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2001 Pest Management Guide for the Production and Maintenance of Herbaceous Perennials

Michigan State University

Michigan State University Extension

Cornell University Extension (Cornell bulletin number 207)

Issued 2000

40 pages

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A Cornell Cooperative Extension Publication

Insert to Information Bulletin 207

# 2001 Pest Management Guide for the Production and Maintenance of Herbaceous Perennials

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The information contained in this bulletin was developed for use in another state. It may contain recommendations for pesticides that are not registered for use in Michigan or practices that are not recommended for use in Michigan. Always consult the label before using any pesticide. If you are unsure about whether a recommended treatment is appropriate, contact your county Extension agent. If you need information about whether a recommended pesticide is registered in Michigan, consult the Michigan Department of Agriculture Pesticide Division at: (517) 373-1087.

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Every effort has been made to provide correct, complete, and up-to-date pest management information for New York State in this publication, which was released for printing December 2000. Changes in pesticide registrations, regulations, and guidelines that occur after publication are regularly available in county Cornell Cooperative Extension offices and from the Pesticide Management Education Program web site, <http://pmep.cce.cornell.edu>. A revision of the printed document is issued annually.

**These guidelines are not a substitute for pesticide labeling. Read the label before applying any pesticide.**

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The following information, presented in tabular form for easy reference, is intended to provide growers with information on the fungicides, nematicides, insecticides, and miticides currently registered for application to herbaceous perennials. For an understanding of how to use cultural (nonchemical) methods for the suppression of pests affecting herbaceous perennials, the reader is referred to the publication *Herbaceous Perennials: Diseases and Insect Pests*, 1601B207.

## PESTICIDE INFORMATION

### Use Pesticides Safely

All pesticides are regulated by state and federal laws to protect the user and consumer. Read labels carefully. Follow instructions.

Most pesticides are poisonous to humans and animals, but when properly used, they are not harmful. Handle them with care. Store them in closed, plainly labeled original containers, out of the reach of children and animals. Keep pesticides in locked storage facilities.

When handling, do not allow pesticides to come in contact with the skin. Do not apply on a windy day. Do not smoke while handling pesticides. Do not inhale dusts, sprays, or vapors. After handling pesticides, wash hands and face before eating or smoking.

To avoid accidental injury to susceptible plants, avoid drift of sprays and dusts. Use separate equipment for applying hormone-type herbicides such as 2,4-D.

**Dispose of empty containers so that children cannot play with them.**

Please refer to New York State Department of Environmental Conservation circular 865, part 325, *Rules and Regulations Relating to the Application of Pesticides*, for further information relating to the use of pesticides in New York State.

### Protecting Honey Bees from Insecticides

Honey bees, wild bees, and other insects are important for proper pollination of many vegetables. Vine crops, for example, must be pollinated because they have male and female flowers, and pollen must be transferred from the male to female flowers if fruit is to set. Poor pollination results in small or odd-shaped fruit as well as low yields. Each flower must be visited eight or more times for adequate pollination to occur.

To avoid harming bees with insecticide treatments, remember these points: do not spray crops in bloom; mow blooming weeds before treatment or spray when the blossoms are closed; avoid application during the time of day when field bees are most numerous; make application in the early morning or evening; and always read the label before use.

If pesticides that are highly toxic to bees are used in strict accordance with label directions, little or no harm should be done to bees. Label statements on pesticides that are highly toxic to honey bees may carry a caution statement such as the following: "This product is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply or allow to drift to weeds in bloom on which an economically

significant number of bees are actively foraging. Protective information can be obtained from your Cooperative Extension Service."

### Pesticide Control Legislation

In accordance with New York State legislation, pesticides that are highly toxic or that are persistent and accumulative are placed on a restricted-use list and may be sold to and used only by certified applicators. Restricted-use pesticides recommended in this publication are identified by an asterisk (\*). The list is subject to annual review; consult your Cornell Cooperative Extension agent if you have questions about the status of a pesticide.

**CERTIFICATION:** Commercial applicators of pesticides as well as private applicators who use restricted-use pesticides must be certified. Certification exams and recertification credits are given throughout the state; consult your Cornell Cooperative Extension agent or regional pesticide specialist if you have questions concerning certification.

### Pesticide Recordkeeping/Reporting for New York State

**Manufacturers and importers.** Requires annual reports from manufacturers and importers of all sales within the state of each restricted-use pesticide product, including EPA registration number; container size; and number of containers sold to New York purchasers. Records would have to be maintained for at least three years.

**Commercial applicators.** Requires annual reports from commercial applicators of pesticide use, including EPA registration number; product name; quantity of pesticide used; date applied; and location of application by address, including 5-digit zip code. Records would be maintained for at least three years and would also include the dosage rates, methods of application and target organisms.

**Reporting at point of sale.** Requires every person who sells or offers for sale restricted-use pesticides to private applicators to report annually each sale of a restricted-use pesticide or general-use pesticide used in agricultural crop production to such applicator, including EPA registration number; product name of pesticide purchased; quantity purchased; date purchased; and location of intended application by address, including 5-digit zip code, or if address is unavailable, by township and 5-digit zip code.

**Recordkeeping by private applicators.** Requires private applicators to maintain, for a minimum of three years, restricted-use pesticide records, including pesticide purchased; crop treated; method and date of application.

For more information, contact the NYS Department of Environmental Conservation (518-457-3542).

## EPA Worker Protection Standard (WPS) for Agricultural Pesticides

The Worker Protection Standard contains requirements designed to reduce the risks of illness or injury resulting from occupational exposures to pesticide handlers and agricultural workers. Accidental exposure of agricultural workers and other persons to pesticides used in the production of agricultural plants on farms, nurseries, greenhouses, and forests are included under these regulations. They include the following:

- Restricted-entry intervals (REIs) for most pesticides
- Personal protective equipment (PPE) for handlers and early-entry workers
- Decontamination supplies and emergency assistance
- Pesticide safety training and posting
- Revised labeling that includes specific WPS instructions

For more complete information on reentry and farmworker protection standards, please contact your local Cornell Cooperative Extension office or the Pesticide Management Education Program, 5123 Comstock Hall, Cornell University, Ithaca, NY 14853, 607-255-1866, web site: <http://pmep.cce.cornell.edu>.

## FIFRA 2(ee) Recommendations

Certain limited variations from the use directions specified on pesticide labels are authorized under FIFRA Section 2(ee).

These “2(ee) recommendations” allow

1. Use at any dosage, concentration, or frequency less than specified on the labeling.
2. Use against any target pest not specified on the labeling.
3. Methods of application not prohibited on the labeling.
4. Mixtures with fertilizer, unless prohibited on the labeling.

In New York State, all 2(ee) recommendations must be approved in writing by the New York State Department of Environmental Conservation with the exception of those pesticides applied for agricultural purposes at less than label rate and mixtures with fertilizer (item 4 above).

No fee is required for a request for a 2(ee) recommendation.

Requirements:

1. Anyone receiving approval of a 2(ee) recommendation is responsible for distributing the recommendation to **all users of the product pursuant to the approved recommendation.**

2. Any user must have the 2(ee) recommendation in his or her possession at the time of application, e.g., “Cornell Guidelines.”

Information required for submission of 2(ee) recommendations:

1. Requests for approval of 2(ee) recommendations must be made in writing by recognized research institutions, certified crop advisers, manufacturers (registrants), or organizations representing individual users. Individual users may **not** request approval of 2(ee) recommendations.
2. Requests must be accompanied by data demonstrating that the use will be effective.

Trade names used herein are for convenience only. No endorsement of products is intended, nor is criticism of unnamed products implied.

The 2001 Pest Management Guide for the Production and Maintenance of Herbaceous Perennials was prepared by K. C. Bennett and John P. Sanderson, Department of Entomology; and Margery L. Daughtrey, Department of Plant Pathology.

### Abbreviations Used in This Publication

A = acre	W = wettable
AI = active ingredient	WDG = water dispersible granules
D = dust	WP = wettable powder
DF = dry flowable	* = restricted-use pesticide; may be purchased and used only by certified applicators
DG = dispersible granule	# = 2(ee) recommendation based on an efficacy statement
E = emulsion, emulsifiable	## = 2(ee) recommendation based on quantitative efficacy data
EC = emulsifiable concentrate	
F = flowable	
G = granular	
L = liquid	
P = pellets	
S = soluble	
SP = soluble powder	
ULV = ultra-low volume	

**Table 1. Selected diseases and effective controls**

<i>Problem</i>	<i>Effective materials<sup>a</sup></i>
bacterial blight, leaf spots	copper hydroxide, copper hydroxide plus mancozeb, copper salts of fatty and rosin acids, copper sulphate pentahydrate
Botrytis	azoxystrobin, chlorothalonil+, chlorothalonil plus thiophanate-methyl, copper hydroxide, copper hydroxide plus mancozeb, copper sulphate pentahydrate, fludioxonil, iprodione, mancozeb, mancozeb plus thiophanate-methyl, maneb with zinc, thiophanate-methyl+, vinclozolin
damping-off	A: Rhizoctonia: azoxystrobin, etridiazole plus thiophanate-methyl, fludioxonil, iprodione, mefenoxam, PCNB, thiophanate-methyl+, triflumizole  B: Pythium: etridiazole, etridiazole plus thiophanate-methyl, metalaxyl
downy mildew	azoxystrobin, copper hydroxide, copper hydroxide plus mancozeb, fosetyl-Al+, mancozeb, mancozeb plus thiophanate-methyl
leaf spots (fungal)	azoxystrobin, chlorothalonil+, chlorothalonil plus thiophanate-methyl, copper hydroxide, copper hydroxide plus mancozeb, copper salts of fatty and rosin acids, fludioxonil, mancozeb, maneb with zinc, myclobutanil, thiophanate-methyl+, triadimefon+, triflumizole
nematodes	*chloropicrin, *dazomet, metam-sodium, *methyl bromide with *chloropicrin
powdery mildew	azoxystrobin, chlorothalonil+, chlorothalonil plus thiophanate-methyl, cinnamaldehyde, copper sulfate pentahydrate, fenarimol, horticultural oil, hydrogen dioxide, kresoxim-methyl, mancozeb plus thiophanate-methyl, myclobutanil, neem oil, piperalin, propiconazole, thiophanate-methyl+, triflumizole, triadimefon+
root and stem rots	A: Rhizoctonia and Sclerotinia: azoxystrobin, etridiazole plus thiophanate-methyl, fludioxonil, iprodione, mancozeb plus thiophanate-methyl, PCNB, thiophanate-methyl+, triflumizole, vinclozolin  B: Pythium and Phytophthora: etridiazole, etridiazole plus thiophanate-methyl, fosetyl-Al+, mefenoxam, metalaxyl, propamocarb
rust	azoxystrobin, chlorothalonil+, chlorothalonil plus thiophanate-methyl, mancozeb, maneb with zinc, myclobutanil, propiconazole, triadimefon+

\* Restricted-use material, to be applied by certified applicator only.

+ Proprietary products containing the active ingredient are available for homeowner use.

<sup>a</sup> Common names; see Table 2 for products with these active ingredients and information regarding formulation, application, and the crop uses for which the material is registered.

**Table 2. Fungicides for control of diseases of herbaceous perennials**

<i>Common name</i>	<i>Commercial application information</i>	<i>Effective against</i>	<i>REI</i>
<b>azoxystrobin</b>	Spray Heritage 50W at 1–4 oz./100 gal. Repeat in 7–28 days.	Alternaria, anthracnose, Botrytis blight, Cladosporium leaf spot, downy mildew, Fusarium spp., iris leaf spot, Phytophthora shoot blight, powdery mildew, rust, Rhizoctonia, Sclerotium rolfsii	12
Conduct small-scale tests for species not mentioned on label.			
<b>chlorothalonil+</b>	Spray PathGuard 90DF using 0.8 lb./100 gal., or use PathGuard 6DF at 1 3/8 pt./100 gal. Use 20–150 gal. spray per acre. Repeat at 7- to 14-day intervals.	Alternaria, anthracnose, Botrytis, Cercospora, Cercosporidium, Curvularia, Didymellina, Fusarium, Mycosphaerella, Phyllosticta, Phytophthora leaf blight, powdery mildew, Ramularia, Rhizopus, Rhizoctonia web blight, rusts, Sclerotinia, Septoria, Stagonospora	12
Registered for use in greenhouse and field on carnation, chrysanthemum, crocus, daffodil, daisy, geranium, gladiolus, hollyhock, hydrangea, iris, lily, narcissus, phlox, statice, and tulip			
<b>chlorothalonil+</b>	Spray 2 pt. Daconil 2787F/100 gal. or 1½ lb. Daconil 2787 75% WP or 1¼ lb. Daconil 2787 90% WDG or 1¼ lb. Daconil Ultrex 82.5%/100 gal. or 1¾ pt. Daconil Weather Stik Flowable Fungicide 54EC /100 gal. at 7- to 14-day intervals.	Botrytis, Alternaria, Cercospora, Curvularia, Volutella, Septoria and Didymellina leaf spots, Mycosphaerella ray blight, rust, anthracnose, Rhizoctonia web blight, powdery mildew	48
Registered for use on chrysanthemum, daisy, gladiolus, gypsophila, hollyhock, iris, lily, pachysandra, phlox, statice, and tulip			
<b>chlorothalonil plus thiophanate-methyl</b>	Apply Spectro 90WDG according to label.	Alternaria, anthracnose, Ascochyta, Botrytis, Cercospora, Didymellina, Phytophthora blight, powdery mildew, Ramularia, Rhizoctonia web blight, rust, Septoria	24
Registered for use on aster, carnation, chrysanthemum, daffodil, daisy, gladiolus, gypsophila, iris, lily, narcissus, pansy, phlox, statice, and tulip			
<b>cinnamaldehyde</b>	Spray Cinnamite at 64–100 fl. oz./100 gal.	Powdery mildew	4
Registered for use on greenhouse- and field-grown flowers.			
<b>copper hydroxide</b>	Spray 1.0 lb. Champion 77% WP/100 gal. Repeat in 7–14 days as needed.	Botrytis, Septoria leaf spot	48
Registered for use on chrysanthemum			
<b>copper hydroxide</b>	Spray 0.75 lb. Kocide 2000 T/N/O per 100 gal. Repeat in 7–14 days as needed.	Alternaria leaf spot, bacterial spot, Botrytis, Cercospora, downy mildew, Septoria	48
Crops listed on the label include chrysanthemum, dahlia, dianthus, echinacea, gladiolus, iris, pansy, peony, plantain lily (hosta), and verbena. Label cautions grower to conduct small-scale tests on other ornamentals not listed on the label for signs of phytotoxicity before commercial use.			
<b>copper hydroxide plus mancozeb</b>	Spray 1.5 lb. Junction/100 gal. water (½ Tbsp./gal.) Repeat at 7- to 14-day intervals.	Alternaria leaf spot, anthracnose, bacterial leaf blight, Botrytis, Cercospora, downy mildew	48
The pH of the spray solution should be less than 6.5 to avoid phytotoxicity. Label cautions grower to test this product for safety to plants not listed on the label. Listed plants include dahlia, gladiolus, pansy, peony, and tulip.			

