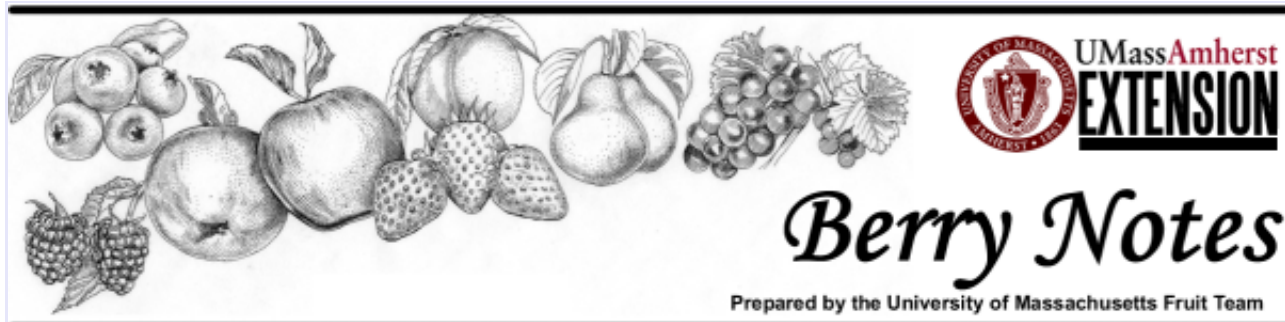


Here is the newest issue of Massachusetts Berry Notes from the [UMass Extension Fruit Team](#).



## Massachusetts IPM Berry Blast

**April 3, 2014**

### Winter Moth Basics for 2014

*Sonia Schloemann, UMass Extension*

**Winter Moth** (*Operophtera brumata*): This is a new and important pest of blueberries, apples and other deciduous plants, especially in Southeastern New England. They can severely defoliate trees and bushes. Moths emerge from the soil usually in late November and may be active into January. The male moths are light brown to tan in color and all four wings are fringed with small elongate scales that give the hind margins a hairy or fringed appearance. The female is gray, almost wingless (brachypterous) and, therefore, cannot fly. Females are usually found at the base of trees or scurrying up tree trunks. Winter moth caterpillars are pale green caterpillars with a white longitudinal stripe running down both sides of the body. They are “loopers” or “inchworms” and have just 2 pairs of prolegs. At maturity, the caterpillars will be approximately one inch long, whereupon they drop to the soil for pupation. Pupation occurs from late May into early June. Winter moth caterpillars are often found in association with both the fall and spring cankerworms, which look and have similar feeding patterns to the winter moth caterpillar.





Winter Moth Larva

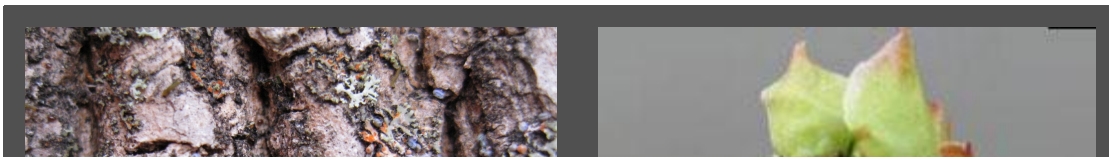


Bruce Spanworm Larva

**Life Cycle:** After mating, the female deposits eggs loosely in bark crevices, under bark scales, under lichen, or elsewhere. The adult moths then die and the eggs over-winter. Eggs are dark-colored at first but turn orange within 3-4 weeks. In late-March or early-April, **just prior to hatching, they turn red and eventually a deep, shiny blue.** Eggs hatch when temperatures average around 55°F. **It is believed that egg hatch in Massachusetts occurs when approximately 177-239 GDD above a base of 40° F (starting Jan 1) have accumulated,** which is historically during the second week in April but later if temperatures are atypically colder, depending. This means that egg hatch occurs just at or right before bud break of most of the host plants. After hatching, the larvae wriggle between bud scales of newly swelling buds of such hosts as: maples, oaks, ash, apples, crabapples, blueberry, cherries, etc. and begin feeding.

See <http://newa.cornell.edu/> or <http://www.weather.com/outdoors/agriculture/growing-degree-days/01002> to calculate the Growing Degree Days for your location. Good bio-indicators are flowering red maples and green tip on Macintosh apples.

See <http://extension.umass.edu/fruitadvisor/2014-bud-stages> for apple. **This year, models suggest that we will reach egg hatch after April 15, 2014. Pinpointing a date is too risky now, but another alert will be sent out in a week to update the forecast.**

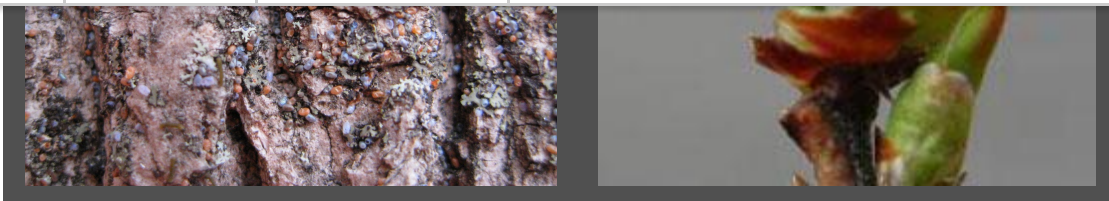


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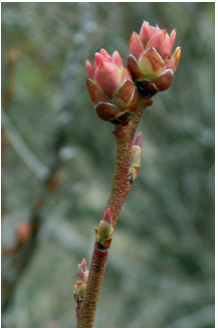
*Photo credit: Heather Faubert, URI from 2012*

**Damage:** Caterpillars feed within both flower and foliar buds. Once a bud has been devoured from within, the caterpillar will migrate to other buds and repeat the process.

Destruction of the flower buds leads to greatly diminished harvest on fruit crops. Older larvae feed in expanding leaf clusters and are capable of defoliating trees and other plants, when abundant.

**Management:** A dormant oil spray to the trunks and branches of bushes may be helpful to kill the overwintering eggs before they hatch. However, some eggs are under bark flaps and loose lichen and may be protected from oil sprays. Insecticides sprays timed to coincide with egg hatch are the most effective way of controlling this pest. The timing is important because if the newly hatched caterpillars are allowed to crawl inside the expanding buds, they are protected from any insecticide that might be applied. **So, sprays should be applied within a day or two of egg hatch (approximately 220 GDD base 40°F).** Caterpillars may also invade host plants by ballooning onto them after treatment has been applied. Several insecticides are labeled for use against either Winter Moth or Spanworm or both and are outlined in the table below.

Additional information can also be found at: <http://extension.umass.edu/landscape/factsheets/winter-moth-overview>

<b>Blueberry Bud Stage</b> <i>Image and Description Source: <a href="http://Michigan State University Blueberry Facts website">Michigan State University Blueberry Facts website</a>.</i>		
 <p><b>Dormant</b>  <b>Description:</b> No visible swelling of the fruit buds. Bud scales tightly closed. No visible signs of growth.</p>	 <p><b>Bud Swell</b>  <b>Description:</b> First sign of growth as plant growth begins in the spring. Visible swelling of the flower buds; outer bud scales begin to separate at the tip revealing paler interior bud scales. This bud stage can usually tolerate cold temperatures of 10 - 15°F.</p>	 <p><b>Budbreak-Green tip</b>  <b>Description:</b> Flower buds open and the individual flowers can be seen between the bud scales. Can tolerate cold temperatures of about 20°F.</p>
<b>Recommendation for Controlling Winter Moth or Spanworm</b>		

Dormant oil, 2-2.5% <b>plus</b> Esteem 35WP, 5 oz/A <b>or</b> Confirm 2F, 16 oz /A <b>or</b> Asana XL, 4.8-9.6 oz/A	Dormant oil, 2-2.5% <b>plus</b> Confirm 2F, 16 oz/A <b>or</b> Delegate 3-7 oz/A <b>or</b> Assail 70WP, 1.9-2.3 oz/A <b>or</b> Asana XL, 4.8-9.6 oz/A <b>or</b> Esteem 35WP, 5 oz/A	NO OIL AFTER BUDSWELL  Confirm 2F, 16 oz <b>or</b> Delegate 3-7 oz/A <b>or</b> Asana XL, 4.8-9.6 oz <b>or</b> Esteem 35WP, 5 oz
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**Organic growers** can use **Entrust** (spinosad), or one of the Neem products such as **AzaDirect**, **Neemix**, or **Ecozin** in place of the insecticides listed in the table above.

