


Mosquitoes

in our communities

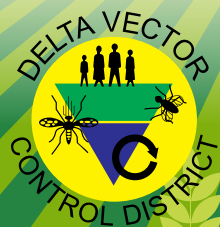
The handy guide for concerned citizens,
families, community leaders, and businesses

A hand is shown pointing towards a small mosquito that is perched on a wooden ruler. The ruler is marked in inches, with the mosquito positioned just below the 1-inch mark. The background is a light green gradient with a stylized mountain range.

These **SMALL** insects
have **LARGE** impacts
on our way of life in
Tulare County

Get the Answers You Need

- Which insect repellents work best?
- Should I worry about West Nile virus, Zika or dengue fever?
- How do I get rid of mosquitoes?



Delta Vector Control District
1737 W. Houston Ave., Visalia, CA 93291
559-732-8606

Tulare Mosquito Abatement District
6575 Dale Fry Rd., Tulare, CA 93274
559-686-6628

Protecting Public Health from Vector-borne Disease

Know the Biology,

No one has ever welcomed mosquitoes into their neighborhood. These insects leave itchy bites and have the potential to vector (transmit) diseases to people and pets.

There are more than 3,500 species of mosquitoes worldwide. California is home to more than 50 species, at least 15 of which are found in Tulare County. A few species have negative impacts on human health. Working with residents, Delta Vector Control District (DVCD) and Tulare Mosquito Abatement District (TMAD) monitor and control mosquitoes.

To understand how to keep your home mosquito-free, let's go over some basics.

What is a Vector?

A vector is any animal or insect that is capable of transmitting a disease. More than 725,000 people worldwide die every year from diseases transmitted by mosquito bites.

Doing Our Part

Since the early 1900's, DVCD and TMAD have monitored and identified populations of both vectors and nuisance species, and controlled for mosquitoes in your communities. The Districts can identify any vector or nuisance species, such as the following:



Mosquito



1/4 - 1/2 Inch

Tick



up to 1/4 inch



Midge




up to 1/2 inch

Know the Threat


Mosquito Life Cycle (“Where Do They Come From?”)

Egg Raft  (lay on standing water)
or Individual Eggs  (lay above water line)

All mosquitoes need standing water to complete their life cycle. After a female mosquito takes a blood meal (bites), she will look for standing water to lay her eggs. Some species of mosquitoes can lay their eggs in containers as small as a **bottle cap!**

Larva 
 (in water)

Larvae (“wigglers”) are often found at the surface of the water where they breathe. Larvae feed on bacteria and algae in the water and shed their skin four times as they grow.

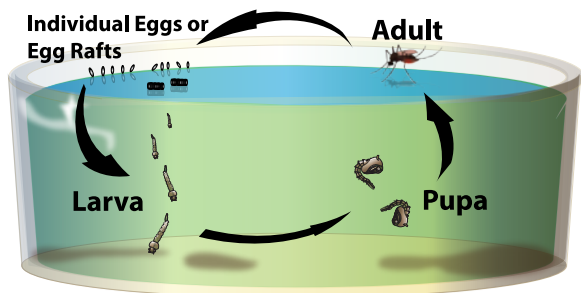
Pupa 
 (in water)

Pupae (“tumblers”) do not feed, but still breathe at the surface of the water.

Adult 

Most people recognize adult mosquitoes. Mosquitoes feed on plant juices for food. **Only female mosquitoes bite** to receive protein needed to produce eggs.

It takes only  **7** days!



Did you know?

Vector control has free mosquitofish that eat mosquito larvae and pupae for your fountains, ponds & water troughs.

Meet The Insects That



“We have mosquitoes?” Yes! At least 15 different species of mosquitoes live in Tulare County. However, for most residents, **two groups (genera)** of mosquitoes pose the most significant public health risks: *Aedes* and *Culex*.

Our Districts continue to monitor and control these mosquitoes wherever they are found. These threats exist where you live, sleep, work, and play.

