Vermont Forest Health

Insect and Disease Observations— July 2019

Department of Forests, Parks & Recreation
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July: Hot, with Late Boomers

Perhaps the most memorable weather-related observations in July were at the tail-end of the month, when severe thunderstorms on July 30 and 31st rocked many locations in Vermont. Considered by many the most intense storm of the summer, damage on July 30th included downed trees and power outages, notably in the parts of St. Albans and the surrounding towns of Highgate, Swanton and Sheldon. But the storm was hit-or-miss. Burlington's New North End and Grand Isle were hit hard, but in South Burlington, the situation was much more tame. On North Hero, wind gusts of 76 mph were recorded.

Storm damage appeared to be from straight line winds, which push debris in the same direction the wind is blowing. The storm knocked out power to thousands in Chittenden, Addison, Franklin and Grand Isle counties.

The mean July temperature in Burlington Vermont was 74.9 degrees, which was 4.3 degrees hotter than normal. It was also the third hottest July on record, with data going back to the 1880s.

Temperatures in Burlington reached 90 or more on seven days. According to data analysis by Matt Sutkoski, Vermont normally experiences about five days per year with 90 degree temperatures. Matt also noted that only two days in July failed to make it to 80 degrees. We usually get many more cool days than that. Four of the top ten hottest Julys in Burlington have happened since the year 2000.

This double rainbow was observed in Lincoln post-storm on July 30th. Double rainbows occur when the light is reflected twice in the drop, so the viewer sees two different reflections, coming from different angles. The result? Instead of seeing red at the top and blue at the bottom like a regular rainbow, the secondary rainbow (which is higher and lighter in color than the primary) has the colors reversed. Photo: E. Odom

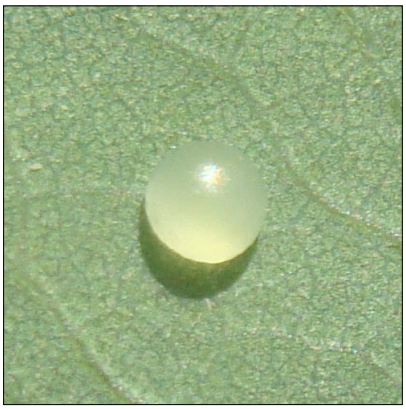
Saddled Prominent Caterpillar Activity

We had a report of saddled prominent activity in Windham County, and suspected feeding in North American Maple Project (NAMP) plots in Sheldon and Walden. As of the end of July, the defoliation is minor, but the sound of frass dropping, and leaf fragments that have fallen to the ground, are noticeable. Saddled prominent outbreaks have a history of following forest tent caterpillar outbreaks in Vermont, so it would not be a surprise if this insect is on the rise.

Outbreaks often develop suddenly and disappear just as quickly. They often start at ridgetops where sugar maple is mixed with beech, and then move downslope in subsequent years. The insect also eats birch but will not defoliate ash trees. When trees are defoliated in August, buds may fail to develop normal winter hardiness. The impact is variable, but we have seen dieback and mortality exceeding 50% following saddled prominent defoliation of recently thinned stands.

Early August is a good time to look for saddled prominent in sugarbushes and northern hardwood stands. The caterpillars feed through the first or second week of August, and then make their presence known as they crawl or drop to the ground to pupate. You can also look for the brown cocoons under the leaf litter in the fall or spring.

If there are signs of saddled prominent, and defoliation would justify Bt treatment or other management changes, egg sampling can predict potential damage. However, there is not much lead time. Eggs are laid on the foliage and caterpillars start feeding when they hatch nine days later. The window for sampling is also short, generally the very end of June and early July. Foliage must be clipped from the crowns for close examination, since eggs are tiny and laid singly.



Saddled prominent eggs (left) are laid singly mid-June to mid-July, usually on the underside of hardwood leaves. Early instar larvae (center) are tiny, spiny, reddish-brown creatures with antler-like horns. Later instars (right) are smooth, without horns and spines, but often with a characteristic "saddle" of contrasting colors. Photos: R. Kelley

Thin Crowns on Sugar Maple

Heavy seed is making some sugar maple foliage look thinner than normal, and anthracnose has resulted in some browning. Heavy seed has also been observed on beech, yellow birch, hophornbeam.

Beech Leaf Disease

Beech Leaf Disease (BLD) has been found in eastern and western New York and Long Island, causing widespread mortality of understory American beech. Early leaf symptoms include dark, striped bands between the leaf veins which are often easier to see when standing beneath the canopy and looking upward on a bright day.

