

Frequently Asked Questions About Anvil Spraying To Reduce Risk of Eastern Equine Encephalitis

What is Eastern equine encephalitis (EEE)?

Eastern equine encephalitis (EEE) is a rare but serious disease caused by a virus. The virus infects birds that live in freshwater swamps and is spread from bird to bird by infected mosquitoes. If a mosquito infected with the virus bites a horse or human, the animal or person can become sick. The risk of getting EEE is typically highest from late July through early September.

Is EEE a serious health problem?

EEE can cause severe illness in any age group, however, people under the age of 15 are at particular risk. The mortality rate for humans who contract EEE is high and survivors often suffer severe neurological damage.

What is typically done early in the season to reduce risk of EEE?

Officials in affected areas typically target early in the season mosquitoes in the immature or larval state. Efforts are also enhanced to provide educational information to residents in affected areas on: 1) source reduction (e.g., removal of potential breeding sites, such as garbage cans, flower pots, bird baths, discarded auto-tires or other containers that hold water); and 2) personal risk reduction (e.g., use of repellants, ensuring screens are in adequate repair, wearing clothing that covers your skin while outdoors).

What is the process for making the decision to conduct aerial spraying in Massachusetts and who is responsible for making that decision?

The decision to conduct more aggressive mosquito control activities is outlined in the MDPH Arbovirus Surveillance and Response Plan. Once that decision is made (based on factors such as early season positive surveillance indicators, sustained elevated field mosquito infection rates, and horse or mammal cases), the Mosquito Advisory Board (MAG) advises the Massachusetts Department of Agricultural Resources Statewide Reclamation and Mosquito Control Board what intervention (e.g., aerial application) should be implemented.

How would aerial spraying be conducted?

Aerial spraying is generally conducted during the early evening and night time hours (i.e., usually from dusk up to shortly after midnight) in areas of concern. Mosquito control professionals apply these pesticides as an ultra low volume (ULV) spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill adult mosquitoes on contact.

Would some areas located in the spray area be excluded?

Yes. Surface drinking water supplies, certified organic farms, fish hatcheries, and limited endangered species habitats might be excluded.

If aerial application is deemed to be necessary, who decides where aerial application should take place?

The MDPH Arbovirus Program provides a map showing the geographic extent of high human EEE risk based on the latest information on EEE surveillance activities. These maps are provided to the environmental agencies (e.g., Massachusetts Department of Environmental Protection, Massachusetts Department of Fish and Game, and Massachusetts Department of Agricultural Resources) responsible for identifying areas within the high-risk zone that should be excluded from aerial application, e.g., organic farms, drinking water reservoirs, priority habitats. Each agency then develops maps or shape files in a Geographic Information System (GIS). These maps are then combined with the DPH high-risk area map to form one GIS shape file that is then provided to the plane(s) that conduct the aerial application. For the 2007 season, the final GIS shape files should be created by the Massachusetts Department of Agricultural Resources (NDAR). The planes fall under the director of the MDAR State Reclamation and Mosquito Control Board.

What pesticide product would be used in the aerial spraying?

The most preferable product to be used in aerial spraying is called Anvil. Anvil (or similar products) is the same product routinely used in ground spraying. Anvil contains sumithrin, which is a man-made pesticide product similar to the natural components of the chrysanthemum flower that is used to control mosquitoes in outdoor residential and recreational areas. Sumithrin can also be found in other pesticide products used indoors in pet shampoo and lice treatments and on pets to control ticks and insects, such as fleas and ants. Piperonyl butoxide is also an active ingredient in Anvil, acting to increase the ability of sumithrin to kill mosquitoes.

Would the aerial spraying involve a more concentrated application of Anvil?

No. The maximum concentration of Anvil 10+10 used in aerial spraying is the same as the maximum concentration used routinely in ground spraying.

Have other states applied pyrethroids to control mosquitoes?

Yes. A number of other states (e.g., New York, New Jersey, Illinois, Delaware, North Carolina, Arkansas, Florida, Alabama, Louisiana, Texas) have applied these products.

What kinds of health problems can be associated with exposure to Anvil?

In occupational studies where significant exposures occurred, loss of coordination, tremors or tingling and numbness in areas of skin contact have been observed. However, with targeted and appropriate aerial spraying, a very low concentration (a maximum of 0.62 ounces active ingredient per acre) is used and exposure to levels that cause health problems are not expected.

What health impacts among the general population can be expected with the aerial spraying of Anvil?

Due to the very low concentrations of Anvil used to control mosquitoes during aerial spraying, adverse health effects are not expected.

Have studies been conducted on possible health effects following aerial spraying for mosquito control?

Yes. The U.S. Centers for Disease Control and Prevention (CDC) reported that when administered properly in a mosquito-control program, insecticides pose a low risk for acute, temporary health effects among

persons in areas that are being sprayed and among workers handling and applying insecticides. CDC also reported that ULV aerial and ground spraying of products similar to Anvil did not result in elevated levels of the pesticides in human tissue in the population living in areas sprayed.

Can exposure to Anvil exacerbate pre-existing conditions?

