

It's Really Going Places.

## *Best Management Practices*

### **Mosquitoes**

**Background:** Mosquitoes are one of the most common and important bloodsucking insects. The adult female mosquito feeds on the warm blood of mammals (including man) and birds and on the cold blood of fish, reptiles and amphibians. Mosquitoes are one of the most important public health pests due to vectoring of disease-causing pathogens. These mosquito-borne pathogens cause diseases like the West Nile virus, malaria, yellow fever, dengue and encephalitis. Worldwide these diseases afflict tens of millions people per year and kill millions per year as well. In the US, West Nile Virus is spreading westward by way of infected birds and encephalitis outbreaks occur frequently.

**Description/Biology:** Mosquitoes undergo a complete life cycle, which means they go through four stages: eggs, larvae, pupae, and adults. All mosquitoes complete their life-cycle in about 10 - 14 days in summer months. Female adult mosquitoes usually are the only ones that feed on blood. They have piercing-sucking mouthparts (needle with suction tube) from which to extract blood from a victim. For normal metabolic function, plant juices and nectar provide the required nutrients. A blood meal is required for egg development from which protein is extracted. It is during this feeding process that pathogens are introduced into victim's blood stream. Eggs are laid singularly or in tight clusters called rafts.

Many species of mosquitoes occur worldwide. *Culex*, *Aedes* and *Anopheles* are general genus groupings.

Common *Culex* species include *C. pipiens* (Northern House), *C. p. quinquefasciatus* and *C. tarsalis*. *Culex pipiens* and *C. p. quinquefasciatus* are plain brown and lay eggs in rafts in rain barrels, flower pots and any other water-holding vessel high in organic pollution. *C. tarsalis* is dark brown with white bands on legs and on proboscis and may lay eggs in clear water. Larvae develop into pupae while still in water.

Common *Aedes* species include salt marsh species like *A. taeniorhynchus* (Black Salt Marsh), *A. sollicitans* and *A. dorsalis*. These species typically breed in salt water marshes along the coast. They lay eggs singularly on water or on mud surfaces. *Aedes* species also include the floodwater species that breed in riverine flood plains and in water seepage areas. *Aedes* species such as *Ae. sierrensis*, *Ae. triseriatus* and *Ae. aegypti* most often breed in water-filled tree hole cavities.

Common *Anopheles* species include *An. freeborni*, *An. quadrimaculatus*, *An. earlei*, *An. occidentalis* and *An. aztecus*. Eggs are laid in clean still water. *Anopheles quadrimaculatus* is common vector for malaria in USA. Life cycle in this species on average may take about 3 weeks to a month, and the egg stage is very prone to desiccation.

**Management:** Mosquito management involves very comprehensive treatment strategies including those established by public health authorities and mosquito abatement agencies. This BMP attempts to provide adult mosquito population management guidance around individual dwellings as part of a perimeter pest management program.

*Inspection:*

The inspection should focus on any current or future breeding sites. These sites include any item that may hold water sufficient enough to maintain life cycle development. These items may include old tires, flowerpots, garbage cans, poorly drained gutters, toys, poor grade slope or soil depressions, tree holes/cavities, bird baths, non-functioning fountains, watering cans, sump-pump discharge, and air conditioner and related discharge. Once identified remove and/or drain the breeding site, if practical. Also inspect all windows and doors for screens in disrepair. If necessary, collect specimens to be identified by the local extension office.

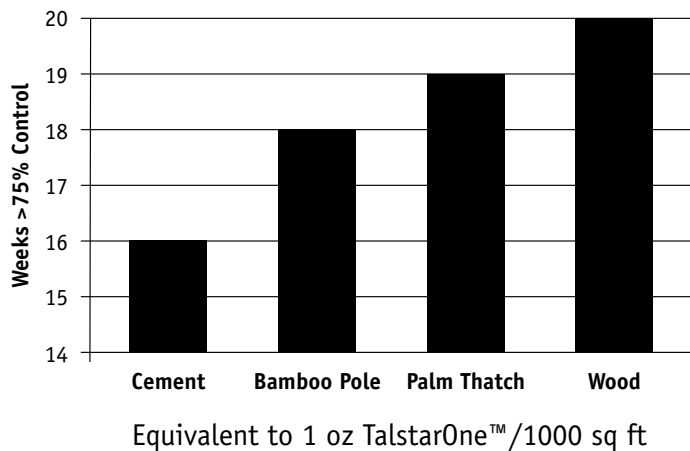
*Assessment:*

Once inspection information is gathered the PMP then determines the best management strategy and discusses it with customer to be sure the customer's needs and concerns are met. This may require the customer to contact mosquito-abatement agencies to address large breeding sites such as ponds.

*Treatment:*

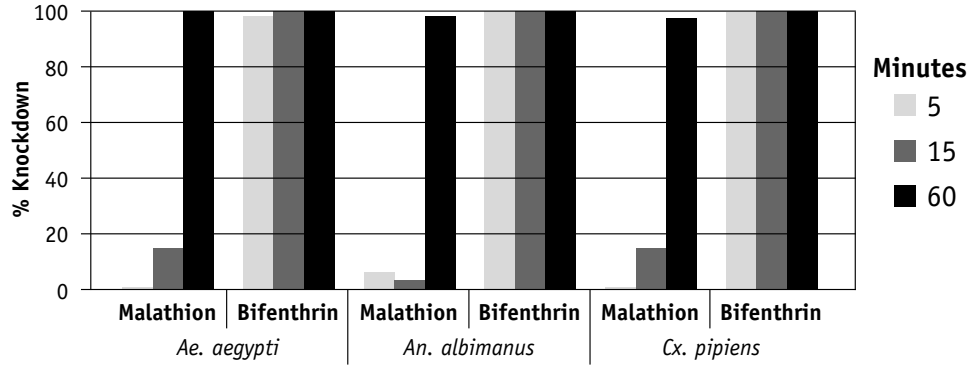
Once assessment is complete an exterior treatment program is then developed. TalstarOne™ multi-insecticide offers the benefit of a long lasting adulticide and a high kill rate by allowing mosquitoes to rest on treated surfaces for longer periods. This is due to TalstarOne's low repellancy. If mosquito resting sites are found around landscaping, lawns, or buildings, apply TalstarOne™ multi-insecticide as a general spray around these areas using 0.5 fl. oz. to 1.0 fl. oz. per gallon of water at a volume of 1 gallon of final dilution per 1,000 square feet. For higher volume applications, TalstarOne™ multi-insecticide may be diluted at lower concentrations; see the label for specific dilution instructions. If mosquito resting sites include ornamental plants then TalstarOne™ multi-insecticide will provide excellent control under typical conditions when applied to ornamentals as a full coverage foliar spray where mosquitoes may be present. Use 0.25 fl. oz. to 0.5 fl. oz. of TalstarOne™ multi-insecticide per 1,000 sq. ft. which is 10.8 fl. oz. to 21.7 fl. oz. per 100 gallon tank of water. Using the higher rate will result in longer residual and better control in high populations.

**Residual Control of Mosquitoes  
with Bifenthrin on Surfaces in Mexico  
*Anopheles* Mortality >75%**



Instituto Nacional de Salud Publica Centro de Investigacion de Paludismo, 2000. WHO Phase III.

## Direct Application to Caged Mosquitoes



24 h = 100% mortality for all treatments  
 0.3 % Bifenthrin diluted to 0.0035 % ai  
 App. rate = 6.2 ml/ft<sup>2</sup>

C. Silcox, 1999 FMC.

**Always read and follow label directions.**