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VECTOR VOCABULARY

Abdomen - rear body region of an insect; one of the three main body parts

Adult - fourth stage of the mosquito's life cycle

Adulticides - Adulticides are products used to reduce adult mosquitoes. Adulticides can be applied from hand-held sprayers, truck-mounted sprayers or using airplanes. Adulticides, immediately reduce the number of adult mosquitoes in an area, with the goal of reducing the number of mosquitoes that can bite people and possibly transmit West Nile virus

Africanized honey bee - The Africanized honey bee (AHB) can be more aggressive in defense of the colony site than the present European honey bee (EHB) populations common in the United States. AHBs originated in Brazil when queens from South Africa and Tanzania were released in the 1950s. Since then AHBs have migrated northward, displacing resident EHB populations in South and Central America. AHBs entered the United States in 1990 at Hidalgo, Texas. In more than 30 years of hybridization with resident EHB populations, AHB behavior has not changed significantly. AHBs are a public health concern because of their ability to attack humans, pets, domestic and wild animals. A victim who cannot escape a bee attack may receive hundreds, or even thousands of stings. AHBs are slightly smaller but similar in appearance and color to EHBs. AHBs can be identified from EHBs only by extensive laboratory examination.

Biological Control – Controlling pests by using predators, parasites and disease-producing organisms instead of pesticides

BTI - For larval mosquito control, SYMVCD typically uses Bacillus thuringensis israelensis (Bti), a microbial larvicide that is highly toxic to mosquito and blackfly larvae.

California Encephalitis – Encephalitis means inflammation of the brain. This condition can be caused by fungus infections, toxic chemicals, parasites, influenza, mumps or other virus infections. Mosquito-borne encephalitis is caused by a virus transmitted by culicine mosquitoes and is commonly called sleeping sickness.

Chemical Control - Chemical control is the judicious use of specific chemical compounds (insecticides) that eliminate adult and immature mosquitoes. It is applied when bio-rational methods fail to maintain mosquito numbers below a level that is considered tolerable or when emergency control measures are needed to rapidly disrupt or terminate the transmission of disease to humans. Adulticides are chemicals that specifically eliminate adult mosquitoes; larvicides target mosquito larva and pupa.

CO2 Baited trap – Attracts host-seeking female mosquitoes

DEET – The active ingredient in one form of insect repellent.

Dengue fever – Dengue fever is caused by a mosquito-borne virus that infects cells of the reticuloendothelial system (spleen, lymph, bone marrow and liver). All the known dengue vectors belong to the mosquito genus *Aedes*. The disease is commonly called "breakbone fever" because one of the symptoms is extreme pain in the joints. The parasite that causes dengue fever belongs to the virus family Flaviviridae, genus Flaviviruses. There are four types (serotypes) of dengue viruses: dengue type 1, dengue type 2, dengue type 3 and dengue type 4. Dengue is antigenically related to St. Louis Encephalitis and yellow fever viruses.

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Egg - first stage of the mosquito's life cycle

Encephalitis mosquito *(Culex tarsalis)* - This mosquito can transmit the encephalitis virus to humans. It is distributed throughout Sacramento and Yolo Counties. Immature mosquitoes develop in wetlands, duck clubs, rice fields, urban sources and irrigated crops. The adult mosquito prefers to feed on birds and mammals. It is most active during fall and summer months.

Gravid Traps – attracts gravid female mosquitoes

Head - front body region of an insect; one of the three main body parts

House mosquito *(Culex pipiens)* - This mosquito has been known to transmit West Nile virus, Western Equine Encephalomyelitis and St. Louis Encephalitis. It is common throughout Sacramento and Yolo Counties. Immature mosquitoes develop in foul water sources such as dairy drains and artificial containers. It prefers to feed on birds but will readily feed on humans. This mosquito is most active during the fall and summer months.

