

Pesticide Options for Important Insect, Mite and Mollusk Pests of Commercial Flowers in Florida¹

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Effective arthropod pest management in commercial floral crops requires that pests be detected in a timely manner through systematic scouting and that appropriate control measures be applied as conditions warrant. Control measures may include economical combinations of cultural controls (such as disposal of crop residue, reducing unnecessary water in the production environment, selection of less affected varieties and species, etc.), physical controls (such as screen barriers, hot water treatments of certain planting stock, hand removal of pests, etc.), biological controls (such as release of beneficial parasites, predators, and pathogens to attack the pests) and chemical controls. This insect control guide is a summary of chemical control measures that are presently available to commercial flower producers in Florida and includes beneficial nematode and microbial insecticides that also are components of biological control.

The tables in this document list pesticides whose labels provide for the product's use on any "ornamental" or "flower" crop. Products whose label permits use on named flower or ornamental crops only are not summarized here but may appear in

other EDIS publications relating to pest management in those specific crops. Tables also indicate the permitted production site, either greenhouse (G) or field or shade house (F) as well as notes taken from the labels to qualify some uses. Usually only one example of each formulation is given; however, there may be other products as effective as those listed. The tables are organized alphabetically by active ingredient and address the following major pest groups:

Aphids

Armyworms (see also Caterpillars)

Caterpillars (see also: Armyworms,

Heliothis & Helicoverpa,

Leafrollers & Leaf tiers, Loopers)

Chrysomelid Beetles

Fleahoppers

Fungus Gnats

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Heliothis & Helicoverpa (see also Caterpillars)

Leafhoppers

Leafminers

Leafrollers & Leaf tiers (see also Caterpillars)

Loopers (see also Caterpillars)

Mealybugs

Mites, Broad & Cyclamen

Mites, Eriophyid

Mites, False Spider (privet mites)

Mites, Spider

Plant (Lygus) Bugs

Shore Flies

Slugs & Snails

Thrips

Whiteflies

Precautionary statements, re-entry intervals (REI), restricted use status, and registrants are provided in a separate publication, *Insecticides, Miticides & Molluscicides Available to Florida's Floricultural Industry* (ENY-679) (<http://edis.ifas.ufl.edu/IN472>), to aid in the selection and safe use of the pesticides. When available, label hyperlinks are provided in the electronic forms of that document.

The product label communicates the lawful use of the product and must be read, understood and followed. The label contains important limitations that may not be presented in these tables. When using a pesticide for the first time, it is important to apply the product first to a small portion of the crop and wait to observe possible detrimental effects, such as leaf distortion and plant stunting.

Many pesticides decompose in the spray tank when mixed with water above pH 7. Growers should test the pH of their water and when above 7, should add a buffering solution to maintain pH between 6.5 and 7.

This summary is only a guide to aid in selection of pesticides. Care has been given to provide accurate and up-to-date information, but it is possible that, through label changes, etc., improper uses may be indicated. In all cases it is the responsibility of the applicator to read, understand, and comply with the label that accompanies each pesticide container.

As an additional precaution, keep the telephone number and address of the nearest county poison control center in a convenient location in case of an accidental poisoning. Also, keep clean copies of labels of all pesticides on your premises. In the event of a poisoning, the label of the pesticide involved should accompany the victim to the poison control center or hospital.

Table 1. Aphid (Homoptera: Aphididae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Abamectin	Avid 0.15 EC	F, G	Suppression; do not use for suppression of aphids on roses, chrysanthemum, and gerbera. Phytotoxicity has been observed on Shasta Daisy.
Acephate	1300 Orthene TR	G	
Acephate & Fenpropathrin	Tame/Orthene TR	G	Do not apply within 48 hours of a previous application.
Acetamiprid	TriStar 70 WSP	F, G	Do not make more than five applications per year. Do not reapply more than once every 7 days. Do not apply more than 22 water soluble packs per acre (0.55 lb. a.i./acre) per year.
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
Azinphos-methyl	Guthion Solupak	F	Nursery stock
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
<i>Beauveria bassiana</i> Strain GHA	Botanigard 22 WP	F, G	Nursery & shade house (F);
	Botanigard ES	F, G	Nursery (F)
	Mycotrol O	F, G	Edible flowers only
Bifenthrin	Attain TR Attain TR Micro	G	
	Talstar Flowable Talstar GH Prescription	G	
	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Capsaicin & other capsaicinoids	Hot Pepper Wax	F, G	Repels; avoid use on variegated African violets and <i>Dicentra eximia</i> . Do not exceed a rate of 1:32 in greenhouses. Avoid use if greenhouse temperature exceeds 85° F before the product has dried.
Chlorpyrifos	Chlorpyrifos Pro 2	F	Nursery stock in nurseries.
	Chlorpyrifos Pro 4	F, G	Nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Duragard ME	F, G	Nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
	Dursban 50W	F	Nursery
Chlorpyrifos & Cyfluthrin	Duraplex TR	G	

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Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Clarified Hydrophobic Extract of Neem Oil	Triact 70	F, G	Test before applying to carnation and the flowers of: Impatiens, fuchsia, hibiscus, and some roses. Most effective when applied early to mid-morning or late afternoon.
Cyfluthrin	Decathlon 20 WP	F, G	
Deltamethrin	Deltagard GC 5 SC	F	Nursery
Diazinon	Diazinon 50W Diazinon Ag 500	F	Precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
	KnoxOut NL	F	Nursery
Endosulfan	Endosulfan 3 EC Endosulfan 50 WP Thionex (Endosulfan) 3 EC Thionex (Endosulfan) 50	F, G	Do not exceed 3.0 lbs. a.i. per acre per year. On chrysanthemums, best results will be obtained if applied before plants flower.
	WP Reclude TR	G	
Fenoxycarb	WP Reclude TR	G	
Fenpropathrin	Tame 2.4EC	F, G	Nursery & shade house (F); do not use less than a 7 day re-treatment interval.
Imidacloprid	Marathon 1% Granular	F, G	Nursery (F); for outdoor ornamentals grown in beds, applications can not exceed a total of 40 lbs. per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon 60 WP	F, G	Nursery (F); this product is to be applied as a soil treatment only. For outdoor ornamentals grown in beds applications can not exceed a total of 10.7 oz. (0.4 lbs. active ingredient) per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon II	F, G	For outdoor ornamentals do not apply more than 1.6 pt. (0.4 lbs. a.i.) per acre per year. Do not apply thru any type of irrigation system.
Lambda-cyhalothrin	Scimitar GC	F, G	Nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Malathion	Atrapa 5E Gowan Malathion 8 F Malathion 5 EC	F	

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Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Naled	Dibrom 8 Emulsive	G	Vapor treatment; spotting, bronzing or localized burning can occur under certain climatic conditions such as slow drying and high humidity or stress caused by drought or high temperature. White Butterfly and Golden Rapture roses, Pink Champagne chrysanthemums, green wandering jew, poinsettias and Dutchman's pipe may be injured by vapor.
Oxydemeton-methyl	Metasystox-R	F	Field grown nursery stock; do not make more than 2 applications per season.
Permethrin	Astro	G	Do not apply more than 2.0 lb. a.i. per acre per year.
Potassium Salts of Fatty Acids	Insecticidal Soap 49.52 CF	F, G	Caution: Do not use on new transplants, newly rooted cuttings, plants stressed by drought, or when tender new foliage is present. Avoid application when leaf temperature exceeds 85°F. Note: Do not use on crown of thorns and test on other euphorbias for phytotoxicity. Do not use on bleeding heart, lantana, lilies or sweetpeas. Some varieties of azaleas, begonias, camellias, fuschias, gardenias, orchids, and impatiens have shown sensitivity. Do not apply to poinsettias after bract coloration begins. Test on chrysanthemums for varietal sensitivity and do not apply to open blooms. Do not apply to ornamentals stressed by drought. Test on eugenia and euonymus for varietal and drought sensitivity.
	M-Pede	F, G	For control of aphids must combine with other pesticides. Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.

Table 1. Aphid (Homoptera: Aphididae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Pymetrozine	Endeavor	F, G	For outdoor use, do not apply more than 48 oz. per acre per year. For indoor use, do not apply more than 100 oz. per acre per year.
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	
	Pyrenone Crop Spray Pyreth-It	F, G	
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.
Pyriproxyfen	Distance IGR	F, G	Suppression; for foliar spray application, apply Distance no more than two times per cropping cycle or no more than two times per 6 months. For sprench application, if a second application is needed, allow a minimum of 21 days between applications. For drench application: Do not drench plants more than one time per crop cycle. Phytotoxicity has been observed on salvia (<i>Salvia</i> spp.), ghost plant (<i>Graptopetalum paraguayense</i>), schefflera (<i>Schefflera</i> spp.), gardenia (<i>Gardenia</i> spp.), and coral bells (<i>Heuchera sanguinea</i>). It is therefore recommended that Distance not be used on these plants. Do not apply to poinsettia after bract formation.

Table 1. Aphid (Homoptera: Aphididae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.
S-Kinoprene	Enstar II	G	Application should be made to poinsettia before bract formation. Foliar damage on some sensitive varieties can result. Some varieties of roses, such as Yellow Blooded roses, show delayed damage. Slight to moderate injury has occurred on some blooms under certain conditions, suggest application be made in pre-bloom stage.
Tau-Fluvalinate	Mavrik Aquaflo	F, G	Repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.
Thiamethoxam	Flagship 25WG	F, G	Shade house, container & nursery grown (F); do not exceed 8 oz. per acre per crop or year, which ever is shorter.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 2. Armyworm (Lepidoptera: Noctuidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
<i>Bacillus thuringiensis aizawai</i>	Xentari DF	F, G	
<i>Bacillus thuringiensis kurstaki</i>	Dipel DF Javelin WG	F, G	
	Troy-BT 2WP	F, G	May be used to control armyworms (1st and 2nd instars) when populations are light and full coverage sprays are applied. If mature worms or heavy populations are present a contact insecticide should be used to enhance control.
<i>Bacillus thuringiensis kurstaki</i> strain ABTS-351	Biobit HP	F, G	May be used to control armyworms (1st and 2nd instars) when populations are light and full coverage sprays are applied. If mature worms or heavy populations are present a contact insecticide should be used to enhance control.
<i>Bacillus thuringiensis kurstaki</i> EG2348	Condor Bioinsecticide	F, G	Precautions: Do not use in combination with any chlorothalonil based fungicide (Bravo, Terranil etc.). Mixing with other oil based products or surfactants could increase the risk of phytotoxicity.
<i>Bacillus thuringiensis kurstaki</i> EG7841	Crymax Bioinsecticide	F, G	
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
Bifenthrin	Talstar Flowable Talstar GH Prescription	G	Beet armyworm
	Talstar N	F, G	Nursery & shade house (F); beet armyworm (G); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
	Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Chlorpyrifos	Chlorpyrifos Pro 2	F	Nursery stock in nurseries
	Chlorpyrifos Pro 4	F, G	Nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Dursban 50W	F	Nursery

Table 2. Armyworm (Lepidoptera: Noctuidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Capsaicin & other capsaicinoids	Hot Pepper Wax	F, G	Repels beet armyworm; avoid use on variegated African violets and <i>Dicentra eximia</i> . Do not exceed a rate of 1:32 in greenhouses. Avoid use if greenhouse temperature exceeds 85°F before the product has dried.
Cyfluthrin	Decathlon 20 WP	F, G	
Deltamethrin	Deltagard GC 5 SC	F	Nursery
Diazinon	Diazinon 50W Diazinon AG 500	F	Precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
Diflubenzuron	Adept	F, G	Shade house (F); do not make more than four applications per crop. Do not apply to poinsettias, hibiscus, and Rieger begonia. Do not reuse potting media, which has been treated with Adept. Do not apply to plants grown on capillary water mats.
	Dimilin 25W	F, G	Beet armyworm; shade house (F)
	Dimilin SC	F, G	Shade house (F)
Fenpropathrin	Tame 2.4EC	F, G	Beet armyworm; nursery & shade house (F); do not use less than a 7 day re-treatment interval.
<i>Heterorhabditis indica</i>	GrubStake 100	F, G	Store at 65°F; use within 5 days of receipt. Native to Florida. Do not inject into drip irrigation systems. Do not apply within 21 days of a nematicide application.
Lambda-cyhalothrin	Scimitar GC	F, G	Nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Novaluron	Pedestal	F, G	Container grown plants; nursery & shade house (F); do not apply more than once every 30 days. Do not make more than two applications per crop year. Do not apply more than 52 fl. oz. per acre per year per crop. Do not apply to poinsettias. Resistance management: Do not apply in successive applications, use only one application before rotation with other classes of insecticides with different modes of action. Use at least two alternative products between applications of Pedestal. Do not use more than once within each generation cycle.

