Chemical Control of Nursery Pests

**Bee warning** Read carefully before applying any material selected for use. Many insecticides are highly toxic to honeybees. Some should not be applied anytime during bloom, while many others should be applied only in the early morning hours and/or late in the evening. Avoid spraying carbaryl and diazinon on plants surrounded by blooming flowers or weeds. Always take simple steps, such as removing (mowing) blooming clover from lawns adjacent to garden areas before applying materials that are hazardous to bees. In all cases, when given the choice, select the least hazardous material when plants in the infested vicinity are in bloom. Avoid using dusts wherever possible; spray formulations are preferred for bee safety.

**Protect pollinators:** See How to Reduce Bee Poisoning from Pesticides.

**Note:** Products are listed by alphabetical order and not in order of preference or superiority of pest control.

*For greenhouse plant see:* Greenhouse Ornamental Pests Characteristics of Insecticides

Using pyrethroid insecticides is associated with subsequent spider mite outbreaks: monitor plant closely after you use these materials.

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### Pesticides available for use in commercial nursery applications

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Trade name (examples)</th>
<th>Chemical class</th>
<th>Typical use pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>abamectin</td>
<td>Avid, Lucid</td>
<td>acyclic lactone</td>
<td>translaminar systemic</td>
</tr>
<tr>
<td>acephate</td>
<td>Acephate, Orthene</td>
<td>organophosphate</td>
<td>foliar systemic</td>
</tr>
<tr>
<td>acequinocyl</td>
<td>Shuttle</td>
<td>nathoquinone</td>
<td>spider mite</td>
</tr>
<tr>
<td>acetamiprid</td>
<td>Tristar</td>
<td>chloro-nicotinyl</td>
<td>whitefly, aphid, adelgid, scale, psyllid, mealybug, leafhopper, thrips, leafminer, plant bug, leaf eating beetles, fungus gnat larvae</td>
</tr>
<tr>
<td>alpha-cypermethrin</td>
<td>Fendona CD</td>
<td>synthetic pyrethroid</td>
<td>aphid, lepidoptera, flea beetle, webworm, grasshopper, plant bug, spittlebug</td>
</tr>
</tbody>
</table>

*Bacillus thuringiensis* various (organic labels available) microbial specific, depends on variety; biopesticide

*Beauveria bassiana* Botanigard, Mycotrol, Naturalis L fungus whitefly, aphid, psyllid, thrips, weevil, mealybug

beta-cyfluthrin Tempo pyrethroid aphid, lepidopterous larvae

bifenazate Floramite carbazate spider mite—good coverage is especially important; compatible with predacious mite.

bifenthrin Menace, Talstar, Wisdom, many labels pyrethroid general, check label; most are restricted use pesticides.

bifenthrin + imidacloprid Atera, Bithor pyrethroid + neonicotinoid combination product; systemic, check label for pests.

buprofezin Talus insect growth regulator scale, whitefly, mealybug, leafhopper, pear psylla acts on immature stages.

carbaryl Sevin carbamate general, check label for pest list.

chlorfenapyr Pylon pyroles spider mites

chlorantraniliprole Acelepryn anthranilic diamide lepidopterous larvae, aphid, lace bug, birch leafminer, beetle, borers
### Pesticides available for use in commercial nursery applications

