

*The Connecticut
Agricultural
Experiment
Station*



CAES

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**Pesticide Guide
Toward
Integrated Insect
Management for
Connecticut
Christmas Tree
Growers**

2021

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*Pesticide Guide Toward
Integrated Insect
Management
for
Connecticut Christmas
Tree Growers*

2021

Prepared by

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This publication was produced by the Connecticut Agricultural Experiment Station

INSTRUCTIONS

Use of this Guide

The purpose of this guide is to help Connecticut Christmas tree growers. This publication was produced by The Connecticut Agricultural Experiment Station. The following Pesticide Guide Toward Integrated Insect Management for Connecticut Christmas tree growers provides growing degree days, plant phenology and approximate dates for planning your yearly monitoring and control program. Pesticides included in this summary are registered for use on the pests listed and Christmas tree farms. In some instances, pesticides listed for a single pest are not all registered for each of the plants named. **Please be sure to check the pesticide label first.** Cultural, biological and non-chemical control methods are also listed when they are known to be effective.

Federal Worker Protection Standard

The Federal Worker Protection Standard (WPS) defines an **agricultural plant** as any plant grown or maintained for *commercial* or *research purposes* and includes, but is not limited to: food, feed and fiber plants; trees; turfgrass; flowers; shrubs; ornamentals, and seedlings. It further defines an *agricultural establishment* as any farm, forest, nursery or greenhouse.

If you own/operate a nursery or Christmas tree farm, you are subject to the WPS and must comply with the provisions therein with regard to the workers and pesticide handlers whom you employ. These provisions include, but are not limited to: notifying employees about pesticide applications; providing and maintaining personal protective equipment; providing pesticide safety training; following label-specific restricted entry intervals (REI's); posting pesticide safety information; monitoring handlers who apply products bearing the skull and crossbones symbol on the label; providing decontamination site and emergency assistance.

For further information on the Worker Protection Standard, or to obtain a free manual titled "The Worker Protection Standard for Agriculture Pesticides-How To Comply", please contact Christina Berger or other staff members of the Department of Environmental Protection, Pesticide Management Division, at (860) 424-3369.

User Input

We are open to any suggestions on how this manual might be improved. A number of the changes in this current edition are as a result of input from several arborists, nurseryman and Christmas tree growers. Rose Hiskes may be reached by phone at (860) 683-4977 (Monday through Friday, 8:30 am to 4:30 pm) or email rose.hiskes@ct.gov.

DISCLAIMER

Suggestions on the use of chemicals listed in this manual have been deemed legal for use in the State of Connecticut. Users of this guide must be aware that state and federal pesticide laws and pesticide labels are subject to change. This guide is meant to be of assistance to Connecticut licensed pesticide applicators in choosing the correct insecticide or miticide. **It is not a substitute for the pesticide label. The applicator assumes all responsibility for the proper use of any pesticide and must always thoroughly read, understand and follow all label directions.** Also, it is important for the applicator to stay current with all changes in the laws that govern the use of pesticides. The Connecticut Agricultural Experiment Station makes no claims of potential efficacy for the listed pesticides. The products listed in this manual are some of the ones we are aware of that are currently registered for use.

Caution: Pesticides may be injurious to humans, domestic animals, desirable plants and fish and other wildlife if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.

The use of trade, firm or corporation names in this publication is for the benefit of the reader. It does not constitute an endorsement or approval of any service or product by The Connecticut Agricultural Experiment Station to the exclusion of others that may be suitable.

PESTICIDE SAFETY

Although specific pesticides are listed in this manual, please note that there are often alternative options for prevention or management concerning some of these pests. Certain pesticides may be more effective than others listed for the same use. Some pesticides may be less of a potential danger to the applicator, environment, beneficial organisms, etc. than others. The user of this manual should know the relative toxicity, effectiveness and potential hazards associated with each compound used.

Careful adherence to label instructions, combined with proper equipment calibration, provide the best method of preventing injury to non-target organisms, protecting the environment and achieving the best levels of control.

POLLINATOR PROTECTION

New to this edition is information about Connecticut's 2016 pollinator health law. In order to better protect our pollinators, the systemic neonicotinoid insecticides containing clothianidin, dinotefuran, imidacloprid and thiamethoxam are now restricted use in Connecticut, but their status in other states varies.

The EPA requires that labels for these four neonicotinoids in products for outdoor foliar use include a Pollinator Protection Box and have additional label instructions prohibiting use while bees are foraging. In the guide they will be given a BEE CAUTION notation.

For all pesticides highly toxic to bees, which have a warning under "Environmental Hazards": Where applicable, apply insecticides after plants bloom. Be aware that bees may be foraging on blooming plants around your application site. If you need to make an insecticide application while non-target plants (such as flowering ground cover) in or around your application site are in bloom, mow the blooming plants first. Control drift during insecticide applications. If you rent honeybees, or if there are honey bee colonies nearby, notify the beekeepers before pesticide applications so that they can close or move their hives. Get to know which plants are attractive to bees. For example, hemlocks can be treated with the above neonicotinoid insecticides as bees rarely visit them. Research at The Connecticut Agricultural Experiment Station (CAES) by Dr. Richard Cowles, is looking at which plants transport how much of the neonicotinoids into their nectar and pollen and how quickly and at what application rates. In the future, rates may be lowered for these insecticides for managing highly sensitive pests, as they can still be effective at the lower doses.

ACKNOWLEDGEMENTS

Thanks to Dr. James LaMondia, Dr. Richard Cowles, and Mr. Thomas Rathier, CAES, for their valuable help and support. Also, Mss. Christina Berger, Diane Jorsey and Linda Schmidt of DEEP for their assistance.

Horticulture/Pest Management Related Web Sites

Connecticut Agricultural Experiment Station www.ct.gov/caes
University of Connecticut Integrated Pest Management www.ipm.uconn.edu

Biological Control (Attracting Beneficials):

pss.uvm.edu/ppp/articles/goodbugs.html
www.finegardening.com/how-to/articles/attracting-beneficial-insects.aspx
njaes.rutgers.edu/pubs/publication.asp?pid=fs930
canr.msu.edu/nativeplants/uploads/files/E2973.pdf

Protecting Pollinators: [ct.gov/caes/cwp/view.asp?a=2826&q=578322&caesNav=|
<http://nenativeplants.uconn.edu/pollinators.php>
<https://pesticidewardship.org/pollinator-protection/pesticide-applicator-bmps/>](http://ct.gov/caes/cwp/view.asp?a=2826&q=578322&caesNav=|http://nenativeplants.uconn.edu/pollinators.php)

Entomology:

Connecticut Agricultural Experiment Station www.ct.gov/caes
Cornell Cooperative Extension www.cce.cornell.edu
Entomological Society of America www.entsoc.org/
Entomology Index of Internet Resources www.ent.iastate.edu/list/

Horticulture Information:

Christmas Tree Farmers Assoc. of New York www.freshnytrees.com
Christmas Tree Pest Manual, USFS www.fs.usda.gov/naspl/sites/default/files/publications/christmas-tree-pest-manual-3rd-editionlowres.pdf

Connecticut Christmas Tree Growers Association <https://ctchristmastree.org>
Massachusetts Christmas Tree Association www.christmas-trees.org
National Christmas Tree Association <https://realchristmastrees.org>
Pennsylvania Christmas Tree Growers Assoc. <https://christmastrees.org>
University of Connecticut Coop. Ext. Forestry www.ctforestry.uconn.edu/

Integrated Pest Management:

[Christmas Trees | New York State Integrated Pest Management \(cornell.edu\)](#)
Biocontrol Network www.biconet.com/index.html
Consortium for International Crop Protection www.IPMnet.org/
Northeast IPM Center www.northeastipm.org/
US Forest Service IPM [fs.fed.us/foresthealth/protecting-forest/
integrated-pest-manament](http://fs.fed.us/foresthealth/protecting-forest/integrated-pest-manament)
Gempler's IPM Almanac www.gemplers.com/tech/ipm-intro.htm
Koppert Biological Systems www.koppertus.com/
Insect Parasitic Nematodes entopsu.edu/extension/factsheets/parasitic-nematodes/
Integrated Pest Management in the US www.nifa.usda.gov/program/integrated-pest-management-program-ipm
IPM Institute www.ipminstitute.org
National Park Service IPM Manual nps.gov/orgs/1027/ipm.htm
Radcliffe's IPM World Textbook ipmworld.umn.edu/
University of Maryland IPM extension.umd.edu/ipm
University of Massachusetts AgroEcology extension.umass.edu/agriculture/

Organic Related:

Extremely Green - Organic gardening supplies extremelygreen.com/
Gardens Alive www.gardensalive.com
Orcon Inc. - sells beneficial organisms www.organiccontrol.com
NOFA Organic Land Care Committee CT/MA www.organiclandcare.net/

Organic Materials Review Institute www.omri.org/
Suppliers of Beneficial Organisms in North America www.cdpr.ca.gov/docs/pestmgmt/ipminov/bensuppl.htm
National Organic Program ams.usda.gov/about-ams/programs-offices/national-organic-program

Ornamental Plant Diseases:

CAES Plant Pest Handbook portal.ct.gov/caes/publications/publications/plant-pest-handbook—A-Guide
Ohio State University ohioline.osu.edu/topic/horticulture
Penn State University extension.psu.edu/pests-and-diseases/pes-disease-and-weed-identification/plant-disease-identification-and-control
Virginia Tech University pubs.ext.vt.edu/tags.resource.html?tag=pubs_ext_vt_edu:plant-diseases#

Pesticide Companies and Labels:

Ag Chemical Database cdms.net/Label-Database
Bayer Turf & Ornamental environmentalscience.bayer.us/turf-and-ornamentals-management
Greenbook www.greenbook.net/
Connecticut DEEP Pesticide Registration www.kellysolutions.com/CT/

State and National Agencies:

Animal & Plant Health Inspection Service www.aphis.usda.gov/
Crop Life America www.croplifeamerica.org/
National Agricultural Statistics Service www.nass.usda.gov
Plant and Life Sciences Publishing cornellstore.com/pals-publishing
NOAA Weather Information www.weather.gov/
USDA Release of Beneficial Organisms ars.usda.gov/northeast-area/Newark-de/beneficial-insects-introduction-research-unit
US Forest Service www.fs.fed.us/

Weeds:

New Jersey Weed Gallery njaes.rutgers.edu/weeds/
Weed Science Society of America www.wssa.net/
UMass Weed Herbarium extension.umass.edu/landscape/weed-herbarium

REFERENCES

The following list of books and educational manuals can provide supplemental information to accompany this publication.

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- Alford, D. 2012. Pests of Ornamental Trees, Shrubs and Flowers. 2nd Edition. Halsted Press, an imprint of John Wiley & Sons, New York, NY.
- Brown-Rytlowski, D. 2015. A Pocket IPM Scouting Guide for Woody Landscape Plants. Michigan State University Extension, East Lansing, MI.
- Clark, RA. & D.C. Swanson. 2001. Trees, shrubs and vines for low maintenance landscapes. Strategies for Plant Health Management of Woody Ornamentals. University of Massachusetts Extension. (413) 545- 2717
- Costello, L., et al. 2003. Abiotic Disorders of Landscape Plants A Diagnostic Guide. Publication 3420. University of California, Agriculture and Natural Resources.
- Dirr, M. 2009. Manual of Woody Landscape Plants, 6th Edition. Stipes Publishing Company. Champaign, IL.
- Dreistadt, S.H. 2001. Integrated Pest Management for Floriculture and Nurseries. University of California Division of Agriculture and Natural Resources, Publication 3402. 1-800-994-8849.
- Dreistadt, S. H. 2016. Pest of Landscape Trees and Shrubs, An Integrated Pest Management Guide. 3rd Edition. University of California Division of Agriculture and Natural Resources, Publication 3359.
- Flint, M.L. & S.H. Dreistadt. 1998. Natural Enemies Handbook: The illustrated guide to biological pest control. UC Division of Agriculture and Natural Resources and University of California Press. Publication 3386.
- Harris, R W., J.R Clark & N.P. Matheny. 2004. Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines, 4th ed. Prentice Hall, Upper Saddle River, NJ.
- Hightshoe, G.L. 1988. Native Trees, Shrubs, and Vines for Urban and Rural America: A Planting Design Manual for Environmental Designers. John Wiley & Sons, Inc. New York, NY.
- Horst, K.R. 2013. Westcott's Plant Disease Handbook, 8th edition. Kluwer Academic Publishers.
- Johnson, W. & H. Lyon. Insects That Feed on Trees and Shrubs, 2nd ed. Cornell University Press, Ithaca, NY.
- Lamb, E. editor. 2016. Pest Management Guide for Commercial Production and Maintenance of Trees and Shrubs. Cornell University, Ithaca, NY.
- Leslie, A. 1994. Handbook of Integrated Pest Management for Turf and Ornamentals. Lewis Publishers, an imprint of CRC Press. Boca Raton, FL.
- Lloyd, J. 1997. Plant Health Care for Woody Ornamentals -A professionals guide to preventing and managing environmental stresses and pests. International Society of Arboriculture. Savoy, IL.

