

INTEGRATED MOSQUITO MANAGEMENT FACT SHEET

What is IMM?

Integrated Mosquito Management (IMM) is the concept of using several strategies to control mosquito populations. This incorporates mosquito surveillance, public outreach/education, source reduction, larval, and adult control. These methods are used to control mosquito populations to a manageable level for the protection of public health and for the ability of the public to enjoy outdoor spaces with minimal irritation.

Mosquito Surveillance:

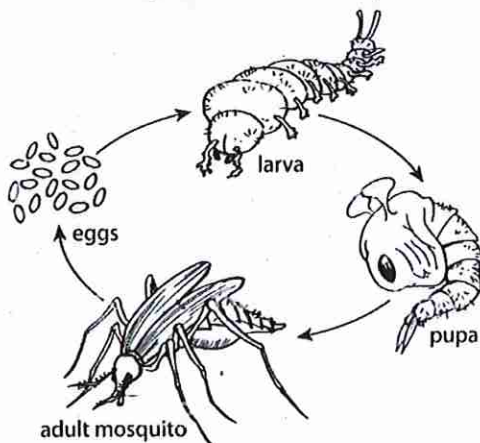
Surveillance is the backbone of an IMM program and is essential in determining where, when, and why intervention may be necessary to control mosquito populations that may pose a risk to public health or a nuisance. Routine surveillance is used to gather data on mosquito population and disease presence allowing for decisions to be made on where controls and outreach should be applied. Reactive surveillance from a public complaint, or a human/animal case allows for determining what control actions must be pursued in areas that may not be routinely surveyed.

Larval sampling needs to be done on a regular basis to establish where mosquitoes are breeding. The samples that are collected can be used to decide how to mitigate the risk of a population becoming a nuisance or a public health threat, whether it is through source reduction or by the use of larval control products.

Adult sampling is used to understand the extent and the species of an adult population. This is routinely done in population centers due to the increased risk of disease transmission. The adult samples that are collected are tested for pathogens consisting of WNV, EEE, SLE, and LAX depending on the species.



Mosquito Life Cycle



Gravid Traps are used to capture mosquitoes that are gravid (already taken a blood meal and are ready to lay eggs). This data is used to determine virus transmission risk using the Vector Index (VI) level to guide control activities. BG/Light Traps determine the population of biting mosquitoes, ones that are looking to take a blood meal. They both use CO₂ as an attractant, but only the BG uses a human scent lure. These traps are used mainly for species density surveys and can be used to gauge nuisance levels in an area.

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Choosing a Trap:

Not all traps are warranted for a given situation. Gravid traps are used to determine disease risk in areas that have habitat that is suitable for container breeders (*Culex pipiens/restuans*, *Aedes japonicus*, *Aedes albopictus* etc.). They are routinely used at WNV fixed sites, STPs, complaints that have artificial containers, responses to disease cases and standing organic water. BG/Light traps are used to capture actively host-seeking mosquitoes especially species that target humans (*Aedes trivittatus*, *Aedes canadensis*, *Aedes albopictus*, *Aedes vexans*, *Psorophora ferox*, etc.) They are used for nuisance complaints, Zika fixed sites, floodwater sites, and woodland pools. Different traps can be used at the same time.

Remember: Gravid traps are used to assess disease; the targeted species are primarily bird biters. BG/Light traps are used to find those species that aggressively go after humans and are used for biting complaints. This should be remembered when you are determining which trap to use in an area. If in doubt place both types of traps.

Public Outreach/ Education:

Public outreach/education is important for informing communities of the possible risks and preventative measures that can be taken to control mosquitoes and disease. Many opportunities exist to provide the public with preventative measures such as: Public presentations, one on one discussions or informational fliers. In the event of a disease outbreak, door to door canvassing may be warranted in some areas that are at an increased risk for disease transmission. Some residents may be willing to have you check some areas that may produce mosquitoes on their property.

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Source Reduction:

Removing larval habitat can be done through dumping, removing, and draining containers. Adult source reduction can be accomplished by removing resting habitat and opening areas to sunlight. Resting habitat consists of high vegetation, brush lines, ivy, and shaded structures etc.



Larval Control:

Larval control kills or inhibits the maturity of the larval life stages of mosquitoes. Larval control is used when the habitat cannot be removed. There are many formulations of products to choose from such as granular, WSPs, briquets, and MMFs (which are the only product that will kill late instars and pupae). There are residual and non-residual products depending on the situation not all products will work for a given scenario. It is best to read the label to determine which products should be used.



Adult control:

Adult control is the last step to control mosquitoes in an IMM program. Larval control alone is not enough to stop WNV outbreaks when the amplification has reached the level of human infection, adult controls are required. Adult controls consist of barriers, ULVs, and fogging. These are used once a predetermined disease (VI) threshold or a nuisance mosquito threshold has been reached.