

Vermont Forest Health

Insect and Disease Observations—September 2016

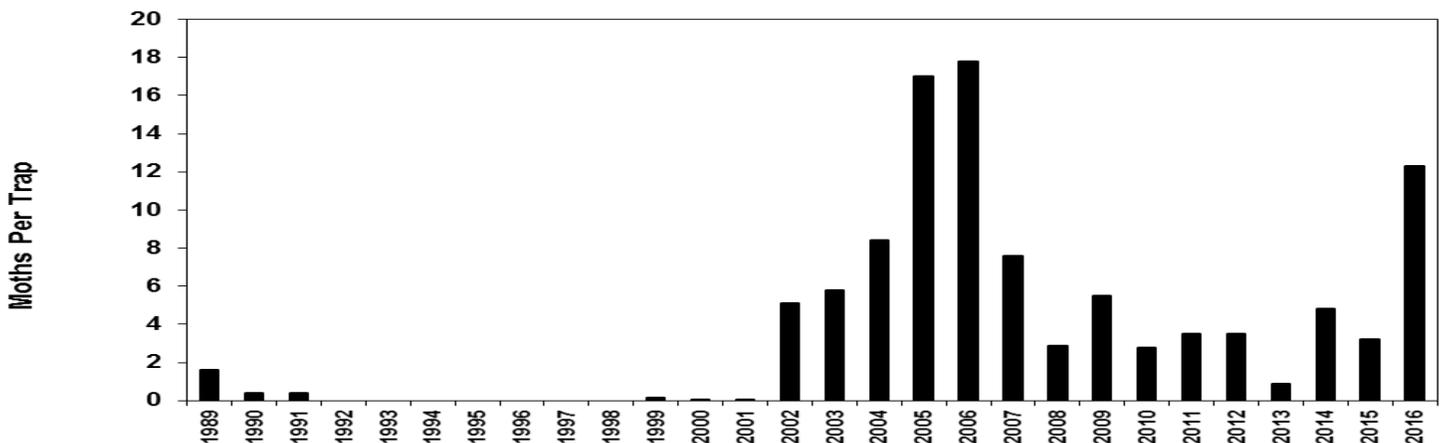
Department of Forests, Parks & Recreation
September 2016 vtforest.com

More Details on Forest Tent Caterpillar

Forest tent caterpillar defoliated areas mapped during 2016 aerial surveys are now available on the [ANR Natural Resources Atlas](#). The layer is called "Forest Tent Caterpillar (2016)" and is available under the "Forests, Parks and Recreation" theme. To view the data, click on "Layers" at the bottom of the left hand sidebar. Click the "+" sign next to Forests, Parks and Recreation. And then click on "Forest Tent Caterpillar (2016)". To see the Legend, click the icon between the check box and the layer name. Users are reminded that this information is acquired at speeds of over 100 mph and may be incomplete, since observers can't see under the plane or behind some of the hills.

The defoliated area is likely to increase in 2017. Moth catches in all but one of our pheromone trap locations increased from 2015, with the statewide average trap catch in double digits for the first time since 2006.

It bears repeating that our [VT FPR Forest Tent Caterpillar Update](#) has been revised to include recent observations, describing the current status of forest tent caterpillar, and providing management information for sugar makers, forest land managers, and others concerned about protecting tree health.



Forest tent caterpillar moth catches increased in 12 of our 13 pheromone trap survey locations. The statewide average in 2016 was 12.5 moths per trap.

All Tied Up

In some areas, larvae of the beech leaftier (the immature stage of a moth in the genus *Psilocorsis*) have been busy. These insects are members of the Family Oecophoridae, known commonly as the “concealer moths” because larvae feed concealed in webs or in rolled or tied leaves of the host plant. When full grown, larvae drop to the ground and crawl under fallen leaves, where they overwinter as pupae.



(Left) Young beech leaftier larvae feed together and skeletonize leaves. (Right) As they mature, larvae feed alone from within their leaf shelters. Photo: J. Frye

Ash (not so pretty) Flower Gall

Distorted, distinctive galls observed on ash are the result of a tiny eriophyid mite known as the [ash flower gall mite](#). Though the health of the tree is unaffected, the galls can make a tree look unsightly.