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Mahr, D. & N. Ridgway. 1993. Biological Control of Insects and Mites: An introduction to beneficial natural enemies and their use in pest management. North Central Publication No. 481. Cooperative Extension Publications. University of Wisconsin-Extension, Madison, WI. (608) 262-3346

Moorman. G.W. 1992. Scouting and Controlling Woody Ornamental Diseases in Landscapes and Nurseries. Agriculture Publications. The Pennsylvania State University, University Park, PA

Pirone, P. 1978. Diseases and Pests of Ornamental Plants. 5th ed. John Wiley & Sons, Inc. New York, NY.

Raupp, M. & J. Davidson. 2014. 3rd edition. Managing Insects and Mites on Woody Plants: An IPM Approach. Available online from tcia.org

Sinclair, W., H. Lyon & W. Johnson. 1987. Diseases of Trees and Shrubs. Cornell University Press. Ithaca, NY.

Uva, R., J. Neal & J. DiTomaso. 1997. Weeds of the Northeast. Cornell University Press. Ithaca, NY.

Wadley, T.L. (ed.). 1995. A Guide to the Plant Health Care Management System, 2nd ed. International Society of Arboriculture. Savoy, IL.

Whitehouse, S. 2012. Common Cultural Problems of Landscape Trees and Shrubs. Plant Disease Diagnostic Clinic, Cornell University.

SOURCES OF BIOLOGICAL CONTROL ORGANISMS AND IPM MATERIAL

GEMPLER'S
PO Box 5175
Janesville, WI53547-5175
Ph: 1-800-382-8473
Email: customerservice@gemplers.com

Evergreen Growers Supply
15875 SE 114th Ave, Suite G
Clackamas, OR 97015
Ph: 1-503-908-1946
info@evergreengrowers.com

BENEFICIAL INSECTARY INC.
9664 Tanqueray Ct.
Redding, CA 96003
Ph: 1-530.226.6300
toll-free: 800.477.3715
Greenmethods.com

GREAT LAKES IPM, INC.
7563 N Crystal Rd
Vestaburg, MI 48891
Ph: 1-989-268-5693, 800-235-0285
Email: glipm@greatlakesipm.com

Tree-Savers
P.O Box68
Greentown, PA 18426
570-871-0088
jayme@tree-savers.com

IPM LABORATORIES
PO Box 300, 980 Main Street
Locke, NY 13092
ph. 315-497-2063
ipmlabs.com

Book Suppliers: Bookshelf by Ball Publishing 1-312-337-0747, 800-888-4741

Information: The Connecticut Agricultural Experiment Station

Insect Inquiries (New Haven):	203.974.8600
Plant Disease Inquiries (New Haven):	203.974.8601
CAES Soil Testing Lab (New Haven):	203.974.8512
Valley Lab, Information and Diagnostic Office:	860.683.4977
Valley Lab, Soil Testing:	860.683.4978

UConn Home and Garden Center	877.486.6271
UConn Soil Testing Lab:	860.486.4274

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COMMON PLANT NAME/PEST INDEX

Common	Plant Genus	Pest	Season	Page
ash	<i>Fraxinus spp.</i>	Conifer root aphid	G	9
Douglas-fir	<i>Pseudotsuga menziesii</i>	bagworm	D	1
		bagworm	DD	2
		bagworm	G	3
		Cooley spruce gall adelgid	DD	10
		Cooley spruce gall adelgid	G	11
		cryptomeria scale	D	12
		cryptomeria scale	G	13
		elongate hemlock scale	D	16
		elongate hemlock scale	G	17
		hemlock scale	DD	23
		hemlock scale	G	24
		pales weevil	DD	26
		pales weevil	G	27
		spruce spider mite	D	50
		spruce spider mite	G	51
		Western pine moth	G	53
		white grubs	G	54
		white pine weevil	DD	58
		white pine weevil	G	59
fir	<i>Abies</i>	bagworm	D	1
		bagworm	DD	2
		bagworm	G	3
		balsam gall midge	G	4
		balsam twig aphid	G	5
		balsam woolly adelgid	G	7
		Bow-legged fir aphid	G	8
		Conifer root aphid	G	9
		cryptomeria scale	D	12
		cryptomeria scale	G	13
		elongate hemlock scale	D	16
		elongate hemlock scale	G	17
		eriophyid mites	G	18
		gypsy moth	G	22
		hemlock scale	DD	23
		hemlock scale	G	24
		pales weevil	DD	26
		pales weevil	G	27
		pine webworm	G	40
		spruce budworm	G	48
		spruce spider mite	D	50

Common	Plant Genus	Pest	Season	Page
fir	<i>Abies</i>	spruce spider mite	G	51
		white grubs	G	54
pine	<i>Pinus</i>	bagworm	D	1
		bagworm	DD	2
		bagworm	G	3
		cryptomeria scale	D	12
		cryptomeria scale	G	13
		eriophyid mites	G	18
		European pine sawfly	G	19
		European pine shoot moth	DD	20
		European pine shoot moth	G	21
		gypsy moth	G	22
		Nantucket pine tip moth	G	25
		pales weevil	DD	26
		pales weevil	G	27
		pine bark adelgid	D	28
		pine bark adelgid	DD	29
		pine bark adelgid	G	30
		pine needle scale	D	31
		pine needle scale	G	32
		pine root collar weevil	G	34
		pine shoot beetle	G	35
		pine tortoise scale	D	36
		pine tortoise scale	G	37
		pine tube moth	G	38
		pine webspinning sawflies	G	39
		pine webworm	G	40
		redheaded pine sawfly	G	43
		spotted lanternfly	G	44
		spruce spider mite	D	50
		spruce spider mite	G	51
		white grubs	G	54
		white pine aphid	D	56
		white pine aphid	G	57
white pine weevil	DD	58		
white pine weevil	G	59		
Zimmerman pine moth	G	60		
spruce, Colorado	<i>Picea pungens</i>	Cooley spruce gall adelgid	DD	10
		Cooley spruce gall adelgid	G	11
spruce, Engelman	<i>Picea engelmannii</i>	Cooley spruce gall adelgid	DD	10
		Cooley spruce gall adelgid	G	11
spruce	<i>Picea</i>	bagworm	D	1
		bagworm	DD	2

Common	Plant Genus	Pest	Season	Page
spruce	<i>Picea</i>	bagworm	G	3
		balsam twig aphid	G	5
		Cooley spruce gall adelgid	DD	10
		Cooley spruce gall adelgid	G	11
		cryptomeria scale	D	12
		cryptomeria scale	G	13
		eastern spruce gall adelgid	D	14
		eastern spruce gall adelgid	G	15
		elongate hemlock scale	D	16
		elongate hemlock scale	G	17
		eriophyid mites	G	18
		gypsy moth	G	22
		hemlock scale	DD	23
		hemlock scale	G	24
		pales weevil	DD	26
		pales weevil	G	27
		ragged spruce gall adelgid	D	41
		ragged spruce gall adelgid	G	42
		spruce bud scale	D	45
		spruce bud scale	DD	46
		spruce bud scale	G	47
		spruce budworm	G	48
		spruce needleminer	G	49
		spruce spider mite	D	50
		spruce spider mite	G	51
		white grubs	G	54
		white pine weevil	DD	58
		white pine weevil	G	59

DORMANT SEASON**Apply thorough treatment only when pest stage found.**Frequency with which pest occurs: **OCCASIONAL**Part of plant to treat: **FOLIAGE, STEMS**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
egg	Jan 01	Mar 31	stem, branch		visual inspection

Additional information on biology and control

Hatching in late spring, this caterpillar weaves itself a bag out of silk and bits of leaves from its host plant. The caterpillar will carry the bag along with it as it moves and feeds and will add to it as it grows. Larvae mature by late summer and pupate inside the bag. Only males emerge as small black hairy, clear-winged moths. Females are flightless and never leave their bags. Males fly to females' bags to mate. Females lay eggs in the fall, which overwinter inside the bag. Chemical controls work best early in the season when caterpillars are small. Physically removing and destroying bags in the fall and winter will prevent eggs from hatching in the spring. Since the silk around the twigs holding the bag can eventually girdle the stem, either remove the stem below this silk strand or slice through it to loosen it.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

BAGWORM**

Thyridopteryx ephemeraeformis

Page 176, 178 (Johnson & Lyon)

DELAYED DORMANT

Apply thorough treatment only when pest stage found.

Host Plants: Common Name

Scientific Name

Douglas-fir

Pseudotsuga menziesii

fir

Abies

pine

Pinus

spruce

Picea

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON**Apply thorough treatment only when pest stage found.****Host Plants: Common Name****Scientific Name**

Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
larva (caterpillar)	Jun 10	Jun 30	foliage	defoliation	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
larva	Jun 10 - Jun 20	563 - 600	plants bloom: mountain laurel, mock-orange, Japanese tree lilac, Washington hawthorn
larva	Jun 20 - Jul 10	600 - 1160	plants bloom: Ceanothus americanus, Clematis jackmanii, Tilia cordata

Chemical Control**Comments****Signal Word****Agricultural Restricted Entry Interval (REI)^***Reference use only. NOT a label substitute.**Select the appropriate insecticide/miticide for the correct life stage of the target pest.*

B. thuringiensis aizawai	XenTari	<i>Most effective against young larvae.</i>	C	4 hours
B. thuringiensis kurstaki	DiPel DF	<i>Most effective against young larvae.</i>	C	4 hours
*bifenthrin	Talstar S Select	<i>BEE CAUTION</i>	C	12 hours
chlorantraniliprole	Acelepryn	<i>BEE CAUTION</i>		4 hours
*diflubenzuron	Dimilin 25W	<i>Effective against immatures. Bee caution.</i>	C	12 hours
dimethoate	Dimate 4EC	<i>BEE CAUTION</i>	W	48 hours
malathion	Malathion 8 Flowable	<i>BEE CAUTION</i>	C	12 hours
*permethrin	Arctic 3.2 EC	<i>BEE CAUTION</i>	C	12 hours
spinosad	Conserve SC	<i>Most effective against young larvae.</i>	C	4 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

BALSAM GALL MIDGE**

Paradiplosis tumifex

Page 116 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **BUD, FOLIAGE**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
fir	<i>Abies</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
larva	May 01	May 31	foliage	needle galls	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
larva	May 01 - May 10	from - 120	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
larva	May 10 - May 20	to - 290	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle

Non Chemical Control

Where feasible, remove and destroy green galls before they open.

