



INSECT REPELLENTS

	DEET	Picaridin	Oil of Lemon Eucalyptus	IR3535	Permethrin
Repels mosquitoes	Yes	Yes	Yes	Yes	Yes
Repels ticks	Yes	Yes	Yes	Yes	Yes
Effectiveness	Highly effective	Highly effective	Highly effective	Moderately effective	Highly effective
Duration of protection	2-8 hours	3-10 hours	2 hours	4-6 hours	5 to 7 washes* <small>*Applied to clothing, not skin</small>
Use on children	Over 2 months	Over 2 months	Over 3 years	Over 2 months	All ages

These products are recommended by the CDC. Always follow the product label for directions. Effectiveness varies depending on the concentration of the ingredients.



When applying insect repellents on the skin (not Permethrin):

- Avoid the eyes and mouth. Do NOT spray the face.
- Do NOT apply repellent to children's hands.
- Keep repellents out of reach of children.
- ALWAYS follow the product label.

Mosquito concerns or complaints

Infestations of mosquitoes or standing water causing mosquito breeding can be reported on the WNV website at www.westnile.state.pa.us

If a dead bird is found, please contact the county coordinator, or visit the website listed above.

For more information about Lebanon County's WNV program, visit www.lccd.org/mosquito-borne-disease-program

Coordinator: Antonio Alvarado, MS

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Email address: antonio.alvarado@lccd.org



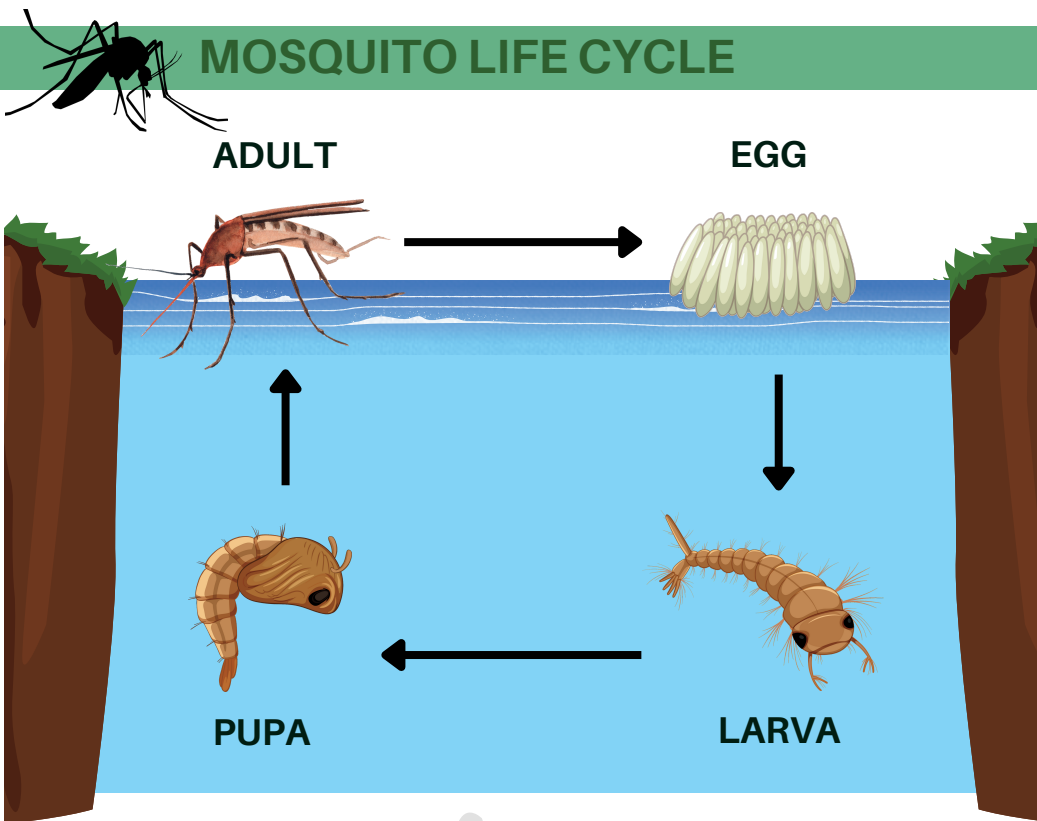
WARD OFF WEST NILE.

