



MOSQUITO CONTROL

GUIDE

mosquito.buzz
...stay outside

Understanding how to prevent and protect ourselves from exposure to mosquitoes is very important. The transmission of diseases like the West Nile virus has become a major public health and safety concern.

INSIDE YOU'LL LEARN:

- The Life Cycle of the Mosquito
- West Nile Virus
- How to Protect Yourself from Mosquitoes
- Preventing Mosquito Populations
- Effective Control Options against Mosquitoes

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LIFE CYCLE OF THE MOSQUITO

Understanding the different stages of the mosquito's life cycle can help prevent and effectively eliminate populations before they become a problem. All mosquito species have four distinct stages to their life cycle. Egg, Larvae, Pupa, and Adult. There are over 300 species of mosquitoes in the world. The most common and most dangerous, are the Culex mosquitoes. The Culex pipiens is the main carrier of the West Nile virus.

Eggs

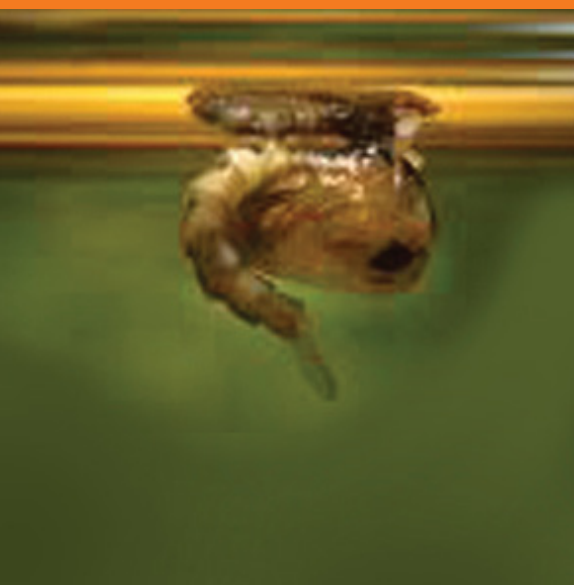
Female mosquitoes lay hundreds of eggs about every few days during their lifespan directly on or near water. Some eggs are laid in spots that will flood at a later date, surviving in dry conditions for months. Water is required in order for the eggs to hatch. Eggs hatch into larvae.

Larvae

After eggs hatch, larvae emerge. Larvae are referred to as "wigglers" because of how they appear when they swim. The length of time to hatch depends on water temperature, food, and type of mosquito. Larvae live in the water; molting several times while they feed on organic matter, and develop into the third stage of their life cycle called the Pupa. Larvae live close to the surface where they breathe through tubes. Larvae can be effectively controlled using products that poison them or block their breathing.



LIFE CYCLE OF THE MOSQUITO



Pupae

As larvae continue to develop through their molting process the mosquito moves into its third life stage called the pupae stage. The pupae does not feed during this stage in the life cycle. Pupa continue to live in the water and are often referred to as a “tumblers” for the way they fall into deeper parts of the water as they avoid predators. Pupae continue to breathe through tubes near the surface of the water just like the larvae do. Pupae emerge into adult mosquitoes within several days depending on species, and water temperature.

Adult

Adult mosquitoes emerge from the water and begin flying a short time after they have dried out and their body parts have hardened. Male mosquitoes begin mating with females after their reproductive organs have fully developed. This usually takes a day or two. Male mosquitoes live for about 3 to 5 days after mating. Female mosquitoes mate once, but continue to lay eggs after every blood meal. Under ideal conditions, females can live upwards of a month.

WEST NILE VIRUS

The West Nile virus is a mosquito-borne infection. Infected mosquitoes can spread the virus to humans and other animals. West Nile virus is usually spread by the bite of a mosquito that has fed on an infected bird. Most people who get West Nile virus experience no symptoms or only mild flu-like symptoms, but it can cause serious illness and there are few medical options to treat or prevent it.

Who is at Risk for the West Nile virus. (WNV)

Anyone can become infected if they are exposed to a mosquito bite. It only takes a single bite from an infected mosquito to contract West Nile virus. The risk of WNV varies from year to year based on precipitation, temperature, and mosquito populations. The highest risk periods are generally when mosquito populations are at their peak during the summer months. Individuals spending time outdoors are greater risk of exposure. Some people are at greater risk for serious health effects from West Nile virus. These include people:

- over the age of 50
- with chronic diseases, such as:
 - > cancer
 - > diabetes
 - > alcoholism
 - > heart disease
- who require medical treatment that may weaken their immune system, such as chemotherapy



WEST NILE VIRUS



What are the symptoms of WNV?