(Left) Mites initiate gall growth early in the spring. (Right) During late summer the galls turn dark brown and woody, and can remain on the tree for more than one season. Photos: R. Kelley (left); J. Esden (right)

We're Still Dry

September began as abnormally dry for most of the state and by mid-month, drought conditions expanded to include the Champlain Valley and most of southern Vermont. Temperatures were warmer than normal and precipitation below normal for the month.

September 2016 Weather Summary Burlington VT

September 2016	Observed	Normal	Departure
High Temperature	**76.8°	70.4°	+6.4°
Low Temperature	54.7°	50.7°	+4.0°
Average Temperature	**65.7°	60.5°	+5.2°
Precipitation	1.39"	3.64"	-2.25"

*3rd Highest Average temp for Sep (Record: 2015 78.9°)
 **2nd Highest Average temp for Sep (Record: 2015 67.4°)

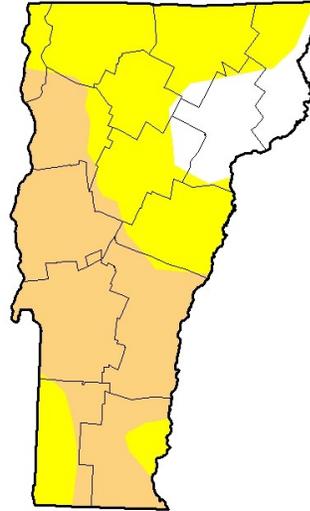
Temperatures are in degrees F and precipitation readings are in inches



www.weather.gov/btv

National Weather Service
Burlington, VT

U.S. Drought Monitor Vermont



September 27, 2016
(Released Thursday, Sep. 29, 2016)
Valid 8 a.m. EDT

	Drought Conditions (Percent Area)					
	None	D0	D1	D2	D3	D4
Current	11.92	44.09	43.99	0.00	0.00	0.00
Last Week 9/20/2016	15.15	48.36	36.49	0.00	0.00	0.00
3 Months Ago 6/29/2016	0.26	88.19	11.56	0.00	0.00	0.00
Start of Calendar Year 1/22/2015	31.63	68.37	0.00	0.00	0.00	0.00
Start of Water Year 9/29/2015	33.80	66.20	0.00	0.00	0.00	0.00
One Year Ago 9/29/2015	33.80	66.20	0.00	0.00	0.00	0.00

Intensity

 D0 Abnormally Dry	 D1 Moderate Drought	 D3 Extreme Drought
 D2 Severe Drought	 D4 Exceptional Drought	

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

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NCE/INSD/IS/NOAA



<http://droughtmonitor.unl.edu/>

Dry conditions prevailed in September, with above normal temperatures and below normal rainfall.

Streamflow data from the [USGS WaterWatch](#) indicate that rivers are running below to much below normal in a large part of the state, and that Lake Champlain's water level is below normal at 93.87 feet. In some areas, dry conditions may affect hay and corn crops but reports indicate that the drought has had little impact on apple orchards. According to news reports, many orchards are reporting a [good apple crop this year](#), and the fruit in many cases is bigger than in years past.

Fire danger indicators ([KDBI](#)) are setting record dry levels for soils at the Essex and Danby fire weather stations. This is a concern for ground fires. The potential for higher fire danger grows as live vegetation cures and leaves drop. A moderate risk of wildland fire has predominated this month and, as fall progresses, these factors can keep fire danger high.



[Drought effects](#) were likely to have been the "last straw" leading to occasional mortality of trees that were already stressed, for example elms with Dutch elm disease, blue spruce repeatedly defoliated by Rhizosphaera needlecast, and shallow-rooted landscape trees. There has also been an increase in interior needle drop of conifers and premature leaf drop of ash and other hardwoods where trees are under stress from drought.

