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### **Mosquito Insecticides Risk Issues**

In 2001, the Maine Board of Pesticides Control (BPC) reviewed ten pesticide active ingredients that are registered by the U.S. Environmental Protection Agency (EPA) for use in controlling mosquitoes in public health situations. The review focused on how risky one product is compared to another to mammals (including humans), fish, shellfish and birds. Worst case exposure estimates were created based on the highest label rate. It is important to note that when these products are used according to label directions, they meet EPA's acceptable risk threshold. In addition, the different classes of chemicals work by different modes of action, and within each class, the rate of application necessary to control mosquitoes is different. Each product therefore has a unique risk profile and the risks for different types of organisms may be compared to each other.

A copy of the Board's report "Human Health and Environmental Relative Risks of WNV Mosquito Control Products" is available to interested parties. Some of the conclusions of the review are summarized below:

#### **Adulticides:**

The synthetic pyrethroids (permethrin, phenothrin and resmethrin) pose less risks to human populations than the organophosphates (malathion and naled).

All five of the adulticides are "toxic to fish" and have label directions for keeping them out of the water. Relative to each other, the synthetic pyrethroids pose less risks than the organophosphates.

#### **Larvicides**

The biological products, *Bacillus thuringiensis* variety *israelensis* (Bti) and *Bacillus sphaericus* (Bs) pose the lowest risks to humans and non-target species (including fish and shellfish). In their 1998 Review of Bt containing products EPA summarized the acute toxicity of *Bacillus thuringiensis* (Bt) to humans, other mammals and other non-target species:

"To date, no known mammalian health effects have been demonstrated in any infectivity/pathogenicity study." and "that toxicity and infectivity risks... to nontarget avian, freshwater fish, freshwater aquatic invertebrates, estuarine and marine animals, arthropod predators/ parasites, honey bees, annelids and mammalian wildlife will be minimal to nonexistent at the label use rates of registered *B. thuringiensis* active ingredients."

The Department of Environmental Protection (DEP) has indicated that the only aquatic pesticide use permits that will be granted will be for use of Bti in selected situations.

Looking at larvicides, the biologicals, Bti and Bs, pose the least risk, followed by the oils and the insect growth regulator, methoprene and the organophosphate, temephos.

Insecticide use is one part of an integrated mosquito management program. Non-chemical steps for mosquito control should be implemented prior to using insecticides. To choose the best mosquito control method for your community, you need to know the mosquito breeding and infested areas. If pesticide use is indicated, the choice of product and application method would be dependent on location, human population density, terrain and other factors. Questions to ask include:

Is the product likely to be toxic to species (other than mosquitoes) in the area to be treated?

Is the individual and their company appropriately licensed?

Do you need a permit from DEP?

Does the applicator have equipment and ability to use the product and keep it out of sensitive areas?

Further information on the use of these products in a mosquito management program may be found in the EPA's Mosquito Control Fact Sheets available at:

<http://www.epa.gov/oppsrrd1/op/malathion/index.html>

Further information on Pesticide use and regulations in Maine may be obtained by calling the Board of Pesticides Control at 207-287-2731 or visiting our website at:

<http://www.thinkfirstspraylast.org>

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