



# Insect Controls for the Greenhouse Industry

Note: An X in the table below indicates insect and mite pests listed on the product label by the company selling the product. It does not guarantee that the insecticide products will provide adequate control of the pests listed on the label. An S indicates suppression only. For more information on how well insecticide products worked in research trials, contact a greenhouse Extension agent in your area.

Trade name	EPA #	Common name	Formulation	Manufacturer	% Active	Signal word	Vegetables	Herbs, spices	RH1 (flrs)	Restricted use	Aphids	Broad mites	Fungus gnats	Leafminers	Mealybugs	Scale insects	Spider mites	Thrips	Whiteflies	Class	Notes
Gnatrol	73049-11	<i>Bacillus thuringiensis</i>	2.19 BIU/gal liquid	Valent	6.38	Caution	X				X									biological-bacterial spores	
BotaniGard 22 WP	70810-8	<i>Beauveria bassiana</i> strain GHA	2 x 10 <sup>13</sup> spores/lb	Emerald Bio-Agriculture	0.22	Caution	X	X	4	X			X				X	X		biological-fungal spores	Apply before high insect populations develop. Apply at 5- to 10-day intervals. There is no limit to the number of applications.
BotaniGard ES	65626-8	<i>Beauveria bassiana</i> strain GHA	2.3 x 10 <sup>10</sup> spores per gram powder	Whitmire/ Emerald Bioscience	11.3	Caution	X	X	4	X			X				X	X		biological-fungal spores	Spores are alive and may be harmed by storage at high temperatures or contact with water for more than 24 hours. Do not apply through any type of irrigation system. Apply at 5- to 10-day intervals. High insect population may warrant a spray interval of 2 to 5 days. Do not apply to poinsettias after bract formation.
1100 Pyrethrum TR	499-382	pyrethrins	aerosol	Whitmire Micro-Gen	2.5	Warning	X	X	12	X		X	X	X	X	X	X	X		botanical	
Pyreth-It	1021-1091-499	pyrethrins & PBO	liquid	Whitmire Micro-Gen	66	Caution	X		12	X							X	X		botanical	
Pyrethrum TR	499-479	pyrethrins	aerosol	Whitmire Micro-Gen	20	Caution	X	X	12	X		X	X	X	X	X	X	X		botanical	
Mesuro 75 W	10163-231	methiocarb	75 W (wetable powder)	Gowan	75	Danger			24	X	X					X	X			carbamate	Do not allow product to drift. Do not apply with oil. Do not make more than 2 applications per year per crop. Applications must be 10 days apart.
Aria	279-3287	flonicamid	50% wettable granule	FMC	50	Caution			12	X			X				X	X		feeding inhibitor	Do not use more than 2 times before switching to a different class of chemicals. Certain pansy cultivars have exhibited sensitivity.
Endeavor	100-913	pymetrozine	50% WDG (water dispersible granule)	Syngenta	50	Caution			12	X								X		feeding inhibitor	Stops the insects from feeding several hours after application. The insects may remain on the plant for 2 to 4 days after application, but damage will have ceased. Endeavor is a good choice for IPM or biocontrol programs as toxicity to beneficials is limited.
Avid 0.15 EC	100-896	abamectin	0.15 lb ai/gal liquid	Syngenta	2	Warning			12			X			X					fermentation product	For suppression of aphids, thrips and whiteflies, make 2 to 3 applications on 7-day intervals. Various strains of mites and insects have developed resistance.
Conserve SC	67719-291	spinosad	1 lb ai/gal liquid	Dow Agro-Sciences	11.6	Caution			4			X			X	X				fermentation product	Regardless of crop or pest treated, do not apply more than 10 times in a 12-month period inside a greenhouse or a structure that can be altered to be closed or opened. No more than 3 consecutive applications — rotate with a different class of chemicals.
