

83222-22

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U.S. ENVIRONMENTAL PROTECTION AGENCY

Office of Pesticide Programs
Registration Division (7505P)
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

EPA Reg. Number:

83222-22

Date of Issuance:

FEB 23 2010

NOTICE OF PESTICIDE:

Registration
 Reregistration
(under FIFRA, as amended)

Term of Issuance:

Conditional

Name of Pesticide Product:

Mepiquat Chloride 4.2%

Name and Address of Registrant (include ZIP Code):

J. Oliver Products, Inc.
3187 Robertson Gin Road
Hernando, MS 38632

Mailed to: Jane Miller
115 Obtuse Hill
Brookfield, CT 06804

Note: Changes in labeling, differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product, always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered under the Federal Insecticide, Fungicide and Rodenticide Act. Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA section 3(c)(7)(A) provided that you:

1) Submit and/or cite all data required for registration of your product under FIFRA section 3(c)(5) when the Agency requires all registrants of similar products to submit such data; and submit acceptable responses required for reregistration of your product under FIFRA section 4.

2) You must submit two copies of a final printed label within 30 days from the date of this notice which makes the following changes:

..... Continued on Page 2

Signature of Approving Official:

Shaja B. Joyner, Product Manager (20)
Fungicide Branch, Registration Division (7505P)

Date:

FEB 23 2010

- A. On page 1 of the labeling,
 - Change the EPA registration number to 86461-6.

- B. On page 2 of the labeling,
 - Add the heading "User Safety Requirements" prior to the text starting "Follow the manufacturer's instructions".

 - Insert the word "exist" in the second sentence of the User Safety Requirements following "If no such instructions".

- C. On page 3 of the labeling,
 - Within the "User Safety Recommendations" box, in the second bullet add "/PPE" following "Remove clothing".

 - Within the "Environmental Hazards" section, replace "disposing or equipment washwaters" with "disposing of equipment washwaters or rinsate".

- D. On page 4 of the labeling,
 - Delete the container information for sizes greater than 5 gallons. Your application indicated that the product will not be sold in container sizes greater than 5 gallons.

 - Replace "often results" with "may result" in the final sentence starting "These benefits can",

- E. On page 5 of the labeling,
 - Replace the word "dosages" with "applications" in the first sentence of the first paragraph within the Application Instructions section.

 - Replace "poor fruit load" with "poor boll load" in the last sentence of the paragraph starting "Fields should be", within the Application Instructions section.

- F. On page 6 of the labeling,
 - In the paragraph starting "Some of these effects", replace "suggested" with "specified" in the final sentence.

- G. On page 7 of the labeling,
 - In the first paragraph, in the sentence starting "Do not apply", insert the word "by" following Mepiquat Chloride 4.2%".

 - Under the header "Spray Drift Management" within the Aerial application methods and equipments; for item #2, replace the word "should" with "must" in the sentences starting "where states have more".

- H. On page 8 of the labeling,
 - In the sentence directly following the Table 1 header, replace the word "should" with "must".

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I. On page 9 of the labeling,

- Amend the header for Table 2 by adding "High rate, less frequent applications". Also replace "should" with "must" in the sentence starting with "The times and rates", following the Table 2 header.

J. On page 10 of the labeling,

- Repeat the Table 2 column and row headers (geographic area, time of application, rate per acre) from page 9 so that it appears above the final table row shown on page 10.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions. A stamped copy of the label stamped "Accepted with Comments" is enclosed for your records. If you have any questions, please contact Shaunta Hill at 703-3437-8961 or by email at hill.shaunta@epa.gov.

Shaja B. Joyner
Product Manager (20)
Fungicide Branch
Registration Division (7505P)

40915

(FRONT BOTTLE LABEL)

MEPIQUAT CHLORIDE 4.2%

Plant Growth Regulator

For Use On Cotton

Active Ingredient:	
Mepiquat Chloride: N,N-dimethylpiperidinium chloride.....	4.2%
Inert Ingredients:	<u>95.8%</u>
Total	100.0%

*Equivalent to 0.35 pounds of active ingredient per gallon.

