

## Insecticides and Miticides for PA Christmas Tree Pests

Prepared by PA Dept Agriculture

\*\*\* Call 1-800-PENN IPM for Christmas tree pest scouting report (April through June) \*\*\*

Penn State Christmas tree website: <http://ctrees.cas.psu.edu/>

To view chemical labels go to <http://www.cdms.net/manuf/manuf.asp>

This publication (prepared by PA Dept Agriculture) contains information pertaining to pesticides currently registered by the Pennsylvania Department of Agriculture for distribution and sale in the Commonwealth of Pennsylvania and is provided for informational purposes only by the PA Dept of Agriculture. Information derived from this publication does not constitute a label replacement or a recommendation. Before applying any pesticide, applicators must read and understand the entire pesticide label and any additional labeling related to the proposed use. Always check the container/package label to determine if the intended use site is included on the label. **READ AND FOLLOW ALL LABEL INSTRUCTIONS BEFORE USING ANY PESTICIDE PRODUCT. NEVER USE ANY PESTICIDE IN A MANNER INCONSISTENT WITH THE US EPA APPROVED LABELING!**

**Aphids** (balsam twig, *Cinara* sp., spotted pine, and white pine aphids): Control over-wintering forms with Damoil or Ultra-fine Oil<sup>k</sup>. When aphids are active and before populations build to damaging levels, apply Abamectin E-Pro 0.15 EC; Acephate E 75 WP; Areca; Ardent 0.15 EC; Avid 0.15EC; Attain Nursery; \*BifenthrinPro; Celero 16 WSG; \*Chlorpyrifos 4E AG, E-Pro 4; Couraz 1.6F; Damoil<sup>k</sup>; Decathlon 20; \*DeltaGard GC; \*Diazinon AG500 or 50W; Dibrom 8E; \*\*Dimethoate 4EC; Discus; Distance; Dormant Oil<sup>k</sup>, \*Dursban 50W \*DuraGuard ME; Endeavor; Flagship 25WG; Imida E Pro 2F or AG 1.6F; Lorsban \*4E, 50W and 75WG; Majesty; Malathion 5EC, 50% E, or 5lb Spray; Marathon II;; \*Mesurol 75% WP; \*MSR Spray Concentrate; Naturalis-L; Nufos RE; Omni Oil 6E; OnyxPro; Orthene TT&O Spray 97 & WSP; Pasada 1.6F; Provado 1.6F<sup>i</sup>; Pyrethrum TR; Pyrenone Crop Spray; Pyreth-it formula 2; Pyromyl Crop Spray; Safari 20SG; \*Scimitar; \*Talstar Nursery Flowable; Triact 70, TriStar 70 WSP; Ultra-fine Oil; \*Whirlwind or Wisdom Flowable. For **balsam twig aphid**, in addition to the above, use \*Adjourn; \*Asana XL<sup>i</sup>; Chipco Sevin<sup>i</sup> 80S or 4L<sup>i</sup> \*\*Dimethoate 4EC; \*Lambda-T; Sevin<sup>i</sup> 4F, 80S, 80WSP, RP4, SL or XLR Plus; \*Silencer or \*Warrior. Products specifically labeled for **Balsam Woolly Adelgid**, Asana XL; \*Adjourn; \*Lambda-T; M-Pede; \*Silencer; or \*Warrior.

**Bagworm**: When practical, hand pick overwintering bags before June. If chemical control is necessary, spray with; Acephate E 75 WP; Attain Nursery; Azatin XL; \*Bifenthrin; Biobit HP; Chipco Sevin<sup>i</sup> 4L or 80S<sup>c</sup>; \*Chlorpyrifos Pro 2 or Pro 4; Conserve SC; Crymax; Decathlon 20;\*DeltaGard GC; \*Diazinon AG500 or 50W; \*\*Dimethoate 4EC; \*Dimilin 4L or 25W; Dipel ES, or Pro DF; Discus; \*Dursban 50W; Entrust; Foray 76B; Javelin WG; \*Lambda-T; Lepinox WDG; Malathion 5EC, 50% E, or 5lb Spray; Mimic 2LV; OnyxPro; Orthene TT&O Spray 97 & WSP; Ornazine 3%EC; \*Permethrin 3.2AG; Pounce \*25WP; Pyrenone Crop Spray; Pyreth-it formula 2; Pyromyl Crop Spray; \*Scimitar; Sevin<sup>i</sup> 4F, 80S, 80WSP, RP4, SL or XLR Plus; \*Silencer; Spintor 2SC; \*Talstar Nursery Flowable; \*Warrior; Wisdom Flowable or XenTari when bags are small (early to mid-June).