While most people who get WNV (70%-80%) show no symptoms and do not become ill, others may show mild symptoms. Symptoms can range from mild to severe. First symptoms usually appear within 2 to 15 days after infection.

Mild symptoms may include:

- fever
- headache
- mild rash
- body aches
- Very few people (fewer than 10% of those with symptoms) have severe symptoms that affect the central nervous system (nerve tissues in the brain and spinal cord)

Severe symptoms may include:

- very bad headache
- fever
- stiff neck
(you might have trouble moving your neck side-to-side)
- nausea or vomiting
- difficulty swallowing
- drowsiness
- blurred vision or worsening eyesight
- confusion
- muscle weakness and reduced coordination

TREATING WEST NILE VIRUS

There is no specific treatment or vaccine for West Nile virus infection in humans. Health care professionals diagnose WNV infection based on: Patients symptoms, geographic location and time of year they were bitten, and the results of laboratory tests. Hospitalization or nursing care may be necessary.

Although most people with serious symptoms and health effects fully recover, others can experience long term, ongoing health problems.

These problems may include:

- Physical effects, muscle weakness, headaches
- Mental effects, confusion, depression, concentration, memory loss
- Functional effects, physical activities, routine daily tasks



PREVENTING MOSQUITO POPULATIONS ON YOUR PROPERTY



The most effective way to avoid becoming infected with West Nile virus is to prevent mosquito bites. Prevention is the first line of defence against WNV.

Reducing Breeding Areas

Eliminating and removing possible breeding habitats for mosquitoes can greatly reduce populations. Mosquitoes breed in standing stagnant water. Eliminating as many of these sites as possible will reduce the incidence of mosquitoes in the vicinity. Poorly drained areas such as low spots, depressions, tire ruts or other areas that collect water need to be remedied and minimized. Items that collect water such as bird baths, old tires, rain barrels/buckets, and clogged gutters need to be monitored and emptied after rain. Catch basins and other areas collecting water should be monitored closely to ensure standing water does not persist.

EFFECTIVE MOSQUITO CONTROL OPTIONS



Reducing Exposure

Aside from not going outside, taking precautions when you do go outside will greatly reduce one's exposure. Wearing a long-sleeved shirt and long pants with socks will cover most of the body thus greatly eliminating exposed skin for mosquitoes to bite. Applying insect repellent to the parts of the body that are exposed will help deter and prevent mosquitoes from biting.

Prevention for You and Your Family:

Apply an appropriate insect repellent that contains DEET, Icaridin, oil of Lemon Eucalyptus, and soybean oil when outdoors and follow the manufacturer's instructions on the label.

- Wear light coloured, loose-fitting clothing with long sleeves and pant legs while outdoors.
- Reduce time spent outdoors between the hours of dusk and dawn.
- Make sure your doors and window screens fit tightly and are free of holes.
- Reduce the mosquito habitat around your home by regularly cleaning and emptying water holding containers such as bird baths, wading pools, children's toys, eavestroughs, tarp covers and plant trays.
- Ensure that rain barrels are covered with a fine screen and tightly sealed around the downspout.
- Clean your yard of old tires, empty flower pots, buckets and any other debris where water collects.
- Keep grass mowed and vegetation trimmed around high use areas (ex: doorways & seating areas).

EFFECTIVE MOSQUITO TREATMENTS

There are several different approaches one can take when trying to control mosquitoes. These options may include reducing the mosquito breeding areas, secondly reducing ones exposure to mosquitoes, and thirdly treating mosquitoes with effective control products, thus eliminating them all together.

Larvacides targets mosquito larvae in their breeding habitat before they can mature into an adult. Larvacide products are applied directly into the water as a liquid or granular pellets and are consumed by the mosquito larvae.

Bti (*bacillus thuringiensis israelensis*) is a naturally occurring bacteria that is commonly used as a natural larvacide. Bti pellets are dropped into mosquito breeding areas where the larvae eat the bacteria, quickly killing them. Bti is not harmful to animals, birds and most other insects.