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

<u>Chemical Control</u>	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
carbaryl Sevin SL	<i>BEE CAUTION</i>	C	12 hours

Additional information on biology and control

The balsam gall midge has not been seen at Connecticut Christmas tree farms as of February 2021. However, it is present in the Canadian Maritimes and the upper Midwest. Eggs of the small fly are laid in early spring on swelling buds of balsam and Fraser fir. The legless maggot moves to a nearby developing needle and begins to feed. This feeding causes plant tissue to expand, encasing the maggot. In late summer the fully developed larva drops to the ground and pupates in the duff where it spends the winter.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **BUD, FOLIAGE**

Host Plants: Common Name	Scientific Name
fir	<i>Abies</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph	May 01	Jul 01	needles buds	distortion	visual inspection
adult	May 15	Jul 01	needles buds	distortion	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
nymph, adult	May 01 - May 10	130 - 187	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry

Biological Control

	Comments
<i>Anystis spp. (whirlygig mite)</i>	occurs naturally
<i>Syrphid fly larvae (predators)</i>	occurs naturally
<i>Harmonia axyridis (lady beetle - predator)</i>	Occurs naturally
<i>Orius sp. (predator)</i>	Available commercially; occurs naturally
<i>Hippodamia convergens (lady beetle - predator)</i>	Available commercially; occurs naturally
<i>Deraeocoris nebulosus (mirid bug - predator)</i>	Occurs naturally
<i>Chrysoperla sp. (green lacewing - predator)</i>	Available commercially; occurs naturally
<i>Aphidoletes aphidimyza (midge, aphid predator)</i>	Available commercially; occurs naturally
<i>Aphidius matricariae (wasp, aphid parasite)</i>	Available commercially; occurs naturally

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
acephate	Acephate 97 WDG	BEE CAUTION	C 24 hours
	Orthene T,T & O WSP	BEE CAUTION	C 24 hours
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C 12 hours
azadirachtin	Aza-Direct		C 4 hours
carbaryl	Carbaryl 4L	BEE CAUTION	C 12 hours
	Sevin SL	BEE CAUTION	C 12 hours
dimethoate	Dimate 4EC	BEE CAUTION	W 48 hours
*esfenvalerate	Asana XL (Christmas tree only)		W 12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil		C 4 hours
*imidacloprid	Mallet 75 WSP	BEE CAUTION	C 12 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate		W 12 hours
	M-Pede		W 12 hours
*permethrin	Arctic 3.2 EC	BEE CAUTION	C 12 hours
pymetrozine	Endeavor		C 12 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

BALSAM TWIG APHID**

Mindarus abietinus

Page 80 (Johnson & Lyon)

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

Comments

Signal Word **Agricultural Restricted Entry Interval (REI)^**

spirotetramat	Movento	BEE CAUTION	C	
*thiamethoxam	Flagship 25WG	BEE CAUTION	C	12 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **STEM**

Host Plants: Common Name	Scientific Name
fir	<i>Abies</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
adult, nymph	Apr 01	Apr 20	stem	swollen stems	visual inspection
adult, nymph	May 01	Mar 30	stem	swollen stems	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
adult, crawler	Apr 01 - Apr 20	20 - 80	plants bloom: silver maple, Cornelian cherry, pussy willow
adult, crawler	Jun 01 - Jun 30	410 - 940	plants bloom: Kousa dogwood, cranberry bush, beautybush
adult, crawler	Sep 01 - Sep 30	2395 - 2850	plant fruit in color: Silver lace vine, Polygonum aubertii

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
carbaryl	Sevin SL	<i>BEE CAUTION</i>	C 12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C 4 hours
*imidacloprid	Mallet 75 WSP	<i>BEE CAUTION</i>	C 12 hours

Additional information on biology and control

The balsam woolly adelgid, which in Connecticut consists of only females, spends its entire adult life with its mouthparts deeply embedded into stem tissue of true firs. All life stages may be found at any time of year. Eggs are laid on the bark behind the female. Mobile crawlers can be dispersed on wind currents. Once they settle and begin to feed, white wax is secreted from glands around the body until the entire insect is covered. As these adelgids feed they inject a substance which injures the phloem and causes swollen ‘gouty’ growth of stems. Growth regulator effects from balsam woolly adelgid feeding cause loss of apical dominance and flat-topped, unsalable Christmas trees.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

BOW-LEGGED FIR APHID**

Cinara curvipes

Page 82 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **SMALL STEMS**

Host Plants: <u>Common Name</u>	<u>Scientific Name</u>
fir	<i>Abies</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph	May 15	Sep 30	bark	decline	visual inspection
adult	Jun 01	Sep 30	bark	decline	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
nymph, adult	Jul 20 - Jul 31	1417 - 1673	plants bloom: butterfly bush, Clethra alnifolia, false spirea
nymph, adult	Aug 01 - Aug 20	1700 - 2173	Remainder of season between the beginning and end phenology
nymph, adult	Aug 20 - Aug 31	2173 - 2399	plant fruit in color: Viburnum dentatum

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C 12 hours
azadirachtin	Aza-Direct		C 4 hours
*bifenthrin	Talstar S Select	BEE CAUTION	C 12 hours
*fenpropathrin	Tame 2.4EC	BEE CAUTION	W 24 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil		C 4 hours
*imidacloprid	Mallet 75 WSP	BEE CAUTION	C 12 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate		W 12 hours
	M-Pede		W 12 hours
pymetrozine	Endeavor		C 12 hours
spirotetramat	Movento		C
*thiamethoxam	Flagship 25WG	BEE CAUTION	C 12 hours

Additional information on biology and control

This large, 1/4" long black aphid, with reddish legs and small cornicles, feeds on the twigs and branches of true firs. Nymphs can have a white to gray waxy coating. The hind legs are long and curved, hence the common name. Honeydew is produced and attracts ants. Needles yellow and drop when twigs are fed on by large colonies. Winged forms are produced which then fly to nearby hosts. Winter is passed as eggs. Spot treatment with insecticidal soap of infested trees just prior to harvest is warranted, as infestations of these aphids are extremely disturbing to customers because they leave trees once the trees are indoors.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **ROOT ZONE, FOLIAGE**

Host Plants: Common Name	Scientific Name
ash	<i>Fraxinus spp.</i>
fir	<i>Abies</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
all stages	Apr 15	May 30	foliage	discoloration, needle drop	visual, check for ant mounds at tree base

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
all stages	May 01 - May 10	from - 133	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
all stages	May 20 - May 30	to - 395	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
*imidacloprid	Mallet 75 WSP	BEE CAUTION	C 12 hours
spirotetramat	Movento	C	C
*thiamethoxam	Flagship 25WG	BEE CAUTION	C 12 hours

Additional information on biology and control

The conifer root aphid can have two hosts: one a deciduous tree, the other a conifer. This species can cycle between feeding on roots of true firs from the fall through the spring, and then emerges as a winged form that migrates to ash leaves, where they are called the woolly ash aphid. In the fall, when ash is dropping its leaves, winged woolly aphids from ash fly back to true firs to found new colonies on the roots. In Christmas trees these aphids may continuously develop by feeding on the roots of true firs. Feeding by these aphids causes trees to become yellow or even die. Typically, infested trees can be recognized along with their poor color by the small ant mounds encircling the stem. Two common species of ant, the field ant and yellow ant, actively feed on honeydew excreted by these aphids. Because they feed underground, conifer root aphids are very difficult to manage. Systemic insecticides rarely move downward from foliage to roots. Only one insecticide (spirotetramat, Movento) currently registered for use in Christmas trees has this property. Apply during shot elongation using a surfactant. The most commonly used product for managing conifer root aphids is imidacloprid, applied as a broadcast application and incorporated in the soil by rainfall so that it can be absorbed by the roots. Because imidacloprid only moves upward in plants, the difficulty in managing root aphids arises from the challenge in having to incorporate the active ingredient deeply enough in the soil to reach the deepest roots, so that all the aphids can be exposed.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

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COOLEY SPRUCE GALL ADELGID**

Adelges cooleyi

Page 76, 112 (Johnson & Lyon)

DELAYED DORMANT

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **BASE OF BUD**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
spruce	<i>Picea</i>
spruce, Colorado	<i>Picea pungens</i>
spruce, Engelman	<i>Picea engelmannii</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph	Apr 01	Apr 10	base of bud		visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
nymph	Apr 01 - Apr 15	0 - 41	plants bloom: silver maple, Cornelian cherry, pussy willow

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
horticultural oil	Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours

Additional information on biology and control

The Cooley spruce gall adelgid has a complex life cycle that can involve two different hosts and takes two years to complete. Its main host for gall formation is Colorado spruce. Immature females overwinter on spruce twig terminals. In spring, after maturing, females lay eggs on lateral terminals. These mobile nymphs move to the newly opened buds and feed at the base of the needles. Their saliva causes the 2" long, pineapple-like gall to form around many adelgids, each in a separate compartment. This generation matures midsummer as the gall becomes woody. An opening develops at the base of each compartment. These adelgids develop wings and migrate to Douglas fir or another spruce. Eggs laid on Douglas fir needles develop into nymphs. As they feed, they cause yellow spots and bent needles. Insects in this generation appear to be woolly aphids and do not form galls. Multiple generations of only females develop on Douglas fir. Note: Horticultural oil will cause waxes on needles to become clear, turning 'blue trees' green and so its use should only be considered several years before trees are salable. Oil causes Douglas fir to turn yellow. They do not tolerate oil sprays. Damoil is the one trade name that has a history of being phytotoxic to evergreens. Pesticide applications to blue spruce will be most effective if applied before galls form. Accessible galls on Colorado blue spruce can be pruned out and destroyed. Control Note: A basal bark spray of imidacloprid, or broadcast application with soil incorporation through rainfall, can result in multiple years of control for adelgids and aphids. Treatment effects may not be observed for several weeks following treatment. Contact sprays should be applied when 50% of the buds have opened.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON**Apply thorough treatment only when pest stage found.**Frequency with which pest occurs: **OCCASIONAL**Part of plant to treat: **BASE OF EXPANDING BUD**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
spruce, Colorado	<i>Picea pungens</i>
spruce, Engelman	<i>Picea engelmannii</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph	May 01	Sep 30	twig bark (spruce)	gall	visual inspection
nymph	Jun 15	Sep 30	foliage (Douglas-fir)	discoloration, distortion	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
nymph, adult	May 01 - May 10	120 - 190	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
nymph, adult	Jul 20 - Jul 31	1500 - 1775	plants bloom: butterfly bush, Clethra alnifolia, false spirea
nymph, adult	Aug 01 - Aug 10	1500 - 1775	plant bloom: Pee Gee Hydrangea blooms turn pink
nymph, adult	Sep 15 - Oct 10	1850 - 1950	None Offered

Non Chemical Control

Where feasible, remove and destroy green galls before they open.

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
carbaryl	Carbaryl 4L	<i>BEE CAUTION</i>	C	12 hours
	Sevin SL	<i>BEE CAUTION</i>	C	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours
*imidacloprid	Mallet 75 WSP	<i>BEE CAUTION</i>	C	12 hours

Additional information on biology and control

Basal bark sprays of imidacloprid, or broadcast application with soil incorporation through rainfall, can result in multiple years of control for adelgids and aphids. Treatment effects may not be observed for several weeks. Contact insecticides are most effective when applied late in the growing season. Use of oil causes yellowing of Douglas-fir.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

CRYPTOMERIA SCALE

Aspidiotus cryptomeriae

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **NEEDLES**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
immature	Mar 01	Apr 15	needles	discoloration (stippling), needle drop	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
immature	Mar 01 - Apr 15	0 - 45	None Offered

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
*dinotefuran	Safari 20 SG	<i>BEE CAUTION</i>	C	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours

Additional information on biology and control

The cryptomeria, or ‘fried egg’ hard scale is native to Japan and can have two generations a year in Connecticut. Crawlers are present from June into July and again in late August into September. This elongated, somewhat transparent scale overwinters as a second instar on the undersides of needles. Horticultural oil will cause waxes on Colorado blue spruces to become clear, thus turning ‘blue’ trees green. Oil causes Douglas-fir to turn yellow. They do not tolerate oil. Damoil is the one trade name that has a history of being phytotoxic. Basal bark, foliar, broadcast, soil drench or soil injection applications of dinotefuran will result in one to two years of control. Beginning at bud break in spring until the end of active growth in fall, applications of this product will move up into plants within days and begin killing pests. Visit the podcast/video section of the CAES website (www.ct.gov/caes) for the video “Basal Bark Sprays and Best Management Practices for Armored Scales in Christmas Trees”.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON**Apply thorough treatment only when pest stage found.**Frequency with which pest occurs: **OCCASIONAL**Part of plant to treat: **NEEDLES**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
crawler	Jun 01	Jun 30	needles	discoloration (stippling), needle drop	visual inspection
crawler	Aug 01	Aug 31	needles	discoloration (stippling), needle drop	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
crawler	Jun 15 - Jul 31	630 - 1660	plants bloom: Abelia, golden rain tree, sourwood
crawler	Aug 20 - Sep 30	2150 - 2850	plant fruit in color: Silver lace vine, Polygonum aubertii

Chemical Control*Reference use only. NOT a label substitute.**Select the appropriate insecticide/miticide for the correct life stage of the target pest.*

		Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C	12 hours
afidopyropen	Ventiga	BEE CAUTION	C	12 hours
*bifenthrin	Talstar S Select	BEE CAUTION	C	12 hours
*dinotefuran	Safari 20 SG	BEE CAUTION	C	12 hours
pyriproxyfen	Distance IGR	Only effective against immatures.	C	12 hours
spirotetramat	Movento	BEE CAUTION	C	

Additional information on biology and control

Basal bark, foliar, broadcast, soil drench or soil injection applications of dinotefuran will result in one to two years of control. Beginning at bud break in spring until the end of active growth in fall, applications of this product will move up into plants within days and begin killing pests. Visit the podcast/video section of the CAES website (www.ct.gov/caes) for the video “Basal Bark Sprays and Best Management Practices for Armored Scales in Christmas Trees”. Foliar sprays can very effectively target scale crawlers. Time applications to coincide with egg hatch by monitoring egg deposition and development under female scales. Efficacy of products targeting scale scrawlers is acetamiprid > dinotefuran = pyriproxyfen = afidopyropen > spirotetramat.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

EASTERN SPRUCE GALL ADELGID**

Adelges abietis

Page 76, 114 (Johnson & Lyon)

Page 35 (Adams & Packauskas)

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **ANNUAL**

Part of plant to treat: **BASE OF EXPANDING BUD**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph	Mar 01	Apr 15	twig bark		visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
immature	Mar 01 - Apr 10	0 - 41	None Offered

Non Chemical Control

Remove highly susceptible white spruce.

