



Drexel

# Malathion ULV

## Insecticide

### ACTIVE INGREDIENT:

Malathion\* ..... 95.0%  
**INERT INGREDIENT:** ..... 5.0%  
**TOTAL:** ..... 100.0%

\*O,O-dimethyl dithiophosphate of diethyl mercaptosuccinate  
This product contains 9.7 pounds of malathion per gallon.

## KEEP OUT OF REACH OF CHILDREN CAUTION

See Below for Practical Treatment (First Aid)  
SHAKE WELL BEFORE USING

EPA Reg. No. 19713-288

EPA Est. No. 19713-GA-1

Net Contents: \_\_\_\_\_

### PRACTICAL TREATMENT (FIRST AID)

**IF SWALLOWED:** Call a physician or Poison Control Center. Drink 1 to 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

**IF INHALED:** Remove victim to fresh air immediately. Get medical attention.

**IF ON SKIN:** Wash with plenty of soap and water. Get medical attention.

**IF IN EYES:** Flush with plenty of water. Call a physician if irritation persists.

**NOTE TO PHYSICIAN:** This material is a cholinesterase inhibitor. Treat symptomatically. Atropine is an antidote. This product is an organophosphorus ester that inhibits cholinesterase.

### PRECAUTIONARY STATEMENTS

#### Hazards to Humans and Domestic Animals

**CAUTION:** Harmful if swallowed, inhaled or absorbed through the skin. Avoid breathing spray mist. Avoid contact with eyes, skin or clothing. Do not contaminate food or feed products.

#### PERSONAL PROTECTIVE EQUIPMENT (PPE)

**WPS USES:** Applicators and other handlers who handle this pesticide for any uses covered by the Worker Protection Standard (40 CFR Part 170) — in general, agricultural-plant uses are covered — must wear: Long-sleeved shirt and long pants, waterproof gloves, and shoes plus socks.

**NON-WPS USES:** Applicators and other handlers who handle this pesticide for any uses NOT covered by the Worker Protection Standard (40 CFR Part 170) — in general, only agricultural-plant uses are covered by the WPS — must wear: Long-sleeved shirt and long pants, waterproof gloves and shoes plus socks.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 180.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

### USER SAFETY RECOMMENDATIONS

**Users should:** 1) Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. 2) Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. 3) Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish, aquatic invertebrates and aquatic life stages of amphibians. For terrestrial uses, do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and run-off may be hazardous to aquatic organisms in areas near the application site. Do not contaminate water when disposing of equipment washwaters. This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

### PHYSICAL OR CHEMICAL HAZARDS

Before using read the directions contained on this label for the proper methods and procedures which must be followed to achieve effective insect control and avoid permanent damage to automobile and other paint finishes.

### DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, greenhouses and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), restricted entry intervals (REI) and notification to workers. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard (WPS). Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours. PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated such as plants, soil or water, is: Coveralls, waterproof gloves and shoes plus socks.

### CHEMIGATION PROHIBITION

Do not apply this product through any type of irrigation system.

### AGRICULTURAL USES

Do not use this product for any uses other than those specified on this label. MALATHION ULV is used undiluted in specially designed aircraft or ground equipment capable of applying ultra-low volumes for control of the insects indicated.

Aerial applications are most effective when made at a boom height

Manufactured By:

**Drexel Chemical Company**

P.O. BOX 13327, MEMPHIS, TN 38113-0327

**SINCE 1972**

of 5 feet and a swath width of 55 feet. Apply only when weather conditions are favorable. Wind and rising air currents may cause undesirable spray drift and reduce insect control. 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 miles per hour.

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 degrees into air blast or rotary atomizers into the air blast that produce an efficient spray particle with a mass median diameter of 40 to 100 microns. Swath widths should not exceed 30 feet. Apply only when weather conditions are favorable. Wind and rising air currents may cause undesirable spray drift and reduce insect control.

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 median diameter of 30 to 100 microns. Apply only when weather conditions are favorable. Wind and rising air currents may cause undesirable spray drift and reduce insect control. Repeat applications should be made as necessary unless otherwise specified.

**IMPORTANT:** Undiluted spray droplets of MALATHION ULV 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. This product is highly toxic to bees exposed to direct treatment or residues on crops. Protective information may be obtained from your Cooperative Agricultural Extension Service.

