

CHEMICAL CONTROL OF COMMON FOREST & SHADE TREE PESTS

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This information is intended as a guide to the chemical control of common insect pests and diseases of forest and shade trees. This is not a complete list of all pesticides available. Other methods of control that do not involve the use of pesticides may be effective against certain pests and should be considered before a pesticide is used.

Trade names have been used for convenience. No endorsement is implied, and no discrimination against similar products not listed is intended. No guarantee of effectiveness is made. **Some pesticides may not be appropriate for certain trees or pests or under certain conditions. Always read and follow the instructions and precautions on the pesticide container.**

CONIFER INSECTS

Insect	Tree	Application Number and Date	Pesticide
Aphids	Pine	1	Throughout the growing season as they appear (May to September). Horticultural oil / Growing season oil Insecticidal soap (brands: Safer, Concern) Imidacloprid (*Merit) Acephate (Orthene, Bonide Systemic Insect Control) Permethrin (Eight, *Astro-- Licensed applicators only)
		1	Soil treatment: Use prior to infestation if a serious problem is expected. Has a 60-day translocation delay. Imidacloprid (Bayer "Advanced Garden" Tree and Shrub Insect Control, *Merit)
Bagworms	Juniper	1	After eggs hatch and small bags appear (late May to June). Can also hand pick bags. Bt <i>Bacillus thuringiensis</i> (Dipel) Permethrin (Eight, Hi-Yield 38 Plus, *Astro-- Licensed applicators only , *PermethrinPro-- Licensed applicators only) Deltamethrin (*DeltaGard) Spinosad (Ferti-lome Borer, Bagworm, Leafminer & Tent Caterpillar Spray; *Conserve) Carbaryl (Sevin) Acephate (Orthene, Bonide Systemic Insect Control) Malathion
Ips bark beetles	Pine	1	Apply in April prior to earliest beetle attack or when recently cut pine logs are brought near living pines. Carbaryl (*Sevin XLR Plus, *Sevin SL, *Carbaryl 4L) Permethrin (Hi-Yield 38 Plus, *Astro-- Licensed applicators only , *PermethrinPro-- Licensed applicators only) *Perm-Up-- Restricted Use
Pales weevil	Scotch & White pines	1	Apply as a drench on cut stumps and surrounding soil in spring (April). Chlorpyrifos (Restricted Use) (*Chlorpyrifos Pro 2-- For nurseries, industrial sites and road medians , *Dursban 50W-- For nurseries)

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CONIFER INSECTS (CONT.)

Insect	Tree	Application Number and Date	Pesticide
Pine bark adelgid	Pine	1	In dormant season just before bud break (April). Dormant oil Horticultural oil / Growing season oil
		1+	Throughout the growing season as they appear (May to September). Horticultural oil / Growing season oil Insecticidal soap (brands: Safer, Concern) Imidacloprid (*Merit)
		1	Soil treatment: Use prior to infestation if a serious problem is expected. Has a 60-day translocation delay. Imidacloprid (Bayer "Advanced Garden" Tree and Shrub Insect Control, *Merit)
Pine needle scale	Pine Spruce	2-3	When eggs hatch and red crawlers appear (late May or early June). Repeat once or twice at 7 to 10-day intervals (Unless prohibited by the label, e.g. oil). Also when eggs hatch in July. Horticultural oil / Growing season oil Oil will remove blue needle color. Insecticidal soap (brands: Safer, Concern) Acephate (Orthene, Bonide Systemic Insect Control) Permethrin (Eight) Malathion
Pine tip moth	Pine	2-4	Third week of May and first week of July. Better control if also second week of June and third week of July. Acephate (Orthene, Bonide Systemic Insect Control) *Dimethoate Commercial sites only Carbaryl (Sevin) Permethrin (Hi-Yield 38 Plus, *Astro-- Licensed applicators only)
Sawflies	Pine	1	When larvae appear (mid- to late April). Permethrin (Hi-Yield 38 Plus, *Astro-- Licensed applicators only) Carbaryl (Sevin) Acephate (Orthene, Bonide Systemic Insect Control) Imidacloprid (*Merit)
Spruce needle miner	Spruce	1	When current-year damage is first observed (June). Carbaryl (Sevin)
Spruce spider mite	Spruce Juniper Pine	1	In dormant season just before bud break (April). Dormant oil Horticultural oil / Growing season oil Oil will remove blue needle color.
		2	When mites are detected (April to May, and September to October). Make a second application 7 to 10 days later with a different or same product according to label directions. (A different product will reduce development of resistance.) A hard spray with water will help keep populations down. Horticultural oil / Growing season oil Oil will remove blue needle color. Insecticidal soap (brands: Safer, Concern) Bifenazate (*Floramite) Hexythiazox (*Hexygon) Commercial use only Abamectin (*Avid) Etoxazole (*TetraSan) Acephate+fenbutatin-oxide (Ortho Systemic Insect Killer)

