



Vector Control District
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FREQUENTLY ASKED QUESTIONS (FAQ) **ABOUT WEST NILE VIRUS AND MOSQUITO** **CONTROL**

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WEST NILE VIRUS (WNV)

Q. What is West Nile virus?

A. West Nile virus (WNV) is a significant public health concern. The California Department of Public Health considers it the most common and serious vector-borne disease in the state. WNV is a disease spread through the bite of infected mosquitoes. It can make people very sick and even cause death. It originated in Africa and was first detected in the eastern United States in 1999. It was first detected in California in 2003 and is now well established in the state.

For more information on West Nile virus, visit the California Department of Public Health's [West Nile virus website](#).

Q. How do people become infected?

A. People almost always get infected through the bite of an infected mosquito. People can also become infected through blood transfusions, organ transplants, and from mother-to-baby transmission during pregnancy.

Q. Who is at risk of getting sick?

A. Elderly people, children, and those with compromised immune systems are more likely to develop complications when infected.

Q. What are the symptoms of WNV?

A. Most people who are infected do not develop symptoms, while others may develop mild symptoms like fever, body aches, headaches, nausea, vomiting and sometimes a skin rash. Elderly people and those with certain medical conditions (such as diabetes, hypertension, cancer, and kidney disease) are at higher risk of severe symptoms (including high fever, neck stiffness, vision loss, confusion, neurological damage, paralysis, and coma) and even death.

Q. Is there a treatment for WNV?

A. There is no known treatment for WNV, making prevention and mosquito control the only lines of defense.

Q. How many WNV human cases are there in California?

A. More than 7,000 people have contracted the disease and nearly 400 of those cases have been fatal. 2015 was a record year for fatalities in the state with 53 deaths. For the most up-to-date information on WNV activity in the state and WNV human cases, please visit the California Department of Public Health's [WNV report's page](#).

Q. What is the WNV cycle?

A. WNV is a mosquito-bird-mosquito cycle, meaning this virus is transmitted to birds through the bite of an infected mosquito and mosquitoes become infected when biting an infected bird. Humans, and other animals like horses, are accidental hosts.

Q. Is WNV seasonal?

A. WNV is more common in warmer months, but there may be a year-round risk of infection in warmer parts of the state and other parts of the Country. It is best to protect yourself year-round.

Q. How can I protect myself from WNV?

A. There are three steps you can follow to protect yourself from mosquito bites.

Wear an insect repellent approved by the [Environmental Protection Agency](#) that contains DEET, IR3535, Picaridin, or oil of lemon eucalyptus as the active ingredient. Always follow the label instructions.

Wear long sleeves and long pants when spending time outdoors.

Avoid outdoor activity during dusk and dawn. This is when mosquitoes that transmit West Nile virus are most active.

Q. What can I do to prevent WNV?

A. The best way to prevent WNV is to keep mosquito populations low. Mosquitoes only need a ¼ inch of stagnant water to lay their eggs and reproduce.

To keep your neighborhood mosquito free:

- Inspect areas around your home for stagnant water sources at least once a week.
- Keep rain gutters clean and free of debris to allow water to flow.
- Throw out unused tires, buckets, and tarps or store them indoors.
- Avoid overwatering your lawns and plants.
- Ensure to fix leaky faucets and sprinklers.
- Scrub clean planter plates and bird baths and do so at least once a week.
- Keep rain barrels tightly covered and in good condition.
- [Certain dead birds](#) can be a sign of WNV activity. Report dead birds by submitting a service request online at vector.santaclaracounty.gov/report-dead-bird or calling our office at 408-918-4770.

Q. Can my pet get sick from WNV?

A. An infected mosquito can bite any animal but not all of them will get sick. Pets like dogs and cats can get WNV but it is rare for them to get sick. If you are worried about your pet and WNV, you should consult your veterinarian.

Mosquito Control

Q. What does the District do to prevent WNV?

A. We have a dedicated mosquito control program focused on education, surveillance, and mosquito management.

Education: We develop informational campaigns and participates in community events to educate

the public about mosquito-borne diseases and what you can do to protect yourselves and prevent mosquitoes from breeding.

Surveillance: We monitor the abundance of mosquitoes throughout the county year-round using encephalitis vector survey (EVS) and gravid traps. EVS traps use dry ice as bait to attract hungry female mosquitoes. The trap has a fan that sucks in approaching mosquitoes. Gravid traps contain a mixture of water and an alfalfa solution that attracts female mosquitoes looking for a source of stagnant water to lay their eggs. The trap blows mosquitoes into an attached collection bag. We then test the collected mosquitoes for the presence of mosquito-borne diseases. We also test dead birds for WNV to gauge areas of high WNV activity.

