

**PRECAUTIONARY STATEMENT  
HAZARDS TO HUMANS  
CAUTION**

Harmful by swallowing, inhalation, or skin contact. Avoid breathing spray mist. Avoid contact with skin. Wash thoroughly after handling. Change contaminated clothing. Do not contaminate food or feed products.

**ENVIRONMENTAL HAZARD**

This product is toxic to fish. Keep out of lakes, streams or ponds. Shrimp and crab may be killed at application rates recommended on this label. Do not apply where these are important resources. 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.

This product is highly toxic to bees exposed to direct treatment. Protective information may be obtained from your Cooperative Agricultural Extension Service.

**DISPOSAL OF DRUMS:** Drain drum completely. Add 5 gals. of water, 1 cup detergent and 2 lbs. of lye. Tighten bungs. Rotate container to wet all surfaces and let stand for at least 15 minutes. Drain completely. Tighten bungs. Transport to a professional drum reconditioner having burning equipment for reconditioning. As an alternative, puncture, crush and bury drum at least 18 inches deep in an isolated area away from water supply.

**DISPOSAL OF PAILS:** Drain pail completely. Add 1/2 gallon of water, 1/4 cup of detergent and 1/4 pound of lye. Tighten closure. Rotate pail to wet all surfaces and let stand for at least 15 minutes. Drain completely and rinse several times with water. Tighten closure. Puncture and crush pail to prevent reuse.

B. G. Pratt Div., Gabriel Chemicals Ltd. does not assume any responsibility for any damages which result from failure to properly design, maintain or operate any LV Equipment or from failure to determine or obtain proper droplet size.

B. G. Pratt Div., Gabriel Chemicals Ltd. warrants only that the material contained herein conforms to the chemical description on the label and is reasonably fit for the use therein described when used in accordance with the directions for use. Any damages arising from a breach of this warranty shall be limited to direct damages and shall not include consequential commercial damages such as loss of profits or values, etc.

B. G. Pratt Div., Gabriel Chemicals Ltd. makes no other express or implied warranty, including any other express or implied warranty of FITNESS or of MERCHANTABILITY. Buyer assumes the risk of any use contrary to label instructions or under abnormal conditions or under conditions not reasonably foreseeable by B. G. Pratt Div., Gabriel Chemicals Ltd.

**IMPORTANT:** Undiluted spray droplets of MALATHION will permanently damage automobile paint. Cars should not be sprayed. If accidental exposure does occur, the car should be washed immediately. Consult your state experiment station or state extension service for proper timing of sprays.

**DIRECTIONS FOR USE**

MALATHION is used undiluted in specially designed aircraft or ground equipment capable of applying ultra low volumes for control of the insects indicated below. Aerial applications are most effective when made at a boom height of 5 feet and a swath width of 50 feet. Do not make application when winds exceed 5 mph.

Mist blowers and boom sprayers utilizing a controlled air flow to facilitate particle size and spray deposition may be used at a vehicle speed of 4 to 10 mph.

Mist blowers with a pump capable of producing up to 40 psi and blower speeds of 2600 rpm are satisfactory. Use flat fan nozzles, 8001 to 8002 placed 30" into air blast or rotary atomizers into the air blast that produce an efficient spray particle with a mass medium diameter of 40 to 100 microns. Swath widths should not exceed 30 feet, and applications should not be made when winds exceed 5 mph.

Boom sprayers with a filtered rotary air compressor, either PTO or gas engine driven or an air pump capable of producing at least 12 psi are satisfactory. Use air pressure on chemical tanks and an accurate metering valve to assure a calibrated flow of the pesticide. Air should be regulated with relief valve and gauge for proper air and liquid mixture. Pneumatic-type spray nozzles, as suggested by equipment manufacturer, should be used for spray particles with mass medium diameter of 30 to 100 microns. Applications should not be made when winds exceed 5 mph.

Repeat application should be made as necessary unless otherwise specified.

