

Winter Moth Control Measures

Damage from Winter moth larvae (caterpillars) is more than a nuisance as this destructive invasive pest can pose significant ecological and economic impacts, as well as cause quality of life problems, especially for those in densely infested areas. Control measures are limited and most appropriate for the protection of commercial and lawn trees. Landscape trees are more effectively treated in late April through early May when winter moth are in the early “free feeding” larval stage. Long-term control will rely on proven biological control methods. In the meantime there are measures that individuals can employ.

Winter moth caterpillars are pale green with white to creamy-yellow longitudinal stripes running down both sides of their body. Newly hatched caterpillars are about 1/4” long while late stage caterpillars are about 3/4” long. Due to the way they move, they are one of many species commonly referred to as “loopers” or “inchworms”. Winter moth feed in early Spring and when found in high numbers can completely defoliate host trees and shrubs. Heavily defoliated trees will be stressed, and may try to put out a second flush of leaf growth in an attempt to survive. Sufficient water is critical to the tree at this time and supplemental watering may be necessary, especially if drought conditions occur. Current best management practices are that fertilization of trees that have been defoliated is *not* recommended.



Photo: R. Childs

Insecticides

There are different insecticidal treatments used to combat this invasive pest depending on what life stage the winter moth is in. Some can be applied by the homeowner, but others must be applied by a licensed pesticide applicator. The effectiveness of insecticide treatments varies with the insecticide type, and application timing is critical. DEM requires that anyone performing any type of pesticide application for a fee be licensed, so when contacting individuals or companies for treatment, ensure that their applicator has a valid *Commercial Pesticide Applicator’s License*.

To find a local arborist or company use the following link <http://rhodeislandwoods.uri.edu/> to navigate to the RI Woods website and click on the **Local Businesses** link.

Treatment of Eggs.

The goal of treating eggs is to smother them before they hatch. Dormant oils can be applied to the eggs by the homeowner just before the eggs hatch. According to URI Researcher Heather Faubert who advises DEM and fruit growers/berry producers throughout the State, the *average* date that eggs begin to hatch in Rhode Island is April 10th. The exact date varies greatly and eggs are monitored throughout the State by Faubert and others to more accurately determine when egg-

hatching begins in any given year. Therefore this treatment is best applied beginning in Mid-March.

Even when used appropriately the success of this method may be limited due to the sheer number of eggs in the environment, and the difficulty in treating eggs that may have been deposited out of the reach of the applicator, or eggs shielded from the treatment by moss, bark etc. The use of physical barriers to concentrate eggs in an area more easily accessible to treatments *may* increase the effectiveness of this technique (see below).

Treatment of Newly Hatched Caterpillars.

The goal of this treatment is to kill larvae before they force their way into the softening plant buds, a process that takes about 24 hours from when they hatch. This treatment is especially critical to protect fruiting trees and shrubs, and is most effective to protect individual, or small numbers of plants. Treatments with insecticides containing spinosad (Delegate®), and imidan, and Sevin®, are effective. Adding a dormant oil may be useful for the first spray.

Treatment for Free Feeding Caterpillars.

Caterpillars which continue to feed on leaves after the buds have opened are in the “free feeding” stage which lasts from late April through early June. Insecticides should be applied after trees leaf-out, but before excessive feeding damage has occurred as it is more difficult to control winter moth in the later period of this life stage once the caterpillars begin “ballooning” from plant to plant on silken threads.

Available for homeowner use are products such as DiPel® or Biobit®, Javelin®, and others containing B.t.k., (a relatively safe bacterium *Bacillus thuringiensis kurstaki*) which are applied to leaves that when ingested by the caterpillars, will eventually kill them. B.t.k. products are most effective on early life stage caterpillars and less effective on late stage caterpillars.

Other available insecticides are those containing the spinosad bacterium such as (Delegate®, Conserve®, Capt’n Jack’s Dead Bug Brew®) which work on young as well as older caterpillars, as will carbaryl based products such as Sevin®.

PESTICIDE/INSECTICIDE PRECAUTIONARY STATEMENT

Pesticides/Insecticides used improperly can be injurious to humans, animals, and plants. Follow the directions and heed all precautions on the labels. Certain pesticides/insecticides have restrictions on their use.

Physical Barriers

Physical barriers such as sticky tapes, glues, oils, grease, etc. applied to the stems of trees, or manually removing caterpillars in the *free feeding* stage have not been proven to be practical or efficient to control winter moth. In a process known as “ballooning” newly hatched caterpillars will spin silken threads and be carried by air currents up into the canopy. Likewise, free feeding caterpillars will balloon down from the canopy of surrounding trees onto nearby plants, each method completely bypassing the barrier.

Although not *proven* to be effective, in an effort to smother eggs before they hatch, homeowner’s may wish to apply physical barriers before winter moth egg laying begins (mid-late November). Barriers should encircle the tree about 5’ above the ground. Just before anticipated

egg hatch (avg. April 10 in our area) dormant oil should be applied below the barrier in an effort to smother eggs before they hatch.

Biological Control

In a continuing effort to combat Winter moth, the population of previously released parasitoid flies (*Cyzenis albicans*) that feed exclusively on winter moth caterpillars continues to be monitored by URI researcher Heather Faubert, and Joseph Elkinton, PhD of the University of Massachusetts Amherst. DEM continues to map Winter moth spread throughout the State and advises Ms. Faubert and Mr. Elkinton on potential *Cyzenis albicans* release sites. The fly population will eventually become established and act as a natural control agent for the Winter moth population. This bio-control approach has been proven effective in limiting populations of Winter moth in Nova Scotia. However it will take several years before the parasitic flies are abundant enough to catch up with the growing population and spread of Winter moth today. In the long run biological control is the most practical tool to permanently manage Winter moth populations.