Mosquito management: We largely focuses on finding sources of stagnant water where mosquitoes breed and eliminate immature mosquitoes (in areas like marshes, creeks, catch basins, storm drains, and curbs). Our goal is to prevent mosquitoes from becoming adults, when they can bite and potentially infect humans. If a WNV-positive adult mosquito is detected, we take the additional step of conducting adult-mosquito-control treatments to reduce the adult (flying) mosquito population in the area and lower the potential risk of a WNV human infection.

Q. Why is it important to control adult mosquitoes?

A. Humans, horses, birds, and other animals can get sick and possibly die from a West Nile virus infection. Adult-mosquito-control treatments, or adulticides, reduce the number of adult (flying) mosquitoes in the area, decreasing the possibility of a WNV-human infection.

Q. What is the District’s adult-mosquito-control treatment?

A. We determine a radius from the location where a positive adult mosquito is detected, and this becomes the treatment area. We use truck-mounted machines that emit a fine mist of microscopic droplets containing a pesticide approved by both the U.S. and California environmental protection agencies. This application method is known as ultra-low volume (ULV). The microscopic droplets are airborne and not intended to leave significant residues. Flying mosquitoes are killed by contact with the pesticide. Adult mosquito control is done only at night when mosquitoes are flying, other insects are not active, and vehicle and human foot traffic are minimal.

Q. Why does the District provide such a short notice regarding adult mosquito control treatments?

A. Due to the urgency of needing to conduct the adult-mosquito-control treatment as soon as possible, we are only able to provide a few days’ notice in order to protect public health.

Q. How can I receive notifications for adult mosquito control treatments?

A. General notifications are provided through social media including [Facebook](#), [Instagram](#), and [X \(previously known as Twitter\)](#), subscription-based [email notifications](#), on our website at vector.santaclaracounty.gov, and through news releases to the media. Direct notifications are sent to neighborhoods in the treatment areas through Nextdoor the County’s emergency alert system, [AlertSCC](#), and emails through emails to registered voters in specific precincts.

Please note that, per [California Code of Regulations, CCR3 §6620](#), we do not need consent from property owners to conduct mosquito treatments and are not required to provide notice to the community beforehand. However, we do our best to send courtesy notifications to the public before conducting adult-mosquito- control treatments.

Q. What types of insecticides does the District use for adult mosquito control treatments?

A. We alternate between two insecticides to prevent pesticide resistance in the local mosquito populations. The two pesticides used are [Zenivex E4](#) and [Merus 3.0](#). Both products are approved by federal, state, and local authorities for use in public areas.

Q. When does the District conduct adult-mosquito-control treatments?

We manage mosquito populations year-round, and the majority of our efforts are focused on eliminating immature stages of mosquitoes found in stagnant water, which is the most efficient way to kill large numbers of mosquitoes.

We conduct adult-mosquito-control treatments to kill adult mosquitoes only when West Nile virus-infected mosquitoes are detected and as a last resort to protect public health.

Mosquitoes thrive in warm weather, so mosquito activity and West Nile virus both typically increase during summer and late fall. Treatments usually start in late June and end around early October.

Q. Are there less mosquitoes during drought conditions?

A. Although mosquitoes need water at each stage of life, they still thrive during drought conditions. Drought years tend to lead to higher WNV activity, as creeks dry up and rushing water is replaced with stagnant pools, creating more favorable breeding habitats for mosquitoes, which need only a quarter inch of water to reproduce. Mosquitoes can also find other stagnant water sources that do not come from rain, such as leaky faucets, overwatered lawns and plants, broken sprinklers, and neglected pools.

Q. What other methods does the District use to control mosquitoes?

A. We follow best management practices (BMP) that include the use of integrated pest management (IPM) methods. This includes the use of physical, cultural, biological, and chemical controls in addition to surveillance.

Physical Control: This means modifying the environment to reduce mosquito breeding sources and mosquito populations. This includes emptying containers and removing leaf litter and other obstructions to allow water to flow, as this eliminates the need for pesticides.

Cultural Control: Education is key to the management of mosquitoes and all vectors. Our outreach team educates the public year-round using a variety of educational methods, including print, radio, TV and online advertisements, social media, newsletters, school and

community presentations, and participation in community events.

Biological Control: We use mosquitofish, a natural predator of mosquitoes in aquatic stages, to help control immature mosquitoes. Mosquitofish are an excellent option for mosquito control in artificial bodies of water such as neglected pools/spas, water troughs, ponds, and rain barrels. We provide mosquitofish to the public for free. For more information on our mosquitofish program, or to request them, visit vector.santaclaracounty.gov/mosquitoes/mosquitofish.

