

View this newsletter as a [PDF](#).
Editor: Shujuan (Lucy) Li, lisj@cals.arizona.edu

Zika

The Arizona Department of Health Services confirmed March 28th that a woman from Maricopa County was confirmed to have contracted the Zika virus while traveling outside the US to an area affected with Zika and later developed symptoms of the illness back in the US. (<http://www.azcentral.com/story/news/local/arizona/2016/03/28/zika-virus-confirmed-arizona/82360994/>). Healthcare workers have ensured that she will stay indoors in an attempt to avoid being bitten by mosquitoes and thus preventing further spread of the virus.

But this is just the latest case to occur in the continental states, and by the time you have read this, there may well be others already reported. Since May 2015 there have been 312 travel related cases. Of those 27 were pregnant women, 6 were sexually transmitted, and 1 had Guillain-Barré syndrome (a life-threatening condition in which the immune system attacks the nerves). To date there are 41 states reporting travel related Zika cases. There are no locally acquired cases in the continental US, though there have been 349 locally acquired cases in Puerto Rico, US Virgin Islands and American Samoa territories combined. There have been cases of sexual transmission in Argentina, Chile, France, Italy, New Zealand and the US.

Zika is a viral disease transmitted by mosquitoes. First isolated in Uganda in 1947, Zika virus is a Flavivirus, related to dengue and West Nile viruses. While periodic Zika outbreaks have been reported since its discovery, Zika was not identified as a global health concern until 2015, when an outbreak in Brazil was linked to a dramatic increase in cases of babies born with microcephaly. Currently, Zika cases are occurring in 61 countries and territories.

Transmission

Zika virus is transmitted to people primarily through the bite of an infected *Aedes* mosquito. For us in North America that will be the yellow fever mosquito (*Aedes aegypti*) and the Asian tiger mosquito (*Aedes albopictus*), the same mosquitoes that potentially vector dengue and chikungunya viruses in the continental states. *Aedes* mosquitoes prefer to live near people and only female mosquitoes bite. They are mostly daytime biters, but also bite at night.

Mosquitoes acquire the virus when they feed on a person during the first week of infection when people are carrying high numbers of Zika virus in their blood.

Once inside the mosquito, the virus moves from the digestive tract into the salivary glands, a process which is thought to take about a week. After that time, the mosquito can spread Zika to

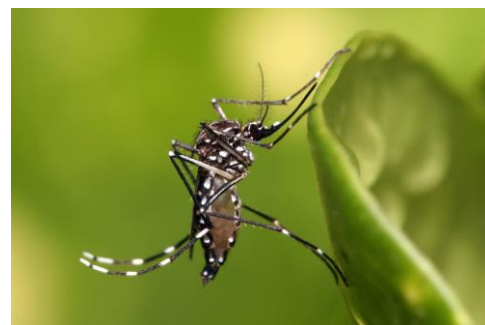


Photo of *Aedes aegypti* adult.
Credit: M. M. Karim.

the next person she bites. Zika virus can also be transmitted from a mother to her fetus during pregnancy, through blood transfusions, and through sexual contact. Currently no mosquitoes are known to be transmitting Zika within the continental US, and significant efforts should be made to prevent local transmission from occurring for as long as possible.

CHIKUNGUNYA, DENGUE, or ZIKA:
What is local transmission?

A person who has not traveled recently gets bitten by an infected mosquito where they live, work, or play.


A mosquito bites a person who is sick. The mosquito gets infected.

Infected mosquitoes can then bite healthy people and spread the infection.

Within 3–7 days, the person may become sick. Other mosquitoes can bite the sick person, become infected, and bite more people.

Protect yourself from mosquito bites. Use insect repellent.