Note: Trade or brand names in this summary are given with the understanding that endorsement is not intended or criticism implied for those products not mentioned. Other labeled formulations may also be available for use. Read label carefully before using any of these chemicals.

+ Proprietary products containing the active ingredient are available for homeowner use.

<sup>a</sup>This fungicide is no longer being registered for ornamental uses. However, previously purchased product with ornamental uses on the label may be used legally.

<sup>b</sup> Not for greenhouse use.

**Table 2. Fungicides for control of diseases of herbaceous perennials (continued)**

<i>Common name</i>	<i>Commercial application information</i>	<i>Effective against</i>	<i>REI</i>
<b>copper salts of fatty and rosin acids</b>	Spray 3–5 tsp./gal. Camelot (= 3–5 pt./100 gal.) at 7- to 10-day intervals.	Bacterial blight on chrysanthemum, scab on iris	12
Do not mix with products containing diazinon, thiophanate-methyl, or fosetyl-Al. Registered for use on chrysanthemum and iris.			
<b>copper sulphate pentahydrate</b>	Spray 1.5–2.5 oz. Phyton 27 21.36%/10 gal.	Bacterial leaf spots, Botrytis, powdery mildew	24
Registered for use on aster, chrysanthemum, clematis, hydrangea, peony, and potentilla			
<b>etridiazole</b>	Drench containers with 3–10 oz. Terrazole 35WP/100 gal./400 sq. ft. For bedding plants (2- to 3-inch soil depth) drench with 4–6 oz. Terrazole 35% WP/100 gal./800 sq. ft.	Pythium, Phytophthora	12
Registered for use on aster, chrysanthemum, dahlia, dianthus, foxglove, gypsophila, salvia, statice, and stokesia			
<b>etridiazole</b>	Drench 3–10 oz. Truban 30WP/100 gal., the area to be covered varying with depth of soil treated. Repeat in 4–12 weeks.	Pythium, Phytophthora	12
Registered for use on aster, dahlia, dianthus, foxglove, gypsophila, salvia, statice, and stokesia			
<b>etridiazole</b>	Drench 3–8 oz. Truban 25EC/100 gal., the area to be covered varying with depth of soil treated. Repeat in 4–12 weeks if needed.	Pythium, Phytophthora	12
Registered for use on ajuga, chrysanthemum, dahlia, dianthus, phlox, and salvia			
<b>etridiazole</b>	Incorporate 10 oz. Terrazole 5G <sup>a</sup> /cu. yd. of growing mix.	Pythium, Phytophthora	12
Registered for use on aster, dahlia, dianthus, foxglove, gypsophila, salvia, and verbena			
<b>etridiazole</b>	Incorporate 5–10 oz. Truban 5G/cu. yd. of growing mix depending on container depth. For broadcast and sidedress applications, see label.	Pythium, Phytophthora	12
Registered for use on aster, chrysanthemum, dianthus, foxglove, gypsophila, salvia, stokesia, and verbena			
<b>etridiazole plus thiophanate-methyl</b>	Drench 4–12 oz. Banrot 40WP/100 gal./400–800 sq. ft. at 4- to 12-week intervals. Rates vary according to container depth.	Rhizoctonia, Pythium, Phytophthora stem and root rots	12
Registered for use on ajuga, aster, chrysanthemum, dahlia, delphinium, fern, gypsophila, lobelia, phlox, salvia, and statice			
<b>etridiazole plus thiophanate-methyl</b>	Mix 8–16 oz. Banrot 8G/cu. yd. soil mix, depending on container depth. See label for broadcast and sidedress applications.	Rhizoctonia, Pythium, Phytophthora, and Fusarium damping-off and stem rots	12
Registered for use on ajuga, aster, chrysanthemum, dahlia, delphinium, gypsophila, phlox, and statice			
<b>fenarimol</b>	Spray 3–5 oz. Rubigan 12.5 EC/100 gal. at 10- to 14-day intervals.	Powdery mildew	12
Registered for use on chrysanthemum, dahlia, delphinium, and phlox			

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+ Proprietary products containing the active ingredient are available for homeowner use.

<sup>a</sup> This fungicide is no longer being registered for ornamental uses. However, previously purchased product with ornamental uses on the label may be used legally.

<sup>b</sup> Not for greenhouse use.



**Table 2. Fungicides for control of diseases of herbaceous perennials (continued)**

<i>Common name</i>	<i>Commercial application information</i>	<i>Effective against</i>	<i>REI</i>
<b>fludioxonil</b>	Spray Medallion 50WP using 1–2 packets/100 gal. for Alternaria, Septoria, and Rhizoctonia. For Botrytis, use 8 packets/100 gal. Repeat at 7-to 14-day intervals.	Alternaria leaf spot, Septoria, Botrytis, Rhizoctonia web blight	12
	For soilborne disease, drench Medallion 50WP using 1 pack/100 gal. Make only one application to a seedling crop; drench transplants at 21- to 28-day intervals.	Rhizoctonia, Myrothecium, and Thielaviopsis root rot	12
The label lists aster, bleeding heart (foliar application), chrysanthemums, coreopsis (foliar), dahlia (foliar), daisy (foliar), pansy, salvia, sunflower (foliar), and verbena and suggests that growers should test unlabeled plants for phytotoxicity before widespread use. For greenhouse use only.			
<b>fosetyl-Al+</b>	Spray Aliette WDG at 2.0–5.0 lb./100 gal. at one-month intervals or drench at 0.4 to 0.8 lb./100 gal./400 sq. ft.	Downy mildew, Phytophthora, Pythium	12
Registered for use on ornamentals in nursery and greenhouse			
<b>horticultural oil</b>	Spray 1–2 gal. Ultra-Fine Oil/100 gal. from midsummer to early fall every 2–4 wk. Use only 1 gal./100 gal. rate in greenhouses.	Powdery mildew	4
Test on ornamental species other than aster, monarda, phlox, and helianthemum before large-scale application. Do not use on stressed plants, when humidity is high, or when temperature is below 50° F.			
<b>hydrogen dioxide</b>	Apply ZeroTol 27%.	Powdery mildew, algae control, disinfectant	0
Registered for use in prevention and control of horticultural diseases in commercial greenhouses, garden centers, landscapes, nurseries and interiorscapes on bedding plants, flowering plants, roses, poinsettia, ornamentals, nursery stock, cut flowers, bulbs, cuttings, seedlings, and seeds.			
<b>iprodione</b>	Spray 1–2 lb. Chipco 26019 50WP/100 gal. at 10- to 14-day intervals.	Alternaria, Ascochyta ray blight, Botrytis, ink spot, Rhizoctonia web blight	12
Registered for use on ajuga, artemisia, aster, chrysanthemum, columbine, dahlia, delphinium, dianthus, gypsophila, heuchera, iris, lilies, monarda, pachysandra, periwinkle, phlox, poppy, salvia, statice, and violet			
<b>iprodione</b>	Drench 0.4 lb. Chipco 26019 50WP/100 gal. at 14-day intervals after transplant. A corm dip is registered for control of Fusarium corm rot of gladiolus.	Rhizoctonia	12
Registered for use on ajuga, artemisia, aster, chrysanthemum, columbine, dahlia, delphinium, dianthus, gypsophila, heuchera, iris, lilies, monarda, pachysandra, periwinkle, phlox, poppy, salvia, statice, and violet			
<b>kresoxim-methyl</b>	Spray Cygnus 50W at 1.6–3.2 oz./100 gal. to drip.	Powdery mildew	12
For greenhouse use. Test on a sample of the crop to be treated. Not for use in Nassau or Suffolk Counties.			
<b>mancozeb</b>	Spray 1 1/2 lb./100 gal. Dithane T/O or Dithane T/O Rainshield or Fore T/O, or use 1.2 qt./100 gal. Dithane WF T/O or Fore Flowable XL T/O as a dilute spray at 7- to 10-day intervals as needed.	Botrytis, rust, Cercospora and Didymellina leaf spots, foliar Phytophthora blight (peony)	24

Test on a small sample before large-scale application to ornamentals not listed on the labels. Adding Latron B-1956 spreader-sticker is recommended for improved performance.

Note: Trade or brand names in this summary are given with the understanding that endorsement is not intended or criticism implied for those products not mentioned. Other labeled formulations may also be available for use. Read label carefully before using any of these chemicals.

+ Proprietary products containing the active ingredient are available for homeowner use.

<sup>a</sup>This fungicide is no longer being registered for ornamental uses. However, previously purchased product with ornamental uses on the label may be used legally.

<sup>b</sup>Not for greenhouse use.

**Table 2. Fungicides for control of diseases of herbaceous perennials (continued)**

<i>Common name</i>	<i>Commercial application information</i>	<i>Effective against</i>	<i>REI</i>
<b>mancozeb + copper hydroxide</b>	Spray 1.5–3.5 lb./A Junction DF at 7- to 14-day intervals as needed	Alternaria, anthracnose, bacterial leaf spot, Botrytis, Cercospora, downy mildew, fungal leaf spot, Phytophthora blight, powdery mildew, Septoria leaf spot	24
Test on a small sample before large-scale application to ornamentals not listed on the label. Do not apply in a spray solution with pH lower than 6.5. Incompatible with fosetyl-Al or thiophanate-methyl materials.			
<b>mancozeb</b>	Spray 1½ lb. Protect T/O/100 gal. at 7- to 10-day intervals.	Alternaria, anthracnose, Ascochyta and Botrytis blights, Cercospora, Didymellina, downy mildew, Mycosphaerella, Phyllosticta, Phytophthora dieback, Rhizoctonia web blight, rusts, and Septoria leaf spots, Volutella blight	24
Registered for use on Boston ivy, chrysanthemum, columbine, dahlia, delphinium, dianthus, English ivy, geranium, gladiolus, gypsophila, iris, lily, lirioppe, lobelia, pachysandra, pansy, peony, periwinkle, phlox, santolina, salvia, senecio, shasta daisy, statice, strawflower, and verbena			
<b>mancozeb plus thiophanate-methyl</b>	Spray 1½ lb. Zyban/100 gal. at 7- to 10-day intervals.	Anthracnose, Botrytis, downy mildew, leaf spots, powdery mildew	24
	Or use 24 oz. (2 bags) Duosan/100 gal. at 7-day intervals.		24
Registered for use on aster, chrysanthemum, dahlia, lirioppe, mondo grass, pansy, phlox, and verbena			
<b>maneb with zinc</b>	Spray 0.8–1.2 qt./A Pentathlon 37F in 100 gal. water at 7- to 10-day intervals.	Alternaria leaf spot, anthracnose, Botrytis, Cercospora, Curvularia, Didymellina, Mystrosporium, narcissus smoulder, Phytophthora blight of peony, rust, Septoria, Stemphylium	24
Registered for use on aster, carnation, chrysanthemum, dahlia, gladiolus, hollyhock, iris, lily, narcissus, pansy, peony, statice, and tulip			
<b>mefenoxam</b>	Use Subdue MAXX through irrigation, as a drench, a soil surface spray, or incorporate into mix. Note that rates are lower than for Subdue 2E. Rates for Subdue MAXX start as low as 0.13 fl oz./100 gal. for drench at seeding.	Phytophthora, Pythium	0
Registered for use on ornamentals, including bedding plants and flowers. Label cautions the user to conduct tests for safety to plants not mentioned on the label before widespread use. To minimize the potential for insensitivity, use mefenoxam or metalaxyl in alternation with other active ingredients for Pythium and Phytophthora control.			
<b>mefenoxam</b>	Apply Quell 25.1% at 0.13–1.0 fl. oz./100 gal. using 1 pt./sq. ft. for growth media depths of 4 in. or less and 1½–2 pts./sq. ft. for depths greater than 4 in.	Phytophthora, Pythium	12
Registered for use on container-, bed-, and bench-grown ornamental plants in greenhouses, shadehouses, nurseries, fields, landscapes, and interiorscapes. To minimize the potential for insensitivity, use mefenoxam or metalaxyl in alternation with other ingredients for Pythium and Phytophthora control.			

