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A diverse complex of insect pests affect Christmas trees, and nearly every part of the tree from the terminal leader to the roots and root collar, can be infested by at least one insect pest. Some insects affect multiple conifer species while others are specialists and affect only one species. Insecticides must be applied when the susceptible stage of the insect is present to control the pest.

**Timing and Control**

Monitoring degree-day accumulation will help you estimate when insects are active. Degree-day accumulation is a way of keeping track of how quickly temperatures warm up in the spring. It is more accurate and reliable to base your scouting and control activities on accumulated degree-days than on the calendar. Generally, insect development progresses only if temperatures are at least 50 degrees F. Therefore, degree-day accumulations are usually based on a threshold temperature of 50 degrees F (DD50). Accumulated degree-days are calculated weekly by Michigan State University (MSU) and are available from the MSU Agricultural Weather site at [www.enviroweather.msu.edu](http://www.enviroweather.msu.edu)

<b>Insect</b>	<b>Life stage</b>	<b>GDD<sub>50</sub></b>	<b>Control Options</b>	<b>Page # Pest Manual*</b>
<b>Ants</b>	Spring to Fall		bifenthrin, carbaryl, chlorpyrifos, thiamethoxam	<b>113</b>
<b>Aphids</b> (Cinara spp., spotted and white pine aphid)	Spring-summer when aphids present		abamectin, acephate, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, disulfoton, imidacloprid, insecticidal soap, malathion, oxydemeton-methyl, pymetrozine, spirotetramat, thiamethoxam	<b>76</b>
<b>Balsam gall midge</b>	adults laying eggs	150-300	carbaryl, chlorpyrifos, cyfluthrin, thiamethoxam	<b>27</b>
	galls apparent	550-700		
<b>Balsam twig aphid</b>	egg hatch	60-100		<b>29</b>
	stem mothers present (control target)	100-140	abamectin, acephate, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, disulfoton, esfenvalerate, imidacloprid, insecticidal soap, horticulture oil, malathion, oxydemeton-methyl, pymetrozine, spirotetramat, thiamethoxam	

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<b>Cooley spruce gall adelgid</b>	1st adults active - <i>Spruce</i>	25-120	bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, horticulture oil, imidacloprid, insecticidal soap, oxydemeton-methyl, spirotetramat, thiamethoxam	<b>106</b>
	1st adults active - <i>Douglas fir</i>	90-180		
	1st galls visible - <i>Spruce</i>	200-310		
	1st nymphs - <i>Douglas fir</i>	90-150		
	2nd nymphs - <i>Douglas fir</i>	600-1000		
	2nd adults active	1500-1600		
<b>Douglas-fir Needle Midge</b>	Time application within a week after first adults are detected in traps.	200 - 250	acephate, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, thiamethoxam	
<b>Eastern pine shoot borer</b>	1st adults active	75-200	bifenthrin	<b>79</b>
<b>Eastern spruce gall adelgid</b>	1st adults active	25-100	bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, horticulture oil, imidacloprid, insecticidal soap, oxydemeton-methyl, spirotetramat, thiamethoxam	<b>107</b>
	egg hatch, galls begin forming	250-310		
	2nd adults active	1500-1600		
<b>Eriophyid mites</b>			abamectin, carbaryl, horticulture oil, spiroadiclofen	<b>35</b>
<b>European pine sawfly</b>	1st larvae	100-195	acephate, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, diflubenzuron, esfenvalerate, horticulture oil, imidacloprid, malathion, phosmet, spinosad, thiamethoxam	<b>58</b>
<b>European pine shoot moth</b>	1st larvae	50-220	carbaryl, chlorpyrifos, cyfluthrin, diflubenzuron, esfenvalerate, horticulture oil, insecticidal soap, malathion, phosmet, tebufenozide	<b>80</b>
	egg hatch	900-1000		
	adults active	700-800		
<b>Grasshopper</b>	Mid-summer		acephate, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, esfenvalerate	<b>59</b>

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<b>Gypsy moth</b>	egg hatch, 1st larvae	145-200	acephate, Bacillus thuringiensis subsp. <i>kurstaki and aizawai</i> , bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, diflubenzuron, phosmet, spinosad, tebufenozide,	<b>60</b>
	young caterpillars	450		
	pupation	900-1200		
<b>Introduced pine sawfly</b>	1st larvae	400-600	acephate, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, diflubenzuron, esfenvalerate, imidacloprid, malathion, phosmet, spinosad, thiamethoxam	<b>62</b>
<b>Jack pine budworm</b>	young larvae feeding	300-350	acephate, Bacillus thuringiensis, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, diflubenzuron, esfenvalerate, spinosad, tebufenozide	<b>63</b>
	large larvae feeding			
	defoliation noticeable	650-700		
<b>Jack pine sawfly</b>	eggs; young larvae	100-200	acephate, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, diflubenzuron, esfenvalerate, imidacloprid, malathion, phosmet, spinosad, thiamethoxam	
	larger larvae consuming	275-500		
<b>Japanese beetle</b>	adult foliar feeding stage		bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, malathion, permethrin, phosmet	
<b>Northern pine weevil</b>	1st adults active	25-100	chlorpyrifos, cyfluthrin (adult foliar feeding stage), esfenvalerate,	<b>85</b>
	2nd adults active	1200-1400		
<b>Pales weevil</b>	1st adults active	25-100	chlorpyrifos (adult and stump treatment), cyfluthrin (adult foliar feeding stage), esfenvalerate, phosmet	<b>86</b>
	2nd adults active	1200-1400		

