

School & Home Integrated Pest Management (IPM) Newsletter – August 2016



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Mosquitoes and the Great Outdoors

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MOSQUITOES AND US

If you were asked to name the most dangerous animals in the world, you may automatically think first of large, powerful predatory species with formidable teeth or claws. If asked to think past all the episodes of Shark Week and When Animals Attack, you may start to conjure up images of rattlesnakes, scorpions and spiders. But if you have spent any time living in countries where malaria is endemic, you would undoubtedly think of the mosquito.

Mosquitoes are the most important insect pests that affect the health and wellbeing of humans and domestic animals worldwide. They can cause a variety of health problems due to their ability to transfer (vector) viruses and other disease-causing pathogens including in the arid Southwest. From a global perspective, mosquitoes are well established as the deadliest animals on earth, and tragically over one million people die worldwide from mosquito-borne diseases every year.

Female mosquitoes usually require a blood meal from a vertebrate animal for egg production. Some specialize on birds, some on humans, and still other mosquitoes feed on a wide range of other hosts. During feeding the mosquito injects her saliva into the host, which can generate an itchy localized reaction. If she has acquired a disease pathogen from an earlier blood meal and the pathogen has developed inside the mosquito (incubation period), it may be transmitted to a new host. Incubation periods are different for each pathogen, differing also due to environmental conditions, and can range from days to weeks. Mosquito-vector diseases of humans include West Nile Fever, St. Louis Encephalitis, Dengue Fever, Chikungunya, Zika, Yellow Fever, Malaria and Filariasis. Different mosquitoes vector specific diseases, and many mosquito species are not vectors of any human disease.

West Nile Fever is currently the most common mosquito-borne disease affecting humans in the U.S. Between 2010-2015 the CDC reported an average of 2,376 West Nile cases in the continental U.S. per year. The number of cases varies greatly year to year, sadly, including 125 deaths each year. The West Nile Virus (WNV) is vectored primarily by *Culex* mosquitoes, which are generally interested in feeding on birds, but the virus can also be transmitted to humans and horses. St Louis Encephalitis (SLEV) and Western Equine Encephalitis (WEEV) viruses are enzootic (present in animal populations), and can occasionally result in local human infections through the bite of infected mosquitoes.

Currently (August 2016), Dengue, Chikungunya and Zika are considered emerging diseases in the U.S. A disease is classified as emerging when the number of cases has increased over the past 20 years and could potentially increase in the future. Dengue, Chikungunya and Zika viruses are all potentially vectored by *Aedes* species mosquitoes in many cities and towns (Fig. 1). Last month the Florida Department of Health identified a neighborhood of Miami where the Zika virus was found being vectored by local mosquitoes.

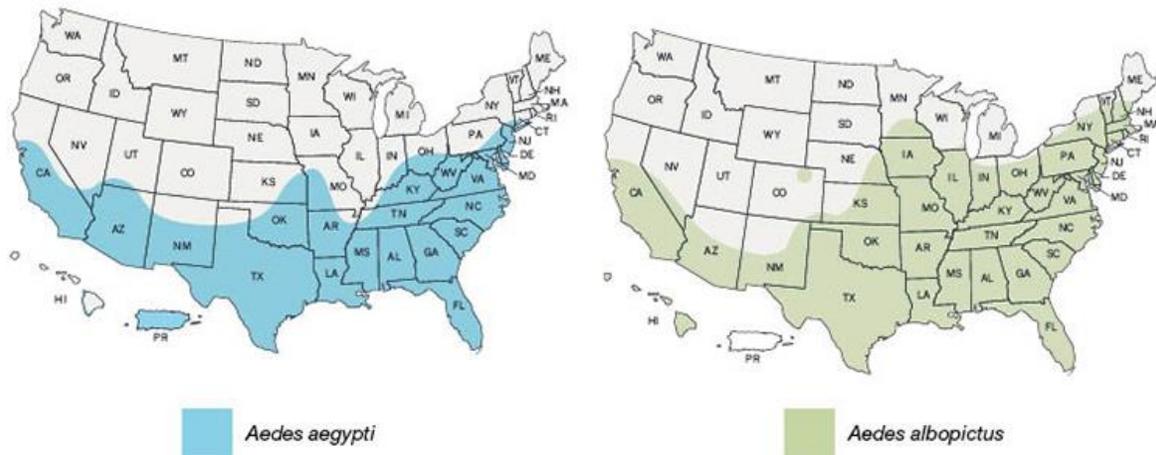


Fig. 1 Estimated range of *Aedes albopictus* and *Aedes aegypti* in the United States, 2016

IMPORTANT SKEETERS

Although there are about 180 species of mosquitoes in the U.S., only a few are problems for residents, the *Culex* and *Aedes* mosquitoes are of greatest concern because of the disease-causing pathogens they vector.