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<sup>a</sup> This fungicide is no longer being registered for ornamental uses. However, previously purchased product with ornamental uses on the label may be used legally.

<sup>b</sup> Not for greenhouse use.

**Table 2. Fungicides for control of diseases of herbaceous perennials (continued)**

<i>Common name</i>	<i>Commercial application information</i>	<i>Effective against</i>	<i>REI</i>
<b>metalaxyl</b>	Drench at rates of 0.25–2 fl. oz. Subdue 2E/100 gal. depending on container size. Reapply in 1–2 months. Subdue II is available in a drench-pac product from W. A. Cleary, packaged with 3336 in water-soluble bags. Subdue GR is a granular formulation that may be incorporated in a mix or applied to the soil surface.	Phytophthora, Pythium	0
Registered for use on ornamentals, including artemisia, aster, baby’s breath, chrysanthemum, columbine, delphinium, foxglove, gaillardia, pansy, phlox, pinks, primrose, salvia, sedum, sempervivum, Shasta daisy, and verbena. Label cautions user to conduct tests for safety to plants not mentioned on the label before widespread use. To minimize the potential for insensitivity, make no more than three applications per season. Use mefenoxam or metalaxyl in alternation with other Pythium/Phytophthora controls.			
<b>myclobutanil</b>	Use 2 oz. (1 pouch) Systhane WSP/50 gal. and apply at 10- to 14-day intervals.	Cercospora leaf spot, powdery mildew, rust	24
Registered for use on greenhouse or field ornamentals, including achillea, anemone, angelica, aster, bellflower, chrysanthemum, columbine, dahlia, delphinium, dianthus, gaillardia, geranium, hollyhock, hydrangea, iris, phlox, salvia, and sunflower. Systemic. Not for use in Nassau or Suffolk Counties.			
<b>neem oil</b> (clarified extract of)	Use 1:200 to 1:100 concentration (0.5%–1.0%) Triact 70EC at 7- to 14-day intervals.	Powdery mildew and other diseases	4
Registered for use on landscape, greenhouse, and nursery ornamentals. Test for safety on your crops.			
<b>PCNB</b>	Drench 6–12 fl. oz. Terraclor 400 40F/100 gal. to cover 400–800 sq. ft., or Defend 75 WP or Terraclor 75WP to cover 800 sq. ft., at seeding or transplanting.  Preplant, broadcast Terraclor 400 40F or Defend 75WP or Terraclor 75WP or apply Defend 10G according to label.	Rhizoctonia, Sclerotinia, and Sclerotium stem rots	12
Registered for use on bedding and flowering plants			
<b>piperalin</b>	Spray ¼ pt. Pipron 82.4 LC/100 gal.	Powdery mildew	12
Registered for greenhouse use only on chrysanthemum, dahlia, and phlox. May be used on other greenhouse ornamentals not listed on the label (growers should test first for safety).			
<b>propamocarb</b>	At seeding or transplant, drench 3 fl. oz. Banol/10 gal., applying 3 qt./10 sq. ft.	Phytophthora, Pythium	12
Registered for use on aster, chrysanthemum, dahlia, and salvia			
<b>propiconazole<sup>b</sup></b>	Spray with 5–12 oz. Banner MAXX/100 gal. as needed for some diseases, every 30 days for others.	Ascochyta ray blight, powdery mildew, rust and leaf spots (including Heterosporium leaf spot on iris)	24
Registered for use on ornamentals, including chrysanthemum, delphinium, iris, monarda, and phlox.			
<b>sulfur</b>	Apply Microthiol Special 80W at 3–10 lb./A; repeat at 5- to 10-day intervals.	Leaf spots, powdery mildew	24
Registered for use on ornamentals, including those grown in greenhouses. Also effective against two-spotted spider mite.			
<b>thiophanate-methyl+</b>	Spray 10 oz. of Cleary’s 3336 46.2% F or Fungo Flo 46.2%/100 gal. or use Fungo 50 WSB in water-soluble bags according to label every 10–14 days.	Botrytis, powdery mildew	12
Registered for use on greenhouse and field ornamentals			

Note: Trade or brand names in this summary are given with the understanding that endorsement is not intended or criticism implied for those products not mentioned. Other labeled formulations may also be available for use. Read label carefully before using any of these chemicals.

+ Proprietary products containing the active ingredient are available for homeowner use.

<sup>a</sup> This fungicide is no longer being registered for ornamental uses. However, previously purchased product with ornamental uses on the label may be used legally.

<sup>b</sup> Not for greenhouse use.

**Table 2. Fungicides for control of diseases of herbaceous perennials (continued)**

<i>Common name</i>	<i>Commercial application information</i>	<i>Effective against</i>	<i>REI</i>
<b>thiophanate-methyl+</b>	Spray 12 oz. of Cleary's 3336 50WP or 8–16 oz. of Fungo 50 WSB or 20 oz. of Cleary's 3336 46.2F/100 gal. every 10–14 days.	Anthracoze, Ascochyta, Cercospora, leaf spots, Phomopsis, powdery mildew	12
Registered for use on greenhouse and field ornamentals			
<b>thiophanate-methyl+</b>	Drench 8–16 fl. oz. of Cleary's 3336 46.2% F or 20 fl. oz. Fungo Flo 46.2%/100 gal. at 2- to 4-wk. intervals, or drench with 3 packets/200 gal. of Cleary's 3336 WP or 8–16 oz. Fungo 50WSB.	Botrytis, Cythrodcladium and Thielaviopsis root rots, Fusarium, Rhizoctonia, Sclerotinia stem, crown, and root rots	12
Registered for use on herbaceous perennials. See label for preplant dip treatment. 3336 is also available in a drench-pak from W.A. Cleary, packaged with Subdue II in water-soluble bags.			
<b>triadimefon+</b>	Spray 2–4 oz. Strike 25% Ornamental Fungicide/100 gal.	Cercospora, Didymellina leaf spots, powdery mildew, rust	12
Registered for use on aster, canna, chrysanthemum, dahlia, delphinium, dianthus, hollyhock, iris, pansy, phlox, salvia, sedum, and sunflowers			
<b>triflumizole</b>	Spray Terraguard 50W at 4–16 oz./100 gal. at 7- to 14-day intervals.	Alternaria leaf spot, powdery mildew, Rhizoctonia aerial blight	12
Registered for use on bedding and flowering plants			
<b>triflumizole</b>	Drench Terraguard 50W at 4–12 oz./100 gal. at 3- to 4-wk. intervals, or soak cuttings at 12–16 oz. for 10 min.	Cylindrocladium, Rhizoctonia, and Thielaviopsis root rot	24
Registered for use on bedding and flowering plants grown in enclosed structures			
<b>vinclozolin</b>	Spray 0.5–0.75 lb. Vorlan 50DF or Vorlan 50EG	Botrytis, Sclerotinia, Stromatinia	12
Registered for use on ajuga, artemisia, aster, bleeding heart, chrysanthemum, columbine, coral bells, delphinium, dianthus, geranium, gladiolus, gypsophila, hyacinth, iris, liatris, lily, lupine, monarda, narcissus, phlox, poppy, primrose, salvia, saxifraga, scilla, shasta daisy, statice, tulip, and violet. May be applied via thermal fogger.			

Note: Trade or brand names in this summary are given with the understanding that endorsement is not intended or criticism implied for those products not mentioned. Other labeled formulations may also be available for use. Read label carefully before using any of these chemicals.

\* Proprietary products containing the active ingredient are available for homeowner use.

<sup>a</sup> This fungicide is no longer being registered for ornamental uses. However, previously purchased product with ornamental uses on the label may be used legally.

<sup>b</sup> Not for greenhouse use.

**Table 3. Preplant nematicides/soil sterilants for use in ornamentals production**

<i>Common name</i>	<i>Commercial application information</i>	<i>REI</i>
<b>*chloropicrin<sup>a</sup></b>	Use *Chlor-O-Pic or other formulation preplant, according to label, when soil temperature is at least 60° F.	NA
Effective against nematodes, weeds, and soil fungi		
<b>dazomet</b>	Apply Basamid Granular 99% pre-plant as a soil fumigant according to label. Ideal soil temperature for treatment is 55–69° F. May not be applied to crops.	24 hours plus ventilation criteria
Effective against nematodes, weeds, and soil fungi		
<b>metam-sodium<sup>a</sup></b>	Use Vapam or other formulation preplant, when soil temperature is at least 60° F.	NA
Effective against nematodes, weeds, and soil fungi		
<b>*methyl bromide with *chloropicrin</b>	Use *Brom-O-Gas preplant, according to label, when soil temperature is at least 50° F.	NA
Effective against nematodes, weeds, and insects		

\* Restricted-use material, to be applied by certified applicator only.

<sup>a</sup> If used within a greenhouse, the structure must be empty of plants.

**Table 4. Trade names, common names, formulations, and EPA registration numbers for bactericides, fungicides, and nematicides used on herbaceous perennials and listed in this publication**

<i>Trade name</i>	<i>Common name</i>	<i>Formulation</i>	<i>EPA reg. no.</i>
Aliette	fosetyl-Al+	80 WDG	264-515
Banner MAXX	propiconazole	14.3% MEC	100-741
Banol	propamocarb	66.5%	45639-88
Banrot	etridiazole plus thiophanate-methyl	40 WP	58185-10
Banrot	etridiazole plus thiophanate-methyl	8 G	58185-23
Basamid Granular	dazomet	99%	7969-99
*Brom-O-Gas	*methyl bromide with *chloropicrin	98% + 2%	5785-42
Camelot	copper salts of fatty and rosin acids	58% EL	1812-381
Champion	copper hydroxide	77% WP	55146-1
Chipco 26019	iprodione	50 WP	359-685
*Chlor-O-Pic	*chloropicrin	96.5%	5785-17
Cleary's 3336 F	thiophanate-methyl+	46.2% F	4581-352
Cleary's 3336 WP	thiophanate-methyl+	50 WP	1001-63
Cygnus	kresoxim-methyl	50 WP	7969-124
Daconil 2787	chlorothalonil+	40.4% F	50534-9
Daconil 2787	chlorothalonil+	75 WP	50534-4
Daconil 2787	chlorothalonil+	90% WDG	50534-195
Daconil Ultrex	chlorothalonil+	82.5% SDG	50534-202
Daconil Weather Stik	chlorothalonil+	54 F	50534-209
Defend WP	PCNB	75 WP	5481-419
Defend 10G	PCNB	10 G	5481-444
Dithane T/O	mancozeb	75 W	707-180
Dithane T/O Rainshield	mancozeb	75 W	707-180
Dithane WF T/O	mancozeb	37 WF	707-156
Fore T/O	mancozeb	80 W	707-87
Fore Flowable XL T/O	mancozeb	80 WF	707-156
Fore WSP T/O in pouches	mancozeb	—	707-240
Fore WSP Rainshield T/O	mancozeb	—	707-240
Fungo Flo	thiophanate-methyl+	46.2% F	58185-33
Fungo 50 WSB	thiophanate-methyl+	50 WSB	58185-30
Heritage	azoxystrobin	50 WSB	10182-408
Junction	mancozeb plus copper hydroxide	61.1% DF	1812-360
Kocide 2000	copper hydroxide	53.8 DF	1812-358
Medallion	fludioxonil	50 WP	100-769
Microthiol Special	sulfur	80%	4581-373
PathGuard	chlorothalonil	6 F	60063-7-499
PathGuard	chlorothalonil	90 DF	60063-10-499
Pentathlon	maneb with zinc	37% F	1812-251
Phyton 27	copper sulphate pentahydrate	21.36%	49538-2
Pipron	piperalin	82.4% LC	1471-58
Protect T/O	mancozeb	80 W	4581-357
Quell	mefenoxam	25.1% EC	55146-73-400
Rubigan	fenarimol	12.5% EC	1471-146
Spectro	chlorothalonil plus thiophanate-methyl	90 WDG	1001-72
Strike	triadimefon+	25%	3125-318
Subdue MAXX	mefenoxam	21.3% MEC	100-796
Subdue	metalaxyl	2 E	100-619
Subdue GR	metalaxyl	0.97% G	100-794
Subdue II	metalaxyl	25 WP	100-717
Systhane WSP	myclobutanil	40%	707-253
Terraclor	PCNB	75% WP	400-399

\* Restricted-use material. To be applied by certified applicator only.

+ Proprietary products containing the active ingredient are available for homeowner use.