Chemical Control: Chemical control includes the use of larvicides (pesticides for larval mosquito stages) and adulticides (pesticides for adult mosquito stages). Larvicides are often based on naturally occurring materials, such as bacteria found in soils (including *lysini bacillus sphaericus*, *bacillus thuringiensis*, and spinosad) and insect growth hormones (methoprene). All larvicides and adulticides we use are approved by federal, state, and local authorities.

Surveillance: We monitor the abundance of mosquitoes year-round. Our surveillance team tests mosquitoes for the presence of diseases including West Nile virus, Western equine encephalitis, and St. Louis encephalitis. The data collected through surveillance is used to predict locations that are most likely to have disease-transmitting mosquitoes and helps determine whether larvicides or adulticides are necessary. To view our surveillance reports, visit our [Reports webpage](#).

Q. How much pesticide is used in each adult mosquito control treatment?

A. We apply insecticides at ultra-low volume (ULV). The amount of insecticide used is equivalent to spreading less than 3 ounces of liquid over a football field.

Q. How does the District know its adult-mosquito-control treatment is effective?

A. To measure the effectiveness of the treatment, we trap mosquitoes in the treatment area before and after a treatment. Overall, the District has seen a reduction in mosquito populations after conducting adult mosquito control treatments.

Q. How long does the adult-mosquito-control treatment take?

A. Adult-mosquito-control treatments often begin around 10 p.m. and are usually completed by 2 a.m. the following morning.

Q. How long does the insecticide stay in the area?

A. The pesticide does not linger in the treatment area and typically drifts only 150 feet from the nozzle of the vehicle. As it travels, it becomes more diluted. Most of the pesticide survives in the environment for only a few hours. Anything that remains will begin to break down as soon as the sun rises and it is exposed to UV rays.

Q. Will you need to enter my property?

A. We will not need access to your property. Once the pesticide is released from the truck-mounted

machines, the microscopic droplets follow the air currents wherever they go. Some will go over the house and some will go around.

Q. Will the treatment cause reduced visibility when I am driving in the neighborhood?

A. No, the ULV treatment is very dilute and will not reduce visibility for driving or other activities.

Q. I didn't hear anything last night. Does that mean the adult mosquito control treatment was cancelled?

A. No. Most of our adult-mosquito-control treatment machines are designed to be very quiet, so most people will probably not hear them as they pass down the street. However, if conditions like wind speed and temperature are not suitable, the treatment will be postponed. Each pesticide label determines the appropriate environmental factors for using the pesticide. When treatments are postponed, we notify residents through social media, email, Nextdoor, and our website.

Q. Where can I get additional information regarding specific insecticides?

A. There are several ways to learn more about Zenivex and Merus, beginning with our [adult mosquito control treatment information webpage](#).

The page includes general background information as well as labels and safety data sheets for both products.

Zenivex: [Label](#) and [safety data sheet](#)

Merus: [Label](#) and [safety data sheet](#)

You can also visit the District's [WNV scientific research webpage](#).

For more information on pesticides, please visit <https://www.epa.gov/pesticides> or call (866) EPA-WEST (866-372-9378). Additional information is also provided by the National Pesticide Information Center. Visit npic.orst.edu or call (800) 858-7378.

Health and Safety

Q. How will this pesticide affect my family and me?

A. At the low concentration we apply pesticide products, , there is no significant risk to you and your family. There is no need to relocate during the adult-mosquito-control treatment. If you want to keep your family and pets away from pesticide droplets, you may choose to keep them inside and shut your doors and windows for the duration of the treatment.

Q. Will the pesticide affect things in my yard such as lawn furniture, toys, plants, and swimming pool water?

A. The treatment should have no effect on your outdoor activities. It should not affect car paints or other painted surfaces. However, if you are concerned about residue on outdoor items or children's

playthings, you can wash or wipe them down before use. Any residue left outside will break down quickly in the sunlight.

Q. Is it safe to consume the fruits and vegetables from my garden?

A. For fruit and vegetables, just normal washing with water before consumption is recommended. The pesticides we use are registered for use over agricultural areas and growing crops, but you may opt to cover your fruit trees and vegetable gardens.

Q. Will the insecticide affect pets?

A. The insecticides do not affect pets. At ULV applications rates, the pesticides have a significant margin of safety for mammals, birds, fish, and reptiles. If you are concerned about insecticide exposure to your pets, you may choose to bring them indoors during the treatment. Although it isn't necessary, you can wash or wipe down any outdoor toys or water dishes before pets use them again.

Q. What if I am pregnant?

A. At ULV application rates, there are no special precautions needed for pregnant women. However, if you wish to minimize exposure, closing windows and turning off air circulation systems will suffice. If you have medical concerns, please consult your physician.

Q. How do we know that adult-mosquito-control treatments will not cause negative health effects?

A. The federal and state environmental protection agencies have determined that Zenivex and Merus are safe for public use. Any claims that human health risks from these materials are greater than the risks from WNV are not supported by current scientific evidence.