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CONIFER INSECTS (CONT.)

Insect	Tree	Application Number and Date	Pesticide
Twospotted spider mite	Juniper Pine Spruce	2 When mites are detected (April through summer). Make a second application 7 to 10 days later with a different or same product according to label directions. (A different product will reduce development of resistance.) A hard spray with water will help keep populations down.	Horticultural oil / Growing season oil Oil will remove blue needle color. Insecticidal soap (brands: Safer, Concern) Bifenazate (*Floramite) Hexythiazox (*Hexygon) Commercial use only Abamectin (*Avid) Etoxazole (*TetraSan) Acephate+fenbutatin-oxide (Ortho Systemic Insect Killer)
Zimmerman pine moths (<i>Dioryctria</i> species)	Pine	2 Second week of April and second week of August. Use rate for borers and apply to trunk and major branches.	Permethrin (Hi-Yield 38 Plus, Super Eight, *Astro-- Licensed applicators only , *PermethrinPro-- Licensed applicators only , *Perm-Up-- Restricted Use) Chlorpyrifos (Restricted Use) (*Chlorpyrifos Pro 2-- For nurseries, industrial sites and road medians , *Dursban 50W-- For nurseries)
		Before the end of April if too late for the April spray above.	*Dimethoate Commercial sites only

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CONIFER DISEASES

Disease	Tree	Application Number and Date	Pesticide
Brown spot	Scotch & White pines	1-2 When new needles are nearly half grown (mid-June). Repeat 3 to 4 weeks later if frequent rains occur.	Chlorothalonil (Fung-onil, *Daconil, *Bravo) Mancozeb (*Dithane, *Fore, *Protect)
Cercospora blight	Juniper Redcedar	2+ Mid-June and late July. Additional sprays at monthly intervals may be necessary if frequent rains occur in August and September. Use of a spreader-sticker may increase effectiveness.	Copper salts of fatty and rosin acids (Bonide Liquid Copper Fungicide, *Camelot) Bordeaux mixture See note‡ Mancozeb (*Dithane, *Fore, *Protect)
Cyclaneusma needlecast	Pine (mostly Scotch)	4+ Before bud break (April). Repeat at 6 to 8-week intervals until fall or monthly during periods of frequent rainfall.	Chlorothalonil (*Daconil, *Bravo) Mancozeb (*Dithane, *Fore, *Protect)
Dothistroma needle blight	Austrian pine	2 As needles are emerging (mid-May) and after new growth has occurred (mid- to late June).	Copper salts of fatty and rosin acids (Bonide Liquid Copper Fungicide, *Camelot) Bordeaux mixture
Phomopsis blight	Juniper Redcedar	2+ Every 7 to 10 days during wet periods in spring and summer (usually May to June).	Thiophanate-methyl (Bonomyl, *3336) Mancozeb (*Dithane, *Fore, *Protect) Propiconazole (*Banner-MAXX)
Rhizosphaera needlecast	Spruce (mostly Colo. blue)	2+ When shoots are ½ to 2 inches in length (May) and 3 to 4 weeks later. If frequent rains occur, spray every 10-14 days through early July.	Chlorothalonil (Fung-onil, *Daconil, *Bravo) Bordeaux mixture
Sirococcus shoot blight	Spruce (Colo. blue, Norway)	2 When shoots are ½ to 2 inches in length (May) and 3 to 4 weeks later.	Chlorothalonil (*Daconil, *Bravo)
Sphaeropsis (Diplodia) blight	Pine	3 First at bud break (April), second just before needles emerge, third 10 days later.	Thiophanate-methyl (Bonomyl, *3336) Propiconazole (*Banner-MAXX)
		2 During third week of April and 10 to 14 days later.	Bordeaux mixture Copper salts of fatty and rosin acids (Bonide Liquid Copper Fungicide, *Camelot)