**Table 4. Trade names, common names, formulations, and EPA registration numbers for fungicides and nematocides used on herbaceous perennials and listed in this publication (continued)**

<i>Trade name</i>	<i>Common name</i>	<i>Formulation</i>	<i>EPA reg. no.</i>
Terraclor 400	PCNB	40 F	400-454
Terraguard	triflumizole	50 W	400-433
Terrazole	etridiazole	35 WP	400-416
Terrazole	etridiazole	25% E	400-417
Terrazole	etridiazole	5 G	400-419
Triact 70	neem oil	70 EC	70051-2-59807
Truban	etridiazole	30 WP	372-43
Truban	etridiazole	25% EC	372-44
Truban	etridiazole	5 G	58185-13
Ultra-Fine Oil	horticultural oil	98.8%	862-23-499
Vapam	metam-sodium		10182-150
Vorlan DF	vinclozolin	50WDG	07969-00085-58185
Vorlan EG	vinclozolin	50EG	07969-00085-58185
ZeroTol	hydrogen dioxide	27%	70299-1
Zyban	mancozeb plus thiophanate-methyl	75%	372-48

\* Restricted-use material. To be applied by certified applicator only.

+ Proprietary products containing the active ingredient are available for homeowner use.

**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup>**

<i>Insect or mite problem</i>	<i>Control</i>
<b>ANTS</b>	
<b>acephate</b>	Orthene 97, Orthene TT & O, #Pinpoint 15G
<b>bifenthrin</b>	*Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>permethrin</b>	*Astro
<b>pyrethrins</b>	Pyrenone Crop Spray, 1100 Pyrethrum TR
<b>APHIDS</b>	
<b>abamectin</b>	Avid 0.15EC
<b>acephate</b>	Address T/O, 1300 Orthene TR, Orthene 97, Orthene TT & O, #Pinpoint 15G
<b>azadirachtin</b>	Azatin XL, Neemix 4.5EC, Neemix 0.25EC, Ornazin 3% EC
<b>Beauveria</b>	BotaniGard, Naturalis-L
<b>bendiocarb</b>	*Closure 76WP
<b>bifenthrin</b>	Attain TR, *Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
<b>chlorpyrifos+cyfluthrin</b>	Duraplex TR
<b>cinnamaldehyde</b>	Cinnamite

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

\* Restricted-use material, to be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>APHIDS (continued)</b>	
<b>cyfluthrin</b>	Decathlon 20WP
<b>diazinon</b>	*Knox Out GH
<b>dichlorvos</b>	DDVP
<b>dimethoate</b>	Dimethoate 4 EC
<b>endosulfan</b>	Gowan Endosulfan 3EC, Gowan Endosulfan 50WSB, Phaser, *Thiodan 3EC, Thiodan 50WP, Fulex Thiodan Smoke
<b>fenoxycarb</b>	Preclude TR
<b>fenpropathrin</b>	*Tame 2.4EC
<b>fluvalinate</b>	*Mavrik Aquaflow
<b>horticultural oil</b>	Ultra-Fine Oil
<b>imidacloprid</b>	Marathon 1G, Marathon 60WP, Merit 75WP
<b>insecticidal soap</b>	I.S. 49.52CF (Olympic), M-Pede
<b>kinoprene</b>	Enstar II
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>methiocarb</b>	*Mesurol
<b>naled</b>	Dibrom 8E
<b>neem oil</b>	Triact 70
<b>nicotine</b>	*Nicotine Smoke
<b>permethrin</b>	*Astro
<b>phosphorodithioate</b>	*Di-Syston 15%
<b>pyrethrins</b>	1100 Pyrethrum TR, Pyrenone Crop Spray
<b>pyriproxyfen</b>	Distance
<b>sulfotepp</b>	*Fulex Dithio, *Plant Fume 103
<b>BETLES</b>	
<b>acephate</b>	Orthene TT&O
<b>azadirachtin</b>	Azatin XL
<b>Beauveria</b>	Naturalis-L
<b>bifenthrin</b>	Talstar F, *Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
<b>cyfluthrin</b>	Decathlon 20WP
<b>fenpropathrin</b>	*Tame 2.4EC
<b>fluvalinate</b>	*Mavrik Aquaflow
<b>insecticidal soap</b>	I.S. 49.52 CF
<b>isofenphos (for Japanese beetle larvae)</b>	*Oftanol 2
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

\* Restricted-use material, to be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>BEETLES (continued)</b>	
malathion	Gowan 8, Malathion 5EC
permethrin	*Astro
pyrethrins	1100 Pyrethrum TR, Pyrenone Crop Spray
spinosad	Conserve SC
<b>BLACK VINE WEEVIL</b>	
acephate	Orthene 97, Orthene TT & O
azadirachtin	Azatin XL
Beauveria	Naturalis-L
bifenthrin	*Talstar Nursery
chlorpyrifos	*Dursban 50W Nursery, *Dursban Pro
fenpropathrin	*Tame 2.4EC
fluvalinate	*Mavrik Aquaflow
lambda-cyhalothrin	Topcide, Topcide O/S
permethrin	*Astro
<i>Steinernema feltiae</i>	ScanMask
<b>CATERPILLARS</b>	
acephate	1300 Orthene TR
azadirachtin	Azatin XL, Neemix 4.5EC, Neemix 0.25EC, Ornazin 3% EC
<i>Bacillus thuringiensis aizawai</i>	Agree, BioBit HP, XenTari
<i>Bacillus thuringiensis kurstaki</i>	Dipel 2X, Javelin WG
Beauveria	Naturalis-L
bendiocarb	Closure 76WP
bifenthrin	Attain TR, *Talstar Nursery
carbaryl	Sevin 80WSP, Sevin SL
chlorpyrifos	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
chlorpyrifos+cyfluthrin	Duraplex TR
cyfluthrin	Decathlon 20WP
diflubenzuron	Dimilin 25W
fluvalinate	*Mavrik Aquaflow
horticultural oil	Ultra-Fine Oil
insecticidal soap	I.S. 49.52 CF, M-Pede
lambda-cyhalothrin	Topcide, Topcide O/S
malathion	Gowan 8, Malathion 5EC
permethrin	*Astro, *Pounce 3.2EC
pyrethrins	1100 Pyrethrum TR, Pyrenone Crop Spray

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

\* Restricted-use material, to be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.



**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>CATERPILLARS (continued)</b>	
pyrethrins+rotenone	Pyrellin EC
spinosad	Conserve SC
trichlorfon	*Dylox 80
<b>CYCLAMEN MITE</b>	
dicofol	Kelthane
endosulfan	Gowan Endosulfan 3EC, Gowan Endosulfan 50WSB, Phaser, *Thiodan 3EC
<b>EARWIGS</b>	
bifenthrin	*Talstar Nursery
chlorpyrifos	*Dursban 50W Nursery, *Dursban Pro
insecticidal soap	I.S. 49.52CF (Olympic), M-Pede
pyrethrins	Pyrenone Crop Spray
<b>FUNGUS GNATS</b>	
acephate	Orthene 1300TR
azadirachtin	Azatin XL, Ornazin 3% EC
<i>Bacillus thuringiensis israelensis</i>	Gnatrol
bifenthrin	Attain TR, *Talstar Nursery
chlorpyrifos	Duraguard ME
chlorpyrifos+cyfluthrin	Duraplex TR
cyfluthrin	Decathlon 20WP
cyromazine	Citation
diazinon	*Knox Out GH
diflubenzuron	Adept
fenoxycarb	Precision
horticultural oil	Ultra-Fine Oil
insecticidal soap	I.S. 49.52 CF
kinoprene	Enstar II
nematodes	Nemasys, ScanMask
pyrethrins	Pyrenone Crop Spray, 1100 Pyrethrum TR
pyriproxyfen	Distance
<b>GALL MIDGES</b>	
carbaryl	Sevin 80WSP, Sevin SL
spinosad	Conserve SC

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

\* Restricted-use material, to be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>GRASSHOPPERS</b>	
<b>bifenthrin</b>	*Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	*Dursban 50W Nursery, *Dursban Pro
<b>cyfluthrin</b>	Decathlon 20WP
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>LACE BUGS</b>	
<b>acephate</b>	1300 Orthene TR, #Pinpoint 15G
<b>bifenthrin</b>	*Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	*Dursban 50W Nursery, *Dursban Pro
<b>cyfluthrin</b>	Decathlon 20WP
<b>dimethoate</b>	Dimethoate 4 EC
<b>fenpropathrin</b>	*Tame 2.4EC
<b>horticultural oil</b>	Ultra-Fine Oil
<b>insecticidal soap</b>	I.S. 49.52 CF (Olympic), M-Pede
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>malathion</b>	Malathion 5EC
<b>permethrin</b>	*Astro, *Pounce 3.2EC
<b>phosphorodithioate</b>	*Di-Syston 15%
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>LEAFHOPPERS</b>	
<b>azadirachtin</b>	Azatin XL
<b>Beauveria</b>	Naturalis-L
<b>bifenthrin</b>	*Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
<b>cyfluthrin</b>	Decathlon 20WP
<b>dimethoate</b>	Dimethoate 4 EC
<b>fenpropathrin</b>	*Tame 2.4EC
<b>fluvalinate</b>	*Mavrik Aquaflow
<b>insecticidal soap</b>	I.S. 49.52 CF (Olympic), M-Pede
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>malathion</b>	Malathion 5EC
<b>neem oil</b>	Triact 70
<b>permethrin</b>	*Astro, *Pounce 3.2EC

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

\* Restricted-use material, to be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>LEAFHOPPERS (continued)</b>	
<b>phosphorodithioate</b>	*Di-Syston 15%
<b>pyrethrins</b>	Pyrenone Crop Spray, 1100 Pyrethrum TR
<b>pyrethrins + rotenone</b>	Pyrellin
<b>LEAFMINERS</b>	
<b>abamectin</b>	Avid 0.15EC
<b>acephate</b>	1300 Orthene TR
<b>azadirachtin</b>	Azatin XL, Neemix 4.5EC, Neemix 0.25EC, Ornazin 3% EC
<b>bendiocarb</b>	Closure 76WP
<b>bifenthrin</b>	*Talstar Nursery
<b>carbaryl</b> (for azalea leafminer)	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
<b>cyromazine</b>	Citation
<b>diazinon</b>	*Knox Out GH
<b>fenoxycarb</b>	Precision
<b>fenpropathrin</b>	*Tame 2.4EC
<b>horticultural oil</b>	Ultra-Fine Oil
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>permethrin</b>	*Astro, *Pounce 3.2EC
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>pyrethrins+rotenone</b>	Pyrellin
<b>spinosad</b>	Conserve SC
<b>trichlorfon</b>	*Dylox 80
<b>LEAFROLLERS</b>	
<b>acephate</b>	1300 Orthene TR, Orthene TT & O, Orthene 97
<b>azadirachtin</b>	Azatin XL
<b>Bacillus thuringiensis kurstaki</b>	Dipel 2X, Javelin WG
<b>bifenthrin</b>	Attain TR, *Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	*Dursban 50W Nursery, *Dursban Pro
<b>cyfluthrin</b>	Decathlon 20WP
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>naled</b>	Dibrom 8E
<b>permethrin</b>	*Astro, *Pounce 3.2EC
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>pyrethrins+rotenone</b>	Pyrellin

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

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# 2(ee) recommendation based on an efficacy statement.

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**Pesticide-contaminated  
clothing must be  
laundered carefully.**



## Tips for Laundering Pesticide-Contaminated Clothing

---

### Air

Hang garments **outdoors** to air.

### Prerinse

Use one of **three methods**:

1. Hose off garments outdoors.
2. Rinse in separate tub or pail.
3. Agitate in automatic washer.

### Pretreat (heavily soiled garments)

Use heavy-duty liquid detergent.

### Washer Load

Wash garments **separate** from family wash.  
Wash garments contaminated with the **same** pesticide together.

### Load Size

Wash only a **few** garments at once.

### Water Level

Use **full** water level.

### Water Temperature

Use **hot** water, 140°F or higher.

### Wash Cycle

Use **regular** 12-minute wash cycle.

### Laundry Detergent

Use a **heavy-duty detergent**.  
Use amount recommended on package or more for heavy soil or hard water.

### Rinse

Use a **full warm** rinse.

### Dry

**Line drying** is preferable, to avoid contaminating dryer.

### Clean Washer

Run complete, but empty, cycle.  
Use **hot water and detergent**.

### Rewash

**Rewash** contaminated garments **two or three times** before reuse for more complete pesticide removal.

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**Do not remove from book.**

## Tips for Laundering Pesticide-Contaminated Clothing

---

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---

**Detach and hang in laundry room.**

## Other Tips

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Remove contaminated clothing **before** entering enclosed tractor cabs.

Remove contaminated clothing **outdoors** or in an entry. If a granular pesticide was used, shake clothing outdoors. **Empty pockets and cuffs.**

Save clothing worn while handling pesticides for that use only. Keep separate from other clothing **before, during, and after** laundering.

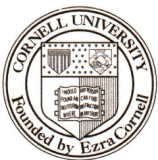
Wash contaminated clothing after **each** use. When applying pesticides daily, wash clothing **daily.**

**Clean** gloves, aprons, boots, rigid hats, respirators, and eyewear by scrubbing with detergent and warm water. Rinse thoroughly and hang in a clean area to dry.

