

**West Virginia Department of Agriculture
Plant Industries Division**

Gypsy Moth Program



PESTICIDE FACT SHEET on Dimilin™ (Diflubenzuron)

What is Dimilin?

Dimilin is the trade name for an insecticidal compound discovered by Duphar B. V. of the Netherlands, which is currently being marketed in the United States by Uniroyal Chemical. Its common name is diflubenzuron. It is an alternative insecticide for gypsy moth suppression and eradication projects in infested areas and is approved for cooperative state-federal programs by the USDA-Forest Service and the USDA-Animal and Plant Health Inspection Service. It is also registered for forest tent caterpillar, Nantucket pine tip moth, Douglas fir tussock moth, boll weevil on cotton, foliar insects on soybeans and certain flies that attack commercial mushrooms.

How Does Dimilin Work?

Dimilin acts as an insect growth regulator by interfering with the production of chitin, a protein found in the body wall of insects. Larval stages are the most susceptible, but pupae and eggs can also be affected. The primary effect is through eating the material, but there can be some contact action through absorption.

When a caterpillar, such as a gypsy moth larva, molts it forms a new skin under the old one before the old one is shed. During molting, the new skin of a caterpillar that has ingested Dimilin is only partially formed. This new weak skin cannot withstand the increased pressure during molting and results in an inability to cast off the old skin. The caterpillar then either dies from a rupture of the new delicate malformed skin or by starvation. In general, young caterpillars are more susceptible than older ones.

How Safe is Dimilin?

Dimilin has very low toxicity to humans and other animals for two primary reasons. First, the inhibition of chitin formation is specific to insects and closely related forms such as crustaceans. Secondly, humans and other animals have the ability to absorb the compound, biochemically degrade it and eliminate it from their systems. These facts, coupled with the extremely low application rates used in gypsy moth spray projects, make it highly unlikely that a health hazard would occur.

What is Dimilin's Environmental Impact?

Extensive environmental impact studies have been conducted in several types of forest ecosystems treated with Dimilin at rates from 0.03 to 0.06 lb. of active ingredient per acre. Treatment related effects have varied between studies and organisms examined. Generally, canopy-feeding macrolepidoptera are the most susceptible nontargets.

Nontarget impact studies in still-water habitat (lakes, ponds and marshes) have reported negative effects on various aquatic arthropods, including Crustacea, predatory insects and mayflies. Results of studies on stream organisms have been mixed with several resulting in no observable impacts.

In other studies, Dimilin has not been found to be detrimental to parasitic wasps, lady beetles, green lacewings, and other beneficial predatory insects. Additional studies have shown no treatment related impacts on soil microbes, small mammals or birds. Honey bees were unaffected when hives were placed directly within test areas. The effects monitored were honey production, egg production by the queen and brood hatch, development and survival.

In general, research studies appear to indicate that Dimilin impacts on susceptible nontarget organisms are short-term, primarily in the season of application and the season following. However, significant impacts on selected canopy arthropods can occur for up to 27 months post-treatment. Treating smaller blocks and allowing a greater chance of repopulating the treated areas can minimize these impacts.

Dimilin and Gypsy Moth

Generally, gypsy moth caterpillar control and subsequent egg mass reduction using Dimilin has been excellent. A single application of a very low dosage (the rate of active ingredient used in applications can be up to 32 times lower than that of other gypsy moth chemical insecticides can provide effective foliage protection and multiyear reduction in gypsy moth levels. Dimilin 4L is commonly used on suppression programs at a rate of 1 oz. of Dimilin 4L (0.5 oz ai) in 1 gallon or ½ gallon of water per acre.

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