Do not grow highly susceptible white spruce.

Chemical Control

Comments

Signal Word **Agricultural Restricted Entry Interval (REI)^**

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

horticultural oil	Sunspray Ultra-Fine Spray Oil		C	4 hours
*imidacloprid	Mallet 75 WSP	<i>BEE CAUTION</i>	C	12 hours

Additional information on biology and control

This adelgid primarily attacks Norway and white spruce. As opposed to Cooley spruce gall adelgid, which produces terminal galls, the eastern spruce gall adelgid forms galls at the base of the current year's twigs. Immature females overwinter but mature in time to lay eggs in a coat of wool at the base of expanding buds in the spring. The mobile nymphs feed on current year's needles. Once they move to feed at the base of the needles, the gall begins to form around them and enclose them. Mid- to late summer the galls crack open, the nymphs crawl out and molt to winged, egg laying females. This second generation of eggs is not surrounded by wool. These nymphs crawl to a nearby bud where they will spend the winter. Basal bark sprays of imidacloprid, or broadcast application with soil incorporation through rainfall, can result in multiple years of control for adelgids and aphids, but treatment effects may not be observed for several weeks. Treatments can be applied from bud break until the end of active growth in fall.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON**Apply thorough treatment only when pest stage found.**Frequency with which pest occurs: **ANNUAL**Part of plant to treat: **BASE OF EXPANDING BUD**

Host Plants: Common Name	Scientific Name
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph	May 01	Sep 01	twig bark	gall	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
nymph	Apr 15 - Apr 30	from - 20	plants bloom: boxelder, star magnolia, periwinkle, Norway maple
nymph	May 01 - May 10	- - -	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
nymph	May 10 - May 20	to - 350	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle
nymph, adult	Aug 01 - Aug 10	from - 1600	plant bloom: Pee Gee Hydrangea blooms turn pink
nymph, adult	Aug 10 - Aug 20	to - 2100	plant fruit in color: Mountain ash, cranberry bush
nymph, adult?	Sep 20 - Oct 10	2600 - 3000	None Offered

Non Chemical Control

Remove highly susceptible white spruce.

Do not grow highly susceptible white spruce.

Chemical Control*Reference use only. NOT a label substitute.**Select the appropriate insecticide/miticide for the correct life stage of the target pest.*

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
carbaryl	Carbaryl 4L	<i>BEE CAUTION</i>	C	12 hours
	Sevin SL	<i>BEE CAUTION</i>	C	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil		C	4 hours
*imidacloprid	Mallet 75 WSP	<i>BEE CAUTION</i>	C	12 hours

Additional information on biology and control

Basal bark sprays of imidacloprid, or broadcast application with soil incorporation through rainfall, can result in multiple years of control for adelgids and aphids, but treatment effects may not be observed for several weeks. Treatments can be applied from bud break until the end of active growth in fall. Foliar sprays used to target mobile stages are best applied as galls crack open in the late summer. Overwintering females can successfully be sprayed in the fall.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

ELONGATE HEMLOCK SCALE**

Fiorinia externa

Page 104 (Johnson & Lyon)

Page 44 (Adams & Packauskas)

DORMANT SEASON

Annual cover sprays are suggested.

Frequency with which pest occurs: **ANNUAL**

Part of plant to treat: **FOLIAGE**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
egg	Mar 01	Apr 15	foliage		visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
adult	Mar 01 - Apr 10	0 - 41	None Offered

Chemical Control

Comments

Signal Word **Agricultural Restricted Entry Interval (REI)^**

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

*dinotefuran	Safari 20 SG	<i>BEE CAUTION</i>	C	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil		C	4 hours

Additional information on biology and control

This hard scale is often seen in conjunction with the circular hemlock and cryptomeria scales. Elongate hemlock scale has one or two generations per year in Connecticut. Fertile females and eggs overwinter. Crawlers are present throughout the spring and summer due to overlapping life stages. Crawlers settle under the thin waxy cuticle of young needles and begin to develop, females through three stages, males five. The males ultimately emerge as tiny 2-winged insects that may be mistaken for wasp parasitoids as they move around the mature brown female scales. The white waxy wool produced by males may sometimes be mistaken for woolly adelgid activity. Basal bark, foliar, broadcast, soil drench or soil injection applications of dinotefuran will result in one to two years of control on small trees. Beginning at bud break in spring until the end of active growth in fall, applications of this product will move up into plants within days and begin killing pests. Visit the podcast/video section of the CAES website (www.ct.gov/CAES) for the video “Basal Bark Sprays and Best Management Practices for Armored Scales in Christmas Trees.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Annual cover sprays are suggested.

Frequency with which pest occurs: **ANNUAL**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
adult	May 01	Sep 30	foliage	discoloration, needle drop	visual inspection
nymph (crawler)	May 15	Jun 30	foliage	discoloration, needle drop	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
crawler	May 20 - May 31	from - 360	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark
crawler, nymph	Jun 01 - Jun 10	- - -	plants bloom: Kousa dogwood, cranberry bush, beautybush
crawler, nymph	Jun 10 - Jun 20	to - 700	plants bloom: mountain laurel, mock-orange, Japanese tree lilac, Washington hawthorn
crawler	Jun 20 - Jun 30	700 - 970	plants bloom: Rhododendron maximum, Spiraea bumalda, Philadelphus

Biological Control

	Comments
<i>Cybocephalus nipponicus</i> (picnic beetle predator)	Becoming established
<i>Encarsia citrinus</i> (parasitic wasp)	Occurs naturally
<i>Lindorus lophanthae</i> (lady beetle - scale predator)	Available commercially
<i>Chilocorus stigma</i> (lady beetle - predator)	Occurs naturally

Chemical Control

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
<i>Reference use only. NOT a label substitute.</i>			
<i>Select the appropriate insecticide/miticide for the correct life stage of the target pest.</i>			
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C 12 hours
afidopyropen	Ventigra	BEE CAUTION	C 12 hours
dimethoate	Dimate 4EC	BEE CAUTION	W 48 hours
*dinotefuran	Safari 20 SG	BEE CAUTION	C 12 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate		W 12 hours
	M-Pede	Only effective against immatures.	W 12 hours
spirotetramat	Movento	BEE CAUTION	C

Additional information on biology and control

Foliar sprays can very effectively target scale crawlers. Time applications to coincide with egg hatch by monitoring egg deposition and development under female scales. Efficacy of products targeting scale scrawlers is acetamiprid > dinotefuran = pyriproxyfen = afidopyropen > spirotetramat.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

ERIOPHYID MITES**

Eriophyidae Nalepella spp.

Page 122 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
immature, adult	May 15	Jun 15	foliage	distortion	visual inspection (magnification)

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
immature	May 20 - May 31	from - 298	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark
immature	Jun 01 - Jun 10	to - 533	plants bloom: Kousa dogwood, cranberry bush, beautybush

Biological Control

Stethorus punctillum (lady beetle - predator)

Comments

Available commercially; occurs naturally

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
abamectin	Avid 0.15 EC		W	12 hours
fenpyroximate	Akari 5SC		W	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil	WARNING: use of oil on blue colored conifers will cause color to change.	C	4 hours
spirodiclofen	Envidor		C	
sulfur	Sulfur 80 WDG		C	

Additional information on biology and control

Eriophyid mites are very small, cigar-shaped mites with four legs at the head end that feed on sap. Some species feed on mature needles, either at the base or along the needle. Other species feed in developing buds. Damage is yellowing needles similar to that caused by ozone or spruce spider mites. There are several generations each year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
larva	Apr 15	May 15	foliage	defoliation	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
larva	Apr 20 - Apr 30	from - 78	plants bloom: boxelder, star magnolia, periwinkle, Norway maple
larva	May 01 - May 20	- -	Remainder of season between the beginning and end phenology
larva	May 20 - May 31	to - 420	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
azadirachtin	Aza-Direct	C	4 hours
*bifenthrin	Onyx Pro	W	12 hours
chlorantraniliprole	Acelepryn		4 hours
*diflubenzuron	Dimilin 25W	C	12 hours
*esfenvalerate	Asana XL (Christmas tree only)	W	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil	C	4 hours
*imidacloprid	Mallet 75 WSP	C	12 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate	W	12 hours
	M-Pede	W	12 hours
malathion	Malathion 5 EC	W	12 hours
	Malathion 8 Flowable	C	12 hours
spinosad	Conserve SC	C	4 hours
*thiamethoxam	Flagship 25WG	C	12 hours

Additional information on biology and control

The European pine sawfly is a nonstinging wasp that, in the larval stage, feeds on the needles of many pine species. Sawfly caterpillars have more than five pairs of the stubby prolegs along the abdomen. Moth and butterfly caterpillars have two to five pairs of these legs. Winter is spent as a cocoon on the ground in duff around the tree trunk. Adult wasps emerge in spring and females insert eggs into pine needles with their saw-like ovipositor. After a month or so, the longitudinally cream and gray to greenish striped larvae with a black head emerge and begin feeding in groups on pine needles. When mature in about a month, larvae drop to the ground and make a cocoon. There is one generation in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

EUROPEAN PINE SHOOT MOTH**

Rhyacionia buoliana

Page 48, 50 (Johnson & Lyon)

Page 17 (Adams & Packauskas)

DELAYED DORMANT

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **BUD**

Host Plants: Common Name

Scientific Name

pine

Pinus

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
larva	Apr 01 - Apr 20	28 - 96	plants bloom: silver maple, Cornelian cherry, pussy willow

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **NEW SHOOTS**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
larva (caterpillar)	May 01	May 31	new foliar growth	borer tunnels	visual inspection
adult (moth)	Jun 01	Jul 31	new foliar growth	borer tunnels	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
adult?, larva	Jun 01 - Jun 10	437 - 563	plants bloom: Kousa dogwood, cranberry bush, beautybush
adult?, larva	Jun 10 - Jun 20	563 - 737	plants bloom: mountain laurel, mock-orange, Japanese tree lilac, Washington hawthorn

Non Chemical Control

Where feasible, cut & destroy twigs that have the pitch mass.