**Bark beetles**: Chipco Sevin<sup>i</sup> 4L or 80S; \*Dursban 50W; OnyxPro; Ornazine 3%EC; and Sevin<sup>i</sup> 4F, 80S, 80WSP, RP4, SL or XLR Plus are labeled for various species of bark beetles on Christmas trees. Applications should be made to the trunk, when adult activity is noted. Most bark beetles are secondary, attacking only dead and dying trees; sanitation is important in reducing the effect of these pests. Nufos 4E; \*Scimitar GC and \*Talstar Nursery Flowable can be used for pine shoot beetle.

**Gypsy moth**: When larvae are still small (early to mid-May), apply Acephate E 75 WP; Attain Nursery; \*BifenthrinPro; Biobit HP; Chipco Sevin<sup>i</sup> 4L or 80S<sup>c</sup>; \*Chlorpyrifos Pro 2 or Pro 4 and 4E AG and E-Pro 4; Confirm 2F; Conserve SC; Crymax; Decathlon 20; \*DeltaGard GC; \*Dimilin 4L or 25W; Dipel ES, or Pro DF; Discus; \*Dursban 50W; Entrust; Foray 76B; Imidan 70-W; Javelin WG; \*Lambda-T; Lepinox WDG; Lorsban \*4E, 50W, and 75WG; M-Pede; Mimic 2LV; \*MSR Spray Consontrate; Nufos 4E; OnyxPro; Ornazine 3%EC; Orthene TT&O Spray 97 & WSP; Pyrenone Crop Spray; Pyreth-it formula 2; Pyromyl Crop Spray; \*Scimitar; Sevin<sup>i</sup> 4F, 80S, 80WSP, SL, RP4 or RP4; \*Silencer; Spintor 2SC; \*Talstar Nursery Flowable; TriStar 70 WSP; \*Warrior or XenTari; or \*Whirlwind.

**Midges (Douglas fir needle midge, pine needle midge)**: Lorsban \*4E, 50W and 75WG; Nufos 4E; Orthene TT&O Spray 97 & WSP; and \*Whirlwind are specifically labeled for Douglas fir needle midge and should be applied when adults are active or late bud swell. \*Adjourn; \*Asana XL<sup>i</sup>; \*Chlorpyrifos Pro 2 or 4E AG; \*Dursban 50W;; Lorsban \*4E and 75WG; Nufos 4E; and \*Whirlwind are labeled for control of pine needle midge on Scotch pine. Applications for pine needle midge should be made to the top 1/3 of tree when needles are beginning to elongate. AZA-Direct; Ornazine 3%EC; Pyrenone Crop Spray; Pyreth-it formula 2; Pyromyl Crop Spray; and \*Scimitar; are labeled for midges, in general.

**\*\*Need special local needs label, which can be found on Christmas tree web site <http://ctrees.cas.psu.edu/>**

\* **RESTRICTED USE PESTICIDE**

<sup>a</sup> not labeled for use on *Abies* sp.

<sup>b</sup> pine and spruce only

<sup>i</sup> spider mite may buildup after use of this material. Monitor susceptible hosts for population increases.

<sup>k</sup> for dormant use, apply before new growth starts, when temperatures are above 40°F, and there is no danger of freezing before spray dries. Horticultural oil may damage Douglas fir flower buds and will remove blue bloom from glaucous trees. Damage has been noted on true fir in late summer.

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**Mites:** Effective mite control requires two sprays, 7 - 10 days apart, unless prohibited on the label. Monitor populations regularly and apply control when increases are noted. Most spider mites and eriophyids on conifers are “cool season” mites, with peak populations in spring and fall. To avoid resistance, use a different class of miticide every third application.

Registered **general miticides** include Abamectin E-Pro 0.15 EC; Ardent 0.15 EC; Attain Nursery; Avid 0.15EC; AZA-Direct; \*BifenthrinPro; \*Chlorpyrifos Pro 2 or Pro 4 and 4E AG and E-Pro 4; \*\*Dimethoate 4EC; \*DeltaGard GC; \*Dursban 50W; Envidor 2 SC; Floramite SC; Judo; \*Mesurol 75% WP; \*MSR Spray Concentrate; Naturalis-L; Nufos 4E; OnyxPro; Pyrethrum TR; Sulfur 6L; \*Scimitar GC or Triact 70. Damoil and Ultra-fine Oil<sup>k</sup> can be used as a dormant spray for overwintering eggs. Additional compounds are labeled only for **spider mites**: Akari 5 SL; Attain Nursery; \*Chlorpyrifos 4E AG; Conserve SC; Damoil<sup>k</sup>; \*Diazinon AG500 or 50W; Dibrom 8E; \*DuraGuard ME; Dormant Oil<sup>k</sup>; Floramite SC; Hexygon DF; Lorsban \*4E, 50W and 75WG; Malathion 5EC, 50% E, or 5lb Spray; M-Pede; Omni Oil 6E; Pyrethrum TR; Savey 50DF; Shuttle 15 SC; \*Talstar Nursery Flowable; \*Tame 2.4EC; TetraSan 5WDG; or \*Whirlwind. **Eriophyid mites** are specified on Abamectin E-Pro 0.15 EC; Akari 5 SL; Ardent 0.15 EC; Avid 0.15 EC; Chipco Sevin<sup>i</sup> 4L or 80S<sup>c</sup>; Envidor 2 SC; Sevin<sup>i</sup> 4F, 80S, 80WSP, RP4, SL and XLR Pro; Judo; Omni Oil 6E; and Ultra-fine Oil.

**Northern (Eastern) pine weevil:** Can be controlled by eliminating suitable breeding material, including slash piles and stumps. \*Adjourn (kerosene); \*Asana XL<sup>i</sup>, in kerosene, chlorpyrifos Pro 2 or Pro 4 or E-Pro 4; \*Dursban 50W in water, can be used in early spring as a cut stump spray. Only stumps from previous season harvest need to be treated. If excessive adult feeding damage is occurring, AZA-Direct; \*Bifenthrin; Dibrom 8E; \*Dimilin 4L<sup>b</sup> or 25W<sup>b</sup>; \*Lambda-T; OnyxPro; Pyrenone Crop Spray; Pyromyl Crop Spray; \*Silencer; \*Talstar Nursery Flowable or Wisdom Flowable can be used as foliar sprays to protect valuable trees. Spraying with \*Dursban 50W immediately after planting can protect pine seedlings.

**Pales weevil:** This weevil breeds in fresh stumps, dying trees, and slash piles of conifers, particularly Scotch pine. \*Adjourn (kerosene); \*Asana XL<sup>i</sup> (kerosene); \*Chlorpyrifos Pro 2 or Pro 4 and 4E AG (water) and E-Pro 4; \*Dursban 50W (water); Lorsban \*4E, 50W and 75WG (water); or \*Whirlwind(water) should be applied to stumps from the previous season harvest in early spring. Pre-plant dipping in \*Furadan 4F (roots), or Imidan 70-W (tops) will protect seedlings. If adults are causing damage to valuable trees, Attain Nursery; AZA-Direct; \*Bifenthrin; \*Chlorpyrifos Pro 2 or Pro 4 and 4E AG; Dibrom 8E; \*Dursban 50W; Imidan 70-W; \*Lambda-T; Lorsban \*4E, 50W and 75WG; Nufos 4E; OnyxPro; Pyrenone Crop Spray; Pyromyl Crop Spray; \*Silencer; \*Talstar Nursery Flowable; \*Warrior; \*Whirlwind or Wisdom Flowable can be used as a foliar spray in spring or fall.

**Pine bark adelgid:** Apply Areca; \*Chlorpyrifos Pro 2 or Pro 4; Damoil<sup>k</sup>; Discus; Dormant<sup>k</sup> Oil<sup>k</sup>; \*Dursban 50W; Imida E Pro 2F or AG 1.6F; Majesty; Marathon II; MSR Spray Concentrate; M-Pede; Provado 1.6F<sup>i</sup>; Omni Oil 6E; OnyxPro; TriStar 70 WSP and Ultra-fine Oil from late April through May, when adelgids are active. To control overwintering forms, apply Damoil or Dormant oil<sup>k</sup> before new growth starts.

**Pine root collar weevil:** Acephate E 75 WP; Attain Nursery; AZA-Direct; \*Bifenthrin; BotaniGard 22WP or ES; \*DuraGuard ME; Imidan 70-W; \*Lambda-T; Mycotrol O; Naturalis-L; OnyxPro; Orthene TT&O Spray 97 & WSP; Pyrenone Crop Spray; \*Scimitar GC; \*Silencer; \*Talstar Nursery Flowable or Wisdom Flowable are labeled for adult weevils.

**Sawflies, general:** Acephate E 75 WP; \*Adjourn; Areca; Azatin XL; Chipco Sevin<sup>i</sup> 4L, 80S; \*Chlorpyrifos Pro 2 or Pro 4 and E-Pro 4; Conserve SC; Couraz 1.6 F; Damoil<sup>k</sup>; Decathlon 20; \*DeltaGard GC; \*Dimilin 4L or 25W; Discus; Dormant Oil<sup>k</sup>; \*Dursban 50W; Entrust; Flagship 25 WG; Imida E Pro 2F or AG 1.6F; Imidan 70-W; \*Lambda-T; Majesty; Marathon II; M-Pede; Omni Oil 6E; OnyxPro; Orthene TT&O Spray 97 & WSP; Pasada 1.6F; Provado 1.6F<sup>i</sup>; \*Scimitar; Sevin<sup>i</sup> 4F, 80S, 80WSP, RP4, SL or XLR Plus; \*Silencer; Spintor 2SC; TriStar 70 WSP; Ultra-fine Oil and \*Warrior are labeled for sawfly control. In addition to these, \*Adjourn; \*Asana XL<sup>i</sup>; \*Chlorpyrifos 4E AG; \*DeltaGard GC; Lorsban \*4E, 50W and 75WG; Nufos 4F; Ornazine 3%EC; and \*Whirlwind are labeled for **European pine sawfly**.

**Scales** (cryptomeria, elongate hemlock, pine needle, pine tortoise, striped pine, and spruce bud scales): Scale control is generally directed toward the crawler stage and at least two applications, 7 days apart, are recommended when crawlers are present. These materials are labeled for general scale control: Acephate E 75 WP; Attain Nursery; Chipco Sevin<sup>i</sup> 4L, 80S; \*Chlorpyrifos Pro 2, or Pro 4, and 4E AG and E-Pro 4; Decathlon 20; \*DeltaGard GC; \*\* 4E; Discus; Dormant Oil<sup>ck</sup>; \*DuraGuard ME; \*Lambda-T; Lorsban \*4E, 50W and 75WG; Majesty; Marathon II; M-Pede; Nufos 4E; Omni Oil 6E; OnyxPro; Orthene TT&O Spray 97 & WSP; Safari 20SG; Pyrethrum TR; \*Scimitar GC; Sevin<sup>i</sup> 4F, 80S, 80WSP,

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RP4, SL or XLR Plus; \*Supracide 2E or 25W<sup>f</sup>; Talus; Triact 70; Ultra-fine Oil; and \*Whirlwind. Damoil may be used in dormant season. **Pine needle scale** can be controlled by using one of the above materials or \*BifenthrinPro; \*Diazinon AG500 or 50W\*Dursban 50W; \*Lambda-T; Lime Sulfur Solution; Malathion 5 EC, 50% E, or 5lb Spray; \*MSR Spray Concentrate; \*Talstar Nursery Flowable; TriStar 70 WSP; \*Warrior. or Wisdom Flowable when crawlers are present, generally late April or early May. Second generation crawlers will emerge in mid- to late July.

**Striped pine and pine tortoise scales** can be controlled by a dormant spray of Ultra-fine Oil<sup>k</sup> or a crawler spray during late May through June. Use one of the materials from the general list above to control these soft scale pests of Scotch pine. These scales tend to be spotty and removal of a few infested trees prior to crawler emergence is effective in limiting spread.

**Shoot and tip boring moths:** Numerous compounds are specifically labeled for **eastern pine shoot borer**, **European pine shoot moth**, and **Nantucket pine tip moth**. Of these, and Imidan 70-W are labeled for all three pests. To control **eastern pine shoot borer**, sprays should be applied in May to kill larvae before they bore into shoots. Most larvae have left shoots when damage is apparent and control will not be effective. Adults emerge from mid-April through June. Larvae of **European pine shoot moth** should be controlled during the first two weeks of April, as they migrate to new shoots. Pines can also be treated in late-June or early-July, after eggs hatch. **Nantucket pine tip moth** controls are directed at young larvae before they conceal themselves. Monitor adult emergence with pheromone traps and apply a registered insecticide 1-2 weeks after peak numbers of moths appear in traps (mid-May to mid-June). A second generation control may be needed between mid-July and late August, again based on male moth emergence. Additional compounds labeled for both **European pine shoot moth** and **Nantucket pine tip moth** include: Azatin XL; Chipco Sevin<sup>1</sup> 4L, 80S; \*Chlorpyrifos E-Pro 4; Confirm 2F; Decathlon 20; \*\*Dimethoate 4EC; \*Dimilin 4L or 25W; Discus; \*Dursban 50W; Mimic 2LV; Pyrenone Crop Spray; Pyromyl Crop Spray; and Sevin<sup>1</sup> 4F, 80S, 80WSP, RP4, SL or XLR Plus. Additional materials labeled for **European pine shoot moth** only include \*Chlorpyrifos 4E AG; \*Diazinon AG500 or 50W; Lorsban \*4E, 50W and 75WG; Malathion 5EC, 50%E, or 5lb Spray; Nufos 4E; Pyreth-it formula 2 and \*Whirlwind. Materials only for use against **Nantucket pine tip moth** include Acephate E 75 WP; \*Adjourn; \*Ambush 25W; \*Asana XL<sup>1</sup>; \*BifenthrinPro; \*Chlorpyrifos Pro 2, and Pro 4; Conserve SC; \*DeltaGard GC; Entrust; \*Lambda-T; OnyxPro; Orthene TT&O Spray 97 & WSP; Ornazine 3% EC; \*Permethrin 3.2EC; Pounce \*25WP; Majesty; Marathon II; \*Scimitar; Spintor 2SC; \*Silencer; \*Talstar Nursery Flowable; or \*Warrior.

**Spittlebugs:** Adult spittlebugs should be controlled when 90% of the spittle masses are empty, usually in July. \*Adjourn; \*Asana XL<sup>1</sup>; \*Chlorpyrifos Pro 2, Pro 4, or 4E AG and E-Pro 4; Decathlon 20; \*DeltaGard GC; Dibrom 8E; Discus; \*Dursban 50W; \*Lambda-T; Lorsban \*4E, 50W and 75WG; Nufos 4E; OnyxPro; Ornazine 3%EC; Pyrenone Crop Spray; Pyromyl Crop Spray; \*Scimitar; \*Silencer; \*Warrior; or \*Whirlwind may be used for **pine spittlebug** and **Saratoga spittlebug**. Carbaryl<sup>1</sup> 4L or 80S and Sevin<sup>1</sup> 4F, 80S, 80WSP, RP4, SL or XLR Plus are only labeled for **pine spittlebug**.