KEEP OUT OF REACH OF CHILDREN

CAUTION

See inside booklet for complete **Precautionary Statements** and **Directions for Use.**

EPA Registration Number 83222-XX
EPA Establishment Number XXXXX-XX-XXX

NET CONTENTS:
LOT NUMBER:

Manufactured By:
J. Oliver Products, Inc.
3187 Robertson Gin Road
Hernando, MS 38632

ACCEPTED
with COMMENTS
In EPA Letter Dated
FEB 23 2010

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

83222-22

(BOOKLET)

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

Caution. Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing.

FIRST AID	
If in eyes:	Hold eyelid 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.
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 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.
Hot Line Number	
Have product container or label with you when calling a poison control center or doctor or going for treatment.	

Personal Protective Equipment (PPE)

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

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves (such as nitrile, butyl, neoprene and/or barrier laminate)
- Shoes plus socks

Follow the 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 Statement

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 pesticide [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- 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

Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

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. 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 this product that are covered by the Worker Protection Standard.

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 made of any waterproof material.
- Shoes plus socks.

Storage and Disposal

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

Pesticide Storage: Do not store below 32° F or above 100° F. Store in a dry place away from heat or open flame.

Pesticide Disposal: Pesticide wastes are toxic. Wastes resulting from this product may be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide spray mix, or rinsate is a violation of Federal law. If these wastes cannot be disposed of according to label instructions, contact the state agency responsible for pesticide regulation of the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal: Nonrefillable Container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Then offer for recycling, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Containers 5 gallons or less: Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Containers larger than 5 gallons: Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

I. GENERAL INFORMATION

MEPIQUAT CHLORIDE 4.2% is a foliar applied plant regulator that modifies the cotton plant in several beneficial ways. It allows the grower to manage the cotton plant for **short-season production** leading to reduced risk of yield and quality loss due to delayed and prolonged harvest. Additional benefits derived from the use of this product include:

- height reduction and more canopy
- better early boll retention and/or larger bolls
- less boll rot
- improved defoliation
- reduced trash and lower ginning costs
- better harvest efficiency
- darker green leaf color

These benefits can provide for earlier maturity and often result in improved yields.

Spray Coverage

Under most circumstances, water is the recommended diluent, however, oil is permitted in the following states for ultra low volume (ULV) aerial applications: Alabama, Arkansas, Florida, Georgia, Louisiana, Missouri, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. Refer to **Air and Ground Application** sections for spray volumes.

Regardless of method or gallonage of application, thorough coverage of the cotton foliage is required.

Cleaning Application Equipment

Clean application equipment thoroughly using a strong detergent or commercial sprayer cleaner according to the manufacturer's directions before and after applying this product, particularly if a product with the potential to injure crops was used.

II. APPLICATION INSTRUCTIONS

Early Application

On both short-staple and Pima cotton, the grower has the option of low-rate multiple applications (see **Table 1**) or higher, less frequent dosages (see **Table 2**) which greatly facilitates his management flexibility. The multiple application option gives the producer the ability to discontinue usage of **MEPIQUAT CHLORIDE 4.2%** if any significant stresses occur after an earlier application. In such a case, the total quantity of **MEPIQUAT CHLORIDE 4.2%** used over a season may be reduced. If stress is relieved, the grower has the option of continuing treatments with **MEPIQUAT CHLORIDE 4.2%**. In addition, the rate and timing ranges indicated in the **Application Rates and Timings Tables** allow the grower to tailor his usage of **MEPIQUAT CHLORIDE 4.2%** to the degree of vegetative vigor in a given field. In areas where insecticides, miticides or foliar fertilizers are frequently applied, the timings are such that tank mixing is often possible. (See section **VII. General Restrictions and Limitations**).