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
*bifenthrin Onyx Pro	<i>BEE CAUTION</i>	W	12 hours
chlorantraniliprole Acelepryn			4 hours

Additional information on biology and control

The European pine shoot moth overwinters as partially grown reddish-brown caterpillars in needles and buds of pine trees. Scotch, red and Austrian pines are the preferred hosts. In spring, those that survive bore into new growth to complete their development and pupate in twigs. Dead, stunted shoots with pitch masses at entrance sites result. Small orange patterned moths emerge in June and July. Eggs are laid on new foliage. Small caterpillars then bore into needles and buds to overwinter. There is one generation per year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GYPSY MOTH**

Lymantria dispar

Page 138 (Johnson & Lyon)

Page 27 (Adams & Packauskas)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
larva	May 01	Jun 01	foliage	defoliation	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
larva	May 10 - May 20	from - 190	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle
larva	May 20 - May 31	to - 400	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
azadirachtin	Aza-Direct	C	4 hours
	AzaGuard	C	4 hours
B. thuringiensis aizawai	XenTari	C	4 hours
	<i>Most effective against young larvae.</i>		
B. thuringiensis kurstaki	DiPel DF	C	4 hours
	<i>Most effective against young larvae.</i>		
*bifenthrin	Talstar S Select	C	12 hours
chlorantraniliprole	Acelepryn		4 hours
*diflubenzuron	Dimilin 25W	C	12 hours
	<i>Effective against immatures. Bee caution.</i>		
spinosad	Conserve SC	C	4 hours
	<i>Most effective against young larvae.</i>		

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

DELAYED DORMANT**Apply thorough treatment only when pest stage found.**Frequency with which pest occurs: **OCCASIONAL**Part of plant to treat: **NEEDLES**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
crawler	Apr 01	Apr 30	needles	discoloration, twig dieback	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
adult, nymph	Apr 01 - Apr 20	22 - 80	None Offered

Chemical Control*Reference use only. NOT a label substitute.**Select the appropriate insecticide/miticide for the correct life stage of the target pest.*

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
*dinotefuran	Safari 20 SG	BEE CAUTION	C 12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil	WARNING: use of oil on blue colored conifers will cause color to change.	C 4 hours

Additional information on biology and control

The hemlock scale is a pest of spruce, fir, Douglas-fir and possibly pine. Partially grown males and females overwinter on the undersides of needles. Adults appear in March with a second generation present in June and early July. Because of the warm temperatures, this generation matures in a month. There are two generations per year. Males are winged. The timing of insecticide applications depends on their mode of action. Contact or residual crawler sprays can be applied early April, and again in late June into July if needed. Basal bark, foliar, broadcast, soil drench or soil injection applications of dinotefuran will result in one to two years of control. Beginning at bud break in spring until the end of active growth in fall, applications of this product will move up into plants within days and begin killing pests. Visit the podcast/video section of the CAES website (www.ct.gov/caes) for the video "Basal Bark Sprays and Best Management Practices for Armored Scales in Christmas Trees". Oil causes Douglas-fir to turn yellow. They do not tolerate oil sprays.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

HEMLOCK SCALE

Hemiberlesia ithacae

Page 102 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **NEEDLES**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
crawler	Aug 01	Sep 01	needles	discoloration, twig dieback	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
crawler	May 01 - May 20	133 - 278	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
crawler	Aug 01 - Aug 31	1685 - 2380	plant fruit in color: Mountain ash, cranberry bush

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C	12 hours
afidopyropen	Ventigra	BEE CAUTION	C	12 hours
*dinotefuran	Safari 20 SG	BEE CAUTION	C	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil	WARNING: use of oil on blue colored conifers will cause color to change.	C	4 hours
pyriproxyfen	Distance IGR	Only effective against immatures.	C	12 hours
spirotetramat	Movento	BEE CAUTION	C	

Additional information on biology and control

Foliar sprays can very effectively target scale crawlers. Time applications to coincide with egg hatch by monitoring egg deposition and development under female scales. Efficacy of products targeting scale scrawlers is acetamiprid > dinotefuran = pyriproxyfen = afidopyropen > spirotetramat.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **NEW SHOOTS**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
larva	May 01	Jun 20	new shoots	distortion, discoloration	visual inspection
adult	Jul 01	Sep 01	foliage		pheromone traps

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
larva	May 01 - May 10	144 - 228	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
larva	May 10 - May 20	228 - 311	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle
larva	May 20 - May 31	from - 311	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark
larva	Jun 10 - Jun 20	to - 737	plants bloom: mountain laurel, mock-orange, Japanese tree lilac, Washington hawthorn
adult	Jul 20 - Jul 31	from - 1417	plants bloom: butterfly bush, Clethra alnifolia, false spirea
adult, larva	Aug 01 - Aug 10	to - 1933	plant bloom: Pee Gee Hydrangea blooms turn pink

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
*bifenthrin	Talstar S Select	<i>BEE CAUTION</i>	C 12 hours
chlorantraniliprole	Acelepryn		4 hours
*diflubenzuron	Dimilin 25W	<i>Effective against immatures. Bee caution.</i>	C 12 hours
dimethoate	Dimate 4EC	<i>BEE CAUTION</i>	W 48 hours
*esfenvalerate	Asana XL (Christmas tree only)		W 12 hours
*permethrin	Arctic 3.2 EC	<i>BEE CAUTION</i>	C 12 hours

Additional information on biology and control

Basal bark sprays of imidacloprid, or broadcast application with soil incorporation through rainfall, can be effective. Treatment effects may not be observed for several weeks. Treatments can be applied from bud break until the end of active growth in the fall.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

PALES WEEVIL**

Hylobius pales

Page 56 (Johnson & Lyon)

DELAYED DORMANT

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **CUT STUMPS, YOUNG TREES**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
adult	Apr 01	Apr 20	stem, trunk	bark eaten	visual inspection, check debris at base of tree

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
adult	Apr 01 - Apr 20	28 - 96	plants bloom: silver maple, Cornelian cherry, pussy willow

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
*bifenthrin	Onyx Pro	<i>BEE CAUTION</i>	W	12 hours
	Talstar S Select	<i>BEE CAUTION</i>	C	12 hours
*diflubenzuron	Dimilin 25W	<i>Only effective against immatures.</i>	C	12 hours

Additional information on biology and control

Pales weevil adult feeding damage to seedling pines, spruce, Douglas fir and true fir makes this a serious pest of nursery and Christmas tree plantings. (It is not a primary landscape pest due to the lack of larval development sites.) The adults, who overwinter in the duff, feed on the bark of small branches April through early June. This girdling of small trees and flagging of side branches can lead to serious damage. Adults congregate around fresh pine or spruce stumps (trees cut within the past year) or dead/dying trees. Females lay eggs below ground in the structural roots of these trees in May. Larvae develop in the phloem making extensive tunnels. After pupation below ground, adults emerge in September. The key to successful control is removing the tree stumps and dead trees. Larvae can develop in stumps removed from the soil and adults can still lay eggs on stumps covered with soil or mulch. Removal of stumps with a grinder is completely effective. If this cannot be done, insecticide applications should be made to these sites to kill adults before they lay eggs, and to any neighboring young trees to protect them from feeding by adults. Insecticides should be applied when forsythia flower buds begin show yellow.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON**Apply thorough treatment only when pest stage found.**Frequency with which pest occurs: **COMMON**Part of plant to treat: **YOUNG TREES**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
adult	May 01	Sep 10	stem, trunk	bark eaten	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
adult	Aug 20 - Aug 31	2173 - 2399	plant fruit in color: Viburnum dentatum

Chemical Control

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
<i>Reference use only. NOT a label substitute.</i>				
<i>Select the appropriate insecticide/miticide for the correct life stage of the target pest.</i>				
*bifenthrin	Talstar S Select	BEE CAUTION	C	12 hours
*diflubenzuron	Dimilin 25W	Effective against immatures. Bee caution.	C	12 hours
*esfenvalerate	Asana XL (Christmas tree only)		W	12 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

PINE BARK ADELGID**

Pineus strobi

Page 76, 78 (Johnson & Lyon)

Page 36 (Adams & Packauskas)

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **STEM, TRUNK**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph	Mar 01	Apr 15	trunk	decline, unsightly	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
immature	Mar 01 - Apr 10	0 - 41	None Offered

Chemical Control

Comments

Signal Word Agricultural Restricted Entry Interval (REI)^

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

horticultural oil	Sunspray Ultra-Fine Spray Oil	C	4 hours
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Additional information on biology and control

The pine bark adelgid is a very small, aphid-like piercing sucking insect that feeds on white pines. Winter is passed as stationary immatures on the bark. With warm weather feeding begins and white wax is secreted over their bodies. In late spring, when mature, eggs are laid. Crawlers hatch and move to new feeding sites on the tree. Crawlers can be windblown onto new plants. In Christmas trees feeding is mainly on new shoots at the base of current years growth. Feeding by this insect does not injure the host.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

DELAYED DORMANT

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **STEM, TRUNK**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph	Apr 01	Apr 20	trunk	decline, unsightly	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
immature	Apr 01 - Apr 20	28 - 96	plants bloom: silver maple, Cornelian cherry, pussy willow

Chemical Control

Comments

Signal Word Agricultural Restricted Entry Interval (REI)^

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

horticultural oil	Sunspray Ultra-Fine Spray Oil	C	4 hours
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Additional information on biology and control

The damage from this insect is purely aesthetic, it does not injure the host.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

PINE BARK ADELGID**

Pineus strobi

Page 76, 78 (Johnson & Lyon)

Page 36 (Adams & Packauskas)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **STEM, TRUNK**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph	Apr 20	Jun 01	trunk	decline, unsightly	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
immature	Apr 20 - Apr 30	from - 58	plants bloom: boxelder, star magnolia, periwinkle, Norway maple
immature	May 10 - May 20	- - -	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle
immature	May 20 - May 31	to - 618	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
horticultural oil	Sunspray Ultra-Fine Spray Oil	C	4 hours
*imidacloprid	Mallet 75 WSP	C	12 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate	W	12 hours
	M-Pede	W	12 hours

Additional information on biology and control

Basal bark sprays of imidacloprid, or broadcast application with soil incorporation through rainfall, can result in multiple years of control for adelgids and aphids, but treatment effects may not be observed for several weeks. Treatments can be applied from bud break until the end of active growth in fall. The damage from this insect is only aesthetic, it does not injure the host.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **UNCOMMON**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
egg	Mar 01	Apr 15	foliage		visual inspection (magnification)

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
egg	Mar 01 - Apr 10	0 - 41	None Offered

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

<u>Chemical Control</u>	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
horticultural oil	Sunspray Ultra-Fine Spray Oil	C	4 hours

Additional information on biology and control

The pine needle scale is a hard scale that overwinters as red eggs underneath the white female's cover. Crawlers hatch in May and June and move to a new feeding site on a needle. They may be windblown to another host. A second generation of crawlers hatches in late July. Adult males have wings and fly to females to mate.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

PINE NEEDLE SCALE**

Chionaspis pinifoliae

Page 108 (Johnson & Lyon)

Page 47 (Adams & Packauskas)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: UNCOMMON

Part of plant to treat: FOLIAGE

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph (crawler)	May 01	Jun 15	foliage	decline	visual inspection
nymph	Jul 15	Aug 01	foliage	decline	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
crawler	May 20 - May 31	from - 298	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark
crawler, immature	Jun 01 - Jun 10	to - 448	plants bloom: Kousa dogwood, cranberry bush, beautybush
crawler	Jul 20 - Jul 31	1290 - 1917	plants bloom: butterfly bush, Clethra alnifolia, false spirea

Biological Control

Lindorus lophanthae (lady beetle - scale predator)

Cryptolaemus montrouzieri (lady beetle predator)

Chilocorus stigma (lady beetle - predator)

Comments

Available commercially

Available commercially; occurs naturally

Occurs naturally

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C	12 hours
afidopyropen	Ventigra	BEE CAUTION	C	12 hours
*bifenthrin	Talstar S Select	Effective against immatures. Bee caution.	C	12 hours
*dinotefuran	Safari 20 SG	BEE CAUTION	C	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil		C	4 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate		W	12 hours
	M-Pede	Only effective against immatures.	W	12 hours
malathion	Malathion 5 EC	Effective against immatures. Bee caution.	W	12 hours
	Malathion 8 Flowable	Effective against immatures. Bee caution.	C	12 hours
pyriproxyfen	Distance IGR	Only effective against immatures.	C	12 hours
spirotetramat	Movento	BEE CAUTION	C	

Additional information on biology and control

Basal bark, foliar, broadcast, soil drench or soil injection applications of dinotefuran will result in one to two years of control. Beginning at bud break in spring until the end of active growth in fall, applications of this product will move up into plants within days and begin killing pests. Visit the podcast/video section of the CAES website (www.ct.gov/caes) for the video “Basal Bark Sprays and Best Management Practices for Armored Scales in Christmas Trees”. Foliar sprays can very

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

effectively target scale crawlers. Time applications to coincide with egg hatch by monitoring egg deposition and development under female scales. Efficacy of products targeting scale scrawlers is acetamiprid > dinotefuran = pyriproxyfen = afidopyropen > spirotetramat.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

***restricted use pesticide**

****ESA approved common name**

^for agricultural applications only.

