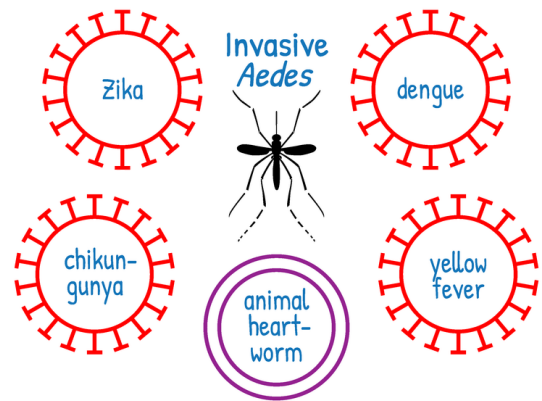




# BEYOND THE BASICS: INNOVATIVE TECHNIQUES NEEDED FOR INVASIVE MOSQUITO CONTROL

Invasive *Aedes* mosquitoes are rapidly spreading across California although they are not native to the state and don't have a place in our ecosystem. These mosquitoes are hard to control and can become resistant to commonly-used insecticides. Female *Aedes* mosquitoes lay their eggs in small water sources in front yards, backyards, and patios, areas where mosquito control agencies can't easily inspect or control. Also, their eggs are resistant to drying out and can survive for many months.

**Invasive *Aedes* mosquitoes are more than a nuisance - they are a serious public health threat and California's mosquito and vector control agencies need new ways to control them.**



There are three different innovative technologies being considered in California: self-limiting mosquitoes, *Wolbachia*, and irradiation. These technologies will be used as part of an overall Integrated Vector Management program.



**INTEGRATED VECTOR  
MANAGEMENT PROGRAM**

Finding environmentally friendly mosquito control tools is a priority. Innovative technologies will not replace traditional mosquito control methods but will be another Integrated Vector Management tool used to protect public health.

**To learn more please visit:  
[mvacac.org](http://mvacac.org)**

# LEARN HOW THE DIFFERENT TECHNOLOGIES WORK



## Self-limiting mosquitoes

**Self-limiting mosquitoes** are produced in a laboratory and carry two types of genes:

- A self-limiting gene that prevents female mosquito larva from surviving to adulthood.
- A fluorescent marker that glows under a special red light. This allows researchers to identify self-limiting mosquitoes in the wild.

Only male *Aedes* mosquitoes that have a self-limiting gene are released because male mosquitoes don't bite. When they mate with wild females their offspring inherit a copy of the self-limiting gene. This prevents female offspring from surviving to adulthood, ultimately reducing the number of biting female mosquitoes. These mosquitoes only mate with their own species, and their self-limiting gene can't establish in the ecosystem.



## Wolbachia

**Wolbachia** are bacteria naturally found in about 60 percent of insects around the world like butterflies, dragonflies, moths, and beetles.

There are different types of *Wolbachia* associated with different types of insects. This bacteria can be used to reduce disease-spreading mosquitoes.

Male *Aedes* mosquitoes are raised in a lab with a specific type of *Wolbachia* that they do not normally have. All male mosquitoes do not bite. These male *Aedes* mosquitoes are released to mate with wild female *Aedes* mosquitoes that have a different type of *Wolbachia* or none at all.

During mating, the mismatched *Wolbachia* bacteria causes the eggs not to hatch.



## Irradiation

**Irradiated mosquitoes** are raised in a laboratory where the male mosquitoes are separated from the females. Male mosquitoes, which don't bite, are sterilized using the same radiation found in x-rays and Gamma rays. The sterile male mosquitoes are released to mate with wild females. The resulting eggs do not hatch. This can reduce the overall number of mosquitoes over time.