Lebanon and Lancaster Counties



Learn more about West Nile virus, mosquito bite prevention, and the Lebanon and Lancaster County Mosquito-borne Disease Control Program

MOSQUITO LIFE CYCLE



- There are four life stages in the mosquito life cycle: egg, larva, pupa, and adult.
- Mosquito eggs are laid on the surface of water or in damp areas that will become submerged in water like flood zones and tidal marshes.
- After the egg hatches, larvae feed on microorganisms or plant matter in the water. They come to the surface to breathe air with the tube on the back.
- The larva then turns into a pupa and stops feeding.
- After a few days, the adult mosquito develops inside the pupa and emerges into the flying form on the surface of the water.
- Only the adult females feed on blood to get nutrients for her eggs.

CULEX MOSQUITOES



What do they look like?

Culex (pronounced cue-lecks) mosquitoes are small brown mosquitoes that usually feed on birds. They bite from sunset to sunrise. Sometimes they will feed on mammals like humans and horses.

Where do they live?

Culex mosquitoes lay eggs in rafts on the surface of standing water that is nutrient rich. Examples of larval habitats include catch basins/storm drains, retention basins and swales, clogged rain gutters, and sewage treatment plants. Adults will rest in shaded bushes, trees, and other plants.

Are they a health risk?

Yes, these mosquitoes can transmit West Nile virus. You may not notice their bite during dusk or dawn, so it's very important to wear insect repellent.

Mosquito prevention tip #2

Bat boxes are not effective tools for controlling mosquito populations around your home in Pennsylvania. It is a myth that they eat up to 8,000 mosquitoes per night. Although some bats eat mosquitoes, they prefer larger insects that provide more energy like moths! Additionally, citronella candles are not recommended for effective bite prevention. Instead, use a fan to blow mosquitoes away from you.

The Lebanon and Lancaster County West Nile virus program pro-actively treats catch basins with larvicide during the mosquito breeding season. Do not dump yard waste or litter in catch basins since that can clog them.



ASIAN TIGER MOSQUITOES

WEST NILE VIRUS

What do they look like?

Asian Tiger mosquitoes are black mosquitoes with white stripes on their legs and a distinct stripe down the middle of their thorax (body part where the legs and wings attach to). They are aggressive and bite during the daytime.

Where do they live?

Asian Tiger mosquitoes lay their eggs one-by-one in artificial containers like bird baths, buckets filled with water, tires, and corrugated drain pipes. Adults rest around shaded vegetation. They are Lancaster and Lebanon County's biggest nuisance mosquito.

Are they a health risk?

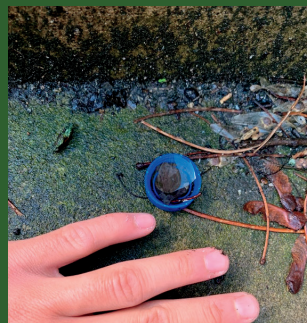
Although these mosquitoes are not normally associated with West Nile virus transmission, they can spread other diseases like Dengue, Zika, and Chikungunya.

Mosquito prevention tip #1

Natural plant oils like lemongrass, cedar oil, and peppermint can cause skin irritations. Many natural plant oil products have not been properly tested for preventing mosquito bites and only prevent mosquito bites for a short amount of time. Instead, use EPA-registered products, which are tested for effectiveness. These effective products contain either DEET, Picaridin, IR3535, Permethrin, and Oil of Lemon Eucalyptus (OLE).

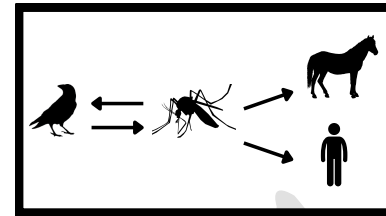
Mosquitoes only need 1 bottle cap of water to survive!

Removing containers from your yard is the best way to stop these pests from annoying you.



What is West Nile virus?

West Nile virus (WNV) is a mosquito-borne virus that can, in rare cases, cause encephalitis or inflammation of the brain. It was first reported in the United States in 1999.