Crop	Pests Controlled	Fluid Ounces Per Acre	Interval Between Last Application and Harvest
Alfalfa	Alfalfa caterpillar Western yellow striped armyworm	8-12	Use lower rate when larvae are small. May be applied on day of harvest or grazing. Use higher rate when larvae are large or when alfalfa is thick. 5 days.
	Alfalfa weevil larvae	16	5 days. Apply when day temperatures are expected to exceed 65°F and when 50-75% of leaves show feeding damage.
	Beet armyworm	8-16	Use lower rate when larvae are small. May be applied on day of harvest or grazing. Use higher rate when larvae are large or when alfalfa is thick. 5 days.
Do not apply to alfalfa in bloom. Do not apply to seed alfalfa.	Grasshoppers	8	May be applied on day of harvest or grazing.
Beans (lima, green, snap, Navy, red kidney, wax, dry, black eye)	Mexican Bean Beetle Leafhoppers Green Cloverworm Japanese Beetle Lygus bug	-	1 day
Blueberries	Blueberry Maggot	16	9 days
Cherries	Cherry Fruit Fly	16	1 day. Apply by aircraft only. Use higher rate when foliage is heavy or infestation is severe. Make first application as soon as flies appear.
Cereal crops (barley, corn, oats, wheat, and grasses)	Grain ear beetle	4-8	Barley, oats, wheat: 7 days of harvest or forage use. Corn: 5 days. Grasses: May be applied on day of harvest or grazing.
Clover, Pasture and Range Grass, Grass, Grass Hay, Non agricultural Land (waste lands, roadsides, soil bank lands)	Grasshoppers	8	May be applied on day of harvest or grazing. Do not apply to clover in bloom.
Corn	Adult Corn Rootworm	4	5 days
	Early Season Insects Thrips Flea-hoppers Leafhoppers	4-8	5 days
	Bolt Weevil	8-12 16	
	Grasshoppers	8	
	Lygus Bugs	8-12 16	



SINCE 1904  
TM

**MALATHION ULV  
CONCENTRATE INSECTICIDE**

ACTIVE INGREDIENT	BY WEIGHT
Malathion*	95%
INERT INGREDIENTS	5%
TOTAL	100%

\*0,0-dimethyl phosphorodithioate of diethyl mercaptosuccinate (one gallon contains 9.7 pounds of malathion.)

KEEP OUT OF REACH OF CHILDREN.

**CAUTION**

See side panel for additional precautionary statements.

Distributed by:

B.G. Pratt Division  
Gabriel Chemicals Ltd.  
204 21st Avenue  
Paterson, New Jersey 07509

EPA Est.  
904-NJ-1

EPA Reg.  
No. 904-243

PROD. NO.

NET CONTENTS: 5 30 55 GALLONS

Crop
Grain Crops (barley, corn, oats, rye, grain sorghum and wheat)
Grain Sorghum
Rice-Grain Form (Louisiana, Texas)
Safflower
Soybeans
Sugar Beets
Non agricultural Lands
Beef Cattle-Feed Lots and Holding Pen
OTHER AGRICULTURAL USES: Alfalfa, Clover, Pasture and Range (wastelands, soil bank lands), Adult m. mosquitoes and at 6 to 8 fluid ounces alfalfa, clover, pasture and range grass, and clover in bloom. Do not use on corn within 5 days of harvest or for FOREST INSECTS. Apply with aircraft equipped for ultra I. Do not allow spray to contact ferns, I. and disease conditions.
Tree
Douglas Fir True Fir Spruce
Hemlock
Pines
Larch

**DIREC  
MALATHI**

Droplet size should be determined as freq. of the newness of this technique, no guide developed by experience. We suggest direct accident and in any event after every 50 hrs of other units. Equipment manufacturer followed to obtain proper droplet size. Per Division, Gabriel Chemicals Ltd. upon re I. Preparation of Slides.

MALATHION droplet sizes are determined a high-power microscope. Ordinary 3"x1" prevent excessive spreading or coalescence and dried at about 200°F for 30 minutes, solution must be freshly prepared. Do not before using to remove any foreign particles. Deposition of MALATHION Droplets or Droplets should be collected under ideal of MALATHION aerosol is deposited on a 5 distance of 25 feet from the point of disc spring paper clip. At least two slides shot location where measurements can be made.

Although label specifications require the position the nozzle parallel to the ground height to obtain a representative sample. III. Determination of MALATHION Droplet A microscope with mechanical stage and a taking measurements, the divisions of the example represented in Table I, droplets calibrated to equal 1.5 microns.

At least 200 droplets should be measured that pass through the micrometer scale as should not be taken along the margins of I and then convert these divisions into microns. The measurements converted into microns spread factor for silicone coated slides is 0 times the 0.5 spread factor.

The measurements are tabulated and pro largest droplet measured into microns. In Maximum Diameter is 33.3 microns (19x1 To determine the Mass Median Diameter (eyepiece divisions (D) on arithmetic probe droplet size in eyepiece divisions which m 1.5 equals a Mass Median Diameter of 11

*Handwritten:* August 1955

**ULV  
INSECTICIDE**

BY WEIGHT  
95%  
5%  
TOTAL.....100%

(ethyl mercaptosuccinate  
malathion.)

