[551-233]

DIRECTIONS FOR DETERMING THE DROPLET SIZE OF SYNERGIZED PYRETHRIN ULV NON-THERMOL AEROSOLS

Preparation of Slides: Ordinary 3" x 1" glass microscope slides are treated with silicone (General Electric Dri-Film SC-87) prior to sampling. Teflon® coated slides can also be used. They are available from:

Gulva Associates
P.O. Box 249
Belle Chasse, Louisiana 70037

Silicone-treated slides are made as follows:

1. Clean slides
2. Dip slide into a solution of 9 parts acetone and 1 part silicone
3. Allow to air-dry
4. Place in clean slide box that is dust-free

Sampling Procedure: Attach a slide to the end of a 2-foot piece of pipe or wood. Standing 20-25 feet from the running ULV generator, quickly wave the slide through the aerosol cloud. Place each slide in a clean box for latter droplet size determination. If you do not have the facilities, equipment (microscope with mechanical stage, optical micrometer) or time to determine spread factor and droplet size, slides can be sent to a commercial laboratory, such as Gulva Assoc.

Spread Factor: In order to establish the size of the spray particle, the spread factor must be determined. The method used by Mount and Pierce (1972) can be used. The spread factor should be determined at a constant temperature each time it is calculated.

1) Using a compound microscope at 400 or 450 magnification, the ocular eyepiece is first calibrated into microns by use of a stage micrometer. Each division will equal so many microns. Record all observations in divisions and later convert to microns.
2) Holding the slide on its side, view a droplet, measure its base and height using the ocular micrometer.
3) The volume of the impinged droplet can then be determined by the formula for a spherical segment:

   $\frac{1}{6} \pi \times \text{height} (\text{height}^2 + 3 \times \text{radius}^2)$ Note: ($\pi = 3.14$)

4) The diameter of a spherical droplet containing the same volume of liquid is then calculated from the formula for the volume of a sphere:

   $\frac{4}{3} \pi \times \text{radius}^3$

5) The final step is to divide the actual measured diameter of the impinged droplet (2) by the calculated diameter (4). This is the SPREAD FACTOR.

BAIRD'S ULV Pyrethrum Concentrate

ULTRA LOW VOLUME CONCENTRATE FOR ADULT MOSQUITO CONTROL

ACTIVE INGREDIENTS:		
	Mineral Oil	70.00%
	Piperonyl Butoxide Technical*	25.00%
	Pyrethrins	5.00%
	TOTAL	100.00%

*Equivalent to 20% (Butylcarbityl) (6-Proplypiperonyl) ether and 5% related com pounds.

CAUTION

KEEP OUT OF REACH OF CHILDREN

HARMFUL IF SWALLOWED. AVOID INHALATION. WASH HANDS, ARMS AND FACE WITH SOAP AND WATER AFTER HANDLING AND BEFORE SMOKING OR EATING.

DIRECTIONS FOR USE

BAIRD'S ULV PYRETHRUM CONCENTRATE IS SPECIFICALLY DESIGNED TO BE USED WITHOUT FURTHER DILUTION IN ULV COLD AEROSOL GENERATORS WHICH PRODUCE ULV SPRAY IN WHICH THE MAJORITY OF DROPLETS ARE 5-25 MICRONS AS GENERATED BY CARDINAL ULV MACHINES, BEECOMIST NOZZLES, AND LECO HD. EQUIPMENT UNABLE TO MAINTAIN THIS DROPLET SIZE RANGE PRECISELY IS UNSUITABLE AND SHOULD NOT BE USED.

This concentrate may be used in mosquito adulticiding programs involving residential and recreational areas, swamps, marshes, overgrown waste areas, roadsides and pastures where mosquitoes are present in annoying numbers.

The rate of application is .002 to .0025 pounds of Pyrethrins and .010 to .0125 pounds of Piperonyl Butoxide per acre or approximately 0.7 fluid ounces of BAIRD'S ULV PYRETHRUM CONCENTRATE per acre. This product should be applied at the rate of 24 fluid ounces per front mile as follows: 2 fluid ounces/minute with a vehicle speed of 5 miles per hour; 4 fluid ounces/minute at 10 miles per hour; 6 fluid ounces/minute at 15 miles per hour; etc. Based on a 300 foot swath each front mile covers approximately 36.4 acres.

The ULV machine should direct spray at an angle of 15-20 degrees above horizontal. Best results are achieved when the ULV spray is directed downwind in a 2-8 mile per hour breeze with a temperature above 58 degrees F. Repeat application as required to obtain desired reduction in adult mosquito populations.

NOTICE The seller guarantees the ingredients as stated.

Manufactured by BAIRD & McGUIRE INC. HOLBROOK, MASS.

EPA REG. NO. 551-233
EPA EST. 551-MA-1

NET CONTENTS GALLONS

This product is toxic to fish. Keep out of lakes, streams or ponds. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes. Apply this product only as specified on this label.

Do not reuse empty drum. Return to drum reconditioner or destroy by perforating or crushing and burying in a safe place away from water supplies.

Droplet Size Determination: Now that the spread factor has been determined, the size of the aerosol particle can be established.

At least 200 drops from each slide should be measured using the ocular micrometer. The diameter of the measured droplet is then multiplied by the spread factor. This will give you the size of the particles in ocular divisions being emitted from a particular aerosol generator. To convert to microns, multiply the size of droplets in divisions times the number of microns per division. This gives you the actual particle size in microns.

Mass Median Diameter: To establish the mass median diameter, a table such as the hypothetical one below should be set up.

Size of Particles (microns)	Number of Droplets In Range	Number Microns (NM)	Percent of Total (total NM)	Accumulative Percentage
1	5	5	.20	.20
2	10	20	.81	1.01
3	9	27	1.10	2.11
4	12	48	1.95	4.06
5	15	75	3.05	7.11
6	12	72	2.93	10.04
7	25	135	5.49	15.53
8	14	112	4.56	20.09
10	28	280	11.39	31.48
12	19	228	9.28	40.76
14	14	196	7.97	48.73
18	10	180	7.32	56.05
20	6	120	4.88	60.93
30	4	120	4.88	65.81
40	11	440	17.90	83.71
50	2	100	4.07	87.78
60	2	120	4.88	96.66
80	1	80	3.25	95.91
100	1	100	4.07	99.98
Total	**200**	**2,458**		

From the hypothetical table above, the MMD can be roughly estimated at 16 microns based on the accumulated percentage. To accurately determine the MMD, the accumulated percentages from the last column are plotted against the size of particle in the first column using arithmetic probability paper. Directly across from the 50% point on the line is the MMD.