

Mosquito Problems After a Storm

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After a severe storm, mosquito populations can increase dramatically, and the diseases they carry can be a danger to humans.

Floodwater and container-breeding mosquitoes

Mosquito problems occur in two distinct waves after a flood. Floodwater mosquitoes arrive first; these include the salt marsh (*Aedes taeniorhynchus*, *Aedes sollicitans*) and pastureland mosquitoes (*Psorophora columbiae*, *Psorophora cyanescens*, and *Aedes vexans*). They deposit their eggs on the soil in areas that flood periodically. The eggs on flooded soil hatch and adults emerge as soon as 5 to 7 days later, resulting in significantly large swarms of mosquitoes during the warmest times of the year. Most of the common floodwater mosquitoes can become severe pests but do not cause disease problems.

Container or stagnant-water breeders are the second wave of mosquitoes that often follow flooding rains. They lay their eggs in cans, children's toys, potted plants, tires or any other container that holds water. This group of mosquitoes includes many of the most important disease-vectoring mosquito species in Texas, such as the yellow fever mosquito (*Aedes aegypti*), Asian tiger mosquito (*Aedes albopictus*), and southern house mosquito (*Culex quinquefasciatus*). Once the eggs hatch, it takes at least 10 to 14 days for the larva to develop into adults.

Mosquito-borne diseases

Yellow fever and Asian tiger mosquitoes prefer to feed on humans, and both species can be carriers (vectors) of Zika, dengue, and chikungunya viruses.

Zika virus symptoms are usually mild—low-grade fever, skin rash, red eyes (conjunctivitis), and joint pain. The biggest impact of Zika is in unborn babies whose mothers contract the virus while pregnant. Transmission occurs from yellow fever and Asian tiger mosquitoes and via sexual intercourse between infected humans.

Dengue occurs each year in northern Mexico and several outbreaks have occurred in South Texas as recently as 2013. Symptoms of dengue fever include a headache, rash, joint and muscle pain, high fever, and vomiting. Dengue hemorrhagic fever is the more severe form of the disease; its symptoms can include a blotchy rash, bleeding from the mouth or nose, shock, respiratory problems, and death.

Chikungunya virus symptoms may include fever, headache, rash, swelling of joints, and joint pain. Symptoms can be severe and long lasting but are not often life threatening.

The southern house mosquito transmits **West Nile virus**. It lays eggs in roadside ditches, storm sewers, birdbaths, or any container or depression that holds water. Eggs hatch in about 7 days.

West Nile virus (WNV) has two distinct clinical forms: West Nile fever (WNF) and West Nile neuroinvasive disease (WNND). Symptoms of WNF include fever, headache, fatigue, swollen lymph glands, and, occa-

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sionally, eye pain and skin rash. WNF does not affect the central nervous system.

WNND is more severe. It affects the central nervous system, causing inflammation of the brain and the tissue surrounding the brain and spinal cord (encephalitis), or inflammation of both the brain and tissues surrounding the brain and spinal cord (meningitis). The more severe form of WNV causes a headache, fever, confusion, seizures, paralysis, coma, and sometimes death.

Disease prevention

There are no vaccines to protect from WNV, Zika, or Dengue virus. Treatment is limited to addressing the various symptoms. The best defense against mosquito-transmitted diseases is to practice the four “Ds” of mosquito control:

1. **Defend:** Use DEET or another mosquito repellent (Picaridin, Oil of Lemon Eucalyptus, para-menthane-diol, IR3535 or 2-undecanone) when outdoors. Many clothing manufacturers market clothing treated with insecticidal active ingredients such as Permethrin to reduce mosquito bites.
2. **Dusk and Dawn:** Stay indoors during these times of day when mosquitoes are most active in the greatest numbers.
3. **Dress:** Wear light-colored, long-sleeved, loose-fitting shirts and pants.
4. **Drain:** Empty or cover all containers that can hold water for more than 3 days.

Adapted from an original publication by Mark Johnson.

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