PINE ROOT COLLAR WEEVIL**

Hylobius radialis

Page 56 (Johnson & Lyon)

Page 19 (Adams & Packauskas)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **ROOT COLLAR**

Host Plants: <u>Common Name</u>	<u>Scientific Name</u>
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
adult	May 15	Sep 30	root collar	decline, girdling	visual inspection, check debris at base of tree

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
adult	Jun 10 - Jun 20	from - 618	plants bloom: mountain laurel, mock-orange, Japanese tree lilac, Washington hawthorn
adult	Jun 20 - Jun 30	to - 912	plants bloom: Rhododendron maximum, Spiraea bumalda, Philadelphus

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
*bifenthrin	Talstar S Select	<i>BEE CAUTION</i>	C	12 hours
*diflubenzuron	Dimilin 25W	<i>Effective against immatures. Bee caution.</i>	C	12 hours
*esfenvalerate	Asana XL (Christmas tree only)		W	12 hours

Additional information on biology and control

The 3/8” long reddish brown pine root collar weevil has patches of white hairs on its wing covers and overwinters as mature females. In May eggs are laid in feeding wounds made by adults in the inner bark of the root collar. Some may be laid in nearby soil. Eggs are laid over many months resulting in overlapping generations. Cream colored larvae with a light brown head capsule feed on bark phloem. Resin flows from the feeding site are a symptom of this weevil’s presence.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

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GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **TRUNK, STEM, FOLIAGE**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
hole, frass from larva	May 01	Jun 30	trunk	borer tunnels	visual inspection
adult	Jul 01	Oct 01	stem, trunk	borer tunnels	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
adult (beetle)	May 01 - May 10	133 - 187	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
adult (beetle)	Jul 10 - Jul 20	1162 - 1393	plants bloom: Abelia, golden rain tree, sourwood
adult (beetle)	Jul 20 - Sep 10	1393 - 2560	Remainder of season between the beginning and end phenology
adult (beetle)	Sep 10 - Sep 20	2560 - 2810	plants bloom: Pee Gee Hydrangea, Sevin-son Flower

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
*bifenthrin	Onyx Pro	W	12 hours
	Talstar S Select	C	12 hours

Additional information on biology and control

This ¼” long, brown to black Eurasian bark beetle attacks Scotch, red, Austrian, and eastern white pine in all counties in Connecticut. Adults emerge from overwintering sites in the base of tree trunks or logs when air temperatures stay in the mid- 50’s and above. After mating, females tunnel between inner bark and cambium of susceptible pines creating a 4 to 10” vertical egg gallery. Eggs are laid along both sides of this gallery and hatch in late April to June. White, ¼’ long, legless larvae make feeding tunnels that radiate away from the egg chamber. The next generation of adults emerges from the tree trunks from July through October. Maturation feeding in stem pith by these new adults occurs in the last 6” of current year’s growth, causing tip dieback. Each adult may feed on from 1 to 6 shoots making this the most destructive stage of the life cycle. This exotic beetle was found in Connecticut in 2006 but as of March 2021, is not a problem.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

PINE TORTOISE SCALE**

Toumeyella parvicornis

Page 96 (Johnson & Lyon)

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **STEM**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph	Apr 15	May 01	stem	decline	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
nymph	Apr 20 - Apr 30	96 - 137	plants bloom: boxelder, star magnolia, periwinkle, Norway maple

Chemical Control

Comments

Signal Word Agricultural Restricted Entry Interval (REI)^

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

horticultural oil	Sunspray Ultra-Fine Spray Oil	C	4 hours
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Additional information on biology and control

The pine tortoise scale is a soft scale and therefore produces honeydew. Mature females look like small 3/16" round, brown turtles. Immature wrinkled females overwinter on branches. After feeding and mating in spring, eggs develop, are laid beneath the female. Hatching in late June to early July, mobile crawlers move out to new sites and may be blown to a different host. Male crawlers, settle, feed for a month, and then pupate for a short time. The winged males emerge and seek stationary females to mate with, then die. There is one generation per year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **STEM**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph (crawler)	Jun 20	Jul 15	stem	decline	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
crawler	Jun 20 - Jun 30	618 - 1050	plants bloom: Rhododendron maximum, Spiraea bumalda, Philadelphus

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	Agricultural Restricted Entry Interval (REI)^
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C	12 hours
afidopyropen	Ventigra	BEE CAUTION	C	12 hours
*bifenthrin	Talstar S Select	Effective against immatures. Bee caution.	C	12 hours
*dinotefuran	Safari 20 SG	BEE CAUTION	C	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil		C	4 hours
*imidacloprid	Mallet 75 WSP	BEE CAUTION	C	12 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate		W	12 hours
	M-Pede	Only effective against immatures.	W	12 hours
pyriproxyfen	Distance IGR	Only effective against immatures.	C	12 hours
*thiamethoxam	Flagship 25WG	BEE CAUTION	C	12 hours

Additional information on biology and control

Basal bark sprays of imidacloprid, or broadcast application with soil incorporation through rainfall, can result in multiple years of control for adelgids, aphids and soft scales, but treatment effects may not be observed for several weeks. Treatments can be applied from bud break until the end of active growth in fall.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

PINE TUBE MOTH**

Argyrotaenia pinatubana

Page 46 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **FOLIAGE**

Host Plants: <u>Common Name</u>	<u>Scientific Name</u>
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
larva	May 15	Jun 15	foliage	distortion, defoliation	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
larva	Apr 20 - Apr 30	from - 91	plants bloom: boxelder, star magnolia, periwinkle, Norway maple
larva	May 01 - May 10	to - 246	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
larva	Jul 01 - Jul 10	from - 1151	plants bloom: Ceanothus americanus, Clematis jackmanii, Tilia cordata
larva	Jul 10 - Jul 20	to - 1514	plants bloom: Abelia, golden rain tree, sourwood

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
azadirachtin	Aza-Direct	C	4 hours
	AzaGuard	C	4 hours
B. thuringiensis aizawai	XenTari	C	4 hours
	<i>Most effective against young larvae.</i>		
B. thuringiensis kurstaki	DiPel DF	C	4 hours
	<i>Most effective against young larvae.</i>		
*bifenthrin	Talstar S Select	C	12 hours
	<i>BEE CAUTION</i>		
chlorantraniliprole	Acelepryn		4 hours
*imidacloprid	Mallet 75 WSP	C	12 hours
	<i>BEE CAUTION</i>		
spinosad	Conserve SC	C	4 hours
	<i>Most effective against young larvae.</i>		

Additional information on biology and control

The ½” long, rusty red and cream pine tube moth attacks mostly Eastern white pine. Yellowish, translucent ½” long larvae have a brown head capsule and feed on needle tips. A shelter is built by webbing 5 – 20 needles together with space for the larva inside. The insect overwinters as a pupa in this tube. Moths emerge in early May and lay eggs on needles. A second generation of moths emerge from their tubes in July with the eggs of the overwintering generation laid in July.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
larva	May 01	Aug 01	foliage	defoliation	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
larva	May 01 - Aug 01	144 - 1700	all season (when webbing found)

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
azadirachtin	Aza-Direct		C	4 hours
	AzaGuard		C	4 hours
*bifenthrin	Talstar S Select	BEE CAUTION	C	12 hours
chlorantraniliprole	Acelepryn			4 hours
*imidacloprid	Mallet 75 WSP	BEE CAUTION	C	12 hours
spinosad	Conserve SC	Most effective against young larvae.	C	4 hours
*thiamethoxam	Flagship 25WG	BEE CAUTION	C	12 hours

Additional information on biology and control

As their name suggests the pine web-spinning sawflies create large loosely webbed masses of frass and needle parts on many species of pine. As opposed to other sawflies, larvae in this group have no prolegs and therefore limited mobility to move throughout the plant to find food. Winter is spent as a pupae in a cell in the soil. Black adults, 1/2" long, with a red head, emerge in early May. After mating, eggs are laid in clusters along previous years needles. As they feed for three weeks or so, the nests enlarge and current years candle extends beyond it. Mature larvae drop to the ground and burrow 1/8" into the soil. There is one generation per year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

PINE WEBWORM**

Pococera robustella

Page 22 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **FOLIAGE**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
fir	<i>Abies</i>
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
larva	Jun 01	Sep 30	foliage	defoliation	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
adult (moth)	Jun 01 - Jun 20	400 - 725	plants bloom: Kousa dogwood, cranberry bush, beautybush
larva	Jun 20 - Jun 30	from - 802	plants bloom: Rhododendron maximum, Spiraea bumalda, Philadelphus
adult, larva	Jul 01 - Jul 31	- -	Remainder of season between the beginning and end phenology
adult, larva	Aug 01 - Aug 10	to - 2000	plant bloom: Pee Gee Hydrangea blooms turn pink

Chemical Control

Comments

Signal Word

Agricultural Restricted Entry Interval (REI)^

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

azadirachtin	Aza-Direct		C	4 hours
*bifenthrin	Onyx Pro	<i>BEE CAUTION</i>	W	12 hours
	Talstar S Select	<i>BEE CAUTION</i>	C	12 hours
spinosad	Conserve SC	<i>Most effective against young larvae.</i>	C	4 hours

Additional information on biology and control

The pine webworm builds nests of frass, webbing and dead needles usually on the terminal shoots of young trees. Caterpillars overwinter in a cocoon in the soil. Adults emerge from June through early August. Eggs are laid in a single row along pine needle, with one needle containing as many as 20 eggs. Young larvae web together needles and begin mining needles. When they outgrow that they join with others and construct a nest from 5cm up to 15 cm depending on the number of caterpillars present. In late September mature larvae drop to the ground and pupate in the soil below the frostline. Damage is not usually considered to be of economic importance, but prevalence has been increasing.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **NEEDLES**

Host Plants: Common Name	Scientific Name
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph	Mar 01	Mar 15	stem	gall	visual inspection

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

Chemical Control	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
horticultural oil Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours

Additional information on biology and control

The ragged spruce gall adelgid damage appears as dead scraggly twig terminals. Needles hide the gall surface. Hosts include Norway, white, red, and Colorado blue spruce. There is no alternate host. Continual attacks make trees look ragged with all terminal foliage brown and clumped each year. Partially grown adelgids overwinters under bud scales. In spring their feeding causes formation of paler green galls 1 – 4 cm long. As galls mature and turn brown both winged and non-winged adelgids emerge. Non-winged forms lay eggs within the gall while winged forms lay eggs in small white tufts on stems. In June to July the reddish brown winged forms fly and lay eggs covered with a white wool on other spruce needles. These then develop into the overwintering generation and settle into bud scales. (Blackman and Eastop, Aphids on the World’s Trees)

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

RAGGED SPRUCE GALL ADELGID

Pineus similis

Page 112 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **NEEDLES**

Host Plants: <u>Common Name</u>	<u>Scientific Name</u>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph	Apr 01	Apr 15	stem	gall	visual inspection
adult	Jun 01	Jun 15	stem	gall	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
adult	Jun 15 - Jun 30	630 - 940	plants bloom: Rhododendron maximum, Spiraea bumalda, Philadelphus
nymph (crawler)	Sep 01 - Sep 30	2400 - 2850	plants bloom: Pee Gee Hydrangea, Sevin-son Flower

Non Chemical Control

Prune off and destroy the affected stems.