Leaves from the same bud tend to have the same conditions, but there may be different leaf conditions on the same branch. Over time, the proportion of thick shrunken leaves increases, and twig dieback develops. A nematode, *Litylenchus crenatae*, has been observed fairly consistently in association with the insect, and may be a causal agent.

If you see trees with these symptoms, we want to check it out. Maladies that can be confused with BLD include beech blight aphids and associated sooty mold, beech leaf aphids, eriophyid mites and beech bark disease. To learn more, see this recent publication by Ewing et. al. This link will help you distinguish BLD from other maladies: https://bygl.osu.edu/node/885

An early symptom of beech leaf disease includes dark, striped bands between leaf veins (left). A later, occasional symptom is a late flush of non-symptomatic leaves. Photos: J. Chatfield and J. Macy.

Another New Beech Issue

Agrilus sp. 9895

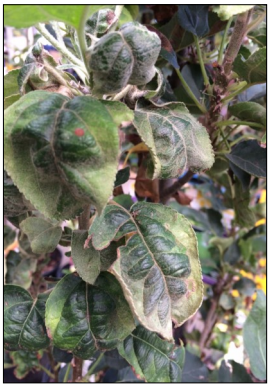
Marc DiGirolomo and others from the Durham USFS group have documented the discovery of a new species of *Agrilus*, a woodboring beetle in the same genus as the emerald ash borer (EAB). The discovery was made in Brooklyn, NY, when the beetle was reared from a stressed European beech. Read more here.

A new species of Agrilus, presently referred to as Agrilus 9895, was captured during a monitoring program that targeted woodboring insects attacking planted landscape trees and shrubs in an arboretum in Brooklyn, NYC. The beech tree from which the beetles were collected had exhibited signs of crown stress and branch dieback. Specimens emerged from branches that were placed in a rearing chamber. Photo: M. DiGirolomo

Leafhopper and Hopperburn

Various species of leafhoppers, with their wide host range, have been observed on trees and shrubs this season. Leafhoppers feed on the undersides of leaves, and the cast skins of nymphs are often found stuck there. Feeding injury can result in discoloration, sometimes called "hopperburn" where leaf edges and leaf tips curl, become yellow and eventually turn brown and brittle. Leafhopper feeding injury is sometimes misdiagnosed as herbicide injury or nutritional deficiencies. Moisture-stress can magnify the feeding injury by leafhoppers.



Damage to apple trees was chalked up to a combination of leafhopper plus hot and dry conditions when these leaves were tender. Leafhopper feeding sign may appear on the upper leaf surface as tiny chlorotic pin-pricks. Photos: G. Kellman (a-c); A. Hazelrigg (d).

Repeat Performances

Feeding by maple leafcutter and maple trumpet skeletonizer is becoming obvious in many areas, including some of our North American Maple Project (NAMP) plots. On July 11 at the Green River Reservoir in Hyde Park, former FPR Forest Health Specialist Ron Kelley commented that, "MLC is going to be very heavy in our area. We are up to 50 mines/leaf now."

Though populations have not been observed at worrisome levels, forest tent caterpillar moths were seen in Newport and very occasional reports of gypsy moth caterpillars (e.g., Johnson NAMP plot) have reached us.


Maple leafcutter larvae continue to cut larger discs in leaves as they grow; the maple trumpet skeletonizer enlarges the size of its frass trumpet.

Photos: G. Anderson (left), E. Mitchell (right)

White and Red Pine

Premature needle drop of white pines associated with **White Pine Needle Disease** (WPND) is a little later this year than in previous years. Needles were dropping more heavily in the last week of July than in the earlier part of the month. Our aerial detection staff were able to detect WPND from the plane as they fly, so the symptoms have definitely been displayed later than usual this year. White pine needle damage was described in fuller detail in our June Forest Health Update.

Areas of **red pine mortality** continue to be noticeable. In one Caledonia County stand we have been watching, tree condition has changed since summer 2018. Red pines were either generally in better condition or else very unthrifty. It appears that the healthier trees are on a "recovery" period from the primary stressor, while the more unthrifty trees are succumbing to secondary pests. The cause remains unclear. Branches from these trees were examined by US Forest Service diagnosticians. Several common shoot blight fungi were present, and there were scattered pine gall weevil galls, but no red pine scale was found.

In red pine study plots, scattered pine gall weevil damage was observed, but no red pine scale was found. Photos: R. Kelley and K. Decker

Appearing Now

Birch leafminer activity has been observed in the eastern part of the Northeast Kingdom. At first, injury may appear as irregular brown scorched areas on the foliage, with small, separate leaf mines. Eventually mines coalesce to form large blotched or blistered areas.

