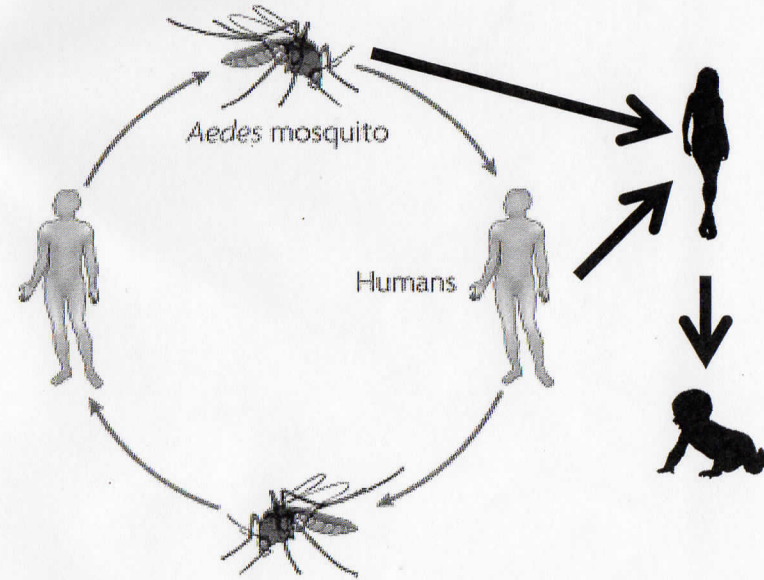
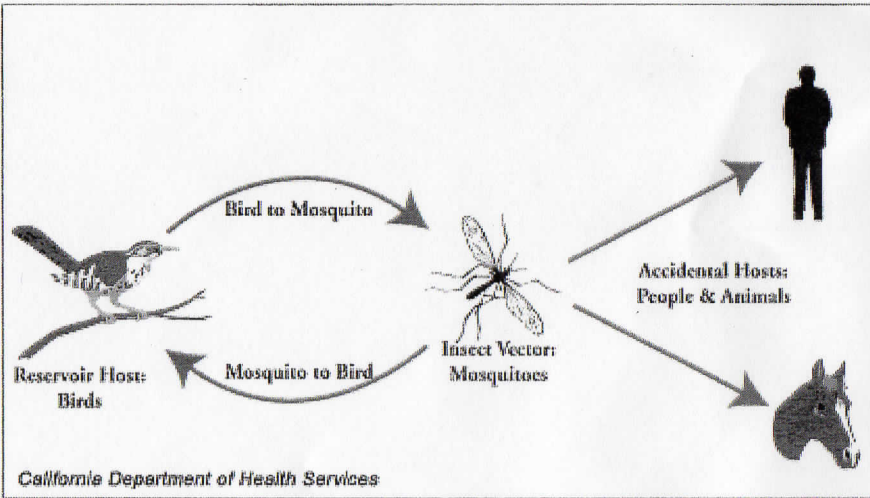


WNV

Zika



	WNV	ZIKA
Reservoir	Bird	Human
Mosquito transmission	<i>Culex</i> spp.	<i>Aedes aegypti</i> , <i>Aedes albopictus</i>
Mosquito's favorite food	Bird	Human
Mosquito flight range	150 meters – several km	<150 meters
Mosquito habitat	Outdoors	Outdoors & indoors

What Leaders Need to Understand

The Zika virus is primarily transmitted by infected mosquitoes from two distinct species—*Aedes aegypti*, the yellow fever mosquito, and *Aedes albopictus*, the Asian tiger. Both of these insects are particularly prone to spreading infection because they breed in close proximity to humans in artificial containers or other areas prone to holding water, even tiny amounts—from rooftop puddles to drainage dishes under planters. In commercial and industrial settings, such as food manufacturing facilities, it is critical to know that indoor water sources might provide mosquito eggs the environment they need to hatch, such as indoor trash receptacles or drainage areas.

Another major consideration for business owners concerned about Zika is the time of day that these mosquitoes bite. Many individuals expect that mosquitoes will be present during evening outdoor activities, but *Aedes aegypti* mosquitoes are primarily active during the day and prefer to make their home in indoor environments—so workplaces could present a major opportunity for them to find their next meal. Business owners, particularly those in the American southeast where Zika infections through mosquito bite are forecast to most likely occur, should be aware of these distinctions to ensure that their anti-mosquito efforts are as effective as possible.

The challenges posed by mosquito-borne illness aren't limited to the Zika virus. The West Nile Virus, which has been present in North America since 1999, has made a recent resurgence in many U.S. communities and caused alarm among public health officials.

Because only certain species of mosquitoes can spread the Zika or West Nile viruses, try to communicate to employees effectively about the risk while not increasing worries beyond a reasonable level. Business owners who have questions about Zika or other mosquito-borne illnesses should work with a pest management professional in their community to learn more about which mosquito species are present in their area and how they might affect employees.

What Should Managers Do?

Business owners should contact a pest management professional who can work with them to evaluate their situation, find areas of their facilities and surrounding grounds that might be serving as an ideal mosquito breeding ground, and develop a plan of action. Entomological experts can assess these areas and determine the best course of action, as well as provide strategic approaches that are best-suited to manage mosquito populations.