Aedes Mosquitoes



Residents can quickly identify *Aedes* mosquitoes by their black-and-white stripes. The *Aedes* mosquitoes that pose the greatest health risks are *Aedes aegypti* (yellow fever mosquito) and *Aedes albopictus* (Asian tiger mosquito). *Aedes* mosquitoes thrive in man-made containers and do not fly far. If you are getting bites, the standing water is probably in your own yard.

Remember!



Aedes aegypti and *Aedes albopictus* are from the tropics and do not belong in Tulare County. People can accidentally bring their eggs into our ecosystem through plant shipments, travel, and commercial activities.



Known to Transmit:	To People: Zika, yellow fever, dengue fever, and chikungunya To Pets: Canine heartworm
Lives and Breeds:	Indoors and outdoors - Prefers small containers with standing water
When They Bite:	Aggressively all day, from dawn to dusk 
Primarily Bite:	People, occasionally other mammals
Lay Their Eggs:	Individually - Eggs can survive on containers/plants for years 
Life Cycle:	From egg to adult in about 7 days

Bug Us The Most

Culex Mosquitoes

Culex mosquitoes are the most prevalent in our cities. They thrive in natural and man-made sources of highly organic standing water. *Culex* mosquitoes can fly a few blocks to 3 miles in search of a blood meal. While these mosquitoes primarily feed on birds, they occasionally feed on people, which is how West Nile virus is spread.



Did you know?

The mosquito species in our cities do not swarm. If you see swarming insects, they're most likely not mosquitoes.

Remember!





1/4 - 1/2 Inch
Size of Mosquito




Known to transmit: To People: West Nile virus, St. Louis encephalitis and Western equine encephalitis. To Pets: West Nile virus (horses and birds) and Canine heartworm.

Lives and Breeds: Outdoors - Prefers larger containers or sources such as pools, ponds and gutters with standing water

When They Bite: Dawn and dusk 

Primarily Bite: Birds, occasionally people and other animals  

Lay Their Eggs: Egg raft containing up to 250 eggs
Dump standing water! 

Life Cycle: From egg to adult in about 7 days

It Only Takes One Bite,

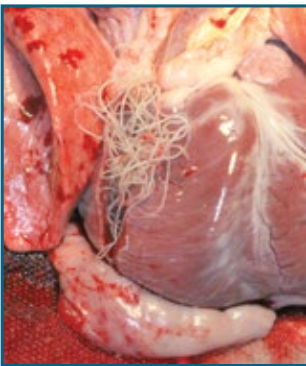
Thousands of people become ill or die from mosquito-borne diseases worldwide every month. Understanding what and where these diseases are is an important step in protecting yourself and your family. Vector control regularly uses mosquito traps to catch and test the mosquitoes in your community. Using trap results, we can more effectively prevent local outbreaks. Here are the diseases that are considered significant public health threats.

West Nile Virus

When mosquitoes infected by West Nile virus (WNV) bite, they can transmit the virus to people. Symptoms include body aches and fever. More severe cases can result in paralysis, coma, or death. There is no cure or vaccine for humans.

Canine Heartworm

Certain *Aedes* and *Culex* mosquitoes can transmit a roundworm that lives in the hearts of dogs and cats. Heartworm is transmitted from one animal to another by the bite of an infected mosquito.



Zika

Zika is transmitted from person to person through the bite of an infected mosquito or through sex. People infected with Zika can develop mild to moderate symptoms that include body rashes, conjunctivitis (red eye), and fever. Fetuses infected with Zika have a higher risk of developing severe birth defects. There is no cure or vaccine.

Other Diseases of Concern

- Yellow fever
- Dengue fever
- Chikungunya
- St. Louis encephalitis
- Western equine encephalitis