A number of leafmining species attack birch, each forming a unique mine. This, along with the presence or absence of frass in the mine and differing seasonal development, can be used to separate the species. Shown here is Fenusa pusilla. Photos: E.B. Walker & R. Kelley

The yellow-necked caterpillar feeds on a number of species, including basswood, paper and yellow birches, elm, honeylocust, oak, maple, mountain-ash, and walnut. Blueberries, apples and other fruit trees round out the list. This one was observed on birch.

Early instars of the yellow-necked caterpillar feed gregariously and skeletonize leaves. Later instars consume all but the stalk. Photo: B. Schultz

In the fruit department, peach leaf curl has been a big problem this year, along with exobasidium and mummyberry disease of blueberry.

Peach leaf curl (left) affects the blossoms, fruit, leaves, and shoots of peaches and nectarines. Exobasidium fungus (center) causes spots on both leaves and berries. Note the white mycelial "star" in these blueberries (right) affected by mummyberry disease. Photos: A. Hazelrigg

The puckered, abnormal growth of this elm leaf is caused by the elm cockscomb aphid. The galls should turn red over the summer, and then brown when the aphids inside leave the leaves.

Elm cockscomb gall is in the "cosmetic" category, meaning that, as far as we know, the tree health impacts are not significant. Photo: S. Hawkey.

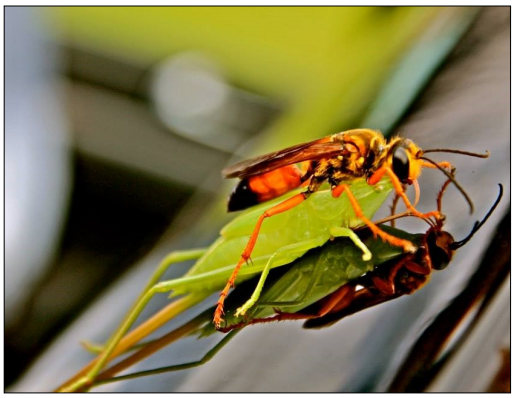
When the exotic Asian longhorned beetle was first discovered in NY City back in 1996, we received numerous inquiries about our most common native sawyer beetle, the white-spotted sawyer. Less common, but not an unusual find, is the northeastern pine sawyer, *Monochamus notatus*. These, and the white-spotted sawyer, are active for several months and it's always amusing to see one in its awkward flight. Imagine balancing with those long antennae!

If you are ever in the vicinity of dead or dying conifers, you might hear one of the sawyer species working away in the tree. Sawyer is a good name for them, because their gnawing can actually sound like a saw blade going back and forth. The frass that piles up around downed pines looks like shredded wheat. Photo: B. Pease

Parsley and dill are great hosts for black swallowtail larvae, but this dill attracted an introduced species, the so-called purple carrot seed moth, *Depressaria depressana*.

Purple carrot seed moth caterpillars feed on plants in the parsley family, mainly the flowers and unripe seeds. These include coriander, dill, carrot, anise, fennel, caraway, cumin, celery, parsley, parsnip and cow-parsnip. To see other reports, visit iNaturalist. Photos: J. Russo

Though the great golden digger wasp may appear fearsome and intimidating, it is a peaceful insect and a beneficial predator and pollinator. The wasp nests in the ground and provisions its young with various Orthoptera (crickets, grasshoppers and katydids).



The great golden digger wasp stings her prey and releases paralyzing venom. She transports the paralyzed insect back to her nest by air if it is light enough to fly with or by dragging it across the ground. Birds are sometimes observed trying to steal prey from these wasps. Photos: C. Caruso

Chemical Defenses

Two relatively unrelated insects that discourage predators in similar ways are active now. Rose chafers have been numerous in some locations this year. Larvae overwinter in soil, pupate in the spring and emerge as adults in late May to early June. Rose chafers produce a neurotoxin that protects them from predation by birds and other predators. Their toxicity to chickens led to one of the early scientific studies of toxins in insects by George Lamson in 1909. Lamson made an extract of chafers and demonstrated that the extract was toxic to both chickens and rabbits.

The red milkweed beetle, frequently observed on forest edges on milkweed and perennial flowers, also seems to be having a good year. Red milkweed beetles seek protection from predators by accumulating in their flesh the alkaloid toxins, called cardiac glycosides (cardenolides), which are concentrated in the milkweed's sap.