<table>
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<th>Trade name (examples)</th>
<th>Chemical class</th>
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</tr>
</thead>
<tbody>
<tr>
<td>chlorpyriphos</td>
<td>Dursban</td>
<td>organophosphate</td>
<td>general, check label for pest list; restricted use pesticide.</td>
</tr>
<tr>
<td>Chromobacterium</td>
<td>Grandevo</td>
<td>microbial</td>
<td>general, check label for pest lift.</td>
</tr>
<tr>
<td>canola oil</td>
<td>Earth-Tone Horticultural Oil (organic)</td>
<td>botanical oil</td>
<td></td>
</tr>
<tr>
<td>citronella + farnesol + geraniol + nerolid</td>
<td>Biomite</td>
<td>botanical</td>
<td></td>
</tr>
<tr>
<td>neem oil</td>
<td>Triact (OMRI), Trilogy (OMRI)</td>
<td>botanical oil</td>
<td>fungicide, miticide, insecticide, whitefly, mealybug, aphid, leafhopper</td>
</tr>
<tr>
<td>clofentezine</td>
<td>Ovation</td>
<td>tetrazine</td>
<td>spider mite</td>
</tr>
<tr>
<td>clothianidin</td>
<td>Arena</td>
<td>neonicotinoid</td>
<td>aphid, mealybug, whitefly, adelgid, lacebug, leaf beetle, psyllid, root weevils, systemic</td>
</tr>
<tr>
<td>cryolite</td>
<td>Cryolite Bait</td>
<td>inorganic</td>
<td>caterpillar, root weevil</td>
</tr>
<tr>
<td>cyantraniliprole</td>
<td>Mainspring</td>
<td>raynoid</td>
<td>plant bug, lepidopera, soft scale, thrips, whitefly, Japanese beetle</td>
</tr>
<tr>
<td>cyflumetofen</td>
<td>Sultan Miticide</td>
<td>pyrethroid</td>
<td>spider mite</td>
</tr>
<tr>
<td>cyfluthrin</td>
<td>Decathlon</td>
<td>pyrethroid</td>
<td>general – check label; restricted use pesticide.</td>
</tr>
<tr>
<td>cyfluthrin + imidacloprid</td>
<td>Discus</td>
<td>pyrethroid + neonicotinoid</td>
<td>general – check label; combination product; systemic; restricted use pesticide.</td>
</tr>
<tr>
<td>cyfluthrin + piperonyl butoxide + pyrethrins</td>
<td>CB Intruder, PT 1600 X-clude</td>
<td>pyrethroid + synergist + pyrethrins</td>
<td>general – check label combination product; restricted use pesticide.</td>
</tr>
<tr>
<td>cypermethrin</td>
<td>Cyper Eight, Enforcer</td>
<td>pyrethroid</td>
<td>ant, silverfish, sowbug greenhouse, seedhouse, and commercial building treatments; restricted use pesticide.</td>
</tr>
<tr>
<td>cyromazine</td>
<td>Citation</td>
<td>triazine: insect growth regulator</td>
<td>acts on immature fungus gnat, leaf miner, shore fly.</td>
</tr>
<tr>
<td>deltamethrin</td>
<td>Deltagard GC</td>
<td>pyrethroid</td>
<td>general – check label; restricted use.</td>
</tr>
<tr>
<td>diazinon</td>
<td>Diazinon</td>
<td>organophosphate</td>
<td>general; restricted use pesticide.</td>
</tr>
<tr>
<td>diflubenzuron</td>
<td>Dimilin 4L</td>
<td>benzoylphenylurea : insect growth regulator</td>
<td>acts on immature stages, conifer nursery; restricted use pesticide.</td>
</tr>
<tr>
<td>dimethoate</td>
<td>Dimethoate</td>
<td>organophosphate</td>
<td>general – check label; systemic.</td>
</tr>
<tr>
<td>dinotefuran</td>
<td>Safari</td>
<td>neonicotinoid</td>
<td>aphid, mealybug, whitefly, fungus gnat, weevil, psyllid, borer, thrips, scale; systemic.</td>
</tr>
<tr>
<td>disulfoton</td>
<td>Di-syston</td>
<td>organophosphate</td>
<td>Easter lily production only – Curry Country, OR; restricted use pesticide; supplemental label needed.</td>
</tr>
<tr>
<td>emamectin benzoate</td>
<td>Enfold</td>
<td>pesticide</td>
<td></td>
</tr>
<tr>
<td>entomopathogenic nematode (live)</td>
<td><em>Heterorhabditis</em> spp., <em>Steinernema</em> spp.</td>
<td>microbial</td>
<td>soil pests such as root weevil.</td>
</tr>
<tr>
<td>esfenvalerate</td>
<td>Fenvastar EcoCap</td>
<td>pyrethroid</td>
<td>general; check label for pests.</td>
</tr>
<tr>
<td>ethoprop</td>
<td>MoCap</td>
<td>organophosphate</td>
<td>nematode, symphylan, field nurseries only, pre-plant only: Easter lilies (Curry County, OR); supplemental label needed; restricted use pesticide.</td>
</tr>
<tr>
<td>Active ingredient</td>
<td>Trade name (examples)</td>
<td>Chemical class</td>
<td>Typical use pattern</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>etoxazole</td>
<td>TetraSan</td>
<td>oxazolin; insect growth regulator</td>
<td>spider mite</td>
</tr>
<tr>
<td>farnesol</td>
<td>Biomite</td>
<td></td>
<td>spider mite</td>
</tr>
<tr>
<td>fenazaquin</td>
<td>Magus Miticide</td>
<td>quinazoline</td>
<td>spider mite, whitefly</td>
</tr>
<tr>
<td>fenbutatin oxide</td>
<td>Vendex, Promite</td>
<td>organotin</td>
<td>spider mite</td>
</tr>
<tr>
<td>fenpropathrin</td>
<td>Tame 2.4 EC</td>
<td>pyrethroid</td>
<td>general – check label; restricted-use pesticide.</td>
</tr>
<tr>
<td>fenpyroximate</td>
<td>Akari</td>
<td>phenoxy pyrazole</td>
<td>spider mite, broad mite, cyclamen mite, erio phyld mite, mealybug</td>
</tr>
<tr>
<td>fenvalerate</td>
<td>Onslaught</td>
<td>synthetic pyrethroid</td>
<td>lepidoptera, aphid, plant bug, sawfly, spittlebug, thrips</td>
</tr>
<tr>
<td>flonicamid</td>
<td>Aria Insecticide</td>
<td>pyridinecarboxamide</td>
<td>aphid, thrips, whitefly, scale leafhopper, mealybug</td>
</tr>
<tr>
<td>garlic oil/powder +</td>
<td>Pestout (OMRI)</td>
<td>botanical</td>
<td>mite</td>
</tr>
<tr>
<td>cottonseed oil + oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of clove</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>geraniol + citronellol</td>
<td>Biomite</td>
<td>botanical derivatives</td>
<td>spider mite</td>
</tr>
<tr>
<td>+ farnesol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hexythiazox</td>
<td>Hexagon</td>
<td>organosulfur</td>
<td>spider mite, ovidical, larvicidal</td>
</tr>
<tr>
<td>hydramethylnon</td>
<td>Amdro, MaxForce</td>
<td></td>
<td>ant</td>
</tr>
<tr>
<td>imidacloprid</td>
<td>Imidacloprid, Marathon</td>
<td>chloronicotinyl</td>
<td>general – check label; systemic.</td>
</tr>
<tr>
<td>indoxacarb</td>
<td>Provaunt</td>
<td>carbamate</td>
<td>lepidopterous larvae, sawfly, leafhopper</td>
</tr>
<tr>
<td>Isaria fumosorosea</td>
<td>Preferal Microbial Insecticide</td>
<td>microbial</td>
<td>general – check label.</td>
</tr>
<tr>
<td>strain 97</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>jojoba oil</td>
<td>Eco E -rase (OMRl)</td>
<td>botanical oil</td>
<td>whitefly</td>
</tr>
<tr>
<td>kaolin</td>
<td>Surround (OMRI)</td>
<td>clay</td>
<td>may leave residue.</td>
</tr>
<tr>
<td>lambda-cyhalothrin</td>
<td>Cyonara, Scimitar GC,</td>
<td>pyrethroid</td>
<td>general – check label; restricted use pesticide.</td>
</tr>
<tr>
<td>limonene</td>
<td>Orange Guard</td>
<td>botanical, monoterpine</td>
<td>aphid, spider mite</td>
</tr>
<tr>
<td>malathion</td>
<td>Malathion 5EC, Fyfanon, Prentox</td>
<td>organophosphate</td>
<td>check label for non-tolerant plant.</td>
</tr>
<tr>
<td>metaldehyde</td>
<td>metaldehyde</td>
<td>aldehyde molluscicide</td>
<td>slug and snail</td>
</tr>
<tr>
<td>Metarhizium anisopliae</td>
<td>Met 52</td>
<td>biological, fungus</td>
<td>root weevil grubs</td>
</tr>
<tr>
<td>strain 52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>methidathion</td>
<td>Supracide</td>
<td>organophosphate</td>
<td>aphid, scale, leafminer, moth, weevil; restricted use pesticide.</td>
</tr>
<tr>
<td>methiocarb</td>
<td>Mesurol</td>
<td>carbamate</td>
<td>slug, snail, thrips; restricted use.</td>
</tr>
<tr>
<td>methoxyfenozide</td>
<td>Intrepid 2F</td>
<td>diacylhydrazine</td>
<td>lepidopterous larvae</td>
</tr>
<tr>
<td>milbemectin</td>
<td>Ultiflora</td>
<td>macrocyclic lactonemite;</td>
<td>mite; restricted use pesticide.</td>
</tr>
<tr>
<td>mineral oil, petroleum</td>
<td>various</td>
<td>oil</td>
<td>soft bodied pests</td>
</tr>
<tr>
<td>distillate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>novaluron</td>
<td>Pedestal</td>
<td>benzozyphenyl urea</td>
<td>whitefly, thrips, leafminer, armypworm; insect growth regulator</td>
</tr>
<tr>
<td>oil of rosemary + peppermint</td>
<td>Ecotec Broad Spectrum (OMRI)</td>
<td>botanical + botanical oil</td>
<td>aphid, beetle, caterpillar, fungus gnat, shorefly, leafhopper, leafminer, mite, soft scale</td>
</tr>
<tr>
<td>oxydemeton-methyl</td>
<td>MSR Spray Concentrate</td>
<td>organophosphate</td>
<td>aphid, adelgid, thrips, white pine weevil, field-grown nursery stock; systemic; restricted use pesticide.</td>
</tr>
<tr>
<td>Paecilomyces fumosoroseus</td>
<td>PFR 97</td>
<td>biological, fungus</td>
<td>whitefly</td>
</tr>
<tr>
<td>permethrin</td>
<td>Ambush, Permethrin, Pounce, many labels</td>
<td>pyrethroid</td>
<td>general – check label; most are restricted-use pesticides.</td>
</tr>
</tbody>
</table>
### Pesticides available for use in commercial nursery applications

