

Mansfield Mosquito Control Frequently Asked Questions

Q: What is West Nile virus?

A: West Nile virus is a member of the family Flaviviridae (genus *Flavivirus*), that is closely related to members of the Japanese encephalitis virus complex that includes St. Louis encephalitis (SLE), Japanese encephalitis, Kunjin, and Murray Valley encephalitis viruses, as well as others.

Q: How many mosquito species are there in the State of Texas? How many of these mosquito species are potential carriers of West Nile Virus?

A: The Texas Department of Health estimates that there are approximately 82-84 mosquito species in the State of Texas. Only about 12 of these mosquito species, however, have been implicated in the transmission of serious diseases. Although it is difficult to determine how many of these species have the potential to carry West Nile virus, approximately 10 of these species have been identified as positive for West Nile Virus in other areas of the country. The mosquitoes most often found positive for WNV are typically *Culex* spp.

Q: Where did West Nile virus come from?

A: West Nile virus has been commonly found in humans and birds and other vertebrates in Africa, Eastern Europe, West Asia, and the Middle East. West Nile virus was first isolated in the West Nile province of Uganda in 1937. The first recorded large epidemics occurred in Israel during 1951-1954, and the largest recorded epidemic to date occurred in South Africa during 1974. Large human outbreaks of WN Encephalitis occurred in Israel in 2000 and have occurred in Southern France (1962), southeastern Romania (1996) and in south-central Russia (1999). Until 1999, West Nile encephalitis had not been documented in the Western Hemisphere. It is not known where the U.S. WNV originated, but it is most closely related genetically to strains found in the Middle East.

Q: How long has West Nile virus been in the U.S.?

A: It is not known how long it has been in the U.S., but Center for Disease Control and prevention (CDC) scientists believe the virus has probably been in the eastern U.S. since the early summer of 1999, possibly longer.

Q: I understand West Nile virus was found in "overwintering" mosquitoes. What does this mean?

A: One of the species of mosquitoes found to carry West Nile virus is the *Culex* species which can survive through the winter, or "overwinter," in the adult stage. An infected mosquito can likely harbor the virus during the winter months and can transmit the virus in the following year.

Q: How do people get West Nile encephalitis?

A: People become infected by the bite of a mosquitoes infected with West Nile virus.

Q: What is the basic transmission cycle?

A: Mosquitoes become infected when they feed on infected birds, which will have the virus in their blood. Infected mosquitoes can then transmit West Nile virus to humans and animals while biting to take blood. The virus is harbored in the mosquito's salivary glands, and during blood feeding the virus may be injected into the animal or human along with mosquito saliva. The virus may then multiply, possibly causing illness.

Q: How far can a mosquito travel?

A: Depending on the species, adult mosquitoes may fly several miles with help from the wind. *Culex* species, which are most commonly associated with the West Nile virus in this area, typically have a maximum travel range of two to three miles and are not considered to be strong fliers.

Q: How long do adult mosquitoes live?

A: Generally, adult female mosquitoes have a life span of 2 weeks to a month while adult male mosquitoes only live a week.

Q: What is the life cycle of a mosquito?

A: A mosquito goes through four distinct stages: egg, larva, pupa and adult.

Q: What is the egg phase of a mosquito?

A: Eggs are laid in clusters and tend to float on the surface of water. They can be stuck together in rafts of hundreds, or laid separately on water or flooded soil. Most eggs hatch into larvae within 48 hours. Adult female mosquitoes can lay eggs every 10-14 days.

Q: What is the larval stage?

A: In general, mosquito larvae live in water from 4 to 14, days depending on the water temperature. They come to the surface frequently to obtain oxygen and feed on algae and small organisms living in the water. The larva sheds its skin four times while it grows. After the fourth time, the larva becomes a pupa, the stage before the mosquito becomes an adult.

Q: What is the pupa stage?

A: The pupal stage is a resting, non-feeding stage. Mosquito pupae must live in water from 1 to 4 days, depending on the species and water temperature. When development is complete, the pupal skin splits and the mosquito emerges as an adult.

Q: What is the adult stage?