‡ **Note:** The label for Bordeaux mixture does not state that the product will control Cercospora blight. Although research conducted in Nebraska has shown this product can be effective in controlling this disease, no guarantee of effectiveness is made.

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BROADLEAF INSECTS

Insect	Tree	Application Number and Date	Pesticide
Aphids	Many trees	1+ Throughout the growing season as they appear (May to September).	Insecticidal soap (brands: Safer, Concern) Horticultural oil / Growing season oil Imidacloprid (*Merit) Acephate (Orthene, Bonide Systemic Insect Control) Malathion Permethrin (Eight, *Astro-- Licensed applicators only)
Ash leaf-curling aphid	Ash	1 Just as leaves begin to curl (May).	Imidacloprid (*Merit) Acephate (Orthene, Bonide Systemic Insect Control)
		1 Soil treatment: Apply in March to be effective in May. Has a 60-day translocation delay.	Imidacloprid (Bayer "Advanced Garden" Tree and Shrub Insect Control, *Merit)
Ash sawfly	Ash	1 When larvae appear (mid- to late April).	Carbaryl (Sevin) Acephate (Orthene, Bonide Systemic Insect Control) Imidacloprid (*Merit)
Bronze birch borer	Birch	2 Spray trunk and branches throughout the tree in late May. Repeat in 3 weeks.	Permethrin (Hi-Yield 38 Plus, Super Eight, *Astro-- Licensed applicators only , *PermethrinPro-- Licensed applicators only , *Perm-Up-- Restricted Use) Chlorpyrifos (Restricted Use) (*Chlorpyrifos Pro 2-- For nurseries, industrial sites and road medians , *Dursban 50W-- For nurseries) Bifenthrin (*Onyx)
		1 Soil treatment: Apply in March to be effective in May. Has a 60-day translocation delay.	Imidacloprid (Bayer "Advanced Garden" Tree and Shrub Insect Control, *Merit)
		1 Trunk inject once if too late to spray.	Imidacloprid (*Imicide, *Pointer)
Elm leaf beetle	Elm	1 When larvae appear (May).	Imidacloprid (*Merit) Permethrin (Eight, *Astro-- Licensed applicators only) Spinosad (Ferti-lome Borer, Bagworm, Leafminer & Tent Caterpillar Spray; *Conserve) Carbaryl (Sevin) Acephate NOT for American elm (Orthene, Bonide Systemic Insect Control)
		1 Soil treatment: Apply in March or previous fall to be effective in May. Has a 60-day translocation delay.	Imidacloprid (Bayer "Advanced Garden" Tree and Shrub Insect Control, *Merit)

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BROADLEAF INSECTS (CONT.)