Integrated Pest Management – Scientifically planned management tactics and control strategies to reduce the abundance of target pests which incorporate four basic methods: Public Relations and Education, Surveillance, Bio-rational control, and Chemical Control. The District applies Integrated Pest Management (IPM) principles in its mosquito management program. These principles serve as the foundation for management strategy development and assessment. Ongoing mosquito population and mosquito-borne pathogen monitoring in addition to specific action thresholds generate the criteria that implement mosquito management measures. The District believes that a benefit of a rigorous IPM program will lead, in the long run, to greater reliance and success of non-pesticide control measures and the avoidance of unnecessary pesticide applications.

Larva – (plural: larvae) the second stage of the mosquito's life cycle.

Larvicides – Larvicides are products used to reduce immature mosquitoes. They can either be biological (such as toxin from specific bacteria that is lethal to mosquito larvae but not to other organisms) or chemical products. Larvicides are applied directly to water sources that hold mosquito eggs or larvae. Larvicides reduce the overall mosquito population by limiting the number of new mosquitoes that are produced.

Malaria – is caused by parasites that attack red blood corpuscles, destroying them while undergoing asexual reproduction. It is transmitted primarily to humans by *Anopheles* mosquitoes and can be contracted by shared needles, blood transfusions or transplacenta infections. Malaria has also been referred to as black-water fever or intermittent fever. Mosquitoes become infected while feeding on other humans that harbor the parasite. Vectors: *Anopholes freeborni, Anopholes hermsi* and *Anopholes puntipennis*

Metamorphosis - the series of changes that an insect goes through during its growth from the egg to larva and pupa to adult

Molt - shedding of the skin

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Mosquito Pools/Samples - Mosquitoes are trapped and collected from the field. The collected females are then pooled together by species. Each sample contains a minimum of one to a maximum of 50 mosquitoes per sample. Each sample is tested for the presence of St. Louis Encephalitis, Western Equine Encephalomyelitis and West Nile viruses by TaqMan real-time polymerase chain reaction (PCR).

Mosquitoes - Mosquitoes are blood-sucking insects from a large group of insects called the Diptera. Mosquitoes successfully transmit various diseases such as West Nile virus, Western Equine Encephalomyelitis, St. Louis Encephalitis, canine heartworm and malaria. There are approximately 3,500 species of mosquitoes distributed worldwide, 53 different species occur in California and over 20 are found in Sacramento and Yolo counties.

Mosquitofish - Mosquitofish, *Gambusia affinis*, a live-bearing American fish, is utilized as a predator of mosquito larvae in many diverse aquatic habitats throughout the world. A comparatively small species, the full-grown females are usually less than 2½ inches (64mm) in total length, while males are typically under 1½ inches (38mm). The muted silver and light olive green body color is common to both sexes. In addition, they are able to lighten or darken their body color pigmentation to more closely match their immediate environment. Mosquitofish are stocked by state-certified vector control technicians.

Norway rat (*Rattus norvegicus*) - Norway rat is found along the shoreline in much of urban California, where it inhabits the riprap of jetties, and is also a subterranean inhabitant of sewer systems in many urban areas. The Norway rat is slightly larger than the roof rat with a heavier, bulkier body. The eyes and ears are comparatively smaller than the roof rat's and the tail is shorter than the combined head and body length. This species nests in underground burrows and will feed on discarded fish, fish bait, garbage, meat scraps, and cereal grains.

New Jersey Light Trap – Captures adult mosquitoes, tracks seasonal abundance and monitors control activities for mosquitoes

Oil of Lemon Eucalyptus – The active ingredient in one form of insect repellent

Parasite – An organism that lives and feeds on or in another plant or animal (known as the host). The host is usually harmed by the parasite. Parasites are among the worst pests; but when parasites help people by attacking and controlling pests which could injure crops or animals, they become forms of biological control.

