

### Mosquito Repellents

Have you been outside lately? I went out for about 5 minutes last weekend and came in with 6 mosquito bites, a prime example of why you should always wear mosquito repellent. With all the rain we have high mosquito numbers and it is important that you take precautions to avoid being bitten.

Activity times for mosquitoes can vary. Most people are familiar with the four D's- DRAIN (standing water), DEET (wear some repellent), DUSK & DAWN (stay indoors during dusk and dawn to avoid peak populations) and DRESS (wear long sleeves and long pants). While this is still good advice, it may be a good idea to spread the dress and repellent advice for anytime you will spend time outdoors.



When outside, wear long pants and a long sleeved shirt in light colors to reduce the number of mosquitoes that can reach your skin. Repellent should only be applied to clothing and exposed skin. Do not apply repellent underneath clothing! If you want to apply repellent to your face, spray your hands with repellent and rub it onto your face. Do not spray repellent directly into your face or near

eyes or mouth. Make sure to apply repellent outdoors. Do not allow children to handle repellents. Wash hands before eating, smoking or using the restroom.

The Center for Disease Control (CDC) recommends using a product *registered with the EPA* (Environmental Protection Agency) containing one of the following active ingredients: DEET, picaridin, IR3535, oil of lemon eucalyptus (OLE), para-methane-diol (PMD), or 2-undecanone. DEET and picaridin are classified as “conventional repellents” while IR3535, OLE, PMD, and 2-undecanone are “biopesticide repellents”.

DEET, also known N,N-diethyl-m-toluamide or N,N-diemethylbenzamide, was developed by the U.S. Army in 1946 to protect soldiers in insect-infested areas. Pesticides containing DEET have been used by the general public since 1957. Products containing DEET should not be used on children younger than 2 months of age (read the label and check with your pediatrician if you have questions). DEET has a slight odor and may have a greasy feel to some people. It may damage plastic, rubber, vinyl or synthetic fabrics. DEET may be irritating to the eyes and skin for some people. DEET comes in a wide variety of concentrations, so choose the one that will work best for your situation.

Picaridin was first made in the 1980's and resembles a natural compound called piperine (which is found in plants used to produce black pepper). Picaridin has been used in Europe and Australia for many years, but has only been in the U.S. since 2005. Picaridin is non-greasy and is odorless.

IR3535, or 3-[N-Butyl-N- acetyl]-aminopropionic acid, ethyl ester, was developed in the mid- 1970's and became registered for use in the U.S. in 1999. It is registered as a biopesticide by the EPA because it is functionally identical to a naturally occurring substance (an amino-acid). It may dissolve or damage plastics and may be irritating to the eyes.

Oil of lemon eucalyptus (OLE) or PMD (para-menthane-3,8-diol) are essentially the same thing; PMD is the synthesized (lab created) version of oil of lemon eucalyptus. “Pure” or “essential” oil of lemon eucalyptus is not labeled as a repellent and has not undergone testing and should not be used as a repellent product. OLE/PMD has been on the market in the U.S. since 2002. OLE/PMD should not be used on children younger than 3 years of age. The natural product (OLE) has known allergens within it while the synthetic version (PMD) has less of a risk of allergens. This product is classified as a biopesticide. OLE/PMD has a varying range of residual, some offering about 20 minutes of protection while other products may last up to two hours.

Products with 2-undecanone, or methyl nonyl ketone, are the most recently added products to the list by the CDC. 2-undecanone is a synthesized version of compound that comes from the leaves and stems of the wild tomato plant, *Lycopersicon hirsutum*.

Many factors play into how long a repellent will last for a person. Some of these are:

- The concentration (or percent of active ingredient) of the product. You can find the percentage on the product label.
- Person's attractiveness. Some people are more attractive to mosquitoes than others (and no scientific research has proven that it is because of eating garlic, taking vitamin B, using tobacco products, etc.). A person's genetic code plays a large part on what makes a person so attractive to mosquitoes.
- Frequency and uniformity of application. In other words, how often is the repellent applied and how good of coverage did you get?
- Activity level of the person. The more active the person is, the more sweat they produce which can cause the repellent to wash off the surface of the skin.

As a word of caution, there are products that combine sunscreen and insect repellent. The CDC recommends that if you need sunscreen and repellent, that you choose two separate products. Sunscreen should be applied more often than repellents.

For more information or help with identification, contact Wizzie Brown, Texas A&M AgriLife Extension Service Program Specialist at 512.854.9600. Check out my blog at [www.urban-ipm.blogspot.com](http://www.urban-ipm.blogspot.com)

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