Fields should be carefully scouted and **MEPIQUAT CHLORIDE 4.2%** should not be applied if plants are under severe stress from weather factors, mite, insect or nematode damage, disease stress, herbicide injury, or fertility stress. In the absence of these stresses, up to 5 low-rate multiple applications can be made each season. After the first application (at matchhead square in the absence of stress), the rate and timing of subsequent applications will depend on vegetative vigor. Under good growing conditions, additional treatments should be made at 7-14 day intervals. However, if new growth at any time is excessive, higher rates of **MEPIQUAT CHLORIDE 4.2%** can be used. If significant loss of squares or young bolls has occurred earlier due to insect pressure or other stresses, but now these stresses have all been alleviated, the need for **MEPIQUAT CHLORIDE 4.2%** is increased – excess vegetative growth is likely because of poor fruit load.

Late Season Application

Late application of **MEPIQUAT CHLORIDE 4.2%** (approximately during the fourth to sixth week of blooming) can provide certain benefits to cotton. However, it should not and does not substitute for early season use – the time of the greatest benefit from the use of **MEPIQUAT CHLORIDE 4.2%**. Late season application can lead to one or more of the following:

- reduction in late season vegetative growth or regrowth after cutout or defoliation
- more complete and manageable cutout
- better defoliation
- earlier maturity
- reduction in trash
- lower ginning costs

Some of these effects may favorably influence the yield potential and fiber quality. A late season application of **MEPIQUAT CHLORIDE 4.2%** should be applied only if fields are not drought or nutrient stressed; that is, those fields likely to experience additional vegetative growth or regrowth. However, fields that are very rank and extremely vigorous due to a combination of poor boll load and excellent growing conditions may not respond as much as desired to late season applications at the suggested rates.

Timing for Late Season Applications

- **On fields where cotton cuts out and then starts regrowth:** Apply when regrowth begins, as evidenced by new leaves in the terminal and stem elongation. This application time is often, but not always, 5-6 weeks after the first bloom.
- **On fields where cotton never completely cuts out:** Apply **MEPIQUAT CHLORIDE 4.2%** when there are 4-6 nodes above the white flower (NAWF). Measure NAWF by counting the number of mainstem nodes from the first position white bloom (the one closest to the mainstem) to the terminal. Count the node with the first position white bloom as zero and the last node in the terminal, which is counted, should have a leaf at least the size of a quarter. Generally, the NAWF first reaches 4-6 nodes during the fourth to sixth week of bloom.

During this time, the NAWF should be decreasing about one node every 5-6 days – if its rate of decrease is less, the plant is not cutting out soon enough (the crop is too vigorous). If the fifth week of bloom arrives and NAWF is still above 5-6, apply **MEPIQUAT CHLORIDE 4.2%**.

Use Rate for Late Season Application

Apply 8-24 fluid ounces of **MEPIQUAT CHLORIDE 4.2%** per acre. Use the lower rate on cotton with only moderate additional growth potential, and the higher rate on fields likely to continue vigorous growth.

AIR APPLICATION

Spray Volume

- **Water as Diluent:** Use a minimum of 2 gallons of water per acre in all states except California. In California, use a minimum of 5 gallons of water per acre.
- **Oil as Diluent:** Use a minimum of 1 quart of oil per acre. When using oil as a diluent, the oil concentrate must contain either a petroleum or vegetable oil base and must meet all of the following criteria:
 - be nonphytotoxic
 - contain only EPA-exempt ingredients
 - provide good mixing quality in the jar test
 - be successful in local experience

The exact composition of suitable products will vary; however, vegetable and petroleum oil concentrates should contain emulsifiers to provide good mixing quality. If the oil does not contain an emulsifier, one must be added during mixing at a volume equal to 3% of the final volume of the mixing tank. Do not apply **MEPIQUAT CHLORIDE 4.2% ULV** without using emulsifiers. Highly refined vegetable oils have proven more satisfactory than unrefined vegetable oils. For additional information, see **Compatibility Test for Mix Components**.