Table 2. Armyworm (Lepidoptera: Noctuidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Permethrin	Ambush 25W	F	Beet armyworm; field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals.
	Ambush Pounce 25 WP Pounce 3.2 EC Pounce WSB	F	Beet armyworm; field grown nursery stock
	Astro	G	Beet armyworm; do not apply more than 2.0 lb. a.i. per acre per year.
	Clean Crop Permethrin 3.2 EC	F	Beet armyworm; field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals. Avoid spraying chrysanthemum blooms.
	Perm-Up 3.2EC	F	Beet armyworm; field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia.
Pyrethrins & Piperonyl Butoxide	Pyrenone Crop Spray Pyreth-It	F, G	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.
Spinosad	Conserve SC	F, G	When used in greenhouse or areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds): Do not apply more than 10 times in a 12-month period per crop regardless of the pest being treated. Because generations of a specific pest may overlap, rotate control products and never apply more than three consecutive applications of Conserve SC or products containing the same a.i. or products with the same mode of action. Except for greenhouses and structures that can be altered to be closed or open, do not reapply within less than 7 days.
<i>Steinernema carpocapsae</i>	Millenium	F, G	Nursery (F)
Tau-Fluvalinate	Mavrik Aquaflo	F, G	Repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.

Table 2. Armyworm (Lepidoptera: Noctuidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Tebufenozide	Confirm T/O	F, G	Nursery (F); do not use to control more than three consecutive generations of pests in a cropping area (field) regardless of the crop rotation on that field. If you are unsure of the number of generations treated do not use more than four times within any 80-day interval. If Confirm has been applied four times in 80 days or less, allow at least 40 days to pass before making additional applications.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 3. Control measures for other caterpillars (Lepidoptera) available to commercial producers of any flower crop in Florida. Also see tables for these other named caterpillars: Armyworms, *Helicoverpa* (corn earworm, etc) and *Heliothis* (tobacco budworm, etc.) Leafrollers, Leaf tiers, and Loopers.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
Acephate	1300 Orthene TR	G	Tent caterpillars
Acephate & Fenpropathrin	Tame/Orthene TR	G	Tent caterpillars; do not apply within 48 hours of a previous application.
<i>Bacillus thuringiensis aizawai</i>	Xentari DF	F, G	Azalea caterpillar, bagworm (F), diamondback moth, ello moth (hornworm), Fall webworm (F), io moth, Jack pine budworm, oleander moth, saddleback caterpillar (F), tent caterpillars (F)
<i>Bacillus thuringiensis kurstaki</i>	Dipel DF	F, G	Azalea caterpillar, bagworm, diamondback moth, ello moth (hornworm), Fall webworm, io moth, oleander moth, saltmarsh caterpillar, tent caterpillars
	Javelin WG	F, G	Bagworm, bollworm, cutworm, diamondback moth, Fall webworm, filbert webworm, hornworms, orangedog, saltmarsh caterpillar, tent caterpillar, tobacco hornworm, tomato pinworm
	Troy-BT 2WP	F, G	Azalea caterpillar, diamondback moth, ello moth (hornworm), io moth, oleander moth
<i>Bacillus thuringiensis kurstaki</i> strain ABTS-351	Biobit HP	F, G	Azalea caterpillar, diamondback moth, ello moth (hornworm), io moth, oleander moth, sod webworm

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Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
<i>Bacillus thuringiensis</i> <i>kurstaki</i> EG2348	Condor Bioinsecticide	F, G	Azalea moth, bagworm (F), diamondback moth, ello moth (hornworm), fall webworm (F), io moth, oleander moth, saddleback caterpillar (F), tent caterpillar (F), tortrix (F); precautions: Do not use in combination with any chlorothalonil based fungicide (Bravo, Terranil etc.). Mixing with other oil based products or surfactants could increase the risk of phytotoxicity.
<i>Bacillus thuringiensis</i> <i>kurstaki</i> EG7841	Crymax Bioinsecticide	F, G	Azalea moth, bagworm (F), diamondback moth, ello moth (hornworm), fall webworm, Florida fern caterpillar, io moth, oleander moth, saddleback caterpillar (F), tent caterpillar (F), tortrix (F)
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
Bifenthrin	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Carbaryl	Carbaryl 4L Carbaryl 80S	F	Bagworms, catalpa sphinx, cutworms, oleander caterpillar, poinsettia hornworm, puss caterpillar, tent caterpillars, webworms
	Cutworm & Cricket Bait	F	Cutworm
	Sevin 80 WSP Sevin SL	F	Bagworms, catalpa sphinx, cutworms, oleander caterpillar, poinsettia hornworm, puss caterpillar, tent caterpillars, webworms; application to wet foliage or during periods of high humidity may cause injury to tender foliage.
Chlorfenapyr	Pylon	G	Non-edible ornamentals; do not apply Pylon more than two times consecutively or a total of three times during a growing cycle (not more than 41 fl. oz. of product/100 gal. / crop / season or 0.64 lbs. of a.i. / 100 gal. / crop / season) (start to finish for one ornamental crop). Do not apply Pylon to consecutive crops in a greenhouse unless the Pylon is applied in combination with other effective miticides or insecticides with a different mode of action. Phytotoxicity is likely to occur to some varieties of carnations, dianthus, kalanchoe, poinsettia, roses, salvia, and zinnia. Additions of crop oils, surfactants, and fertilizers or other tank additives have been shown to increase the likelihood of foliar injury.

Table 3. Control measures for other caterpillars (Lepidoptera) available to commercial producers of any flower crop in Florida. Also see tables for these other named caterpillars: Armyworms, *Helicoverpa* (corn earworm, etc) and *Heliothis* (tobacco budworm, etc.) Leafrollers, Leaf tiers, and Loopers.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Chlorpyrifos	Chlorpyrifos Pro 2	F	Bagworms, catalpa sphinx, cutworms, Fall webworms, hornworms, oleander caterpillars, puss caterpillars, tent caterpillars; nursery stock in nurseries
	Chlorpyrifos Pro 4	F, G	Bagworms, catalpa sphinx, cutworms, Fall webworms, hornworms, oleander caterpillars, puss caterpillars, tent caterpillars; nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Duragard ME	F, G	Cabbage worms, hornworms; nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
	Dursban 50W	F	Bagworms, catalpa sphinx, cutworms, Fall webworms, hornworms, oleander caterpillars, puss caterpillars, tent caterpillars; nursery
Cyfluthrin	Decathlon 20 WP	F, G	
Deltamethrin	Deltagard GC 5 SC	F	Nursery
Diazinon	Diazinon 50W Diazinon AG 500	F	Bagworms, cutworms, Fall webworms, tent caterpillars; precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
<i>Heterorhabditis indica</i>	GrubStake 100	F, G	Webworm, tree borers including banana moth; store at 65° F; use within 5 days of receipt. Native to Florida. Do not inject into drip irrigation systems. Do not apply within 21 days of a nematicide application.
Lambda-cyhalothrin	Scimitar GC	F, G	Leaf-feeding caterpillars & cutworms; nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Malathion	Atrapa 5E Gowan Malathion 8 F Malathion 5 Malathion 5 EC	F	Bagworm, tent caterpillar

Table 3. Control measures for other caterpillars (Lepidoptera) available to commercial producers of any flower crop in Florida. Also see tables for these other named caterpillars: Armyworms, *Helicoverpa* (corn earworm, etc) and *Heliothis* (tobacco budworm, etc.) Leafrollers, Leaf tiers, and Loopers.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Permethrin	Ambush 25W	F	Cutworms; field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals.
	Ambush	F	Cutworm; field grown nursery stock
	Pounce 25 WP Pounce 3.2 EC Pounce WSB	F	Bagworm; field grown nursery stock
	Clean Crop Permethrin 3.2 EC	F	Bagworm; field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals. Avoid spraying chrysanthemum blooms.
	Perm-Up 3.2 EC	F	Bagworm; field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia.

Table 3. Control measures for other caterpillars (Lepidoptera) available to commercial producers of any flower crop in Florida. Also see tables for these other named caterpillars: Armyworms, *Helicoverpa* (corn earworm, etc) and *Heliothis* (tobacco budworm, etc.) Leafrollers, Leaf tiers, and Loopers.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Potassium Salts of Fatty Acids	Insecticidal Soap 49.52 CF	F, G	Tent caterpillars; caution: Do not use on new transplants, newly rooted cuttings, plants stressed by drought, or when tender new foliage is present. Avoid application when leaf temperature exceeds 85°F. Note: Do not use on crown of thorns and test on other euphorbias for phytotoxicity. Do not use on bleeding heart, lantana, lilies or sweetpeas. Some varieties of azaleas, begonias, camellias, fuschias, gardenias, orchids, and impatiens have shown sensitivity. Do not apply to poinsettias after bract coloration begins. Test on chrysanthemums for varietal sensitivity and do not apply to open blooms. Do not apply to ornamentals stressed by drought. Test on eugenia and euonymus for varietal and drought sensitivity.
	M-Pede	F, G	Buck moth larvae, cutworm (F), tent caterpillar. Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.
Pyrethrins & Piperonyl Butoxide	Pyrenone Crop Spray Pyreth-It	F, G	
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.

Table 3. Control measures for other caterpillars (Lepidoptera) available to commercial producers of any flower crop in Florida. Also see tables for these other named caterpillars: Armyworms, *Helicoverpa* (corn earworm, etc) and *Heliothis* (tobacco budworm, etc.) Leafrollers, Leaf tiers, and Loopers.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Webworms; bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Webworms; caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.
Spinosad	Conserve SC	F, G	Lepidopterous larvae; when used in greenhouse or areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds): Do not apply more than 10 times in a 12-month period per crop regardless of the pest being treated. Because generations of a specific pest may overlap, rotate control products and never apply more than three consecutive applications of Conserve SC or products containing the same a.i. or products with the same mode of action. Except for greenhouses and structures that can be altered to be closed or open, do not reapply within less than 7 days.
<i>Steinernema carpocapsae</i>	Millenium	F, G	Nursery (F); cutworms, sod webworms, banana moths
Tau-Fluvalinate	Mavrik Aquaflow	F, G	Cutworms, leaf-feeding caterpillars; repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.

