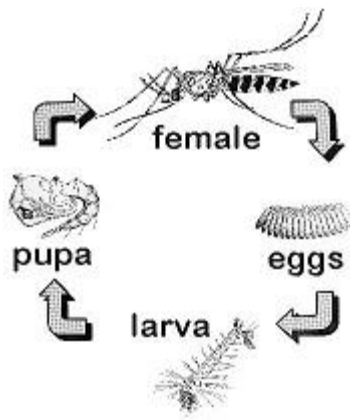


WHAT YOU SHOULD KNOW ABOUT MOSQUITO CONTROL PESTICIDES

Mosquitoes can be a nuisance and cause allergic reactions in people when they bite. Some mosquitoes in California may carry germs that can cause serious disease. For these reasons there are government programs that control mosquitoes.

Life Cycle of a Mosquito



Mosquitoes need water to live. They lay their eggs on standing water. The egg hatches into a larva in the water. The larva becomes a pupa, and then finally becomes a flying adult mosquito in 1 – 3 weeks. The adult female mosquito then needs to bite an animal or person for blood so that she can lay eggs and repeat the cycle.

Mosquito control programs use many ways to control mosquitoes. They try to get rid of standing water in cities and in the country where mosquitoes will lay eggs. They add fish to ponds to eat the larvae and pupae of mosquitoes. Mosquito control programs also use pesticides to kill mosquitoes.

A **pesticide** is material used to kill or hurt a certain pest. There are mosquito pesticides that are used in water to kill only mosquito larvae and pupae and in the air to kill only adult mosquitoes. The parts of the products that are poisonous to the mosquito are the **active ingredients**.

Studies have been done to determine the effects of mosquito control pesticides on animals. The studies showed that small amounts of pesticides did not harm the animals, but very large amounts could. The very large amounts fed to animals would be equal to a person eating pounds or drinking cups of the active ingredient every day for years.

The studies also determined the smallest amount of pesticide that can harm animals. When pesticides are used correctly, people and pets are exposed to much less than the smallest amount that can harm animals.

Scientists also found that people who live in places where routine mosquito spraying is done have no more chemical related health problems than those in areas that are not sprayed.

The pesticides that are put into water to kill mosquito larvae and pupae before they become adults are called **larvicides**. People and pets may come into contact with very small quantities of these products if they enter water that has been recently treated. These products are made to kill mosquitoes and do not harm other insects or animals when used properly.

Adulticides are pesticides that kill adult mosquitoes. The active ingredients in adulticides work by stopping the mosquito's brain from working properly. Adulticides are used by spraying the product from a truck or airplane, using a very small amount of the pesticide (less than 4 ounces per acre of land). The liquid comes out of the airplane or truck-mounted sprayer as a mist of very small drops or a "fog". The fog floats with the air currents. Mosquitoes must come into contact with the fog to be killed. Mosquito spraying is done in the evening after sunset or in the morning before sunrise when most mosquitoes are flying instead of resting.

There are easy steps to take to avoid being sprayed, though exposure to these products is safe for most people. During mosquito spraying, people can stay inside and close windows. Extra care should be taken to keep babies and pregnant women away from pesticides because they are more easily harmed by pesticides than other people. People who are allergic to some chemicals may decide to take the extra step of calling their local mosquito control program to find out when and where spraying will take place.

Larvicides Used in California:

Bacillus thuringiensis israelensis and Bacillus sphaericus: Commonly called Bti and Bs for short, these larvicides are made from bacteria. These larvicides are made with natural bacteria mixed with clay, ground-up corn cob, or as a liquid.

How they work: When put into water where mosquito larvae are found, the larvae eat the bacteria. The bacteria destroy the guts of the larvae causing the mosquito to die.

This product does not hurt people or pets even if eaten because the guts of a person or pet are much different than the guts of mosquitoes.

Methoprene: Methoprene is a man-made chemical that is a copy of a chemical normally found inside mosquito larvae.

How it works: Methoprene is mixed with clay or is used as a liquid and put into water. This chemical stops the larvae from growing into adult mosquitoes.

Danger to people and pets: This product has no effect on people or pets at the amounts used for mosquito control.