**Spruce gall adelgids: Cooley gall adelgids** on Douglas fir and Colorado spruce, and **Eastern spruce gall adelgid** on Norway spruce are best controlled in the overwintering stage. Thorough coverage, including inner branches, is essential. Spray from mid-September through early October, or just before bud break in spring, when temperatures are above 60° F.

Registered materials include Areca; Chipco Sevin<sup>1</sup> 4L or 80S; \*Chlorpyrifos 4E AG, E-Pro 4; Couraz 1.6 F; Damoil<sup>k</sup>; \*DeltaGard GC; Discus; Dormant Oil<sup>k</sup>; \*Dursban 50W; Lorsban \*4E, 50W and 75WG; Majesty; Marathon II; \*MSR Spray Concentrate; M-Pede; Provado 1.6F<sup>1</sup>; Nufos 4E; Omni Oil 6E; OnyxPro; Pasada 1.6F; Sevin<sup>1</sup> 4F, 80S, 80WSP, RP4, SL or XLR Plus; TriStar 70 WSP; Ultra-fine Oil<sup>k</sup>; and \*Whirlwind. After budbreak, chemical controls are not effective. If only a few galls are present, pruning and destroying unopened green galls before mid-July is recommended.

**White pine weevil:** Attain Nursery; \*\*Avaunt; AZA-Direct; \*Bifenthrin; Dibrom 8E; \*Chlorpyrifos E-Pro4; \*Dimilin 4L<sup>b</sup> or 25W<sup>b</sup>; \*Lambda-T; \*MSR Spray Concentrate; OnyxPro; Pyrenone Crop Spray; Pyromyl Crop Spray; \*Silencer; \*Talstar Nursery Flowable; \*Warrior or Wisdom Flowable may be used to control adult weevils by application to the top 1/3 of the tree in early spring, when adult weevils are active. Pruning and destroying infested terminals before adults emerge in mid-July will give some control.

**Zimmerman pine moth:** Apply Dibrom 8E; \*\*Dimethoate 4EC; \*Dimilin 4L or 25W; \*Dursban 50W; Endosulfan 3EC; Mimic 2LV; OnyxPro; or \*Thionex 3EC from early April through early May to control overwintering larvae before they enter stem.