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<tbody>
<tr>
<td>phosmet</td>
<td>Imidan</td>
<td>organophosphate</td>
<td>birch leafminer</td>
</tr>
<tr>
<td>potassium laurate</td>
<td>M-Pede, Insecticidal Soap (several OMRI, organic)</td>
<td>soap</td>
<td>general, contact only, no residual.</td>
</tr>
<tr>
<td>propargite</td>
<td>Omite</td>
<td>organosulfur</td>
<td>mite</td>
</tr>
<tr>
<td>propylene glycol laurate</td>
<td>Acratouch</td>
<td>fatty acid monoester</td>
<td>spider mite – good contact required.</td>
</tr>
<tr>
<td>pymetrozine</td>
<td>Endeavor</td>
<td>triazine</td>
<td>aphid, whitefly</td>
</tr>
<tr>
<td>pyrethrins + piperonyl butoxide (PBO)</td>
<td>PT 1600 X-clude, PT Pyrethrum TR pyrethrins + synergist</td>
<td>general – check label.</td>
<td></td>
</tr>
<tr>
<td>pyrethrins + canola</td>
<td>PyGanic Dust (OMRI)</td>
<td>pyrethrins</td>
<td>general – check label.</td>
</tr>
<tr>
<td>pyridalyl</td>
<td>Overture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pyridaben</td>
<td>Sanmite</td>
<td>pyridazinone</td>
<td>spider mite, whitefly</td>
</tr>
<tr>
<td>pyriproxyfen</td>
<td>Distance</td>
<td>insect growth regulator</td>
<td>aphid, whitefly, scale, fungus gnats, leafminer</td>
</tr>
<tr>
<td>s-kinoprene</td>
<td>Enstar</td>
<td>insect growth regulator</td>
<td>greenhouse, shadehouse, lath structures only; acts on immature stage of aphids, whitefly, scale, mealybug, thrips</td>
</tr>
<tr>
<td>sodium borate complex</td>
<td>Prev-Am</td>
<td>inorganic</td>
<td>aphid, leafhopper, lygus, mealybug, mite, thrips, whitefly</td>
</tr>
<tr>
<td>sorbitol octanoate</td>
<td>Sorbishield 90</td>
<td>sugar ester</td>
<td>soft-bodied insects</td>
</tr>
<tr>
<td>spinetoram</td>
<td>Delegate</td>
<td>spinosyn</td>
<td>lepidopterous larvae</td>
</tr>
<tr>
<td>spinosad</td>
<td>Conserve, Entrust</td>
<td>fungal metabolite</td>
<td>thrips, caterpillar, midge</td>
</tr>
<tr>
<td>spiromesifen</td>
<td>Judo</td>
<td>ketoenole</td>
<td>spider mite, broad mite, cyclamen mite, false spider mite, eriophyid mite, whitefly</td>
</tr>
<tr>
<td>spirotetratramat</td>
<td>Kontos</td>
<td>tetramic acid</td>
<td>aphid, adelgid, whitefly, rust mite, spider mite, psyllid, spittlebug, mealybug, leafhopper; systemic chemistry</td>
</tr>
<tr>
<td>sulfoxaflor</td>
<td>Closer</td>
<td>sulfoximines</td>
<td>sap-feeding insects</td>
</tr>
<tr>
<td>tau-fluvalinate</td>
<td>Mavrik Aquaflow</td>
<td>pyrethroid</td>
<td>general, container stock only.</td>
</tr>
<tr>
<td>tebufenozide</td>
<td>Confirm</td>
<td>hydrazine, IGR</td>
<td>acts on moth immature stages.</td>
</tr>
<tr>
<td>thiamethoxam</td>
<td>Flagship</td>
<td>neonicotinoid</td>
<td>beetle grub, aphid, whitefly, mealybug</td>
</tr>
<tr>
<td>tolenpyrad</td>
<td>Hachi-Hachi</td>
<td>pyrazole</td>
<td>aphid, leafhopper, lepidoptera, scale, thrips</td>
</tr>
<tr>
<td>trichlorfon</td>
<td>Dylox Turn &amp; Ornamental Ins.</td>
<td>organophosphate</td>
<td>lepidopterous larvae, bulb fly, cinch bug, beetle larvae</td>
</tr>
<tr>
<td>zeta-cypermethrin</td>
<td>various labels</td>
<td>pyrethroid</td>
<td>aphid, lepidopterous larvae, sucking insects</td>
</tr>
</tbody>
</table>
Pesticides registered for use on specific nursery pests

**adelgid**
- abamectin (Avid)
- acephate (Acephate 90WDG)
- acetamiprid (TriStar)
- azadirachtin (Azatin)
- bifenthrin (Taflat, various)
- canola oil (Earth-tone Hort Oil)
- carbaryl (Sevin)
- chlorpyrifos (Dursban, various)
- Chromobacterium subtsugae
- chlorpyrifos (Dursban, various)
- carbaryl (Sevin)
- bifenthrin (Talstar, various)
- azadirachtin (Azatin, Neemix, various)
- acetamiprid (TriStar)
- acephate (Acephate 90WDG)
- abamectin (Avid)
- pyrethrin/PBO3
- pymetrozine (Endeavor)
- permethrin (Ambush, Pounce, Permethrin, various)
- pyrethrin (Pyganic Dust)
- pyrethrin/canola (various)
- sulfoxaflor (Closer SC)
- tolenpyrad (Hachi-Hachi)
- zeta-cypermethrin (Talstar, Cycoff)

**aphid**
- abamectin (Avid)
- acephate (Orthene, various)
- acetamiprid (TriStar)—Systemic activity
- alpha-cypermethrin (Fendona)
- azadirachtin (Azatin, Neemix, various)—
  - Acts as an insect growth regulator and antifeedant.
- Beavaria bassiana (Botanigard, Naturalis L)—Fungal pathogens.
- bifenthrin (Talstar, various)
- canola oil (Earth-tone Hort Oil)—Other oils include clove, cottonseed, rosemary, peppermint, sesame.
- carbaryl (Sevin)
- chlorpyrifos (Dursban, various)
- Chromobacterium subtsugae (Grandevo)
- cinnamaldehyde (Cinnacure)
- clarified hydrophobic extract of neem oil (Triact, Trilogy)—Avoid tank mixes of oxythioquinox, captan, sulfur, chlorothalonil.
- clothianidin (Arena)
- cyfluthrin (Decathlon)
- deltamethrin (Deltagard)—For perimeter treatments.
- diazinon (Diazinon)
- dimethoate (Dimate, Dimethoate)
- dinotefuran (Safari)
- esfenvalerate (Fenvarstar EcoCap)
- fenpropathrin (Tame)
- fenvlrate (Onslaught)
- flonicamid (Aria)
- garlic oil/powder (Alliyn Insect Repellent)
- garlic powder/oil of clove/cottonseed oil (Pest Out)
- horticultural oil (various)
- imidacloprid (Marathon, various)
- imidacloprid + cyfluthrin (Discus)
- Isaria fumosorosea Apopka strain 97 (Preferal Microbial Insecticide, PFR 97)
- kaolin (Surround)—May leave residue;
  - thorough coverage essential.
- lambda-cyhalothrin (Scimitar, various)
- malathion (various)
- methiocarb (Mesoil)
- mineral oil
- neem oil (Trilogy)
- oxydemeton-methyl (MSR Spray Concentrate)
- potassium laurate (various)
- pyrethrin (Pyganic Dust)
- pyrethrin/canola (various)
- pyrethrin/PBO3
- pyriproxyfen (Distance)—Apply to the immature stages of the insect.
- s-k roprene (Enstar II)—Apply to the immature stages of the insect.
- sodium borate
- sorbitol octanoate (Sorbishield 90)
- spirotronemat (Kontos)—Systemic activity
tau-fluvalinate (Mavrak Aquaflow)
thiamethoxam (Flagship)
zeta-cypermethrin (Talstar, Cycoff)