Table 3. Control measures for other caterpillars (Lepidoptera) available to commercial producers of any flower crop in Florida. Also see tables for these other named caterpillars: Armyworms, *Helicoverpa* (corn earworm, etc) and *Heliothis* (tobacco budworm, etc.) Leafrollers, Leaf tiers, and Loopers.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Tebufenozide	Confirm T/O	F, G	Bagworms, cutworms, fall webworm, Florida fern caterpillar, puss caterpillar, Eastern tent caterpillar, Forest tent caterpillar, Western tent caterpillar; nursery (F); do not use to control more than three consecutive generations of pests in a cropping area (field) regardless of the crop rotation on that field. If you are unsure of the number of generations treated do not use more than four times within any 80-day interval. If Confirm has been applied four times in 80 days or less, allow at least 40 days to pass before making additional applications.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 4. Chrysomelid Beetle (cucumber, flea, and leaf beetles) (Coleoptera: Chrysomelidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Azadirachtin	Azatin XL	F, G	
	Ornazin 3% EC	F	
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Cucumber & flea beetles; do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
Bifenthrin	Talstar GH Prescription Talstar Flowable	G	Flea beetles
	Talstar N Talstar Nursery Flowable	F, G	Flea beetles; nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Carbaryl	Carbaryl 4L Carbaryl 80S	F	Flea beetle
	Sevin 80 WSP Sevin SL	F	Flea beetle; application to wet foliage or during periods of high humidity may cause injury to tender foliage.

Table 4. Chrysomelid Beetle (cucumber, flea, and leaf beetles) (Coleoptera: Chrysomelidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Chlorpyrifos	Chlorpyrifos Pro 2	F	Nursery stock in inurseries
	Chlorpyrifos Pro 4	F, G	Nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Duragard ME	F, G	Nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
	Dursban 50W	F	Nursery
Cryolite	Kryocide	F	Flea beetles
Cyfluthrin	Decathlon 20WP	F, G	Flea beetles
Deltamethrin	Deltagard GC 5 SC	F	Flea beetles; nursery
Diazinon	Diazinon 50W Diazinon AG 500	F	Flea beetles; precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
Imidacloprid	Marathon II	F, G	Leaf beetles; for outdoor ornamentals do not apply more than 1.6 pt. (0.4 lbs. a.i.) per acre per year. Do not apply thru any type of irrigation system.
Lambda-cyhalothrin	Scimitar GC	F, G	Flea beetles; nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	Flea, cucumber & watermelon beetles
	Pyrenone Crop Spray	F, G	
	Pyreth-It	F, G	Flea & cucumber beetles
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	Flea beetles
Refined Petroleum Distillate	Ultra-Fine Oil	F	Leaf beetle larvae; caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.

Table 4. Chrysomelid Beetle (cucumber, flea, and leaf beetles) (Coleoptera: Chrysomelidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Spinosad	Conserve SC	F, G	When used in greenhouse or areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds): Do not apply more than 10 times in a 12-month period per crop regardless of the pest being treated. Because generations of a specific pest may overlap, rotate control products and never apply more than three consecutive applications of Conserve SC or products containing the same a.i. or products with the same mode of action. Except for greenhouses and structures that can be altered to be closed or open, do not reapply within less than 7 days.
Tau-Fluvalinate	Mavrik Aquaflow	F, G	Flea & cucumber beetles; repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 5. Fleahopper (Hemiptera: Miridae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 6. Fungus Gnat (Diptera: Sciaridae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Acephate	1300 Orthene TR	G	
Acephate & Fenpropathrin	Tame/Orthene TR	G	Do not apply within 48 hours of a previous application.
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
<i>Bacillus thuringiensis israelensis</i>	Gnatrol	F, G	In potting soil mixtures only (F); soil drench for control of larvae.
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
Bifenthrin	Attain TR Attain TR Micro Talstar Flowable Talstar GF Prescription	G	
	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
	Talstar Nursery Granular	F	Larvae; for balled and containerized nursery stocks.
Chlorfenapyr	Pylon	G	Early stage larvae (<i>Bradysia</i> sp.); non-edible ornamentals; do not apply Pylon more than two times consecutively or a total of three times during a growing cycle (not more than 41 fl. oz. of product/100 gal. / crop / season or 0.64 lbs. of a.i. / 100 gal. / crop / season) (start to finish for one ornamental crop). Do not apply Pylon to consecutive crops in a greenhouse unless the Pylon is applied in combination with other effective miticides or insecticides with a different mode of action. Phytotoxicity is likely to occur to some varieties of carnations, dianthus, kalanchoe, poinsettia, roses, salvia, and zinnia. Additions of crop oils, surfactants, and fertilizers or other tank additives have been shown to increase the likelihood of foliar injury.
Chlorpyrifos	Duragard ME	F, G	Nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
Chlorpyrifos & Cyfluthrin	Duraplex TR	G	
Cyfluthrin	Decathlon 20 WP	F, G	
Cyromazine	Citation	F, G	Container grown (F) or shade house grown (F); will not control adult stages.
Deltamethrin	Deltagard GC 5 SC	F	Nursery
Diazinon	KnoxOut NL	F	Larvae; nursery

Table 6. Fungus Gnat (Diptera: Sciaridae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Diflubenzuron	Adept	F, G	Shade house (F); do not make more than four applications per crop. Do not apply to poinsettias, hibiscus, and Rieger begonia. Do not reuse potting media, which has been treated with Adept. Do not apply to plants grown on capillary water mats.
Fenoxycarb	Precision	F, G	<i>Bradysia</i> spp.; Container grown (F) or shade house grown (F); will not control the adult stages of insect pests. Do not exceed a maximum of 30 applications per year for greenhouse use. Applications should not be made to poinsettia after bract formation.
Permethrin	Astro	G	
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	
	Pyrenone Crop Spray	F, G	
Pyriproxyfen	Distance IGR	F, G	For foliar spray application, apply Distance no more than two times per cropping cycle or no more than two times per 6 months. For srench application, if a second application is needed, allow a minimum of 21 days between applications. For drench application: Do not drench plants more than one time per crop cycle. Phytotoxicity has been observed on salvia (<i>Salvia</i> spp.), ghost plant (<i>Graptopetalum paraguayense</i>), schefflera (<i>Schefflera</i> spp.), gardenia (<i>Gardenia</i> spp.), and coral bells (<i>Heuchera sanguinea</i>). It is therefore recommended that Distance not be used on these plants. Do not apply to poinsettia after bract formation.
S-Kinoprene	Enstar II	G	Application should be made to poinsettia before bract formation. Foliar damage on some sensitive varieties can result. Some varieties of roses, such as Yellow Blooded roses, show delayed damage. Slight to moderate injury has occurred on some blooms under certain conditions, suggest application be made in pre-bloom stage.
<i>Steinernema carpocapsae</i>	Millenium	F, G	Nursery (F)
<i>Steinernema feltiae</i>	Nemasys	F, G	Nursery (F); if fungus gnats are established it may take 2-3 weeks before the number of adults is noticeably reduced. Do not use through drip irrigation or mist system.
Thiamethoxam	Flagship 25WG	F, G	Shade house, container & nursery grown (F); do not exceed 8 oz. per acre per crop or year, which ever is shorter.

Table 6. Fungus Gnat (Diptera: Sciaridae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 7. *Heliothis* (tobacco budworm, etc.), *Helicoverpa* (corn earworm, etc.) control measures available to commercial producers of any flower crop in Florida. See also caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Azadirachtin	Azatin XL	F, G	Corn earworm, tobacco budworm
	Ornazin 3% EC	F	Bollworm, corn earworm
<i>Bacillus thuringiensis aizawai</i>	Xentari DF	F, G	<i>Heliothis</i> , tobacco budworm
<i>Bacillus thuringiensis kurstaki</i>	Dipel DF Troy-BT 2WP	F, G	<i>Heliothis</i> , tobacco budworm
	Javelin WG	F, G	Bollworm, <i>Heliothis</i> , <i>Helicoverpa</i> , tobacco budworm
<i>Bacillus thuringiensis kurstaki</i> strain ABTS-351	Biobit HP	F, G	<i>Heliothis</i> , tobacco budworm
<i>Bacillus thuringiensis kurstaki</i> EG2348	Condor Bioinsecticide	F, G	Tobacco budworm; precautions: Do not use in combination with any chlorothalonil based fungicide (Bravo, Terranil etc.). Mixing with other oil based products or surfactants could increase the risk of phytotoxicity.
<i>Bacillus thuringiensis kurstaki</i> EG7841	Crymax Bioinsecticide	F, G	Tobacco budworm
Permethrin	Ambush Ambush 25W Clean Crop Permethrin 3.2 EC Pounce 3.2 EC	F	<i>Heliothis</i> ; field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: <i>Salvia</i> , <i>dieffenbachia</i> . Application to blooming plants may cause browning of petals.
	Pounce 25 WP Pounce WSB	F	<i>Heliothis</i> ; field grown nursery stock
	Astro	G	<i>Heliothis</i> ; do not apply more than 2.0 lb. a.i. per acre per year.
	Perm-Up 3.2EC	F	<i>Heliothis</i> ; field grown roses
Polyhedral Occlusion Bodies (POBs) of the nuclear polyhedrosis virus of <i>Helicoverpa zea</i>	Gemstar LC	F	Corn earworm (<i>Helicoverpa zea</i>); tobacco budworm (<i>Heliothis virescens</i>); use non-chlorinated water at a ph near 7.0 in the spray tank mix.
Pyrethrins & Piperonyl Butoxide	Pyrenone Crop Spray	F, G	Bollworm, <i>Heliothis</i> , corn earworm
	Pyreth-It	F, G	<i>Heliothis</i> sp., corn earworm

Table 7. *Heliothis* (tobacco budworm, etc.), *Helicoverpa* (corn earworm, etc.) control measures available to commercial producers of any flower crop in Florida. See also caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 8. Leafhopper (Homoptera: Cicadellidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Acetamiprid	TriStar 70 WSP	F, G	Do not make more than five applications per year. Do not reapply more than once every 7 days. Do not apply more than 22 water soluble packs per acre (0.55 lb. a.i./acre) per year.
Azadirachtin	Azatin XL	F, G	
	Ornazin 3% EC	F	
Azinphos-methyl	Guthion Solupak	F	Nursery stock
<i>Beauveria bassiana</i> Strain GHA	Mycotrol 0	F	Edible flowers only
Bifenthrin	Talstar Flowable Talstar GH Prescription	G	
	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Buprofezin	Talus Insect Growth Regulator	F, G	Glassy-winged sharpshooter, variegated leafhopper and brown planthopper; to preserve usefulness of Talus, do not make more than two consecutive applications. Prior to subsequent applications, use an alternative chemistry with a different mode of action.
Carbaryl	Carbaryl 4L Carbaryl 80S	F	
	Sevin 80 WSP Sevin SL	F	Application to wet foliage or during periods of high humidity may cause injury to tender foliage.