Physical Control – physically manipulating or altering mosquito habitats, thus reducing or eliminating mosquito production

Picaridin - The active ingredient in one form of insect repellent

Predator - an animal that attacks another animal in order to feed upon it

Proboscis - long mouthpart of a mosquito

Pupa - (plural: pupae) third stage of the mosquito's life cycle

Red box – Attracts and traps mosquitoes seeking shelter

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Roof rat (Rattus rattus) - is a major problem species in California. This agile rat is slender with the tail longer than the head and body combined. Roof rats frequently enter buildings and move about neighborhoods by using utility lines and fences as runways. The roof rat prefers to feed on many of the fruits, nuts, ivy and pet food commonly found in residential backyards. Rats and their fleas are capable of transmitting a variety of human diseases. Among the diseases transmitted by rats, bubonic plague is perhaps the most serious. Murine typhus is another rat-borne disease that exists in certain areas of California. This disease, like plague, can be transmitted by rat fleas. Rats also may be involved in the transmission of a variety of filth diseases in areas with poor sanitation.

Saliva - liquid that mosquito injects in our body before it drinks blood; sometimes called spit

Sentinel Chicken flocks – Sacramento-Yolo Mosquito and Vector Control District utilizes sentinel chicken flocks to detect disease transmission of mosquito-borne arboviruses such as West Nile virus (WNV), Western Equine Encephalomyelitis (WEE) or St. Louis Encephalitis (SLE). Data generated by these flocks assist mosquito control professionals in making mosquito control management decisions and is used to reduce the risk of mosquito-borne disease transmission. Within a few days after having been bitten by a mosquito infected with one of these viruses the chickens develop specific antibodies to that virus. They do not become ill or die. Blood samples from the chickens are routinely taken by laboratory staff and tested for the presence of these antibodies. Typically, the chickens are sampled every other week during the mosquito season (May until October) and once a month during November until April.

Siphon - breathing tube of a mosquito larva

St. Louis Encephalitis – In the United States, the leading cause of epidemic flaviviral encephalitis is St. Louis Encephalitis (SLE) virus. SLE is the most common mosquito-transmitted human pathogen in the U.S. While periodic SLE epidemics have occurred only in the Midwest and southeast, SLE virus is distributed throughout the lower 48 states. Since 1964, there have been 4,437 confirmed cases of SLE with an average of 193 cases per year (range 4 - 1,967). However, less than one percent of SLE viral infections are clinically apparent and the vast majority of infections remain undiagnosed. Illness ranges in severity from a simple febrile headache to meningoencephalitis, with an overall case-fatality ratio of five to 15 percent. The disease is generally milder in children than in adults, but in those children who do have disease, there is a high rate of encephalitis. The elderly are at highest risk for severe disease and death. During the summer season, SLE virus is maintained in a mosquito-bird-mosquito cycle, with periodic amplification by peridomestic birds and *Culex* mosquitoes.

Ultra Low Volume (droplet size) – This highly concentrated solution may contain the active ingredient alone; it is applied without diluting. These solutions require special equipment to apply them at ultra low volumes. ULV applications are frequently made from aircraft or from groundbased equipment to control adult mosquitoes.

Thorax - middle body region of an insect; one of the three main body parts

Tick – A bloodfeeding external parasite of mammals, birds, and reptiles. Some ticks can transmit diseases to humans and animals. The primary vector for Lyme disease in Sacramento and Yolo Counties is Ixodes pacificus, also known as the western black-legged tick. The bacterium that causes Lyme disease is called Borrelia burgdorferi. Ticks are usually found in grassy areas, in brush or in wooded areas. They wait on the tips of vegetation for a human or other animal host to

pass by (this is called "questing"). As the host brushes against it, the tick makes contact, looks for a suitable location and begins the feeding process. Contrary to popular belief, ticks do not embed their heads in skin. Ticks are equipped with mouthparts adapted to penetrate and hold fast in the skin of its host. Additionally, they secrete a cement-like material that helps them stay attached to their host. Ticks go through four life stages: egg, larva, nymph and adult. Both males and females in the last three stages require a blood meal.