Despite (or perhaps because of) drought conditions (see [August Update](#)), fall foliage has been particularly stunning in some areas, with lots of reds.

Hemlock showing interior needle yellowing symptomatic of drought. Photo: D. Dillner

Scaling Up

Many trees and shrubs are host to scale insects. Scales ingest plant fluids by inserting their piercing/sucking mouthparts into leaves, twigs, fruits, or the trunk of the tree. Some, like the magnolia scale, are host-specific and others, like oystershell scale, are polyphagous, feeding on a variety of species. Some scales can cause serious damage while others may go unnoticed. Scales like the cottony maple scale and the pine needle scale have conspicuous ovisacs and/or waxy coverings. On the other hand, Matsucoccus scales, like the red pine scale, are more cryptic, wedged in bark crevices for much of their lifespan.

Life cycles of scales tend to be complex. Most adult females are wingless and often legless, and lay eggs under a protective cover or within an egg sac. First instar nymphs, often referred to as "crawlers," are mobile and can move to a suitable location to settle and feed. Crawlers may also be wind-dispersed or moved to new sites on the feet of birds and other organisms. Male scales, rarely observed, are winged, short-lived, and resemble small gnats.



(Left) *Magnolia scales* secrete a large amount of honeydew which, in turn, promotes the growth of sooty mold on nearby surfaces; (Center) *Oystershell scales* feed on lilac, beech, birch, ash, maple, poplar, willow, elm, apple, and other trees; (Right) The cyst stage of red pine scale, *Matsucoccus matsumarae*, on a red pine sample. Photo: B. Guenther (left), R. Kelley (center), Maine Forest Service (right).

What is the actual cause of death when scales attack trees? Here are two examples:

Beech scale, like some other scales, teams up with a fungus (*Nectria spp.*) and the resulting "beech bark disease" kills or injures American beech. When trees are attacked by beech scale, sometimes the bark forms a wound periderm and walls off the injury. In those cases, any *Nectria* infection is superficial. It may disfigure the bark but is not a cause of mortality. However, when the wound periderm does not wall off the injury, *Nectria* can infect and kill the cambium. If there are multiple infections and/or tree resistance is poor (e.g. due to drought stress) cambium mortality is enough to kill the tree.

Red pine scale sucks sap from the phloem parenchyma of shoots, preferably the 3-year old portion, "causing desiccation and dieback of branches and tree death within 2 to 5 years", according to a publication by Mark McClure. As of 1991 when the publication was written, the exact mechanism was unknown. It does explain that the saliva of other species which feed on the cortical parenchyma triggers "an imbalance in plant growth hormones, causing structural modification of the xylem, restriction of water uptake by the sapwood, and rapid desiccation and death of the tree." See http://www.nrs.fs.fed.us/pubs/gtr/gtr_ne153/gtr_ne153_256.pdf for more information.

Scales to Watch Out For

The black pineleaf scale, *Dynaspidiotus californica* (formerly *Nuculaspis californica*) was brought to our attention recently when it was observed on needles of Austrian pine in northeastern Windsor County. Though we didn't have any records of this scale in our FPR database, the insect has been found in nearby states, so observing it in Vermont would not be too surprising. The black pineleaf scale is apparently native to North America and has not been recorded elsewhere. Johnson and Lyon (in *Insects That Feed on Trees and Shrubs*) wrote: "Known in virtually all areas of the United States and Canada where susceptible hosts occur, the black pineleaf scale has only occasionally inflicted sufficient damage to be considered an important pest..."



Cold temperatures and parasitism are thought to be limiting factors of black pineleaf scale. For additional photos, see <http://www.forestryimages.org/browse/subthumb.cfm?sub=323>. Photo: G. Maia

We've been alerted to be on the lookout for the coniferous fiorinia scale (*Fiorinia japonica*), which has never been reported in Vermont. This non-native insect feeds on the upper and lower surface of foliage of a variety of conifers. Little is known about its distribution or potential damage. This insect may be mistaken for the elongate hemlock scale (*Fiorinia externa*), which generally feeds on the lower surface of needles. In Vermont, the elongate scale is only known to be established in southeastern Windham County, where it was first found by a Forest Pest First Detector in 2014.



