



AgBrief

Mosquito Control Section

Plant Protection & Weed Management Section



The primary goal of the Maryland Department of Agriculture Mosquito Control Program is to prevent mosquito-borne diseases in humans, pets and domestic livestock. Different mosquitoes can carry and transmit different diseases, and the methods for combating one species can differ from how the department combats another. Managing mosquito populations across the state generally requires the department to undertake several tasks.

- 1. Monitor and test mosquitoes for diseases that pose a threat to public health.** This is called arbovirus surveillance. The department monitors what kind of mosquitoes are in an area, how many there are, and what kind of diseases those mosquitoes are capable of carrying. Throughout the season, Mosquito Control staff strategically set traps and check the results. Trapped mosquitoes are sent to the Department of Health and Mental Hygiene where they are tested for human pathogens. These efforts determine whether a threat exists and give a good idea of how big the threat is. This information helps staff decide how to combat a threat.
- 2. Reduce mosquito breeding grounds.** The department regularly inspects breeding areas from March through September to figure out how many larvae are developing and what type of species are present. If necessary, efforts are made to control the larvae before they grow into adults. If you see areas that may breed mosquitoes, such as abandoned swimming pools and stagnant retention ponds, report them to: **410-841-5870**. The most important thing residents can do to help combat mosquito infestations is to take the simple steps necessary to eliminate potential breeding grounds. Native mosquitoes breed in marshlands and wetlands, but new invasive species, like the Asian tiger mosquito, breed in containers of water (even very small containers of water). The department has extensive information on [its website](#) to help homeowners inspect their own yards for potential breeding areas.
- 3. Manage biological control initiatives.** Biological control agents – also known as “natural predators” – are almost always used against larvae and pupae rather than adult flying mosquitoes. The use of fish is particularly effective in controlling mosquito populations in the larval stage. On the lower shore, the department uses Open Marsh Water Management to control salt marsh mosquitoes without using pesticides. The technique essentially creates an underwater highway in marshes so that fish can get to and eat mosquito larvae. All of the larvicides used in the mosquito program are biological relying on bacteria or growth hormones to control larval populations. Many residents advocate using birds, bats, dragonflies, frogs and other predators to combat adult populations, but a documented study shows that they do not consume enough adult mosquitoes to be effective control agents. The department does not advocate the use of bat boxes due to the increased risk of human exposure to rabies.
- 4. Larval mosquito control.** The department controls mosquitoes by placing insecticides in waters where mosquito larvae are developing. This is a far more effective way of controlling mosquitoes and uses techniques that are more environmentally



friendly. The pesticides that are used against larvae are either bacteria or chemicals that mimic insect hormones. Both types of pesticides kill mosquito larvae, midge larvae and little else. If every location where mosquito larvae develop could be located and treated, we would never have to do adult control.

- 5. Conduct ground and aerial application of insecticides.** Mosquito control is conducted according to the concept of Integrated Mosquito Management (IMM), which uses a variety of pest management strategies to protect public health and the environment. One of those strategies is pesticide application.

The department does two kinds of spraying to control adult mosquitoes:

- Truck-mounted, ultra low volume (ULV) aerosol generators –** This is the truck you see if your neighborhood is being treated. The principle insecticide applied for adult mosquito control in Maryland is a [synthetic pyrethroid](#) diluted in mineral oil. The active ingredients are Permethrin and piperonyl butoxide, the same active ingredients in lice shampoo and flea treatments for pets. The spray is applied at about 0.0031 pounds of active ingredient per acre. The ULV units disperse the insecticides over an effective swath width of 300 feet. Applications ideally are made when wind velocity is 2 to 10 mph, temperature is 60 to 85 degrees, relative humidity is high and a temperature inversion exists. All applications are made at night, when these conditions usually exist and when most mosquito species are active. Night time application also protects pollinators that are active during the day.

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- Aerial ultra low volume application** – Aerial application is only done on the Eastern Shore because it is more effective against salt marsh mosquitoes. Aerial application is never done on the Western side of the Chesapeake Bay. The pesticide used for aerial application is Trumpet. The active ingredient is naled. It is applied at 0.05 to 0.10 pound of active ingredient per acre. The department owns a plane and it flies low to the ground during application.