To Learn More:

www.cdc.gov

www.cdph.ca.gov

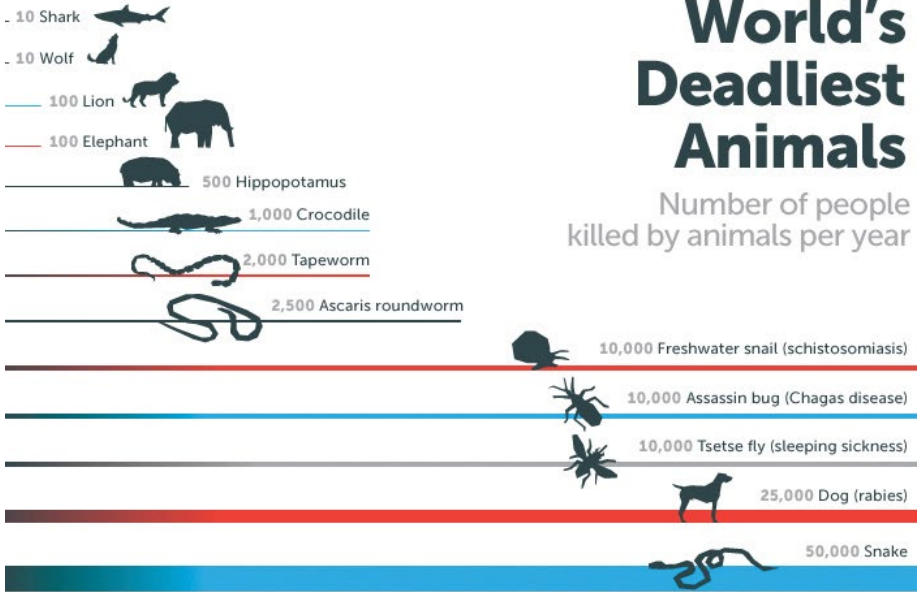
Remember!



Only female mosquitoes bite and are responsible for transmitting diseases to people and pets.

Don't Risk Your Health

Number of deaths | Killer



World's Deadliest Animals

Number of people killed by animals per year



475,000
Human



725,000
Mosquito

SOURCES: WHO; crocodile-attack.info; Kasturiratne et al. (doi.org/10.1371/journal.pmed.0050218); FAO (webcitation.org/6OgpS8SVO); Linnell et al. (webcitation.org/6ORL7DBUO); Packer et al. (doi.org/10.1038%2F436927a); Alessandro De Maddalena. All calculations have wide error margins.

Protect Your Family &

Did you know patios and yards are the #1 source of mosquito problems? While the Tulare County Districts protect your health from mosquito-borne diseases, you can do your part by hunting down these common sources at least once a week during the spring, summer, and early fall.

Where Do Mosquitoes Grow?



In anything that can hold water for more than 5 days

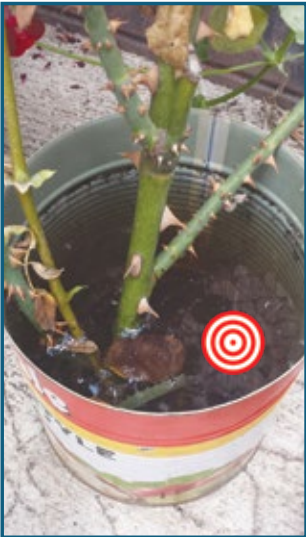
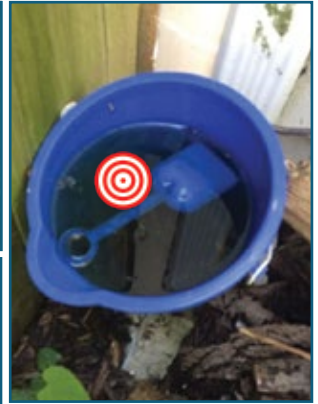


Avoid an embarrassing yard or patio full of mosquito sources:

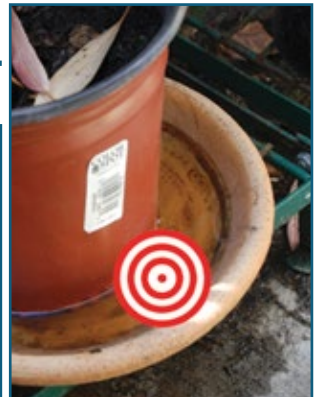
- Remove all standing water!
- Tightly screen/seal containers
- Drill holes in bottoms of containers
- Dispose of old containers not in use
- Chlorinate pools and fountains
- Empty & clean pet dishes weekly



Take Back Your Home



Dump out any standing water at least once a week



**Don't Let Mosquitoes Take Over Your Home.
Be the Master of Your Domain!**

Stop the Bites and



Insect Repellent - Which is Best?

