

## Winter moth in Rhode Island 2014

Winter moth eggs starting hatching in Kingston on April 17 and were 100% hatched by April 24. We monitored eggs by setting up tree wraps last November. Tree wraps halt the wing-less female moths as they climbed up trees in November and December; they then lay a large number of eggs just below the tree wraps. Tree wraps were removed in March and eggs on the trunk circled with a Sharpie so they could easily be found again and watched. Winter moth eggs start out orange, but then turn blue a few days before hatching. Very handy for monitoring egg hatch!

For landscape trees it's not important to control winter moth just when hatching, but for apple and blueberry growers it's very important. Once eggs hatch, winter moth caterpillars wriggle into swollen buds and begin feeding. For apple trees and blueberry bushes, swollen buds are primarily flower buds and once caterpillars are inside buds they are protected from insecticide sprays until just before bloom. By this time many flowers may have been damaged or destroyed, destroying the crop. Landscape trees, on the other hand, can withstand early winter moth feeding damage. To save trees from being defoliated, insecticides can be applied after trees leaf-out, but before excessive feeding damage has occurred.

Winter moth caterpillars continue to feed and grow until around the end of May. Once mature they drop to the ground, dig down a few inches, and pupate. Pupae will remain in the soil until November or December when winter moths emerge as adults. It's male moths that more and more Rhode Islanders are seeing at their porch lights and headlights, especially on warm evenings between Thanksgiving and Christmas. Females are rarely seen because they don't fly.

In collaboration with Joe Elkinton from UMass, we have released a parasitic fly that attacks only winter moth caterpillars. The fly, *Cyzenis albicans*, has successfully controlled winter moth outbreaks in Nova Scotia in the 1950's and the Pacific Northwest in the 1970's. *Cyzenis albicans* lay eggs on leaves of winter moth host plants. When eating leaves, winter moth caterpillars accidentally eat fly eggs too. A fly egg hatches and larva develops inside a caterpillar body. When a parasitized caterpillar drops to pupate, it digs into the soil but instead of a winter moth caterpillar pupating, the fly pupates instead. The fly pupa remains in the soil until the following spring when it emerges as an adult fly at the same time winter moth eggs hatch.

Parasitic flies were released in Goddard State Park in 2011. In 2013, *Cyzenis albicans* were released in Bristol and Jamestown. In 2014, flies were released in Kingston and again in Jamestown (because the 2013 release was deemed insufficient). At the end of May, before many caterpillars drop to the soil, we will collect caterpillars from previous release sites. This year we hope to recover flies for the first time at Goddard Park. It usually takes several years to recover flies and then several more years before seeing a decline in the winter moth population due to parasitism.

Heather Faubert



Figure 1 Tree Banded in Nov.



Figure 2 Winter moth eggs showing blue



Figure 3 *C. albicans*



Figure 4 Winter moth eggs circled



Figure 5 Release Kingstown