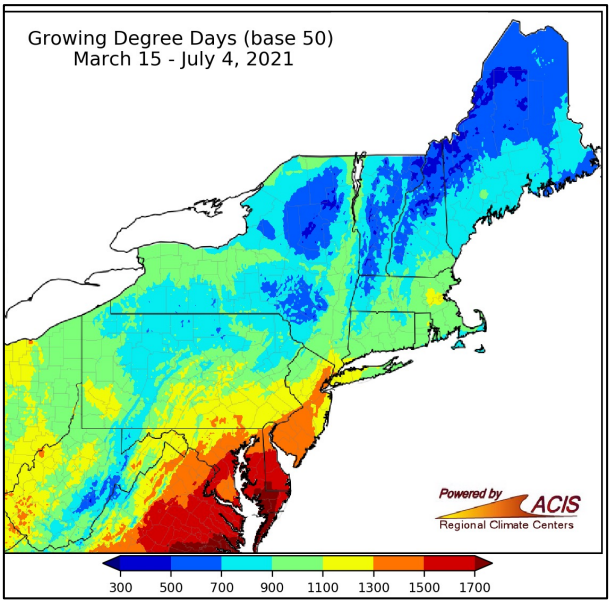

Pest Scouting Guide: (1300-2200 GDD_{50})

The information provided here gives **scouting ranges** for insect pests as well as forecasting of **GDD_{50} accumulation *predictions*** to help time scouting and treatment efforts. This document supports scouting, *it does **not** replace it*. Keeping good notes on pest development will help dial in scouting and treatment efforts at your local level.

Location specific GDD_{50} models

USPEST.org/dd/model_app and http://newa.cornell.edu/

E: twaller@njaes.rutgers.edu for information

Projected GDD50 accumulation as of 7/1/2021

Region	Location	1-Jul	1-Aug	1-Sep	1-Oct	1-Nov
Southern	Upper Deerfield (NJ50)	1303	2145	2931	3477	3682
Central	Howell / Freehold (NJ10)	1102	1896	2630	3109	3249
Northern	High Point (NJ59)	884	1490	2045	2352	2384

Forecast: NOAA NCEP Coupled Forecast System model version 2 (CFSv2) forecast system (3.5 months) (USPEST.ORG)

Redheaded flea beetle - life stage predictions for South, Central, and Northern New Jersey with material considerations

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Calendar date predictions for target range as of 7/6/2021

Information compiled by Dr. Timothy J. Waller - Rutgers Cooperative Extension (2021)

Growth Stage	Gen.	GDD50 TARGET RANGE -LOW-	GDD50 TARGET RANGE -HIGH-	SOUTH Upper Deerfield (NJ50) LOW (DATE)	SOUTH Upper Deerfield (NJ50) HIGH (DATE)	CENTRAL Howell (NJ10) LOW (DATE)	CENTRAL Howell (NJ10) HIGH (DATE)	NORTH High Point (NJ59) LOW (DATE)	NORTH High Point (NJ59) HIGH (DATE)	NOTES *Systemic (S) - Contact (C) - Biologicals (B) - Herbicides (H)*	Material / Compound Considerations (*Examples = no endorsements implied*) [IRAC GROUP #]
Egg hatch - larvae	1st	242	600	**2-May**	29-May	**10-May**	6-Jun	**24-May**	21-Jun	**(S) Initiate systemic treatments 1-month prior to adult activity** **(C) Contact materials may be used to knock-down larvae** **(B) Some bio-rational / logicals are effective on larvae** - Look for larval activity on the outside of root balls - Larvae may be active prior to this GDD50 timeframe	**SYSTEMIC** **Cyantraniliprole [28]** (Mainspring) **Chlorantraniliprole [28]** (Acelepryn) **Neonicotinoids [4A]** Dinotefuran (Safari 20SC) ; Thiomethoxam (Flagship 25 WG) ; Imidacloprid (Imidacloprid 2F, Marathon 1G, Marathon II) ; cyfuthrin [3A] + imidicloprid (Discus) **Organophosphates [1B]** Acephate (Orthene, Acephate 97UP)
Adults (feeding / laying eggs)	1st	517	1028	**24-May**	20-Jun	**5-Jun**	28-Jun	**9-Jun**	9-Jul	**(S/C/B) Start adult contact sprays - continue systemic treatments** **(H) Control weeds - adults will hide-in and feed-on them** - Adult feeding damage will be apparent - Scout to determine best time for applications - Use of agitator compounds may drive adults from hiding	
				POTENTIAL OVERLAP OF GENERATIONS / STAGES							
Egg hatch - larvae	2nd	1570	1860	**11-Jul**	21-Jul	**19-Jul**	30-Jul	**5-Aug**	21-Aug	**(S) Continue systemic treatments** **(C/B) Contact materials to target larvae *AND* adults** - Potential for considerable overlap of larvae - adult stages **(H) Control weeds - adults will hide in and feed on them**	**CONTACT** **Bifenthrin** [3A] (UP Star SC, Talstar Select) **Carbamates** [1A] - Carbaryl (Sevin SL) **Tolfenpyrad** [21A] (Hachi-Hachi SC) **Cyclaniliprole** [28] + **Flonicamid** [29] (Pradia)
Adults (feeding / laying eggs)	2nd	1878	2318	**22-Jul**	7-Aug	**31-Jul**	18-Aug	**21-Aug**	1-Oct	**(C/B) Adult contact sprays** **(S) * If pest pressure is high *** - continue systemic materials **(H) Control weeds - adults will hide-in and feed-on them** - Adult feeding damage will be apparent - Use of agitator compounds may drive adults from hiding	**BIOLOGICAL / BIORATIONAL** **Azadirachtin** (Aza-Direct, Azatin-O) **Beneficial nematodes** (Millennium) **Entomopathogenic fungi** (Ancora, BotaniGuard) **Agitator** (Captiva Prime)