**caterpillars**
- acephate (Orthene, various)
- acetamiprid (TriStar)
- alpha-cypermethrin (Fendona)
- azadirachtin (Azatin, Neemix, various)
- Bacillus thuringiensis aizawai (Dipel, various)—Most effective on younger stages of the caterpillars.
- Bacillus thuringiensis kurstaki (Zentari)—
  - Most effective on younger stages of the caterpillars.
- Beauvaria bassiana (Mycotrol, Naturalis O)
- bifenthrin (Taflat, various)
- carbaryl (Sevin)
- chlorpyrifos (Dursban, various)
- Chromobacterium subtsugae (Grandevo)
- cinnamaldehyde (Cinnacure)
- clothianidin (Arena)
- cyantraniliprole (Mainspring)
- cyfluthrin (Decathlon)
- esfenvalerate (Fenvarstar EcoCap)
- deltamethrin (Deltagard)
- fenvalerate (Onslaught)
- garlic powder/oil (Alliyn Insect Repellent)—Acts as an insect growth regulator and antifeedant.
- other oils include canola, neem, peppermint.
- imidacloprid + bifenthrin (Atera)
- imidacloprid + cyfluthrin (Discus)
- indoxacarb (Proavaunt)
- insect growth regulator
- Isaria fumosorosea Apopka strain 97 (Preferal Microbial Insecticide, PFR 97)
- lambda-cyhalothrin (Scimitar, various)
- malathion (various)
- methoxyfenozide (Intrepid)—Begin treatments.
- methylparathion (Varan)
- spinosad (Conserve, Entrust)
- zeta-cypermethrin (Talstar, Cycoff)

**borders (general)**
- acephate (Acephate 90WDG)
- azadirachtin (Azatin, Neemix, various)
- bifenthrin (Taflat, various)
- carbaryl (Sevin)
- clothianidin (Arena)
- chlorpyrifos (Dursban, various)
- cinnamaldehyde (Cinnacure)
- cyfluthrin + imidacloprid (Discus)
- cyfluthrin (Decathlon)
- dimethoate (Dimate, Dimethoate)
- dinotefuran (Safari)
- esfenvalerate (Fenvarstar EcoCap)
- garlic oil/powder (Alliyn Insect Repellent)
- imidacloprid (Marathon, various)
- lambda-cyhalothrin (Scimitar, various)
- permethrin (Ambush, Pounce, Permethrin, various)
- prallethrin (ETOC)
- pyrethrins
- spinosad (Conserve, Entrust)
- zeta-cypermethrin (Talstar, Cycoff)
flea beetle
imidaclorpid + bifenthrin (Atera, Bithor)
kaolin (Surround)
lambda-cyhalothrin (Scimitar, various)
malathion (various)
peppermint (Ecotec Broad Spectrum)—
Other oils include rosemary, canola oil, permethrin (Ambush, Pounce, Permethrin, various)
kasson laurate (various)
pyrethrin (ETOC)
pyrethrin (Pyganic Dust)
imidaclorpid + bifenthrin (Atera, Bithor)
imidaclorpid + cyfluthrin (Discus)
lambdacyhalothrin (Scimitar, various)
mineral oil/petroleum distillate (various)
oil of rosemary (Ecotec Broad Spectrum)
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
permethrin (Ambush, Pounce, Permethrin, various)
thiamethoxam (Flagship)

lace bug
lace bug (Orthene, various)
açaídractin (Açatim, Neemix, various)
Bacillus thuringiensis aizawai (Xentari)
Bacillus thuringiensis kurstaki (Dipel, various)
carbaryl (Sevin)
dimethoate (Dimate, Dimethoate)
garlic oil/powder (AllIynt Insect Repellent)
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
spinosad (Conserve, Entrust)

lace bug
lace bug (Orthene, various)
açaídractin (Açatim, Neemix, various)
Bacillus thuringiensis aizawai (Xentari)
Bacillus thuringiensis kurstaki (Dipel, various)
carbaryl (Sevin)
dimethoate (Dimate, Dimethoate)
garlic oil/powder (AllIynt Insect Repellent)
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
spinosad (Conserve, Entrust)

leaf hopper
acephate (Orthene, various)
acetamiprid (TriStar)
açaídractin (Açatim, Neemix, various)
Bacillus thuringiensis tenebrionus (Btt)
Bacillus thuringiensis kurstaki (Botanigard, Naturalis L)
bifenthrin (Talstar, various)
carbaryl (Sevin)
deltamethrin (Deltagard)—For perimeter treatments.
dimethoate (Dimate, Dimethoate)
dinofeturan (Safari)
esfenvalerate (Fenvastar EcoCap)
imidaclorpid (Marathon, various)
imidaclorpid + bifenthrin (Atera, Bithor)
imidaclorpid + cyfluthrin (Discus)
lambdacyhalothrin (Scimitar, various)
mineral oil/petroleum distillate (various)
oil of rosemary (Ecotec Broad Spectrum)
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
potassium laurate (various)
thiamethoxam (Flagship)

leaf hopper
acephate (Orthene, various)
acetamiprid (TriStar)
açaídractin (Açatim, Neemix, various)
Bacillus thuringiensis tenebrionus (Btt)
Bacillus thuringiensis kurstaki (Botanigard, Naturalis L)
bifenthrin (Talstar, various)
carbaryl (Sevin)
deltamethrin (Deltagard)—For perimeter treatments.
dimethoate (Dimate, Dimethoate)
dinofeturan (Safari)
esfenvalerate (Fenvastar EcoCap)
imidaclorpid (Marathon, various)
imidaclorpid + bifenthrin (Atera, Bithor)
imidaclorpid + cyfluthrin (Discus)
lambdacyhalothrin (Scimitar, various)
mineral oil/petroleum distillate (various)
oil of rosemary (Ecotec Broad Spectrum)
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
potassium laurate (various)
thiamethoxam (Flagship)

