

67760-35

04/02/2004

S 7415-85-  
S 7415-87 1/13



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

WASHINGTON, D.C. 20460

OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

APR 2 2004

Ms. Kari E. Mavian  
Senior Regulatory Affairs Manager  
Cheminova, Inc.  
1700 Route 23, Suite 300  
Wayne, NJ 07470

Dear Ms. Mavian:

Subject: Deletion of Unsupported Uses  
Malathion ULV  
EPA Reg. No. 67760-35  
Your Application of June 30, 2003  
Federal Register Notice of March 18, 1991

The labeling amendment referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, As Amended (FIFRA), is acceptable, provided that you submit two copies of your final printed label incorporating the following correction before you release the product for shipment.

Reinstate the signal word, Caution as the sub-heading immediately following the Hazards to Humans and Domestic Animals heading so that the section heading and sub-headings read as cited below.

Precautionary Statements  
Hazards to Humans and Domestic Animals  
Caution

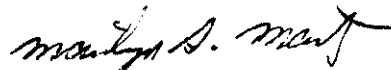
If this condition is not complied with, the registration will be subject to cancellation in accordance with FIFRA sec. 6(e). Your release for shipment of the product bearing the amended

label constitutes acceptance of this condition.

A stamped copy of the label is enclosed for your records.

The updated basic Confidential Statement of Formula (CSF) received with your subject application along with the updated Formulator's Exemption Statement is acceptable and has been incorporated into our file for the subject product.

Sincerely,



Marilyn A. Mautz  
Biologist  
Insecticide-Rodenticide Branch  
Registration Division (7504C)

APR 2 2004

Under the Federal Insecticide,  
Fungicide, and Rodenticide Act  
as amended, for the product  
registered under EPA Reg. No.

67760-35

# Malathion® ULV

## ULTRA LOW VOLUME CONCENTRATE INSECTICIDE

**ACTIVE INGREDIENT:**

\*Malathion..... 96.5 %

**INERT INGREDIENTS:**..... 3.5 %

**TOTAL:**..... 100.0%

\* O,O-dimethyl phosphorodithioate of diethyl mercaptosuccinate  
Contains 9.9 lbs. malathion per gallon

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

**SEE BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS AND USE DIRECTIONS**

EPA Reg. No. 67760-35

EPA Est. No. 4787-DN-1  
NET CONTENTS:

Cheminova, Inc.  
1700 Route 23  
Wayne, NJ 07470  
Product of Denmark

**IN CASE OF A MEDICAL EMERGENCY INVOLVING THIS PRODUCT, CALL TOLL FREE, DAY OR NIGHT, 1-866-303-6950.**

**FIRST AID**

**This product is an organophosphate and is a cholinesterase inhibitor.**

- IF SWALLOWED:** Call a poison control center or doctor immediately for treatment advice.  
Have person sip a glass of water if able to swallow.  
Do not induce vomiting unless told to do so by a poison control center or doctor.  
Do not give anything by mouth to an unconscious person.
- IF INHALED:** Move person to fresh air.  
If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.  
Call a poison control center or doctor for further treatment advice.
- IF ON SKIN OR CLOTHING:** Take off contaminated clothing.  
Rinse skin immediately with plenty of water for 15-20 minutes.  
Call a poison control center or doctor for treatment advice.
- IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15-20 minutes.  
Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.  
Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-866-303-6950 for emergency medical treatment information.

**NOTE TO PHYSICIAN-** This product is a cholinesterase inhibitor. Treat symptomatically. Atropine is antidotal.

**PRECAUTIONARY STATEMENTS**

**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

Harmful by swallowing, inhalation or skin contact. Avoid contact with skin. Avoid breathing spray mist. Do not contaminate food or feed products.

**PERSONAL PROTECTIVE EQUIPMENT**

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category F on an EPA chemical-resistance category selection chart.

**Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants
- Chemical-resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber, or Viton
- Shoes plus socks

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.

**ENGINEERING CONTROLS STATEMENTS**

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets with requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240 (d)(4-6), the handler PPE requirements may be reduced or modified as specified in the WPS.

<p><b>USER SAFETY RECOMMENDATIONS</b></p> <p>User should:</p> <ul style="list-style-type: none"> <li>•Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.</li> <li>•Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.</li> <li>•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.</li> </ul>
---

**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 runoff may be hazardous to aquatic organisms in areas near the application site. Do not contaminate water when disposing of equipment washwaters.

For aquatic uses, do not apply directly to water except as specified on this label.

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.

Protective information can be obtained from your Cooperative Agricultural Extension Service.

**PHYSICAL OR CHEMICAL HAZARDS**

Before using, read the directions contained in this labeling 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.