A: The newly emerged adult mosquito rests on the surface of the water for a short time to dry and allow all its parts to harden. If nothing eats or kills it, the female adult can live up to a month, the male typically only a week.

Q: What is the City of Mansfield doing to address the problem of West Nile Virus?

A: The City of Mansfield has developed a comprehensive plan aimed at reducing the risk of illness due to West Nile Virus. The main goal of this plan is to decrease the number of adult mosquitoes by eliminating mosquito-breeding sites wherever possible. In areas where the elimination of mosquito breeding grounds is not possible, larvicides will be applied. The City has also formed a partnership with the Tarrant County Health Department to perform mosquito surveillance activities during times of the year when mosquito populations are high. The City's mosquito control responses will be based on the likelihood of threats to human health from WNV or other mosquito-borne illness.

Q: If I live in an area where birds or mosquitoes with West Nile virus have been reported and a mosquito bites me, am I likely to get sick?

A: No. Even in areas where mosquitoes do carry the virus, very few mosquitoes—much less than 1%—are likely infected. Even if the mosquito is infected, less than 1% of people who get bitten and become infected will get severely ill. The Maine Environmental Policy

Institute (MEPI) estimates that in areas where West Nile Virus is endemic, approximately 1 in 1000 mosquitoes actually carry the virus. The MEPI also estimates that only 1 in 300 people bitten by a West Nile Virus infected mosquito will show any signs of sickness. Even if you contract the WNV and become ill, most people will only exhibit mild flu-like symptoms. The chances you will become severely ill from any one mosquito bite are extremely small. The greatest risk is to those over the age of 50 or individuals that have compromised immune systems. These members of the population should take the greatest care to prevent exposure to mosquito bites.

Q: How many types of animals have the potential to be infected with West Nile virus?

A: Although the vast majority of infections have been identified in birds, WN virus has been shown to infect horses, cats, bats, chipmunks, skunks, squirrels, and domestic rabbits.

Q: How does West Nile virus actually cause severe illness and death in humans?

A: Following transmission by an infected mosquito, West Nile virus multiplies in the person's blood system and crosses the blood-brain barrier to reach the brain. The virus interferes with normal central nervous system functioning and causes inflammation of brain tissue.

Q: What proportion of people with severe illness due to West Nile virus die?

A: Less than 1% of those infected with West Nile virus will develop severe illness. Among those with severe illness due to West Nile virus, case-fatality rates range from 3% to 15% and are highest among the elderly.

Q: A mosquito has bitten me. Should I be tested for West Nile Virus?

A: No. Illnesses related to mosquito bites are still uncommon in the United States. However, you should see a doctor immediately if you develop symptoms such as high fever, confusion, muscle weakness, severe headache, stiff neck, or light sensitivity.

Q: How long does it take to become sick if bitten by an infected mosquito?

A: Most people who are infected with WNV have no symptoms or only experience mild illness. If illness does occur, symptoms usually appear within 3 to 15 days after being bitten by an infected mosquito.

Q: What should I do if I think I have West Nile encephalitis (the illness from infection from West Nile Virus)?

A: Seek medical care as soon as possible if you develop signs of encephalitis. Signs include fever, muscle weakness, and confusion.

Q: Is there a vaccine against West Nile virus?

A: No, but several companies are working towards developing a vaccine.

Q: What can I do to reduce my risk of becoming infected with West Nile virus?

A:

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin, picaridin or DEET, since mosquitoes may bite through thin clothing.

- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35%) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands of children.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: "ultrasonic" devices are NOT effective in preventing mosquito bites.

Q: What can I do around my home to help reduce exposure to mosquitoes?

A:

- Repair or replace all screens in your home that have tears or holes.
- Eliminate any standing water that collects on your property.
- Remove discarded tires, tin cans, plastic containers, or similar water-holding containers.
- Make sure gutters drain properly. Clean gutters on a regular basis.
- Clean and chlorinate swimming pools, outdoor saunas, and hot tubs. If not in use, empty or cover.
- Drain the water from pool covers, tarps, etc...
- Change the water in birdbaths at least once a week.
- Turn over plastic wading pools, wheel barrows, etc... when not in use.
- Remind neighbors and / or form neighborhood organizations to help the entire neighborhood eliminate mosquito breeding sites.
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Q: What is the status of horse (equine) West Nile Virus Infection?