Table 8. Leafhopper (Homoptera: Cicadellidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Chlorpyrifos	Chlorpyrifos Pro 2	F	Nursery stock in nurseries
	Chlorpyrifos Pro 4	F, G	Nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Duragard ME	F, G	Nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
	Dursban 50W	F	Nursery
Clarified Hydrophobic Extract of Neem Oil	Triact 70	F, G	Test before applying to carnation and the flowers of: Impatiens, fuchsia, hibiscus, and some roses. Most effective when applied early to mid-morning or late afternoon.
Cyfluthrin	Decathlon 20 WP	F, G	
Deltamethrin	Deltagard GC 5 SC	F	Nursery
Diazinon	Diazinon 50W Diazinon AG 500	F	Precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
Fenpropathrin	Tame 2.4EC	F, G	Nursery & shade house (F); do not use less than a 7 day re-treatment interval.
Imidacloprid	Marathon II	F, G	For outdoor ornamentals do not apply more than 1.6 pt. (0.4 lbs. a.i.) per acre per year. Do not apply thru any type of irrigation system.
Malathion	Atrapa 5E Gowan Malathion 8 F Malathion 5 EC	F	Potato leafhopper, rose leafhopper
Permethrin	Ambush 25W	F	Field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals.
	Ambush Pounce 25 WP Pounce 3.2 EC Pounce WSB	F	Field grown nursery stock.
	Astro	G	Do not apply more than 2.0 lb. a.i. per acre per year.
	Clean Crop Permethrin 3.2 EC	F	Field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals. Avoid spraying chrysanthemum blooms.
	Perm-Up 3.2EC	F	Field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia.

Table 8. Leafhopper (Homoptera: Cicadellidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Potassium Salts of Fatty Acids	Insecticidal Soap 49.52 CF	F, G	Caution: Do not use on new transplants, newly rooted cuttings, plants stressed by drought, or when tender new foliage is present. Avoid application when leaf temperature exceeds 85°F. Note: Do not use on crown of thorns and test on other euphorbias for phytotoxicity. Do not use on bleeding heart, lantana, lilies or sweetpeas. Some varieties of azaleas, begonias, camellias, fuschias, gardenias, orchids, and impatiens have shown sensitivity. Do not apply to poinsettias after bract coloration begins. Test on chrysanthemums for varietal sensitivity and do not apply to open blooms. Do not apply to ornamentals stressed by drought. Test on eugenia and euonymus for varietal and drought sensitivity.
	M-Pede	F, G	Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	
	Pyrenone Crop Spray Pyreth-It	F, G	
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.

Table 8. Leafhopper (Homoptera: Cicadellidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
Tau-Fluvalinate	Mavrik Aquaflo	F, G	Repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.
Thiamethoxam	Flagship 25WG	F, G	Shade house, container & nursery grown (F); do not exceed 8 oz. per acre per crop or year, which ever is shorter.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 9. Leafminer, dipterous (Diptera: Agromyzidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Abamectin	Avid 0.15 EC	F, G	<i>Liriomyza</i> leafminers; Phytotoxicity has been observed on Shasta daisy.
Acephate ³	1300 Orthene TR	G	
Acephate ³ & Fenpropathrin ³	Tame/Orthene TR	G	Do not apply within 48 hours of a previous application.
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
Bifenthrin ³	Talstar Flowable Talstar GH Prescription	G	
	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.

Table 9. Leafminer, dipterous (Diptera: Agromyzidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Chlorpyrifos ³	Chlorpyrifos Pro 2	F	Nursery stock in nurseries
	Chlorpyrifos Pro 4	F, G	Nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Duragard ME	F, G	Nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
	Dursban 50W	F	Nursery
Cyromazine	Citation	F, G	Container grown (F) or shade house grown (F); will not control adult stages. Leafminers can develop resistance, therefore, do not use as the only control for leafminers, make no more than three applications at 7-day intervals, then switch to Avid as an alternative control for the same period, then Citation may be applied again at 7-day intervals if necessary. Do not make more than six applications to one crop.
Deltamethrin ³	Deltagard GC 5 SC	F	Nursery
Diazinon ³	Diazinon 50W Diazinon AG 500	F	Precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
	KnoxOut NL	F	Nursery
Fenpropathrin ³	Tame 2.4EC	F, G	Nursery & shade house (F); do not use less than a 7 day re-treatment interval.

Table 9. Leafminer, dipterous (Diptera: Agromyzidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Imidacloprid	Marathon 1% Granular	F, G	Nursery (F); for outdoor ornamentals grown in beds, applications can not exceed a total of 40 lbs. per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon 60 WP	F, G	Nursery (F); this product is to be applied as a soil treatment only. For outdoor ornamentals grown in beds applications can not exceed a total of 10.7 oz. (0.4 lbs. Active ingredient) per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon II	F, G	For outdoor ornamentals do not apply more than 1.6 pt. (0.4 lbs. a.i.) per acre per year. Do not apply thru any type of irrigation system.
Lambda-cyhalothrin ³	Scimitar GC	F, G	Nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Novaluron	Pedestal	F, G	Container grown plants; nursery & shade house (F); do not apply more than once every 30 days. Do not make more than two applications per crop year. Do not apply more than 52 fl. oz. per acre per year per crop. Do not apply to poinsettias. Resistance management: Do not apply in successive applications, use only one application before rotation with other classes of insecticides with different modes of action. Use at least two alternative products between applications of Pedestal. Do not use more than once within each generation cycle.
Oxydemeton-methyl ³	Metasystox-R	F	Field grown nursery stock; do not make more than 2 applications per season.

Table 9. Leafminer, dipterous (Diptera: Agromyzidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Permethrin ³	Ambush 25W	F	Field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals.
	Ambush Pounce 25 WP Pounce 3.2 EC Pounce WSB	F	Field grown nursery stock
	Astro	G	Do not apply more than 2.0 lb. a.i. per acre per year.
	Clean Crop Permethrin 3.2 EC	F	Field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals. Avoid spraying chrysanthemum blooms.
	Perm-Up 3.2EC	F	Field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia.
Potassium Salts of Fatty Acids	M-Pede	F, G	For control of leafminers must combine with other pesticides. Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.
Pyrethrins & Piperonyl Butoxide	Pyrenone Crop Spray	F, G	
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.

Table 9. Leafminer, dipterous (Diptera: Agromyzidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.
Spinosad	Conserve SC	F, G	When used in greenhouse or areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds): Do not apply more than 10 times in a 12-month period per crop regardless of the pest being treated. Because generations of a specific pest may overlap, rotate control products and never apply more than three consecutive applications of Conserve SC or products containing the same a.i. or products with the same mode of action. Except for greenhouses and structures that can be altered to be closed or open, do not reapply within less than 7 days.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc. ³ <i>Liriomyza trifolii</i> leafminers have become resistant to organophosphate and pyrethroid insecticides. Infrequent use may be effective, but repeated use may be ineffective, depending on the history of the target population.			

Table 10. Leafrollers & leaf tiers (Lepidoptera: Tortricidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Acephate	1300 Orthene TR	G	Leafrollers
Acephate & Fenpropathrin	Tame/Orthene TR	G	Leafrollers; do not apply within 48 hours of a previous application.
Azadirachtin	Azatin XL	F, G	
	Ornazin 3% EC	F, G	Leafrollers
<i>Bacillus thuringiensis aizawai</i>	Xentari DF	F, G	Omnivorous leafroller
<i>Bacillus thuringiensis kurstaki</i>	Dipel DF Troy-BT 2WP	F, G	Omnivorous leafroller
	Javelin WG	F, G	Omnivorous leaf tier, Omnivorous leafroller
<i>Bacillus thuringiensis kurstaki</i> strain ABTS-351	Biobit HP	F, G	Omnivorous leafroller
<i>Bacillus thuringiensis kurstaki</i> EG2348	Condor Bioinsecticide	F, G	Omnivorous leafroller; precautions: Do not use in combination with any chlorothalonil based fungicide (Bravo, Terranil etc.). Mixing with other oil based products or surfactants could increase the risk of phytotoxicity.
<i>Bacillus thuringiensis kurstaki</i> EG7841	Crymax Bioinsecticide	F, G	Leafrollers
Bifenthrin	Attain TR Attain TR Micro	G	Omnivorous leafroller
	Talstar Flowable Talstar GH Prescription	G	Leafrollers
	Talstar N Talstar Nursery Flowable	F, G	Leafrollers; nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Carbaryl	Carbaryl 4L Carbaryl 80S	F	Leafrollers
	Sevin 80 WSP Sevin SL	F	Leafrollers; application to wet foliage or during periods of high humidity may cause injury to tender foliage.
Chlorpyrifos	Chlorpyrifos Pro 2	F	Leafrollers; nursery stock in nurseries
	Chlorpyrifos Pro 4	F, G	Leafrollers; nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Dursban 50W	F	Leafrollers; nursery
Cryolite	Kryocide	F	Leafrollers
Cyfluthrin	Decathlon 20 WP	F, G	Leafrollers
Deltamethrin	Deltagard GC 5 SC	F	Leafrollers; nursery
Diazinon	Diazinon 50W Diazinon AG500	F	Obliquebanded leafroller, omnivorous leaf tier; precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.

Table 10. Leafrollers & leaf tiers (Lepidoptera: Tortricidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Fenpropathrin	Tame 2.4EC	F, G	Leafrollers; nursery & shade house (F); do not use less than a 7 day re-treatment interval.
Lambda-cyhalothrin	Scimitar GC	F, G	Leafrollers; nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Naled	Dibrom 8 Emulsive	G	Leafrollers; vapor treatment; spotting, bronzing or localized burning can occur under certain climatic conditions such as slow drying and high humidity or stress caused by drought or high temperature. White Butterfly and Golden Rapture roses, Pink Champagne chrysanthemums, green wandering jew, poinsettias and Dutchman's pipe may be injured by vapor.
Permethrin	Astro	G	Leafrollers; do not apply more than 2.0 lb. a.i. per acre per year.
Pyrethrins & Piperonyl Butoxide	Pyrenone Crop Spray Pyreth-It	F, G	
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	Leafrollers
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Leafrollers; Apply in intervals of 7 days or less.
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Leafrollers; caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.

Table 10. Leafrollers & leaf tiers (Lepidoptera: Tortricidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Spinosad	Conserve SC	F, G	Obliquebanded leafroller; when used in greenhouse or areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds): Do not apply more than 10 times in a 12-month period per crop regardless of the pest being treated. Because generations of a specific pest may overlap, rotate control products and never apply more than three consecutive applications of Conserve SC or products containing the same a.i. or products with the same mode of action. Except for greenhouses and structures that can be altered to be closed or open, do not reapply within less than 7 days.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 11. Looper (Lepidoptera: Noctuidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Acephate	1300 Orthene TR	G	Cabbage loopers
Acephate & Fenpropathrin	Tame/Orthene TR	G	Cabbage loopers; do not apply within 48 hours of a previous application.
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
<i>Bacillus thuringiensis aizawai</i>	Xentari DF	F, G	
<i>Bacillus thuringiensis kurstaki</i>	Dipel DF Javelin WG Troy-BT 2WP	F, G	
<i>Bacillus thuringiensis kurstaki</i> ABTS-351	Biobit HP	F, G	
<i>Bacillus thuringiensis kurstaki</i> EG2348	Condor Bioinsecticide	F, G	Precautions: Do not use in combination with any chlorothalonil based fungicide (Bravo, Terranil etc.). Mixing with other oil based products or surfactants could increase the risk of phytotoxicity.
<i>Bacillus thuringiensis kurstaki</i> EG7841	Crymax Bioinsecticide	F, G	

Table 11. Looper (Lepidoptera: Noctuidae) control measures available to commercial producers of any flower crop in Florida. Also see Caterpillars (Lepidoptera).