Insect	Tree	Application Number and Date	Pesticide
Fall webworm	Cottonwood	1 When caterpillars and their webs appear (July).	Bt <i>Bacillus thuringiensis</i> (Dipel) Permethrin (Hi-Yield 38 Plus, *Astro-- Licensed applicators only) Spinosad (Ferti-lome Borer, Bagworm, Leafminer & Tent Caterpillar Spray; *Conserve) Carbaryl (Sevin)
Greenstriped mapleworm	Maple	1 When larvae appear (June). Repeat for second generation if needed.	Bt <i>Bacillus thuringiensis</i> (Dipel) Permethrin (Hi-Yield 38 Plus, *Astro-- Licensed applicators only) Carbaryl (Sevin)
Honeylocust plant bug	Honeylocust	1 When leaves fail to appear after budbreak (May) and small green bugs are present.	Insecticidal soap (brands: Safer, Concern) Horticultural oil / Growing season oil
Lace bugs	Sycamore Hackberry Oak Linden	1 When feeding damage (small yellow spots) and insects appear (June).	Insecticidal soap (brands: Safer, Concern) Horticultural oil / Growing season oil Permethrin (Hi-Yield 38 Plus, *Astro-- Licensed applicators only) Imidacloprid (*Merit) Acephate (Orthene, Bonide Systemic Insect Control) Malathion
		1 Soil treatment: Apply in April to be effective in June. Has a 60-day translocation delay.	Imidacloprid (Bayer "Advanced Garden" Tree and Shrub Insect Control, *Merit)
Lilac (ash) borer	Ash	2 Spray trunk and large branches around May 10. Repeat in 3 weeks.	Permethrin (Hi-Yield 38 Plus, Super Eight, *Astro-- Licensed applicators only , *PermethrinPro-- Licensed applicators only , *Perm-Up-- Restricted Use) Chlorpyrifos (Restricted Use) (*Chlorpyrifos Pro 2-- For nurseries, industrial sites and road medians , *Dursban 50W-- For nurseries) Bifenthrin (*Onyx)
Mimosa webworm	Honeylocust	1 When webs first appear (early June). Repeat for second generation in August if needed.	Bt <i>Bacillus thuringiensis</i> (Dipel) Permethrin (Hi-Yield 38 Plus, *Astro-- Licensed applicators only) Acephate (Orthene, Bonide Systemic Insect Control)
Oystershell scale	Ash Maple	2 When eggs hatch and light-yellow crawlers appear (late May). Repeat in 7 to 10 days (Unless prohibited by the label, e.g. oil). Repeat at August egg hatch if needed.	Horticultural oil / Growing season oil Oil may damage some maples. Insecticidal soap NOT for some maples (brands: Safer, Concern) Acephate NOT for some maples (Orthene, Bonide Systemic Insect Control) Malathion

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BROADLEAF INSECTS (CONT.)

Insect	Tree	Application Number and Date	Pesticide
Peach tree borer	Peach Cherry Plum	3 Apply to lower trunk and soil around July 1, July 25, and August 15. Some chemicals cannot be used on trees grown for fruit production/consumption.	Permethrin (Super Eight, Eight, *Astro-- Licensed applicators only , *Perm-Up-- Restricted Use)
Spider mites	Many trees	2 When mites are present (as early as April, but mostly June through August). Make a second application 7 to 10 days later with a different or same product according to label directions. (A different product will reduce development of resistance.)	Horticultural oil / Growing season oil Insecticidal soap (brands: Safer, Concern) Bifenazate (*Floramite) Hexythiazox (*Hexygon) Commercial use only Abamectin (*Avid) Etoxazole (*TetraSan) Acephate+fenbutatin-oxide (Ortho Systemic Insect Killer)
Tent caterpillars	Plum Cherry Apple Crabapple	1 When caterpillars and their webs appear (April). Some chemicals cannot be used on trees grown for fruit production/consumption.	Bt <i>Bacillus thuringiensis</i> (Dipel) Permethrin (Eight, Hi-Yield 38 Plus, *Astro-- Licensed applicators only) Spinosad (Ferti-lome Borer, Bagworm, Leafminer & Tent Caterpillar Spray; *Conserve) Carbaryl (Sevin) Acephate NOT for crabapple (Orthene, Bonide Systemic Insect Control) Malathion
Walnut caterpillar	Walnut	1 When caterpillars appear (June).	Bt <i>Bacillus thuringiensis</i> (Dipel) Permethrin (Hi-Yield 38 Plus, *Astro-- Licensed applicators only) Carbaryl (Sevin)

