

Using Growing Degree Days For Insect Management

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UNH Cooperative Extension is working in cooperation with the New England Agricultural Statistics and the NH Department of Agriculture to bring you weekly growing degree day (GDD) information throughout the growing season. GDD can be used to help predict events in an insect's life cycle during the season by measuring growth in terms of temperature over time. When control measures are warranted, growing degree days can be used, along with scouting, as a guide for timing control actions.

The GDD method takes into account the average daily temperature accumulations which influence insect development. Due to temperature differences, insect development varies from year to year and among locations throughout New Hampshire. For each day that the average temperature is one degree above the base temperature of 50°F, one degree day accumulates – negative numbers are ignored. GDD data is collected beginning March 1. Early in the season the numbers will accumulate slowly but as the average daily temperature increases, the GDD will accumulate faster.

The GDD for insects is listed on the accompanying pages. The time for pest control is expressed in a range of numbers beginning with first perceptible feeding injury and continuing until approximately the end of the insect's plant injury cycle. For example, Cooley spruce gall adelgid GDD are 22-92 and 1500-1775. This means the insect is active starting around 22 GDD and control measures can be implemented until approximately 92 GDD. Cooley spruce gall adelgid also has another period during the growing season when controls may be effective and necessary. This period is between 1500 and 1775 GDD.

Scouting practices should be employed at some point before the GDD number is reached to determine if a pest problem exists and if some type of control is warranted. Decisions as to whether or not to use control measure will be dependent upon such things as the level of damage or potential damage and the life stage of the insect. Treatment, if decided upon, would be timed to correspond with some point within the GDD range. If more than one range is listed, then multiple generations or control periods in an insect's life cycle exist. The most recent control recommendations can be found in: The New England Management Recommendations for Insects, Diseases, and Weeds of Shade Trees and Woody Ornamentals, \$20, UMass, Bulletin Distribution Center, Draper Hall, Box 32010, Amherst, MA, 01033, (413) 545-2717.

GDD information may be found in a number of different locations

Web Page: <http://ceinfo.unh.edu/Agriculture/Documents/Growdd.htm>

UNH Cooperative Extension's web site contains a complete listing of GDD data from each of the 19 NH sites. A complete listing of insect emergence for different GDD ranges as well as an explanation of GDD is also provided.

Telephone Message: (603) 862-4800

A recorded message will be updated weekly listing GDD date for only a selected number of sites and insects.

Weekly Market Bulletin

Selected GDD sites will be profiled each week and insect alerts will be highlighted.

Common names, scientific names of insects, and growing degree days (GDD) affecting ornamental plants.