CHILDREN.

utionary statements.

Crop	Pests Controlled	Fluid Ounces Per Acre	Interval Between Last Application and Harvest
Grain Crops (barley, corn, oats, rye, rice, grain sorghum and wheat)	Grasshoppers	8	7 days - 5 days of harvest or forage use
Grain Sorghum	Sorghum Midge	8-12	Apply during the bloom stage - 7 days of harvest or forage use
Rice Grain Form (Louisiana, Texas)	Rice Stink Bug	8	7 days - Apply by aircraft only - Apply during early milk and dough stage of growing rice
Safflower	Grasshoppers Lygus Bugs	8	3 days of harvesting seeds
Soybeans	Mexican Bean Beetle Grasshoppers Japanese Beetle Green Cloverworm	8	7 days of harvest or forage use
Sugar Beets	Grasshoppers Sugar Beet Root Maggot Adults	8	7 days if tops are to be used as feed
Non agricultural Lands	Beet Leafhopper (on wild host plants)	8	6 day
Beet Cattle-Feed Lots and Holding Pens	Adult Flies and Mosquitoes	6-8	0 day
<b>OTHER AGRICULTURAL USES</b> Alfalfa, Clover, Pasture and Range Grass, Grass and Grass Hay, Grain Crops, Beans, Rice and Nonagricultural Lands (wastelands, soil bank lands). Adult mosquitoes and flies - Apply MALATHION at the rate of 2 to 4 fluid ounces for control of adult mosquitoes and at 6 to 8 fluid ounces per acre for control of adult flies and mosquitoes. Repeat applications as necessary. On alfalfa, clover, pasture and range grass, grass and grass hay, may be applied on day of harvest or grazing. Do not apply to alfalfa and clover in bloom. Do not use on seed alfalfa. On grain crops, make no application within 7 days of harvest or forage use, on corn, within 5 days of harvest or forage, on rice, within 7 days of harvest, on beans within 1 day of harvest. <b>FOREST INSECTS</b> Apply with aircraft equipped for ultra low volume application. Make application when air is calm and temperature is below 68°F. Do not allow spray to contact ferns, hickory and maples as injury may result. Do not spray on elms under extreme heat, drought and disease conditions.			
Tree	Pests Controlled	Fluid Ounces per Acre	Directions
Douglas Fir True Fir Spruce	Spruce Budworm	13	Apply when highest percentage of larvae are in the fifth instar
Hemlock	Hemlock Looper	8	Apply when most larvae are in third and fourth instar
Pines	European Pine Sawfly Seratoga Spittlebug	10	Apply when larvae are in first or second instar or before they reach 1/2 inch in length Apply when 95% of the population has become adult
Larch	Larch Casebearer		Apply in spring as soon as larvae break hibernation and begin feeding on new foliage

**DIRECTIONS FOR DETERMINING THE DROPLET SIZE OF MALATHION ULTRA LOW VOLUME NONTHERMAL AEROSOLS**

Droplet size should be determined as frequently as necessary to insure that proper droplet size is maintained for each operation. Because of the newness of this technique, no guidelines exist as to how frequently droplet size should be rechecked. Until such guidelines can be developed by experience, we suggest droplet size determinations be made every time the unit is installed on a vehicle, following any accident and in any event after every 50 hours of operation in the case of commercially manufactured units and more frequently in the case of other units. Equipment manufacturer instructions setting forth cleaning and maintenance of the unit must also be consulted and followed to obtain proper droplet size. Permanent records of each droplet size determination must be kept and made available to BG Pratt Division, Gabriel Chemicals Ltd. upon request.

**I. Preparation of Slides**  
 MALATHION droplet sizes are determined by depositing a sample of the aerosol on a coated glass slide and measuring the droplets under a high-power microscope. Ordinary 3" x 1" glass slides must be coated with silicone (General Electric SC-87 Dri-Film) prior to sampling to prevent excessive spreading or coalescence of the droplets. The slides are dipped into a 10 percent solution of Dri-Film in toluene, drained and dried at about 200°F for 30 minutes, after which they are dipped in acetone, allowed to dry and stored in a tight slide box. Coating solution must be freshly prepared. Do not store coating solution because it will deteriorate. Slides are lightly polished with a soft tissue before using to remove any foreign particles.

**II. Deposition of MALATHION Droplets on Slides**  
 Droplets should be collected under ideal operating conditions to insure representative sampling of droplets in the aerosol. A sample of the MALATHION aerosol is deposited on a slide by waving the slide as rapidly as possible perpendicular through the aerosol cloud at a distance of 25 feet from the point of discharge. The slide velocity may be increased by attaching it to a 3 or 4 foot stick by means of a spring paper clip. At least two slides should be exposed to insure an adequate sample. Store slides in a tight slide box for transfer to a location where measurements can be made. Avoid excessive heat during transit and store in a cool place until measurements can be made.