<p><b>STORAGE AND DISPOSAL</b></p> <p><b>PROHIBITIONS:</b> Do not contaminate water, food or feed by storage or disposal.</p> <p><b>STORAGE:</b> Malathion ULV 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.</p> <p><b>PESTICIDE DISPOSAL:</b> Pesticide, spray mixture, or rinse water that cannot be used according to label instructions may be disposed of on site or at an approved waste disposal facility.</p> <p><b>CONTAINER DISPOSAL:</b> Returnable/refillable: Return to manufacturer for refilling. Disposable: 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.</p>
--

**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, and 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), and restricted-entry interval. The requirements in this box only apply to uses of the product that are covered by the Worker Protection Standard.

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
- Chemical resistant gloves such as barrier laminate, butyl rubber, nitrile rubber, or Viton
- Shoes plus socks.

#### **AGRICULTURAL USES**

Do not use this product for any uses other than those specified on this label.

Malathion ULV is used undiluted in any specially designed aircraft or ground equipment that has been adapted and calibrated for ultra low volume spraying. Spray machines must be equipped with accepted low-volume devices that will produce droplets within the range of 30 to 100 microns in size. 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 mph.

Mist blowers with a pump capable of producing 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 placed into the air blast that produce an efficient spray particle with a mass median diameter of 40 to 100 microns. Other similar application equipment which has demonstrated the capability to deliver even distribution of the labeled rate over the desired area may be used. 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 a 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 - 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.

CROP	PESTS CONTROLLED	FL. OZ. / ACRE	PRE-HARVEST INTERVAL/ COMMENTS
Alfalfa	Alfalfa caterpillars	8	0 days. Apply when larvae are small.
	Western yellow striped armyworms	12	5 days. Apply when larvae are large or when foliage is dense.
	Alfalfa weevil larvae	16	5 days. Apply when day temperature is expected to be above 65° F and when 50-70% of leaves show damage.
	Beet armyworms	8	0 days. Apply when larvae are small.
		16	5 days. Apply when larvae are large or when foliage is dense.
	Grasshoppers	8	0 days.
<i>Do not apply to alfalfa in bloom. Do not apply to seed alfalfa</i>			
Clover; pasture & range grass; grass; grass hay; uncultivated non-agricultural areas (wastelands, roadsides)	Grasshoppers	8-12	0 days. Do not apply to clover in bloom.
Beans (lima, green, snap, navy, red kidney, wax, dry, black-eyed)	Mexican bean beetles, aphids, thrips, spider mites, asparagus beetles, pea weevils, leafhoppers, green cloverworms, Japanese beetles, lygus bugs	8	1 day. Do not graze or feed foliage, vines/ forage, straw/ hay.
Blueberry	Blueberry maggots	10	1 day
Cereal crops (barley, corn, oats, wheat) and grasses	Cereal leaf beetles	4-8	Barley, oats, wheat: 7 days. Corn: 5 days. Grasses: 0 days.
Grain crops (barley, corn, oats, rye, rice, grain sorghum (milo), and wheat)	Grasshoppers	8	7 days except corn. 5 days for corn. Do not graze or feed grain sorghum forage fodder/stover, or hay.
Corn	Adult corn rootworms	4	5 days
Grain sorghum (milo)	Sorghum midges	8-12	7 days. Apply during the bloom stage. Do not graze or feed grain sorghum forage, fodder/stover, or hay.

CROP	PESTS CONTROLLED	FL. OZ./ACRE	PRE-HARVEST INTERVAL/ COMMENTS
Cherries	Cherry fruit flies	12-16	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.
Cotton	Early season insects, thrips, fleahoppers, Leafhoppers	4 - 8	0 days
	Boll weevils	8 - 16 16	0 days. Early to midseason. Late season.
	Grasshoppers	8	0 days
	Lygus bugs	8 - 12 16	0 days 0 days. Very heavy migrating population.
For use on cotton: Malathion ULV can be used alone as a Malathion ULV concentrate spray or diluted in once-refined cottonseed or vegetable oil sufficient to make at least one quart of finished spray per acre.			
Rice - grain from Louisiana, Texas	Rice stink bugs	8	7 days. Apply by aircraft only. Apply during early milk and dough stage of growing rice.
<b>NOTE FOR AQUATIC USES (rice):</b> 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 leafhoppers on wild host plants	8	0 days

#### OTHER AGRICULTURAL USES

**Alfalfa, clover, pasture and range grass, grass and grass hay, grain crops (barley, corn, oats, rye, rice, sorghum/milo, wheat), beans, and non-agricultural lands (wasteland):**

Adult mosquitoes and flies - Apply Malathion ULV at the rate of 2 to 4 fluid ounces per acre 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 or 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. Do not graze or feed grain sorghum forage, fodder/stover, or hay.