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<u>Class of Chemical</u>	<u>Active ingredient</u>	<u>Products (Manufacturers)</u>
	acequinocyl	Shuttle 15 SC (Arysta LifeScience)
Biological/ Botanical	azadirachtin pyrethrin	AZA-Direct (Gowan); Azatin XL (OPH); Triact 70 (OHP); Ornazine 3% EC (Sepro) Pyreth-it Formula 2 (Whitmire); Pyrenone Crop Spray (Bayer/Enviro Sci/Aventis Enviro Sci.); Pyrethrum TR (Whitmire micro-gen); Pyromyl Crop Spray(Prentis);
Carbamates	carbaryl	Carbaryl <sup>i</sup> 4L or 80S (Drexel); Sevin <sup>i</sup> Brand 4F, 80S, 80WSP, RP4, and XLR Plus (Bayer Crop Science); Chipco Sevin <sup>i</sup> SL, and 80WSP (Bayer/Aventis Enviro Sci)
	carbofuran	*Furadan 4F (FMC)
	hexythiazox methiocarb	Hexygon DF (Gowan); Savey 50DF (Gowan) *Mesurool 75% WP(Gowan)
Carbazate	bifenazate	Floramite SC (Chemtura)
Hydrocarbon	endosulfan	Endosulfan 3EC (Drexel); *Thionex 3EC (Makhteshim)
Insect Growth Regulator	diflubenzuron	*Dimilin 4L and 25W (Chemtura)
	pyriproxyfen	Distance (Valent U.S.A.)
	Tebufenozide Buprfezin	Confirm 2F and Mimic 2LV (Dow Agriscience) Talus (Sepro)
Macrocyclic lactone	abamectin	Avid 0.15EC and Ardent 0.15 EC (Syngenta); Abamectin E-Pro 0.15 EC (Etigra)
Microbials	<i>Bacillus thuringiensis</i> <i>Beauveria bassiana</i>	Biobit HP (Valent Biosci); Crymax (Certis); Dipel ES, or Pro DF and Foray 76B (Valent Bioscience); Javelin WG (Certis); Lepinox WDG (Certis); XenTari (Valent BioSci.) Naturalis-L (Troy Bioscience); BotaniGard ES and 22WP; Mycotrol O (Enerald BioAgriculture)
Nicotinoid	dinotefuran	Safari 20 SG (Valent USA)
	Imidacloprid	Provado 1.6 Flowable (Bayer Crop Science); Majesty, Areca, and Marathon II (OHP); Pasada 1.6 (Makhteshim); Imida E AG 1.6F or ImidaE Pro 2 F (Etigra); Couraz 1.6 F (Cheminova).
	thiamethoxam	Flagship 25WG (Syngenta)
	Acetamiprid Clothianidin	TriStar 70WSP; (Nippon Soda Co.) Celerio 16 WSG (Arysta LifeScience)
Organophosphates	acephate	Orthene TT&O Spray 97 and WSP (Valent U.S.A.); Acephate E 75 WP (Etigra)
	chlorpyrifos	*Chlorpyrifos Pro 2 & Pro 4 & E-Pro 4 (Etigra); *Chlorpyrifos 4E AG (Drexel, *Makhteshim, and Arysta); *DuraGuard ME (Whitmire Micro-gen); *Dursban 50W and *Lorsban-4E, 75WG and 50W (Dow AgroSciences); Lorsban 75WG (Gowan); *Whirlwind (Helena); Nufos 4E (Cheminova).
	Diazinon	*Diazinon 50W and AG500 (Makhteshim) <b>**Dimethoate 4EC (Arysta) (Need special local needs label if Christmas tree use is not on container label)</b>
	malathion	Malathion 5EC (Arysta and Drexel Chemical); 5lb. or 50% Malathion Spray (Prentiss);
	methidathion naled oxydemeton-methyl phosmet	*Supracide 25W <sup>f</sup> and 2E (Gowan) Dibrom 8E (AMVAC) *MSR Spray Concentrate (Gowan) Imidan 70-W (Gowan)
Oxadiazine	Indoxacarb	<b>**Avaunt (DuPont) (Need special local need label before using)</b>
Petroleum oils	horticultural oil	Damoil <sup>k</sup> (Drexel); Ultra-fine Oil (Whitmire Micro-gen.); Omni Oil 6E (Helena)
Potassium salt of fatty acid	insecticidal soap	M-Pede (Dow AgroSciences)
Pyridine azomethine	pymetrozine	Endeavor (Syngenta)
Phenoxypryrazoles	fenpyroximate	Akari 5SL (Sepro)
Spinosyn	spinosad	Conserve SC; Entrust and Spintor 2SC (Dow AgroSciences)
	calcium polysulfide sulfur	Lime Sulfur Solution (Miller) Sulfur 6L (Arysta)
Tetronic Acid	Spiromesifen Spirodiclofen	Judo (OHP) <b>Envidor 2 SC (Bayer Crop Sci)**(Need special local need label before using)</b>
Synthetic pyrethroids	bifenthrin	*BifenthrinPro (BASF); *Talstar Nursery Flowable (FMC); Wisdom Flowable (AMVAC); OnyxPro (FMC); Attain Nursery (Whitmire Micro-gen). Decathlon 20 WP and Discus (OHP)
	Cyfluthrin	*DeltaGard GC (Bayer Enviro Sci/Aventis Enviro Sci)
	deltamethrin	*Asana XL (Dupont)
	fenvalerate	*Tame 2.4EC (Valent U.S.A.)
	fenpropathrin	*Lambda-T (Helena); *Scimitar GC and *Silencer (Makhteshim); *Warrior (Syngenta);
	lambda-cyhalothrin	*Ambush 25W (AmVac); Permethrin 3.2AG (MicroFlo, or Helena); *Pounce 25WP (FMC)
	permethrin esfenvalerate	* Adjourn (Makhteshim)
Oxazoline	etoxazole	TetraSan 5WDG (Valent USA)

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