Mineral oil or alcohol-based surface products: Golden Bear 1111, Agnique MMF, and other surface films are put on water to kill mosquito larvae and pupae. These larvicides spread out and form a thin layer over the surface of the water where mosquito larvae or pupae are present.

How they work: Mosquito larvae and pupae breathe through tubes at the surface of the water. These products suffocate the mosquito larva or pupa by preventing them from breathing.

Dangers to people and pets: These products can cause a mild skin rash if they are sprayed directly on a person. Once these products are on the water, a person or animal would not be bothered even if they went swimming. The products are not poisonous and pets are not harmed by drinking from a pond sprayed with these products.

Adulticides Used in California:

Pyrethrins are two chemicals taken from chrysanthemum flowers that are poisonous to mosquitoes. The sun destroys pyrethrins very fast so when they are used in mosquito control, most of the chemicals are gone within an hour after sunrise. Pyrethrins are a small portion of the total liquid in adulticides made with them – most of the liquid is water or mineral oil.

How they work: Pyrethrins block the movement of information from the mosquito's brain so its heart no longer beats and it cannot breathe.

Danger to people and pets: Most people are not harmed by these chemicals when they are used in mosquito spraying. People who are allergic to pyrethrins may feel a tight or tingly feeling under their skin, soreness around their eyelids, or a scratchy throat. When used correctly, pyrethrins will not kill fish.

Pyrethroids are man-made chemicals that are almost the same as pyrethrins. Pyrethroids last longer in sunlight than pyrethrins (up to a couple of days). Most of the liquid in adulticides is either water or mineral oil.

How they work: Like pyrethrins, pyrethroids block the movement of information from the mosquito's brain so its heart no longer beats and it cannot breathe.

Danger to people and pets: Most people are not harmed by pyrethroids used in mosquito spraying. People who have allergies to these chemicals may feel a tight or tingly feeling under their skin, soreness around their eyelids, or a scratchy throat. Pyrethroids can kill fish if they accidentally get into water where fish live.

Piperonyl Butoxide or **PBO** is a chemical that is added to pyrethrins or pyrethroids to make them work better.

How it works: When PBO is mixed in the mosquito spray, it makes it harder for the mosquito to get rid of the pesticide from their body. When PBO is used, less active ingredient is needed to kill mosquitoes.

Danger to people and pets: The small amounts of PBO a person or pet could come into contact with during mosquito spraying would not harm them.

Mineral oil is often the main ingredient that other chemicals are mixed with to make adulticides. If skin is coated with mineral oil, minor problems like a burning feeling or a rash can occur. The tiny amount of mineral oil a person could get on their skin from spraying mosquitoes would not cause any problem. Mineral oil is not harmful when swallowed.

Contact with pyrethrins, pyrethroids, PBO, and mineral oil from mosquito spraying has not been shown to cause long-term health problems in humans or animals.

Organophosphates are used infrequently in California and only in rural areas. There are two chemicals of this type used to spray mosquitoes in California. Both of these chemicals have been used for mosquito control, or to spray insect pests on farms and around houses for more than 40 years.

How they work: These pesticides kill mosquitoes by blocking the movement of information from the mosquito's brain so the mosquito dies because its heart no longer beats and it cannot breathe.

Why they are used: If the same pesticide is used for a long time to spray adult mosquitoes, the mosquitoes can become immune to that pesticide and will not die when sprayed. Mosquito control programs can make sure more commonly used pesticides will stay effective by occasionally using a different chemical to kill adult mosquitoes. This is called "rotating" pesticides.

In California, organophosphates are occasionally used for rotation, or used over farmland where pyrethroids may not be allowed. Organophosphates can be more effective than pyrethrins in some conditions.

Malathion and Naled are organophosphates that are used in California.

Danger to people and pets: Organophosphates can be harmful to people who work with them and do not follow safety rules. People who come into contact with large amounts of these chemicals can have headaches, become dizzy, feel sick to their stomach, or even die. Coming into contact with small amounts of these chemicals from spraying mosquitoes does not harm people or pets because the body gets rid of them quickly. No chronic health effects have been seen in people where these chemicals are routinely used for mosquito spraying.

For More Information Contact: