

## HOW DOES THE SANTA CRUZ COUNTY MOSQUITO AND VECTOR CONTROL (MVC) CONTROL MOSQUITOES?

The MVC is charged with the responsibility for the abatement of breeding mosquito populations in order to provide relief from biting annoyance to residents and visitors to the County. Secondary responsibilities include the prevention of mosquito-transmitted diseases and providing assistance and information on other vectors. A vector is any insect, rodent, or other arthropod or animal that can threaten health by carrying disease agents or causing discomfort.

Our program practices Integrated Mosquito Management techniques which emphasizes the prevention of mosquito production by reducing breeding sources and, when necessary, by sustainable suppression of aquatic larval stages using biorational materials selected and applied on the basis of maximum safety to the public, applicator and environment. Where appropriate, standing water is drained off or mosquito-eating fish (*Gambusia*) are stocked. The key to using these integrated pest management methods is in obtaining cooperation from landowners to use good water management and in careful monitoring of mosquito populations.

When mosquito breeding exceeds the nuisance threshold, the aquatic source is treated to control the larval stages by using one or a combination of the materials described below. Adulticiding (fogging) is rarely used as it is less selective and effective, but sometimes necessary to provide relief from high numbers of adult mosquitoes, especially if there is mosquito-borne disease present. Any adulticide use in Santa Cruz County would require the approval of the Board of Supervisors.

*Bacillus thuringiensis israelensis* is a highly selective microbial insecticide effective for short term control of mosquito larvae, blackflies and some midges. Protein crystals produced by the Bti bacteria dissolve the gut of these larvae when ingested. Other non-target invertebrates and vertebrates are unaffected. It is least-toxic because it breaks down in the aquatic environment within hours and does not persist in the food chain. It is also useful in agricultural settings because it is approved for organic crops in its liquid formulation.

*Bacillus sphaericus* is similar in most respects to Bti, but has the advantage of being effective in ponds with a high organic content, such as wastewater, and the microbe can recycle in mosquito larvae to provide longer lasting control.

**Methoprene** is an insect growth regulator. It does not control mosquitoes through toxic action, rather it mimics the activity of a mosquito juvenile hormone and

disrupts the process of metamorphosis into the adult stage. What this means is that when mosquito larvae are exposed, they appear to develop normally and continue to be part of the food chain, but then die before they can emerge and fly off as adults.

At recommended application rates, it has little effect on non-targets because it rapidly breaks down in the environment and does not persist in the food chain.

**Larviciding oils** are effective in polluted sources where there are generally few non-target organisms, or as spot treatments where the non-feeding mosquito pupal stage is present in sufficient numbers and their development into flying adults is imminent. The staff is discriminating in its use of oils as they can affect other surface-breathing invertebrates. These are light petroleum or fatty-acid alcohol-based oils, which create a short lasting biodegradable surface film.