Adept 25 W	400-477	diflubenzuron	25% WSP (powder in water-soluble packet)	Crompton/ Uniroyal	25	Caution			12			X	X					X		insect growth regulator	Repeat applications can be made at 4-to-8-week intervals. Do not make more than 4 applications per crop. Do not apply to poinsettias, hibiscus or Reiger begonia.
Citation	100-667	cyromazine	75% WSP (powder in a water-soluble packet)	Syngenta	75	Caution			12			X	X							insect growth regulator	Repeat applications at 7-day intervals or as needed. This chemical will not control the adult stage of the insect pest. Make no more than 3 consecutive applications and only a total of 6 applications per crop.
Distance	59639-96	pyriproxyfen	0.86 lb ai/gal liquid	Valent	11.2	Caution			12	S	X	S	X					X		insect growth regulator	Distance does not control adults. Apply no more than 2 times per cropping cycle or 2 times every 6 months. In a few instances, malformation of roots and newly expanded leaves has been observed on certain poinsettia varieties (i.e., Freedom Bright, Freedom Bright Red) following a drench application. The malformation of leaves was permanent. Do not apply after bract formation.
Enstar II	2724-476	kinoprene	0.625 lb ai/pint	Wellmark International	65.1	Warning			4	X	X	X	X					X		insect growth regulator	Slight to moderate injury has occasionally been noted on some blooms under certain conditions. Do not use on poinsettia after bract formation.
Pedestal	66222-40-400	novaluron	0.83 lb ai/gal liquid	Crompton/ Uniroyal	10	Caution			12			X					X	X		insect growth regulator	Do not use Pedestal more than once within each generation cycle. Do not apply to poinsettias.
Precision	100-750	fenoxycarb	25% WSP (powder in water-soluble packet)	Syngenta	25	Caution			12			X	X	X	X	X	X	X		insect growth regulator	For control of soft scales, whiteflies and thrips, repeat applications every 7 to 14 days. Do not exceed 30 applications per year. Precision affects the larval stages of the pests.
Preclude TR	499-437	fenoxycarb	aerosol	Whitmire Micro-Gen	4.8	Caution			12	X		X	X	X	X	X	X	X		insect growth regulator	Do not re-apply product within 48 hours of a previous application.
Talus	71711-15-67690	buprofezin	70% wettable powder	Sepro	70	Caution			12			X	X					X		insect growth regulator	The entire contents of the water-soluble bag must be used. Apply no more than two applications per growing cycle. Allow at least 28 days between applications.
Flagship 25 WG	100-955	thiamethoxam	25% wettable granule	Syngenta	25	Caution			X	X	X							X		insecticide	Do not exceed 8 oz per crop or per year.
Hexygon DF	10163-251	hexythiazox	50% DF (dust free powder)	Gowan	50	Caution			12						X					miticide-carboxamide	Adult mites are not directly affected. Do not apply to stressed plants. Make only one application per cropping cycle or per year.
Floramite	400-481	bifenazate	50 WSP (powder in a water-soluble bag)	Crompton/ Uniroyal	50	Caution			4						X					miticide-diphenyl	Use at least two alternative products between treatments of Floramite.
Floramite SC	400-508	bifenazate	2 lb ai/gal liquid	Crompton/ Uniroyal	22.6	Caution			12						X					miticide-diphenyl	Do not make more than 2 applications of Floramite SC per year. Use at least two alternative products between treatments of Floramite.
TetraSan 5 WDG	59639-108	etoxazole	5 WDG (water-dispersible granules)	Valent	5	Caution			12						X					miticide-oxazoline	Apply no more than two times per cropping cycle.