Take these **precautions** when handling contaminated clothing:

- Ventilate area.
- Avoid inhaling steam from washer or dryer.
- Wash hands thoroughly.
- Consider wearing chemical-resistant gloves.

Prepared by Charlotte Coffman, Department of Textiles and Apparel, telephone: 607-255-2009.



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**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>MEALYBUGS</b>	
<b>acephate</b>	Address T/O, 1300 Orthene TR, Orthene TT & O, Orthene 97, #Pinpoint 15G
<b>azadirachtin</b>	Azatin XL, Neemix 4.5EC, Neemix 0.25EC, Ornazin 3% EC
<b>Beauveria</b>	BotaniGard, Naturalis-L
<b>bendiocarb</b>	Closure 76WP
<b>bifenthrin</b>	Attain TR, *Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
<b>chlorpyrifos+cyfluthrin</b>	Duraplex TR
<b>cyfluthrin</b>	Decathlon 20WP
<b>diazinon</b>	*Knox Out GH
<b>dichlorvos</b>	DDVP
<b>fenpropathrin</b>	*Tame 2.4EC
<b>horticultural oil</b>	Ultra-Fine Oil
<b>imidacloprid</b>	Marathon 1G, Marathon 60WP, Merit 75WP
<b>insecticidal soap</b>	I.S. 49.52 CF (Olympic), M-Pede
<b>kinoprene</b>	Enstar II
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>naled</b>	Dibrom 8E
<b>neem oil</b>	Triact 70
<b>permethrin</b>	*Astro
<b>phosphorodithioate</b>	*Di-Syston 15%
<b>pyrethrins</b>	1100 Pyrethrum TR, Pyrenone Crop Spray
<b>pyrethrins+rotenone</b>	Pyrellin
<b>sulfotepp</b>	*Fulex Dithio, *Plant Fume 103
<b>MILLIPEDES</b>	
<b>bifenthrin</b>	*Talstar Nursery
<b>chlorpyrifos</b>	*Dursban Pro
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>MITES</b>	
<b>abamectin</b>	Avid 0.15EC
<b>acephate</b>	Orthene 1300TR
<b>Beauveria</b>	Naturalis-L
<b>bifenazate</b>	Floramite
<b>bifenthrin</b>	Attain TR, *Talstar Nursery

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

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# 2(ee) recommendation based on an efficacy statement.



**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>MITES (continued)</b>	
chlorpyrifos	Duraguard ME, *Dursban 50W, *Dursban Pro
chlorpyrifos+cyfluthrin	Duraplex TR
cinnamaldehyde	Cinnamite
diazinon	*Knox Out GH
dichlorvos	DDVP
dicofol	Kelthane
dimethoate	Dimethoate 4 EC
fenbutatin	Vendex 50WP
fenpropathrin	*Tame 2.4EC
fluvalinate	Mavrik Aquaflow
hexythiazox	Hexygon
horticultural oil	Ultra-Fine Oil
insecticidal soap	I.S. 49.52CF (Olympic), M-Pede
lambda-cyhalothrin	Topcide
methiocarb	*Mesurol
naled	Dibrom 8E
neem oil	Triact 70
oxythioquinox	Joust
phosphorodithioate	*Di-Syston 15%
propargite	Omite 30WS, Ornamite
pyrethrins	Pyrenone Crop Spray, Pyrethrum 1100TR
pyrethrins+rotenone	Pyrellin
pyridaben	Sanmite
sulfotepp	*Fulex Dithio,*Plant Fume 103
<b>NARCISSUS BULB FLY</b>	
dimethyl phosphonate	Proxol 80 SP
trichlorfon	*Dylox 80
<b>PLANT BUGS</b>	
acephate	Orthene 97, Orthene TT & O, Naturalis-L
bifenthrin	Attain TR, *Talstar Nursery
carbaryl	Sevin 80WSP, Sevin SL
chlorpyrifos	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
cyfluthrin	Decathlon 20WP
fluvalinate	*Mavrik Aquaflow
insecticidal soap	I.S. 49.52 CF (Olympic), M-Pede
lambda-cyhalothrin	Topcide, Topcide O/S

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

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**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>PLANT BUGS (continued)</b>	
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>permethrin</b>	*Astro
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>pyrethrins+rotenone</b>	Pyrellin
<b>trichlorfon</b>	*Dylox 80
<b>SAWFLIES</b>	
<b>azadirachtin</b>	Azatin XL
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	*Dursban 50W Nursery, *Dursban Pro
<b>cyfluthrin</b>	Decathlon 20WP
<b>horticultural oil</b>	Ultra-Fine Oil
<b>insecticidal soap</b>	I.S. 49.52 CF (Olympic), M-Pede
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>spinosad</b>	Conserve SC
<b>SCALE</b>	
<b>acephate</b>	1300 Orthene TR, Orthene TT & O, Orthene 97
<b>azadirachtin</b>	Ornazin 3% EC
<b>bendiocarb</b>	Closure 76WP
<b>bifenthrin</b>	Attain TR, *Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
<b>chlorpyrifos +cyfluthrin</b>	Duraplex TR
<b>cyfluthrin</b>	Decathlon 20WP
<b>diazinon</b>	*Knox Out GH
<b>dimethoate</b>	Dimethoate 4 EC
<b>fenoxycarb</b>	Precision, Preclude TR
<b>horticultural oil</b>	Ultra-Fine Oil
<b>insecticidal soap</b>	I.S. 49.52 CF, M-Pede
<b>kinoprene</b>	Enstar II
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>neem oil</b>	Triact 70
<b>phosphorodithioate</b>	*Di-Syston 15%
<b>pyrethrins</b>	1100 Pyrethrum TR
<b>pyriproxyfen</b>	Distance
<b>sulfotepp</b>	*Fulex Dithio, *Plant Fume 103

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

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**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>SHORE FLY LARVAE</b>	
<b>azadirachtin</b>	Azatin XL, Ornazin 3% EC
<b>chlorpyrifos+cyfluthrin</b>	Duraplex TR
<b>cyromazine</b>	Citation
<b>diazinon</b>	*Knox Out GH
<b>diflubenzuron</b>	Adept
<b>fenoxycarb</b>	Precision
<b>pyriproxyfen</b>	Distance
<b>SLUGS, SNAILS</b>	
<b>iron phosphate</b>	Sluggo
<b>metaldehyde</b>	Deadline Granules
<b>methiocarb</b>	*Mesurol
<b>SOWBUGS</b>	
<b>bifenthrin</b>	*Talstar Nursery
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	*Dursban 50W Nursery, *Dursban Pro
<b>cyfluthrin</b>	Decathlon 20WP
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>SPITTLEBUGS</b>	
<b>chlorpyrifos</b>	*Dursban 50W Nursery, *Dursban Pro
<b>cyfluthrin</b>	Decathlon 20WP
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>SPRINGTAILS</b>	
<b>bendiocarb</b>	Closure 76WP
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>THRIPS</b>	
<b>abamectin</b>	Avid 0.15EC
<b>acephate</b>	Address T/O, 1300 Orthene TR, Orthene TT & O
<b>azadirachtin</b>	Azatin XL, Neemix 4.5EC, Neemix 0.25EC, Ornazin 3% EC
<b>Beauveria</b>	BotaniGard, Naturalis-L
<b>bendiocarb</b>	Closure 76WP
<b>bifenthrin</b>	Attain TR, *Talstar Nursery

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

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**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>THRIPS (continued)</b>	
<b>carbaryl</b>	Sevin 80WSP, Sevin SL
<b>chlorpyrifos</b>	Duraguard ME, *Dursban 50W Nursery, *Dursban Pro
<b>chlorpyrifos+cyfluthrin</b>	Duraplex TR
<b>cyfluthrin</b>	Decathlon 20WP
<b>diazinon</b>	*Knox Out GH
<b>dimethoate</b>	Dimethoate 4 EC
<b>fenoxycarb</b>	Precision, Preclude TR
<b>fluvalinate</b>	*Mavrik Aquaflo
<b>imidacloprid</b>	Marathon
<b>insecticidal soap</b>	I.S. 49.52 CF (Olympic), M-Pede
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>methiocarb</b>	*Mesuro
<b>nicotine</b>	*Nicotine smoke
<b>phosphorodithioate</b>	*Di-Syston 15%
<b>pyrethrins</b>	Pyrenone Crop Spray
<b>pyrethrins+rotenone</b>	Pyrellin
<b>spinosad</b>	Conserve SC
<b>sulfotepp</b>	*Fulex Dithio, *Plant Fume 103
<b>WHITEFLIES</b>	
<b>abamectin</b>	Avid 0.15EC
<b>acephate</b>	Orthene 97, 1300 Orthene TR, Orthene TT & O
<b>azadirachtin</b>	Azatin XL, Neemix 4.5EC, Neemix 0.25EC
<b>Beauveria</b>	BotaniGard, Naturalis-L
<b>bendiocarb</b>	Closure 76WP
<b>bifenthrin</b>	Attain TR, *Talstar Nursery
<b>chlorpyrifos</b>	*Dursban 50W Nursery, *Dursban Pro
<b>chlorpyrifos+cyfluthrin</b>	Duraplex TR
<b>cyfluthrin</b>	Decathlon 20WP
<b>diazinon (suppression)</b>	*Knox Out GH
<b>dichlorvos</b>	DDVP
<b>dimethoate</b>	Dimethoate 4 EC
<b>endosulfan</b>	Gowan Endosulfan 3EC, Gowan Endosulfan 50WSB, Phaser *Thiodan 3EC, Fulex Thiodan Smoke
<b>fenoxycarb</b>	Precision, Preclude TR
<b>fenpropathrin</b>	*Tame 2.4EC

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**Table 5. Pesticides registered for control of specific insect and mite pests<sup>a</sup> (continued)**

<i>Insect or mite problem</i>	<i>Control</i>
<b>WHITEFLIES (continued)</b>	
<b>fluvalinate</b>	*Mavrik Aquaflow
<b>horticultural oil</b>	Ultra-Fine Oil
<b>imidacloprid</b>	Marathon 1G, Marathon 60WP, Merit 75WP
<b>insecticidal soap</b>	I.S. 49.52 CF (Olympic), M-Pede
<b>kinoprene</b>	Enstar II
<b>lambda-cyhalothrin</b>	Topcide, Topcide O/S
<b>malathion</b>	Gowan 8, Malathion 5EC
<b>naled</b>	Dibrom 8E
<b>neem oil</b>	Triact 70
<b>oxythioquinox</b>	Joust
<b>permethrin</b>	*Astro, *Pounce 3.2EC
<b>phosphorodithioate</b>	*Di-Syston 15%
<b>pyrethrins</b>	1100 Pyrethrum TR, Pyrenone Crop Spray
<b>pyrethrins+rotenone</b>	Pyrellin
<b>pyridaben</b>	Sanmite
<b>pyriproxyfen</b>	Distance
<b>sulfotepp</b>	*Fulex Dithio, *Plant Fume 103

<sup>a</sup> See Table 6 for information regarding formulation, application, specific pests and the crop uses for which the material is registered. This table does not indicate the crop and setting for which the pesticides are registered.

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**Table 6. Insecticides for control of insect and mite pests of perennials**

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>Address T/O</b>	acephate 75%WP	70506-1-707	24	OP
Registered against: aphids, mealybugs, thrips				
For use in shadehouses and greenhouses on field-grown ornamentals and foliage plants. Apply as foliar spray. Has translaminar properties. Do not apply more than 16 fl. oz. or less than 8 fl. oz. per acre. For resistance management, make no more than six applications per cropping cycle. Do not use more frequently than at seven-day intervals. Rotate with products that have different modes of action. See label for complete plant list, rates, and specific instructions.				
<b>Adept</b>	diflubenzuron 25% WP	400-469	12	IGR
Registered against: armyworms, fungus gnat larvae, shore fly larvae				
For use in enclosed commercial structures only. Apply as soil drench or coarse spray to soil surface for control of certain soil-inhabiting insects. For control of certain foliar-feeding insects apply as foliar spray. See label for specific rates and instructions.				
<b>Agree</b>	Bacillus thuringiensis subsp. aizawai 3.8%WP	100-733	4	Bacteria
Registered against: lepidopterous larvae (caterpillars)				
Labeled for use on spearmint, peppermint, herbs, and spices. See label for specific rates and instructions.				
<b>*Astro</b>	permethrin 36.8% EC	279-3141	24	P
Registered against: adult root weevils, ants, aphids, armyworms, bagworms, Japanese beetles, lace bugs, leaf-feeding caterpillars, leafhoppers, leafminers, leafrollers, lygus bugs, mealybugs, plant bugs, root weevils, whiteflies				
For ornamental use. Apply when insects appear or feeding is noticed. Leaf burn may occur on salvia and Pteris fern. See label for specific rates and instructions.				
<b>Attain TR</b>	bifenthrin 0.5% aerosol	499-306	WPS ventilation requirements must be met	P
Registered against: aphids, armyworms, bagworms, caterpillars, fungus gnats, mealybugs, mirids, mites, omnivorous leafroller, plant bugs, scale, thrips, whiteflies				
For use in greenhouses. Greenhouse temperatures should be between 60° and 80° F for best results. See label for specific rates and instructions.				
<b>Avid 0.15EC</b>	abamectin	618-96	12	ML
Registered against: aphids, leafminers, spider mites, thrips, whiteflies				
For use on shadehouse, greenhouse, field-grown ornamentals, and foliage plants. Apply as foliar spray. Not recommended for use on ferns and Shasta daisies. See label for specific rates and instructions.				
<b>Azatin XL</b>	azadirachtin 3% EC	62552-10	4	IGR
Registered against: aphids, armyworms, bagworms, beetles, cankerworms, caterpillars, chafers, cutworms, flies, fungus gnats, grubs, leafhoppers, leafminers, leafrollers, mealybugs, psyllids, sawflies, shore flies, thrips, weevils, whiteflies				
Can be used indoors and outdoors. Controls insect larvae when they ingest or come in contact with it. Interferes with insect's ability to molt. See label for specific rates and instructions.				
<b>BioBit HP</b>	Bacillus thuringiensis subsp. aizawai	275-131	4	EB
Registered against: caterpillars				
For use on flowers, bedding plants, ornamentals, and greenhouse crops. May be used to control small immatures; apply when eggs start hatching and larvae are small. Must be ingested to be effective, so thorough coverage is essential. See label for specific rates and instructions.				
<b>BotaniGard 22WP</b>	Beauveria bassiana 20%WP	65626-10	4	M
Registered against: aphids, mealybugs, thrips, whiteflies				
For use on ornamentals and vegetables in indoor and outdoor nurseries, greenhouses, shadehouses, commercial landscapes/interiorscapes, and on turf. Designed for application without additional wetting agents and spreaders. Acts by contact: spores must attach to cuticle of target insect to be effective, so thorough coverage is essential. Most effective when used early, before high insect populations develop. Typically it takes three to seven days for insects to die and 7 to 10 days after first spray to see a reduction in an insect population. Do not tank mix with fungicides. See label for plant list, rates, and specific instructions.				

