



# MOSQUITO and VECTOR MANAGEMENT DISTRICT of SANTA BARBARA COUNTY

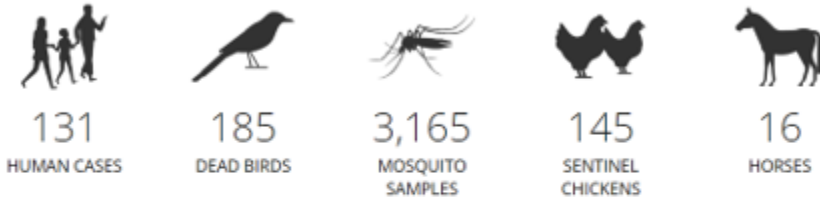
## DISEASE SURVEILLANCE REPORT

December 2022

### Vector-borne Disease Surveillance

The 2022 mosquito trapping season ended with zero mosquito samples testing positive for mosquito-borne viruses in Santa Barbara County. In Santa Barbara County in December, one dead bird was reported, but it was not tested since it had been dead longer than 24 hours. No mosquito pools were tested.

#### 2022 West Nile Virus Activity in California through November



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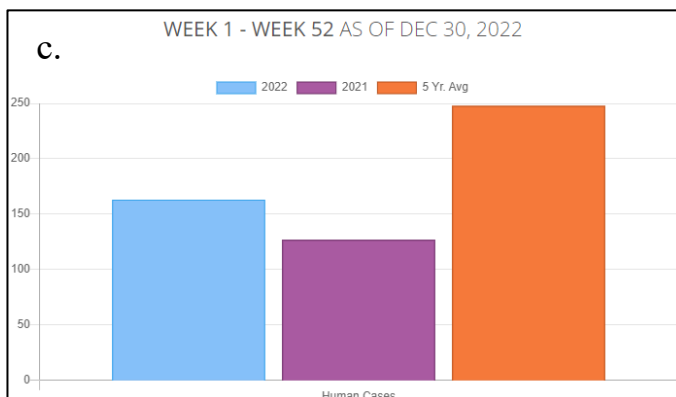
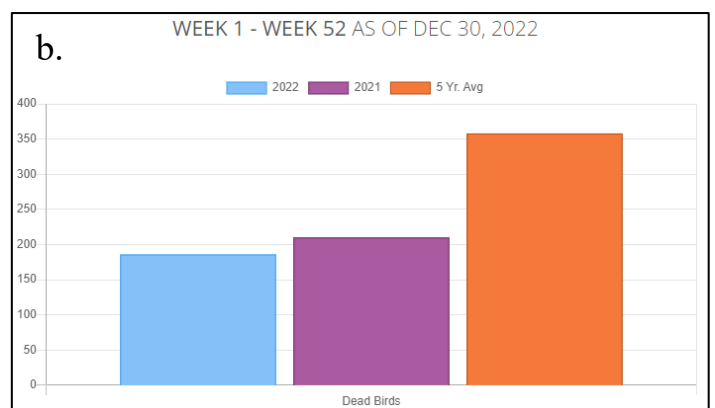
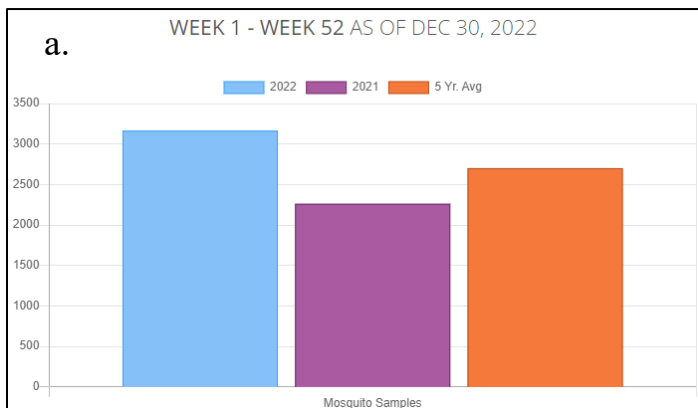


### California Arbovirus Detection

In December, most California districts or counties greatly reduced their surveillance activity. No additional positive mosquito pools, sentinel chickens, or horses were reported. The number of positive dead birds increased by only one. Thirty-two human cases were added to the 2022 total last month. Out of the total of 163 human WNV cases, 10 were fatal; 13 additional cases were asymptomatic blood donors.

There were 153 mosquito pools positive for Saint Louis encephalitis virus in 2022; there were 11 human cases. No detections

of Western equine encephalitis virus were reported in California last year.



2022, 2021 and 5 year average  
of West Nile Virus in CA

- a. Mosquito samples
- b. Dead birds
- c. Human cases

## Invasive *Aedes* Mosquito and Zika Virus Update

No *Aedes aegypti* mosquitoes or other invasive *Aedes* species were detected in Santa Barbara County in 2022.