(Left) Coniferous fiorinia scale, also known as Japanese fiorinia scale, feeds on upper and lower surfaces of needles; (Right) Elongate hemlock scale was discovered in Vermont in 2014 by a First Detector. Photos: (Left) G. Arakelian, (Right) J. Weimer

Steeplebush look-a-like is an early detection invasive

A member of the rose family (Rosaceae), False spiraea (alt. false spirea) (*Sorbaria sorbifolia*) has a native range in the more northerly climes of Asia (northern China, Korea, Japan, Siberia). It is a shrub, and can be found in forest edges, meadows, fields, and disturbed areas. The presence of this species tends to be related to human settlement and landscaping, but local populations become very dense and impact the ability of native species to grow or regenerate.

False spiraea is spread throughout the northeastern US and eastern Canadian provinces, and in places along the West Coast and Alaska. Cornell University's [Woody Plants Database](#) considers this plant to be hardy to zone 3a. It has been mapped across New England, into Pennsylvania and points west. In Vermont, populations are isolated but expanding locally, with well-developed populations in numerous counties, and in sensitive areas like the Green Mountain National Forest and the Northeast Kingdom.

False spiraea is currently considered moderately invasive in Southern Ontario, and is identified as having invasive tendencies by the Adirondack Park in New York. It is soon to be added to the watch list in Vermont, meaning the plant has invasive tendencies, but is not yet prohibited. This plant is considered an early detection invasive species in Vermont, as there are several accounts of the spread of this plant in the state, but it is not yet well established.

The best time to identify this plant is during the late summer, when it is flowering. The flowers are tall panicles, similar in appearance to the native white or rosy meadowsweets (*Spiraea alba*, *Spiraea tomentosa*), and is where it gets its common name of "false spiraea".

To learn more, check out the [USDA NRCS Plants Database](#), [Cornell University's Woody Plants Database](#), [Wisconsin DNR](#), [Southern Ontario Urban Forests Associates](#), [Urban Forest Associates Inc.](#), [Credit Valley Conservation, Ontario](#), [Invasive Plant Council of New York State](#), [NY Non-native Plant Invasiveness Ranking Form](#), [New Jersey Conservation Foundation](#)), and the [Invasive Plant Atlas of New England](#).



False spiraea foliage (left) and pyramid-shaped panicles of white flowers (right). Photos: [R. Vidéki](#) at Bugwood (left) [A. Haines](#) at GoBot-any right)

Odds and Ends

Hemlock woolly adelgid: The publication entitled [Biology and Control of Hemlock Woolly Adelgid](#) by Havill et. al. has recently been updated.

Bee keepers: For some, this has been an excellent summer for honey bees. One keeper reported taking 180 lbs of honey off one hive, and leaving them about 100 lbs for winter.

EAB and crime: [A recent report](#) says that EAB infestation was significantly and positively associated with relative increases in some categories of crime, demonstrating another social cost associated with invasive tree pests.

EAB in Syracuse: A retired Vermont forester who recently visited Syracuse sent some photos reminding us what some classic [EAB symptoms](#) look like. The green ash crowns were completely dead, except for live epicormic growth, mostly towards the base of the crowns.

Pandorus on the prowl: While most sphinx moth caterpillars sport a “horn” over the 8th abdominal segment, the [pandorus sphinx](#) has a thin, whip-like horn that is replaced by a button in the last stage.

Short-winged blister beetles: [Adult beetles](#), often observed in the fall, eat herbaceous foliage (especially potatoes), while the larvae are parasitic on wild bees.



(Left) EAB-infested street trees in Syracuse NY showing epicormic growth. Photo: G. Salmon



(Top) Pandorus sphinx moth caterpillars like this one are sometimes encountered as they search for a pupation site. Photo: J. Runcie



(Bottom) If disturbed, blister beetles play dead by falling on their sides. Photo: B. Boccio



**For more information,
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