VERMONT
DEPARTMENT OF HEALTH

Eastern Equine Encephalitis (EEE) and Mosquito Control

SEPTEMBER 3, 2012

The first two human cases of Eastern Equine Encephalitis (EEE) in Vermont were confirmed on September 1, 2012. Both are adults from the Addison and Rutland County areas where mosquito pools had recently tested positive for EEE and West Nile virus. Like West Nile virus, EEE is spread by the bite of an infected mosquito. In September 2011, emus were the first and only confirmed cases of EEE to date in animals.

What is Eastern Equine Encephalitis?

Eastern Equine Encephalitis (EEE) is a rare but serious disease caused by a virus that is spread by the bite of an infected mosquito. The EEE virus is one of a group of mosquito-transmitted viruses that can cause inflammation of the brain (encephalitis). The disease most commonly affects people and horses, but illness has been reported in other animals including alpacas, llamas, donkeys, pheasants and emus. EEE in humans is a severe disease, and is often fatal. Many people who survive have mild to severe brain damage. There is no vaccine for humans.

Why is mosquito spraying planned?

The EEE and West Nile viruses will continue to circulate until a hard freeze. Because the risk to public health is significant, Vermont health and agriculture officials are planning very targeted aerial spraying with the product Anvil 10+10 (Sumithrin) in the Brandon and Whiting area to reduce the population of adult mosquitoes. Weather conditions permitting, this could begin the evening of Thursday, Sept. 6 from about 8 to 11 p.m.

Aerial spraying is more effective than ground spraying. However, the local Mosquito Control District has also been conducting ground spraying in recent days. Along with these efforts, Vermonters are asked to take personal precautions to limit outdoor activities at dawn and dusk when mosquitoes are most active, to wear protective clothing outdoors, and to use mosquito repellants.

How would spraying be conducted?

The Anvil (Sumithrin) will be applied by aircraft in an ultra-low volume (ULV) mode. ULV sprayers dispense very fine aerosol droplets that stay in the air and kill flying mosquitoes on contact. ULV applications involve small quantities of the insecticide ingredient in relation to the size of the area treated. The pesticides are applied by licensed applicators following EPA guidelines.

What health risks are posed to people and pets from pesticides for adult mosquitoes?

In the amounts used, risk to people and pets are relatively low. However, some people may be more sensitive to pesticides and may want to reduce their chance of exposure by following suggestions given here.

Will the public be notified about when spraying will be conducted?

Stay tuned for news media announcements, check the Health Department's social media, website: www.healthvermont.gov, the Agency of Agriculture website http://www.vermontagriculture.com, or dial 2-1-1 to get the specifics. Weather permitting, spraying is planned for Thursday, Sept. 6 from about 8 to 11 p.m.

What can I do to reduce exposure to Anvil?

As with any pesticide, steps can be taken to help reduce possible exposures to Anvil before, during, or after spraying.

Actions you should take:

- Stay inside or avoid the area when spraying takes place and for about 30 minutes after spraying. That time period will greatly reduce the likelihood of your breathing pesticide in air.
- Close windows and doors and turn off window air-conditioning units or close their vents to circulate indoor air before spraying begins. Windows and air-conditioner vents can be reopened about 30 minutes after spraying.
- If you come in direct contact with Anvil spray, protect your eyes. If you get Anvil spray in your eyes, immediately rinse with water. Wash exposed skin. Wash clothes that come in direct contact with spray separately from other laundry.
- Consult your health care provider if you think you are experiencing health effects from spraying.

Actions you may want to take:

- If spraying just occurred, minimize your contact with surfaces and wash skin that has come in contact with these surfaces.
- Pick homegrown fruits and vegetables you expect to eat soon before spraying takes place. Rinse homegrown fruits and vegetables (in fact, all produce) thoroughly with water before cooking or eating.
- Cover outdoor tables and play equipment before spraying or wash them off with detergent and water after they have been sprayed.
- Bring laundry and small toys inside before spraying begins. (Wash with detergent and water if exposed to Anvil during spraying.)
- Bring pet food and water dishes inside, and cover fishponds to avoid direct exposure.

For more information about mosquito-borne illness and precautions to take:

www.healthvermont.gov

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About Anvil (Sumithrin) & Health

SEPTEMBER 3, 2012

What is Anvil?

Anvil is a pesticide product that is used to control mosquitoes in outdoor residential and recreational areas. It contains sumithrin and piperonyl butoxide as active ingredients. *Sumithrin* is a man-made pyrethroid insecticide that is also found in other pesticide products used indoors and on pets to control ticks and insects such as fleas and ants. *Piperonyl butoxide* does not directly kill insects on its own, but acts to increase the ability of sumithrin to kill insects. These active ingredients are dissolved in a petroleum solvent.