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Permethrin	Ambush 25W	F	Cabbage looper; field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals.
	Ambush Pounce 25 WP Pounce 3.2 EC Pounce WSB	F	Cabbage looper; field grown nursery stock
	Astro	G	Cabbage looper; do not apply more than 2.0 lb. a.i. per acre per year.
	Clean Crop Permethrin 3.2 EC	F	Cabbage looper; field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals. Avoid spraying chrysanthemum blooms.
	Perm-Up 3.2EC	F	Cabbage looper; field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia.
Pyrethrins & Piperonyl Butoxide	Pyrene Crop Spray	F, G	
	Pyreth-It	F, G	Cabbage looper
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.
Tebufenozide	Confirm T/O	F, G	Hemlock looper; nursery (F); do not use to control more than three consecutive generations of pests in a cropping area (field) regardless of the crop rotation on that field. If you are unsure of the number of generations treated do not use more than four times within any 80-day interval. If Confirm has been applied four times in 80 days or less, allow at least 40 days to pass before making additional applications.
Footnotes:			
¹ "F" indicates field production. "G" indicates greenhouse production.			
² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 12. Mealybug (Homoptera: Pseudococcidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Acephate	1300 Orthene TR	G	
Acephate & Fenpropathrin	Tame/Orthene TR	G	Do not apply within 48 hours of a previous application.
Acetamiprid	TriStar 70 WSP	F, G	Do not make more than five applications per year. Do not reapply more than once every 7 days. Do not apply more than 22 water soluble packs per acre (0.55 lb. a.i./acre) per year.
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
<i>Beauveria bassiana</i> Strain GHA	Botanigard 22 WP	F, G	Nursery & shade house (F)
	Botanigard ES	F, G	Nursery (F)
	Mycotrol O	F, G	Edible flowers only
Bifenthrin	Attain TR Attain TR Micro	G	
	Talstar Flowable Talstar GH Prescription	G	
	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
	Talstar Nursery Granular	F	For balled and containerized nursery stocks.
Buprofezin	Talus Insect Growth Regulator	F, G	Citrus, longtailed and Mexican mealybug; to preserve usefulness of Talus, do not make more than two consecutive applications. Prior to subsequent applications, use an alternative chemistry with a different mode of action.
Carbaryl	Carbaryl 4L Carbaryl 80S	F	
	Sevin 80 WSP Sevin SL	F	Application to wet foliage or during periods of high humidity may cause injury to tender foliage.
Chlorpyrifos	Chlorpyrifos Pro 2	F	Nursery stock in nurseries
	Chlorpyrifos Pro 4	F, G	Nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Duragard ME	F, G	Nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
	Dursban 50W	F	Nursery
Chlorpyrifos & Cyfluthrin	Duraplex TR	G	

Table 12. Mealybug (Homoptera: Pseudococcidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Clarified Hydrophobic Extract of Neem Oil	Triact 70	F, G	Test before applying to carnation and the flowers of: Impatiens, fuchsia, hibiscus, and some roses. Most effective when applied early to mid-morning or late afternoon.
Cyfluthrin	Decathlon 20 WP	F, G	
Deltamethrin	Deltagard GC 5 SC	F	Nursery
Diazinon	KnoxOut NL	F	Citrus, stem & root mealybugs; nursery
Fenpropathrin	Tame 2.4EC	F, G	Nursery & shade house (F); do not use less than a 7 day re-treatment interval.
Imidacloprid	Marathon 1% Granular	F, G	Nursery (F); for outdoor ornamentals grown in beds, applications can not exceed a total of 40 lbs. per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon 60 WP	F, G	Nursery (F); this product is to be applied as a soil treatment only. For outdoor ornamentals grown in beds applications can not exceed a total of 10.7 oz. (0.4 lbs. active ingredient) per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon II	F, G	For outdoor ornamentals do not apply more than 1.6 pt. (0.4 lbs. a.i.) per acre per year. Do not apply thru any type of irrigation system.
Lambda-cyhalothrin	Scimitar GC	F, G	Nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Malathion	Atrapa 5E Gowan Malathion 8 F Malathion 5 EC	F	
Methidathion	Supracide 25-W	F	Nursery stock

Table 12. Mealybug (Homoptera: Pseudococcidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Naled	Dibrom 8 Emulsive	G	Vapor treatment; spotting, bronzing or localized burning can occur under certain climatic conditions such as slow drying and high humidity or stress caused by drought or high temperature. White Butterfly and Golden Rapture roses, Pink Champagne chrysanthemums, green wandering jew, poinsettias and Dutchman's pipe may be injured by vapor.
Permethrin	Astro	G	Do not apply more than 2.0 lb. a.i. per acre per year.
	Perm-Up 3.2 EC	F, G	Nursery stock (F); marginal leaf burn may occur on salvia, dieffenbachia and pteris fern. Application to blooming plants may cause browning of petals.
Potassium Salts of Fatty Acids	Insecticidal Soap 49.52 CF	F, G	Caution: Do not use on new transplants, newly rooted cuttings, plants stressed by drought, or when tender new foliage is present. Avoid application when leaf temperature exceeds 85°F. Note: Do not use on crown of thorns and test on other euphorbias for phytotoxicity. Do not use on bleeding heart, lantana, lilies or sweetpeas. Some varieties of azaleas, begonias, camellias, fuschias, gardenias, orchids, and impatiens have shown sensitivity. Do not apply to poinsettias after bract coloration begins. Test on chrysanthemums for varietal sensitivity and do not apply to open blooms. Do not apply to ornamentals stressed by drought. Test on eugenia and euonymus for varietal and drought sensitivity.
	M-Pede	F, G	Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.

Table 12. Mealybug (Homoptera: Pseudococcidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	
	Pyrenone Crop Spray	F, G	
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.
Pyriproxyfen	Distance IGR	F, G	Suppression; for foliar spray application, apply Distance no more than two times per cropping cycle or no more than two times per 6 months. For srench application, if a second application is needed, allow a minimum of 21 days between applications. For drench application: Do not drench plants more than one time per crop cycle. Phytotoxicity has been observed on salvia (<i>Salvia</i> spp.), ghost plant (<i>Graptopetalum paraguayense</i>), schefflera (<i>Schefflera</i> spp.), gardenia (<i>Gardenia</i> spp.), and coral bells (<i>Heuchera sanguinea</i>). It is therefore recommended that Distance not be used on these plants. Do not apply to poinsettia after bract formation.
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.

Table 12. Mealybug (Homoptera: Pseudococcidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
S-Kinoprene	Enstar II	G	Application should be made to poinsettia before bract formation. Foliar damage on some sensitive varieties can result. Some varieties of roses, such as Yellow Blooded roses, show delayed damage. Slight to moderate injury has occurred on some blooms under certain conditions, suggest application be made in pre-bloom stage.
Tau-Fluvalinate	Mavrik Aquaflo	F, G	Repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.
Thiamethoxam	Flagship 25WG	F, G	Shade house, container & nursery grown (F); do not exceed 8 oz. per acre per crop or year, which ever is shorter.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 13. Mites, broad & cyclamen (Acari: Tarsonemidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Abamectin	Avid 0.15 EC	F, G	Phytotoxicity has been observed on Shasta daisy.
Bifenthrin	Attain TR Attain TR Micro	G	Mites
	Talstar Flowable Talstar GH Prescription	G	Broad mites
	Talstar N	F, G	Mites such as broad mites; nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
	Talstar Nursery Flowable	F, G	Mites such as broad mites (F); broad mites (G); nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.

Table 13. Mites, broad & cyclamen (Acari: Tarsonemidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Chlorfenapyr	Pylon	G	Broad mite (<i>Polyphagotarsonemus latus</i>), cyclamen mite (<i>Phytonemus pallidus</i>); non-edible ornamentals; do not apply Pylon more than two times consecutively or a total of three times during a growing cycle (not more than 41 fl. oz. of product / 100 gal. / crop / season or 0.64 lbs. of a.i. / 100 gal. / crop / season) (start to finish for one ornamental crop). Do not apply Pylon to consecutive crops in a greenhouse unless the Pylon is applied in combination with other effective miticides or insecticides with a different mode of action. Phytotoxicity is likely to occur to some varieties of carnations, dianthus, kalanchoe, poinsettia, roses, salvia, and zinnia. Additions of crop oils, surfactants, and fertilizers or other tank additives have been shown to increase the likelihood of foliar injury.
Diazinon	Diazinon 50W Diazinon AG 500	F	Cyclamen mites; precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
	KnoxOut NL	F	Mites; nursery
Dicofol	Kelthane 50WSP	F, G	Nursery (F); applicators (applicators using this product for agricultural uses only) must be in enclosed cabs or cockpits. Do not make more than two applications per crop or season. Resistance management: As a general rule, the utility of Kelthane 50WSP can be maintained indefinitely by rotating use of Kelthane 50WSP with miticides with different modes of action and by limiting the number of applications of Kelthane 50WSP to an average of one per season. If two applications are made in a single growing season, no application should be made during the following year.
Endosulfan	Endosulfan 3 EC Endosulfan 50 WP Thionex (Endosulfan) 3 EC Thionex (Endosulfan) 50 WP	F, G	Cyclamen mite; do not exceed 3.0 lbs. a.i. per acre per year. On chrysanthemums, best results will be obtained if applied before plants flower.
Lambda-cyhalothrin	Scimitar GC	F, G	Mites such as broad mites (F); broad mite (G); nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Pyridaben	Sanmite	F, G	Broad mite; maximum seasonal use rate: Do not exceed 21.34 ounces per acre per year.

Table 13. Mites, broad & cyclamen (Acari: Tarsonemidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 14. Mites, eriophyid (Acari: Eriophyidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Abamectin	Avid 0.15 EC	F, G	Bud & rust mites; phytotoxicity has been observed on Shasta daisy.
Carbaryl	Carbaryl 4L Carbaryl 80S	F	
	Sevin 80 WSP Sevin SL	F	Application to wet foliage or during periods of high humidity may cause injury to tender foliage.