The spiny legs of the rose chafer (left and center) can make it difficult to dislodge them when removing them by hand. If you get a close look at a milkweed beetle, you will see that the antennae bisect their compound eyes, creating two sets of eyes with one set located above the antennae and one set below. Photos: T. Greaves (left and center), J. Russo (right)

Federal Noxious Weed List Spotlight: *Inula britannica*, British Yellowhead

Vermont's Noxious Weed Quarantine includes species listed as **Class A** (not native to Vermont, not known to occur in Vermont, and pose a serious threat), and **Class B** (not native to Vermont, known to occur in Vermont and pose a serious threat), as well as those listed on the **Federal Noxious Weed List**. While many of the species on the Federal Noxious Weed List likely won't occur in Vermont, there are a few that have the potential. The objective of this series of articles is to draw attention to lesser known invasive species from the Federal Noxious Weed List, that can be found in the Northeast, and are, in fact, part of Vermont's Noxious Weed Quarantine.

This month's focal quarantine species is British Yellowhead (*Inula britannica*), also known as meadow fleabane or British elecampan. It is a member of the Aster family (Asteraceae), and is native to Europe and temperate Asia. It is also a member of the genus *Inula*, which has two other introduced species present in the Northeast, Horse Yellowhead (*Inula helenium*) and Willow-leaved Yellowhead (*Inula salicina*). British Yellowhead was first introduced in Ontario in 1928, and had subsequent introductions throughout the later part of the 20th century and early 2000s in New York, Michigan, Minnesota and Maryland.

Inula britannica plants have yellow flowerheads. Leaves are hairy and elliptical to ovate-elliptical in shape, about 1.5-6" in length, with either entire or finely toothed margins. There is a horizontal underground stem (rhizome) which puts out lateral shoots and adventitious roots. Photos: Robert Richardson, Michigan State University, Bugwood.org

Contaminated root stock of imported hostas have been traced back to cultivated fields in the Netherlands, where British Yellowhead grew as a weed amongst the crop. Despite pressure-washing, the root and rhizome fragments of the invasive plant clung to the hosta roots, making detection exceedingly difficult. Many nurseries across the United States receive hosta stock from the Netherlands.

There is potential for the seeds to disperse in the wind or on wildlife, but the primary mode of spread is by this accidental transport of roots and rhizomes by humans. This plant grows aggressively, and can contaminate and outcompete nursery stock, and escape cultivation, creating localized dense colonies until spread further by humans or wildlife. It can be found in wet habitats, along rivers, streams, marshes, and disturbed areas.

It is because of this invasive behavior, potential for spread, and impacts to agriculture, that the United States added British Yellowhead to the Federal Noxious weed list in 2010. In Canada, it is also included as a Class 1 Prohibited Noxious Weed under the Canadian Weed Seeds Order 2016. The Netherlands, a major exporter of nursery stock (and specifically in this case, hostas), started an aggressive campaign in 2010 to restrict any stock grown in fields with this plant present because of the potential for spread.

British Yellowhead is a biennial or perennial, sunflower-like herbaceous plant reaching 6-30" in height. A "mother" plant is typically observed ringed by 6-10 "satellite" plants, which are all connected by a system of rhizomes. The stems have soft white hairs, as do the leaves, which are alternately arranged. It has been observed to produce flowers from mid to late summer, that turn to seeds with a pappus (featherlike hairs), producing a look like a dandelion puff. A similar looking species, Common ragwort (*Senecio vulgaris*) is common in Vermont and New England, but has lobed leaves.

To learn more about British Yellowhead, check out these resources: Missouri Botanical Garden; USDA Plants Database; Centre for Agriculture and Bioscience International; and Canadian Food Inspection Agency.

July Invasive Plant Phenology

In a pilot project started this year, volunteers are keeping track of invasive plant phenology in order to time management treatments most effectively. Below are observations made from July 8-12, 2019. To participate, contact elizabeth.spinney@vermont.gov.

Addison County — Flowering: Goutweed; Fruit Forming: Wild Parsnip

Caledonia County — Flowering: False Spiraea, Honeysuckle; Leafed Out: Goutweed; Vegetative Growth: Knotweed (up to 72"), Phragmites (up to 48")

Chittenden County — Flowering: Wild Parsnip, Goutweed, Purple Loosestrife; Fruit Forming or going to seed: Wild Parsnip, Asiatic Bittersweet, European Spindle Tree, Honeysuckle, Common Buckthorn, Black Swallowwort; Vegetative Growth: Knotweed (exceeding 72"); Leafed Out: Norway Maple

Essex County — Flowering: Honeysuckle, Wild Parsnip

Grand Isle County — Flowering: Honeysuckle

Orleans County — Flowering: False Spiraea, Honeysuckle; Leafed Out: Goutweed

Rutland County — Flowering: Wild Parsnip, Purple Loosestrife, Goutweed; Fruit Forming or going to seed: Wild Parsnip, Honeysuckle, Common Buckthorn; Mostly or Fully Seeded: Dame's Rocket; Leafed Out: Norway Maple, Asiatic Bittersweet, Goutweed

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