Akari 5SC	71711-4-67690	fenpyroximate	0.42 lb ai/gal liquid	Sepro	5	Warning			12						X					miticide-pyrazole	Do not use Akari in successive miticide applications in the same greenhouse. No more than two applications per growing season or per crop cycle.
Sanmite	7969-106	pyridaben	75% WP wettable powder	The Scott's Company	75	Warning			12		X				X		X			miticide-pyridazinone	Do not use Sanmite in successive miticide applications. Do not apply this product through any type of irrigation system. Use Sanmite in rotation with other treatments having different modes of action.
Pylon	241-374-59807	chlorfenapyr	2 lb ai/gal liquid	Olympic	21.4	Caution			12		X	X			X					miticide-pyrrol	Do not apply more than 2 times consecutively or times during a growing season.
Ovation SC	66222-53-58185	clofentezine	4 lb ai/gal liquid	The Scott's Company	42	Caution			12						X					miticide-tetrazine	Use only once per crop cycle.
Judo	432-1280-59807	spiromesifen	4 lb ai/gal liquid	Olympic	45.2	Caution			12						X		X			miticide-tetronic acid derivative	Do not use Judo on geranium or <i>Impatiens</i> spp.
Azatin XL	70051-27-59807	azadirachtin	0.27 lb ai/gal liquid	Olympic	3	Caution	X	X	4	X	X	X	X				X	X		neem extract	Repeat applications every 7 days or as needed.
Ornazin 3% EC	5481-476	azadirachtin	0.27 lb ai/gal liquid	Amvac	3	Warning	X	X	12	X		X	X	X			X	X		neem extract	
Triact 70	70051-2-59807	neem oil extract	5.46 lb ai/gal liquid	Olympic	70	Caution			4	X	X			X	X		X			neem extract	Do not apply to impatiens flowers, fuchsia, hibiscus and some rose flowers. Use care on plants with tender tissue. Material also has fungicidal properties.
Celero 16 WSG	66330-52	clothianidin	16% water soluble granule	Arvesta	16	Caution			12	X			X					X		neonicotinoid	Drench or foliar.
Marathon 1% G	3125-452-59807	imidacloprid	1 G (granular)	Olympic	1	Caution			12	X	X	X	X	X			S	X		neonicotinoid	This material is applied to the soil for systemic uptake by the plants. Do not apply to water-saturated soils. To prevent leaching the material out of the soils. Do not overwater.
Marathon 60 WP	3125-492-59807	imidacloprid	60 WSP (powder in a water-soluble packet)	Olympic	60	Caution			12	X	X	X	X	X			S	X		neonicotinoid	Do not allow the leachate to run out of the pots for the first 10 days.
Marathon II	3125-549-59807	imidacloprid	2 lb ai/gal liquid	Olympic	21.4	Caution	X		12	X		X	X	X			S	X		neonicotinoid	Do not apply to waterlogged soils. Do not allow leachate to run out of the pots for the first 10 days after application. May be applied foliarly, as a drench, or in ebb and flow watering systems.
Safari 20 SG	33657-16-59639	dinotefuran	20 SG (water-soluble granule)	Valent	20	Caution			12	X	S	X	X	X	X		X	X		neonicotinoid	Do not apply more than a total of 2.7 lbs of Safari (0.54 lb ai) per acre per season as foliar sprays.
Tristar 70 WSP	8033-22-1001	acetamiprid	70% WSP (powder in water-soluble packets)	Cleary	70	Caution			24	X		X						X		neonicotinoid	Do not make more than 5 applications per year.
Ultra-Fine Oil	862-23-499	paraffinic oil	7.1 lb ai/gal liquid	Whitmire Micro-Gen	98.8	Caution	X	X	4	X		X	X	X	X	X	X	X		oil	Do not spray plants that are under stress. Do not apply during times of high temperatures. Spray no more than four consecutive sprays. Do not exceed more than two sprays a week. Thorough coverage is necessary for maximum efficiency.
