

Potential Mosquito Problems after a Hurricane

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The aftermath of hurricane Dolly has set up south Texas as a potential hot bed for mosquito production and the diseases they transmit. The mosquito problem is divided up into two distinct waves of activity that occur after a flooding event. The initial influx or first wave of mosquitoes belong to a group known as flood water mosquitoes which include the salt marsh (*Aedes taeniorhynchus*, *Aedes sollicitans*) and pastureland mosquitoes (*Psorophora columbiae*, *Psorophora cyanescens*, *Aedes vexans*). These mosquito species deposit their eggs on soil and in depressions that are subject to periodic flooding. When flooded, the eggs hatch simultaneously resulting in large swarms of mosquitoes five to seven days after the flooding event during the warmest times of the year. These mosquitoes are primarily annoyance species that play minor roles in disease transmission.



Aedes taeniorhynchus or the black salt marsh mosquito

The two most common backyard biters in south Texas are also included in the flood water group of mosquitoes and play a significant role in disease transmission. *Aedes aegypti* (yellow fever mosquito) and *Aedes albopictus* (Asian tiger mosquito) are black and white in coloration, oviposit (lay) their eggs in artificial containers (cans, children's toys, tires, potted plants, or any object that holds water for over 7 days), and prefer to



Aedes aegypti or the yellow fever mosquito

feed on humans. These facts make them excellent vectors for the dengue virus which is endemic (found yearly) in northern Mexico and has caused several outbreaks in south Texas. The last dengue outbreak was in 2005 and resulted in 24 confirmed cases of dengue fever and 1 case of dengue hemorrhagic fever in Texas (the first locally acquired case in the United States) and 1,251 cases of dengue fever and 223 cases of dengue hemorrhagic fever in northern Mexico.

Dengue is an arbovirus (arthropod-borne virus) that is transmitted between humans by the bite of an infected mosquito. The dengue virus can manifest itself in two distinct clinical forms known as classic dengue fever (DF) and dengue hemorrhagic fever (DHF). Symptoms of classic dengue fever include headache, rash, joint and muscle pain, high fever, and vomiting. Dengue hemorrhagic fever is the more severe form of the disease and is classified by fever, blotchy rash, bleeding from the mouth or nose, shock, respiratory problems, and high mortality (death) in patients suffering from this form of the disease.



Aedes albopictus or the Asian tiger mosquito

After the initial wave of flood water mosquitoes disperses, a new group of mosquitoes move into the new pools of standing water left after the flood waters begins to recede. This new group of mosquitoes prefer habitats with calm, temporary or permanent pools of standing water to oviposit their eggs. Many of the most important disease vectoring mosquitoes in Texas belong to this group of standing water mosquitoes and compose the second wave of mosquito invaders.



Culex quinquefasciatus or the southern house mosquito

The most important standing water mosquito species is the southern house mosquito (*Culex quinquefasciatus*), the primary vector of West Nile virus and St. Louis encephalitis in Texas. This mosquito species breeds in septic water found in roadside ditches, storm sewers, birdbaths, or any container or depression that holds water for more than seven days.

West Nile virus (WNV) is split into two distinct clinical forms known as West Nile Fever (WNF) and West Nile encephalitis (WNE). The symptoms of WNF include fever, headache, fatigue, swollen lymph glands, eye pain (occasional), and skin rash (occasional) but does not include any central nerve system infection. The more severe WNV induced illness (West Nile Encephalitis, West Nile Meningitis, or West Nile Meningoencephalitis) is identified by what part of the central nervous system it affects (encephalitis = inflammation of the brain, meningitis = inflammation of the tissue surrounding the brain and spinal cord). Symptoms of the more severe form of WNV include fever, headache, seizures, confusion, coma, paralysis, and may result in death. The symptoms of St. Louis encephalitis (SLE) are similar to WNV in humans. WNV can also severely affect horses while SLE appears to have little or no effect on horses.

While there are vaccines available to protect horses against WNV, there is currently no human vaccine for this virus, or for St. Louis encephalitis, or dengue virus and treatment is limited to treating the various symptoms caused by the pathogen. The best defense against this disease is to practice the four “Ds” of mosquito control. These include:

1. **DEET** - Wear DEET or another mosquito repellent (Picaridin, Oil of Lemon Eucalyptus, or IR3535) when outside.
2. **Dusk and Dawn** - Restrict activities during the hours of peak mosquito activity.
3. **Dress** – Wear loose fitting, light colored, long sleeved shirts and pants.
4. **Drain** – Dump, clean, or cover all containers that can hold water for over three days

Further information on this disease and fact sheets on mosquito biology and ecology can be found on the Agricultural and Environmental Safety website (www-aes.tamu.edu) or from m-johnsen@tamu.edu.



Flooded pastureland is a typical oviposition and larval habitat of flood water mosquito species.



Mosquito control personnel checking a typical *Culex quinquefasciatus* larval habitat.