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# 2(ee) recommendation based on an efficacy statement.

**Table 6. Insecticides for control of insect and mite pests of perennials (continued)**

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>BotaniGard ES</b>	Beauveria bassiana Strain GHA 11.3%	65626-8	12	M
Registered against: aphids, mealybugs, thrips, whiteflies				
For use on ornamentals and vegetables in indoor and outdoor nurseries, greenhouses, shadehouses, commercial landscapes/interiorscapes, and on turf. Designed for application without additional wetting agents and spreaders. Acts by contact: spores must attach to cuticle of target insect to be effective, so thorough coverage is essential. Most effective when used early, before high insect populations develop. Typically it takes three to seven days for insects to die and 7 to 10 days after first spray to see a reduction in an insect population. Do not tank mix with fungicides. See label for plant list, rates, and specific instructions.				
<b>Cinnamite</b>	cinnamaldehyde 30%EC	58866-12-65626	4	BOT
Registered against: aphids, mites				
Can be used on herbs and spices, bedding plants, flowers (greenhouse and field), greenhouse ornamentals and vegetables, bare root stock, container stock, fresh-cut flowers, ornamental starts, roses, vegetable and fruit starts, shade trees, and nursery trees. Product kills primarily by contact so complete coverage is essential. All applications should be preceded by a phytotoxicity check to ensure that the material is safe for that particular plant variety. It is recommended that no more than two consecutive applications of product be used; after two applications rotate to alternative chemicals for at least two applications. Product works best in a pH range of 3.5 to 7.5; use outside this range many cause product degradation. See label for complete plant list, rates, and specific instructions.				
<b>Citation</b>	cyromazine 75% WP	100-667	12	IGR
Registered against: larvae of dipterous leafminers, fungus gnats, and shore flies				
For use on indoor and outdoor ornamentals. For use on shore fly larvae only on greenhouse ornamental crops and in interiorscapes. Rotate with insecticides with different modes of action for leafminer control. See label for specific rates and instructions.				
<b>Closure 76WP</b>	bendiocarb 76% WP	58185-18	12	C
Registered against: aphids, caterpillars, leafminers, mealybugs, scale, springtails, thrips, whiteflies				
For use in greenhouses, saran or shade houses, and on nursery ornamentals. Do not use on cardoon, coleus, espiscia, and gloxinia because plant injury may occur. See label for complete plant list, rates, and specific instructions.				
<b>Conserve SC</b>	spinosad 11.6% SC	62719-2914	4	fermentation product
Registered against: beetles, caterpillars, gall midges, leafminers, sawflies, thrips (exposed)				
For use on ornamentals in nurseries, lath houses, shadehouses, or growing outdoors. Fermentation-derived insect control agent; because of its unique mode of action, can be used in resistance management programs in rotation with any other class of products. See label for specific rates and instructions.				
<b>DDVP</b>	dichlorvos smoke	1327-36	WPS ventilation requirements must be met	OP
Registered against: aphids, mealybugs, mites, whiteflies				
Fumigant, for use in greenhouses only. Greenhouse temperatures should be between 70° and 90° F during application. See label for specific rates and instructions.				
<b>Deadline Granules</b>	metaldehyde 4% bait	64864-2	12	Molluscicide
Registered against: slugs, snails				
For use in ornamental greenhouses, on ornamental plantings, commercial ornamental nurseries, and ground covers. For best results apply in the evening. Especially beneficial if applied following rain or irrigation. See label for specific rates and instructions.				
<b>Decathlon 20WP</b>	cyfluthrin 20% WP	3125-430	12	P
Registered against: aphids, armyworms, bristly rose slugs, budworms, crickets, cutworms, flea beetles, fungus gnats, grasshoppers, Japanese beetles (adults), June beetles (adults), lace bugs, leaf-feeding caterpillars, leafhoppers, leafrollers, leaf skeletonizers, mealybugs, midges, pillbugs, plant bugs, sawfly larvae, scale (crawlers), sowbugs, spittlebugs, thrips, whiteflies				
For use on ornamentals in nurseries and greenhouses, outdoor landscaped areas, and interior plantscapes. See label for specific rates and instructions.				

\* Restricted-use material. To be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Table 6. Insecticides for control of insect and mite pests of perennials (continued)**

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>Dibrom 8E</b>	naled 58% EC	59639-15	24	OP
Registered against: aphids, leafrollers, mealybugs, spider mites, whiteflies (adults)				
For use in greenhouses as a vapor treatment of roses and other ornamentals. Avoid overtreatment and direct application to plants; corrosive to metals. See label for specific rates and instructions.				
<b>Dimethoate 4 EC</b>	dimethoate 44.8%	5905-493	48	OP
Registered against: aphids, iris borer, lace bugs, leafhoppers, mites, scale, thrips, whiteflies				
Can be applied to ornamental plantings. Use only on ornamental plants listed on label. Can be applied as foliar spray, soil drench, or soil injection. See label for specific rates and instructions.				
<b>Dimilin 25W</b>	diflubenzuron 25% WP	400-469	12	EB
Registered against: caterpillars (beet armyworm)				
For use on field- or greenhouse-grown chrysanthemums. See label for specific rates and instructions.				
<b>Dipel 2X</b>	Bacillus thuringiensis subsp. kurstaki 6.4% WP	275-37	12	IGR
Registered against: armyworms, caterpillars, leafrollers, loopers				
For use on indoor and outdoor ornamentals. Larvae of targeted insect pest must ingest deposits of product to be affected. Treat when larvae are young. See label for specific rates and instructions.				
<b>Distance</b>	pyriproxyfen 11.23%	59639-96	12	EB
Registered against: aphids (suppression only), fungus gnats, scale, shore flies, whiteflies				
For use on indoor (greenhouse, lath, and shadehouse and interiorscapes) and outdoor ornamentals, including flowering and foliage crops, ground covers, and shrubs and on nonbearing fruit and nut trees. Will not control adult insects, and it is recommended to be used in combination and/or rotation with other IPM materials. Apply no more than two times per cropping cycle or no more than two times per six months. Do not apply to Boston fern, coral bells, ghost plant, salvia, or schefflera. Do not apply to poinsettias after bract formation. See label for complete plant list, rates, and specific instructions.				
<b>*Di-Syston 15%</b>	phosphorodithioate 15%	3125-172	48	OP
Registered against: aphids, lace bugs, leafhoppers, leafminers, mites, scale, thrips, whiteflies				
For outdoor use only. For use on ornamental flowers and groundcovers and on shrubs and trees. Granular product is a systemic and should be thoroughly incorporated in the soil. See label for specific rates and instructions.				
<b>Duraguard ME</b>	chlorpyrifos 20% ME	499-367	12	OP
Registered against: ants, aphids, beetles, caterpillars, centipedes, crickets, cockroaches, flies, fungus gnats, Japanese beetles, leafhoppers, leafminers, mealybugs, mites, plant bugs, scale, thrips				
For use on indoor and outdoor ornamentals. See label for plant list, specific rates, and instructions.				
<b>DuraPlex TR</b>	chlorpyrifos 8% + cyfluthrin 1.6%	499-405	12	OP
Registered against: aphids, caterpillars, fungus gnats, mealybugs, mites, scale, shore flies, thrips, whiteflies				
Labeled for use in greenhouses and commercial garden centers only as a total release spray. May be used on bedding plants, cut flowers, hanging baskets, foliage plants, flowering plants, and ornamentals. See label for specific rates and instructions.				
<b>*Dursban 50W Nursery</b>	chlorpyrifos 50 WP <sup>1</sup>	62719-255	12	OP
Registered against: adelgids, ants, aphids, armyworms, beetles, borers, caterpillars, cutworms, earwigs, grasshoppers, lace bugs, leafhoppers, leafminers, leafrollers, mealybugs, mites, plant bugs, psyllids, sawflies, scale, sowbugs, spittlebugs, thrips, weevils, whiteflies				
Use on ornamentals growing outdoors or in outdoor nurseries. See label for specific rates and instructions.				

<sup>1</sup>New end-use products containing chlorpyrifos may be restricted or cancelled. Check the registration status before purchase and use.

\* Restricted-use material. To be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.



**Table 6. Insecticides for control of insect and mite pests of perennials (continued)**

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>*Dursban Pro</b>	chlorpyrifos 22.5% EC <sup>1</sup>	62719-166	NA	OP
Registered against: adelgids, ants, aphids, armyworms, beetles, black vine weevil, caterpillars, cutworms, earwigs, grasshoppers, lace bugs, leafhoppers, leafminers, leafrollers, mealybugs, millipedes, mites, plant bugs, psyllids, sawflies, scale, sowbugs, spittlebugs, thrips (exposed), whiteflies				
For use on outdoor ornamentals not grown for sale or commercial production. See label for specific rates and instructions.				
<sup>1</sup> New end-use products containing chlorpyrifos may be restricted or cancelled. Check the registration status before purchase and use.				
<b>Dylox 80</b>	trichlorfon 80% WP	3125-184	NA	OP
Registered against: armyworms, caterpillars, cutworms, dipterous leafminers, lygus bugs, narcissus bulb fly				
For use on landscape ornamentals and narcissus. Not for use on plants being grown for sale or other commercial use. Phytotoxicity has occurred on certain varieties of carnations and zinnias. See label for specific rates and instructions.				
<b>Enstar II</b>	kinoprene	55947-82	12	IGR
Registered against: aphids, fungus gnat larvae, mealybugs, scale, whiteflies				
For use in greenhouses and interiorscapes on ornamentals. Apply before bract formation in poinsettia. Some varieties of roses show delayed damage. See label for specific rates and instructions.				
<b>Floramite</b>	bifenazate 50% WP	400-481	12	CAE
Registered against: mites				
For use in greenhouses, shadehouses, and nurseries and on field, interiorscape, and outdoor ornamentals. Product should be applied as soon as mites appear and will provide residual control for up to 21 days. Primarily active on the motile stages of mites but also has ovicidal activity against spider mites. Do not use product in successive applications. Make only one application of product before rotating to products of an alternative chemical class, and use at least two alternative products between treatments of product. See label for complete plant list, rates, and specific instructions.				
<b>*Fulex Dithio Smoke</b>	sulfotepp	1327-38	WPS ventilation requirements must be met	OP
Registered against: aphids, brown soft scale, mealybugs, mites, thrips, whiteflies				
Fumigant for use in greenhouses only and only on azaleas, carnations, chrysanthemums, geraniums, poinsettia, roses, and snapdragons. Greenhouse temperatures should be between 70° and 90° F during application. Do not apply when foliage is wet. See label for specific rates and instructions.				
<b>Fulex Thiodan Smoke</b>	endosulfan 15% smoke	1327-35	WPS ventilation requirements must be met	CH
Registered against: aphids, whiteflies				
For use in greenhouses only. Greenhouse temperatures should be between 70° and 85° F during application. See label for specific rates and instructions.				
<b>Gnatrol</b>	Bacillus thuringiensis subsp. israelensis	275-52	4	EB
Registered against: fungus gnat larvae				
For use in ornamental and nursery plantings in greenhouse or potting soil mixtures. Use as a soil drench. Larvicide—must be applied when larvae are present. See label for specific rates and instructions.				
<b>Gowan 8</b>	malathion 79% EC	10163-21	12	OP
Registered against: aphids, beetles, caterpillars, leafhoppers, mealybugs, millipedes, plant bugs, scale, sowbugs, springtails, thrips, whiteflies				
For use on ornamentals. Avoid using on ferns and Crassula. See label for specific rates and instructions.				
<b>Gowan Endosulfan</b>	3EC (34% EC)	10163-110	24	CH
	or 50WSB (50% WP)	10163-130	24	CH
Registered against: aphids, cyclamen mites, leatherleaf fern borer, rose chafer, whiteflies				
For use on commercially grown ornamentals in greenhouses and outdoors. On chrysanthemums best results will be obtained before plants flower. Certain varieties of chrysanthemums may be injured; see label. See label for specific rates and instructions.				