Chemical Control

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
<i>Reference use only. NOT a label substitute.</i>				
<i>Select the appropriate insecticide/miticide for the correct life stage of the target pest.</i>				
horticultural oil	Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours
*imidacloprid	Mallet 75 WSP	<i>BEE CAUTION</i>	C	12 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
larva	Jun 01	Sep 01	foliage	defoliation	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
larva	Jun 01 - Jun 10	437 - 563	plants bloom: Kousa dogwood, cranberry bush, beautybush
larva	Jun 10 - Aug 20	563 - 2173	Remainder of season between the beginning and end phenology
larva	Aug 20 - Aug 31	2173 - 2399	plant fruit in color: Viburnum dentatum

Chemical Control

Comments

Signal Word **Agricultural Restricted Entry Interval (REI)^**

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

azadirachtin	Aza-Direct		C	4 hours
	AzaGuard		C	4 hours
chlorantraniliprole	Acelepryn			4 hours
*diflubenzuron	Dimilin 25W	<i>Effective against immatures. Bee caution.</i>	C	12 hours
*esfenvalerate	Asana XL (Christmas tree only)		W	12 hours
*imidacloprid	Mallet 75 WSP	<i>BEE CAUTION</i>	C	12 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate	<i>Only effective against immatures.</i>	W	12 hours
	M-Pede	<i>Only effective against immatures.</i>	W	12 hours
malathion	Malathion 5 EC	<i>BEE CAUTION</i>	W	12 hours
	Malathion 8 Flowable	<i>BEE CAUTION</i>	C	12 hours
spinosad	Conserve SC	<i>Most effective against young larvae.</i>	C	4 hours
*thiamethoxam	Flagship 25WG	<i>BEE CAUTION</i>	C	12 hours

Additional information on biology and control

The redheaded pine sawfly is a nonstinging wasp that, in the larval stage, feeds on the needles of many pine species. Sawfly caterpillars have more than five pairs of stubby prolegs along the abdomen. Moth and butterfly caterpillars have two to five pairs of these legs. Winter is spent as a cocoon on the ground in duff around the tree trunk. Black ½” long wasps with red to orange colored heads and light yellow sides to the body, emerge in spring. After mating females insert eggs into pine needles with their saw-like ovipositor. After a month or so, the black spotted, cream colored larvae also with a reddish head emerge and begin feeding in groups on pine needles. When mature in about a month, larvae drop to the ground and make a cocoon. There are two generations in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

SPOTTED LANTERNFLY

Lycorma delicatula

GROWING SEASON

Apply thorough treatment only when pest stage found.

Host Plants: Common Name

Scientific Name

pine

Pinus

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
adult	Sep 15	Nov 15	trunk	weeping wounds on trunk	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
nymph, adult	May 15 - Sep 30	200 - 2500	all season

Additional information on biology and control

As of March 2021, the exotic spotted lanternfly has spread throughout southeastern Pennsylvania, with infestations in Delaware and New Jersey to the east as well. In Connecticut multiple live adults have been found in Greenwich and a single live adult was found in West Haven in the fall of 2020. Adults are 1” long with cream to gray colored front wings with black spots and hind wings that are red, black and white. Wingless nymphs are initially black and white but late instars are red and black with white spots. It was thought to prefer jumping to flying between hosts such as fruit trees, hops, grapes, tree of heaven and deciduous trees. However, the spread of this insect from one to thirteen counties in the past three years may be indicative of the insect flying long distances. With piercing-sucking mouthparts sap is removed from leaves, stems and trunks of host plants often leaving a weeping area of sap that attracts bees and wasps. In areas with high lanternfly populations, excretions of honeydew drip like rain from infested plants. Winter is passed as eggs indiscriminately deposited in a gray mass on objects near feeding sites. Nymphs hatch in spring and will move off tree of heaven to other hosts where they feed on leaves and young stems before becoming adults by late July. (Tim Abbey, Penn State Extension, personal communication.) If you think you have seen the spotted lanternfly, please send digital photos to ReportSLF@ct.gov or contact the Information Offices in New Haven at 203-974-8600 or Windsor at 860-683-4977. For Christmas tree growers, there is no concern over feeding damage. However, egg masses deposited on trees may hatch in customer’s home and cause complaints. Movement of cut trees can also spread the pest to new areas via egg masses.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **BASE OF BUD**

Host Plants: Common Name	Scientific Name
spruce	<i>Picea</i>

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
immature	Mar 01 - Apr 10	0 - 41	None Offered

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
horticultural oil Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours

Additional information on biology and control

The spruce bud scale is a soft, honeydew making scale that attacks many species of spruce but favors Norway spruce. Winter is passed in the immature crawler stage on the undersides of needles. As weather warms in the spring, female crawlers move to stems to feed and complete development. Reddish brown, 3mm round, smooth globular mature scales are found at the base of current year's growth. They can easily be mistaken as part of the plant. After mating, females produce eggs that stay within their bodies. Crawlers emerge in early June. There may be two generations a year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

SPRUCE BUD SCALE**

Physokermes piceae

Page 96 (Johnson & Lyon)

DELAYED DORMANT

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **BASE OF BUD**

Host Plants: <u>Common Name</u>	<u>Scientific Name</u>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
nymph	Apr 01	Apr 20	base of bud	decline	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
immature	Apr 01 - Apr 20	28 - 96	plants bloom: silver maple, Cornelian cherry, pussy willow

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
horticultural oil Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours

Additional information on biology and control

Basal bark sprays of imidacloprid, or broadcast application with soil incorporation through rainfall, can result in multiple years of control for adelgids, aphids and soft scales, but treatment effects may not be observed for several weeks. Treatments can be applied from bud break until the end of active growth in fall.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **NEW GROWTH**

Host Plants: Common Name	Scientific Name
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph (crawler)	Jun 01	Sep 30	twig	decline	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
crawler	Jun 20 - Jun 30	from - 912	plants bloom: Rhododendron maximum, Spiraea bumalda, Philadelphus
crawler	Jul 01 - Jul 10	- - -	plants bloom: Ceanothus americanus, Clematis jackmanii, Tilia cordata
crawler	Jul 10 - Jul 20	to - 1388	plants bloom: Abelia, golden rain tree, sourwood

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C	12 hours
afidopyropen	Ventigra	BEE CAUTION	C	12 hours
*dinotefuran	Safari 20 SG	BEE CAUTION	C	12 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil	WARNING: use of oil on blue colored conifers will cause color to change.	C	4 hours
*imidacloprid	Mallet 75 WSP	BEE CAUTION	C	12 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate		W	12 hours
	M-Pede	Only effective against immatures.	W	12 hours
pyriproxyfen	Distance IGR	Only effective against immatures.	C	12 hours
*thiamethoxam	Flagship 25WG	BEE CAUTION	C	12 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

SPRUCE BUDWORM**

Choristoneura fumiferana

Page 28 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **BUD**

Host Plants: Common Name	Scientific Name
fir	<i>Abies</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
larva	Apr 15	Jul 01	bud	defoliation	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
larva	Apr 20 - Apr 30	96 - 137	plants bloom: boxelder, star magnolia, periwinkle, Norway maple
larva	May 01 - Jun 10	144 - 563	Remainder of season between the beginning and end phenology
larva	Jun 10 - Jun 20	563 - 737	plants bloom: mountain laurel, mock-orange, Japanese tree lilac, Washington hawthorn

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
azadirachtin	Aza-Direct		C	4 hours
	AzaGuard		C	4 hours
B. thuringiensis aizawai	XenTari	Most effective against young larvae.	C	4 hours
B. thuringiensis kurstaki	DiPel DF	Most effective against young larvae.	C	4 hours
chlorantraniliprole	Acelepryn			4 hours
*diflubenzuron	Dimilin 25W	Effective against immatures. Bee caution.	C	12 hours
*esfenvalerate	Asana XL (Christmas tree only)		W	12 hours
spinosad	Conserve SC	Most effective against young larvae.	C	4 hours

Additional information on biology and control

The spruce budworm is an important defoliator of spruce and fir. Winter is passed as a first instar caterpillar in a webbed case in foliage. In spring the rosy pink larva with a dark head capsule feeds on flowers and mines in needles. Larger larvae feed on expanding buds and then developed needles. Mature, 1" long larvae web together multiple shoot tips where pupation to the adult moth occurs. Mottled gray, cream and brown, 1" long moths emerge in mid-July. After mating, groups of eggs are laid on needles. There is one generation a year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **RARE**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
larva	Jun 01	Jun 20	foliage	discoloration (mining)	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
larva	Jun 01 - Jun 10	from - 448	plants bloom: Kousa dogwood, cranberry bush, beautybush
larva	Jun 10 - Jun 20	to - 802	plants bloom: mountain laurel, mock-orange, Japanese tree lilac, Washington hawthorn

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
acetamiprid	TriStar 8.5 SL	BEE CAUTION	C	12 hours
azadirachtin	Aza-Direct		C	4 hours
	AzaGuard		C	4 hours
*bifenthrin	Talstar S Select	BEE CAUTION	C	12 hours
chlorantraniliprole	Acelepryn			4 hours
*permethrin	Arctic 3.2 EC	BEE CAUTION	C	12 hours
spinosad	Conserve SC	Most effective against young larvae.	C	4 hours

Additional information on biology and control

The spruce needleminer is a small moth, whose larvae mine the contents of Norway, white and Colorado spruce. Winter is passed as an immature caterpillar protected inside a hollowed out needle closed off by a web. Feeding resumes in the spring with multiple larvae in one needle. Pupate in mid-April. Mottled cream and brown 1/2" long moths emerge in May and June. After mating females lay eggs in a fish scale pattern at the base of spruce needles. There is one generation a year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

SPRUCE SPIDER MITE**

Oligonychus ununguis

Page 118, 120, 475 (Johnson & Lyon)

Page 41 (Adams & Packauskas)

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **FOLIAGE**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
egg	Mar 01	Apr 15	foliage		visual inspection (magnification)

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
egg	Mar 01 - Apr 10	0 - 30	None Offered

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

<u>Chemical Control</u>	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
horticultural oil Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours

Additional information on biology and control

The ½ mm long spruce spider mite feeds on many conifers, being most problematic in spring and fall. Winter is passed in the egg stage under bud scales or along stems. As eggs mature they become a dark reddish brown and have a white bristle on the top. Larvae emerge with six legs. All later stages have eight legs. Damage appears as white, yellow or orange stippling on the upper needle surface, often conspicuously concentrated at the base of the needles near the stem. There can be three generations per year in Connecticut. Oil sprays cause Douglas-fir to turn yellow. They do not tolerate oil.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **FOLIAGE**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
immature	Apr 15	Nov 01	foliage	discoloration (stippling), needle drop	visual inspection (magnification), plant tapping
adult	May 10	Nov 01	foliage	discoloration (stippling), needle drop	visual inspection (magnification), plant tapping

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
immature, adult	May 01 - May 20	from - 130	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle
immature, adult	May 20 - May 31	- - -	plants bloom: ruby horsechestnut, Laburnum alpinum, black locust, ninebark
immature, adult	Jun 01 - Jun 10	to - 540	plants bloom: Kousa dogwood, cranberry bush, beautybush
immature, adult	Aug 20 - Aug 31	from - 2150	plant fruit in color: Viburnum dentatum
immature, adult	Sep 01 - Sep 10	- - -	plant fruit in color: Silver lace vine, Polygonum aubertii
immature, adult	Sep 10 - Sep 20	to - 2710	plants bloom: Pee Gee Hydrangea, Sevin-son Flower

Biological Control

Stethorus punctillum (lady beetle - predator)
Phytoseiulus persimilis (predatory mite)
Orius sp. (predator)
Neoseiulus cucumeris (predatory mite)
Chrysoperla sp. (green lacewing - predator)

Comments

Available commercially; occurs naturally
 Available commercially; occurs naturally
 Available commercially; occurs naturally
 Available commercially; occurs naturally
 Available commercially; occurs naturally

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
abamectin	Avid 0.15 EC	W	12 hours
bifenazate	Floramite SC	C	12 hours
*bifenthrin	Talstar S Select	C	12 hours
cyflumetofen	Sultan	C	12 hours
etoxazole	Tetrasan 5 WDG	C	12 hours
fenpyroximate	Akari 5SC	W	12 hours
hexythiazox	Hexygon DF	C	12 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

SPRUCE SPIDER MITE**

Oligonychus ununguis

Page 118, 120, 475 (Johnson & Lyon)

Page 41 (Adams & Packauskas)

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
horticultural oil	Sunspray Ultra-Fine Spray Oil	<i>WARNING: use of oil on blue colored conifers will cause color to change.</i>	C	4 hours
pyridaben	Sanmite	<i>BEE CAUTION</i>	W	12 hours
spirodiclofen	Envidor		C	

Additional information on biology and control

WARNING: use of oil on blue colored conifers will cause color to change. Oil may also injure balsam fir.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASONFrequency with which pest occurs: **OCCASIONAL**Part of plant to treat: **LEADER AND LATERAL STEMS**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
larva	Apr 15	May 31	Base of main branches	borer tunnels	visual inspection
adult	Jun 15	Sep 30	Base of main branches	borer tunnels	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>		
larva	Apr 20 - Apr 30	from - 96	plants bloom: boxelder, star magnolia, periwinkle, Norway maple		
larva	May 01 - May 10	- - -	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry		
larva	May 10 - May 20	- - 311	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle		
adult (moth)	Jul 10 - Jul 20	from - 1160	plants bloom: Abelia, golden rain tree, sourwood		
adult (moth)	Jul 20 - Jul 31	- - -	plants bloom: butterfly bush, Clethra alnifolia, false spirea		
adult, larva	Aug 10 - Aug 20	to - 2173	plant fruit in color: Mountain ash, cranberry bush		

Chemical Control*Reference use only. NOT a label substitute.**Select the appropriate insecticide/miticide for the correct life stage of the target pest.*

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
*bifenthrin	Talstar S Select	<i>BEE CAUTION</i>	C	12 hours
*diflubenzuron	Dimilin 25W	<i>Effective against immatures. Bee caution.</i>	C	12 hours

Additional information on biology and control

The Western pine moth attacks Douglas-fir. Signs of infestation include yellowish pitch masses mixed with feces on the trunk near main branches and resultant dead branches. Young caterpillars overwinter inside small cocoons under bark scales. In spring, reddish brown caterpillars may first bore into branch terminals, then proceed to the base of the branch near the trunk. Affected branches may crack and break off. They feed on the phloem or inner bark causing sap to seep out of the entry wound. As they feed, frass or feces is expelled and gets mixed into the pitch mass. Full grown larvae pupate at the entrance site. Dark grey and brick-colored moths with a zig-zag black and light grey pattern across the wing, ½" long, emerge late August through October. After mating eggs are laid in bark cracks and crevices. Eggs hatch in about two weeks and young larvae spin the silk cocoon in which they will pass the winter. There is one generation per year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

WHITE GRUBS

Popillia, Anomala, Rhizotrogus, Maladera spp.