Because pesticide products are inherently toxic, no exposure is risk free. The likelihood of experiencing adverse health effects from exposure to any pesticide, including Anvil, depends primarily on the amount of pesticide that a person is exposed to, and the amount of time the person is exposed. A person's age, sex, genetic makeup, lifestyle and general health can affect the likelihood of experiencing health effects as a result of exposure to pesticides.

Is spraying of Anvil harmful to a person's health?

Anvil is applied at very low concentrations to control mosquitoes. It is unlikely that most people will be affected by this use, but some may experience health effects. For these reasons, individuals should consider taking steps to minimize their exposure.

Short-term exposures to very high levels of pyrethroid pesticides similar to sumithrin can affect the nervous system, causing effects such as loss of coordination, tremors or tingling and numbness in areas of skin contact. Short-term exposure to high levels of petroleum solvents can cause irritation of the eye, skin, nose, throat or lung. Vomiting or central nervous system depression may occur if very high levels of petroleum solvents are ingested. There are no studies examining whether the use of Anvil to control mosquitoes has caused any long-term health effects in humans.

Is Anvil an "endocrine disruptor"?

Endocrine disruptors are chemicals that interfere with endocrine system function. The endocrine system consists of glands that produce hormones that act together to guide development, growth, reproduction and behavior, and to maintain normal organ function.

Knowledge about the relationship between exposure and endocrine system effects is still developing. Some chemicals that act like the hormone estrogen (for example, DES) have been reported to cause long-term effects in mice born to mothers who ingested low levels during pregnancy. This area of research is the subject of intense scientific inquiry.

When added to cells growing in plastic dishes in a laboratory, high concentrations of sumithrin acted like an estrogen (a class of naturally occurring hormones). This suggests that sumithrin may interfere with endocrine system function in animals. However, sumithrin did not mimic estradiol (a natural estrogen) in three different tests in another study. Although changes in thyroid hormone levels occurred in animals repeatedly exposed to some other pyrethroids, there are no specific studies examining whether or not sumithrin or the other components of Anvil interfere with endocrine system function in animals.

Are some people more likely than others to experience symptoms after they have been in contact with Anvil spray?
Most people would not be expected to experience any symptoms when Anvil is sprayed for mosquito control. However, there could be some individuals who may be particularly sensitive to one or more constituents of Anvil, and could possibly experience short-term effects, such as eye, skin, nose or throat irritation or breathing problems. Children in particular may be at greater risk of experiencing adverse effects from the application of Anvil since they may have the potential for greater exposure than adults.

If I'm pregnant, can the spraying affect this pregnancy or harm my baby?
As with chemical exposures in general, pregnant women should take care to avoid exposures when practical, as the fetus may be vulnerable. Sumithrin and piperonyl butoxide are unlikely to affect pregnancy outcomes in people as a result of spraying. Although some effects occurred in laboratory animals given large amounts of either sumithrin or piperonyl butoxide during pregnancy, these amounts far exceeded the amounts that individuals are likely to contact from the spraying of Anvil.

Should I be concerned about cancer because of the spraying program?
Sumithrin did not cause cancer in rats or mice when they were fed high levels for their lifetime. Experimental studies have reported that piperonyl butoxide causes liver tumors in rats and mice when they are fed high levels of piperonyl butoxide every day for a long period of time. *The amount of piperonyl butoxide ingested by animals in these studies, however, far exceeds the amount humans might be exposed to as a result of the use of Anvil to control mosquitoes.* Available information indicates that piperonyl butoxide is unlikely to cause cancer in humans as a result of its use to control mosquitoes.

Should I be concerned about coming into contact with pesticides on surfaces after spraying (e.g. outdoor furniture, toys, soil and, grass)?
Some pesticide residues may be present on outdoor surfaces after spraying. Limited studies on other chemicals suggest the amount of pesticide transferred to skin decreases with more time after spraying (and very little transfers 24 hours after spraying), is less on dry skin compared to wet skin, and is less from porous surfaces compared to non-porous ones

Pesticides are degraded from surfaces more rapidly when exposed to sunlight and water. Although not necessary under most circumstances, if spraying has just occurred and surface contact is high (e.g. playing field sports), then exposure can be minimized by wearing long pants and sleeves and washing exposed skin. Normally, most people would not be expected to experience any symptoms from contact with outdoor surfaces after spraying.

Remove children's toys, outdoor equipment and clothes from outside areas. If toys are left outside, wash them with soap and water before using again.

Can pets go outside during the spraying?
If possible, keep your pets inside during the spraying and for about 30 minutes afterwards to help minimize exposure. The amount of pesticide that a pet is likely to track into the house will depend on many of the same factors that were discussed in the previous question.

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This information has been adapted from the New York Department of Health, the New York City Department of Health and Mental Hygiene, and the Massachusetts Department of Environmental Protection.

Vermont Department of Health/Environmental Health• TEL 800-439-8550

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