The Yellow Fever mosquito *Aedes aegypti* is not native to the desert southwest, but was introduced to the Western Hemisphere during the U.S. domestic slave trade years, becoming established in many eastern cities during the 18th and 19th centuries. *Aedes aegypti* was responsible for multiple epidemics of Yellow Fever during the 19th century. Yellow Fever has been eliminated from North America. But the vector remains and has spread across the country into the desert southwest, establishing well in urban areas. This species lives in close association with humans, even breeding indoors, and is very capable of exploiting our environment. Unlike *Culex* mosquitoes, *Aedes aegypti* does not disperse far from breeding sites. *Aedes aegypti* is a “you breed it – you feed it” mosquito.

Female *Aedes aegypti* mosquitoes typically lay their eggs in water-containers such as old tires, flowerpots, barrels, cans, and various containers that hold a limited amount of water. They particularly favor saucers under flowerpots; simply removing these can significantly reduce the mosquito population around your home. Eggs are laid singly on a moist surface just above the water line, and they hatch when the water level is raised by rain, an overhead sprinkler, or other source. *Aedes aegypti* eggs are very resilient. They can remain dormant during dry conditions for several months up to a year, and resume development when water becomes

available. Once they hatch, the larvae develop in a relatively short time depending on the temperature. Adult females often bite around the ankles throughout the day with peak activity in the early evening.

PREVENTION

Mosquitoes need water to complete their life cycle and humans create a lot of opportunities for mosquitoes to exploit. It is likely that many of us have mosquitoes developing in our neighborhood and even in our own backyards. Standing water left from rains or irrigation water will support mosquito populations. Stagnant water in neglected swimming pools is another ideal habitat for many species, though mosquitoes cannot develop in a well-maintained swimming pool. ***Aedes aegypti* can develop in “cryptic” sites, utilizing very small amounts of water in tree-holes, artificial containers and even leaf axils.**

The most effective strategy for mosquito management in communities in general is prevention. The best way to prevent mosquito-borne diseases is to eliminate standing water where they can develop in the first place. Here are some tips on what you can do to manage mosquitoes around your home.

1. Eliminate standing water in plant pots, plant saucers, birdbaths, fountains, tires, tarpaulins covering boats or other objects, backyard trampolines and other items. Check for standing water after every rain or at least once per week; twice per week is ideal.
2. Remove unnecessary clutter. Keep rain gutters free of leaves and other debris that prevent water from draining. Store boats, canoes and other objects so they do not collect rainwater. Saucers placed under potted plants are a favorite breeding site for *Aedes aegypti*. They should be drained after watering, or removed entirely. If eggs are suspected, they need to be scrubbed away; otherwise they remain viable for months and will hatch at a later date.
3. Repair water leaks (leaky pipes, sprinkler systems, and outside faucets). Correct drainage problems in yards and playing fields. Report drainage problems in ditches etc. Valve and meter boxes are favorite breeding and resting sites for *Aedes aegypti*.
4. Empty water containers for pets regularly and check livestock watering troughs and tanks. Mosquito eating fish can be added to large (undrainable) water troughs for livestock and horses.
5. Eliminate tree-hole breeding sites. Not all tree cavities need to be filled. However, if a tree hole is retaining water, expanding foam may be a good solution. Use foam with a lower expansion ratio (to protect the tree) and inject the foam slowly. It is not necessary to clean out decay from the cavity before filling.
6. Add *Gambusia* (mosquito eating fish) into personal ponds or stagnant swimming pools. **It is very important to avoid releasing *Gambusia* into natural water bodies, as these are voracious predators and can displace native fish.**
7. Larvicides specifically target the larval life stage of an insect and are generally more efficient control tools compared to adulticides.

SURVEILLANCE

Inspect around your home and buildings to reduce or prevent breeding of mosquitoes (Fig. 2).