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BROADLEAF DISEASES

Disease	Tree	Application Number and Date	Pesticide
Anthracnose	Sycamore	3-4	At budbreak (mid-April) and repeat 2 or 3 times at 7 to 14-day intervals. Chlorothalonil (Fung-onil, *Daconil) Thiophanate-methyl (Bonomyl, *3336) Copper salts of fatty and rosin acids (Bonide Liquid Copper Fungicide, *Camelot) Bordeaux mixture
	Ash Maple Oak Walnut	3-4	At budbreak (mid-April) and repeat 2 or 3 times at 7 to 14-day intervals. Damage is seldom serious enough to justify a treatment. Thiophanate-methyl (Bonomyl, *3336) <i>ash, maple, oak, walnut</i> Chlorothalonil (*Daconil) <i>ash, maple, walnut</i> Copper salts of fatty and rosin acids (Bonide Liquid Copper Fungicide, *Camelot) <i>maple, oak</i> Bordeaux mixture <i>ash, maple, oak, walnut</i> Propiconazole (Infuse, Ferti-lome Liquid Systemic Fungicide, *Banner-MAXX) <i>walnut</i> Mancozeb (*Dithane 4SC, *Dithane T/O, *Dithane WF, *Dithane 75DF) <i>white ash, walnut</i> (*Fore) <i>white ash, walnut</i> (*Protect) <i>ash, maple, oak, walnut</i>
Apple scab	Crabapple	5+	At 7 to 14-day intervals from prebloom (April) through rainy periods of growing season. Some chemicals cannot be used on trees grown for fruit production/consumption. Chlorothalonil (Fung-onil, *Daconil) Thiophanate-methyl (Bonomyl, *3336) Myclobutanil (Immunox, *Systhane, *Eagle) Mancozeb (*Dithane, *Fore, *Protect) Propiconazole (Infuse, Ferti-lome Liquid Systemic Fungicide, *Banner-MAXX)
Ash rust	Ash	3-4	At budbreak (mid-April) and repeat 2 or 3 times at 10 to 14 day intervals. Myclobutanil (Immunox, *Systhane, *Eagle)
Cedar-apple rust	Crabapple Hawthorn	5+	As flower buds break (mid-April), at petal drop, and 3 or 4 additional sprays at 7 to 10-day intervals. Some chemicals cannot be used on trees grown for fruit production/consumption. Chlorothalonil (Fung-onil, *Daconil) Thiophanate-methyl (Bonomyl, *3336) Propiconazole (Infuse, Ferti-lome Liquid Systemic Fungicide) (crabapple only) Mancozeb (*Dithane, *Fore, *Protect) Myclobutanil (Immunox, *Systhane, *Eagle)
Cherry leaf spot	Cherry	4+	At petal fall (May) and every 10 to 14 days as fruit matures. Some chemicals cannot be used on trees grown for fruit production/consumption. Chlorothalonil (Fung-onil, *Daconil, *Bravo) Myclobutanil (Immunox, *Systhane, *Eagle) Propiconazole (Infuse, Ferti-lome Liquid Systemic Fungicide, *Banner-MAXX)

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BROADLEAF DISEASES (CONT.)

Disease	Tree	Application Number and Date	Pesticide	
Dutch elm disease	American elm	1	Preventive treatment: Trunk inject when leaves approach full size (late May). Therapeutic treatment: Trunk inject as soon as current year infections are seen (5% or less of crown infected; late June through August).	Thiabendazole (*Arbotect)
		1	Trunk inject as soon as symptoms begin appearing or before. High volume injection (macro-injection) more effective than small volume injection (micro-injection).	Propiconazole (*Alamo)
Fire blight	Apple Pear	3-4	At pink stage (3 to 4 days before blossoms open, mid-April) and every 5 to 7 days until petal drop.	Streptomycin (Agri-Mycin)
Oak wilt	Oak	1	Trunk inject as soon as symptoms begin appearing or before. High volume injection (macro-injection) more effective than small volume injection (micro-injection).	Propiconazole (*Alamo)
Tubakia leaf spot	Bur oak	3	At budbreak (April) and repeat 2 times at 10 to 14-day intervals.	Propiconazole (Infuse, Ferti-lome Liquid Systemic Fungicide, *Banner-MAXX) Mancozeb (*Dithane, *Fore)

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