Table 14. Mites, eriophyid (Acari: Eriophyidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Chlorfenapyr	Pylon	G	Citrus budmite (<i>Eriophyes sheldoni</i>), rust mite (<i>Phyllocoptruta</i> sp., <i>Epirimerus</i> sp., <i>Aculus</i> sp.); non-edible ornamentals; do not apply Pylon more than two times consecutively or a total of three times during a growing cycle (not more than 41 fl. oz. of product / 100 gal. / crop / season or 0.64 lbs. of a.i. / 100 gal. / crop / season) (start to finish for one ornamental crop). Do not apply Pylon to consecutive crops in a greenhouse unless the Pylon is applied in combination with other effective miticides or insecticides with a different mode of action. Phytotoxicity is likely to occur to some varieties of carnations, dianthus, kalanchoe, poinsettia, roses, salvia, and zinnia. Additions of crop oils, surfactants, and fertilizers or other tank additives have been shown to increase the likelihood of foliar injury.
Chlorpyrifos	Chlorpyrifos Pro 2	F	Mites such as bermudagrass; nursery stock in nurseries
	Chlorpyrifos Pro 4	F, G	Mites such as bermudagrass; nursery (F); soil treatment, dormant spray of tree pests, and pre-plant incorporation of field grown nursery stock (G); some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy show varying degrees of phytotoxicity.
	Dursban 50W	F	Mites; nursery
Diazinon	Diazinon 50W Diazinon AG 500	F	Carnation bud mites, carnation shoot mites; precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
	KnoxOut NL	F	Mites; nursery

Table 14. Mites, eriophyid (Acari: Eriophyidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Dicofol	Kelthane 50WSP	F, G	Pear rust mite, plum nursery mite, plum rust mite, tomato russet mite; nursery (F); applicators (applicators using this product for agricultural uses only) must be in enclosed cabs or cockpits. Do not make more than two applications per crop or season. Resistance management: As a general rule, the utility of Kelthane 50WSP can be maintained indefinitely by rotating use of Kelthane 50WSP with miticides with different modes of action and by limiting the number of applications of Kelthane 50WSP to an average of one per season. If two applications are made in a single growing season, no application should be made during the following year.
Endosulfan	Endosulfan 3 EC Endosulfan 50 WP Thionex (Endosulfan) 3 EC Thionex (Endosulfan) 50	F	Taxus bud mite; do not exceed 3.0 lbs. a.i. per acre per year. On chrysanthemums, best results will be obtained if applied before plants flower.
Potassium Salts of Fatty Acids	WP Pede	F, G	Mites such as rust mite (F); rust mite (G); tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.

Table 14. Mites, eriophyid (Acari: Eriophyidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 15. Mites, privet (Acari: Tenuipalpidae (false spider mites)) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Diazinon	Diazinon 50W Diazinon AG 500	F	Privet mites; precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
	KnoxOut NL	F	Mites; nursery

Table 15. Mites, privet (Acari: Tenuipalpidae (false spider mites)) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Dicofol	Kelthane 50WSP	F, G	Privet mites; nursery (F); applicators (applicators using this product for agricultural uses only) must be in enclosed cabs or cockpits. Do not make more than two applications per crop or season. Resistance management: As a general rule, the utility of Kelthane 50WSP can be maintained indefinitely by rotating use of Kelthane 50WSP with miticides with different modes of action and by limiting the number of applications of Kelthane 50WSP to an average of one per season. If two applications are made in a single growing season, no application should be made during the following year.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 16. Mites, spider (Acari: Tetranychidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Abamectin	Avid 0.15 EC	F, G	Carmine spider mite, European red mite, twospotted spider mite; phytotoxicity has been observed on Shasta daisy.
Acephate ³	1300 Orthene TR	G	
Acephate & Fenpropathrin ³	Tame/Orthene TR	G	Do not apply within 48 hours of a previous application.
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Mites; do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.

Table 16. Mites, spider (Acari: Tetranychidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Bifenazate	Floramite	F, G	Do not make more than two applications per crop per year. Do not apply more than 16 oz. per acre per year. Apply only one application of Floramite before rotating to products of an alternative chemical class and use at least two alternative products between treatments of Floramite.
	Floramite SC	F, G	Twospotted spider mite, European red mite, citrus red mite, southern red mite; do not use in successive applications. Apply only one application before rotating to products of an alternative chemical class. Use at least two alternative products between treatments of Floramite SC. Do not make more than two applications per crop per year. Do not apply more than 32 fl. oz. per acre per year.
Bifenthrin ³	Attain TR Attain TR Micro	G	Mites
	Talstar Flowable Talstar GH Prescription	G	
	Talstar N	F, G	Mites such as spider mites; nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
	Talstar Nursery Flowable	F, G	Mites such as spider mites (F); nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Chlorfenapyr	Pylon	G	Non-edible ornamentals; do not apply Pylon more than two times consecutively or a total of three times during a growing cycle (not more than 41 fl. oz. of product/100 gal. / crop / season or 0.64 lbs. of a.i. / 100 gal. / crop / season) (start to finish for one ornamental crop). Do not apply Pylon to consecutive crops in a greenhouse unless the Pylon is applied in combination with other effective miticides or insecticides with a different mode of action. Phytotoxicity is likely to occur to some varieties of carnations, dianthus, kalanchoe, poinsettia, roses, salvia, and zinnia. Additions of crop oils, surfactants, and fertilizers or other tank additives have been shown to increase the likelihood of foliar injury.
Chlorpyrifos & Cyfluthrin ³	Duraplex TR	G	Mites

Table 16. Mites, spider (Acari: Tetranychidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Clarified Hydrophobic Extract of Neem Oil	Triact 70	F, G	Mites; test before applying to carnation and the flowers of: Impatiens, fuchsia, hibiscus, and some roses. Most effective when applied early to mid-morning or late afternoon.
Clofentezine	Ovation SC	F, G	Shade house, container, or nursery grown (F); European red mite, twospotted spider mite; recommended application frequency is once per crop cycle in greenhouse, saran house, and shade house culture, and once per each crop cycle occurring within a year for outdoor ornamentals. Has limited effect on beneficial insects, particularly predatory mites and can be used in ipm programs employing beneficial insects. Highly active on mite eggs and early mite stages. Has shown activity and persistence up to 45 days after application.
Dicofol	Kelthane 50WSP	F, G	European red mite, six-spotted mite, twospotted spider mite; nursery (F); applicators (applicators using this product for agricultural uses only) must be in enclosed cabs or cockpits. Do not make more than two applications per crop or season. Resistance management: As a general rule, the utility of Kelthane 50WSP can be maintained indefinitely by rotating use of Kelthane 50WSP with miticides with different modes of action and by limiting the number of applications of Kelthane 50WSP to an average of one per season. If two applications are made in a single growing season, no application should be made during the following year.
Etoxazole	Tetrasan 5 WDG	F, G	Shade house only (F)
Fenbutatin-oxide	Vendex 50WP	F, G	<i>Oligonychus</i> mites, twospotted spider mite; apply to foliage only, on chrysanthemums (pre-bloom) and poinsettias (pre-bract). Minor sensitivity observed on: <i>Celosia argentea</i> (cockscomb), <i>Verbena hortensis</i> (verbena), <i>Ageratum houstonianum</i> (floss flower), <i>Rosa</i> sp. (common rose - some varieties, especially Yellow). When daily temperatures at application averages below 70° performance is reduced.
Fenpropathrin ³	Tame 2.4EC	F, G	Southern red mite, twospotted spider mite; nursery & shade house (F); do not use less than a 7 day re-treatment interval.

Table 16. Mites, spider (Acari: Tetranychidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Fenpyroximate	Akari 5SC	G	Do not use in successive miticide applications in the same greenhouse. Allow at least two different chemicals with two different modes of action to be used between treatments of Akari 5SC. Do not apply more than 48 fl. oz. per crop cycle or per growing season, whichever is longer. For best results make no more than two applications per growing season or crop cycle, whichever is longer.
Hexythiazox	Hexygon	F, G	Nursery (F); European red mite, southern red mite, twospotted spider mite; for use on orchids follow supplemental labeling. Make only one application per crop cycle or once per year.
	Hexygon DF	F, G	Nursery (F); European red mite, southern red mite, twospotted spider mite; for use on orchids follow supplemental labeling. Do not use Plyac or household detergents in tank mix combinations with Hexygon DF. Apply Hexygon DF only once per crop cycle.
Lambda-cyhalothrin ³	Scimitar GC	F, G	Mites such as spider mites (F); nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Methiocarb	Mesurool 75-W	F, G	Mites; nursery (F); do not apply with oil.

Table 16. Mites, spider (Acari: Tetranychidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Potassium Salts of Fatty Acids	Insecticidal Soap 49.52 CF	F, G	Caution: Do not use on new transplants, newly rooted cuttings, plants stressed by drought, or when tender new foliage is present. Avoid application when leaf temperature exceeds 85°F. Note: Do not use on crown of thorns and test on other euphorbias for phytotoxicity. Do not use on bleeding heart, lantana, lilies or sweetpeas. Some varieties of azaleas, begonias, camellias, fuschias, gardenias, orchids, and impatiens have shown sensitivity. Do not apply to poinsettias after bract coloration begins. Test on chrysanthemums for varietal sensitivity and do not apply to open blooms. Do not apply to ornamentals stressed by drought. Test on eugenia and euonymus for varietal and drought sensitivity.
	M-Pede	F, G	Mites such as spider mite (F); Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.
Propargite	Ornamite	F	Do not use in spray mixes containing oil.
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	Mites, such as spider mites.
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	Mites
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Mites; apply in intervals of 7 days or less.
Pyridaben	Sanmite	F, G	European red mite, southern red mite, tumid mite, twospotted spider mite; maximum seasonal use rate: Do not exceed 21.34 ounces per acre per year.

Table 16. Mites, spider (Acari: Tetranychidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.
Spinosad	Conserve SC	F, G	For spider mites, label says control is variable and that a non-ionic adjuvant may increase efficacy. When used in greenhouse or areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds): Do not apply more than 10 times in a 12-month period per crop regardless of the pest being treated. Because generations of a specific pest may overlap, rotate control products and never apply more than three consecutive applications of Conserve SC or products containing the same a.i. or products with the same mode of action. Except for greenhouses and structures that can be altered to be closed or open, do not reapply within less than 7 days.
Tau-Fluvalinate ³	Mavrik Aquaflo	F, G	Mites such as twospotted spider mites; repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.

Table 16. Mites, spider (Acari: Tetranychidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc. ³ Some spider mite populations have become resistant to organophosphate and pyrethroid insecticides. Infrequent use may be effective but repeated use may be ineffective, depending on the history of the target population.			

Table 17. Plant (lygus) bugs (Hemiptera: Miridae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Acephate	1300 Orthene TR	G	
Acephate & Fenpropathrin	Tame/Orthene TR	G	Do not apply within 48 hours of a previous application.
Azadirachtin	Ornazin 3% EC	F	
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
<i>Beauveria bassiana</i> Strain GHA	Botanigard ES	F, G	Nursery (F)
	Mycotrol O	F	Edible flowers only
Bifenthrin	Attain TR Micro	G	
	Talstar Flowable Talstar GH Prescription	G	
	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Carbaryl	Carbaryl 4L Carbaryl 80S	F	
	Sevin 80 WSP Sevin SL	F	Application to wet foliage or during periods of high humidity may cause injury to tender foliage.
Chlorpyrifos	Duragard ME	F, G	Tarnished plant bug; nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
	Dursban 50W	F	Nursery
Cyfluthrin	Decathlon 20 WP	F, G	
Deltamethrin	Deltagard GC 5 SC	F	Nursery
Fenpropathrin	Tame 2.4EC	F, G	Tarnished plant bug; nursery & shade house (F); do not use less than a 7 day re-treatment interval.