Although label specifications require the aerosol nozzle to be angled upward at 45° or more during operation, it is more convenient to position the nozzle parallel to the ground for droplet sampling. If this is not possible it will be necessary to be positioned at a sufficient height to obtain a representative sample of the aerosol.

**III. Determination of MALATHION Droplet Sizes**  
 A microscope with mechanical stage and an eyepiece micrometer are used to determine the size of the individual aerosol droplets. Prior to taking measurements, the divisions of the eyepiece micrometer must be calibrated into microns by means of a stage micrometer. In the example represented in Table 1, droplets were measured at 400x magnification. At that magnification each division of the eyepiece was calibrated to equal 3.5 microns.

At least 200 droplets should be measured. Usually this is easily accomplished on one slide. An accurate method is to measure all droplets that pass through the micrometer scale as the slide is moved from one edge to the other by using the mechanical stage. Measurements should not be taken along the margins of the slide. It is more convenient to measure in terms of the divisions of the eyepiece micrometer and then convert these divisions into microns.

The measurements converted into microns must then be corrected for the amount of spread that occurred on the slides. The MALATHION spread factor for silicone coated slides is 0.5. Therefore, in Table 1 each division of the eyepiece actually equals 1.75 microns (3.5 microns times the 0.5 spread factor).

The measurements are tabulated and processed as in Table 1. The Maximum Diameter is calculated by converting the diameter of the largest droplet measured into microns. In Table 1, the largest droplet measured had a diameter of 19 eyepiece divisions. Therefore, the Maximum Diameter is 33.3 microns (19 x 1.75 = 33.3).

To determine the Mass Median Diameter (MMD), the accumulative percentages from the last column in Table 1 are plotted against the eyepiece divisions (D) on arithmetic probability paper as in Figure 1. Directly across from the 50 percent point on the line is the median droplet size in eyepiece divisions which must be converted to microns. In Figure 1, 9.2 eyepiece divisions times the conversion factor of 1.75 equals a Mass Median Diameter of 16.1 microns.

**ADULT MOSQUITO CONTROL  
DIRECTIONS FOR USE:**

(For Ultra Low Volume Aerial Application where automobiles, trailers and pleasure boats are present.)

**IMPORTANT**

Malathion ULV Concentrate is to be used in ultra low volume spraying over cities, towns and other areas where automobiles, trailers and pleasure boats are present. Apply with aircraft equipped for ultra low volume application. Generally, spraying should not be attempted when the wind is at or above 10 mph or temperatures are above 82°F.

Spray droplets of this product undiluted will permanently damage automobile paint unless all of the following conditions are met:

1. Aircraft is operated at 150 mph or more.
2. There are no leaks in the ultra low volume spray system.
3. Nozzles are placed on the boom at a 45° angle down and into the wind.
4. Diaphragm check valves are used on all nozzles to insure positive cut-off of the spray.
5. Dosage of this product does not exceed 3.2 fluid ounces per acre (40 acres per gallon).
6. The spray system produces droplets of this product in the 50 to 60 mass median diameter (MMD) micron range, with no more than 10% of the droplets exceeding 100 microns, as determined by readings made from microscope slides coated with Dri-Film.

This use is restricted to professional mosquito control personnel who have the experience, knowledge and equipment necessary to follow the highly technical and specific instructions which follow. If these requirements cannot be met, do not use those products for nonthermal aerosol LV application.

To be applied only by trained personnel of mosquito abatement districts or pest control operators.

**DIRECTIONS FOR USE**

Adult Mosquito Control - For control of adult mosquitoes over a 300-foot swath with nonthermal aerosols of MALATHION using the ultra low volume method, use the following flow rates at the indicated truck speeds:

Truck Speed Miles per Hour	Flow Rate of MALATHION Fluid Ounces per Minute
5	1 to 1.5 fluid ounces
10	2 to 3 fluid ounces

Eyepiece Divisions (D*)	Number of Droplets (N)	% of Total D x N		Accumulative Percentages
		D x N	(D x N)	
1	5	5	0.31	0.31
2	10	20	1.22	1.53
3	9	27	1.65	3.18
4	12	48	2.93	6.11
5	15	75	4.58	10.63
6	12	72	4.40	15.09
7	25	175	10.70	25.79
8	14	112	6.85	32.64
9	28	252	15.40	48.04
10	19	190	11.61	59.65
11	14	154	9.41	69.06
12	10	120	7.33	76.39
13	6	78	4.77	81.16
14	4	56	3.42	84.58
15	11	155	10.09	94.67
16	2	32	1.96	96.63
18	2	36	2.20	98.83
19	1	19	1.16	99.99
Total	199	1636		

Flow rate must be constantly monitored by the operator to maintain uniform control of discharge rate.