Yes, for some people, short-term exposure at low levels may exacerbate existing respiratory conditions (e.g., asthma) or cause irritation of the eyes, skin, nose, throat or lungs. For these reasons, individuals should consider taking steps to minimize their exposure risk to Anvil if it is applied to control mosquitoes. You should call your doctor, go to your local emergency room, or call the Massachusetts Poison Control Center if you believe that you are experiencing any symptoms that may be related to pesticide exposure.

Could there be health concerns if I am pregnant?

As with all chemical exposures, pregnant women should take care to avoid them. Sumithrin is unlikely to affect pregnancy outcomes in people as a result of the proposed aerial spraying. Although some effects occurred in laboratory animals that were given large amounts of sumithrin during pregnancy, these amounts far exceeded the amounts that individuals are likely to contact from the proposed aerial spraying of Anvil.

Could the aerial spraying result in long-term health effects?

Sumithrin did not cause cancer in rodents when they were fed high levels for their lifetime. Experimental studies have reported that piperonyl butoxide causes liver tumors in rodents 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 aerial use of Anvil to control mosquitoes. Although uncertainties exist, available information indicates that piperonyl butoxide is unlikely to cause cancer in humans as a result of its use to control mosquitoes.

What are the environmental characteristics and impacts of sumithrin?

Sumithrin is rapidly inactivated and decomposed by exposure to light and air with a half-life of less than one day in the air, and on plants and other surfaces subject to sunlight. It does not dissolve easily in water, and is broken down by microorganisms in streams and water bodies that receive sunlight. Thus, residues in water would not be expected. Because of environmental fate and dilution characteristics and the fact that spraying does not occur over drinking water supply reservoirs, opportunities for exposure via drinking water are not expected. Anvil and other pyrethroid pesticides are toxic to terrestrial and aquatic invertebrates (e.g., dragonflies, beetles) and to fish. However, as the size of the fish pool or pond decreases the risk to the fish increases. The risks to large natural water bodies are minimal. Thus, you may want to cover a small ornamental fish pond in your yard during the night of spraying.

What kinds of precautions are recommended if aerial spraying is scheduled in my area?

You can reduce/eliminate your exposure risk to the insecticide by staying indoors during spraying. Otherwise, no special precautions are recommended. The active ingredients of the pesticide product as it is used for aerial application for mosquito control generally break down quickly and do not leave a toxic residue.

If individuals want to take extra steps to minimize or avoid exposure, what steps can be taken?

Common sense steps that can be followed in areas where aerial spraying is scheduled to take place include:

- If the immediate area of your home is being sprayed, keep windows closed and fans off. Shut off air conditioners unless they have a setting for recirculating indoor air. In very hot weather, make sure you open the windows or turn fans and air conditioners back on soon after the aerial spraying is completed.
- Rinse any homegrown fruits and vegetables with water.
- Keep pets indoors during spraying to minimize their risk of exposure. Pets that remain outdoors could be exposed to small amounts of pyrethroids, but would not be expected to experience adverse health effects from the spraying. Again, there are many pesticide products (e.g., flea collars, pet shampoo, dips) containing sumithrin that are used directly on pets to control ticks and insects.
- If skin or clothes or other items are exposed to the sprayed pesticide, wash with soap and water.
- If the spray gets in your eyes, immediately rinse them with water or eye drops, and call your doctor.
- Because Anvil breaks down quickly in sunlight and water, and considering dilution factors, no special precaution or waiting periods are recommended for outdoor swimming pools or beaches.

If I am a beekeeper, should I take special precautions to protect them prior to or following aerial spraying?

No. Pyrethroid applications at night will not impact honeybee colonies since honeybees are inside the hives at night.

Whom should I contact to find out whether or when aerial spraying will be conducted in my area?

Your local health department will be aware of any plans for aerial spraying. Announcements will be made through local media outlets (e.g., local cable).

What if I think that I am experiencing an adverse reaction to pesticide spraying?

If you think that you are experiencing any health effects from pesticides, call your doctor or the Massachusetts Poison Control Center 800-222-1222 or go to your local Emergency Room. Toxicology staff at the MDPH can also be consulted by calling the WNV information line at 1-866-MASS-WNV (press 5 to be connected to the Bureau of Environmental Health), or by calling (617) 624-5757.

For more information, please contact:

- **For general information about mosquito control:** visit the following webpage www.mass.gov/agr/mosquito/index.htm or contact the State Reclamation and Mosquito Control Board within the Massachusetts Department of Agricultural Resources at (617) 626-1777.
- **For questions about mosquito control in your city or town:** Contact your local board of health (listed in the telephone directory under "government")
- **For questions about aerial spraying and health effects of pesticides or to report any concerns about adverse reactions to pesticides:** MDPH, Bureau of Environmental Health at (617) 624-5757

- **For general questions about EEE:** MDPH, Division of Epidemiology and Immunization at 617-983-6800 or toll free at 1-866-MASS-WNV or online at [West Nile Virus](#). You may also contact your local board of health (listed in the telephone directory under “government”).

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