

3. Space Sprays

NVBDCP recommends ULV fogging both indoors and outdoors to mitigate mosquitoes and disease vectors. It has the potential to be effective against peri-domestic breeding vectors. The effectiveness of fogging depends on: dosage; droplet size of the aerosol [1–50 μm volume mean diameter (VMD)]; correct application rate; and when flight activity of the mosquito is maximum

Evaluation should be done indoors and outdoors.

3.1. Indoor evaluation

3.1.1. Objectives

- To determine the effective dose of the candidate insecticide for space spray
- Human safety

3.1.2. Room method

Different concentrations of insecticide should be prepared in suitable solvent for fogging. Rooms of 3 cubic metres should be selected for the laboratory evaluation. The room should be made mosquito-free prior to evaluation. A room fogged with only solvent is treated as control. A known number of mosquitoes (25 adult females of the test species) should be released into a cage. Four cages should be placed at four corners of the room. Fogging should be done in the room with portable ULV sprayer for 1 minute and the doors should be closed immediately. After 30 minutes the doors should be opened and the knock-down or dead mosquitoes should be collected. Corrected percent mortality of each dose should be calculated following Abbott's formula. Optimal dose should be calculated on the basis of maximum mortality of mosquitoes occurred in different doses. The most effective dose should be used for field evaluation. The data should be recorded in the format given in Table 34.

3.1.3. Safety evaluation

Data regarding perception of the staff involved in fog generation and collection of mosquitoes should be recorded in the pre-structured questionnaire (Annexure 3).

Table 34. Observed mortality of mosquitoes at different doses

Type*	No. in cages	No. dead in cages	Total		Mortality	Corrected %mortality
			Dead	Alive		
Dose 1						
Dose 2						
Control						
* Separate row for each dose.						

3.2. Outdoor evaluation

For this evaluation, fogging will be carried out by vehicle mounted ULV equipment on roads or by the portable ULV equipment in peri-domestic areas. Bioassays are carried out in cubical mosquito cages (1 cu ft). For these bioassays 3-day old sugar fed laboratory strain of the vector species or sugar fed female F₁ progeny of the field collected vector species from study villages or field collected mixed age female population of the vector species from unsprayed villages should be used. Batches of 20–25 mosquitoes should be held in 7 replicate cages. Four replicate cages should be hung above the ground level at different heights outdoors and one in a room. At least two cages should be held as control away from the fogging area. After exposure for one hour, the cages should be kept preferably in an unsprayed room maintained at 27 ± 2°C and 60–70% RH; where it is not feasible to maintain the temperature and relative humidity a moist chamber can be used (WHO 1981). Mosquitoes should be provided with 10% sugar solution soaked cotton wool placed on the top of the cage. Percent mortality should be scored after exposure and 24 h holding period and recorded in the format given in Table 35.

Table 35. Toxicity evaluation

Village.....Sub-centre.....PHC.....District.....Date of bioassay.....
 Temperature: Min Max..... Relative humidity: MinMax.....
 Test species.....Lab/F₁/Field collected.....

Replicate* Cage No.	No. of mosquitoes in cage	No. knocked- down after 1 h	No. killed after 24 h	% Mortality after 1h	% Mortality after 24h
Replicate 1					
Replicate 2					
Replicate 3					
Replicate 4					
Replicate 5 (indoors)					
Control 1					
Control 2					

*Separate row for each replicate.

