethroid	Sodium and potassium channel disrupter (nerve)	MITES: Broad Mites, Clover Mites, European Red Mite, Pecan Leaf Scorch Mites, and Spider Mites	adults primarily	Long Persistence: Toxic to parasitoids, lacewings, predatory bugs, predatory mites, & bees. Not toxic to nematodes.	Label states "Repeat as necessary to achieve control using higher rates as pest pressure & foliage area increases". This process often leads to mite flareback due to resistance and/or natural enemy elimination.
TETRASAN	GH, S/L, IN, L, N, X	12 hours	etoxazole	10b	biphenyl oxaline	MOA not yet known	SPIDER MITES: Lewis, Pacific, Spruce, Citrus red, Southern red, European red, McDaniel, & Two-spotted.	eggs and nymphs	Label states "...most beneficial insects not harmed".	Translaminar movement in plants and transovarial action primarily on spider mites.
THONEX	F, L, N, V, X	48 - 96 hours	endosulfan	2a	Cyclodiene Organo-chlorine	GABA-gated chloride channel antagonist	MITES: Cyclamen Mite, Taxus Bud Mite; Eriophyid Needle Mite, Apple Rust Mite, Pear Silver Mite, Blueberry Bud Mite, Plum Rust Mite, Pear Rust Mite, Pear Leaf Blister Mite, Pineapple Fruit Mite, Tomato Russet Mite,	eggs, nymphs, and adults	Long Persistence: Toxic to parasitoids, lacewings, predatory bugs, predatory mites, & bees. Not toxic to nematodes.	RESTRICTED USE PESTICIDE: Ornamentals use restricted to nurseries for Taxus Bud Mite only. Extremely toxic to fish and aquatic invertebrates, and toxic to birds, and mammals.
TRIACT	G/H, N, IN, L, T	4 hours	clarified hydrophobic extract of Neem oil	None listed	botanical	Mainly a contact/repellent; other Neems are ecdysone agonists (IGRs)	MITES	eggs, nymphs, and adults	Toxic to predatory mites & bees but persistence is short. No toxicity to lacewing, ladybeetle, predatory bug, & nematode.	Neem oil product. Used in similar fashion as horticultural oil to achieve mite control. No Azadractin in formulation. OMRI certified.
VENDEX	GH, N, L, F, X	48 hours	fenbutatin-oxide	12b	organotin	Metabolic poison; oxidative phophorylation	SPIDER MITES: Two-spotted, Spruce, Olingonychus, Spruce	eggs, nymphs, and adults	Toxic to bees. Not toxic to parasitoids, lacewings, ladybeetles, predatory bugs, & predatory mites.	Restricted use pesticide. Class 1 mammal toxicant. Eye hazard also high. Good egg activity.

¹ KEY FOR SITE OF USES: GH-greenhouse S/L-shade or lathhouse IN-interiorscape N-nursery T-turf L-landscape X-Christmas trees V-vegetables H-herbs F-fruit

² Data compiled from side-effects data base at www.koppert.com