A: Near the end of December 2002, the Texas Department of Health reported that 1577 horses have tested positive for West Nile Virus within the State of Texas. The total number of organisms that have tested positive for West Nile Virus within the state (mosquitoes, humans, birds, and horses combined) was 2458. During 2003, the number of infected horses dropped to 663. The decrease is likely due to the widespread use of vaccines.

Q: What is the most effective means of mosquito control?

A: According to the Center for Disease Control and Prevention, source reduction is most effective and economical method of providing long-term mosquito control in many habitats. The term source reduction refers to the alteration or elimination of mosquito larval habitat. Source reduction can include activities such as the proper disposal of used tires, cleaning rain gutters, emptying and refilling bird baths on a weekly basis, and any activity which reduces small pools of water. An item as small as a bottle cap can be a potential mosquito breeding ground.

Q: Is larval control an effective means of controlling mosquitoes?

A: Yes. The Center for Disease Control and Prevention considers larviciding, or the application of chemical or biological agents to kill mosquito larva or pupae, as more effective and target-specific than killing adult mosquitoes, but less permanent than source reduction. The objective is to control the immature stages of the insect before adult populations can develop and disperse. If populations of adult mosquitoes are kept at low levels, the risk of arbovirus transmission is small. The *Bacillus thuringiensis israelensis* (Bti) donuts used by the City of Mansfield are an example of a biological larvicide.

Q: How can I get the *Bacillus thuringiensis israelensis* (Bti) donuts for my yard?

A: Many local stores selling home goods, feed stores and nurseries stock Bti in different forms. Bti is now also available in a granular form that can be sprinkled into water that has the potential to be a mosquito breeding ground, as well as the round mosquito dunks or donuts.

Q: Is adulticide and effective means of controlling mosquitos?

A: Adulticiding, or the killing of adult mosquitoes by ground or aerial applications of chemicals, is considered by the Center for Disease Control and Prevention to be the least efficient mosquito control method. There are several reasons adulticiding is not highly effective. For example, there are several different types of mosquitoes that have the potential to carry disease, each with its own particular preference for flight times and habitats, which makes timing spray events difficult. In areas where there are many houses, trees, and other obstructions, the chance of actually hitting a mosquito with the spray cloud is greatly diminished. Although it is very difficult to measure the efficacy of a large spray event, the results of trap experiments conducted in Houston and Florida suggest that a large spray event will typically reduce the adult population of mosquitoes by only about 30 percent (8).

Q: Does the City of Mansfield plan to apply pesticides?

A: If West Nile Virus is found in the community, the City's initial response will be to intensify efforts to reduce mosquito populations through source reduction and larviciding in those areas where WNV has been found. Reducing the adult mosquito populations through the use of pesticide aerosols (fogging) will only be considered if there are conditions indicative of Risk Level Three or above (Public Health Alert) **and** if other control measures appear to be ineffective. If adulticiding is implemented, applications will be targeted to only those areas in which the adult mosquito populations have tested positive for the presence of WNV or other mosquito-borne diseases of human health concern. No adulticiding will be used as a means of controlling nuisance populations of mosquitoes.

Q: What risks are associated with applying mosquito adulticides?

A: In the amounts used, the risks to people, pets, and the environment are relatively low. However, some people or pets may be more sensitive to pesticides and should therefore attempt to minimize exposures. Anyone experiencing persistent or significant adverse reactions to pesticides should seek medical care or call the North Texas Poison Center:

North Texas Poison Center
Parkland Memorial Hospital
5201 Harry Hines Blvd.

Dallas, TX 75235

Emergency Phone: (800) 222-1222

<http://www3.utsouthwestern.edu/parkland/poison.html>

Q: Will the public be notified in advance about spraying activities?

A: Residents can learn about adulticiding schedules in advance through public service announcements, the media, and the City of Mansfield's web site (www.mansfield-tx.gov)