AERIAL APPLICATION METHODS AND EQUIPMENT

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

1. The distance of the outer most nozzles on the boom must not exceed $\frac{3}{4}$ the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downward more than 45 degrees. Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the publication titled A Summary of Aerial Application Studies by the Spray Drift Task Force.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying the larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversion section of this label).

Controlling Droplet Size

Volume – Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets. Use a minimum of 2 gallons of water per acre. Increase water volume to at least 10 gallons of water per acre if grass foliage or crop canopy is dense.

Pressure – Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure. Use up to 40 psi.

Number of Nozzles – Use the minimum number of nozzles that provide uniform coverage.

Nozzle Orientation – Orienting nozzles so that the spray is released backward, parallel to the airstream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.

Nozzle Type – Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types. Use only diaphragm-type nozzles that produce fan spray patterns.

Boom Length – For some use patterns, reducing the effective boom length to less than ¾ of the wingspan or rotor length may further reduce drift without reducing swath width.

Application – Applications should not be made at a height greater than 10 feet above the top of the largest plants. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment

When applications are made with a cross-wind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. Do not apply **MEPIQUAT CHLORIDE 4.2%** by aircraft when wind is blowing more than 10 mph. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Table 1. Application Rates and Timings: Low Rate Multiple Applications

The times and rates of application have been carefully researched and the **Directions for Use** should be observed as specified below. See section VI. **General Restrictions and Limitations.**

Geographic Area	Time of Application	Fields with Moderate Vegetative Vigor: Rate Per Acre	Fields with High Vegetative Vigor: Rate Per Acre
AL, AR, AZ, CA, FL, GA, LA, MO, MS, NC, NM, OK, SC, TN, TX, VA	First Application: Optimal results will be achieved when plants are in the matchhead square ¹ stage of growth	2 fluid ounces	4 fluid ounces
	Second Application: 7-14 days later, or when regrowth occurs.	2 fluid ounces	4 fluid ounces
	Third Application: 7-14 days later, or when regrowth occurs.	2-4 fluid ounces ²	4-8 fluid ounces ²
	Fourth Application: 7-14 days later, or when regrowth occurs.	2-8 fluid ounces ²	4-12 fluid ounces ²
	Fifth Application (if needed): 7-14 days later, or when regrowth occurs.	4-8 fluid ounces ²	4-12 fluid ounces ²
	Late Season: Refer to Late Season Application of MEPIQUAT CHLORIDE 4.2%	8-16 fluid ounces ²	12-24 fluid ounces ²

¹ Matchhead square is when the first square of a typical cotton plant is 1/8-1/4 inches in diameter. The first application should be applied when 50% of the plants have one or more matchhead squares.

² Use higher rates if previous application was not made or if growing conditions are conducive to vigorous growth.

Table 2. Application Rates and Timing

The times and rates of application have been carefully researched and section II. **Application Instruction** should be observed as specified below. See section VI. **General Restrictions and Limitations**.

