



COLORADO ENVIRONMENTAL PESTICIDE EDUCATION PROGRAM

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Mosquito Larvicides— What are They and How are They Registered?

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This fact sheet describes what mosquito larvicides are and how they registered nationally and in the state of Colorado.

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Mosquito Larva Control Products

Larvicides are a category of insecticides used to control immature stages of insects such as mosquito larvae. Treatment of breeding habitats with larvicides help reduce the adult mosquito population in nearby areas. Examples of larvicides used to control mosquito larvae include biological insecticides, such as the microbial larvicides *Bacillus sphaericus* and *Bacillus thuringiensis israelensis (Bti)*. Other larvicides include: temephos, methoprene, oils, and monomolecular films.

State and local agencies in charge of mosquito control typically employ a variety of techniques in an Integrated Pest Management (IPM) program. An IPM approach includes *surveillance, source reduction, larviciding* and *adulticiding* to control mosquito populations. Surveillance starts in the spring of the year. Homeowners should incorporate surveillance into their every day activities. Since mosquitoes must have water to breed, source reduction can be as simple as turning over trapped water in a container to undertaking large-scale engineering and management of water levels.



Larviciding involves applying pesticides to breeding habitats to kill mosquito larvae.

Larviciding can reduce overall pesticide usage in a control program. Killing mosquito larvae before they emerge as adults can reduce or eliminate the need for ground or aerial application of pesticides (adulticides) to kill adult mosquitoes.

Registration Process

Larvicides that you buy, or that are being applied commercially are the result of ten or more years of research and testing. The process starts with the discovery of a new chemical and proceeds to initial evaluation of activity against mosquitoes and preliminary toxicology screening. Eventually, the compound undergoes extensive field and toxicology testing. Finally, the data from the years of testing regarding the pesticide, its formulation and its proposed use are evaluated by the [US Environmental Protection Agency](http://www.epa.gov) (EPA) to determine if it can be registered. Standards for registration of pesticides are provided by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Food Quality Protection Act (FQPA) of 1996.

The Federal Government carefully regulates pesticides to ensure that they do not pose unreasonable risks to human health or the environment. EPA requires extensive test data from pesticide producers that demonstrate pesticide products can be used without posing harm to human health or the environment.

The process EPA uses for evaluating the health impacts of a pesticide is called risk assessment. Risk assessment is broken up into a four-step process:

- **Step One: Hazard Identification** - identify potential health effects that may occur from different types of pesticide exposure. EPA considers the full spectrum of a pesticide's potential health effects
- **Step Two: Dose-Response Assessment** - the amount of substance a person is exposed to is as important as a chemical's toxicity. This step involves considering the dose levels at which adverse effects were observed in test animals, and using these dose levels to calculate an equal dose in humans
- **Step Three: Exposure Assessment** - People can be exposed to pesticides in three ways: inhaling pesticides (inhalation exposure), absorbing through the skin (dermal exposure), and getting pesticides in their mouth or digestive tract (oral exposure). Pesticides could enter the body by any one or all of these routes. EPA looks at the following exposure sources: food, home and personal use pesticides, pesticides in drinking water, and worker exposure to pesticides
- **Step Four: Risk Characterization** - process of combining the hazard, dose-response and exposure assessments to describe the overall risk from a pesticide. EPA's role is to evaluate both toxicity and exposure to determine the risk associated with use of the pesticide. $RISK = TOXICITY \times EXPOSURE$. This means that the risk to human health from pesticide exposure depends on both the toxicity of the pesticide and the likelihood of people coming into contact with it



Colorado Specifics

In addition to being registered with EPA every pesticide product used or sold in the state of Colorado must also be registered with the [Colorado Department of Agriculture](#).

The Colorado Department of Agriculture offers a pesticide registration query to verify the registration status of a pesticide product in the state of Colorado. The query can be found at

http://npirpublic.ceris.purdue.edu/state/state_menu.aspx?state=CO

The Colorado Environmental Pesticide Education Program offers a web page with a table of mosquito larvicides registered in the state of Colorado. This table can be found at

<http://npic.orst.edu/pest/mosquito/mosqcides.html>

For more information on the development of new pesticides see Pesticide Factsheet [#102](#) "Discovery and Development of New Pesticides".

References and Resources

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