Trumpets –breathing tubes through which mosquito pupae breathe

Tumblers – common name for mosquito pupae

Vector - an animal or insect that is capable of transmitting a disease to humans or other animals, or is considered a public health nuisance

West Nile virus – is a disease transmitted to humans, birds, horses and other animals, by infected mosquitoes. It is well established in Sacramento and Yolo Counties. It is now in all 58 counties in California! Mosquitoes get the disease from infected birds while taking blood, and can later transmit it when they bite animals or humans.

Western Equine Encephalomyelitis – The alphavirus Western Equine Encephalitis (WEE) was first isolated in California in 1930 from the brain of a horse with encephalitis, and remains an important cause of encephalitis in horses and humans in North America, mainly in western parts of the USA and Canada. In the western United States, the enzootic cycle of WEE involves passerine birds, in which the infection is inapparent, and culicine mosquitoes, principally *Culex tarsalis,* a species that is associated with irrigated agriculture and stream drainages. The virus has also been isolated from a variety of mammal species. Other important mosquito vector species include *Aedes melanimon* in California, *Ae. dorsalis* in Utah and New Mexico and *Ae. campestris* in New Mexico. WEE virus was isolated from field collected larvae of *Ae. dorsalis,* providing evidence that vertical transmission may play an important role in the maintenance cycle of an alphavirus. Expansion of irrigated agriculture in the North Platte River Valley during the past several decades has created habitats and conditions favorable for increases in populations of granivorous birds such as the house sparrow, Passer domesticus, and mosquitoes such as *Cx. tarsalis, Aedes dorsalis* and *Aedes melanimon*. All of these species may play a role in WEE virus transmission in irrigated areas. In addition to *Cx. tarsalis, Ae. dorsalis* and *Ae. melanimon,* WEE virus also has been isolated occasionally from some other mosquito species present in the area. Two confirmed and several suspect cases of WEE were reported from Wyoming in 1994. In 1995, two strains of WEE virus were isolated from *Culex tarsalis* and neutralizing antibody to WEE virus was demonstrated in sera from pheasants and house sparrows. During 1997, 35 strains of WEE virus were isolated from mosquitoes collected in Scotts Bluff County, Nebraska. Human WEE cases are usually first seen in June or July. Most WEE infections are asymptomatic or present as mild, nonspecific illness. Patients with clinically apparent illness usually have a sudden onset with fever, headache, nausea, vomiting, anorexia and malaise, followed by altered mental status, weakness and signs of meningeal irritation. Children, especially those under 1 year old, are affected more severely than adults and may be left with permanent sequelae, which is seen in 5 to 30 percent of young patients. The mortality rate is about three percent.

Western malaria mosquito *(Anopheles freeborni)* - *Anopheles freeborni* can transmit the malaria parasite to humans. It is common in rice growing regions of California. Immature stages develop in rice fields, wetlands, duck clubs and rain pools. It prefers to feed on mammals. This species is most active in late winter until early fall.

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Western treehole mosquito *(Aedes sierrensis)* - This mosquito can transmit the dog heartworm parasite Dirofilaria immitis, and is a severe outdoor pest. It is common in oak woodlands. Immature stages develop in tree rot holes. It feeds primarily on mammals. This mosquito is most active during the late winter months until early spring.

Wetlands mosquito *(Aedes melanimon)* - *Aedes melanimon* is involved in the encephalitis transmission cycle and is a severe outdoor pest. It is common in Sacramento and Yolo Counties. This mosquito develops in wetlands, duck clubs and irrigated pastures. It prefers to feed on mammals. *Ae. melanimon* is most active during the fall and spring months

For Additional Information – Please contact Sacramento-Yolo Mosquito & Vector Control District at 1.800.429.1022 or online at www.FIGHTtheBITE.net