Common Name	Scientific Name	Dormant ^B	Growing Degree Days ^A						
			min	max	min2	max2	min3	max3	
Beech scale	<i>Cryptococcus fagisuga</i>	*							
Honeysuckle aphid	<i>Hyadophis tataricae</i>	*							
Aphids	several species	*	7	120	135	250			
Cottony taxus scale	<i>Pulvinaria floccifera</i>	*	7	91	802	1388			
Elm bark beetles	<i>Scolytus</i> sp., <i>Hylurgopinus</i> sp.		7	120					
Elongate hemlock scale	<i>Fiorinia externa</i>	*	7	120	360	700	2515	2625	
European red mite	<i>Panonychus ulmi</i>	*	7	58	240	810			
Golden oak scale	<i>Asterolecanium variolosum</i>	*	7	121	802	1266			
Hemlock eriophyid mite	<i>Nalepella tsugifolia</i>	*	7	22					
Kermes oak scales	<i>Allokermes</i> spp.	*	7	91	298	912			
Northern pine weevil	<i>Pissodes nemorensis</i>		7	192					
Oak leaf-tier	<i>Croesia semipurpurana</i>		7	35					
Oystershell scale	<i>Lepidosaphes ulmi</i>	*	7	91	363	707			
Pales weevil	<i>Hylobius pales</i>		7	121					
Southern red mite	<i>Oligonychus ilicis</i>	*	7	91	246	363	618	802	
Spruce spider mite	<i>Oligonychus ununguis</i>	*	7	121	192	363	2375	2806	
Taxus mealybug	<i>Dysmicoccus wistariae</i>	*	7	91	246	618			
White pine aphid	<i>Cinara strobis</i>	*	7	121	121	246	1917	2271	
White pine weevil	<i>Pissodes strobis</i>		7	58					
Tuliptree scale	<i>Toumeyella liriodendri</i>	*	12	121	2032	2629			
Cooley spruce gall adelgid	<i>Adelges cooleyi</i> - on spruce	*	22	92	1500	1775			
Juniper scale	<i>Carulaspis juniperi</i>	*	22	148	707	1260			
Magnolia scale	<i>Neolecanium cornuparvum</i>	*	22	91	246	448	2155	2800	
Pine bark adelgid	<i>Pineus strobis</i>	*	22	58	58	618			
Spruce bud scale	<i>Physokermes piceae</i>	*	22	121	912	1388			
European pine shoot moth	<i>Rhyacionia buoliana</i>		34	121					
Euonymus scale	<i>Unaspis euonymi</i>	*	35	120	533	820			
European fruit lecanium	<i>Parthenolecanium corni</i>	*	35	145	1266	1645			
Fletcher scale	<i>Parthenolecanium fletcheri</i>	*	35	148	1029	1388	2515	2800	
Hemlock scale	<i>Abgrallaspis ithacae</i>	*	35	121	1388	2154			
Balsam twig aphid	<i>Mindarus abietinus</i>	*	58	120					
Honeylocust plant bug	<i>Diaphnocoris chlorionis</i>		58	246					
Maple bladder gall mite	<i>Vasates quadripedes</i>	*	58	148	98	155			
Pine tortoise scale	<i>Toumeyella parvicornis</i>	*	58	148	618	1050			
Eastern tent caterpillar	<i>Malacosoma americanum</i>		90	190					
Gypsy moth	<i>Lymantria dispar</i>		90	448					
Hickory leaf stem gall phyllo.	<i>Phylloxera caryaecaulis</i>		91	246					
Pine tube moth	<i>Argyrotaenia pinatubana</i>		91	246	1151	1514			
Balsam gall midge	<i>Paradiplosis tumifex</i>		120	290					
Cooley spruce gall adelgid	<i>Adelges cooleyi</i> - on Fir	*	120	190	1500	1775			
Nantucket pine tip moth	<i>Rhyacionia frustrana</i>		121	448	1514	1917			
Spotted tentiform leafminer	<i>Phyllonorycter crataegella</i>		121	192	363	533			
Woolly elm aphid	<i>Erisoma americanum</i>		121	246					
Zimmerman pine moth	<i>Diorcytria zimmermani</i>		121	246	912	1917	1917	2154	
Black vine weevil	<i>Otiorhynchus sulcatus</i>		148	400					
Cankerworms (inch worms)			148	290					
Dogwood borer	<i>Synanthedon scitula</i>		148	700					
Hackberry psylla	<i>Pachypsylla</i> spp.		148	448					
Lilac borer	<i>Podosesia syringae</i>		148	299					

Growing Degree Days^A

Common Name	Scientific Name	Dormant ^B	Growing Degree Days ^A						
			min	max	min2	max2	min3	max3	
Pine spittlebugs	Aphrophora parallela, A. sara.		148	298					
Snowball aphid	Neoceruraphis viburnicola		148	298					
Taxus bud mite	Cedidophyopsis psilaspis		148	448	707	912			
Arborvitae weevil	Phyllobius intrusus		150	260					
Birch leafminer	Fenusa pusilla		190	290	530	700			
Clover mite	Bryobia praetiosa		192	298					
Forest tent caterpillar	Malacosoma disstria		192	363					
Holly leafminer (Soil Tr't)	Phytomyza ilicis		192	290	246	448			
Honeylocust pod gall midge	Dasineura gleditschiae								
Imported willow leaf beetle	Plagiodera versicolora		192	448					
Larch sawfly	Pristophora erichsonii		192	299					
Linden looper	Erannis tiliaris		192	363					
Native holly leafminer	Phytomyza ilicicola		192	298	1029	1266			
Privet thrips	Dendrothrips ornatus		192	618	1029	1266			
Rhododendron borer	Synanthedon rhododendri		192	298	533	707			
Rhododendron gall midge	Clinodiplosis rhododendri		192	363					
Tussock moths	Halysidota tessellaris		192	298	2145	2516			
Lace bugs	Corythuca spp.		239	363	1266	1544			
American plum borer	Euzophera semifuneralis		245	440					
Arborvitae leafminers	Argyresthia spp.		245	360	533	700	1700	2100	
Boxwood mite	Eurytetranychus buxi	*	245	600					
Lilac leafminer	Caloptila syringella		246	363	1388	1644			
Pine sawflies	Diprion spp., Neodiprion spp.		246	1388					
Boxwood psyllid	Psylla buxi		290	440					
Cherry and hawthorn leafminer	Profenusa canadensis		295	610					
Locust leafminer	Odontota dorsalis		298	533	1029	1388			
Pine eriophyid mites	Eriophyidae	*	298	533					
Pine needle scale	Chionaspis pinifoliae	*	298	448	1388	1917			
Pitch twig moth	Petrova comstockiana		298	707					
Privet rust mite	Aculus ligustri	*	298	802	1266	1515			
Redbanded leafroller	Argyrotaenia velutinana		298	618					
Rhododendron stem borer	Oberea myops		298	802					
Satin moth	Leucoma salicis		298	618	1917	2271			
Elm casebearer	Coleophora ulmifoliella		300	533					
Fruittree leafroller	Archips argyrospilus		300	618					
Elm leaf beetle	Xanthogaleruca luteola		363	912					
Elm leaf miner	Fenusa ulmi		363	530					
Larch casebearer	Coleophora laricella		363	618	2375	2805			
Periodical cicada	Magicicada septendecim		363	618					
Sassafrass weevil	Odontopus calceatus		363	618					
Twospotted spider mite	Tetranychus urticae	*	363	618					
Walnut blister mite	Eriophyes erinea		363	707					
Willow flea weevil	Rhynchaenus rufipes		363	618	707	1029			
Woolly beech aphids	Phyllaphis fagi		363	707					
Bronze birch borer	Agrilus anxius		440	800					
Azalea whitefly	Pealius azaleae		448	700	1250	1500	2032	2150	
Boxwood leafminer	Monarthropalpus buxi		448	700					
Hemlock looper	Lambdina fiscellaria		448	707					
Lace bugs	Stephanitis spp.		448	618	802	1029			
Mountain ash sawfly	Pristiphora geniculata		448	707					