Table 17. Plant (lygus) bugs (Hemiptera: Miridae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Lambda-cyhalothrin	Scimitar GC	F, G	Nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Malathion	Atrapa 5E Gowan Malathion 8 F Malathion 5 EC	F	Tarnished plant bug
Permethrin	Ambush 25W	F	Field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals.
	Astro	G	Do not apply more than 2.0 lb. a.i. per acre per year.
Potassium Salts of Fatty Acids	Insecticidal Soap 49.52 CF	F, G	Caution: Do not use on new transplants, newly rooted cuttings, plants stressed by drought, or when tender new foliage is present. Avoid application when leaf temperature exceeds 85°F. Note: Do not use on crown of thorns and test on other euphorbias for phytotoxicity. Do not use on bleeding heart, lantana, lilies or sweetpeas. Some varieties of azaleas, begonias, camellias, fuschias, gardenias, orchids, and impatiens have shown sensitivity. Do not apply to poinsettias after bract coloration begins. Test on chrysanthemums for varietal sensitivity and do not apply to open blooms. Do not apply to ornamentals stressed by drought. Test on eugenia and euonymus for varietal and drought sensitivity.
	M-Pede	F, G	Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	
	Pyrenone Crop Spray	F, G	

Table 17. Plant (lygus) bugs (Hemiptera: Miridae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Honeylocust plant bugs; caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.
Tau-Fluvalinate	Mavrik Aquaflo	F, G	Repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.
Thiamethoxam	Flagship 25WG	F, G	Shade house, container & nursery grown (F); do not exceed 8 oz. per acre per crop or year, which ever is shorter.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 18. Shore fly (Diptera: Ephydriidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
Chlorpyrifos	Duragard ME	F, G	Nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
Chlorpyrifos & Cyfluthrin	Duraplex TR	G	
Cyfluthrin	Decathlon 20 WP	F, G	Flies
Cyromazine	Citation	G	Will not control adult stages.
Deltamethrin	Deltagard GC 5 SC	F	Flies; nursery
Diazinon	Diazinon 50W (EPA# 100-460-34704) Diazinon AG 500	F	Flies (larvae); precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
	KnoxOut NL	F	Larvae; nursery
Diflubenzuron	Adept	F, G	Shade house (F); do not make more than four applications per crop. Do not apply to poinsettias, hibiscus, and Rieger begonia. Do not reuse potting media, which has been treated with Adept. Do not apply to plants grown on capillary water mats.
Fenoxycarb	Precision	F, G	<i>Scatella</i> spp.; Container grown (F) or shade house grown (F); will not control the adult stages of insect pests. Do not exceed a maximum of 30 applications per year for greenhouse use. Applications should not be made to poinsettia after bract formation.
Potassium Salts of Fatty Acids	M-Pede	F, G	Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.

Table 18. Shore fly (Diptera: Ephydriidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	Flies
	Pyrenone Crop Spray	F, G	Flies
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	Flies
Pyriproxyfen	Distance IGR	F, G	For foliar spray application, apply Distance no more than two times per cropping cycle or no more than two times per 6 months. For sprench application, if a second application is needed, allow a minimum of 21 days between applications. For drench application: Do not drench plants more than one time per crop cycle. Phytotoxicity has been observed on salvia (<i>Salvia</i> spp.), ghost plant (<i>Graptopetalum paraguayense</i>), schefflera (<i>Schefflera</i> spp.), gardenia (<i>Gardenia</i> spp.), and coral bells (<i>Heuchera sanguinea</i>). It is therefore recommended that Distance not be used on these plants. Do not apply to poinsettia after bract formation.
<i>Steinernema carpocapsae</i>	Millenium	F, G	Nursery (F)
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 19. Slugs & snails (Mollusca: Gastropoda: Pulmonata: Limacidae)) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Iron phosphate	Monterey Sluggo-Ag	F, G	<i>Deroceras reticulatum</i> (field slug); <i>Deroceras laeve</i> (smooth slug); <i>Arion subfuscus</i> (dusky slug); <i>Arion circumscriptus</i> (gray garden slug); <i>Arion hortensis</i> (black field slug); <i>Arion rufus</i> (large red slug); <i>Arios ater</i> (large black slug); <i>Limax flavus</i> (spotted garden slug); <i>Limax tenellus</i> (slender slug); <i>Ariolimax columbianus</i> (banana slug); <i>Helix</i> spp.; <i>Helicella</i> spp.; <i>Cepaea</i> spp.

Table 19. Slugs & snails (Mollusca: Gastropoda: Pulmonata: Limacidae)) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Metaldehyde	Deadline Bullets Deadline M-Ps	F, G	Nursery (F); for best results apply in evening.
	Durham Granules 3.5 Durham Granules 7.5 Trails End 3.5 Trails End LG	G	Do not apply directly on to plants. Use only as a baiting treatment ... [Product] should never be applied to dry soil. Applications should be made following irrigation for best results. Apply any time of the day but evening applications are preferred. Do not re-water for 48 hours after application. Some slight tip burning has been noticed on extremely tender orchids. For heavily infested greenhouses a second application is recommended 7-10 days following the first application.
	Prozap Snail & Slug AG	F, G	Use only as a baiting treatment ... [Product] should never be applied to dry soil. Applications should be made following irrigation for best results. Apply any time of the day but evening applications are preferred. Do not re-water for 48 hours after application. Some slight tip burning has been noticed on extremely tender orchids. For heavily infested greenhouses a second application is recommended 7-10 days following the first application.
	Slug-Fest All Weather Formula	F, G	Do not apply directly to plants unless prior experience has shown the plant to be tolerant, however some slight tip burning has been noticed on extremely tender orchids. Thoroughly water areas to be treated before application. For best results apply in the evening.
Methiocarb	Mesuro 75-W Mesuro Pro	F, G	Nursery (F); do not apply with oil.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 20. Thrips (Thysanoptera: Thripidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Abamectin	Avid 0.15 EC	F, G	Suppression; do not use for suppression of thrips on roses, chrysanthemum, and gerbera. Phytotoxicity has been observed on Shasta daisy.
Acephate	1300 Orthene TR	G	
Acephate & Fenpropathrin	Tame/Orthene TR	G	Do not apply within 48 hours of a previous application.
Acetamiprid	TriStar 70 WSP	F, G	Citrus thrips; do not make more than five applications per year. Do not reapply more than once every 7 days. Do not apply more than 22 water soluble packs per acre (0.55 lb. a.i./acre) per year.
Azadirachtin	Azatin XL	F, G	
	Ornazin 3% EC	G	
Azinphos-methyl	Guthion Solupak	F	Nursery stock
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
<i>Beauveria bassiana</i> Strain GHA	Botanigard 22 WP	F, G	Nursery & shade house (F)
	Botanigard ES	F, G	Nursery (F)
	Mycotrol O	F, G	Edible flowers only
Bifenthrin	Attain TR Attain TR Micro	G	
	Talstar Flowable Talstar GH Prescription	G	
	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Carbaryl	Carbaryl 4L Carbaryl 80S	F	Exposed thrips
	Sevin 80 WSP Sevin SL	F	Exposed thrips; application to wet foliage or during periods of high humidity may cause injury to tender foliage.
Chlorpyrifos	Duragard ME	F, G	Nursery (F); bedding plants, potted and cut flowers. Direct spray to some open blooms may cause petal drop. Do not spray on kalanchoes.
	Dursban 50W	F	Exposed thrips; nursery
Chlorpyrifos & Cyfluthrin	Duraplex TR	G	
Cyfluthrin	Decathlon 20 WP	F, G	
Diazinon	Diazinon 50W Diazinon AG 500	F	Precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
	KnoxOut NL	F	Nursery

Table 20. Thrips (Thysanoptera: Thripidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Fenoxycarb	Precision	F, G	Container grown (F) or shade house grown (F); will not control the adult stages of insect pests. Do not exceed a maximum of 30 applications per year for greenhouse use. Applications should not be made to poinsettia after bract formation.
	Preclude TR	G	
Fenpropathrin	Tame 2.4EC	F, G	Nursery & shade house (F); do not use less than a 7 day re-treatment interval.
Imidacloprid	Marathon 1% Granular	F, G	Suppression; nursery (F); for outdoor ornamentals grown in beds, applications can not exceed a total of 40 lbs. per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon 60 WP	F, G	Suppression; nursery (F); this product is to be applied as a soil treatment only. For outdoor ornamentals grown in beds applications can not exceed a total of 10.7 oz. (0.4 lbs. active ingredient) per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon II	F, G	Suppression; for outdoor ornamentals do not apply more than 1.6 pt. (0.4 lbs. a.i.) per acre per year. Thrips are suppressed on foliage only, not in buds or flowers. Do not apply thru any type of irrigation system.
Lambda-cyhalothrin	Scimitar GC	F, G	Nursery & shade house (F); do not apply more than 0.36 lbs. a.i. (52.4 fl. oz. of concentrate) per acre per year.
Malathion	Atrapa 5E Gowan Malathion 8 F Malathion 5 EC	F	
Methiocarb	MesuroI 75-W	F, G	Western flower thrips; nursery (F); do not apply with oil.

Table 20. Thrips (Thysanoptera: Thripidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Novaluron	Pedestal	F, G	Container grown plants; nursery & shade house (F); do not apply more than once every 30 days. Do not make more than two applications per crop year. Do not apply more than 52 fl. oz. per acre per year per crop. Do not apply to poinsettias. Resistance management: Do not apply in successive applications, use only one application before rotation with other classes of insecticides with different modes of action. Use at least two alternative products between applications of Pedestal. Do not use more than once within each generation cycle.
Permethrin	Ambush 25W	F	Citrus thrips; field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals.
	Ambush Pounce 25 WP Pounce 3.2 EC Pounce WSB	F	Citrus thrips; field grown nursery stock.
	Astro	G	Citrus thrips; do not apply more than 2.0 lb. a.i. per acre per year.
	Clean Crop Permethrin 3.2 EC	F	Citrus thrips; field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals. Avoid spraying chrysanthemum blooms.
	Perm-Up 3.2EC	F	Citrus thrips; field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia.

Table 20. Thrips (Thysanoptera: Thripidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Potassium Salts of Fatty Acids	Insecticidal Soap 49.52 CF	F, G	Caution: Do not use on new transplants, newly rooted cuttings, plants stressed by drought, or when tender new foliage is present. Avoid application when leaf temperature exceeds 85°F. Note: Do not use on crown of thorns and test on other euphorbias for phytotoxicity. Do not use on bleeding heart, lantana, lilies or sweetpeas. Some varieties of azaleas, begonias, camellias, fuschias, gardenias, orchids, and impatiens have shown sensitivity. Do not apply to poinsettias after bract coloration begins. Test on chrysanthemums for varietal sensitivity and do not apply to open blooms. Do not apply to ornamentals stressed by drought. Test on eugenia and euonymus for varietal and drought sensitivity.
	M-Pede	F, G	Exposed thrips; tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	
	Pyrenone Crop Spray Pyreth-It	F, G	
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.

Table 20. Thrips (Thysanoptera: Thripidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
S-Kinoprene	Enstar II	G	Application should be made to poinsettia before bract formation. Foliar damage on some sensitive varieties can result. Some varieties of roses, such as Yellow Blooded roses, show delayed damage. Slight to moderate injury has occurred on some blooms under certain conditions, suggest application be made in pre-bloom stage.
Spinosad	Conserve SC	F, G	Exposed thrips; when used in greenhouse or areas of commercial production of herbaceous (non-woody) ornamentals in nurseries (including plant propagation beds): Do not apply more than 10 times in a 12-month period per crop regardless of the pest being treated. Because generations of a specific pest may overlap, rotate control products and never apply more than three consecutive applications of Conserve SC or products containing the same a.i. or products with the same mode of action. Except for greenhouses and structures that can be altered to be closed or open, do not reapply within less than 7 days.
Tau-Fluvalinate	Mavrik Aquaflo	F, G	Repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc.			