Methoprene is an insect growth regulator used to control mosquito larvae. Methoprene applications interrupt the life cycle of the mosquito and prevent it from reaching maturity and reproducing. Methoprene degrades rapidly in water and is slightly toxic to some fish species.

Adulticides targets the adult life cycle of mosquitoes. They are commonly applied as ultra-low volume sprays (ULV) or through fog. Adulticides provide quick, powerful, and immediate response.

Malathion – an organophosphate often used to treat crops against a wide array of insects. It can be sprayed directly onto vegetation, such as the bushes where mosquitoes like to rest, or used in a 5 percent solution to fog the yard. In the small amounts used for mosquito control it poses no threat to humans or wildlife. In fact, malathion is also used to kill head lice.

Permethrin – one of a group of chemicals called pyrethroids, it is a synthetic form of a natural insecticide found in chrysanthemum flowers. It usually is mixed with oil or water and applied as a mist, about 1/100th of a pound per acre. Like malathion, permethrin kills mosquitoes by disrupting their central nervous systems. Not harmful to people and animals in small amounts, but it is toxic to fish and bees.



OTHER METHODS OF MOSQUITO CONTROL



Space Sprays

Aerosol space sprays can be used to kill adult mosquitoes. Space sprays can be used indoors when mosquitoes get inside the house. They provide immediate knockdown using synergized pyrethrum.

Mosquito Traps

There are several variations of mosquito traps that utilize different methods of attracting and killing mosquitoes. CO2 systems, lighting arrays, attractant lures, Heat systems, and catch systems are common features found on mosquito traps.

Mechanical Barriers

Mosquitoes can be kept out of a home using mesh screens on doors and windows. Outdoor living furniture and structures can also be screened to keep mosquitoes out.

Vegetation Management

Adult mosquitoes prefer to rest on plants and vegetation. Reducing the number of areas they can find shelter and replacing these areas with plants that deter mosquitoes can help reduce populations such as: Basil, Lavender, Lemon Grass, Lemon Thyme, Mint, and Rosemary.

MOSQUITO F.A.Q



How long do mosquito bites last?

The bumps are actually an allergic reaction to mosquito saliva. The reaction can vary from person to person, but usually bites last no more than 24 hours. Try a topical anti-itch cream or an anti-histamine such as Benadryl.

Does a mosquito have teeth?

No. A mosquito has a proboscis, which is a long, pointed mouth part used to pierce the skin. It contains two tubes; one for injecting saliva and one for drawing blood.

How many times can a mosquito bite?

A female will continue to bite and draw blood until her abdomen is full. If she is interrupted before she is full, she will fly to the next person. After feeding, the mosquito rests for two or three days before laying her eggs, then is ready to bite again.

How do mosquitoes spread malaria?

The mosquito feeds on an infected person and picks up the Plasmodium parasite. The parasite develops in the mosquito's body for about two weeks. When the mosquito feeds, the Malaria parasite is passed on in saliva. They transmit West Nile virus and other diseases in similar ways.

How long does a mosquito live?

Males usually live about five to seven days, while females can live two weeks to a month, under ideal conditions. However, the females of some species hibernate during winter, so they can live several months.

Can a mosquito pass HIV?

No. Mosquitoes actually digest the virus, so it does not replicate and is broken down before it can be transmitted to someone else. Also, mosquitoes pass such minuscule amounts of blood when biting that infection is not possible.

How much blood can a mosquito drink?

When its abdomen is completely full, between 0.001 and 0.01 milliliters, depending on the species.

MOSQUITO F.A.Q

At what range can mosquitoes detect a person?

A mosquitoes can sense plumes of carbon dioxide from human breath at several hundred feet. At under 100 feet, it can smell the odors of human skin.

How do male mosquitoes find females?

By the sound of their wings. The females can beat their wings up to 500 times per minute, and the males listen for that frequency when seeking a mate.

Why do some people get bitten more than others?

Scientists aren't sure what makes certain people more attractive to mosquitoes. They know that mosquitoes are drawn by large amounts of carbon dioxide and heat. They also prefer the scent of cholesterol, folic acid, bacteria from drying sweat and many perfumes, colognes and shampoos.