Our [Scientific Research Page](#) provides peer-reviewed scientific literature on this and related topics. If you feel ill after an adult-mosquito-control treatment, please consult your physician.

Environmental Impact

Q. Do the adult-mosquito-control treatments affect bees?

A. Pesticides can be toxic to bees when applied to them directly. However, our adult-mosquito-control treatments are done late at night when bees are not active. Bees are active from one hour before sunrise to one hour after sunset. The dried insecticide residue on plants is not harmful to bees and quickly breaks down when exposed to sunlight.

Multiple studies have shown adult-mosquito-control products do not harm native bees or honeybees when applied using proper methods and concentrations. Claims that the problems with bee colonies are due solely to pesticides are not supported. For a list of research studies on the effect of adulticides on bees, please view the additional resources listed below or visit our [Scientific Research Page](#).

If you own bees, make sure to register them through the Cal Ag Permits ([BeeWhere](#)) or the [County of Santa Clara Agriculture Division](#). We notify the public, including direct notifications to beekeepers, as a courtesy before conducting treatments in their area.

For more information on bee keeping, visit the [Santa Clara Valley Beekeepers Guild](#).

Q. What about sensitive species?

A. We use pesticides that do not harm non-target species. Our staff is regularly trained to know where endangered and sensitive species are located within the county and how to avoid negative impacts.

Most of our sensitive species in Santa Clara County are located in rural areas such as wetlands, while most of our adult-mosquito-control treatments take place in or near densely populated areas. The EPA has [a useful map tool](#) with more information on pesticide limitations in areas related to threatened and endangered species in the Bay Area.

Additional Resources

West Nile Virus and Mosquito Control

- American Medical Association: [West Nile Virus: Review of the Literature](#)
- California Department of Public Health: [West Nile Virus overview](#)
- California Department of Public Health: [West Nile Virus website](#)
- California Environmental Quality Act (CEQA): [Exemption Notice](#)
- Centers for Disease Control and Prevention: [Mosquito Control at Home](#)
- Centers for Disease Control and Prevention: [West Nile Virus information](#)
- Centers for Disease Control and Prevention: [West Nile Virus Surveillance and Control Guidelines](#)
- Centers for Disease Control and Prevention: [What Mosquito Control Programs Do](#)
- County of Santa Clara Vector Control District - Adult Mosquito Control Treatment Email Notification: [Subscribe to the notification list](#)
- County of Santa Clara Vector Control District: [Adult Mosquito Control Treatment Information](#)
- County of Santa Clara Vector Control District: [Mosquito-Borne Virus Response and Operations Plan](#)
- County of Santa Clara Vector Control District: [Mosquitoes](#)
- County of Santa Clara Vector Control District: [Scientific Research Relating to West Nile Virus](#)
- [County of Santa Clara Vector Control District: West Nile Virus Activity in the County](#)
- U.S. Environmental Protection Agency: [Mosquito Control](#)

Pesticides and Treatment Materials

- Centers for Disease Control and Prevention: [Adulticides](#)
- Centers for Disease Control and Prevention: [Larvicides](#)
- Centers for Disease Control and Prevention: [Truck Spraying](#)
- [National Pesticide Information Center](#)
- Pesticide - Merus 3.0: [Label](#)

- Pesticide - Merus 3.0: [Safety Data Sheet](#)
- Pesticide - Zenivex E4: [Label](#)
- Pesticide - Zenivex E4: [Safety Data Sheet](#)
- U.S. Environmental Protection Agency: [Pesticides Approved to Control Adult Mosquitoes](#)
- World Health Organization: [WHO Specifications and Evaluations for Public Health Pesticides](#) (Etofenprox/Zenivex)

Research Studies on Adulticide Effects on Bees

- Comparison of the Effect of Insecticides on Bumble Bees (*Bombus impatiens*) and Mosquitoes (*Aedes aegypti* and *Culex quinquefasciatus*) by Standard Mosquito Research Methods: [Journal of Economic Entomology | Oxford Academic](#)
- Effects of Single and Multiple Applications of Mosquito Insecticides on Nontarget Arthropods: [BioOne Complete](#)
- Effects of truck-mounted, ultra-low volume mosquito adulticides on honeybees (*Apis mellifera*) in a suburban field setting: [PLOS ONE](#)
- Limited impacts of truck-based ultra-low-volume applications of mosquito adulticides on mortality in honey bees (*Apis mellifera*): [Bulletin of Entomological Research | Cambridge Core](#)
- The Effects of an Ultra-Low-Volume Application of Etofenprox for Mosquito Management on *Megachile rotundata* (Hymenoptera: Megachilidae) Larvae and Adults in an Agricultural Setting: [Journal of Economic Entomology | Oxford Academic](#)