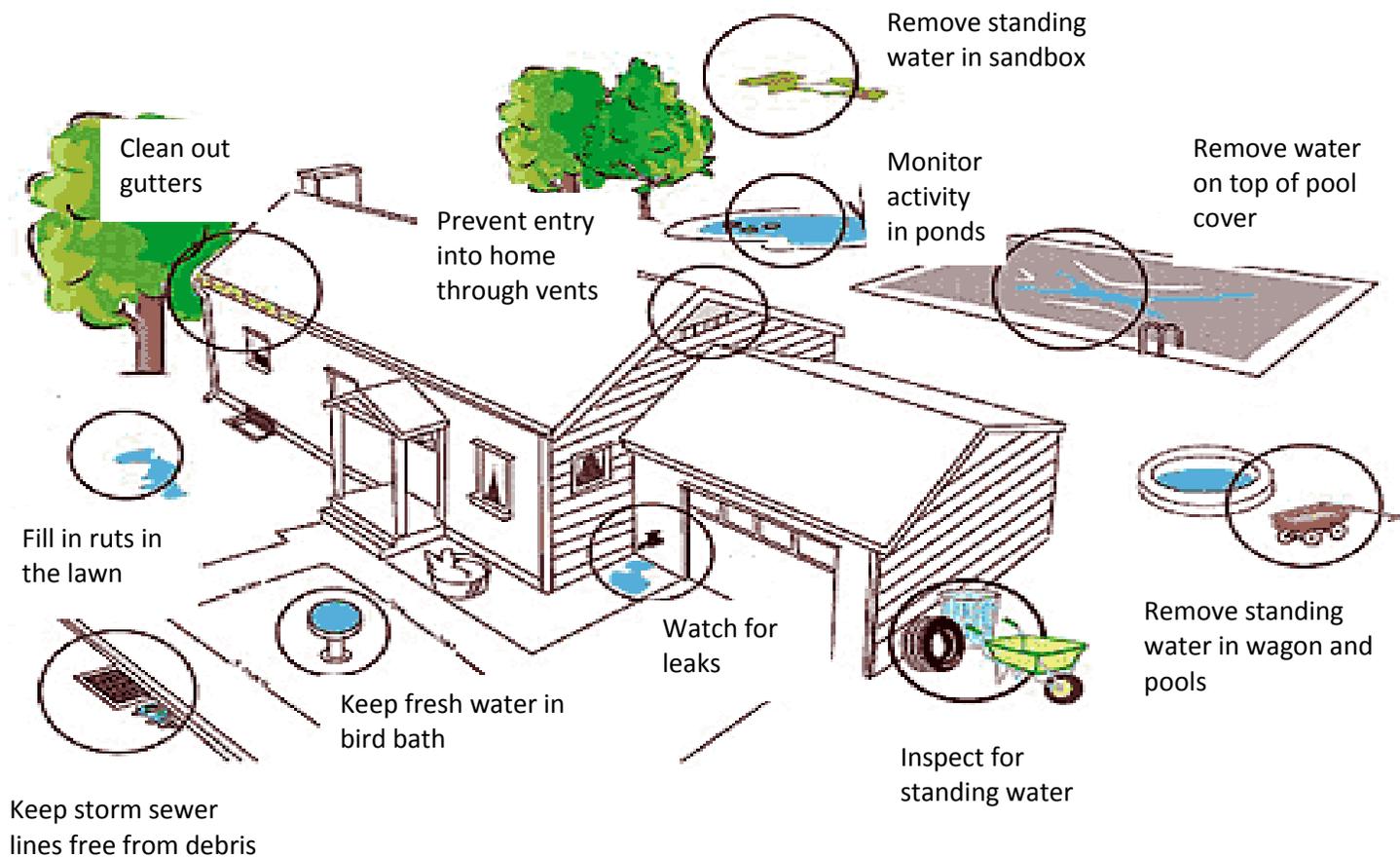


Fig. 2. Illustration of mosquito breeding habitats around buildings. Image by Raul Rivas (Metropolitan School District of Pike Township), enhanced for this publication.