Vendex 50 WP-T/N/O	1812-413	fenbutatin-oxide	50% wettable powder	Griffin	50	Danger			48	X					X					organic-tin	Apply to the foliage only on chrysanthemums (pre-bloom) and poinsettias (pre-bract). Do not add oil to spray solution.
Endosulfan 3 EC	51036-92	endosulfan	3 lbs ai/gal liquid	Micro-Flo	34	Danger	X		24	X										organophosphate	Certain varieties of chrysanthemum have shown damage.
1300 Orthene TR	499-421	acephate	aerosol	Whitmire Micro-Gen	12	Caution			24	X	X	X	X	X	X	X	X	X		organophosphate	
DuraGuard ME	499-367	chlorpyrifos	1.66 lb ai/gal liquid	Whitmire Micro-Gen	20	Caution			24	X	X	X	X	X	X	X	X	X		organophosphate	
Orthene Turf, Tree & Ornamental Spray	59639-26	acephate	75 WSP (water-soluble packet)	Valent	75	Caution			24	X			X	X			X	X		organophosphate	Phytotoxicity has occurred in the following foliage plants: <i>Blechnum gibbum</i> , <i>Cissus antarctica</i> , <i>Ficus triangularis</i> , <i>Fittonia verschaffelii</i> , <i>Maranta leuconeura kerchoveana</i> , <i>Pachystachya lutea</i> , <i>Plectranthus australis</i> , <i>Polypodium aureum</i> , <i>Polystichum</i> , <i>Pteris ensiformis</i> , <i>Tolmiea menziesii</i> . Do not apply to roses with open leaves. Some varieties of chrysanthemum have shown sensitivity.
Orthene Turf, Tree & Ornamental Spray 97	59639-91	acephate	97 PE (water-soluble pellet)	Valent	97	Caution	X		24	X			X	X			X	X		organophosphate	Phytotoxicity has occurred in the following foliage plants: <i>Blechnum gibbum</i> , <i>Cissus antarctica</i> , <i>Ficus triangularis</i> , <i>Fittonia verschaffelii</i> , <i>Maranta leuconeura kerchoveana</i> , <i>Pachystachya lutea</i> , <i>Plectranthus australis</i> , <i>Polypodium aureum</i> , <i>Polystichum</i> , <i>Pteris ensiformis</i> , <i>Tolmiea menziesii</i> . Do not apply to roses with open leaves. Some varieties of chrysanthemum have shown sensitivity.
Duraplex TR	499-405	chlorpyrifos & cyfluthrin	aerosol	Whitmire Micro-Gen	9.6	Warning			24	X	X	X	X	X	X	X	X	X		organophosphate & pyrethroid	For best results, apply during early evening.
Insecticidal Soap	36488-45-59807	potassium salts of fatty acids	liquid	Olympic	49.5	Warning	X	X	12	X			X	X	X	X	X	X		soap	Do not use on bleeding heart, jade plant, lantana, lilies or sweet peas. Some varieties of azaleas, begonias, camellias, fuchsias, gardenias, orchids and impatiens have shown sensitivity.
Astro	279-3141	permethrin	3.2 lb ai/gal liquid	FMC	36.8	Caution			12	X	X	X	X				X			synthetic pyrethroid	
Attain TR	499-472	bifenthrin	aerosol	Whitmire Micro-Gen	4	Warning			12	X	X	X	X	X	X	X	X	X		synthetic pyrethroid	
Decathlon 20 WP	3125-430-59807	cyfluthrin	20% wettable powder	Olympic	20	Caution			12	X	X		X	X	X	X	X			synthetic pyrethroid	
Mavrik Aquaflo	2724-478	fluvalinate	2 lb ai/gal liquid	Wellmark International	22.3	Caution			12	X			X	X	X	X	X	X		synthetic pyrethroid	Apply no more than 4 times per month.
Scimitar GC	100-1088	lambda-cyhalothrin	0.88 lb ai/gal liquid	Syngenta	9.7	Caution			24	X	X	X	X	X	X	X	X	X		synthetic pyrethroid	Apply at 7-day intervals if necessary.
Talstar Flowable	279-3105	bifenthrin	0.67 lb ai/gal liquid	FMC	7.9	Caution			12	X	X	X	X	X	X	X	X	X		synthetic pyrethroid	
Talstar Nursery Flowable	279-3155	bifenthrin	0.67 lb ai/gal liquid	FMC	7.9	Caution			12	X	X	X	X	X	X	X	X	X		synthetic pyrethroid	
Tame 2.4 EC Spray	59639-77	fenpropathrin	2.4 lb ai/gal liquid	Valent	30.9	Warning			24	X	X		X	X			X			synthetic pyrethroid	Phytotoxicity has occurred on poinsettia after bract formation. Do not apply to chrysanthemums or roses with open flowers.