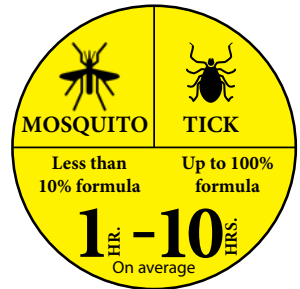
Not all repellents are equal. Which repellent is best for you depends on your age, activities, and type of pest you'll encounter. Use this guide to start your search for the most effective repellent ingredients registered with the U.S. Environmental Protection Agency and recommended by the CDC. **ALWAYS FOLLOW LABEL INSTRUCTIONS** when applying repellent.

DEET

Repellents containing DEET are available in a variety of forms. DEET is considered one of the most effective and popular ingredients to use against mosquitoes and other biting insects.



For Children: Over 2 Months

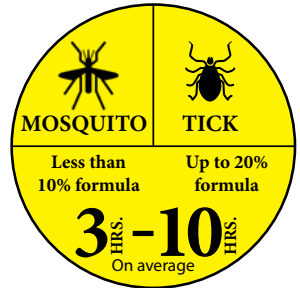


Picaridin

For many people, Picaridin is an effective alternative to DEET. Picaridin is generally odorless and colorless, allowing many brands to offer pleasantly-scented options.



For Children: Over 2 Months



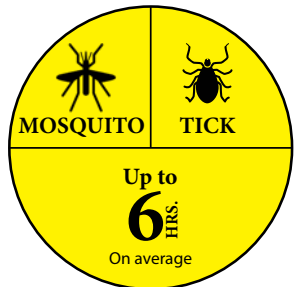
Oil of Lemon Eucalyptus

This is a natural plant-based repellent that is available as pump sprays and lotions.

Oil of lemon eucalyptus repellents provide similar protection to that of products containing DEET.



For Children: Over 3 years



More info: www.epa.gov/insect-repellents

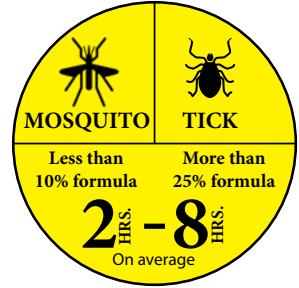
Repel the Mosquitoes

IR3535

Repellents containing IR3535 are available as aerosol, pump sprays and wipes. Be advised that this formula is an eye irritant.



For Children: Over 6 Months



Facts About Repellent



Bracelets only protect the area around the wrist.



Belt Fans and Candles only protect the area immediately around the device. A strong breeze can easily render these useless.



Citronella and other “mosquito plants” will not repel mosquitoes on their own. Leaves must be crushed and repellent oils extracted to be effective.



Stop the Bites!

In addition to eliminating standing water and using insect repellent, follow these steps to prevent further mosquito bites at home and when traveling:

- Maintain screens on windows and doors
- Wear loose-fitting long sleeves and pants
- Once a month, inspect your rain barrels to make sure lids are tightly screened and in good repair with no holes
- Stay alert, traveler! - Watch CDC's travel advisories and follow recommendations



Notice mosquito breeding sources in your neighborhood?

Are you experiencing mosquito bites?

Contact DVCD at www.deltavcd.com or call (559) 732-8606

Contact TMAD at www.tularemosquito.com or call (559) 686-6628

Controlling Mosquitoes & Outbreaks

You're not alone in the fight against mosquitoes. We work **tirelessly** to minimize public health risk to our communities.

Next time you see this:



Think this:



Monitoring and Controlling:

- **Inspecting underground storm drain and catch basins** - Millions of mosquitoes seek safety and breeding sites right underneath your feet!
- **Monitoring vectors using traps** - Mosquitoes are analyzed and tested for mosquito-borne diseases to ensure swift response to protect your family.



- **Surveying dairy pits and other agricultural sources** - Here in Tulare County we have a lot of agriculture! Our technicians check for potential sources, looking for places that are known to hold water, like dairy pits and basins, or ones that are incidentally holding water from irrigation. Any standing water is a place mosquitoes can breed!