Growing Degree Days^A

Common Name	Scientific Name	Dormant ^B	Growing Degree Days ^A					
			min	max	min2	max2	min3	max3
Oak skeletonizer	Bucculatrix ainsliella		448	707	1798	2155		
Pine needle miner	Exoteleia pinifoliella		448	802				
Rose chafer	Macroductylus subspinosus		448	802				
Spruce needle miner	Endothenia albolineane		448	802				
Azalea leafminer	Caloptilia azaleella		450	800	1260	1500		
Greenstriped mapleworm	Dryocampa rubicunda		533	1645				
Oak blotch leafminers	Cameraria spp., Tischeria spp.		533	912				
Rust mites	Eriophyidae	*	533	802	1644	2033		
Leafhoppers	several species		618	802	1266	1514	1917	2155
Pine root collar weevil	Hylobius radialis		618	912				
White prunicola scale	Pseudaulacaspis prunicola	*	707	1151				
Elm leaf aphid	Tinocallis ulmifolii		710	1500				
Cottony maple scale	Pulvinaria innumerabilis	*	802	1265				
Oak spider mite	Oligonychus bicolor	*	802	1266				
Pine webworm	Tetralopha robustella		802	2000				
Roundheaded apple tree borer	Saperda candida		802	1029	1514	1798		
Honeylocust mite	Eotetranychus multidigituli	*	912	1514				
European elm scale	Gossyparia spuria	*	1029	1388				
Japanese beetle	Popillia japonica		1029	2154				
Dogwood sawfly	Macremphytus tarsatus		1151	1500				
Tuliptree aphid	Macrosiphum liriodendri		1151	1514	1917	2033		
Birch skeletonizer	Buccalatrix canadensisella		1266	1580				
Fall webworm	Hyphantria cunea		1266	1795				
European hornet	Vespa crabra germana		1388	2271				
Maple trumpet skeletonizer	Epinotia aceriella		1388	2032				
Peachtree borer	Synanthedon exitiosa		1500	1800				
Twobanded Japanese weevil	Callirhopalus bifasciatus		1644	2271				
Willow twig aphids	Lachnus spp.		1644	2271				
Juniper webworm	Dichomeris marginella		1645	1917				
Sugar maple borer	Glycobius speciosus		2032	2375				
Locust borer	Megacyllene robiniae		2271	2805				
Poplar and willow borer	Crytorhynchus lapathi		2271	2806				

^A If more than one range of numbers appear, this is indicative of multiple generations and/or control periods in an insect's life cycle.

^B If an asterisk (*) appears in this column, then a treatment with horticultural oil at a 3% application during the dormant season (before bud break) would be appropriate providing a pest problem is present. Do not use on Douglas fir, blue spruce, Japanese red maples, hickory, walnut, or butternut.

^C If plant growth (indicated by bud swell) has begun and a horticultural oil is used, then use the summer application rate of 1% to 2% (use 1% rate for conifers) otherwise treat as dormant. Apply the same precautions as in footnote 2.

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