

UF/IFAS/FMEL

Mosquito Timed Spray Systems Recommendations

The first responsibility in any pest control application is to know the specific pest one is trying to manage: identify it, know its feeding habits, where it rests, when it moves, when it mates, where the eggs are deposited, etc. Entomologists and insect control professionals know from experience that a lack of understanding of pest behavior often leads to ineffective control measures and unnecessary exposure of the environment and non-target organisms to a pesticide.

Seventy-seven species of mosquitoes have established populations in Florida; over 150 species are known to North America. Different mosquito species exhibit different behaviors. The various mosquito species have preferences for the type of host they will feed on and the time of day or night they are flying/biting/feeding. Since species differ in many traits, what is known about one species cannot be assumed to pertain to another species. For example, it is well established that mosquito activity (flight/feeding) fluctuates depending on the humidity, the wind, the season, the temperature, host availability, the time of day, and the mosquito species. There are some Florida species of mosquitoes that exhibit a narrow window of feeding that lasts approximately 1 hour right before sunset; others may feed at any time of day when a host is near.

In order to reduce the number of biting mosquitoes of any given species, one must monitor several variables and respond with appropriate control measures that are specific for the intended pest species. This is the science (and the art) of mosquito surveillance. Surveillance should include:

- Proper identification of the pest species
- Considerations of the behavior of various species
- Population density monitoring; landing rates, trap counts, larval development
- Weather monitoring

Why is surveillance and precise identification of target species important?

- Effective and efficient mosquito control programs respond to mosquito density. It is inappropriate to apply an adulticide for mosquitoes if there are no adult mosquitoes present at the time of the application.
- Proper timing of application is critical. It can be very difficult to time a mosquito adulticide application that specifically targets resting or flying mosquitoes. The product must reach the mosquito in flight, or get through the vegetation where the mosquitoes rest. The insecticide must come into contact with the mosquito and be of a certain size droplet that has high probability of actually hitting the insect. Those that are too big will drop before contacting the mosquito and those that are too small will go around the mosquito body without contact. Every droplet of pesticide that misses a mosquito or has low probability of contacting a mosquito is a waste of product and an unnecessary exposure of the environment and non-target organisms to an insecticide. One needs to know what the mosquitoes are doing in order to time the application so that it will be effective.
- Scheduled spraying, that is, ANY application that relies on spraying on a regular interval without surveillance and decision-making by humans, leads to inappropriate applications. Inappropriate applications can contribute to insecticide tolerance and resistance.

Mosquito control misting systems, or any other system that simply releases insecticides on a timer, whether it is a barrier application or to kill flying mosquitoes, lack the human element that is critical for effective and proper mosquito control.

Effective, efficient, and environmentally proper mosquito control organizations conduct their operations of applying pesticide based on surveillance to ensure that the application will have maximum effect on mosquitoes with minimal effect on the environment. Timed release of pesticides into the environment, with no biological surveillance or human decision making to assess the need and impact, is NOT a part of a responsible mosquito control application. Therefore, it is against good mosquito control practices to advocate automatic release of pesticides simply based on a timer.