UNIVERSITY OF NEW HAMPSHIRE
COOPERATIVE EXTENSION
Helping You Put Knowledge And Research To Work

Using Growing Degree Days For Insect Management

Nancy E. Adams
Extension Educator, Agricultural Resources

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.

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

			Growing Degree Days[A]					
Common Name	**Scientific Name**	Dormant[B]	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 tesselaris		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		
Moutain ash sawfly	Pristiphora geniculata		448	707				

			Growing Degree Days[A]					
Common Name	**Scientific Name**	Dormant[B]	min	max	min2	max2	min3	max3
Oak skeletonizer	Bucculatrix ainsliella		448	707	1798	2155		
Pine needle miner	Exoteleia pinifoliella		448	802				
Rose chafer	Macrodactylus 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 radicis		618	912				
White prunicola scale	Pseudaulacaspis prinicola	*	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 threat as dormant. Apply the same precautions as in footnote 2.

This project was supported in part by a grant from New England Grows.