## GENERAL USES

Crop	Pest	Rate / A	PHI (days)	Special Instructions	
Alfalfa	Alfalfa caterpillar	8 fl. ozs.	0	Apply when larvae are small.	
	Western yellow striped armyworm	12 fl. ozs.	5	Apply when larvae are large or when foliage is dense.	
	Alfalfa weevil larvae	16 fl. ozs.	5	Apply when day temperatures are expected to exceed 65° F and when 50 to 70% of leaves show feeding damage.	
	Beet armyworm		8 fl. ozs.	0	Apply when larvae are small.
			16 fl. ozs.	5	Apply when larvae are large or when foliage is dense.
	Grasshoppers	8 fl. ozs.	0		
Do not apply to alfalfa in bloom. Do not apply to seed alfalfa.					
Beans (lima, green, snap, navy, red kidney, wax, dry, blackeye)*	Mexican bean beetle, Leafhoppers, Green cloverworm, Japanese beetle, Lygus bug	8 fl. ozs.	1		
Blueberries	Blueberry maggot	10 fl. ozs.	0		
Cherries	Cherry fruit fly	12 to 16 fl. ozs.	1	Apply by aircraft only. Use higher rate when foliage is heavy or infestation is severe. Make first application as soon as flies appear.	
Cereal Crop (Barley, Oats, Wheat)	Cereal leaf beetle	4 to 8 fl. ozs.	7		
Cereal Crop (Corn)	Cereal leaf beetle	4 to 8 fl. ozs.	5		
Grasses	Cereal leaf beetle	4 to 8 fl. ozs.	0		
Clover, Pasture and Range Grass, Grass, Grass hay, Non-agricultural land (Wasteland, Roadsides)		8 to 12 fl. ozs.	0	Do not apply to clover in bloom.	
Corn	Adult corn rootworm	4 fl. ozs.	5		
Cotton	Early season insects, Thrips, Fleahoppers, Leafhoppers	4 to 8 fl. ozs.	0		
(Continued)					

Crop	Pest	Rate / A	PHI (days)	Special Instructions
(Continued) Cotton	Boll weevil	8 to 12 fl. ozs.	0	For early mid-season.
		16 fl. ozs.		For late season.
	Grasshopper	8 fl. ozs.	0	
	Lygus bugs	8 to 12 fl. ozs.	0	For very heavy migrating populations.
16 fl. ozs.				
Grain Crops (Barley, Corn, Oats, Rye, Rice, Grain Sorghum* and Wheat)	Grasshopper	8 to 12 fl. ozs.	7 (except corn - 5)	
Grain Sorghum*	Sorghum midge	8 to 12 fl. ozs.	7	Apply during the bloom stage.
	Grasshoppers	8 fl. ozs.	7	
Rice (Grain Form) (LA, TX)	Rice stink bug	8 fl. ozs.	7	Apply by aircraft only. Apply during early milk and dough stage of growing rice. Broadcast use only over intermittently flooded areas. Application may not be made around bodies of water where fish or shellfish are grown and/or harvested commercially.
Non-Agricultural Lands	Beet leafhopper (on wild host plants)	8 fl. ozs.	0	

\*After use on beans and sorghum, the resultant crop foliage of beans (forage and straw/hay) and sorghum (fodder/stover and forage) cannot be used as livestock feed. In addition, livestock grazing is not permitted for the foliage of beans and sorghum.

## OTHER AGRICULTURAL USES

**Alfalfa, Clover, Pasture and Range Grass, Grass and Grass Hay, Grain Crops (Barley, Corn, Grain sorghum, Oat, Rice, Rye and Wheat), Beans, Rice and Non-agricultural Lands (Wasteland): Adult Mosquitos and Flies** — Apply Malathion ULV at the rate of 2 to 4 fluid ounces for control of adult mosquito 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 applications 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.

## MOSQUITO (Mosquito control in populated and rural areas)

**IMPORTANT NOTICE:** To be applied only by the trained personnel of public health organizations, mosquito abatement districts or pest control operators.

**AERIAL APPLICATION:** Adult mosquito control over cities, towns and other areas where automobiles, trailers, trucks, and pleasure boats are present: Apply 2.6 to 3.0 fluid ounces of MALATHION ULV per acre. Apply only when weather conditions are favorable. Wind and rising air currents may cause undesirable spray drift and reduce insect control.

**IMPORTANT:** Undiluted spray droplets of MALATHION ULV will permanently damage vehicle paint finishes unless the aircraft used for the ultra low volume application meets all of the specifications listed below:

### FIXED WING AIRCRAFT

- Aircraft is operated at 150 mph or more.
- There are no leaks in the ultra-low volume spray system.
- Nozzles are placed on the boom at a 45 degree angle down and into the wind.
- Diaphragm check valve are used on all nozzles to insure positive cut-off of the spray.
- Dosage of MALATHION ULV does not exceed 3 fluid ounces per acre.
- 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® or Teflon®.