AVOID MOSQUITO BITES

- Wear light colored clothing with loose fitting long-sleeves, long pants and socks. Use protective clothing when exposure to mosquitoes cannot be avoided.
- Properly apply insect repellent even if you are outside for just a short period of time, and share your insect repellent with those around you. For additional help selecting which repellent is right for you, go to the EPA search page: <http://cfpub.epa.gov/oppref/insect/#searchform>.
- Use a DEET product or a good non-DEET alternative <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4667684/pdf/iev125.pdf> and if you are outside for more than a few hours, reapply repellent frequently. The higher the temperature, the more frequently you must reapply repellent for it to remain effective.

- Apply repellents only to exposed skin and/or clothing (as directed on the product label). Do not use under clothing. Apply **over** sunscreen after it has dried.
 - Never use repellents over cuts, wounds, or irritated skin.
 - Do not apply to eyes and mouth, and apply sparingly around ears. When using sprays do not spray directly onto face, it's better to spray on hands first and then apply to face.
 - Do not allow children to handle the products, and do not apply to children's hands. When using on children, apply to your own hands and then put it on the child.
 - Do not apply repellent on babies under 2 months old. Use mosquito netting or avoid mosquito habitats in which you are likely to encounter mosquitoes as much as possible. **Insect repellents are a kind of pesticide, please read the label and follow instructions.** Most products specify the youngest age allowable for a given product.
 - Do not spray in enclosed areas. Avoid breathing a repellent spray, and do not use it near food.
 - After returning indoors, gently wash treated skin with soap and water or bathe. If you suspect that you or your child is reacting to an insect repellent, discontinue use and wash treated skin. Call your local poison control center (800) 222-1222 if symptoms persist.
 - When properly used, personal repellents can discourage biting insects from landing on treated skin or clothing.
 - Using repellent and sunscreen products at the same time is an acceptable practice. However, the use of combination products that contain both an insect repellent and a sunscreen is not recommended.
- Type of repellents: According to the Centers for Disease Control and Prevention (CDC), the most common active ingredients in repellents are DEET, picaridin, IR3535, and oil of lemon eucalyptus. DEET and picaridin are considered to be the most effective. Reactions to DEET are uncommon, but picaridin products are less likely to trigger dermal reactions when used repeatedly over extended periods of time.

MOSQUITO-PROOF YOUR HOME AND YARD

Drain Standing Water: Mosquitoes lay their eggs in standing water. Limit the number of places around your home for mosquitoes to develop in by getting rid of items that hold water.

Install or Repair Screens: Some mosquitoes like to come indoors. Keep them outside by having well-fitting screens on all windows and doors. Offer to help neighbors whose screens might be in bad shape. **Do not prop doors or keep unscreened windows open.**

Check for Indoor Sites Supporting Mosquitoes: If a female mosquito wanders inside your home she will utilize any water reservoir she can find. Check for wriggling larvae in the toilet cisterns that are not flushed daily. Maintain water in drain traps. Check swamp-cooler systems, flower vases and lucky bamboo. Use sticky tape over floor drains, sink overflows, etc. to see if you can catch mosquitoes emerging from areas you cannot see. Kill any mosquitoes noticed indoors!

AFTER-BITE CARE

Consider the following tips for relieving the itch of mosquito bites. The first step is to

clean the bite area with soap and water. Topical corticosteroids can reduce the rash, itching, and discomfort. Oral antihistamines can be used effectively to reduce the symptoms of mosquito bites. Use of a cold compress can be helpful, but do not apply ice directly to the skin.

CONTROL

Effective Integrated Pest Management of mosquitoes can often be complex and expensive, and frequently requires the cooperative efforts of communities. Many people are concerned about the harmful effects of pesticides on the environment, their animals and themselves. Pesticide toxicity and pesticide hazard is not the same thing. “Toxicity” is the “killing power”, whereas “hazard” is the risk of negative impact when a product is used. **The dosage used, the type of chemical compound, how and when the application is made, route of exposure, all determine the hazard level of a pesticide. The correct use of Personal Protective Equipment (PPE) greatly reduces your risk.**

**Always read the pesticide label! Always use a pesticide precisely as the label instructs.
For more information on options and relative risk contact:**



National Pesticide Information Center

1.800.858.7378 npic@ace.orst.edu

Pest management companies offer a variety of around-home adulticide options. Generally, they are more effective than over-the-counter do-it-yourself treatments. Retail adult mosquito catch-traps do catch mosquitoes and can be helpful, but they do catch a great deal of other insects as well as mosquitoes. Instructions tend to suggest placing the traps on patio and deck areas where you want to sit, but better results may result from placing the devices **away** from areas being used in ones backyard, or they can attract the mosquitoes to where you are!