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<b>Pine Bark Adelgid</b>			bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, horticulture oil, imidacloprid, insecticidal soap, oxydemeton-methyl, spirotetramat	<b>117</b>
<b>Pine chafer (Anomela beetle)</b>	1st adults active	450-600	esfenvalerate	<b>64</b>
<b>Pine needle midge</b>	1st adults active	400-500	bifenthrin, chlorpyrifos, cyfluthrin, thiamethoxam	<b>65</b>
<b>Pine needle scale</b>	1st generation egg hatch	250-400	acephate, bifenthrin, buprofezin, carbaryl, chlorpyrifos, cyfluthrin, disulfoton, horticultural oil, insecticidal soap, malathion, oxydemeton-methyl, spirotetramat	<b>44</b>
	1st generation - hyaline stage (control target)	400-500		
	2nd generation egg hatch	1250-1350		
	2nd generation - hyaline stage (control target)	1500		
<b>Pine root collar weevil</b>	1st adults active	300-350	chlorpyrifos, cyfluthrin (adult foliar feeding stage), phosmet	<b>118</b>
	2nd adults active	1200-1400		
<b>Pine shoot beetle</b>	new adults emerge		bifenthrin, chlorpyrifos, cyfluthrin	<b>90</b>
	begin shoot-feeding	500-550		
	optimal control window	450-500		
<b>Pine thrips</b>			acephate, carbaryl, bifenthrin, malathion, oxydemeton-methyl, thiamethoxam	<b>45</b>
<b>Pine tortoise scale</b>	egg hatch begins; 1st crawlers	400-500	acephate, bifenthrin, buprofezin, carbaryl, chlorpyrifos, cyfluthrin, disulfoton, horticultural oil, insecticidal soap, malathion, spirotetramat	<b>93</b>
	egg hatch ends crawlers settling	1000-1200		

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<b>Red-headed pine sawfly</b>	1st larvae	400-600	acephate, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, esfenvalerate, imidacloprid, malathion, phosmet, spinosad	<b>68</b>
<b>Spittlebugs (Pine)</b>	early to mid July to control adults		carbaryl, chlorpyrifos, cyfluthrin, esfenvalerate,	<b>92,95</b>
<b>Spruce budscale</b>	egg hatch, 1st crawlers	700-1150	acephate, bifenthrin, buprofezin, carbaryl, chlorpyrifos, cyfluthrin, disulfoton, horticultural oil, insecticidal soap, malathion, oxydemeton-methyl, spirotetramat	<b>99</b>
<b>Spruce budworm</b>	1st larvae	200-300	acephate, Bacillus thuringiensis, bifenthrin, carbaryl, chlorpyrifos, cyfluthrin, diflubenzuron, esfenvalerate, spinosad, tebufenozide	<b>69</b>
<b>Spruce-fir looper</b>			bifenthrin, cyfluthrin, diflubenzuron, spinosad	
<b>Spruce gall midge</b>	adult emerge eggs hatch (control window)	70-100 130-145	carbaryl, chlorpyrifos, cyfluthrin, thiamethoxam	
<b>Spruce needleminer</b>	1st larvae	150-200	bifenthrin, carbaryl, chlorpyrifos, spinosad	<b>70</b>
<b>Spruce spider mite</b>	1st egg hatch	150-175	abamectin, bifenthrin, chlorpyrifos, clofentezine, disulfoton, hexythiazox, horticultural oil, insecticidal soap, oxydemeton-methyl, propargite, spirotetramat	<b>51</b>
<b>Striped pine scale</b>	egg hatch	750-800	acephate, bifenthrin, buprofezin, carbaryl, chlorpyrifos, cyfluthrin, disulfoton, horticultural oil, insecticidal soap, malathion, spirotetramat,	<b>93</b>

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<b>White grubs</b>			carbaryl, imidacloprid, thiamethoxam	<b>123</b>
<b>White pine weevil</b>	1st adults active	25-220	chlorpyrifos, cyfluthrin (adult foliar feeding stage), diflubenzuron, oxydemeton-methyl	<b>101</b>
	2nd adults active	1200-1400		
<b>Zimmerman pine moth</b>	1st larvae	25-100	bifenthrin, chlorpyrifos, diflubenzuron	<b>126</b>
	adult flight	1700		

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\* **Christmas Tree Pest Manual, Second Edition (Michigan State University Extension Bulletin E-2676)**