

Area-wide Management of the Asian Tiger Mosquito Adulticide Application Standard Operating Procedure¹



Purpose

The purpose of this document is to detail the methods used for a truck-mounted application of an adulticide product using an ultra low-volume (ULV) sprayer to reduce biting populations of *Aedes albopictus*. Bioassays using caged mosquitoes in open field settings and droplet accumulation trials under operational conditions (in the actual treated sites) were performed to examine the penetration and efficacy of the applications. Detailed protocols are available upon request. We are in the process of submitting a publication with the overall results and will make that available as soon as possible.

Personnel, Equipment, & Materials

Personnel

1. Two personnel (driver and navigator) per vehicle are needed – these are night time adulticide applications.

ULV Sprayer

1. Clarke Cougar[®] (Clarke Mosquito Control, Roselle, IL) cold aerosol ULV generator (or similar machine capable of delivering ULV droplets and rates).
 - a. The unit we use is fitted with a SmartFlow system (Clarke Mosquito Control, Roselle, IL) and GPS to accurately control variable flow of adulticide over varying field conditions.
 - b. DataMaster[™] real-time tracking is used to record location, miles driven/sprayed, amount of adulticide used, acres sprayed, and average speed of vehicle.
 - c. Sprayer is mounted in the back of a flatbed truck with a nozzle height of 6 ft (1.8 m), and the spray boom is angled 45.5° pointing backwards in a straight line directly behind vehicle.
 - d. A 15 gallon (57 liter) formulation tank is used for the adulticide.

Calibration

1. Our Clarke Cougar was determined to have a $Dv_{0.5}$ of 15.2 μm based on readings from the AIMS machine (Model DC-III; KLD Laboratories, Huntington Station, NY).

¹ Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the USDA or other involved parties.

- a. An AIMS hot wire portable droplet counter was used to characterize droplet spectrum of the Cougar sprayer prior to operational use to ensure droplet size spectra stipulated on pesticide label. Pre-calibrations can be accomplished by contacting your local pesticide sales representatives who will perform this function at your facilities.

Vehicle

1. A pickup truck is needed during all applications.
 - a. Minimal specifications for the bed must accommodate an ULV sprayer with average dimensions of 42”L x 38”W x 43”H (107cm x 97cm x 109cm).
 - b. The vehicle is driven at an average speed of 10 mph (16.1 km h⁻¹).

Adulticide

1. DUET™ Dual-action Adulticide (Clarke®, Roselle, IL).
 - a. Adulticide is applied neat (undiluted) at full label rate (1.23 oz/ac) in suburban neighborhoods and at half label rate (0.61 oz/ac) in urban neighborhoods.
 - b. Between applications adulticide needs to be stored inside a temperature controlled pesticide storage facility.

Procedure

Application Time

1. All truck-mounted ULV adulticide applications are conducted at night between 1:00-5:00 a.m. when human activity and vehicle traffic is at minimum for logistic purposes.
2. An average application within a 120 acre site will take about 2 hours from start to finish. An application in a 400 acre suburban site, using two machines, will take approximately 2 hours from start to finish.

Swath & Area

1. Plan for an average swath width of 150 ft (46 m) within urban treatment sites and 300 ft (91 m) within suburban treatment sites. An “average” city block is roughly 300 ft (91 m) wide from one street to the next, and insecticide flow rates should be set to provide an effective swath of at least one block.
2. If you can, within highly urbanized residential areas where dense housing such as duplexes or row homes abound (average parcel size 2,150 ft²), conduct applications from streets and alleys located within the site. Usually in less dense urban settings and in suburban residential areas containing larger parcels (average size 6,130 ft²), adulticide applications can only be conducted from the streets.

Environmental Conditions

1. All adulticide applications should be done when convection currents are minimal, ground wind speed is above 1mph, rain is negligible, and air temperatures are above 50 °F (10 °C). Applications may be performed during light fog or light rain (drizzle) as long as wind speed is above 1mph.