*Aedes aegypti* mosquitoes are present in 24 California counties. *Ae. albopictus* is present in five counties. *Aedes notoscriptus* occurs in L.A., Orange and San Diego Counties.

In the summer of 2022, there were two human cases of dengue virus in Santa Barbara County, but both infections were most likely travel-related. There were 57 cases of dengue virus in California in 2022.

### Sterile Insect Technique for Control of Mosquitoes

Sterile insect technique, or SIT, is a strategy to control a species of insects by releasing sterile individuals that cannot produce viable offspring. Male mosquitoes are used because they do not bite. There are three techniques that produce sterile mosquitoes: irradiation, *Wolbachia* bacteria incompatibility, and genetic modification.

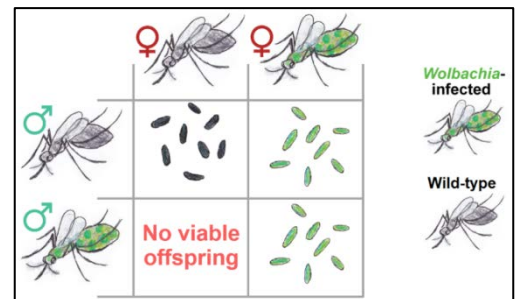
#### Irradiation

After the target species is mass produced, males are separated-out and x-rays are applied to sterilize them. Sterile males mate with wild females that then lay infertile eggs which do not hatch. Very large numbers of irradiated males must be released repeatedly for this type of control to be successful. This technique can be “boosted” by coating the males with larvicide or densovirus powder to kill wild females.

Image Credit: Perran Ross at University of Melbourne

#### *Wolbachia* bacteria incompatibility

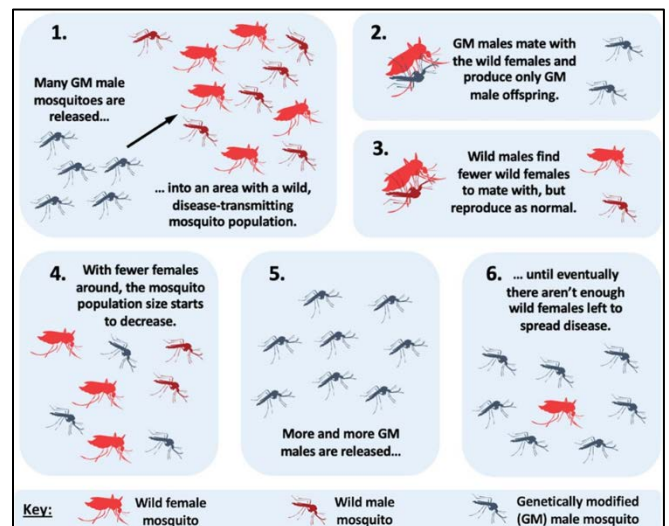
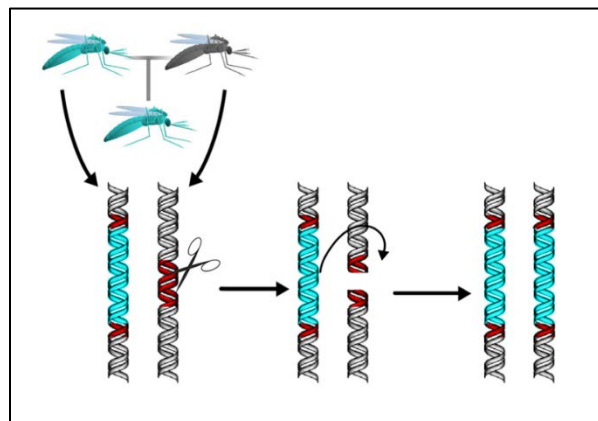
Males are mass-produced in the lab and infected with *Wolbachia*. Their sperm cells are not compatible with an uninfected (wild) female’s eggs, so the eggs do not hatch. The company MosquitoMate and others have used this strategy in Texas, Singapore, Australia, Thailand, Mexico, and Calif. (Fresno County Consolidated Mosquito Abatement District). This technique is commercially-available in Kentucky against *Ae. aegypti* and *Ae. albopictus*.



#### Genetic modification

Mosquitoes are genetically modified to contain a gene fatal to female offspring. The gene copies and inserts itself, so it is inherited by all male offspring. Males are released as adults or distributed as eggs in a container (“just add water”). The company Oxitec has developed this technology for use in Brazil, the Cayman Islands, Panama, India, Florida, Texas, and Tulare County, California (Delta MVCD).

Credit: E. P. Caragata, UF/IFAS



Credit: Harvard University

Fact sheets and videos available at <https://www.mvac.org/vectors-and-public-health/innovative-technologies/>