### Helicopter Equipment Specifications:

- Rotary nozzle equivalent to Beecomist Spray Head Assembly Model No. 350 equipped with:
  - a direct reading RPM tachometer or low RPM signal light readily visible to operator;
  - a stainless steel porous metal sleeve, 20 micron pore size, dynamically balanced to the nozzle;
  - a diaphragm check valve as near to the rotary nozzle as possible to insure positive cut off to the spray;
  - nozzle on-off switch separate from main switch and pump switch.
- Minimum no-load nozzle speed of 10,500 RPM.

3. A continuous non-plussating metered flow must be maintained by a variable speed metering pump equipped with:
  - a. a positive cut off valve between tank and pump;
  - b. a flow gauge or tachometer visible to operator;
  - c. a pump on-off switch separate from main switch and nozzle switch.
4. Maximum flow rate of ½ gallon per minute per nozzle.
5. Rotary nozzle must be mounted behind and below the boom with sleeve directed toward the rear of the aircraft and parallel to the ground during flight.  
Nozzle must be positioned to minimize air turbulence and the collection of MALATHION ULV droplets on mounting brackets, feed lines, fittings, etc., or any part of the aircraft.

## OPERATING PROCEDURES

1. MALATHION ULV must be pre-filtered through a 10 micron filter prior to transfer into helicopter tank. A 50 mesh stainless steel line strainer must be installed in the pump feed line.
2. Entire system, including tank, pump, nozzle and feed lines, to be used only for application of MALATHION ULV.
3. Entire system must be inspected daily to insure that there are no leaks.
4. Sleeve must be removed and cleaned immediately after each use by washing with hot water and blowing dry from outside in with clean air.
5. Rotating nozzle must be turned on and operating before turning on pump. For shut-off, pump must be shut off and lines cleaned prior to stopping nozzle rotation.
6. Dosage of MALATHION ULV does not exceed 3 fluid ounces per acre.
7. The spray system must produce droplets of MALATHION ULV with a Mass Median Diameter (MMD) of less than 50 microns, with no more than 2.5% of the droplets exceeding 10 microns, as determined by readings made from microscope slides coated with Dri-Film® or Teflon®.

## GROUND APPLICATION

**Thermal Aerosols or Fogs:** For control of adult mosquitoes with thermal aerosols or fogs, apply MALATHION ULV at the rate of 6 to 8 fluid ounces actual/gallon (3.9 to 5.2 gallons MALATHION ULV in 100 gallons finished solution\*) by ground equipment delivering 40 gallons per hour at a vehicle speed of 5 miles per hour to treat a swath width of 300 to 400 feet.

**NOTE:** There is a great variation in the chemical composition of fuel oils which may be used as thermal fog solvents. These differences may cause sludge and/or affect the solubility of the MALATHION ULV.

**Non-Thermal Aerosols (Adult Mosquito Control):** For control of adult mosquitoes over a 300 foot swath with non-thermal aerosols of MALATHION ULV using the following rates at the indicated vehicle speeds:

Vehicle Speed Rate per Hour	Flow Rate of MALATHION ULV Fluid Ounces per Minute	Maximum Flow Rate per Hour
5	1.0 to 2.1	1 gallon
10	2.0 to 4.3	2 gallons
15	3.0 to 6.3	3 gallons
20	4.0 to 8.6	4 gallons

**ADULT STABLE FLY CONTROL:** For control of adult stable flies over a 300 foot swath with non-thermal aerosols of MALATHION ULV using the ultra-low volume method, use the following flow rates at the indicated vehicle speeds.

Vehicle Speed Rate per Hour	Flow Rate of MALATHION ULV Fluid Ounces per Minute	Maximum Flow Rate per Hour
5	2.1	1 gallon
10	4.3	2 gallons

## DROPLET SIZE

1. The Mass Median Diameter (MMD) of the droplets should not exceed 17 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 sizes below the MMD and 50% is above the MMD.
2. Spray droplets should not exceed 32 microns in size. Three percent of the spray droplets (6 droplets out of 200) can exceed 32 microns providing the MMD does not exceed 17 microns and no droplets exceed a maximum of 48 microns. Larger droplets, when transported by a natural air currents, impinge more readily on objects in their pathway and will permanently damage automobile type paints.
3. More than one-half of the total spray mass must consist of droplets in the 6 to 18 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 24 microns in range.