Graphic illustrating the WNV transmission cycle. Notice how horses and humans cannot transmit the virus back to mosquitoes.

WNV transmission cycle

In nature, WNV is transmitted between several types of birds and *Culex* mosquitoes.

- A bird infected with WNV is bitten by a mosquito.
- The mosquito gets the virus after feeding on the bird and can spread the virus in about 1 week.
- The infected mosquito will feed on uninfected birds and transmit the virus to new birds.
- Sometimes the infected mosquito will feed on humans or horses, which can get sick or die from the infection.
- Horses and humans are called "dead end hosts" because they cannot spread the virus to uninfected mosquitoes.

Who is at risk for WNV?

Although everyone is at risk for WNV, people over the age of 50 are at increased risk for a more severe form of the disease. There is no cure or vaccine for humans (there is a vaccine for horses).

NO symptoms in MOST people

About 80% of people who are infected with WNV will not show any symptoms.

MILD symptoms in SOME people

1 in 5 people infected will develop a mild infection: symptoms include fever, headache, body aches, and skin rash.

SEVERE symptoms in FEW people

1 in 150 people infected will develop a severe infection; symptoms include fever, headache, neck stiffness, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and possibly death.



DEFEND YOUR YARD AND FAMILY

WHAT OUR PROGRAM DOES



Most mosquitoes are weak fliers. If they are biting you around your yard, they are most likely breeding around your home. Check your yard for containers holding water. There are many unconventional items that hold water like the folds in tarps, clogged rain gutters, corrugated pipes, and wheelbarrows.

Things you can do:

EVERY WEEK

- Tip and toss containers that are holding water.
- Turn containers and wheelbarrows over, so that they cannot collect water.
- Change the water in bird baths.
- Trim bushes and vegetation to reduce adult mosquito resting habitat.

ONCE A MONTH

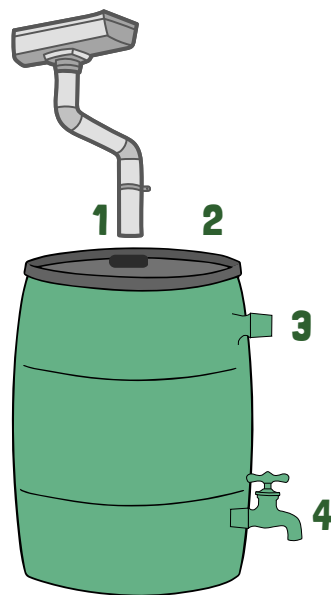
- Use larvicide (an insecticide that kills mosquito larvae) to water that cannot be removed. Mosquito Dunks® are safe and effective products sold in most home improvement stores.

WHEN NECESSARY

- Repair any tears or rips in window screens to prevent mosquitoes from entering your home.
- Clean leaves and debris from gutters, which can hold water if they are clogged.
- Recycle old tires, which are perfect habitats for mosquito larvae.

Keep mosquitoes out of your rain barrel

1. Use a double layer of fine mesh window screen in the intake opening and keep it tightly sealed.
2. Choose a barrel with a smooth top or dump any water on the top of the barrel.
3. Use a double layer of fine mesh window screen in the overflow port.
4. Keep the valve of the outflow port closed and use a double layer of fine mesh window screen in the valve.



The Lebanon and Lancaster Counties Mosquito-borne Disease Control Program works to protect the community from WNV by monitoring mosquito populations and conducting mosquito control events, while minimizing potential effects on people, wildlife, and the environment.

Our program begins by conducting educational and habitat reduction events to increase the awareness and support of residents (like tire collections as pictured on the top left).

Then, we perform larval and adult surveillance to determine the abundance and distribution of mosquito species.

We use gravid traps (pictured on the right) to collect mosquitoes. These mosquitoes are sent to the PA Department of Environmental Protection's lab in Harrisburg to be tested for WNV. In 2022, our technicians set over 900 gravid traps.

If habitat reduction or water management is not practical, we employ biological control methods. Biological pesticides generally have low toxicity to humans and other mammals and few environmental impacts. When biological control is not practical nor effective, we then use EPA registered chemical pesticides administered at low volumes from trucks to suppress adult mosquitoes.