For more information:
www.cdc.gov/chikungunya • www.cdc.gov/dengue • www.cdc.gov/zika

 U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

CS262035-A

Symptoms

About 1 in 5 people infected with Zika virus become ill (i.e., develop Zika). The most common symptoms are fever, rash, joint pain, and/or conjunctivitis (red eyes). Other symptoms include muscle pain and headache. The incubation period (the time from infection through a bite to the development of symptoms) is typically between 2 and 7 days. The illness is usually mild with symptoms lasting for a few days to a week. **Severe disease symptoms requiring hospitalization are uncommon, the most significant being Guillain-Barré syndrome (GBS).** GBS is an uncommon sickness of the nervous system in which a person's own immune system damages the nerve cells, causing muscle weakness, and sometimes, paralysis. The Brazil Ministry of Health has reported an increased number of people who have been infected with Zika virus who also have GBS. Symptoms include weakness of the arms and legs that is usually the same on both sides of the body. In some cases, the muscles of the face that control eye movement or swallowing may also become weak. In the most serious cases, this muscle weakness can affect breathing, and people sometimes need a breathing

tube to help them breathe. These symptoms can last a few weeks or several months. Although most people fully recover from GBS, some people have permanent damage, and in 1 out of 20 cases people have died.

See a healthcare provider if you develop symptoms, particularly if you have visited an area where Zika is common: <http://wwwnc.cdc.gov/travel/page/zika-travel-information>. If you have recently traveled, tell your healthcare provider where and when you traveled. Your blood may be tested for Zika or viruses that cause similar symptoms like dengue and chikungunya.

There is no vaccine for Zika. Treatments for symptoms include rest, drinking plenty of fluids, and medicine such as acetaminophen to relieve fever and pain.

The main Zika health concerns are related to pregnant women and impacts on the developing fetus.

Zika virus can be passed from a mother to her fetus during pregnancy. Pregnant women who have traveled to an area where Zika is common should talk to their obstetrician about recent travel history, even if they are not ill. The Centers for Disease Control and Prevention (CDC) has guidance for healthcare providers caring for pregnant women and women of reproductive age at: <http://www.cdc.gov/zika/hc-providers/qa-pregnant-women.html>. It is especially important that pregnant women see a doctor if they develop a fever, rash, joint pain, or red eyes during or within 2 weeks of traveling to a country where Zika has been reported.

Brazilian communities have experienced a significant number of Zika cases since May 2015. Officials have also noticed an increase in the number of babies with congenital [microcephaly](#) (a neurological condition in which the brain develops abnormally in the womb, and an infant's head is smaller than the heads of other babies of the same sex and age). Additional studies are needed to determine the degree to which Zika might be linked with microcephaly. Because of the possible association between Zika infection and microcephaly, pregnant women should take steps to prevent mosquito bites. Pregnant women should also minimize their exposure to pesticides.

The best way to avoid getting Zika virus is to **avoid being bitten by infected mosquitoes**. We can minimize mosquito numbers by eliminating breeding habitats, e.g. standing water in containers, around our homes. When outdoors, dress properly and apply insect repellents that best protect against Zika: <http://www.consumerreports.org/insect-repellents/mosquito-repellents-that-best-protect-against-zika/>. For detailed information on mosquito management, see <http://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1221-2013.pdf>

Additional information:

The University of Arizona and Texas A&M AgriLife Extension have prepared an IPM Short regarding the Zika Virus that is available at <http://cals.arizona.edu/apmc/docs/Zika-virus.pdf>.

For more information on Zika virus, please view CDC website at: <http://www.cdc.gov/zika/index.html>

Li, S., Gouge, D.H., Fournier, A., Nair, S., Baker, P., Olson, C. 2013. Mosquitoes. University of Arizona Cooperative Extension. Publication no. AZ1221. <http://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1221-2013.pdf>

For additional information selecting which repellent is right for you, go to the EPA search page: <http://cfpub.epa.gov/oppref/insect/#searchform>

Promote School IPM with Two New Resources from EPA Center of Expertise for School IPM

Two new EPA documents highlight the health benefits afforded to students, teachers, and staff by IPM. [Preventing Pests for Healthier Schools: The Health Case for Integrated Pest Management](#) provides a synopsis of the research supporting IPM as a proven method for creating healthier school environments. [Making Pests a Thing of the Past: Integrated Pest Management for Healthier Schools and Students](#) concisely conveys the basics of IPM, its science-based approach, and how pest control via IPM makes for a healthier school environment.