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# 2(ee) recommendation based on an efficacy statement.

**Table 6. Insecticides for control of insect and mite pests of perennials** (*continued*)

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>Hexygon</b>	hexythiazox 50% WP	10163-208	12	TH
Registered against: mites (eggs and immatures)				
For use on outdoor ornamentals; not for use in greenhouses. Activity is predominantly ovicidal/larvicidal, thus must be applied before adult mite buildup. See label for specific rates and instructions.				
<b>I.S. 45.52 EC</b>	potassium salts of fatty acids 49.52%	36488-31	12	Soap
Registered against: aphids, beetles, caterpillars, crickets, earwigs, fungus gnats, lace bugs, leafhoppers, mealybugs, mites, plant bugs, sawflies, scale and scale crawlers, thrips, whiteflies				
For use on ornamentals. Kills by contact so complete coverage is essential. Apply when temperatures are below 85° F. Do not apply to nasturtium, sweetpea, violet, or newly planted cuttings. See label for specific rates and instructions.				
<b>Javelin WG</b>	Bacillus thuringiensis subsp. kurstaki 7.5%	55947-136	12	EB
Registered against: caterpillars, leafrollers				
For use on flowers and ornamentals outdoors and in the greenhouse. See label for specific rates and instructions.				
<b>Joust</b>	oxythioquinox 38% EC	3125-437	24	Dithiocarbonate
Registered against: mites, mite eggs, whiteflies				
For use on ornamentals—outdoor use only. For best results apply before insect pests are present in high numbers and before any foliar symptoms appear. See label for specific rates and instructions.				
<b>Kelthane T/O</b>	dicofol 50% WP	707-229	12	CH
Registered against: mites				
For use in nurseries, on flowers and ornamentals. Spray to ensure penetration of dense foliage and to give uniform and thorough coverage of upper and lower leaf surfaces. To prevent or delay mite resistance, alternate product with a miticide that has a different mode of action. See label for specific rates and instructions.				
<b>*Knox Out GH</b>	diazinon 23% ME	4581-379	12	OP
Registered against: aphids, fungus gnat larvae, leafminers, mealybugs, mites, scale, shore fly larvae, thrips, whiteflies (suppression)				
For use on ornamentals indoors and outdoors. Treat when insects appear. Can be used as a foliar spray or soil drench. See label for list of ornamental plants and specific rates and instructions.				
<b>Malathion 5EC</b>	malathion 57%	19713-217	12	CH
Registered against: aphids, beetles, caterpillars, lace bugs, leafhoppers, leafminers, mealybugs, millipedes, plant bugs, scale, sowbugs, spider mites, springtails, thrips, whiteflies				
For use on ornamentals and flowers, in and around greenhouses and gardens. Injury may occur on ferns, Crassula, and lantana. See label for specific rates and instructions.				
<b>Marathon 1G</b>	imidacloprid 1% G	3125-452	12	CN
Registered against: aphids, mealybugs, whiteflies				
For use on ornamental plants in commercial nurseries and greenhouses. Systemic insecticide: must be placed where roots of the plant can absorb the active ingredient. Apply when root systems are well established. See label for specific rates and instructions.				
<b>Marathon 60WP</b>	imidacloprid 60%	3125-492	12	CN
Registered against: adelgids, aphids, mealybugs, thrips (suppression), whiteflies				
For use only on greenhouse and nursery ornamental plants. For application as a soil treatment only; is a systemic insecticide. Apply when root systems are well established. See label for specific rates.				
<b>*Mavrik Aquaflo</b>	fluvinate 22%	55947-101	12	P
Registered against: aphids, beetles, caterpillars, leafhoppers, mealybugs, mites, plant bugs, thrips, weevils, whiteflies				
For use on ornamentals. Spray water should be buffered to pH 5–7. Can also be used as a dip for flower and foliage cuttings. See label for specific rates and instructions.				

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# 2(ee) recommendation based on an efficacy statement.

**Table 6. Insecticides for control of insect and mite pests of perennials (continued)**

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>Merit 75WP</b>	imidacloprid 75% WP	3125-439	NA	CN
Registered against: aphids, mealybugs, whiteflies				
For use on ornamentals in commercial and residential landscapes and interior plantscapes—not for use in greenhouses and nurseries. For use as a foliar or broadcast application. See label for specific rates and instructions.				
<b>*Mesurol</b>	methiocarb 75% WP	3125-288	24	C
Registered against: aphids, mites, slugs, snails, western flower thrips				
May be used on nursery and greenhouse ornamentals. Do not apply in conjunction with foliar fertilizers. Make up to four applications per season. See label for specific rates and instructions.				
<b>M-Pede</b>	potassium salts of fatty acids 49% EC	53219-6	12	Soap
Registered against: aphids, caterpillars, earwigs, grasshoppers, lace bugs, leafhoppers, mealybugs, mites, plant bugs, sawflies, scale, spittlebugs, thrips, whiteflies				
For use on ornamentals. Kills by contact so complete coverage is essential. See label for specific rates and instructions.				
<b>Naturalis-L</b>	Beauveria bassiana	53871-9	4	EF
Registered against: aphids, beetles, caterpillars, lygus bugs, leafhoppers, mealybugs, mites, psyllids, thrips, weevils, whiteflies				
Insect-specific fungus. See label for specific rates and instructions.				
<b>Neemix 0.25EC</b>	azadirachtin .25% EC	70051-5	12	IGR
Registered against: aphids, caterpillars, leafminers, mealybugs, thrips, whiteflies				
For use on plants in and around commercial nurseries, greenhouses, and interiorscapes. Most effective when applied two to three times in succession. Insect growth regulator—will not kill adult insects. pH sensitive; should be used within several hours of preparation for maximum effectiveness. See label for specific rates and instructions.				
<b>Neemix 4.5EC</b>	azadirachtin 4.5% EC	70051-9	12	IGR
Registered against: aphids, caterpillars, leafminers, mealybugs, thrips, whiteflies				
For use on plants in and around commercial nurseries, greenhouses, and interiorscapes. Most effective when applied two to three times in succession. Insect growth regulator—will not kill adult insects. pH sensitive; should be used within several hours of preparation for maximum effectiveness. See label for specific rates and instructions.				
<b>Nemasys</b>	Steinernema feltiae	NA	NA	Nematodes
Registered against: fungus gnat larvae				
Can be used on ornamental plants in nurseries, greenhouses, landscapes, and interiorscapes. Naturally occurring, insect-parasitic nematode that seeks out fungus gnat larvae, enters their natural body openings, and releases symbiotic bacteria that kill the pests. Can be used as a preventive or curative control. Apply as soon as possible after potting or placement in the greenhouse. Apply solution to moist soil or growing media.				
<b>*Nicotine Smoke</b>	nicotine 14% smoke	1327-41	WPS ventilation requirements must be met	BOT
Registered against: aphids, thrips				
For use in greenhouses only. Greenhouse temperatures must be between 70° and 85° F during application. Do not fumigate violets. See label for specific rates and instructions.				
<b>*Oftanol 2</b>	isofenphos 22% EC	3125-342	NA	OP
Registered against: Japanese beetle larvae				
For use on outdoor ornamental areas and outdoor container-grown ornamentals only. Apply as a coarse spray or a drench. See label for specific rates and instructions.				

\* Restricted-use material. To be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Table 6. Insecticides for control of insect and mite pests of perennials (continued)**

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>Omite 30WS</b>	propargite 30% WP	400-82	7 days (or after 48 hours if early entry PPE [listed on label] is worn)	OS
Registered against: mites				
For use on field-grown roses. Packaged in water-soluble bags. Not compatible with alkaline materials. Complete coverage of upper and lower leaf surfaces is necessary for effective control. See label for specific rates and instructions.				
<b>Ornamite</b>	propargite 30% WP	400-426	7 days (or after 48 hours if early entry PPE [listed on label] is worn)	OS
Registered against: mites				
For use on field and nursery ornamentals, including field-grown roses. Packaged in water-soluble bags. Not compatible with alkaline materials. Complete coverage of upper and lower leaf surfaces is necessary for effective control. See label for specific rates and instructions.				
<b>Ornazin 3% EC</b>	azadirachtin	5481-476	12	IGR
Registered against: caterpillars, fungus gnat larvae, leafminers, mealybugs, scale, whiteflies				
For greenhouse, lath, and shadehouse use. For use on bedding plants, cut flowers, foliage plants, and flowering plants. Product is an insect growth regulator that prevents the development of the immature insects. Product will not control adult insects. Apply no more than two times per cropping cycle or no more than two times per six months. See label for complete plant list, rates, and specific instructions.				
<b>Orthene 1300TR</b>	acephate 3% total release	499-369	24	OP
Registered against: aphids, cabbage loopers, cankerworms, caterpillars, fungus gnats, lace bugs, leafminers, leafrollers, lygus bugs, mealybugs, mites, scale, thrips, whiteflies				
For use in commercial greenhouses. Greenhouse temperatures should be between 65° and 85° F for best results. See label for specific rates and instructions.				
<b>Orthene TT &amp; O</b>	acephate 75% WP	59639-26	24	OP
Registered against: ants, aphids, black vine weevil, Japanese beetles, leafrollers, lygus bugs, mealybugs, scale (crawlers), thrips, whiteflies				
For use in greenhouses, outdoors, and on ground covers. See label for specific rates and instructions.				
<b>Orthene 97</b>	acephate 97% pellets	59639-91	24	OP
Registered against: ants, aphids, black vine weevil, leafrollers, mealybugs, plant bugs, scale (crawlers), whiteflies				
May be used on container-grown nursery stock, outdoor floral crops and ground covers, and greenhouse floral and foliage plant crops. Application of product on poinsettias after bract formation may result in phytotoxicity on certain varieties. Do not apply to chrysanthemums and roses with open flowers. Some phytotoxicity has been observed on certain foliage plants and some chrysanthemum varieties. See label for specific rates and instructions.				
<b>Phaser</b>	endosulfan 50% WP	8340-14	24	CH
Registered against: aphids, cyclamen mites, leatherleaf fern borer, rose chafer, whiteflies				
For use on commercially grown ornamentals—greenhouse and outdoors—and on leatherleaf fern. On chrysanthemums best results will be obtained before plants flower. Certain varieties of chrysanthemums may be injured; see label. See label for specific rates and instructions.				
<b>#Pinpoint 15 G</b>	acephate 15% G	59639-87	12	OP
ants, aphids, azalea lace bug, mealybugs				
For use on container-grown azalea, holly, pyracantha, photinia, crape myrtle, and poinsettia. Granular product must be uniformly distributed over soil surface. Do not apply to freshly rooted cuttings. See 2(ee) bulletin for lower rates in smaller pots. Applicator must have 2(ee) request in his or her possession at time of application if using lower rates. See label for specific rates and instructions.				
<b>*Plant Fume 103</b>	sulfotepp	8241-10	WPS ventilation requirements must be met	OP
aphids, brown soft scale, mealybugs, mites, thrips, whiteflies				
For use on greenhouse ornamentals only. Do not apply when foliage is wet. See label for specific rates and instructions.				

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# 2(ee) recommendation based on an efficacy statement.