Products that contain B.t., may also be effective but depend on the caterpillars ingesting enough product to be effective.

**For detailed information concerning the biology and management of Winter Moth, visit the following:**

<http://extension.umass.edu/landscape/fact-sheets/winter-moth-identification-management>

<http://extension.umass.edu/landscape/fact-sheets/winter-moth-overview>

## Winter Moth Update for 2014

*Deborah C. Swanson, Extension Horticulturist, retired, UMass Extension/Plymouth County*

**Question:** *What is UMass Extension predicting for winter moth caterpillar populations this spring?*

**Answer:** Each November to the early part of January, UMass Amherst Entomologist, Dr. Joe Elkinton, and his staff conduct intensive monitoring of winter moth flight in several areas of Massachusetts east of Worcester, especially along the coast including Cape Cod and the Islands, where winter moth has become established. Trees are banded and winter moth females are captured and their eggs are counted. According to Dr. Elkinton and his staff, there was a significant moth flight last fall and a significant number of eggs were laid in those areas where winter moth has been a problem in previous years. The exception to this is in the town of Wellesley, one of seven release sites where Dr. Elkinton released the predatory fly *Cyzenis albicans*. Of all the release sites, the Wellesley site is showing high levels of parasitism of winter moth and winter moth numbers appear to have declined dramatically. In those other areas where winter moth densities have been high in the past, Dr. Elkinton expects high numbers of caterpillars this spring, but “the wildcard is whether the subzero temperatures we have seen this winter have killed a lot of winter moth eggs”. Unfortunately, we will not know this until eggs start to hatch in the spring.

**Question:** *When does winter moth egg hatch begin?*

**Answer:** Depending on the type of winter, snow cover, geographic location and site

microclimate, winter moth egg hatch usually occurs in early to mid April, and again, this can vary depending on location. In Hanson, MA, the earliest winter moth egg hatch was on March 24, 2012, but 2012 was an unusually warm winter. Typically, winter moth egg hatch in Hanson usually begins between April 2 and April 15<sup>th</sup>. Eggs hatch over a period of time, with eggs located on the west and south sides of a tree usually opening first.

**Question:** *How do I know if winter moth eggs have hatched in my area?*

**Answer:** Check the UMass Extension Landscape Message at [www.UMassGreenInfo.org](http://www.UMassGreenInfo.org). Also, one of the best ways is to monitor host trees (oak, maple, birch, apple, crabapple, etc). Using a hand lens, gently peel back the bud scales or “leaves” of a bud and look for the black, tiny, eyelash-size caterpillars. Once the winter moth caterpillars start to feed, they turn light green.

**Question:** *Winter moth caterpillar defoliation seemed to be down in 2012 and 2013. Can you explain this and why would the numbers be back up this year?*

**Answer:** The winter moth egg count for spring 2012 was very high and by all rights it should have been a banner year for winter moth caterpillars; however, weather events changed that forecast. 2012 was a very warm winter with mid-March temperatures in the 80's and the winter moth hatch occurred very early (1-2 weeks early) in most areas. According to Dr. Elkinton, the warm, 80+ degrees that most likely induced early winter moth hatch was also probably responsible for killing winter moth eggs on the south sides of trees. That year, winter moth eggs began hatching in the greater Boston area on March 21st with a 50% hatch by March 25<sup>th</sup>, and on the South Shore there was a reported 80% hatch by March 25<sup>th</sup>. On March 26 and 27<sup>th</sup>, the temperature suddenly dropped below freezing (teens and twenties in some areas) killing many of the newly hatched caterpillars. So, the March warm temperatures, followed by freezing temperatures, are what likely reduced the winter moth population for 2012.

So, overall in 2012, the number of caterpillars that remained to feed and defoliate trees, pupate and eventually become adult moths and lay eggs for 2013 was greatly reduced. As a result, the spring of 2013 produced fewer winter moth caterpillars, which resulted in reduced foliar damage. However, those caterpillars that were produced, fed, pupated and emerged as moths in the fall, and those well-fed females produced many eggs, which are now waiting to hatch this spring of 2014.

To sum it up, if there is limited winter mortality (winter kill) of winter moth eggs and there are no major spring weather events (extreme heat or freezing temperatures) at the time of egg hatch or soon there-after, then it looks like 2014 may turn out to be a banner year for winter moth caterpillar defoliation, based on egg counts by Dr. Elkinton's lab.



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