EPA's Center of Expertise for School IPM serves as a resource for school districts seeking to develop and implement an IPM program. The Center provides information and tools that school administrators, facility managers, and pest management service providers can use to create a safer learning environment for children. For more information, contact the Center of Expertise for School IPM at school.ipm@epa.gov or 844-372-7476 (toll-free).

Spring Preemergence Weed Control in Lawns

Authored by Dave Kopec and Kai Umeda.

Spring means warmer weather, whether you are in Flagstaff or Yuma, AZ. Turfgrass weeds that come up from seeds and then die later in the same season are called "annuals". There are two categories of annual weeds in the desert: "summer" and "winter" annual weeds. Summer annual weeds germinate from seed in late winter or early spring, and then thrive through the summer months, which includes the production of more seeds to come up in future years! Winter weeds in the low desert emerge in the late summer through winter during the cooler season.

At sites where the same species of annual weeds come up year after year because of the accumulation of thousands or millions of seeds in the soil, they can be prevented from becoming established at all by using a preemergence herbicide, rather than to treat them after they come up with a postemergence weed control product.

Weed seed germination occurs below the soil surface and then the first visible leaf or shoot emerges through the soil. Preemergence herbicides stop the seedling root from growing after germination or prevent the emergence of the shoot that you "don't see".

For preemergence herbicides to be effective, the product has to be applied evenly across the surface of the turf and then immediately "irrigated in". Most preemergence herbicides must be watered in very soon after application, so they can bind to the soil particles so that the roots and shoots of the germinating seedling can be exposed to the herbicide. The product label will specify that adequate rainfall or sprinkler irrigation should occur within a month or so to ensure the herbicide is "activated". Otherwise, exposure on the soil surface to sunlight will result in breakdown of the herbicide and reduced weed control efficacy.

There are several active ingredients that are often sold under a variety of branded product names. Commonly sold active ingredients of preemergence herbicides include the following: trifluralin, benefin, pendimethalin, oryzalin, prodiamine, dithiopyr, metolachlor, dimethenamid, and oxadiazon.

Summer annual grassy weeds include (at low desert locations) southwest cupgrass (Figure 1), liverseedgrass (Figure 2), stinkgrass, goosegrass (Figure 3) and sometimes crabgrass (Figure 4). At higher elevation locations crabgrass is a major summer annual grass weed. The above active ingredients are predominately active against grassy weeds.



Figure 1. Southwest cupgrass. Oklahoma State University.



Figure 2. Liverseedgrass. Ptrpest.com



Figure 3. Goosegrass. Extesion.umass.edu



Figure 4. Crabgrass. www.senske.com

Small-seeded broadleaved annual weeds such as spurge and purslane can be controlled by the same preemergence herbicides used against the grass weeds. Herbicide products containing the active ingredient, isoxaben can control additional broadleaved weeds with preemergence applications to the soil.

Preemergence weed control products should be applied when the soil temperature is 50-55 °F or so. Normally, preemergence herbicides should be applied by the end of February/early March in Tucson and Phoenix, and by early to mid-February in Yuma. These same products can be applied the first week in April in Payson, Prescott, Globe and Kingman.

Likewise, the similar temperatures occur in early May in Flagstaff. Soil temperatures can be found at the following web site <http://cals.arizona.edu/AZMET>.

Some preemergence herbicides are also formulated with the active ingredient attached to a granular fertilizer. This can offer some convenience since a fertilizer application can be made when applying suitable pre-emergence weed control agent. These types of products are often referred to as “weed and feed” products.

Active ingredients and product references included are provided for technical/educational purposes and examples only. No recommendations or exclusions are intended, or implied.