**Table 6. Insecticides for control of insect and mite pests of perennials (continued)**

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>*Pounce 3.2EC</b>	permethrin 38.4% EC	279-3014	24	P
Registered against: bagworms, beet armyworm, cabbage looper, caterpillars, lace bugs, leafhoppers, leafminers, leafrollers, whiteflies				
For field-grown ornamental nursery stock and chrysanthemums. Apply when insects appear or feeding is noticed. Avoid spraying blooms of chrysanthemums. Leaf burn may occur on salvia and Pteris fern. See label for specific rates and instructions.				
<b>Precision</b>	fenoxycarb 25% WP	100-750	12	IGR
Registered against: fungus gnat larvae, lepidopterous leafminers, shore fly larvae, soft scales, thrips, whiteflies				
For use on ornamentals in greenhouses and outdoors. Apply as a spray or drench for control of fungus gnats and shore flies. Do not apply to poinsettia after bract formation. See label for specific rates and instructions.				
<b>Preclude PT 1200TR</b>	fenoxycarb 0.6% total release	499-375	12	IGR
Registered against: aphids, scale, thrips, whiteflies				
For use in greenhouses. Greenhouse temperatures should be between 65° and 80° F for best results. See label for specific rates and instructions.				
<b>Pyrellin EC</b>	pyrethrins (0.6%) + rotenone (0.5%)	30573-2	12	BOT
Registered against: aphids, caterpillars, leafhoppers, leafminers, leafrollers, mealybugs, mites, plant bugs, thrips, whiteflies				
May be used on greenhouse and outdoor ornamentals, herbs, and spices. May be combined with other insecticides for a quicker and more complete kill where insect resistance may a problem, and as an insect “exciter” to flush insects out of hiding and into contact with other spray residues. If use of a spreader/sticker spray adjuvant is desired, use a natural vegetable oil product. See label for specific rates and instructions.				
<b>Pyrenone Crop Spray</b>	pyrethrins (6%)	4816-490	12	BOT
Registered against: ants, aphids, beetles, caterpillars, earwigs, fungus gnats, grasshoppers, lace bugs, leafhoppers, leafminers, leafrollers, mealybugs, millipedes, mites, plant bugs, sowbugs, spittlebugs, springtails, thrips, whiteflies				
May be used on greenhouse and outdoor ornamentals, herbs, and spices. May be combined with other insecticides for a quicker and more complete kill where insect resistance may a problem, and as an insect “exciter” to flush insects out of hiding and into contact with other spray residues. If use of a spreader/sticker spray adjuvant is desired, use a natural vegetable oil product. See label for specific rates and instructions.				
<b>Pyrethrum TR 1100</b>	pyrethrins 0.5% aerosol	499-243	12	BOT
Registered against: ants, aphids, beetles, cabbage worm, caterpillars, centipedes, cockroaches, crickets, fleas, flies, fungus gnats, leafhoppers, mealybugs, mites, rose chafer, rose slug, scale, weevils, whiteflies				
For use in greenhouses, garden centers, hobby greenhouses, and nurseries. For best results apply when greenhouse temperatures are 65° to 80° F. See label for specific rates and instructions.				
<b>PYRIGRO</b>	pyriproxyfen micro-encapsulated flowable	499-439	12	IGR
Registered against: fungus gnat larvae, scale, whiteflies				
For greenhouse, lath, and shadehouse use. For use on bedding plants, cut flowers, foliage plants, and flowering plants. Insect growth regulator that prevents the development of immature insects thus will not control adult insects. Apply no more than two times per cropping cycle or no more than two times per six months. See label for complete plant list, rates, and specific instructions.				
<b>Sanmite</b>	pyridaben 75% WP	7969-106	12	PDZ
Registered against: mites (broad mites, European red mite, two-spotted mites), whiteflies				
Labeled for use in greenhouses on ornamental plants. Do not use in successive miticide applications in the same greenhouse. See label for specific rates and instructions.				
<b>ScanMask</b>	Steinernema feltiae	NA	NA	Nematodes
Registered against: black vine weevil, fungus gnat larvae				
Can be used on ornamental plants in nurseries, greenhouses, landscapes, and interiorscapes. Product is a naturally occurring, insect-parasitic nematode that seeks out fungus gnat larvae, enters their natural body openings, and releases symbiotic bacteria that kill the pests. Can be used as a preventive or a curative control. Apply as soon as possible after potting or placement in the greenhouse. Apply solution to moist soil or growing media.				

\* Restricted-use material. To be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Table 6. Insecticides for control of insect and mite pests of perennials (continued)**

<i>Trade name</i>	<i>Common name</i>	<i>EPA reg. no.</i>	<i>REI</i>	<i>Chem. class</i>
<b>Sevin 80WSP</b>	carbaryl 80% WP	264-526	12	C
Registered against: ants, aphids, armyworms, azalea leafminer, blister beetle, caterpillars, cutworms, flea beetles, Fuller rose beetle, gall midges, grasshoppers, Japanese beetle, June beetle, lace bugs, leafhoppers, leafrollers, mealybugs, orange tortrix, plant bugs, psyllids, rose chafer, rose slug, sawflies (exposed), scale, sowbugs, springtails, thrips, webworms				
For use on ornamentals. Do not use on Boston Ivy, Virginia Creeper, or maidenhair fern because injury will result. See label for specific rates and instructions.				
<b>Sevin SL</b>	carbaryl 41% EC	264-335	12	C
Registered against: ants, aphids, armyworms, azalea leafminer, blister beetle, caterpillars, cutworms, flea beetles, Fuller rose beetle, gall midges, grasshoppers, Japanese beetle, June beetle, lace bugs, leafhoppers, leafrollers, mealybugs, orange tortrix, plant bugs, psyllids, rose chafer, rose slug, sawflies (exposed), scale, sowbugs, springtails, thrips, webworms				
For use on ornamentals. Do not use on Boston Ivy, Virginia Creeper, or maidenhair fern because injury will result. See label for specific rates and instructions.				
<b>Sluggo</b>	iron phosphate 1%	67702-3-54705	none	Other
Registered against: slugs, snails				
For use in greenhouse and outdoor ornamentals. For terrestrial use only. See label for complete plant list, rates, and specific instructions.				
<b>Talstar F</b>	Bifenthrin 7.9% flowable	279-3105	12	P
Registered against: ants, aphids, black vine weevil, beetles, caterpillars, centipedes, earwigs, fungus gnats, grasshoppers, lacebugs, leafhoppers, leafminers, leafrollers, mealybugs, millipedes, mites, plant bugs, scales, sowbugs, thrips, whiteflies				
For use in greenhouses and on interiorscapes. Use of an alternate class of chemist in a treatment program is recommended to prevent or delay pest resistance. See label for complete plant list, rates, and specific instructions.				
<b>*Talstar Nursery</b>	bifenthrin 7.9% flowable	279-3155	12	P
Registered against: ants, aphids, bagworms, black vine weevil, centipedes, crickets, cutworms, earwigs, flea beetles, fungus gnats, grasshoppers, Japanese beetle (adults), lace bugs, leafhoppers, leafminers, leafrollers, mealybugs, millipedes, mites, plant bugs, scale, sowbugs, thrips, weevils, whiteflies				
For use on landscape ornamentals and in greenhouses. See label for specific rates and instructions.				
<b>*Tame 2.4EC</b>	fenprothrin 30.9% EC	59639-77	24	P
Registered against: aphids, black vine weevil, Japanese beetles, lace bugs, leafhoppers, leafminers, mealybugs, mites, whiteflies				
For use on ornamentals indoors only in New York State. To aid in preventing insect resistance, products from other chemical classes should be included with or alternated with this product in a spray program. See label for specific rates and instructions.				
<b>*Thiodan 3EC</b>	endosulfan 33.7% EC	279-2924	24	CH
Registered against: aphids, cyclamen mite, leatherleaf fern borer, rose chafer, whiteflies				
For use on ornamentals outdoors and in greenhouses, also for use on leatherleaf fern for leatherleaf fern borer. See label for specific rates and instructions.				
<b>Thiodan 50WP</b>	endosulfan 50% WP	279-1380	24	CH
Registered against: aphids, cyclamen mite, leatherleaf fern borer, rose chafer, whiteflies				
For use on ornamentals outdoors and in greenhouses, also for use on leatherleaf fern for leatherleaf fern borer. See label for specific rates and instructions.				
<b>Topcide</b>	lambda-cyhalothrin 10% WP	10182-379	24	P
Registered against: ants, aphids, armyworms, bagworms, beetles, black vine weevils (adults), caterpillars, cockroaches, crickets, cutworms, lace bugs, leafhoppers, leafminers (adults), leafrollers, mealybugs, midges, mites, pillbugs, plant bugs, root weevils, sawflies, scale, spiders, spittlebugs, thrips, whiteflies				
For use on ornamentals grown in greenhouses and shadehouses. See label for specific rates and instructions.				

\* Restricted-use material. To be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Table 6. Insecticides for control of insect and mite pests of perennials (continued)**

Trade name	Common name	EPA reg. no.	REI	Chem. class
<b>Topcide O/S</b>	lambda-cyhalothrin 10% WP	10182-417	24	P
Registered against: ants, aphids, beetles, black vine weevils (adults), caterpillars, lace bugs, leafhoppers, leafminers, leafrollers, pillbugs, plant bugs, sawflies, scale, spittlebugs, thrips, whiteflies				
For use on ornamentals in nurseries. Packaged in water-soluble bags. Applications should be started before establishment of high pest populations; apply at seven-day intervals if retreatment is necessary. See label for specific rates and instructions.				
<b>Triact 70</b>	neem oil 70%EC	70051-2	4	BOT
Registered against: aphids, leafhoppers, mealybugs, mites, scale, whiteflies				
For use on plants in and around commercial nurseries, greenhouses, and interiorscapes. Most effective when applied 2–3 times in succession. pH sensitive; should be used within several hours of preparation for maximum effectiveness. See label for specific rates and instructions.				
<b>*Turcam</b>	bendiocarb 76% WP	45639-59	12	C
Registered against: aphids, azalea leafminer, black vine weevil, lace bugs, mealybugs, scale, thrips, whiteflies				
Labeled for use on outdoor ornamentals. For control of black vine weevil larvae in container production, use as a soil drench. See label for specific rates and instructions.				
<b>Ultra-Fine Oil</b>	refined petroleum distillate 98.8%	862-23-499	4	Hort Oil
Registered against: aphids, caterpillars, fungus gnats, lace bugs, leafminers, mealybugs, mites, sawflies, scale (immatures), whiteflies				
For use on greenhouse ornamentals and outdoor flower and foliage plants. Kills by contact only so adequate coverage is essential. See label for specific rates and instructions.				
<b>*Vendex 50WP – T/N/O</b>	fenbutatin 50%WP	1812-413	48	OP
Registered against: mites				
For use on greenhouse and outdoor ornamentals. To achieve best results apply when mite populations are just beginning to build. Product performs best when the daily temperature averages above 70° F. Do not add oil to spray solution. Under greenhouse conditions, foliage and flowers of certain species may demonstrate sensitivity to repeat applications. See label for complete plant list, rates, and specific instructions.				
<b>XenTari DF</b>	<i>Bacillus thuringiensis</i> subsp. <i>aizawai</i> 10.3%	275-104	4	EB
Registered against: lepidopterous larvae (caterpillars)				
For use in greenhouses or the field. Treat when larvae are young and actively feeding. Product must be ingested to be effective, so thorough coverage is essential. See label for complete plant list, rates, and specific instructions.				
<b>XenTari WDG</b>	<i>Bacillus thuringiensis</i> subsp. <i>aizawai</i>	275-85	4	EB
Registered against: caterpillars				
For use on greenhouse, shadehouse, and outdoor nursery crops. May be used to control small immatures; apply when eggs start hatching and larvae are small. Must be ingested to be effective, so thorough coverage is essential. See label for specific rates and instructions.				

\* Restricted-use material. To be applied by certified applicator only.

# 2(ee) recommendation based on an efficacy statement.

**Note:** Trade or brand names in this summary are given with the understanding that endorsement is not intended or criticism implied for those products not mentioned. Other labeled formulations may also be available for use. Read label carefully before using any of these chemicals.

A suitable spreader-sticker might improve efficacy on perennials having glossy or waxy leaves. However, be sure to follow label directions/precautions, and test for phytotoxicity on a few plants before extensive use.

Chemical classes: BOT = Botanical  
C = Carbamate  
CAE = Carboxylic Acid Ester  
CH = Chlorinated Hydrocarbon  
CN = Chloronicotinyl  
Cyclo = Cyclodiene  
EB = Entomopathogenic Bacteria  
EF = Entomopathogenic Fungus  
IGR = Insect Growth Regulator  
M = Mycoinsecticide  
ML = Macrocyclic lactone  
N = Nematodes  
OC = Organochlorine  
OP = Organophosphate  
OS = Organosulfur  
P = Pyrethroid  
PDZ = Pyridazinone  
TH = Thiazolinone





# Pesticide Emergency Numbers

## Pesticide Spills and Accidents

CHEMTREC

1-800-424-9300

## Pesticide/Information Emergencies

National Pesticide Telecommunications Network

1-800-858-7378

## Report Oil and Hazardous Material Spills

NYS Department of Environmental Conservation

(in NY) 1-800-457-7362  
(from outside NY) 1-518-457-7362

## Agricultural Nurse Program

Western New York 1-800-388-6536

Central New York 1-800-343-7527

Eastern New York 1-518-436-5511

## Information on Symptoms and Treatment

You can obtain prompt and up-to-date information about the symptoms and treatment of cases resulting from exposure to toxic agricultural chemicals by telephoning any of the centers listed below and asking for "Poison Control Center."

When you are unable to reach a Poison Control Center or obtain the information your doctor needs, the office of the NYS Pesticide Coordinator at Cornell University may be able to assist you in obtaining such information: 607-255-1866.

# Poison Control Centers

Western New York 1-800-888-7655

Eastern New York 1-800-336-6997

Finger Lakes Region 1-800-333-0542

New York City 1-212-340-4494

Central New York 1-800-252-5655

Long Island 1-631-542-2323

Additional copies of this publication may be purchased from Cornell University, Media and Technology Services Resource Center, 7 Cornell Business & Technology Park, Ithaca, NY 14850. Phone: 607-255-2080. Fax: 607-255-9946. E-mail: resctr@cornell.edu

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This publication is issued to further Cooperative Extension work mandated by acts of Congress of May 8 and June 30, 1914. It was produced with the cooperation of the U.S. Department of Agriculture, Cornell Cooperative Extension, New York State College of Agriculture and Life Sciences, New York State College of Human Ecology, and New York State College of Veterinary Medicine, at Cornell University. Cornell Cooperative Extension provides equal program and employment opportunities. D. Merrill Ewert, Director.

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Printed on recycled paper  
160PMRHP 913/1035 1/01 8C CR MTS00229