One example of a promising solution for food manufacturing facility business owners is Terminix's Attractive Targeted Sugar Bait (ATSB) mosquito service, which is non-toxic and safe for use in both residential as well as business settings. The active ingredient in the ATSB solution is garlic oil, which is combined with sugar from natural sources to attract mosquitoes and eliminate them before they can bite a human host. Because the solution does not include any chemicals, it is harmless to humans and pets, making it an ideal option for grounds around food manufacturing facilities. According to the company, ATSB has been shown to reduce mosquito populations by more than 90 percent in just three weeks.

Facilities managers can also take action themselves by conducting common-sense preventive activities. Facility owners should be mindful of opportunities inside and around their business for mosquitoes to breed, particularly by eliminating areas of standing water. Keep vegetation, such as plants, grass, and trees, well-trimmed to ensure that they are not creating ideal homes for these pests.

In addition to stopping mosquitoes from breeding, facility owners can mitigate the potential for mosquitoes to affect themselves and their staff. Employees working in outdoor areas or in facilities with mosquito challenges should wear long-sleeved shirts and long pants to prevent bites, and consider using an EPA-registered insect repellent containing DEET, picaridin, or oil of lemon eucalyptus. Business owners may also consider using box fans to keep mosquitoes away since they are relatively weak fliers and will find it difficult to land against the fan's gusts.

Simple precautions prevent bromeliads from becoming mosquito nurseries

Bromeliads get a bad rap, and they don't deserve it. These exotic tropical's seem to be on every mosquito-fearing homeowner's blacklist, forever banished from the garden for fear their capacity to hold water provides safe harbor for the blood-sucking pests.

But bromeliads are a delight in a Florida garden and one of the easiest plants you'll ever grow. Incredibly forgiving and adaptable, they're found throughout the world in tropical and subtropical climates. There are thousands of species, from sun-loving bromeliads that thrive in sandy deserts and on rocks in the mountains, to shade-lovers that inhabit trees and the jungle floor.

Several bromeliads are native to Florida; most of them are found in South Florida and are considered endangered. In our area you're more likely to find native bromeliads in the *Tillandsiagenus*, which includes true air plants, which are happy growing in trees. Air plants (epiphytes) absorb water and minerals through their leaves and use their roots merely for anchoring.

Not all bromeliads have little reservoirs at their center. Spanish moss (*Tillandsia usneoides*) and ball moss (*Tillandsia recurvata*) are perfect examples. But many exotic bromeliads that produce spectacular blooms have those "cups" or "tanks," and they like a little puddle of water there now and then. It's even better when organic debris settles in, providing nature's best plant food. But it creates a potential problem: Stagnant water is the perfect environment for mosquitoes to lay their eggs.

Horticulturists have conducted plenty of studies to determine if the plant is indeed a major contributor to mosquito populations and to identify which kinds of mosquitoes favor its tanks. A study by the University of Florida found that of 78 mosquito species in Florida, none were specifically associated with bromeliads. However, under certain conditions, certain mosquitoes can be drawn to bromeliads, primarily the small *Wyeomyia* mosquito, which is active in daytime but doesn't wander far from its home.

"Bromeliads are very environmentally friendly. Mosquitoes can be a problem, but it's a problem that can be solved," says horticulture agent Pam Brown of the Pinellas County Extension/Florida Botanical Gardens in Largo, which has an extensive bromeliad garden with several thousand individual bromeliads.

Several hundred offshoots, or pups, from the Botanical Gardens' bromeliad collection will be offered for sale May 10 at the Pinellas County Master Gardener Plant Sale in Largo. The annual event is one of the bay area's largest sales, with thousands of low-cost plants raised by volunteer master gardeners who, along with professional horticulturists, will provide on-site plant care and landscaping advice.

Mosquitoes aren't a problem at the botanical gardens because horticulturists there regularly apply a safe bacterial toxin that kills mosquito larvae, says Bob Albanese, a Pinellas County horticulturist. Called *Bacillus thuringiensis israelensis* (BTI), the product is available in granular and doughnut-shaped pieces at nurseries and online suppliers. Brand names include Mosquito Dunks, Quick Kill and Aquabac. At the botanical gardens, granules are applied once a month with a broadcast spreader, but most homeowners need only a few granules per plant sprinkled in the cups about every 45 to 60 days, says Albanese, who follows that program with his bromeliads at home in St. Petersburg. Pinellas County Master Gardener Luis Rey, who grows bromeliads at his home and volunteers at the plant sale, insists mosquitoes aren't a problem. However, he's careful not to cluster the plants, to prevent the accumulation of water. It's also important to regularly remove decaying leaf matter from the plant's cup and adjust irrigation sprinklers so they aren't overwatering.

An inexpensive alternative to BTI can be found in the kitchen cabinet. Just 1 drop of cooking oil placed in the bromeliad's cup will smother mosquito larvae. Use a medicine dropper to apply oil about every 20 days, Brown recommends. Another approach is to simply flush the water regularly with a garden hose, to interrupt the mosquito's life cycle so it can't reproduce.

One of the biggest misconceptions about bromeliads is that they are the culprit for mosquito attacks morning, noon and night. Not so, says Albanese. "If you are getting bitten at night, they are coming from somewhere else," he says. That's because the *Wyeomyia* mosquito flies only during the day, and it doesn't travel more than 50 feet from its host plant. If mosquitoes are a problem in your yard, stop blaming bromeliads and start looking for standing water in other sources, such as open containers, a much more likely breeding ground for those irritating pests.

Yvonne Swanson is a freelance writer in St. Petersburg and a master gardener for Pinellas County.