



## Zika, Dengue and Chikungunya Vector Control Backpack Spraying of VectoBac<sup>®</sup> WDG Bacterial Larvicide

### STANDARD OPERATING PROCEDURE (SOP) FOR THE USA

#### **VECTOBAC WDG SPRAY APPLICATION**

Motorized backpack spray application of VectoBac<sup>®</sup> WDG is recommended when container mosquito larval habitats of less than 10 gallons in volume capacity are numerous in a specific area. Such containers are often hard-to-locate or hard-to-reach with conventional application methods. Spray application will complement existing vector control measures including direct larvicidal treatment of large containers (>10 gallons) and general sanitation.

Backpack spray application can be utilized to cover relatively large areas (spray blocks), while targeting the spray to known or suspected habitats within the block. Spray application can also be targeted strategically to areas of special concern, areas of high virus transmission (hot spots), or where populations of container mosquitoes are high due to the presence of extensive container mosquito sources. In these strategic areas entire blocks should be treated.

For spray application, VectoBac WDG is suspended in water and mixed to the desired concentration prior to transferring into the selected spray equipment. VectoBac WDG suspension is then sprayed into areas within the spray block containing known or suspected container larval habitats. Spray equipment capable of generating appropriate droplet spectra and sufficient spray distribution into the target larval habitats is required for this type of application.

#### **LARVAL HABITATS**

Common larval habitats for Zika, dengue and chikungunya vectors include artificial containers made from various materials such as cement, clay, plastics, metal, fiberglass, etc. Examples of such containers are trash (eg. bottle caps), tires, toys, concrete drainage systems, roof gutters, and any other containers which can hold water. Habitats also include natural containers which can hold water, such as leaf axils, bromeliads, tree holes, leaves, natural pools with leaf litter, and others.

#### **SPRAY EQUIPMENT**

Conventional power backpack spray equipment that is capable of generating droplets with a volume median diameter (VMD) between 50 and 150um is recommended. Backpack sprayers should also be capable of providing complete and uniform coverage of target habitats. Local conditions will dictate the most efficient drop size and effective swath.

Back pack or shoulder carried motorized sprayers should have a nozzle with an orifice that is able to deliver the spray droplets with sufficient projection to reach and penetrate target larval



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habitats under varied environmental conditions. A sprayer that is able to provide an effective swath of 20+ feet (horizontal and vertical distance) is preferred.

An example of a back pack sprayer capable of meeting these specifications is the Stihl® SR450. The Stihl® SR450, equipped with the ULV nozzle, the standard strainer and the optional pump accessory kit installed is recommended. Flow should be set with the ULV metering knob on setting number 0.8, giving a discharge rate of about 450 mL/min of VectoBac WDG suspensions. The engine should be running at full throttle during spraying. Other spray equipment models should approximate these specifications.

#### APPLICATOIN RATE

Target mean VectoBac WDG application rate is 7.0 oz/acre (range 3.5-14 oz/acre). Higher doses (7 to 14 oz/acre) are occasionally needed, and may be used when local experience indicates the need for higher rates to control larvae in specific habitat types.

#### SPRAY VOLUMES

With a walking speed of 1.0 mph and a swath of 20 feet, the Stihl SR450 is expected to deliver a spray volume of approximately 3 gallons per acre with a flow rate of 450ml/min. Actual spray volume per acre will depend on target habitat conditions and flow rate of specific machines in use. Spray mixes for residential treatments in the US will typically require 2.33 ounces of Vectobac WDG per gallon of spray mix at an average spray volume of 3 gpa. Actual spray volumes should be monitored during initial operational sprays, and adjustments in spray mix concentration should be made to consistently achieve the targeted application rate. The table below offers typical spray volumes for various applications.

HABITAT TYPE	SPRAY VOLUME
Trash, dense vegetation, leaf litter, flower pots, etc.	1.5 to 3 gallons per acre
Open drains, roof gutters, containers in sparse vegetation, tires	3-6 gallons per acre
Covered concrete drains	15-20 gallons per acre

While spot application volumes to specific habitat types may be significantly higher than the average, total application volumes for each spray block should average near 3 gallons per acre, and not exceed 6 gallons per acre or be less than 1.5 gallons per acre to maintain application rates in the range of 3.5-14 oz/acre.



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#### APPLICATION PROCESS

Applicators should walk slowly through the targeted area, taking time to focus spray on both observed container habitats and areas suspected to contain habitats such as dense vegetation, trash accumulations, collections of flower pots, roof gutters, drainage channels, etc. If large trash accumulations or tire piles are present, these should receive larger amounts of spray than the less dense accumulations of potential habitats. Open areas of pavement or well trimmed lawns do not need to be sprayed.

#### SPRAY MIX PREPARATION

VectoBac WDG spray mix should be prepared with clear water on the day of the spray. It is also recommended that the spray mix not be prepared in the insecticide tank of the spray equipment, but rather in a separate mixing vessel.

In the field, the required amount of VectoBac WDG can be easily measured without the use of a weighing scale. For example, a one quart kitchen measuring jug will typically hold just over one pound of VectoBac WDG. After confirming the weight/volume ratio, appropriate measuring devices can be calibrated and used for field measurement of VectoBac WDG.

Add the required amount of VectoBac WDG to water under moderate agitation. VectoBac WDG suspends readily in water and will stay suspended during normal application periods. Brief mixing might be necessary if the spray mixture is left undisturbed for several hours.

#### SPRAY CONDITIONS

It is highly recommended that spraying be conducted when meteorological conditions at the treatment site allow the spray cloud to settle into target habitats, and not drift upward into the atmosphere. **These conditions occur most often in the night and cool morning hours**, when atmospheric mixing (turbulence) is low and winds are light to moderate.

#### EQUIPMENT CLEAN UP

All spray equipment used to spray VectoBac WDG must be cleaned with liquid detergent and water after use. Flush the used nozzle/orifice with detergent and water. Immediate cleaning and proper flushing of the nozzle will prevent the coating of VectoBac WDG on spray equipment components.