leafhopper
acephate (Orthene, various)
alpha-cypermethrin (Fendona)
açaídractin (Açatim, Neemix, various)—
Acts as an insect growth regulator and anti-feedant.
Bacillus thuringiensis aizawai (Xentari)
bifenthrin (Talstar, various)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
clothianidin (Arena)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)—For perimeter treatments.
dimethoate (Dimate, Dimethoate)
dinofeturan (Safari)
esfenvalerate (Fenvastar EcoCap)
imidaclorpid (Marathon, various)
imidaclorpid + bifenthrin (Atera, Bithor)
imidaclorpid + cyfluthrin (Discus)
lambdacyhalothrin (Scimitar, various)
malathion (various)
mineral oil/petroleum distillate (various)
peppermint oil, rosemary oil
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
spinosad (Conserve, Entrust)

leafhopper
acephate (Orthene, various)
alpha-cypermethrin (Fendona)
açaídractin (Açatim, Neemix, various)—
Acts as an insect growth regulator and anti-feedant.
Bacillus thuringiensis aizawai (Xentari)
bifenthrin (Talstar, various)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
clothianidin (Arena)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)—For perimeter treatments.
dimethoate (Dimate, Dimethoate)
dinofeturan (Safari)
esfenvalerate (Fenvastar EcoCap)
imidaclorpid (Marathon, various)
imidaclorpid + bifenthrin (Atera, Bithor)
imidaclorpid + cyfluthrin (Discus)
lambdacyhalothrin (Scimitar, various)
malathion (various)
mineral oil/petroleum distillate (various)
peppermint oil, rosemary oil
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
spinosad (Conserve, Entrust)

lace bug
lace bug (Orthene, various)
açaídractin (Açatim, Neemix, various)
Bacillus thuringiensis aizawai (Xentari)
bifenthrin (Talstar, various)
carbaryl (Sevin)
dimethoate (Dimate, Dimethoate)
garlic oil/powder (AllIynt Insect Repellent)
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
spinosad (Conserve, Entrust)

lace bug
lace bug (Orthene, various)
açaídractin (Açatim, Neemix, various)
Bacillus thuringiensis aizawai (Xentari)
bifenthrin (Talstar, various)
carbaryl (Sevin)
dimethoate (Dimate, Dimethoate)
garlic oil/powder (AllIynt Insect Repellent)
permethrin (Ambush, Pounce, Permethrin, various)
phosmet (Imidan)
spinosad (Conserve, Entrust)
pyrethrins + piperonyl butoxide
sodium borate
sorbitol octanoate (SorbiShield)
spinosad (Conserve, Entrust)
spirotetramat (Kontos)—Systemic activity.
tau-fluvalinate (Mavrik Aquaflow)
thiamethoxam (Flagship)
tolenpyrad (Hachi-Hachi)
zeta-cypermethrin (Talstar, Cynoff)

leafroller
acephate (Orthene, various)
azadirachtin (Azatin, Neemix, various)
Bacillus thuringiensis aizawai (Xentari)—Works best on small larvae.
Bacillus thuringiensis kurstaki (Dipel, various)
Beauveria bassiana (Botanigard, Naturalis L)
bifenthrin (Talstar, various)
canola oil (Earth-tone Hort Oil)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
Chromobacterium subsugae (Grandevo)—Systemic activity.
Chromobacterium subtsugae (Grandevo)
cin namaldehyde (Cinnacure)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)
diazinon (Diazinon)
emamectin benzoate (Enfold)
esfenvalerate (Fenvastar EcoCap)
fenpropathrin (Tame 2.4EC)
garlic oil/powder (Allitin Insect Repellent)
imidacloprid + bifenthrin (Atera, Bithor)
kaolin (Surround)
lamba-cyhalothrin (Scimitar, various)
methoxyfenozide (Intrepid)—Specific to caterpillars; mimics action of molting hormone.
mineral oil/petroleum distillate (various)
novaluron (Pedesta)—Apply to immature insects.
oil of rosemary (Ecotec Broad Spectrum)
permethrin (Ambush, Pounce, Permethrin, various)
pyrethrin (Pyganic Dust)
spinosad (Conserv, Entrust)
tebufenozide (Confirm)—Specific to caterpillars; apply at initiation of egg hatch.
zeta-cypermethrin (Talstar, Cynoff)

mite, eriophyid
abamectin (Avid)
acephate (Orthene, various)
acequinocyl (Shuttle)
azadirachtin (Azatin, Neemix, various)
bifenthrin (Talstar, various)
bifenthrin (Talstar)
cin namaldehyde (Cinnacure)
clofentezine (Ovation)
cyflumeto fen (Sultan Miticide)
diazinon (Diazinon)
dimethoate (Dimate, Dimethoate)
emamectin benzoate (Enfold)
esfenvalerate (Fenvastar EcoCap)
etoxazol (Tetrasan)
farnesol (Biomit)
fenazaquin (Magus Miticide)
fenbutatin-oxide (Vendex)
fenpyroximate (Akari)
garlic powder/oil of clove/cottonseed
mineral oil/petroleum distillate

mite, spider
abamectin (Avid)
acephate (Orthene, various)
acequinocyl (Shuttle)
azadirachtin (Azatin, Neemix, various)
bifenthrin (Talstar, various)
bifenthrin (Talstar)
cin namaldehyde (Cinnacure)
clofentezine (Ovation)
cyflumeto fen (Sultan Miticide)
diazinon (Diazinon)
dimethoate (Dimate, Dimethoate)
emamectin benzoate (Enfold)
esfenvalerate (Fenvastar EcoCap)
etoxazol (Tetrasan)
farnesol (Biomit)
fenazaquin (Magus Miticide)
fenbutatin-oxide (Vendex)
fenpyroximate (Akari)
garlic powder/oil of clove/cottonseed
mineral oil/petroleum distillate

