

# Comprehensive Mosquito Management

## **INNOVATIVE & EFFECTIVE PRODUCTS & APPLICATION STRATEGIES**

Rockwell Labs Ltd offers a full line of mosquito management products for PMPs. While large scale mosquito control efforts are typically undertaken by government mosquito control districts, PMPs have the opportunity to provide relief for their customers and revenue to their bottom line through barrier treatments and breeding prevention around structures.

An effective mosquito management plan includes a range of tools and procedures. An IPM (Integrated Pest Management) approach is most effective and includes reduction of adult mosquitoes using adulticides, reduction of breeding sources and resting sites, prevention of egg laying and larval development using larvicides, and reducing the risk of human exposure through education and preventative measures. A mosquito control program should consider the target species, mosquito biology and behavior, and local and regional environmental conditions and regulations.

## **ID & BEHAVIOR**

Mosquitoes belong to the order Diptera, the true flies. There are over 180 different species of mosquitoes in the United States. Each species may exhibit unique behaviors and breeding preferences, prefer specific habitats, and feeding on different organisms.

Despite the many differences among species, they all share many common traits. Mosquitoes develop through four life stages-egg, larva, pupa, and adult (complete metamorphosis). Understanding how to target these life stages for species present in your geographic area can prove crucial to pest management efforts. Typical mosquito life cycles are short, developing from egg to biting adult in 2 weeks. However under varying environmental conditions development may take as little as 4 days to several months.

Adult mosquitoes feed on plant nectar. Adult female mosquitoes mate quickly after emerging and require a blood meal to produce eggs. Male mosquitoes do not take a blood meal. While some species are non-specific feeders, many specialize on one specific group of organisms, such as birds, mammals or reptiles. After obtaining a blood meal, females search for preferred habitat to lay eggs on or near a water source.

## **BREEDING**

All mosquito larvae live in water. Different species of mosquitoes prefer different types of standing water to complete reproduction. The areas chosen for breeding sites and depositing eggs are species specific, but can be placed into three general groups:

**1. Permanent water breeders** lay eggs on the water surface individually or in egg masses or rafts on permanent water sources such as ponds and ditches (**Culex, Anopheles**).

**2. Floodwater mosquitoes** generally lay eggs out of water on moist surfaces in flood prone areas and marshes (**Aedes, Psorophora**).

**3. Container, treehole, and temporary water source breeders** including **Aedes aegypti** and **Aedes albopictus**. These mosquitoes will lay eggs in manmade items, temporary ponds/puddles, and any area where water may accumulate for short periods of time (10-14 days). Many species use available habitat within their geographic area despite their primary preferences.

## PESTICIDE APPLICATIONS

In addition to non-chemical strategies to reduce breeding, staging and resting areas, insecticides can be used to kill existing adult populations and control larval development.

### KILLING ADULT MOSQUITOES

Mosquitoes are attracted to carbon dioxide, body heat, lactic acid, and other scents on the body. Mosquitoes may be drawn to certain areas or structures due to these attractants, habitat preferences or breeding sites, but the source of the population may be located some distance away.

#### USING LAMBDASTAR ULTRACAP AGAINST MOSQUITOES

The innovative capsule suspension formulation protects the active ingredient Lambda-cyhalothrin from conditions that break down most pyrethroid insecticides; heat, UV light and rain leading to long term residual control.

Thorough coverage is a must. Apply **LambdaStar UltraCap** as a barrier treatment using a backpack mist blower or other forced air misting device to all dense vegetation, bushes, landscaping and other foliage on the property. Backpack and handheld misters improve results by thoroughly covering both sides of leaves, grasses, or branches. For the best results, place the sprayer nozzle deep into the plant canopies where mosquitoes rest to apply pesticides.

Mosquito resting areas on siding, under decks, and other areas on accessible surfaces may also be treated using a coarse spray backpack sprayer with a fine fan pattern.

Treatments should be made during the peak season of activity as needed. When applying insecticides to bushes and shrubs, avoid spraying at times when pollinators are active and avoid any flowers and blooms in the area to reduce the impact on pollinating insects. Mosquitoes are generally found deep inside the plant.

#### USING ECOVIA BOTANICALS AS A COMPLETE GREEN SOLUTION PROGRAM TO KILL AND REPEL MOSQUITOES

Unlike synthetic pesticides which exhibit repellency only when insects touch a treated surface (known as excitorepellency) botanical pesticides exhibit true repellency due to their volatile aromatic components. Each EcoVia product allows maximum versatility for applications without pyrethroid or neonicotinoid use restrictions, as well as providing quick knockdown and residual control through repellency.

##### EcoVia Emulsifiable Concentrate

Apply **EcoVia EC** as a barrier treatment using a backpack mist blower, compressed air sprayer or power sprayer to all vegetation, landscaping and other mosquito resting surfaces. EcoVia EC may also be fogged over bodies of water such as ponds or lakes. When diluted, EcoVia EC may be applied near or over water sources and other environmentally sensitive areas where mosquitoes reside. See product label for details.

##### EcoVia Granular Insecticide

Apply **EcoVia G** to provide repellent protection against mosquitoes. EcoVia G should be applied under bushes and heavy vegetation, throughout landscaping, on the boundary between wooded areas and turf, under decks and other areas where mosquitoes may reside. Note the wind direction and apply such that vapors travel in the intended direction.

##### EcoVia Wettable Dust

**EcoVia WD** is a versatile wettable dust formulation that can be applied as a dust in areas such as mulch beds and under low/ground level decks where liquid treatments may be difficult, and in a liquid suspension in other areas. The formulation of EcoVia WD provides a long lasting repellency, as well as larvicidal action in standing water.

#### ECOVIA PRODUCT TIPS

EcoVia products can be reapplied as necessary. If oil sensitive plants are in the vicinity, or pollinators are present apply EcoVia G granules on the soil surface, instead of a liquid formulation. EcoVia WD and EcoVia G are excellent products for areas in landscaping that tend to pool or become supersaturated after rainfall.

#### MAXIMIZE RESULTS BY COMBINING LAMBDASTAR ULTRACAP WITH ECOVIA PRODUCTS

The most effective way to eliminate and repel mosquitoes is to use a combination of tactics and products. Provide your clients with a 1-2 punch by combining EcoVia EC with your LambdaStar UltraCap treatment\*. This combination will provide a rapid knockdown due to the contact kill of EcoVia EC and repellency due to the volatile botanical oils. Also, field evidence suggests that tank-mixing EcoVia EC at 1 oz/gal with pyrethroid treatments extends the residual activity compared to either product used alone. Adding EcoVia G and EcoVia WD to the program in areas as described above will also enhance results.

*\* Remember, when mixing these two products, always follow the more restrictive LambdaStar UltraCap label.*

### AFTER THE INITIAL SERVICE

After you have reduced contributing conditions and performed an initial pesticide application, you may choose to reduce the application rate of LambdaStar UltraCap on follow-up services depending on the level of mosquito pressure. Another option is to provide treatment with a second active ingredient on subsequent visits. Apply **FenvaStar EcoCap**, micro-encapsulated esfenvalerate, as a standalone treatment or tank mixed with EcoVia EC.