Table 21. Whitefly (Homoptera: Aleyrodidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Abamectin	Avid 0.15 EC	F, G	Suppression; do not use for suppression of whiteflies on roses, chrysanthemum, and gerbera. Phytotoxicity has been observed on Shasta daisy.
Acephate ³	1300 Orthene TR	G	
Acephate & Fenprothrin ³	Tame/Orthene TR	G	Do not apply within 48 hours of a previous application.

Table 21. Whitefly (Homoptera: Aleyrodidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Acetamiprid	TriStar 70 WSP	F, G	Do not make more than five applications per year. Do not reapply more than once every 7 days. Do not apply more than 22 water soluble packs per acre (0.55 lb. a.i./acre) per year.
Azadirachtin	Azatin XL Ornazin 3% EC	F, G	
<i>Beauveria bassiana</i> ATCC 74040	Naturalis L	F, G	Do not tank mix with fungicides. Wait a minimum of 48 hours after application before applying fungicides.
<i>Beauveria bassiana</i> Strain GHA	Botanigard 22 WP	F, G	Nursery & shade house (F)
	Botanigard ES	F, G	Nursery (F)
Bifenthrin	Attain TR Attain TR Micro	G	
	Talstar Flowable Talstar GH Prescription	G	
	Talstar N Talstar Nursery Flowable	F, G	Nursery & shade house (F); do not apply more than 0.2 lbs. a.i. per acre per year for outdoor applications.
Buprofezin	Talus Insect Growth Regulator	F, G	Silverleaf, sweet potato and greenhouse whitefly; to preserve usefulness of Talus, do not make more than two consecutive applications. If another insect growth regulator with the mode of action as a chitin synthesis inhibitor (ie. cyromazine, diflubenzuron, novaluron) has been used in the greenhouse within 28 days, do not apply Talus as the first whitefly application. Prior to subsequent applications, use an alternative chemistry with a different mode of action.
Chlorpyrifos	Chlorpyrifos Pro 2	F	Nursery stock in nurseries
	Dursban 50W	F	Nursery
Chlorpyrifos & Cyfluthrin	Duraplex TR	G	
Clarified Hydrophobic Extract of Neem Oil	Triact 70	F, G	Test before applying to carnation and the flowers of: Impatiens, fuchsia, hibiscus, and some roses. Most effective when applied early to mid-morning or late afternoon.
Cyfluthrin	Decathlon 20 WP	F, G	
Diazinon	Diazinon 50W Diazinon AG 500	F	Precaution: Do not use on ferns, poinsettias, hibiscus, pilea, and gardenia since injury to the plants may occur.
	KnoxOut NL	F	Suppression; nursery

Table 21. Whitefly (Homoptera: Aleyrodidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Diflubenzuron	Adept	F, G	Suppression; shade house (F); do not make more than four applications per crop. Do not apply to poinsettias, hibiscus, and Rieger begonia. Do not reuse potting media, which has been treated with Adept. Do not apply to plants grown on capillary water mats.
	Dimilin 25W	F, G	Suppression; shade house (F)
	Dimilin SC	F, G	Suppression; shade house (F)
Endosulfan	Endosulfan 3 EC Endosulfan 50 WP Thionex (Endosulfan) 3 EC Thionex (Endosulfan) 50 WP	F, G	Do not exceed 3.0 lbs. a.i. per acre per year. On chrysanthemums, best results will be obtained if applied before plants flower.
Fenoxycarb	Precision	F, G	Silverleaf (alias sweetpotato) whitefly, greenhouse whitefly; container grown (F) or shade house grown (F); will not control the adult stages of insect pests. Do not exceed a maximum of 30 applications per year for greenhouse use. Applications should not be made to poinsettia after bract formation.
	Preclude TR	G	
Fenpropathrin	Tame 2.4EC	F, G	Silverleaf/sweetpotato whitefly (includes all instars and transitional stages [pupae]), greenhouse whitefly; nursery & shade house (F); do not use less than a 7 day re-treatment interval.

Table 21. Whitefly (Homoptera: Aleyrodidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Imidacloprid	Marathon 1% Granular	F, G	Nursery (F); for outdoor ornamentals grown in beds, applications can not exceed a total of 40 lbs. per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon 60 WP	F, G	Nursery (F); this product is to be applied as a soil treatment only. For outdoor ornamentals grown in beds applications can not exceed a total of 10.7 oz. (0.4 lbs. active ingredient) per acre per year. On plants with a production cycle of less than 1 year, application is not to exceed a frequency of more than once each 16 weeks for a particular plant. On stock plants and woody crops with a production cycle of greater than 1 year, application may not exceed once a year.
	Marathon II	F, G	For outdoor ornamentals do not apply more than 1.6 pt. (0.4 lbs. a.i.) per acre per year. Do not apply thru any type of irrigation system.
Malathion	Atrapa 5E Gowan Malathion 8 F Malathion 5 EC	F	
Naled	Dibrom 8 Emulsive	G	Adults; vapor treatment; spotting, bronzing or localized burning can occur under certain climatic conditions such as slow drying and high humidity or stress caused by drought or high temperature. White Butterfly and Golden Rapture roses, Pink Champagne chrysanthemums, green wandering jew, poinsettias and Dutchman's pipe may be injured by vapor.

Table 21. Whitefly (Homoptera: Aleyrodidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Novaluron	Pedestal	F, G	Container grown plants; nursery & shade house (F); do not apply more than once every 30 days. Do not make more than two applications per crop year. Do not apply more than 52 fl. oz. per acre per year per crop. Do not apply to poinsettias. Resistance management: Do not apply in successive applications, use only one application before rotation with other classes of insecticides with different modes of action. Use at least two alternative products between applications of Pedestal. Do not use more than once within each generation cycle.
Permethrin	Ambush 25W	F	Field grown nursery stock; do not apply more than 2.0 lbs. a.i. per acre per season. Marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals.
	Ambush Pounce 25 WP Pounce 3.2 EC Pounce WSB	F	Field grown nursery stock.
	Astro	G	Do not apply more than 2.0 lb. a.i. per acre per year.
	Clean Crop Permethrin 3.2 EC	F	Field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia. Application to blooming plants may cause browning of petals. Avoid spraying chrysanthemum blooms.
	Perm-Up 3.2EC	F	Field grown nursery stock; marginal leaf burn may occur on: Salvia, dieffenbachia.

Table 21. Whitefly (Homoptera: Aleyrodidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Potassium Salts of Fatty Acids	Insecticidal Soap 49.52 CF	F, G	Caution: Do not use on new transplants, newly rooted cuttings, plants stressed by drought, or when tender new foliage is present. Avoid application when leaf temperature exceeds 85°F. Note: Do not use on crown of thorns and test on other euphorbias for phytotoxicity. Do not use on bleeding heart, lantana, lilies or sweetpeas. Some varieties of azaleas, begonias, camellias, fuschias, gardenias, orchids, and impatiens have shown sensitivity. Do not apply to poinsettias after bract coloration begins. Test on chrysanthemums for varietal sensitivity and do not apply to open blooms. Do not apply to ornamentals stressed by drought. Test on eugenia and euonymus for varietal and drought sensitivity.
	M-Pede	F, G	Tank mixes with chlorothalonil should be avoided. Potential for injury increases on plants stressed by heat, humidity, drought, or insect, mite or disease pressure. Do not apply to very sensitive plants such as: Cherimoya, bleeding heart, or sweetpeas. The following may be sensitive: Crown of thorns and other euphorbia, fuchsia, gardenia, impatiens, Asiatic and oriental lily varieties, lantana, ornamental ivy, poinsettia, redbud, schefflera, zebra plant and some succulents. Flowers of the following may be injured when sprayed: African violet, ageratum, azalea, begonia, camellia, chrysanthemum, dahlia, geranium, gloxinia, impatiens, lily, marigold, orchid, pansy, petunia, poinsettia bracts, rose, salvia, snapdragon, vinca, and zinnia.
Pymetrozine	Endeavor	F, G	For outdoor use, do not apply more than 48 oz. per acre per year. For indoor use, do not apply more than 100 oz. per acre per year.
Pyrethrins & Piperonyl Butoxide	1100 Pyrethrum TR	G	
	Pyrenone Crop Spray Pyreth-It	F, G	
Pyrethrins, Piperonyl Butoxide & Silicon Dioxide	Diatect Multipurpose Insecticide II	F	
Pyrethrins, Rotenone & other Cube Resins	Pyrellin E.C.	F, G	Apply in intervals of 7 days or less.

Table 21. Whitefly (Homoptera: Aleyrodidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
Pyridaben	Sanmite	F, G	Maximum seasonal use rate: Do not exceed 21.34 ounces per acre per year.
Pyriproxyfen	Distance IGR	F, G	Greenhouse, silverleaf & sweetpotato whitefly; for foliar spray application, apply Distance no more than two times per cropping cycle or no more than two times per 6 months. For sprench application, if a second application is needed, allow a minimum of 21 days between applications. For drench application: Do not drench plants more than one time per crop cycle. Phytotoxicity has been observed on salvia (<i>Salvia</i> spp.), ghost plant (<i>Graptopetalum paraguayense</i>), schefflera (<i>Schefflera</i> spp.), gardenia (<i>Gardenia</i> spp.), and coral bells (<i>Heuchera sanguinea</i>). It is therefore recommended that Distance not be used on these plants. Do not apply to poinsettia after bract formation.
Refined Petroleum Distillate	Saf-T-Side Spray Oil	F	This insecticide's mode of action is through suffocation of eggs, larvae and nymphs of insects and adults of soft bodied insects. This mode of action necessitates total spray coverage. Bedding plants; do not use in combination with or immediately before or after spraying with fungicides such as captan, oxythioquinox or any product containing sulfur. Also do not use with carbaryl (Sevin) or dimethoate. Do not use with any product whose label recommends the use of no oils. Do not use in combination with NPK foliar fertilizer applications.
	Ultra-Fine Oil	F	Caution: Spray no more than 4 consecutive sprays. The frequency of consecutive sprays should not exceed once every 2 weeks. Early morning applications are recommended. Do not tank mix with insecticide or miticide whose label indicates that it should not be used with oil. Do not use with captan, chlorothalonil, dimethoate, methiocarb, oxythioquinox, propargite, or any product containing sulfur. This list is not exhaustive; therefore for products not included in this list consult label for compatibility information.

Table 21. Whitefly (Homoptera: Aleyrodidae) control measures available to commercial producers of any flower crop in Florida.

Common Name	Trade Name/Formulation	Production Site ¹	Notes from Label ²
S-Kinoprene	Enstar II	G	Application should be made to poinsettia before bract formation. Foliar damage on some sensitive varieties can result. Some varieties of roses, such as Yellow Blooded roses, show delayed damage. Slight to moderate injury has occurred on some blooms under certain conditions, suggest application be made in pre-bloom stage.
Tau-Fluvalinate	Mavrik Aquaflow	F, G	Repeat applications not more than four times per month at 5-7 day intervals unless otherwise noted in use directions.
Thiamethoxam	Flagship 25WG	F, G	Shade house, container & nursery grown (F); do not exceed 8 oz. per acre per crop or year, which ever is shorter.
Footnotes: ¹ "F" indicates field production. "G" indicates greenhouse production. ² Notes are taken from product labels and restrict use to the condition indicated (suppression, beet armyworm, exposed thrips, etc.), limit numbers or patterns of applications, provide phytotoxicity precautions, etc. ³ The combination of acephate with a pyrethroid, such as fenpropathrin, has resulted in synergistic effects on whitefly mortality.			