Also see: <http://wssa.net/wssa/weed/articles/wssa-choosing-herbicides/>

Contact: **Dave Kopec**, Turf Specialist. Email: dkopec@ag.arizona.edu

Kai Umeda, Extension Agent, Turf. Email: kumeda@cals.arizona.edu

RFQ for School Districts - Free Econ Assessment of Integrated Pest Management Programs

Health Resources in Action (HRiA) **is seeking applications from school districts across the country to participate in an economic assessment of the implementation of integrated pest management (IPM) programs** www.asthmaregionalcouncil.org/our-work/keeping-the-pests-out/. The project, *Keeping the Pests Out: The Economics of IPM in Schools*, is funded by the Environmental Protection Agency (EPA) Office of Chemical Safety and Pollution Prevention, and will inform school pest management policies nationwide. **We appreciate if you would share this on-line RFQ <http://bit.ly/HRiAIPM> with your public health and school networks.**

Exposure to pesticides is a public health and environmental issue. IPM is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices that focus on **prevention, reduction and the elimination** of conditions that lead to pest infestations. The goal of IPM is to provide the safest, most effective, most economical, and sustained remedy to pest infestations. **IPM reduces the risk from pests while reducing the risk from the overuse or inappropriate use of hazardous chemical pest-control products.**

http://www.cdc.gov/nceh/ehs/Docs/Factsheets/What_Is_Integrated_Pest_Management.pdf

Benefits for school districts participating:

- ***The economic assessment is provided free to the selected school districts.***
- ***Each of the selected three school districts will be compensated \$6000*** for their participation over the project period.
- ***Districts will receive a detailed cost analysis*** for their selected schools on pre-post IPM implementation. HRiA will conduct the analysis on two-four schools per district.
- ***Districts will receive national visibility*** (if they so choose). Case studies will inform school pest management policy nationwide. Districts may request that their case study be anonymous, or may choose to be identified for their participation in this EPA-funded project. We anticipate that project results will be broadly disseminated. This will potentially include publication in peer reviewed journals, webinars and case studies posted on numerous websites.
- ***The evaluation may help to identify best practices for IPM implementation, enhancements/ improvements and/or cost savings measures.*** This may benefit selected districts when updating or improving bid specifications for IPM contractors.

HRiA will hold an [Informational webinar](#): April 20th at 2pm EST ([register](#))

Application deadline: May 6, 2016 submitted on-line or by e-mail.

Health Resources in Action

<http://www.hria.org>

<http://www.asthmaregionalcouncil.org>

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. Managing Pests of Backyard Pecans – May 6, 2016
2. Spotted Wing Drosophila – June 3, 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>

April 19, Tuesday, 2:00-3:30 pm. Eastern / 11:00-12:30 pm. Arizona. EPA Webinar: [Vertebrate Turf Pests on School Grounds](#)

It is sometimes easy to overlook the little varmints busily working below ground to access the roots, grasses, and insects found in many school's turf. Vertebrate turf pests, including moles,

voles, pocket gophers, prairie dogs, and groundhogs, are found across the country. Our presenters will share their experiences in investigating and resolving conflicts with these pests. Join us to learn how you can incorporate vertebrate pest prevention and control in your school district's Integrated Pest Management (IPM) program.

To register now, please visit the following link: https://epawebconferencing-events.acms.com/content/connect/c1/7/en/events/event/shared/100004141/event_landing.html?sco-id=100035312& charset =utf-8

Upcoming webinars include:

- [April 19, 2016 -- Vertebrate Turf Pests on School Grounds](#)
- [May 10, 2016 -- Stop School Pests and iPestManager – School IPM Educational Programs](#)
- [May 17, 2016 -- Ants - The #1 Pest in Schools](#)

For more information about upcoming and past School IPM webinars:

<http://www.epa.gov/managing-pests-schools/webinars-about-integrated-pest-management-schools>

April 13-14, 2016. National Environmental Health Association (NEHA). [Enhancing Environmental Health Knowledge \(EEK\): Vectors and Public Health Pests Virtual Conference.](#)



EEK: Vectors and Public Health Pests Virtual Conference is designed to bring environmental health professionals together in a unique virtual environment to exchange information and discover new solutions to issues in vectors and public health pests. Conference content will include topics such as:

- rodents, ticks, mosquitoes, and bed bugs;
- institutional integrated pest management (IPM);
- emerging vectors and vector-borne diseases;
- new technologies in vector and pest control;
- climate change and vectors;
- lessons learned;
- inspection successes; and
- stories from the field, among others.