When spraying is conducted, it is done under two conditions:

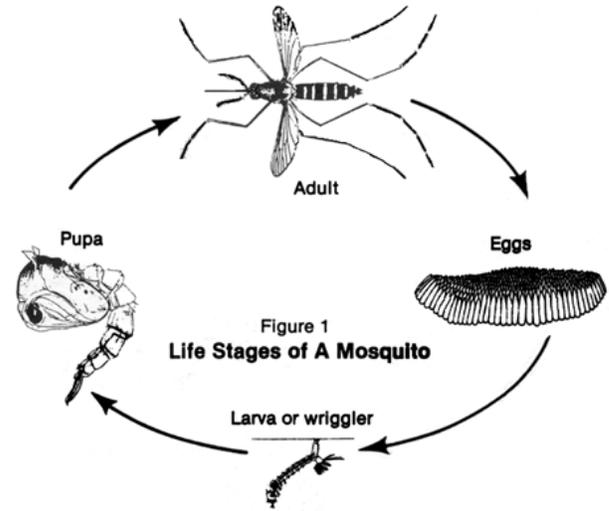
- Scheduled spraying:** Every year, about 2,000 communities in 16 counties across the state voluntarily participate in this program, sharing the cost with the state. Mosquito populations in these communities are regularly monitored. When/if the adult mosquito population gets too large and/or dangerous to public health, truck mounted spraying is done. The scheduled spray dates of all participating communities are listed on the department's website.
- Unscheduled spraying:** Unscheduled spraying is only done in response to a public health concern related to mosquito-borne disease. In the western part of the state, truck mounted ULV spraying will be conducted whether or not the community is in the regular spray program. On the Eastern Shore, spraying for disease control may be truck mounted or aerial. If spraying is required in an area with a regular spray program but is done on a different night, it is considered unscheduled.

Notifications: The department announces all of its unscheduled spraying on the [agency website](http://www.mda.maryland.gov) (www.mda.maryland.gov), on Twitter [@MdAgMosquito](https://twitter.com/MdAgMosquito) and [@MdAgDept](https://twitter.com/MdAgDept), and through [press releases](#). Citizens who wish to receive the press release by email should send their address to: mda.news@maryland.gov and request to be put on the distribution list.

Exemptions: Residents who live in a community that participates in the scheduled spraying program can request that their property be excluded. That form is [on the website](#). All spray exemptions, however, are suspended if spraying is required due to a public health threat.

About Pesticides

Most questions the department receives are related to the safety of pesticides used in the truck mounted spray program. We understand that concern and take it very seriously. Every year, the department reviews the list of insecticides registered by the U.S. Environmental Protection Agency and chooses which to use based on the product's effectiveness in controlling mosquitoes in residential and recreational areas. The EPA has determined that the pesticide products that the department uses for adult mosquito control present no unacceptable level of risk to the health of humans, domestic animals, wildlife or the environment when used according to approved label instructions. All ground-based products used for adult mosquito control by the department bear the signal word "Caution," which is the lowest toxicity rating for which the EPA requires a signal word. The results of studies by the Centers for Disease Control that assessed human exposure to ULV naled, permethrin and d-phenothrin used in emergency, large-scale mosquito control activities did not result in substantial pesticide exposure to humans.



Pesticides and Pollinators:

Other frequently asked questions involve the impact mosquito control pesticides have on honeybees and other pollinators. First, truck mounted mosquito spraying only reaches about 300 feet from the truck. If beehives are close to the road, they should be covered. If they are further than 300 feet from the road, they should not be impacted. In addition, the EPA-approved labels for the pesticides used for adult mosquito control include pollinator protective restrictions that must be followed except in cases of dire health emergencies. The department follows those restrictions. Finally, the department conducts adult mosquito spraying after sunset and before sunrise when pollinators generally are not active.

Beekeepers can get their property exempted from routine sprays and/or they can cover their hives. There is a growing body of evidence that shows mosquito control done properly has minimal effects on the health of honeybees.

Insecticide applications are made under the supervision of certified pesticide applicators, pest control category VIII, and regulated by state and federal laws. The department employs several certified applicators.

Zika virus: Concerns about the Zika virus and the department's response to them are relatively new. For information about the state's Zika response and to find out some simple things you can do around your house to prevent mosquitoes from breeding, see our website, especially our FAQs, at: www.mda.maryland.gov/Zika.

The state's Mosquito Control Program has existed since July 1956 and currently operates under authority of Sections 5-401 through 5-408, Agriculture Article, Maryland Annotated Code.



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