#### MOSQUITO CONTROL

**Mosquito control in populated and rural areas**

**IMPORTANT NOTICE: TO BE APPLIED ONLY BY TRAINED PERSONNEL OF PUBLIC HEALTH ORGANIZATIONS, MOSQUITO ABATEMENT DISTRICTS OR PEST CONTROL OPERATORS.**

**NOTE FOR AQUATIC USES:** 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.

#### 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:** IN AREAS WHERE AUTOMOBILES, TRAILERS, TRUCKS AND PLEASURE BOATS ARE PRESENT, 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 following specifications:

**Fixed Wing Aircraft**

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 Malathion ULV does not exceed 3 fluid ounces per acre.
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™ or TEFLON™.

**Helicopter**

Equipment Specifications:

1. Rotary nozzle equivalent to Beecomist Spray Head Assembly Model No. 350 equipped with:
  - a) A direct reading RPM tachometer or low RPM signal light readily visible to operator.
  - b) A stainless steel porous metal sleeve, 20 micron pore size, dynamically balanced to the nozzle.
  - c) A diaphragm check valve as near to the rotary nozzle as possible to ensure positive cut-off of the spray.
  - d) A nozzle on-off switch separate from main switch and pump switch.
2. Minimum no-load nozzle speed of 10,500 RPM.
3. A continuous non-pulsating 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 0.5 gallon per minute per nozzle.
5. Rotary nozzle must be mounted behind and below the boom with the 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 prefiltered through a 10 micron filter prior to transfer into aircraft tank when using the rotary type nozzles described above. 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 cleared 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 100 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 - 8 oz. actual / gallon (3.9 - 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 - 400



feet.

\*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.

#### Nonthermal Aerosols

Adult Mosquito Control - Control of adult mosquitoes over a 300-foot swath can be obtained with nonthermal aerosols of Malathion ULV using the following rates at the indicated vehicle speeds:

Vehicle Speed – Miles per Hour	Flow Rate of Malathion - Fl. oz./Min.	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 Flies, Outdoors

Control of adult stable flies around the outside of stables over a 300-foot swath can be obtained, with nonthermal aerosols of Malathion ULV using the ultra low volume method. Use the following flow rates at the indicated vehicle speeds:

Vehicle Speed - Miles per Hour	Flow Rate of Malathion – Fl. oz./Min.	Maximum Flow - Rate per Hour
5	2.1	1 gallon
10	4.3	2 gallons

#### Adult Mosquitoes and Flies on Rangeland, Pasture, and Other Uncultivated Non-Agricultural Areas (Wastelands, Roadsides)

Apply Malathion ULV at the rate of 2 to 4 fluid ounces per acre for control of both adult mosquitoes and flies. Application may be made via ground or aerial equipment and may be repeated as necessary.

For enhanced knock-down effects against mosquitoes and flies, Malathion ULV can be mixed with a synergized pyrethrin emulsifiable concentrate (6% pyrethrin + 60% PBO) in accordance with the most restrictive of label limitations and precautions indicated on both this and the tank-mixed product. No label rates should be exceeded. This product may not be mixed with any product bearing a label which specifically prohibits such mixing. Prior to tank mixing large quantities, mix a small amount in a glass jar to verify that the products are physically compatible.

A tank mix of these may be prepared as follows:

Component	Rapid knock-down	Improved knock-down
Malathion ULV	107 fl. oz.	117 fl. oz.
Synergized pyrethrin (6%/ 60%)	21 fl. oz.	11 fl. oz.

Depending upon your operational needs for knock-down, the amount of synergized pyrethrin can be reduced or adjusted. Application rates of Malathion ULV and droplet distribution requirements remain the same as for Malathion ULV used alone.

#### 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 are drop sizes

below the MMD and 50% are 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 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 must consist of droplets not exceeding 24 microns in range.

#### **OPERATING EQUIPMENT**

Each nonthermal 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 obstructions in the spray system; to detect whether the nozzle, hoses, or other parts are worn and need replacement; to insure that the flow meter is properly calibrated and to determine that the pressure recommended by the manufacturer is being maintained.

- |                         |  |
|-------------------------|--|
| <b>Flow Rate</b>        | - Must be regulated by accurate flow meter<br>- Not greater than 1 gallon per hour at 5 mph; 2 gallons per hour at 10 mph; 3 gallons per hour at 15 mph, or 4 gallons per hour at 20 mph |
| <b>Nozzle Direction</b> | - Rear of the vehicle<br>- Upward at an angle of 45° or more   |
| <b>Vehicle Speed</b>    | - Not greater than 20 mph<br>- 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 label are met. If accidental exposure does occur, the vehicle should be washed at once.