## OPERATING EQUIPMENT

Each Non-Thermal Aerosol Generator used for dispersal of MALATHION ULV to control adult mosquitoes must have minimum capability of producing the droplet spectrum described under DROPLET SIZE. The initial determination of droplet size is made after the unit is installed in a vehicle and prior to its use in mosquito control operations. The unit should be rechecked as frequently as necessary to insure that proper droplet size is maintained for each operation.

Determination of droplet size every two months is usually sufficient if the unit has been maintained in good operating condition. Equipment manufacturer's instructions setting forth cleaning and maintenance of the unit must be followed. The unit must be inspected before each operation to correct any leaks or obstruction in the spray system; to detect whether the nozzle, hoses or other parts are worn and in need of replacement; to ensure that the flow meter is properly calibrated; and to determine that the pressure recommended by the manufacturer is being maintained.

**FLOW RATE:** Must be regulated by accurate flow meter — not greater than 1 gallon per hour at 5 mph, or 2 gallons per hour at 10 mph, or 3 gallons per hour at 15 mph, or 4 gallons per hour at 20 mph.

**NOZZLE DIRECTION:** Rear of the vehicle — upward at an angle of 45 degrees or more.

**VEHICLE SPEED:** Not greater than 20 miles per hour — shut off spray equipment when vehicle is stopped.

**IMPORTANT:** Spray droplets of undiluted MALATHION ULV will permanently damage automobile paint unless all the conditions described and recommended in this leaflet are met.

## DIRECTIONS FOR DETERMINING THE DROPLET SIZE OF MALATHION ULV (Non-Thermal Aerosols)

Permanent records of each droplet size determination must be kept and made available to Drexel Chemical Company, upon request.

**PREPARATION OF SLIDES WITH DRI-FILM®:** MALATHION ULV 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% 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.

**DEPOSITION OF MALATHION ULV DROPLETS ON SLIDES:** Droplets should be collected under ideal operating conditions to ensure representative sampling of droplets in the aerosol. A sample of the MALATHION ULV 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 measurement 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 degrees 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.

**DETERMINATION OF MALATHION ULV 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 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 occurs on the slides. The MALATHION ULV spread factor for the 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 spread factor for Teflon-coated slides is 0.69. The following procedures are given for silicone-coated slides, would be the same for Teflon-coated slides once the value for each eyepiece division has been determined. 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 has a diameter of 19 eyepiece divisions. Therefore, the Maximum Diameter is 33.3 microns (19 x 1.76 = 33.3). To determine the Mass Median Diameter (MMD), the accumulative percentages from the largest column in TABLE 1 are plotted against the eyepiece division (D) on arithmetic probability paper as in FIGURE 1. Directly across from the 50% 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.

TABLE 1				
Representative count of MALATHION ULV aerosol droplets iminged on microscope slides coated with Dri-Film®				
Eyepiece Divisions (D)*	Number of Droplets (N)	D X N	% of Total D X N (D X N)	Accumulative Percentages
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	10.69
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	65.06
12	10	120	7.33	76.39
13	6	78	4.77	81.16
14	4	56	3.42	84.58
15	11	165	10.09	94.67
16	2	32	1.96	96.63
18	2	36	2.20	98.93
19	1	19	1.16	99.99
TOTAL	199	1636		

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

Also for use in accordance with the recommendations and instructions issued by the United States Department of Agriculture for quarantine programs. To be used only by or under the direction of Federal / State personnel for quarantine treatment.

**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 Medial Diameter (MMD) = 9.2 divisions times 1.75 = 16.1 microns.

ACCUMULATED PERCENTAGE

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal.

**PESTICIDE STORAGE:** This product should be stored at temperatures not exceeding 25° C (77° F). It should never be heated above 55° C (131° F) and also local heating above this temperature should be avoided.

**PESTICIDE DISPOSAL:** Waste resulting from the use of this product maybe disposed of on site or at an approved waste disposal facility.

**CONTAINER DISPOSAL:** Triple rinse (or equivalent). Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or incineration, or, if allowed by State and Local authorities, by burning. If burned, stay out of smoke.

EYEPIECE DIVISIONS (DIVISION =1.75)

## WARRANTY—CONDITION OF SALE

OUR RECOMMENDATIONS FOR USE of this product are based upon tests believed reliable. Follow directions carefully. Timing and method of application, weather and crop conditions, mixtures with other chemicals not specifically recommended and other influencing factors in the use of this product are beyond the control of the Seller. Buyer assumes all risks of use, storage and handling of this material not in strict accordance with directions given herewith.

In no case shall the Manufacturer or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product when such use and/or handling is not in strict accordance with directions given herewith. The foregoing is a condition of sale by the Seller and is accepted as such by the Buyer.