peach twig borer
azadirachtin (Azatin, Neemix, various)
Bacillus thuringiensis kurstaki (Dipel, various)
bifenthrin (Talstar, various)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
Chromobacterium subsugae (Grandevo)—Systemic activity.
Chromobacterium subtsugae (Grandevo)
cin namaldehyde (Cinnacure)
diazinon (Diazinon)
esfenvalerate (Fenvastar EcoCap)
kaolin (Surround)
lamba-cyhalothrin (Scimitar, various)
minimal oil/petroleum distillate (various)
pyrethrin (Pyganic Dust)
spinosad (Conserv, Entrust)
plant bug
acephate (Orthene, various)
acetamiprid (TriStar)
alpha-cypermethrin (Fendona)
azadirachtin (Azatin, Neemix, various)
Beauveria bassiana (Botanigard, Naturalis L)
bifenthrin (Talstar, various)
canola oil + pyrethrin (various)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
Chromobacterium subsultusgae (Grandevo)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)—For perimeter treatments.
dimethoate (Dimate, Dimethoate)
esfenvalerate (Fenvastar EcoCap)
fenvalerate (Onslaught)
flonicamid (Aria)
garlic oil/powder (Allityn Insect Repellent)—Other oils include peppermint, rosemary.
imidacloprid (Marathon, various)
imidacloprid + bifenthrin (Atera, Bithor)
Isaria fumosorosea Apopka strain 97 (Preferal Microbial Insecticide, PFR 97)
lambda-cyhalothrin (Scimitar, various)
methidathion
mineral oil/petroleum distillate (various)
novaluron (Pestedal)
permethrin (Ambush, Pounce, Permethrin, various)
potassium laurate (various)
prallethrin (ETOCl)
sorbitol octanoate (Sorbishield 90)
tau-fluvalinate (Mavrik Aquaflow)
thiamethoxam (Flagship)
Imidacloprid (Marathon, various)
Isaria fumosorosea Apopka strain 97 (Preferal Microbial Insecticide, PFR 97)
kaolin (Surround)
mineral oil/petroleum distillate (various)
oil of rosemary + peppermint (Ecotec Broad Spectrum)
potassium laurate (various)
pyrethrin (Pyganic Dust)
sorbitol octanoate (Sorbishield 90)
spirotetramat (Kontos)—Systemic activity.
tau-fluvalinate (Mavrik Aquaflow)
thiamethoxam (Flagship)
Zeta-cypermethrin (Talstar, Cy努ff)

root weevil
acephate (Orthene, various)
azadirachtin (Azatin, Neemix, various)
Beauveria bassiana (Botanigard, Naturalis L)
bifenthrin (Talstar, various)
clothianidin (Arena)
cryolite (Gowan Cryolite Bait)
cyfluthrin (Decathlon)
dinofetuan (Safari)
imidacloprid (Marathon, various)
imidacloprid + cyfluthrin (Discus)
Isaria fumosorosea Apopka strain 97 (Preferal Microbial Insecticide, PFR 97)
lambda-cyhalothrin (Scimitar, various)
Metarhizium anisoplaeae (Met 52)
permethrin (Ambush, Pounce, Permethrin, various)
pyrethrins (Pyganic Dust)
tau-fluvalinate (Mavrik Aquaflow)
thiamethoxam (Flagship)

sawfly
acephate (Orthene, various)
azadirachtin (Azatin, Neemix, various)
bifenthrin (Talstar, various)
canola oil (Earth-tone Hort Oil)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
Chromobacterium subsultusgae (Grandevo)
clothianidin (Arena)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)—For perimeter treatments.
dimethoate (Dimate, Dimethoate)
dinotefuran (Safari)
esfenvalerate (Fenvastar EcoCap)
garlic oil/powder (Allityn Insect Repellent)—Other oils include cottonseed, peppermint.
imidacloprid (Marathon, various)

sawfly
acephate (Orthene, various)
azadirachtin (Azatin, Neemix, various)
bifenthrin (Talstar, various)
canola oil (Earth-tone Hort Oil)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
Chromobacterium subsultusgae (Grandevo)
clothianidin (Arena)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)—For perimeter treatments.
dimethoate (Dimate, Dimethoate)
dinotefuran (Safari)
esfenvalerate (Fenvastar EcoCap)
garlic oil/powder (Allityn Insect Repellent)—Other oils include cottonseed, peppermint.
imidacloprid (Marathon, various)

scale
abamectin (Avid)
acephate (Orthene, various)
acetamiprid (TriStar)
azadirachtin (Azatin, Neemix, various)
bifenthrin (Talstar, various)
buprofesin (Talus)—Do not rotate with chitin synthesis inhibitors.
canola oil (Earth-tone Hort Oil)—Other oils include cottonseed.
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
cinnamaldehyde (Cinnacure)
clothianidin (Arena)
cyrantriliprole (Mainspring)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)—For perimeter treatments.
diazinon (Diazinon)
dimethoate (Dimate, Dimethoate)
dinofeturan (Safari)
esfenvalerate (Fenvastar EcoCap)
flonicamid (Aria)
garlic oil/powder (Allityn Insect Repellent)
imidacloprid (Marathon, various)
lamba-cyhalothrin (Scimitar, various)
limonene (Orange Guard)
malathion (various)
methidathion (Supracide)
mineral oil/petroleum distillate (various)
oil of rosemary (Ecotec Broad Spectrum)
permethrin (Ambush, Pounce, Permethrin, various)
potassium laurate (various)
pyrethrin (Pyganic Dust)
S-kinoprene (Enstar II)
sodium borate
sorbitol octanoate (Sorbishield 90)
spinetoram (Delegate)
thiamethoxam (Flagship)
tolpyrad (Hachi-Hachi)
zeta-cypermethrin (Talstar, Cy努ff)