*** A third generation of larvae and feeding adults is possible in the southern and central regions ***

Estimated using USPEST.org, 3.5-month CFSv2 based seasonal climate forecast, simple average growing degree-days, min temp: 50F, max temp: 95F.

Insect development growing degree-day ranges based on trials by Dr. Kunkel - Extension Specialist - University of Delaware

Pest Scouting - Growing Degree-day Ranges

(1300-2200 GDD50)

CROP TYPE	Common Name	Scientific Name	GDD Min (50F)	GDD Max (95F)	Reference	Developmental / Target Stage
Many	**Japanese beetle**	*Popillia japonica*	950	2150	5	Adults emerge and feed
Turf	**Bluegrass billbug**	*Sphenophorus parvulus*	1094	1217	RU	Larvae (40%)
Many	**Indian wax scale**	*Ceroplastes ceriferus*	1145	-	6	Crawlers (1st generation)
Many	**Oriental Beetle**	*Anomala orientalis*	1147	-	6	Adult emergence
Euonymus	**Euonymus Scale**	*Unaspis euonymil*	1150	1388	5	2nd generation targeted treatments
Dogwood	**Dogwood sawfly**	*Macremphytus tarsatus*	1151	1500	RU	Larvae Treatment
Tulip	**Tuliptree aphid**	*Illinoia liriodendri*	1151	1514	RU	Nymphs / adults
Boxwood	**Boxwood leafminer**	*Monoarthropalpus flavus*	1200	1400	5	Larvae Treatment
Conifer	**Northern pine weevil**	*Pissodes nemorensis*	1200	1400	4	2nd generation adults active
Conifer	**Pales weevil**	*Hylobius pales*	1200	1400	4	Adults 2nd generation
Conifer	**Pine root collar weevil**	*Hylobius radicis*	1200	1400	4	2nd generation adults active
Conifer	**White pine weevil**	*Pissodes strobi*	1200	1400	4	2nd generation adults active
Rhododendron	**Azalea whitefly**	*Pealius azaleae*	1250	1500	5	Adults/nymphs (2nd generation)
Turf	**Bluegrass sod webworm**	*Parapediasia teterrella*	1250	1920	RU	Larvae
Birch	**Birch Skeletonizer**	*Bucculatrix canadensisella*	1266	1580	5	Typical treatment window
Shade trees	**European fruit lecanium**	*Parthenolecanium corni*	1266	1645	5	Crawlers
Many	**Fall webworm**	*Hyphantria cunea*	1266	1795	2	Caterpillars present - larvae treatment
Many	**Lacebugs (on hawthorn)**	*Corythucha cydoniae*	1266	1544	RU	Nymphs / adults
Many	**Leafhoppers**	Species within *Cicadellidae*	1266	1544	RU	Nymphs / adults
Privet	**Privet rust mite**	*Aculus ligustri*	1266	1515	5	Second typical treatment window
Conifer	**Pine Needle Scale**	*Chionaspis pinifoliae*	1290	1917	3	Crawlers emerge (2nd generation)
Many	**Two spotted spider mite**	*Tetranychus urticae*	1300	2000	RU	Nymphs / adults
Turf	**N. Masked chafer**	*Cyclocephala borealis*	1377	1579	RU	Adults (90%)
Conifer	**Hemlock scale**	*Abgrallaspis ithacae*	1388	2154	5	Typical treatment window
Lilac	**Lilac leafminer**	*Caloptilia syringella*	1388	1644	5	Typical treatment window
Conifer	**Cooley spruce gall adelgid**	*Adelges cooleyi*	1500	1775	RU	Adults/nymphs (Douglas Fir)
Malus, Prunus, many	**Peachtree borer**	*Synanthedon sp.*	1500	1800	RU	Larvae Treatment
Conifer	**Pine Needle Scale**	*Chionaspis pinifoliae*	1500	-	4	Hyaline crawlers = treatment timing
Conifer	**Nantucket tip moth**	*Rhyacionia frustrana*	1514	1917	RU	Adults 2nd generation
Many	**Roundheaded apple tree borer**	*Saperda candida*	1514	1798	5	Typical treatment window
Many	**Redheaded flea beetle**	*Systena frontalis*	1570	1860	Udel.	2nd generation egg hatch
Many	**Japanese beetle**	*Popillia japonica*	1590	1925	RU	Adults (90%)
Many	**White prunicola scale**	*Pseudaulacaspis prunicola*	1637	-	6	Egg hatch / crawler (2nd generation)
Conifer	**Rust-mites**	*Nalepella and Setoptus spp.*	1644	2030	RU	Nymphs / adults
Many	**Two-banded Japanese weevil**	*Pseudocneorhinus bifasciatus*	1644	2271	RU	Adults
Willow	**Willow twig aphids**	*Lachnus spp.*	1644	2271	5	Typical treatment window
Conifer	**Juniper webworm**	*Dichomeris marginella*	1645	1917	RU	Larvae Treatment
Euonymus	**Euonymus Scale**	*Unaspis euonymil*	1700	-	RU	Continued 2nd generation treatments
Conifer	**Cryptomeria scale**	*Aspidiotus cryptomeriae*	1750	2130	RU, 4	Crawlers emerge (2nd generation)
Many	**Obscure scale**	*Melanaspis obscura*	1774	-	6	Egg hatch / crawler
Oaks	**Oak skeletonizer**	*Bucculatrix ainsliella*	1798	2155	RU	Larvae
Conifer	**Arborvitae leafminer**	*Argyresthia thuiella*	1800	2200	RU	Larvae Treatment (3rd generation)
Mimosa, Honeylocust	**Mimosa webworm**	*Homadaula anisocentra*	1800	2100	RU	Larvae (2nd generation)
Conifer	**Cooley spruce gall adelgid**	*Adelges cooleyi*	1850	1950	RU	Galls open (Spruce)
Turf	**Hairy chinch bug**	*Blissus leucopterus*	1903	2160	RU	Second generation- 50%- 2nd instars
Tulip	**Tuliptree aphid**	*Illinoia liriodendri*	1917	2033	RU	Nymphs
Conifer	**Zimmerman pine moth**	*Dioryctria zimmermani*	1917	2154	5	Treatment window (adult flight-1700 GDD)
Mainly Oaks	**Orangestriped oakworm**	*Anisota senatoria*	1917	-	6	Egg hatch - early instars
Conifer	**White pine aphid**	*Cinara strobi*	1991	2271	RU	Adults
Rhododendron	**Azalea whitefly**	*Pealius azaleae*	2032	2150	5	Adults/nymphs (3rd generation)
Maple	**Sugar maple borer**	*Glycobius speciosus*	2032	2375	5	Typical treatment window
Conifer	**Maskell scale**	*lepidosaphes pallia*	2035	-	6	Egg hatch / crawler (2nd generation)
Mainly Tulip	**Tulip tree scale**	*Toumeyella liriodendri*	2037	2629	RU	Crawlers (1st generation)
Mainly Magnolia	**Magnolia scale**	*Neolecanium cornuparvum*	2155	2800	RU	Crawlers (1st generation)
Locust	**Locust borer**	*Magacyllene robiniae*	2271	2805	5	Typical treatment window
Poplar and Willow	**Poplar and willow borer**	*Crytorhynchus lapathi*	2271	2806	5	Typical treatment window
Conifer	**Spruce spider mite**	*Oligonychus ununguis*	2375	2806	5	Typical treatment window

Note: Growing degree-day values utilize daily average air temperatures with a minimum temperature threshold (a.k.a. 'base') of 50F = GDD50 (max. temp. threshold set at 95F). These values are accumulated from a biofix date, such as January or March 1st in the NE USA. Provided GDD50 are scouting ranges and should be truthed.

Daily GDD50 =
(Max + Min temp.) / 2 - 50 *(min temp. threshold)*

References

RU	Rutgers Cooperative Extension - Landscape IPM Notes
2	http://ccetompkins.org/resources/using-growing-degree-days-for-insect-management
3	https://extension.psu.edu/ipm-basics-for-christmas-trees#section-2
4	https://www.canr.msu.edu/ipm/agriculture/christmas_trees/gdd_of_conifer_insects
5	https://www.agriculture.nh.gov/publications-forms/documents/landscape-pests.pdf
6	https://extension.umd.edu/ipm/pest-predictive-calendar-landscapenursery
7	https://www.canr.msu.edu/ipm/agriculture/christmas_trees/gdd_of_landscape_insects
Unv. Del.	Coorespondance with Dr. Kunkel (University of Delaware)-*evolving GDD ranges*

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