## PESTICIDE EMERGENCY INFORMATION

For any type of an emergency involving a pesticide, immediately contact the following emergency information centers for assistance.  
Current as of June 2005



### Human Pesticide Poisoning

**POISON CONTROL**  
From anywhere in the United States, call

**1 - 8 0 0 - 2 2 2 - 1 2 2 2**

### Special Pesticide Emergencies

#### Animal Poisoning

Your veterinarian:

Phone No.

or

Animal Poison Control Center (\$50 consultation fee per case)

**\*1-888-426-4435 \*911**  
**www.asPCA.org**

\* Telephone Number Operated 24 Hours

#### Pesticide Fire

Local fire department:

Phone No.

and

**\*911**

#### Traffic Accident

Local police department or sheriff's department:

Phone No.

and

Operations Division, Michigan State Police:

**\*(517) 336-6605**

#### Environmental Pollution

District Michigan Department of Environmental Quality (MDEQ) Office Phone No.

Phone No.

and

MDEQ Pollution Emergency Alerting System (PEAS):

**\*1-800-292-4706**

also

**\*1-800-405-0101**

Michigan Department of Agriculture Spill Response

#### Pesticide Disposal Information

Michigan Clean Sweep, Michigan Department of Agriculture Environmental Stewardship Division.

Monday - Friday: 8 a.m. - 5 p.m.  
**(517) 241-0236**

#### National Pesticide Information Center

Provides advice on recognizing and managing pesticide poisoning, toxicology, general pesticide information and emergency response assistance. Funded by EPA, based at Oregon State University  
7 days a week; excluding holidays  
6:30 a.m. - 4:30 p.m. Pacific Time Zone

**1-800-858-7378**  
**FAX: 1-541-737-0761**  
**Web: npic.orst.edu**

Revised by Carolyn J. Randall, Pesticide Education Program, Michigan State University Extension

## Insect Controls for the Greenhouse Industry

Extension Bulletin - E-2696 • Revised August 2005 (Destroy Previous Editions)

By David R. Smitley, Terrance W. Davis and Nicole A. Kay, Department of Entomology, Michigan State University

The Michigan Department of Agriculture (MDA) requires that chemicals used in the greenhouse must have Worker Protection Standards and list "greenhouse" or "glasshouse" or "glasshouse" on the label in a location other than the "Agricultural Use Requirements" box.



The MDA has also ruled that if the site, host plant and chemical are listed on the label, insects not on the label may be treated. Any other use inconsistent with the label can lead to injury of crops, humans, animals and the environment, and can lead to fines and/or condemnation of the crop.

"Vegetables" include any plants being used as food or that will be transplanted as food crops later.

Always check the label for updated information. Labels change often. Some chemicals listed in this bulletin may be dropped by the manufacturer or distributor sometime after publication. If you have questions about the legality and/or the registration status of pesticides, contact your county Extension office, pesticide dealer or manufacturer.

Do not apply chemicals to plants that are stressed (by high temperature, high humidity or water stress) because this increases the possibility of phytotoxicity. Always treat a small portion of plants of each variety with any new chemical (or combination of chemicals) and check them for damage 7 days later before treating the whole crop. Chemicals that may not cause phytotoxicity when applied by themselves may cause damage when mixed together.



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Major Revision (destroy old E-2696) MKM/KJG/SL/GJ, for sale only