

# STERILE INSECT TECHNIQUE



(SIT)



## What is SIT?

- SIT is a technique used to sterilize insects to reduce their population or to eradicate them.
- It involves releasing lab reared sterilized insects to mate with the wild population to reduce or eliminate the targeted species.
- This method of control can be achieved using irradiation from gamma rays or X-rays.

## How does SIT work in mosquito control?

- Female mosquitoes will only mate with male mosquitoes once in their lifetime. If lab reared sterile male mosquitoes are released into an environment with wild females and they mate, the female mosquitoes will not produce viable offspring. This will reduce or eliminate the local population through successive releases.
- X-rays will be used on mosquito pupae to render them sterile when they reach the adult stage. Sterile males will then be released to mate with wild females.
- Male mosquitoes, unlike females, do not bite. Releasing male sterile mosquitoes will not increase the number of mosquito bites in a particular area.

## Is there any genetic modification with this method of control?

- No. Sterilization is achieved through irradiation and requires no genetic manipulation of the organism. The x-rays used are the same as those used in medical practices.

## Which mosquito will be targeted with the LCMCD's SIT Program?

- The *Aedes aegypti* mosquito will be targeted, an invasive exotic species in our county. This mosquito is a viable vector of the following viruses: Yellow fever, dengue fever, chikungunya, and Zika.
- *Aedes aegypti* is an urban mosquito, meaning it breeds around homes and prefers to feed on humans. They are difficult to control by conventional means (insecticide applications, source reduction) due to their cryptic behavior and daytime biting habits.

## Will any female mosquitoes be released?

- Male mosquitoes are separated from females prior to release. However, a small number of females may slip through with the large number of males released. These females are no different from the local female population, except they are sterile.

## Has SIT been used before?

- SIT is not a new technology. In fact, its first use in the United States occurred on Sanibel Island in 1951 to eliminate the screwworm fly. Recently, sterile screwworm flies were released to successfully control a localized outbreak in the Florida Keys. Currently, SIT is used in agriculture to control fruit flies as well as the medically-important Tsetse fly, which spreads sleeping sickness pathogens to cattle and humans in Africa.