Geographic Area	Time of Application	Rate Per Acre
AL, AR, AZ, CA, FL, GA, LA, MO, MS, NM, NC, SC, TN, VA	<p>First Application: Apply MEPIQUAT CHLORIDE 4.2% to actively growing cotton that is 20-30" tall, provided cotton is not more than 7 days beyond early bloom stage (5-6 blooms per 25 row feet). If cotton is 24" tall and has no blooms, apply MEPIQUAT CHLORIDE 4.2%. Use 8-16 fluid ounces per acre on cotton where excessive vegetative growth is not likely to be a problem, and 16 fluid ounces per acre in areas tending to have excessive vegetative growth.</p>	8-16 fluid ounces
	<p>Second Application for Control of Excessive Vegetative Growth: If the cotton field has a history of vigorous growth or if conditions after the first application of MEPIQUAT CHLORIDE 4.2% favor vigorous growth, make a second application 2-3 weeks after the first application.</p>	8-16 fluid ounces
	<p>Third Application for Control of Excessive Vegetative Growth: If the cotton field has a history of vigorous growth or if conditions continue to favor vigorous growth, make a third application 1-2 weeks after the second application.</p>	8-16 fluid ounces
	<p>Late Season Application: Refer to Late Season Application in section II. Application Instructions.</p>	8-24 fluid ounces
OK, TX (except Rio Grande Valley)	<p>Areas Where Excessive Vegetative Growth is Not a Problem First Application: Apply MEPIQUAT CHLORIDE 4.2% to actively growing cotton in the early bloom stage (5-6 blooms per 25 row feet). If no blooms are present and the cotton is 20" tall and actively growing, apply MEPIQUAT CHLORIDE 4.2%.</p>	8 fluid ounces
	<p>Second Application: If conditions after the first application of MEPIQUAT CHLORIDE 4.2% favor vigorous growth, make a second application 2-3 weeks after the first application.</p>	8 fluid ounces
	<p>Third Application: If conditions after the second application of MEPIQUAT CHLORIDE 4.2% continue to favor vigorous growth, make a third application 1-2 weeks after the second application.</p>	8 fluid ounces
	<p>Late Season Application: Refer to Late Season Application in section II. Application Instructions.</p>	8-24 fluid ounces
OK, TX (including Rio Grande Valley)	<p>Areas Where Excessive Vegetative Growth is a Problem First Application: Apply MEPIQUAT CHLORIDE 4.2% to actively growing cotton that is 20-30" tall, provided cotton is not more than 7 days beyond early bloom stage (5-6 blooms per 25 row feet). If cotton is 24" tall and has no blooms, apply MEPIQUAT CHLORIDE 4.2%.</p>	16 fluid ounces
	<p>Second Application for Control of Excessive Vegetative Growth: If cotton field has a history of vigorous growth, or conditions after the first application of MEPIQUAT CHLORIDE 4.2% favor vigorous growth, make a second application 2-3 weeks after the first application.</p>	8-16 fluid ounces
	<p>Third Application: If conditions after the second application of MEPIQUAT CHLORIDE 4.2% continue to favor vigorous growth, make a third application 1-2 weeks after the second application.</p>	8-16 fluid ounces

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	Late Season Application: Refer to Late Season Application in section II. Application Instructions.	8-24 fluid ounces
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Temperature and Humidity

When making applications in low relative humidity, set equipment up to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion, because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light and variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

The pesticide should only be applied when the potential for drift to adjacent areas, (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, nontarget crops) is minimal (e.g. when wind is blowing away from the sensitive areas). Do not apply **MEPIQUAT CHLORIDE 4.2%** by air if sensitive species are within 200 feet.

GROUND APPLICATION

Spray Volume

- **Water as Diluent:** Use 2 gallons of spray solution per acre in all states except California. In California, use a minimum of 5 gallons of spray solution per acre.

III. ADDITIVES

If rain is expected within 8 hours, use a high-quality EPA-exempt surfactant to make **MEPIQUAT CHLORIDE 4.2%** rain-safe after 4 hours.

Compatibility Test for Mix Components

Add components in the following sequence using 2 teaspoons for each pound or 1 teaspoon for each pint of recommended label rate per acre.

1. **Water** – for 20 gallons per acre spray volume, use 3.3 cups (800 ml) of water. For other spray volumes, adjust rates accordingly. Use only water from the intended source at the source temperature.
2. **Products in PVA Bags** – Cap the jar and invert 10 cycles.

3. **Water-Dispersible Products** – (dry flowables, wettable powders, suspension concentrates, or suspo-emulsions) Cap the jar and invert 10 cycles.
4. **Water-Soluble Products** – (such as **MEPIQUAT CHLORIDE 4.2%**) Cap the jar and invert 10 cycles.
5. **Emulsifiable Concentrates** – (oil concentrate) Cap the jar and invert 10 cycles.
6. **Water-Soluble Additives** – Cap the jar and invert 10 cycles.
7. Let the solution stand for 15 minutes.
8. **Evaluate** the solution for uniformity and stability. The spray solution should not have free oil on the surface, nor fine particles that precipitate to the bottom, not thick (clabbered) texture. Do not use any spray solution that could clog spray nozzles.

