

Facts:

from the Colorado Department of Public Health and Environment



Mosquito control insecticides: Permethrin (pyrethroids)

Trade names: Ambush, Anvil, Aqua-Reslin, Astro, Biomist, Cellutec, Ectiban, Kafil, Kestril3, Pramex, Qamlin, Torpedo

Chemical name: cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)2,2-dimethyl-(3-phenoxyphenyl)methyl ester (permethrin)

Mode of action: Permethrin belongs to a class of chemicals known as pyrethroids. Pyrethroids work quickly by paralyzing the nervous system of insects. Pyrethroids kills insects upon direct contact or when eaten.

Persistence/duration: Permethrin degrades, or breaks down, and is almost completely eliminated from the body within 12 days. Ninety percent of the permethrin in soil will break down in about one month. Permethrin binds tightly to soil and is unlikely to pass into groundwater. Permethrin degrades when exposed to sunlight.

Uses: Permethrin is registered by the U.S. Environmental Protection Agency and products containing permethrin are registered by the Colorado Department of Agriculture for mosquito control and for use in controlling agricultural and household insect pests.

Rate of application: For mosquito control, ultra-low volume technology is used, which requires very small amounts of insecticide. The maximum rate for ground and aerial application is 0.16 ounces of the active ingredient (less than 4 ounces of mixed formulation) per acre.

What is permethrin?

Permethrin is an insecticide (a chemical that kills insects) used for controlling adult mosquitoes. The chemical was first registered for use in 1977 and is approved by the U.S. Environmental Protection Agency (EPA) and the Colorado Department of Agriculture for controlling insects on food and feed crops, and on livestock.

Is permethrin dangerous?

Insecticides are designed to kill the target insect. If mishandled or used incorrectly, these products could cause human illness.

Insecticide applicators are licensed and regulated by the state and EPA, and the products must be applied exactly as instructed on the label, using the recommended safety precautions.

Does this mean that permethrin is safe?

No insecticide can be considered completely "safe." Federal law prohibits claims that insecticides are "safe."

Any insecticide's safety depends on how it is used. Insecticides that are approved by EPA are considered to present an "acceptable level of risk" when used as directed.

What is an "acceptable level of risk?"

EPA scientists conduct studies to estimate an insecticide's risk to humans. These studies look at the risk of causing illness when used as directed, and the potential for illness if a person is exposed to much higher levels. From these studies, the amount of chemical that can be applied is determined. These approved application levels are well below the amount that will result in immediate human illness, but are at levels that will still kill mosquitoes. Permethrin and other pyrethroids should be used only when needed, and applied at the lowest rate to do the job, while following all safety recommendations.

What are the health risks of permethrin?

The effects of permethrin on human health and the environment depend on how much, how long, and how often permethrin is present. The effects also depend on the person's health or the condition of the environment in which permethrin is used.

Permethrin is a man-made chemical based on a natural insecticide in the chrysanthemum flower. The natural

insecticide, pyrethrin, can cause skin irritation or sneezing, nasal stuffiness, or breathing difficulties for people with hay fever or for people who are sensitive to ragweed and pollen. It is unknown if permethrin can cause these same symptoms. Permethrin may produce numbing, tingling, and burning sensations of the skin. These sensations usually go away within 12 hours.

It is very unlikely that anyone will become ill as a result of contact with the very low concentrations of permethrin used in spraying operations.

High-dose exposure usually results from drinking the chemical, either accidentally or intentionally, or from accidents when working with the undiluted chemical. Contact with higher doses of permethrin can affect the nervous system and cause numbness, headaches, dizziness, tremors, and nausea. High-dose exposure to the general public would not occur in the community during mosquito spraying.

EPA has classified permethrin as a possible carcinogen (cancer-causing agent) because there is some evidence of cancer in laboratory animals. There are no human

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cancer data available. Permethrin has been used widely for more than 29 years in agriculture, mosquito control, and home products without any known connection to cancer in people.

Are some people at greater risk for problems from permethrin?

Most people will not experience any symptoms, because exposure to the chemical during spraying is so low.

- People who are highly sensitive to chemicals in general could experience short-term effects, such as skin, eye, and nose irritation, or respiratory problems.
- Results of animal studies suggest that infants may be more sensitive to permethrin than adults.
- Individuals who are sensitive to ragweed or pollen may experience allergic-type reactions to permethrin.
- Permethrin may worsen conditions such as asthma.

How is permethrin used to kill mosquitoes?

Permethrin is sprayed using ultra-low volume sprayers mounted on trucks or small aircraft. The sprayers produce very small droplets (5 to 20 microns; several droplets would fit on the tip of a pin) that drift in the air and kill flying adult mosquitoes on contact.

Will permethrin harm pets or other animals?

Just as with humans, when pesticides are evaluated, the risk to pets, fish, birds, wildlife, and livestock is considered. No

specific risks to animals are expected when used as directed and no special precautions are required.

If you are concerned, you can reduce pets' exposure by keeping them indoors and covering fishponds during spraying. Permethrin has not been shown to harm birds.

Is permethrin harmful to bees?

Permethrin is an insecticide and it will kill bees. Mosquito spraying operations should be scheduled after dusk when mosquitoes are most active and when bees would be back in their hives.

Is it safe to swim in the swimming pool after spraying with permethrin?

There are no special precautions required for swimming pools. Permethrin breaks down in water and in sunlight. If you are concerned, cover your pool before spraying to reduce exposure.

What can I do to reduce exposure to insecticides like permethrin during mosquito control spraying?

No special actions are recommended and there is no need to relocate during mosquito control spraying.

If you are concerned, take common-sense steps to help reduce exposure to insecticides during spraying:

- Contact your mosquito control district office or local health agency to find out about mosquito control programs in your area. A well-run mosquito control program will post spray times and locations several days prior to spraying.

- Persons with chemical sensitivities, asthma, or other respiratory conditions should stay indoors during spraying since there is a possibility that spraying could worsen those conditions.
- Pregnant woman may choose to stay indoors during spraying to limit exposure.
- Protect eyes from spray. If you get insecticide spray in your eyes or on your skin, rinse with water.
- Shut windows and turn off air conditioners during spraying.
- Bring children's toys, pets' dishes, outdoor furniture and equipment, and clothing indoors. Cover outdoor furniture, barbecue grills, and play equipment. Items left outside can be rinsed with water.
- Wash fruits and vegetables from the garden with water before storing, cooking, or eating them.

If you think you may have a reaction to insecticides, call your doctor or the Rocky Mountain Poison and Drug Center at 1-800-222-1222.

Why are public health agencies using permethrin and other pyrethroids for mosquito control?

The risk of West Nile virus infection is a public health threat. The virus is transmitted by mosquitoes. Permethrin is one way to control mosquitoes that is effective, with minimal risk to human health.

Reliable sources of information

Colorado HELP hotline

www.cohelp.us
1-877-462-2911 (toll-free)
M-F 7 a.m. – 11 p.m.; S-S 9:30 a.m. – 8 p.m.

Colorado Agriculture Pesticide Program

www.ag.state.co.us/dpi/pesticides/
303-239-4146

National Pesticide Information Center

npic.orst.edu
1-800-858-7378
7:30 a.m. – 5:30 p.m. MST

U.S. Environmental Protection Agency

www.epa.gov/pesticides/factsheets/pyrethroids4mosquitos.htm
Region VIII: 1-800-227-8917



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