The most important element in mosquito management is you. By managing water carefully around your property you can significantly reduce mosquito populations.

More information about mosquitoes and mosquito-borne viral diseases can be found at Centers for Disease Control and Prevention (CDC) - the Division of Vector-Borne Diseases (DVBD) <http://www.cdc.gov/ncezid/dvbd/>, Arizona Pest Management Center (APMC) site <http://cals.arizona.edu/apmc/public-health-IPM#mosquitoes>, and Arizona Department of Health Services site <http://azdhs.gov/preparedness/epidemiology-disease-control/vector-borne-zoonotic-diseases/index.php>.

Program Evaluation Survey

Can you help our program by taking this short survey?

The University of Arizona Community IPM Team produces numerous resources and events every year to serve our stakeholders in community environments. If you have attended one or more events or used one or more resources (publications, newsletters, information sheets) produced by the University of Arizona Community IPM team, please provide your feedback here: <https://www.surveymonkey.com/r/XL53WQQ>.

Your responses will be anonymous and will only be used to gather information about our program activities. Your feedback will help us greatly to improve our programs. Thank you!

New Language Translations of EPA Read the Label First

The Read the Label fact sheets are now available online in six new languages: Chinese (simplified and traditional), Korean, Russian, Spanish, Tagalog and Vietnamese. Translations of the fact sheets will help in pesticide education efforts across the country. The Fact Sheets are individually written to target the safety for kids, pets, garden, and the household. ITRMD posted the fact sheets on July 29 to <https://www.epa.gov/pesticide-labels/keep-safe-read-label-first>.

School IPM DPR-101 Basic Course Available in Spanish

The DPR School and Child Care IPM Program, California Department of Pesticide Regulation is happy to announce that the basic-level Healthy Schools Act training course, DPR-101 “Basic Pest Management in the School and Child Care Settings,” is now available IN SPANISH for both online and DVD group training kit formats.

To register for “DPR-101S: Manejo Básico de Plagas en Sitios Escolares y Guarderías,” go here: <http://www.cce.csus.edu/form/department-pesticide-regulation>.

To request a group training kit with both Spanish and English versions, please email school-ipm@cdpr.ca.gov. If your district or center has already received a kit, but would like the Spanish version of the course DVD and quiz, please email school-ipm@cdpr.ca.gov.

Webinars and Events

Attend Free Sessions of the [Green Strides Webinar Series](#). View archived webinars [here](#).

Please join in for the [2016 All Bugs Good and Bad Webinar Series](#). This webinar series provides information about good and bad insects. Webinars are free and open to everyone.

Webinars will be on the **first Friday of each month at 2 p.m. Eastern time**. The webinars are brought to you by the following eXtension Communities of Practice: [Imported Fire Ants](#), and [Urban IPM](#); and by the [Alabama Cooperative Extension System](#), the [Texas A&M AgriLife Extension Service](#), and the [University of Georgia Center for Urban Agriculture](#).

Upcoming webinars include:

1. Snake Identification – September 2, 2016
2. Don't Use Too Much Pesticide or Fertilizer: Learn How to Calibrate Your Lawn and Garden Sprayers and Spreaders – October 7, 2016
3. Rodenticides – November 4, 2016

For more information about upcoming and past School IPM webinars:
<http://articles.extension.org/pages/73368/2016-all-bugs-good-and-bad-webinar-series>.

**August 17, Wednesday, 2:00-3:15 pm. Eastern / 11:00-12:30 pm. Arizona. EPA Webinar:
[Back to School Webinar](#)**

Exposure to pests and unnecessary pesticides can affect student performance and often lead to school absenteeism. By taking simple steps, you can reduce pests in your learning environment. This is a new school year, a new beginning! It's a good opportunity for the School Administrator, facility manager, custodian, teacher, school nurse and others with key roles in the learning environment to embrace school IPM principles. We all look forward to a future where all schools can effectively manage pest management issues through integrated pest management and sustain healthy learning environments.

For more information about the EPA Schools program, visit:
<http://www.epa.gov/schools/>

For more information about the Community IPM, visit:
<http://www.extension.org/pages/23359/urban-integrated-pest-management-community-page>



For more information about School IPM in Arizona, visit:
<http://cals.arizona.edu/apmc/westernschoolIPM.html>

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