Page 236 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **ROOT ZONE**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
Douglas-fir	<i>Pseudotsuga menziesii</i>
fir	<i>Abies</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
adult	Jul 01	Sep 01	foliage	defoliation	visual inspection
larva	Sep 01	Nov 01	roots	decline	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
larva	May 01 - May 31	133 - 395	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
larva	Jun 01 - Jun 30	-	Remainder of season between the beginning and end phenology
adult, larva	Jul 01 - Aug 31	960 - 2380	plants bloom: Ceanothus americanus, Clematis jackmanii, Tilia cordata

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
Bacillus thuringiensis galleriae	GrubGONE! G	Only effective against immatures.	C
carbaryl	Sevin SL	BEE CAUTION, effective against adults only	C 12 hours
chlorantraniliprole	Acelepryn		4 hours
*imidacloprid	Mallet 75 WSP	BEE CAUTION	C 12 hours

Additional information on biology and control

White grubs are the larvae of Japanese beetles, Asiatic garden beetles, oriental beetles and European chafers that feed on roots. Cream colored with a dark head capsule, the 1" long insects overwinter as partially grown larvae below the frost line in the soil. As the soil warms in the spring, they come back up to the root zone and continue feeding. They pupate for the month of June. Adults emerge from the soil in late June through July. They fly to host plants such as roses, linden trees, grapes or many other woody and herbaceous hosts. Asiatic garden beetle adults feed only at night, hiding in the duff during the day. Japanese beetles feed only in the heat of the day. Oriental beetles will feed either day or night. European chafer adults do not feed. After feeding and mating, adult females return to the soil to lay eggs in late July to early August. Eggs hatch in two weeks depending on temperatures and rainfall. Adults prefer to lay eggs in moist soils favorable for egg development and hatch. The small larvae are hard to see but begin feeding on finer roots until frost. Systemic insecticides such as imidacloprid or chlorantraniliprole can be put down early in the season while biologicals, such as GrubGone, should be applied after egg hatch in August. These products need to be watered in immediately or applied during a significant rainfall event.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

Management is especially important in tree nurseries, where preventive application of imidacloprid or chlorantraniliprole is warranted. At the time of planting a preplant root dip of bifenthrin is usually effective. This treatment protects only the roots and stems that are coated, not any young emerging roots. Therefore, if high populations of white grubs are found at the time of planting, damage may still occur.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

***restricted use pesticide**

****ESA approved common name**

^for agricultural applications only.

WHITE PINE APHID**

Cinara strobis

Page 84 (Johnson & Lyon)

DORMANT SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **NEEDLES**

<u>Host Plants: Common Name</u>	<u>Scientific Name</u>
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
egg	Mar 01	Apr 15	needles		visual inspection (magnification)

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
egg	Mar 01 - Apr 10	0 - 41	None Offered

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

<u>Chemical Control</u>	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
horticultural oil	Sunspray Ultra-Fine Spray Oil	C	4 hours

Additional information on biology and control

The up to 1/4" long white pine aphid has a gray black body with a white raised stripe down the top of the body with large white dots on the side of the abdomen. A long-legged aphid, the cornicles are reduced to bumps. The host is white pine only. Winter is passed as eggs laid end to end on needles. Eggs, laid in the fall by winged females, turn black at maturity. Nymphs hatch in the spring and pierce phloem through the stem as they feed in a group. Several generations occur each year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

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GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **COMMON**

Part of plant to treat: **NEEDLES**

Host Plants: Common Name	Scientific Name
pine	<i>Pinus</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
nymph	May 01	Sep 30	stem, trunk	decline	visual inspection
adult	May 15	Sep 30	stem, trunk	decline	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
nymph, (?adult)	May 01 - May 10	121 - 246	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle
nymph, (?adult)	May 01 - May 10	121 - 246	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
nymph, (?adult)	Aug 10 - Aug 31	1917 - 2271	

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
acetamiprid	TriStar 8.5 SL	<i>BEE CAUTION</i>	C 12 hours
azadirachtin	Aza-Direct		C 4 hours
	AzaGuard		C 4 hours
*bifenthrin	Talstar S Select	<i>BEE CAUTION</i>	C 12 hours
*fenpropathrin	Tame 2.4EC	<i>BEE CAUTION</i>	W 24 hours
horticultural oil	Sunspray Ultra-Fine Spray Oil		C 4 hours
insecticidal soap	Des-X Insecticidal Soap Concentrate		W 12 hours
	M-Pede		W 12 hours
pymetrozine	Endeavor		C 12 hours
spirotetramat	Movento	<i>BEE CAUTION</i>	C
*thiamethoxam	Flagship 25WG	<i>BEE CAUTION</i>	C 12 hours

Additional information on biology and control

Spot treatment with insecticidal soap of infested trees just prior to harvest is warranted, as infestations of these aphids are extremely disturbing to customers because they leave trees once the tree is indoors.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

WHITE PINE WEEVIL**

Pissodes strobi

Page 54 (Johnson & Lyon)

Page 21 (Adams & Packauskas)

DELAYED DORMANT

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: ANNUAL

Part of plant to treat: LEADER AND LATERAL STEMS

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
adult	Apr 01	Apr 20	leader and lateral stems	some notching	visual inspection: tree base, branch, bud

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
adult	Apr 01 - Apr 20	28 - 96	plants bloom: silver maple, Cornelian cherry, pussy willow

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	Comments	Signal Word	Agricultural Restricted Entry Interval (REI)^
*bifenthrin	Talstar S Select	BEE CAUTION	C 12 hours

Additional information on biology and control

The ¼” long, reddish-brown white pine weevil has patches of white hairs on the wing covers and is a pest of pines, spruces and infrequently Douglas-fir. Winter is passed as an adult hibernating in protected spots in the litter near host trees. The first warm day of spring adults emerge, fly to the terminals of host trees, where they feed and mate. Females dig a pit in the bark and lay multiple eggs. White, legless larvae feed on the cambium, killing all plant parts above the feeding site. A pupal chamber, filled with shredded wood and bark, is made in the stem in early July. Destroying the affected plant parts before adults emerge in late July will decrease the population. Cut out the affected areas, being sure to remove all larvae. Then select a shoot from the uppermost remaining whorl to tie upright to form a new leader. Adults feed on current year’s twigs before dropping to the ground and dispersing to surrounding woods to overwinter. There is one generation per year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **ANNUAL**

Part of plant to treat: **LEADER AND LATERAL STEMS**

Host Plants: Common Name	Scientific Name
Douglas-fir	<i>Pseudotsuga menziesii</i>
pine	<i>Pinus</i>
spruce	<i>Picea</i>

Pest Survey Information:

Pest Stage	From	To	Plant Part	Plant Damage	Survey Method
adult	Apr 20	Jun 01	leader and lateral stems	some notching	visual inspection: tree base, branch, bud
larva	Jun 15	Aug 01	leader and lateral stems	dieback	visual inspection

Control: Stage(s) and Timing

Stage(s)	Ideal Control Dat	Degree Days	Treat HOST PLANT when the following
adult	Apr 20 - Apr 30	7 - 58	plants bloom: boxelder, star magnolia, periwinkle, Norway maple

Non Chemical Control

Remove and destroy infested plant parts.

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

		<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
*bifenthrin	Talstar S Select	BEE CAUTION	C	12 hours
chlorantraniliprole	Acelepryn			4 hours
*diflubenzuron	Dimilin 25W	Effective against immatures. Bee caution.	C	12 hours

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

^for agricultural applications only.

ZIMMERMAN PINE MOTH**

Dioryctria zimmermani

Page 48, 50 (Johnson & Lyon)

GROWING SEASON

Apply thorough treatment only when pest stage found.

Frequency with which pest occurs: **OCCASIONAL**

Part of plant to treat: **BASE OF MAIN BRANCHES, TERMINAL SHOOT**

Host Plants: <u>Common Name</u>	<u>Scientific Name</u>
pine	<i>Pinus</i>

Pest Survey Information:

<u>Pest Stage</u>	<u>From</u>	<u>To</u>	<u>Plant Part</u>	<u>Plant Damage</u>	<u>Survey Method</u>
larva	Apr 15	May 31	base of main branches, terminal shoot	borer tunnels	visual inspection
adult	Jun 15	Sep 30	base of main branches, terminal shoot	borer tunnels	visual inspection

Control: Stage(s) and Timing

<u>Stage(s)</u>	<u>Ideal Control Dat</u>	<u>Degree Days</u>	<u>Treat HOST PLANT when the following</u>
larva	Apr 20 - Apr 30	from - 96	plants bloom: boxelder, star magnolia, periwinkle, Norway maple
larva	May 01 - May 10	- - -	plants bloom: Japanese quince, saucer magnolia, bridalwreath, Japanese flowering cherry
larva	May 10 - May 20	to - 311	plants bloom: redbud, Sargent crabapple, flowering almond, Tatarian honeysuckle
adult	Jul 10 - Jul 20	from - 1160	plants bloom: Abelia, golden rain tree, sourwood
adult (moth)	Jul 20 - Jul 31	- - -	plants bloom: butterfly bush, Clethra alnifolia, false spirea
adult, larva	Aug 10 - Aug 20	to - 2173	plant fruit in color: Mountain ash, cranberry bush

Chemical Control

Reference use only. NOT a label substitute.

Select the appropriate insecticide/miticide for the correct life stage of the target pest.

	<u>Comments</u>	<u>Signal Word</u>	<u>Agricultural Restricted Entry Interval (REI)^</u>
*bifenthrin	Talstar S Select	BEE CAUTION	C 12 hours
*diflubenzuron	Dimilin 25W	Effective against immatures. Bee caution.	C 12 hours
dimethoate	Dimate 4EC	BEE CAUTION	W 48 hours

Additional information on biology and control

The Zimmerman pine moth attacks all species of pine. Scotch and Austrian pine are the preferred hosts. Signs of infestation include yellowish pitch masses mixed with feces on the trunk near main branches and resultant dead branches. Young caterpillars overwinter inside small cocoons under bark scales. In spring, reddish brown caterpillars may first bore into branch terminals, then proceed to the base of the branch near the trunk. Affected branches may crack and break off. They feed on the phloem or inner bark causing sap to seep out of the entry wound. As they feed, frass or feces is expelled and gets mixed into the pitch mass. Full grown larvae pupate at the entrance site. Brown to cream patterned moths, 1/2" long, emerge late August through October. After mating eggs are laid in bark cracks and crevices. Eggs hatch in about two weeks and young larvae spin the silk cocoon in which they will pass the winter. There is one generation per year in Connecticut.

Signal words: C=Caution; W = Warning; DP = Danger Poison

Growing season control may not be necessary if Dormant or Delayed Dormant Season control is effective.

*restricted use pesticide

**ESA approved common name

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