thrips
abamectin (Avid)
acephate (Orthene, various)
acetamiprid (TriStar)
azadirachtin (Azatin, Neemix, various)
Beauveria bassiana (Botanigard, Naturalis L)
bifenthrin (Talstar, various)
bifenazate (Floramite)—Good coverage is especially important with bifenazate. Compatible with predatory mites.
canola oil + pyrethrin (various)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
Chromobacterium subtsugae (Grandeo)
cinnamaldehyde (Cinnacure)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)—For perimeter treatments.
diazinon (Diazinon)
dimethoate (Dimate, Dimethoate)
dinotefuran (Safari)
esfenvalerate (Fenvastar EcoCap)
fenvalerate (Onslaught)
flonicamid (Aria)
garlic oil/powder (Allityn Insect Repellent)
garlic powder/oil of clove/cottonseed oil (Pest Out)
imidacloprid (Marathon, various)
Isaria fumosorosea Apopka strain 97 (Preferal Microbial Insecticide, PFR 97)
kaolin (Surround)
lambdacyhalothrin (Scimitar, various)
malathion (various)
Metarhizium anisopliae (Met 52)
methodion (Supracide)
neem oil, clarified hydrophobic extract of (Triact, Trilogy)—Avoid tank mixes of oxythioquinox, captan, sulfur, chlorothalonil.
novaluron (Pedestal)
oil of rosemary (Ecotec Broad Spectrum)
oxymethon-methyl (MSR Spray Concentrate)
permethrin (Ambush, Pounce, Permethrin, various)
pyrethrins (Pyganic Dust)
pyrethrin
pyridial (Overture)
S-kinoprene (Enstar II)
spinosad (Conserve, Entrust)
tau-fluvalinate (Mavrik Aquaflow)
thiamethoxam (Flagship)
tolenpyrad (Hachi-Hachi)

webworm
acephate (Orthene, various)
alphacypermethrin (Fendona)
azadirachtin (Azatin, Neemix, various)
Bacillus thuringiensis aizawai (Xentari)
Bacillus thuringiensis kurstaki (Dipel, various)
bifenthrin (Talstar, various)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
Chromobacterium subtsugae (Grandeo)
cyfluthrin (Decathlon)
deltamethrin (Deltagard)—For perimeter treatments.
diazinon (Diazinon)
dimethoate (Dimate, Dimethoate)
dinotefuran (Safari)
esfenvalerate (Fenvastar EcoCap)
fenvalerate (Onslaught)
flonicamid (Aria)
garlic oil/powder (Allityn Insect Repellent)
garlic powder/oil of clove/cottonseed oil (Pest Out)
imidacloprid (Marathon, various)
Isaria fumosorosea Apopka strain 97 (Preferal Microbial Insecticide, PFR 97)
kaolin (Surround)
lambdacyhalothrin (Scimitar, various)
malathion (various)
Metarhizium anisopliae (Met 52)
methodion (Supracide)
neem oil, clarified hydrophobic extract of (Triact, Trilogy)—Avoid tank mixes of oxythioquinox, captan, sulfur, chlorothalonil.
novaluron (Pedestal)
oil of rosemary (Ecotec Broad Spectrum)
oxymethon-methyl (MSR Spray Concentrate)
permethrin (Ambush, Pounce, Permethrin, various)
pyrethrins (Pyganic Dust)—Some products.
spinosad (Conserve, Entrust)
white pine weevil
abamectin (Avid)
acephate (Acephate 90WDG)
bifenthrin (Talstar, various)
chlorpyrifos (Dursban, various)
imidacloprid (Marathon, various)
oxymethon-methyl (Metasystox-R)
spinosad (Conserve, Entrust)
whitefly
abamectin (Avid)
acephate (Orthene, various)
acetamiprid (TriStar)
azadiractin
Beauveria bassiana (BotaniGard, Naturalis L)
bifenthrin (Talstar, various)
buprofezin (Talus)
canola oil (Earth-tone Hort Oil)—Other oils include cottonseed, peppermint.
canola oil + pyrethrin (various)
carbaryl (Sevin)
chlorpyrifos (Dursban, various)
Chromobacterium subtsugae (Grandeo)
cinnamaldehyde (Cinnacure)
clarified hydrophobic extract of neem oil (Triact, Trilogy)
clothianidin (Arena)
cyfluthrin (Decathlon)
diazinon (Diazinon)
dimethoate (Dimate, Dimethoate)
dinotefuran (Safari)
esfenvalerate (Fenvastar EcoCap)
fenazaquin (Magus)
fenpropathrin (Tame 2.4EC)
fenpyroximate (Akari)
flonicamid (Aria)
garlic oil/powder (Allityn Insect Repellent)
garlic powder/oil of clove/cottonseed oil (Pest Out)
imidacloprid + cyfluthrin (Discus)
lambda-cyhalothrin (Scimitar, various)
methoxyfenozide (Intrepid)
mineral oil/petroleum distillate (various)
oil of rosemary (Ecotec Broad Spectrum)
permethrin (Ambush, Pounce, Permethrin, various)
pyrethrin (Pyganic Dust)—Some products.
spinosad (Conserve, Entrust)
limonene (Orange Guard)
malathion (various)
Metarhizium anisopliae (Met 52)
mineral oil/petroleum distillate (various)
novaluron (Pedestal)
oil of rosemary (Ecotec Broad Spectrum)
permethrin (Ambush, Pounce, Permethrin, various)
sodium borate
sorbitol octanoate (Sorbishield 90)
spiromesifen (Judo)
spirotetratram (Kontos)—Systemic activity.
sulfoxaflor (Closer SC)
tau-fluvalinate (Mavrik Aquaflow)
thiamethoxam (Flagship)
zeta-cypermethrin (Talstar, Cynoff)