IV. MIXING ORDER

1. **Water:** Begin by agitating a thoroughly clean sprayer tank half full of clean water.
2. **Products in PVA Bags:** Rinse the tank thoroughly before adding any material in PVA bags as boron residue will prevent adequate mixing. Place the water-soluble PVA bag into the mixing tank. The water-soluble PVA bag will dissolve in water to allow the contents to disperse. Wait until all water-soluble PVA bags have fully dissolved and the plant regulator is evenly mixed in the spray tank before continuing.
To prepare spray solution for aerial application, use a mixing tank or mixing vat first to get the product into suspension before transferring suspension to air application equipment.
3. **Water-Dispersible Products:** (dry flowables, wettable-powders, suspension concentrates, or suspo-emulsions).
4. **Water-Soluble Products**
5. **Emulsifiable Concentrates**
6. Remaining quantity water.

Only moderate agitation should be used while mixing and transporting.

V. GENERAL TANK MIXING INFORMATION

MEPIQUAT CHLORIDE 4.2% has an aqueous base, and as such, is compatible with most insecticides and miticides. You may combine **MEPIQUAT CHLORIDE 4.2%** with foliar fertilizers if prior experience has shown the original liquid formulation of **MEPIQUAT CHLORIDE 4.2%** to be compatible and noninjurious under your conditions. Always perform a **Compatibility Test for Mix Components** before preparing a tank mix application.

Read and follow the applicable **Restrictions and Limitations** and **Directions for Use** on all products involved in tank mixing. The most restrictive labeling applies to tank mixes.

VI. GENERAL RESTRICTIONS AND LIMITATIONS

- Maximum seasonal use rate: Do not apply more than a **total of 48 fluid ounces (3 pints) of MEPIQUAT CHLORIDE 4.2% plant regulator** (0.132 pounds a.i.) per acre, per season.
- The sum of all products and formulations containing mepiquat chloride must not exceed **0.132 pounds** of mepiquat chloride per acre per season.
- **Preharvest Interval (PHI):** Do not apply within **30 days** of harvest.
- **Restricted Entry Interval (REI): 12 hours**
- Do not plant another crop within 75 days of last treatment.
- **Stress:** Do not apply to cotton plants under severe stress due to adverse weather conditions, mite, insect, or nematode damage, disease, herbicide injury, or fertility stress. If using the low-rate multiple option, discontinue use until the stress is alleviated. Do not apply a single application of 8-16 fluid ounces of **MEPIQUAT CHLORIDE 4.2%** to cotton that is stressed due to lack of soil moisture.
- Do not graze or feed cotton forage to livestock.
- Do not apply through any type of **irrigation** equipment.

Table 3. Restrictions and Limitations

Crop	Minimum Time from Application to Harvest (PHI)	Maximum Rate Per Acre Per Application	Maximum Rate Per Acre Per Season	Livestock Grazing or Feeding	Aircraft Application
Cotton	30 days	24 fluid ounces (1.5 pints)	48 fluid ounces (3 pints)	No	Yes

CONDITIONS OF SALE AND WARRANTY

The **Directions For 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, ineffectiveness, or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or use of the product in a manner inconsistent with its labeling, all of which are beyond the control of J. Oliver Products, Inc. or Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer. J. Oliver Products, Inc. warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks, referred to above. J. Oliver Products, Inc. makes no other express or implied warranty of fitness or merchantability or any other express or implied warranty. To the extent consistent with applicable law, in no case shall J. Oliver Products, Inc. or the Seller be liable for consequential, special, or indirect damages resulting from the use or handling of this product. J. Oliver Products, Inc. and Seller offer this product and the Buyer and User accept it, subject to the foregoing **Conditions of Sale and Warranty**, which may be varied only by agreement in writing signed by a duly authorized representative of J. Oliver Products, Inc..