Learn more and register here <http://pop.neha.org/news-events/community-calendar/EEK-vectors-and-public-health-pests-virtual-conference>

April 29, Friday, 8:00-5:00 pm. Arizona. [Pesticide Applicator Training and Testing: A Review in Preparation for Initial Licensing Exam](#) Golf and Agriculture Applicators. University of Arizona Maricopa County Cooperative Extension, 4341 East Broadway Rd, Phoenix, AZ 85040

Review highlights of the learning objectives of the National Pesticide Applicator Core Manual. Initial licensing exam will be administered by the Arizona Department of Agriculture immediately after the review session, 3-5 pm. There is NO FEE for either review or testing. Contact Kai Umeda at kumeda@cals.arizona.edu. Deadline to register is Monday, April 25. For more information, view <http://turf.arizona.edu>.

May 4, Wednesday, 7:30-1:00 pm. Arizona. [Turfgrass Field Day](#), University of Arizona Karsten Turf Research Facility, 2101 E. Roger Rd, Tucson, AZ 85719.

Topics include: Irrigation and salinity effects on turfgrasses, view turf colorants, observe fraise mowing & turf recuperation, observe and discuss what's new in weed control, view National Turfgrass Evaluation Program Bermudagrasses and Zoysiagrasses, compare maintenance operations for natural vs. synthetic turf. CEUs will be applied for AZ Dept. of Ag and OPM. Please register before April 29. Contact Kai Umeda at kumeda@cals.arizona.edu. For more information, view <http://turf.arizona.edu>

May 5, Thursday, 8:00-5:00 pm. Integrated Pest Management Workshop for schools, homes, and related environments. University of Arizona South, Sierra Vista, 1140 Colombo Ave, Public Meeting Room, Sierra Vista, AZ 85635

This workshop is for anyone who is interested in safe and effective pest management in community environments including homes, schools, child/elder care facilities, medical facilities, offices, parks-rec. facilities, in Cochise County. Lunch and refreshments will be provided at venue! 6 OPM CEUs will be awarded to OPM license holders. Pre-registration is required. There is no registration fee. Email Shaku Nair at nairs@email.arizona.edu for more information and to register.

June 3, Friday. [25th Annual Desert Horticulture Conference](#). JW Marriott Starr Pass Resort, 3800 W Starr Pass, Tucson, AZ 85745

Desert Horticulture is the premier annual conference for all members of the Southwest Green Industry: landscape architects, designers, growers, retailers, contractors, maintenance personnel, suppliers and educators. There are three tracks: Plants and Landscapes, Plant Health, and Back to Basics. CEU's from ISA, OPM, and ADA will be available. For program and registration please visit: <http://cals.arizona.edu/deserthort>

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>

Shujuan (Lucy) Li, Assistant in Extension - Public Health IPM. Email: lisj@cals.arizona.edu

Dawn H. Gouge, Public Health IPM Expert. Email: dhgouge@cals.arizona.edu

Shaku Nair, Assistant in Extension - Community IPM. Email: nairs@email.arizona.edu

Al Fournier, IPM Assessment. Email: fournier@cals.arizona.edu

Ursula Schuch, Environmental Horticulture. Email: ukschuch@ag.arizona.edu

Kai Umeda, Extension Agent, Turf. Email: kumeda@cals.arizona.edu; <http://turf.arizona.edu>

Dave Kopec, Turf Specialist. Email: dkopec@ag.arizona.edu

Peter Warren, Extension Agent, Urban Horticulture. Email: plwarren@cals.arizona.edu

Michael Wierda, Assistant in Extension - Pesticide Safety Education. Email:
mwierda@email.arizona.edu

Acknowledgements

This material is based upon work that is supported in part by the National Institute of Food and Agriculture, U.S. Department of Agriculture (USDA NIFA). Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture. Additional support is provided by the U.S. Environmental Protection Agency (EPA) and the University of Arizona – Arizona Pest Management Center (APMC).



United States
Department of
Agriculture

National Institute
of Food and
Agriculture