**IMPORTANT** - Undiluted spray droplets of MALATHION will permanently damage automobile paint unless these specific instructions are followed.

**DROPLET SIZE**

1. Spray droplets must not be less than 5 microns in size as the smaller droplets do not impinge readily on adult mosquitoes.
2. Spray droplets must not exceed the range of 23 to 27 microns in size as larger droplets when transported by natural air currents, impinge more readily on objects in their pathway and will permanently damage automobile paint.
3. More than one-half of the total spray mass must consist of droplets in the 5 to 15 micron range to achieve adequate dispersal of insecticide over a 300-foot swath.
4. A minimum of two-thirds, preferably four-fifths of the total spray mass must consist of droplets not exceeding 20 microns in range.
5. The mass median diameter (MMD) of the droplet should not exceed 14 microns. The MMD is the drop diameter which divides the spray volume into two equal parts, i.e. 50% of the volume is in the drop size below MMD and 50% is above the MMD.
6. The average diameter of the droplets should not exceed 12 microns.

Table 1  
Representative Count of Malathion ULV Concentrate Aerosol Droplets Impinged on Microscope Slides

\*Measurements were taken at 400x magnification. Each eyepiece division equals 1.75 microns (3.5 microns times the 0.5 spread factor).

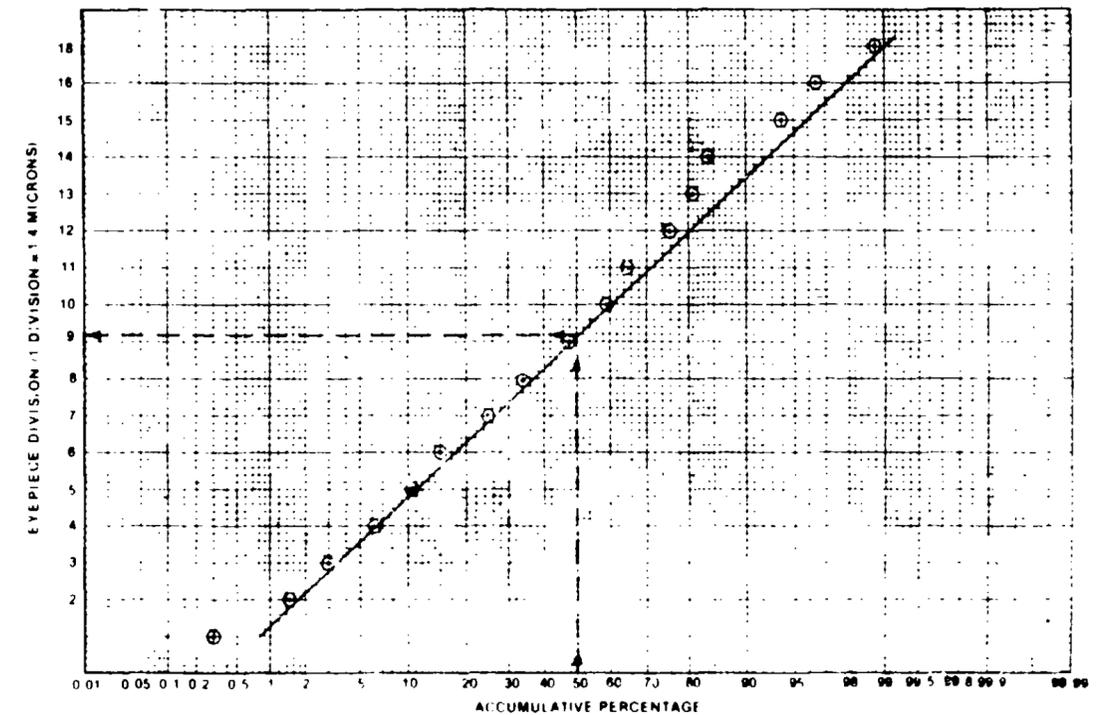


Figure 1  
Percentage of the total volume of aerosol samples below each stated droplet size (from Table 1). The Mass Median Diameter is determined from the 50 percent point on the line. The Mass Median Diameter (MMD) 9.2 divisions times 1.75 = 16.1 microns.

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