#### **DIRECTIONS FOR DETERMINING THE DROPLET SIZE OF MALATHION ULV NONTHERMAL AEROSOLS**

**NOTE:** Other methods of determining droplet size may also be used. Such methods must first be validated by the user, to ensure droplet sizes are within label parameters. Permanent records of each droplet size determination must be kept and made available to Cheminova upon request.

##### **1. 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 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.

##### **2. Deposition of Malathion ULV 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 ULV aerosol is deposited on a slide by passing the slide as rapidly as possible perpendicular through the aerosol cloud at a distance of 6 to 10 feet from the point of discharge. The slide speed 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 sufficient height to obtain a representative sample of the aerosol.

### 3. 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 division 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 ULV 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 X the 0.5 spread factor).

The spread factor for TEFLON - coated slides is 0.69. The following procedure, as 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 had a diameter of 19 eyepiece divisions. Therefore, the maximum diameter is 33.3 microns ( $19 \times 1.75 = 33.3$ ).

To determine the Mass Median Diameter (MMD), the accumulative percentages from the last column in Table 1 are plotted against the eyepiece division (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.

**Table 1**

Representative Count of Malathion ULV Aerosol Droplets Impinged on Microscope Slides Coated with DRI-FILM

Eyepiece Divisions (D)*	No. of Droplets (N)	D x N	% of Total $\frac{D \times N}{\text{Sum } (D \times N)}$	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	4.4	15.09
7	25	175	10.7	25.79

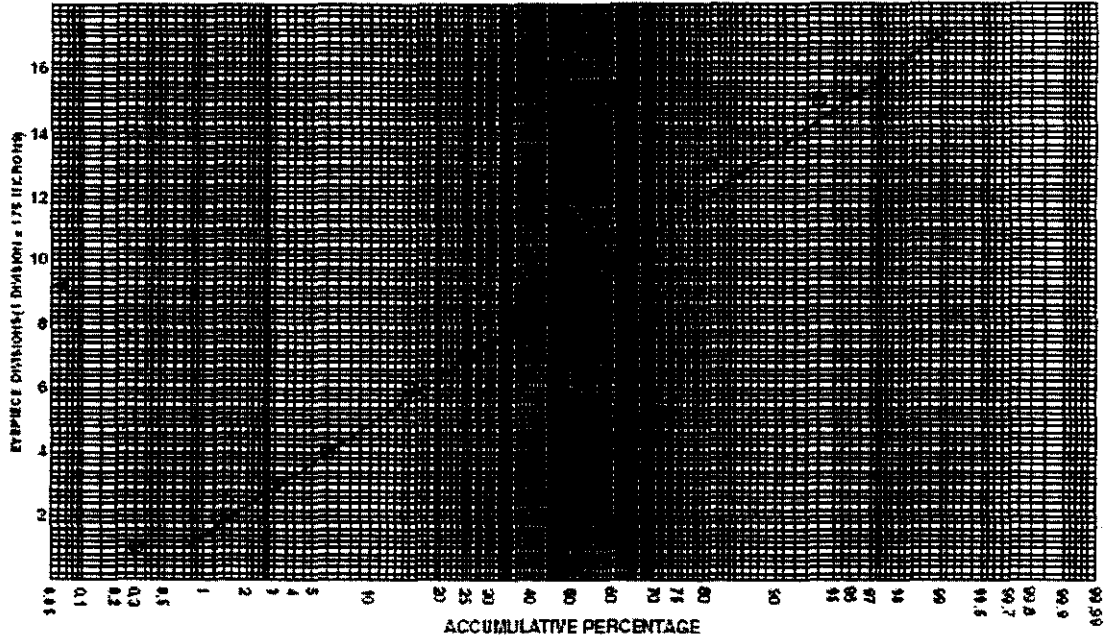
12/13

<b>Eyepiece Divisions (D)*</b>	<b>No. of Droplets (N)</b>	<b>D x N</b>	<b>% of Total D x N Sum (D x N)</b>	<b>Accumulative Percentages</b>
8	14	112	6.85	32.64
9	28	252	15.4	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	165	10.09	94.67
16	2	32	1.96	96.63
18	2	36	2.2	98.83
19	1	19	1.16	99.99
<b>TOTAL</b>	<b>199</b>	<b>1636</b>		

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

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

**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.



**DISCLAIMER**

The label instructions for the use of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, automobile paint damage, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Cheminova. All such risks shall be assumed by the user.

Cheminova 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 subject to the risks referred to above.

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 or any other special or indirect damages.

CHEMINOVA makes no other express or implied warranty of FITNESS or MERCHANTABILITY. The sale of this product does not include a license under any patent owned by Cheminova.

DRI-FILM is a trademark of General Electric Company  
TEFLON is a trademark of E.I. duPont de Nemours & Co., Inc.

5/21/2003 – Update per May 2, 2003 letter from EPA