Prevention Starts with Education:

Different presentations are available and customizable to suit the needs of various audiences. Potential educational opportunities include, but are not limited to:

- Service organizations and other club meetings
- Community events
- Fairs
- Classrooms



Contact your District for more information!

In Your Neighborhood:

- **Inspecting dirty, green swimming pools** - One pool can produce at least 10,000 mosquitoes a week! Making sure pools in our community are in working order is essential.
- **Yard Inspections** - Due to the cryptic nature of some breeding habitats, homeowners may be completely unaware of the breeding taking place in their own backyards!



Protecting Your Community


Public Health Pesticides

As part of our Integrated Vector Management (IVM) strategy, we always attempt to physically remove the source of mosquito breeding first. That's why we always say "Get rid of stagnant water!"



However, when physical control isn't possible or if there is a serious and immediate threat to public health, we will use pesticides to eliminate the public health threat. Our various approaches take the environment into account and pose minimal risk to humans and animals.

Fighting Larvae and Pupae

 A majority of our pesticide use is on immature stages of mosquitoes. Tackling mosquitoes in standing water is extremely effective using the following materials.

B.t.i. (*Bacillus thuringiensis*) and B.s. (*Bacillus sphaericus*)

Naturally-occurring soil bacterium that targets mosquito larvae

Methoprene

Mosquito juvenile hormone

Spinosad

Naturally-occurring bacterium


Surface film oil

Prevents larvae and pupae from breathing.

Mosquitofish

These hardy fish will gobble up mosquito larvae and pupae in your pond and fountain

Fighting Adult Mosquitoes

It is more difficult to control mosquitoes when they're flying, but tools are available to control a mosquito infestation or disease outbreaks. These materials target the adult mosquitoes (adulticides). 

Most applications of adulticides use less than 1 fl. oz. (2 tbsp) per acre. They're dispersed in diluted amounts as ultra-fine droplets, which break down to harmless ingredients very quickly in the environment.

Pyrethroid and Pyrethrin

Derived from chrysanthemum flowers

For more information, visit npic.orst.edu/

Don't Be Fooled

There are many insects that look like mosquitoes, but they are not! Don't let these mosquito imposters bug you. These insects have short life spans and will usually go away in a couple weeks.

Midge

up to 1/2 inch



Crane Fly

up to 2 inches



Fungus Gnat

up to 3/8 inch



Mosquito Breeding Hunt Checklist

Most mosquito problems exist in backyards and patios. Spending **10 minutes a week** to dump stagnant water will greatly reduce the risk of getting bit by mosquitoes and getting sick. Here are the top mosquito problems commonly found around a home:



- Rain barrels and containers
- Trash and trash bins
- Roof rain gutters & street gutters
- Bird baths and fountains
- Plant containers and plant saucers
- Troughs and pet water bowls
- Toys that hold water
- Yard drains
- Tarps
- Ponds
- Swimming pools and spas

Wheelbarrows

Old tires

Other Tips:

- Fix broken window screens
- Fix leaking water
- Inform your neighbors

Remember!

Aedes eggs are stuck to containers even if you dump out stagnant water. Sanitize with a 10% bleach solution weekly and dispose of containers you aren't using.

No Standing Water. No Mosquitoes. No Diseases.

You Need to Read This Mosquito Guide

Do any of these fit into your lifestyle or future plans? If you answer “Yes” to at least one of the following, then you need to read this!



Travel



Have a family



Own or Rent Home



Go to Outdoor Events



Collect Rain Water



Share Plant Cuttings



Own Pets



Hike or Camp

Mosquito Control is a Joint Effort in Tulare County



**You play a vital role in preventing a
disease outbreak in your neighborhood!**



Did You Know...?

- DVCD and TMAD cover a combined area of more than 1,270 square miles - That's almost as large as the state of Rhode Island!
- Our agencies have **disease outbreak emergency plans** that include local and state public health agencies. If there's a disease outbreak, such as Zika, know that multiple agencies will be there for you and your family.



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