

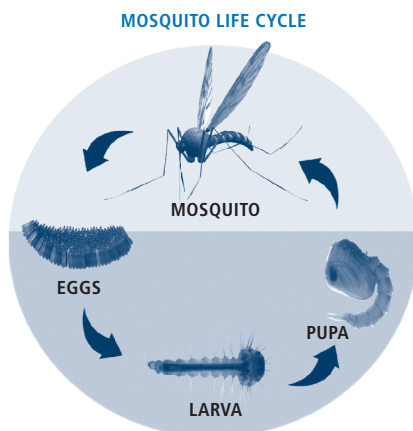
# INTEGRATED PEST MANAGEMENT: MOSQUITOES



Mosquitoes are small flying insects. The females bite because they need blood to nourish their eggs. While mosquitoes can carry diseases and their bites are annoying, they also provide food for fish, birds, and bats.

## When are mosquitoes a problem?

Mosquito bites can cause allergic reactions, pain, irritation, redness, and itching. Mosquito bites can get infected when children scratch them with dirty fingers. Mosquitoes can also carry diseases such as dengue fever, malaria, and West Nile virus.



Mosquitoes go through several stages. Female mosquitoes lay their eggs in or near standing water in puddles, neglected swimming pools, tree holes, and even old tires (such as those used for tire swings). The mosquito larvae, or wigglers, swim in this water and soon develop into pupae. The pupae then transform into winged adults, which fly away and live for about a week.

## How do mosquitoes find you?

Female mosquitoes bite people, pets, and livestock. They detect chemicals in your sweat and heat from your body. Most mosquitoes come out at dusk, although some are active during the day.

## IPM Strategies

It's impossible to completely eliminate mosquitoes. The goals are to keep mosquitoes from coming indoors and prevent them from biting us. Sprays and bombs don't necessarily keep mosquitoes away and they expose children and staff to pesticides and solvents.

### 1 KEEP MOSQUITOES OUT TO PREVENT MOSQUITO BITES

- ▶ Cover windows and doors with mesh screens.
- ▶ Avoid being outdoors at dusk or when mosquitoes are active.
- ▶ Wear long sleeves, long pants, and socks when you're outdoors.
- ▶ Try keeping mosquitoes away using an electric fan outdoors or a ceiling fan under enclosed porches. Keep fans and cords out of children's reach.

### 2 REMOVE STANDING WATER AND SHELTER

Cut down tall grass and pull weeds where mosquitoes rest during the day. Drain anything that can hold water immediately after use or rain. Empty water that collects in cinder blocks, flower pot saucers, toys, old tires, crotches of trees, and other objects.

- ▶ Drain standing water (puddles) after a rainstorm.
- ▶ Change water in pet dishes, watering troughs, and bird baths every few days.
- ▶ Avoid overwatering lawns and gardens, which leads to puddles.
- ▶ Clean rain gutters at least once a year to remove debris.
- ▶ Fill open tree holes with sand or mortar.

[IPM Strategies continued]

### 3 ASSESS YOUR RISK

Check with a health care provider or your local public health department about the risk for illnesses spread by mosquitoes in your neighborhood. You can use repellents if mosquitoes are biting and you have to be outdoors. Follow the label directions. Keep away from eyes and the mouth. Get signed consent from parents before applying insect repellents on children. For a sample consent form: [cchp.ucsf.edu/InsectPermissionForm](http://cchp.ucsf.edu/InsectPermissionForm)

Some effective repellents are:

**Picaridin (20% concentration)** is odorless, doesn't feel greasy or sticky, and rarely irritates skin.

**Oil of lemon eucalyptus (30% concentration)** has a eucalyptus scent and is somewhat oily. Don't use it on children younger than 3 years.

**IR3535 (20% concentration)** is derived from natural materials. Does not last as long as picaridin or lemon eucalyptus.

**Products containing DEET** are also effective, but may be more toxic at high doses. If you decide to use DEET, stick to products that have a concentration between 10% to 30%. Always follow the directions on the label. Do not use DEET on children under 2 months.

## ACTION PLAN FOR MOSQUITOS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LEAST HARMFUL PESTICIDE	LAST RESORT
<ul style="list-style-type: none"> <li>▶ When mosquitoes bite.</li> <li>▶ When you notice standing water.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Keep window screens in good repair.</li> <li>▶ Wear long pants and sleeves.</li> <li>▶ Eliminate standing water.</li> <li>▶ Use a fly swatter or newspaper to individually kill mosquitoes.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Use insect repellents safely, according to label directions.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Contact your vector control district (see below).</li> </ul>

## LESS COMMON SITUATIONS

If you have a lot of mosquitoes, they are best managed by vector control districts. In California, there are more than 50 districts, all of which provide free services. Call the California Mosquito and Vector Control Association at (916) 440-0826 to find your local district. You can report a mosquito problem, potential mosquito breeding source, or ask a professional to visit.

## RESOURCES

- University of California Statewide IPM Program: *Mosquitoes*  
[www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7451.html](http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7451.html)
- Mosquito and Vector Control Association of California  
[www.mvacac.org](http://www.mvacac.org)
- U.S. EPA: All About Mosquitoes  
[www2.epa.gov/mosquitocontrol](http://www2.epa.gov/mosquitocontrol)
- American Academy of Pediatrics, Healthychildren.org, Choosing an Insect Repellent for Your Child, 2012  
[www.healthychildren.org/English/safety-prevention/at-play/Pages/Insect-Repellents.aspx](http://www.healthychildren.org/English/safety-prevention/at-play/Pages/Insect-Repellents.aspx)

California Childcare Health Program, University of California, San Francisco School of Nursing • [cchp.ucsf.edu](http://cchp.ucsf.edu)



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