

## Caterpillar Update: Old and New

*Hort Notes*

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After the long, cold, snow-filled winter of 2014-2015, everyone was delighted to see spring arrive. It took a long time for the snow to melt, but when it did, landscape operations were underway.

In many areas of Massachusetts, notably the Worcester area and eastward, one of the earliest insect problems is the emergence of winter moth caterpillars in April. This year, staff from Dr. Joe Elkinton's UMass Amherst lab reported that winter moth numbers were up, especially along the coastal areas and Cape Cod.

Winter moth caterpillar season ended in mid-late May, and trees slowly started to recover by producing new foliage. What came next, taking most people by surprise, was the discovery of gypsy moth caterpillars (which hatch early-mid-May and had been feeding unnoticed alongside the winter moth caterpillars) were now feeding on the newly developing foliage of oak trees, and other trees, that had just been damaged by the winter moth caterpillars. Subsequently, when the oak foliage was depleted, the gypsy moth caterpillars turned to other species like maple, pine, spruce, etc. to feed.

Some people believe that gypsy moth is cyclical, but in reality, there are a number of factors that keep gypsy moth numbers in check. One of the most predominant factors is the entomopathogenic (insect killing) fungus *Entomophaga maimaiga*, which can work to keep gypsy moth caterpillars in low numbers.

Under the right conditions (wet spring weather), this fungus becomes active and attacks and kills gypsy moth caterpillars. Unfortunately, unlike previous wet springs which helped to keep the gypsy moth population in low numbers, the spring of 2015 was very dry with very little precipitation and *Entomophaga maimaiga* did not become active, paving the way for gypsy moth caterpillars to go about their business of devouring foliage unencumbered; and devour they did.

In many areas east of Worcester, gypsy moth caterpillars caused widespread defoliation on a wide variety of plant species beyond their favorite oak, which already had been heavily damaged by winter moth caterpillars. As gypsy moth caterpillar season was ending in late June-early July, many areas finally received rain. The rain that fell activated the fungus, *Entomophaga maimaiga*, and many late instar caterpillars were infected and died.

The fungus that infected those caterpillars produced "resting spores" that reportedly may last in the soil for 20 years. These spores if activated in a wet spring should help to reduce future gypsy moth outbreaks ([ag.umass.edu/fact-sheets/gypsy-moth](http://ag.umass.edu/fact-sheets/gypsy-moth))

However, according to Ken Gooch, MDCR (Massachusetts Department of Conservation and Recreation) Forest Health Program Supervisor, there were many gypsy moth caterpillars that pupated before the rain fell and those gypsy moth caterpillars were not affected by the fungus. They were able to successfully pupate and emerge as moths, in July, to mate and lay eggs.

In fact according to Gooch, "there's an incredible amount of healthy Gypsy moth egg masses out there. So it's hard to predict what will happen next year in terms of defoliation, but with the amount of healthy

Gypsy moth egg masses I'm seeing in the east, my thoughts are that in 2016, we could be in for another significant defoliation event, even with the *Entomophaga maimaiga* fungus out there." Also, according to Gooch, "based on the annual defoliation aerial survey, there were over 96,800 acres of gypsy moth defoliation statewide, although it is hard to say how much of that was also defoliated by Winter moth, since the two insects both caused damage in some of the same areas."

So the bottom line for next spring is to **monitor trees early**, for winter moth caterpillar hatch in April and Gypsy moth caterpillar hatch in May. There are most likely going to be "hot spots" with high numbers of both insects, especially in those areas that experienced outbreaks in 2015. If the 2016 spring is a rainy one, and *Entomophaga maimaiga* is activated, then there is always the possibility that gypsy moth may not be as large a factor, as this past spring. **However**, as Ken Gooch said, "there are numerous healthy gypsy moth egg masses out there". So, be prepared: monitor and manage early.

In recent years, another caterpillar pest has started to show up in gardens and it is the caterpillar of the sunflower moth, *Homoeosoma electellum*. The adult moth is a slender, grey-tan moth that is usually active at night. Reportedly the moth originates in northern Mexico and migrates northward, as its "northern limit for overwintering is about 40 degrees north latitude". It has been a known pest on sunflower crops for years, but is now gaining attention for the damage it does to *Echinacea* sp., *Coreopsis*, *Bidens*, marigolds, *Heliopsis*, *Helianthus* and other plants in the *Asteraceae* (formerly *Compositae*) family.

The damage is subtle and therefore often goes unnoticed, but if the centers of marigold, *Echinacea*, *Bidens*, *Heliopsis*, etc. flowers are turning brown earlier than usual, then suspect sunflower moth caterpillars to be the cause. Dissect the flower heads to look for sunflower moth caterpillars ("brown head capsule, purplish or reddish brown body with alternate dark and light stripes running longitudinally"), as the female moth lays eggs on the center or cone of composite flowers. The eggs hatch into small, or early stage, caterpillars which feed on pollen in the disk flowers (florets).

As the caterpillars feed, they produce frass and webbing, turning the cone into a trashy mess. After feeding in the florets, the caterpillars tunnel into the receptacle and feed on the receptacle tissue and developing seeds. (There may be one to several caterpillars per flower, depending on the size of the flower).

Feeding by these caterpillars may shorten the lifespan of the flowers, making them unattractive as a garden ornamental, and decrease the pollen food source for pollinators and the formation of viable seed heads.

Managing this insect is difficult, as using certain insecticides (especially long-acting residual insecticides) on open flowers may result in the death of pollinators. However, according to UMass, *Bacillus thuringiensis* subsp. *kurstaki* (*Btk*) may be used on flowers for early instar larvae. *Btk* works by ingestion, is specific to lepidopteron caterpillars and is not a contact insecticide.

